



SWIFTLOCK DUACLAVE

SECURE-TOUCH+ TOUCHSCREEN CONTROL

AUTOFILL STERILIZER

FRONT-LOADING DOUBLE AUTOCLAVES 120 & 153 Litre x2



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Instruction Manual INSTALLATION OPERATION MAINTENANCE FAQ

**Part No mxn746-d01ed a Swiftlock
Duaclave #6&7 autofill & Dir
Steam.doc**

CE 0120 (MDD)

CE 0353 (PED)

**For the associated
"SECURE-TOUCH
CONTROL SYSTEM
PROGRAMMING MANUAL "
See Part No. MXN782**

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DUACLAVE Innovative Dual chamber sterilizers

INTRODUCTION

Where space is limited the Duaclave double chamber autoclave provides the ideal solution offering two identical chambers with a footprint of only one autoclave

These machine are available with various options and accessories, including Assisted Air Cooling, Load Sensed Process Timing, Advanced Water Cooling, Pulsar Free Steaming, Data Recording devices etc.

- Suitable for a wide range of Laboratory applications
- Ultra Quick Swiftlock Door Mechanism
- Fully Programmable Touch Screen Controller
- Guaranteed precision in sterilization
- PIN Restricted User Programming with
- Holdwarm / Delayed Start, Timed Free Steaming, Cooling Locks
- Full Range of Options & Accessories

Optional Extras

Integral Data Printer

IQ/OQ Documentation

Direct Steam (heating option)

Load Sensed Process Timing RS232 Interface

Ethernet Interface

Pictured right: An ASB270BTDV fitted with the printer option



Technical details

Model No.	Volume (Litres)	Internal Chamber dims (dia x depth)	Overall Dims wxhxd	Power Supply Heaters in Chamber
ASB260BTDV 3 phase 415V	120 (x2)	450 x 635 (x2)	685 x 1855 x 1310	3 Phase 380-440 v15Amps x2 off (each chamber has a separate supply)
ASB260BTDV Single phase 230V	120 (x2)	450 x 635 (x2)	685 x 1855 x 1310	1 Phase 27Amps x2 off (each chamber has a separate supply)
USB260BTDV 3 Phase 208V	120 (x2)	450 x 635 (x2)	685 x 1855 x 1310	3 Phase 208v 27Amps x2 off (each chamber has a separate supply)
ASB270BTDV Single phase 230V	153 (x2)	450 x 865 (x2)	685 x 1855 x 1310	3 Phase 380-440 v15Amps x2 off (each chamber has a separate supply)
ASB270BTDV Single phase 230V	153 (x2)	450 x 865 (x2)	685 x 1855 x 1310	1 Phase 27Amps x2 off (each chamber has a separate supply)
USB270BTDV 3 Phase 208V	153 (x2)	450 x 865 (x2)	685 x 1855 x 1310	3 Phase 208v 27Amps x2 off (each chamber has a separate supply)

WARNING IEC61010

In accordance with IEC61010

The safety features and protection for the operator in this equipment are only designed to operate when the equipment is used in the way described in these instructions. & if used in any way not specified such protection may be impaired.

GENERAL OPERATION & LOG-BOOK

Although the safety record of laboratory Sterilizers is good, remember at all times that they store considerable potential energy, and should be treated with respect and care . If correctly used and cared for, your Sterilizer will give you long and safe service .

Pay proper attention to regular maintenance . Never force the locking mechanism, or operate the machine with any leaks, or incorrectly operating parts.

Report any defects to your Supervisor . If deterioration or defects are noticed, record them in a log book and contact our Service Department .

Record also the results of annual and periodic inspections . Every 4 to 6 weeks is recommended. Check the logbook before you start using the machine, as someone else may have recorded a fault of which you are not aware.]

DOCUMENT ISSUES AND DETAILS

Date	Issue & Edition	Filename	Details of changes and revisions + software issues & notes
03012013	P01 ed A	mxn746-d01ed a Swiftlock Duaclave #6&7 autofill & Dir Steam.doc	Original issue based on mxn734-p02ed a B&R machine #5-10 auto-fill & Dir Steam.doc

SAFETY VALVE TESTING

**This machine contains a Safety Valve
(PRESSURE RELIEF SAFETY VALVE)**

To comply with typical safety regulations this must be kept in a serviceable condition and must be regularly tested. Test periods depend upon local regulations ,;-

Astell Scientific advise that the Safety Valve should be tested every 3 months.

A special SAFETY VALVE TEST CYCLE is provided to make this easier,

This is accessed from the ENGINEER level.

SAFETY VALVE LOCATION

The Safety Valve is situated in different positions depending upon model specification and size. & is mounted at the rear or the side discharging downwards in a position allowing access for servicing

All models – have an Automatic Safety Valve Test Warning System and monitor the date of the last Safety Valve Test Cycle.

At Power-On & Cycle Start the system checks the current date and shows a warning after the 3 month period has elapsed,

Note that this period is fixed to meet the requirements of most countries for Steam Safety Valve Testing.

The only way to cancel this warning is to run a Safety valve Test Cycle.

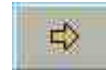
IMPORTANT *
**THE MACHINE MUST BE
ATTENDED AT ALL TIMES
UNTIL TEST IS COMPLETED.**

Safety Valve Test

TOUCH



SELECT “SETTINGS”



TOUCH

**SELECT “SITE ENGINEER”
ENTER “333333”**

SELECT “EDIT MACHINE SETTING”

**SELECT “TEST CYCLE”
(Background Turns Green)**

TOUCH



(3 Times = Return To Main Menu)

CLOSE & LOCK DOOR




TOUCH [to select cycle]

SELECT “TEST CYCLE” ON MENU

**TOUCH “START”
(To Start Cycle)**



TEST CYCLE IS NOW RUNNING

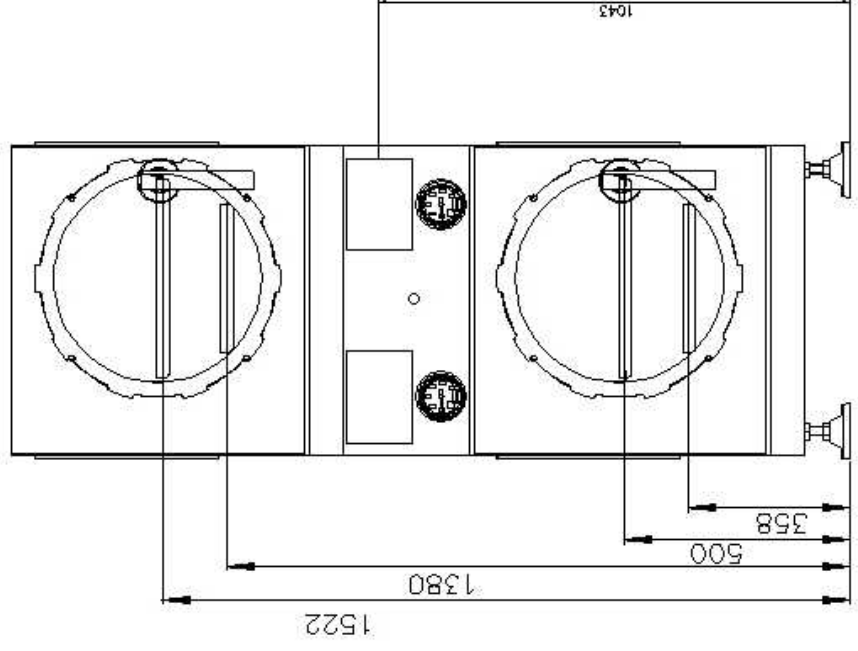
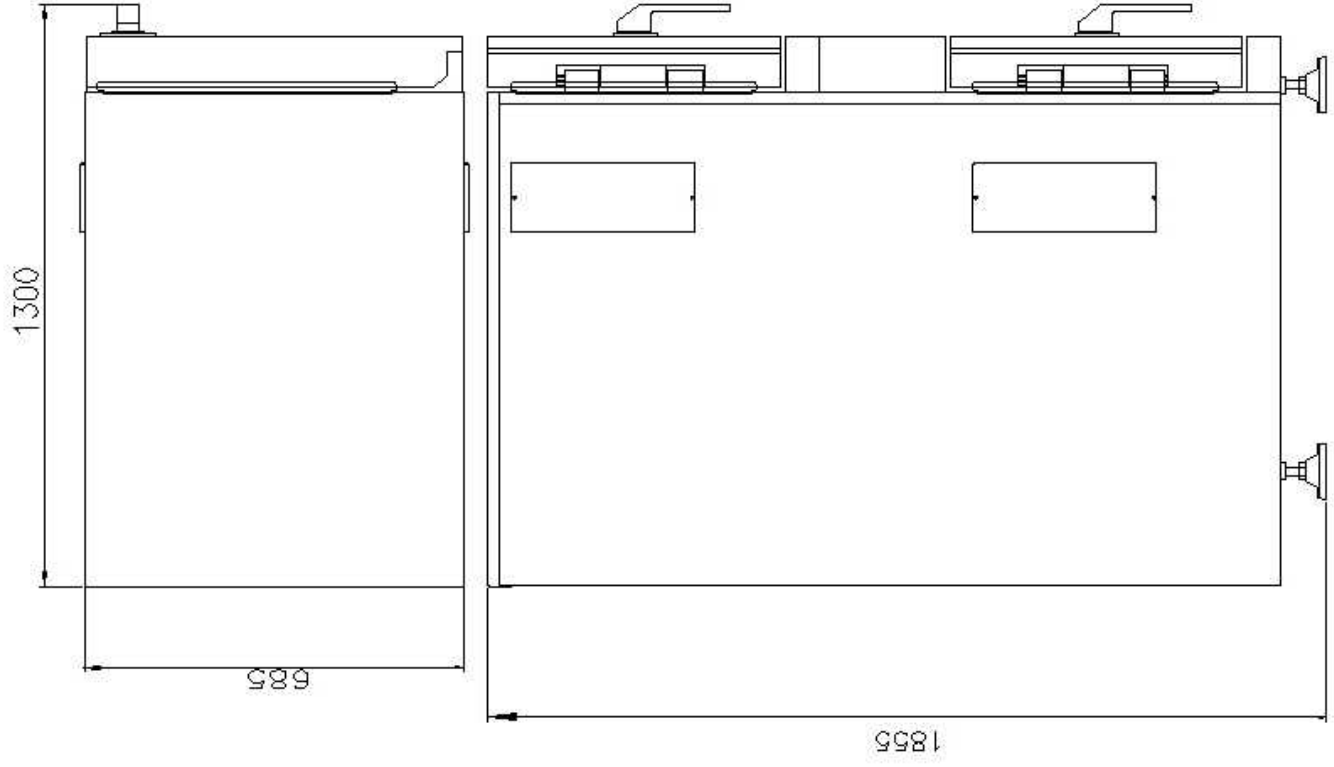
When steam is seen coming from the safety-valve outlet, touch  to terminate the test and advance machine into cooling.

**LEAVE UNTIL COMPLETE
& THEN OPEN DOOR**

**IF THE SAFETY VALVE DOES
NOT OPERATE AT THE
STATED PRESSURE IT MUST
BE CHECKED AND
ADJUSTED BY A QUALIFIED
ENGINEER.**

746-999-435

Astell Duaclave Dimensions Double Swiftlock Sterilizer



INSTALLATION CONNECTION DETAILS 746-999-564

Note— See also Installation Instructions in main Manual Text

2 ELECTRICAL CONNECTIONS:—

2 separate electrical supplies 208v 3 Phase + Earth 25/27 Amp each. Please consult the instruction manual and voltage rating plate Before attempting installation of this Autoclave.

MAINS WATER INLET:— Øfor optional Autofill/Drain Cooler)

This is a blue plastic hose with a 3/4" BSP female tap connector and must be connected to a water supply, 2-6 Bar, 4 L/min minimum. This supply must be fitted with a shut-off valve & have a maximum flow rate of 20 L/min. Maximum temperature 25°C.

CHAMBER DRAIN:—

For cleaning purposes only.

May be connected to building drain if required.

Must be kept closed when Autoclave is hot or pressurised.

CHAMBER EXHAUST:—

35mm pipe carrying steam and condensate. Must be connected to building drain, vented to external atmosphere or extraction hood.

BUILDING DRAIN:—

Free venting, non-manifolded drain Øminimum Ø50mm) capable of withstanding temperatures of 100°C & having a downward slope of at least 1 in 50.

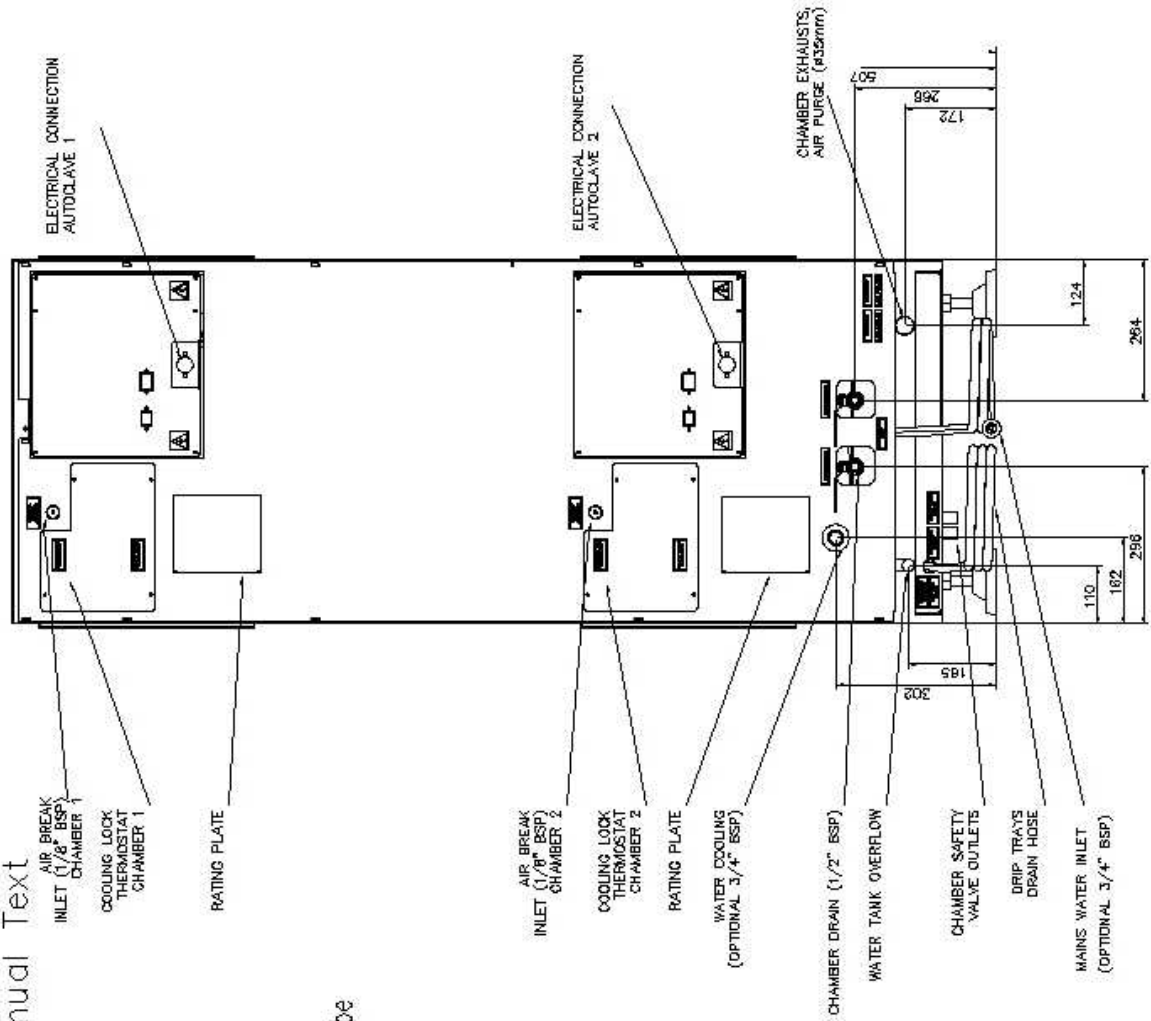
SAFETY VALVE OUTLETS:—

These exhaust vertically downwards close to the floor. They may not be connected to any other pipework.

WATER TANK OVERFLOW/WARNING PIPE:—

Must be visible to the operator.

White polypropylene pipe can be fed to an open tundish or to an open drain.



ELECTRICAL FIRE RISK

This equipment contains electrical circuitry which carries sufficient energy to cause and sustain a fire . Active system Thermal energy-input protection & Over-current protection is provided on all appropriate circuits. A Safety-Valve prevents excessive pressure build-up. The Sterilizer is protected from overheating by an electrical Thermal Cut-out sensing Boiler Temperature. Temperatures due to the Designed Heat Source(s) in extreme fault conditions (ie; not inc. fire) could exceed 150C internal to the Chamber / boiler. The user must satisfy himself that the equipment is suitable to process the load.

This equipment should be sited & operated on a heat-proof , non-combustible waterproof surface.

CLIMATIC CONDITIONS

The following details are provided in accordance with iso EN601010

STORAGE

Storage of this product in cold or damp conditions may lead to a Hazard or operating faults if the equipment is put into service before it has dried out and achieved equilibrium with the surroundings of the operating site.

Place in the area where it is intended to use the equipment .

Do NOT connect to a power supply.--Allow 48 Hrs to reach Humidity Equilibrium.

CLIMATIC SPECIFICATIONS

OPERATING

Permitted Humidity not exceeding 75% mean non-condensing.

Permitted Temperature range 0-40 C

Do not site the equipment in an area where there are significant quantities of dust. this will gather on the electronics and cause malfunction.

Do not site the equipment in an area where Spray or fumes from other equipment may touch the cabinet or cooling vents.

STORAGE

Permitted Temperature range -10 / +70 C

Humidity not specified but an equalising time is required- see above.

BATTERY BACKUP

Data Backup - Main system and Cycle memory
Via FLASH memory

Data settings & Realtime Clock

REPLACEABLE lithium

CR2477 battery in Screen Unit

Observe local Environmental Disposal Rules if battery is replaced.

ELECTRICAL FIRE RISK

This equipment contains electrical circuitry which carries sufficient energy to cause and sustain a fire . Active system Thermal energy-input protection & Over-current protection is provided on all appropriate circuits. A Safety-Valve prevents excessive pressure build-up. The Sterilizer is protected from overheating by an electrical Thermal Cutout sensing Boiler Temperature. Temperatures due to the Designed Heat Source(s) in extreme fault conditions (ie; not inc. fire) could exceed 150C internal to the Chamber / boiler. The user must satisfy himself that the equipment is suitable to process the load.

This equipment should be sited on a heat-proof , non-combustible waterproof surface.

HANDLING/MOVING

Information provided in accordance with IEC61010 in advisory form only- User must carry out all operations including moving/handling this equipment in accordance with health and safety regulations & Observe all Manual Handling regulations... No liability accepted by the Manufacturers or their agents for loss or injury or consequential damage /injury howsoever caused by the handling/moving of this equipment.

This equipment is heavy, not portable and is not provided with lifting handles.

If in doubt, Remove sidepanels before lifting Lift at sides or rear of case, taking the load of the unit on the internal structure. Do not lift or handle using the Plastic Door cover or Control Panel or any other projection. Do not drag across surfaces or the Feet may be damaged.. Do not adjust Feet on frontload models- these are fixed to tilt the machine backwards

POSITIONING & LOCATION

The equipment should be placed on a suitable surface and levelled before use. This must allow the door or cover to open unobstructed, and will permit the chamber to be operated and loaded by the operator whilst complying with local regulations regarding lifting and manual handling - Please see "HANDLING" instructions.

The equipment should be positioned so that the Power switch is unobstructed and easily accessible from the operating position (in front of the equipment).

Do not cover or obstruct Cooling vents. Do not place objects on top of the equipment.

Failure to comply with these positioning requirements when installing this machine may result in refusal of service or extra charges being incurred during service (including even warranty visits) if the resulting position makes service access difficult or the unit is affected by walls or other equipment.

DISTANCE FROM WALLS

This machine will require service access.

This is carried out from both sides and the rear.

- Leave 400mm clearance either side and 500mm at the rear.
- Do Not build into benches or alcoves.
- Do Not position either side up against a wall.
- Do Not site other equipment close to either side or the rear.
- Do not cover or obstruct Cooling vents.
- Do not place objects on top of the equipment.

DISCLAIMER

The manufacturers or their agents cannot accept responsibility for damage that may be caused by exhaust gases water or condensate should the machine be operated other than in accordance with the instructions in the provided operating manuals, or if the Pipework system is modified, misused, blocked or obstructed, or by use of non-approved alternative spare parts .

INSTALLATION

POWER, WATER & DRAINAGE

WATER , STEAM ,DRAINAGE SERVICES & CONNECTIONS.

NOTE- This machine comprises **TWO** separate sterilizers however for convenience the water inlet, exhaust/drain and drip tray drain are shared.

- 1] The Chamber Exhaust must be connected to a suitable Building Drain to carry away condensate.
- 2] A Steam Vent is required to exhaust the steam produced during the Heatup and Freesteaming parts of the cycle.
- 3] The Safety Valve exhausts into the room.
- 4] These Electrically Heated models require a supply of cold Mains water. and where fitted provision for the Autofill tank Overflow / Warning Pipe.
- 5] These models are provided with a Chamber Cleaning Drain which may be connected to the Building Drain .
- 6] Steam heated models require a supply of steam .The Condensate Drain should be connected to the building drain .]

PIPEWORK CONNECTIONS.

A] EXHAUST

The exhaust outlet will produce steam and condensate. Connect the outlet pipe to a suitable drain using the largest pipe bore available, provided with a suitable air vent to the outside above the level of the machine to vent the exhaust steam, and to avoid air locks which may result in contaminated effluent being drawn back during cooling.

Pipework Temperature Capability

The drainage pipework must be capable of carrying condensate at temperatures up to about **80C**, and the exhaust vent pipework must be able to withstand **135C**.

Note- If the pipework will not withstand the temperatures involved the manufacturer cannot accept responsibility for any damage that may be caused by hot exhaust gases or condensate. (see below.)

Fitting to Plastic Drainage Systems;

A range of steam quench and cooling heat exchange systems is available factory-fitted to the the machine, which automatically cool the

PULSE FREESTEAMING OPTION !!! WARNING !!!

If this option is fitted or configured Installation to Plastic Drainage systems, or the Astell range of Quench /Cooling boxes is not possible without danger to premises or personnel. Operation in such an installation constitutes misuse and the manufacturers accept no liability for the effects of such action, and reserve the right to withhold warranty provisions for parts concerned with the Chamber or steam system .

hot exhaust to below 60C using cold mains water . if one of these has been supplied please install according to the separate instructions supplied. At the rear of this manual

B] EXHAUST VENT

Separate Vent is strongly advised , but where no separate vent-pipe can be provided, the connection to the drain must include an air-break to avoid back-suction.

C] SAFETY VALVE

The Safety-Valve exhausts vertically downwards at the rear of the machine close to the floor. When it operates a large volume of low-velocity steam will be produced .

The Safety-Valve must not be connected to any other pipework or altered in any way.

Please see other references in this manual to SAFETY-VALVE TESTING.

D] AIR INLET / FILTER

This is a 1/8 BSP screwed inlet socket sited behind the Cover Plate on the right-hand Side . A screw-fit Disposable bacteriological Air-filter is available which may be screwed into the socket,

E] DRAIN VALVE

(Electric internal heaters Models only)

The **DRAIN VALVE** permits the Chamber to be drained for cleaning purposes. This is at the rear of the autoclave fitted with a lever action hand-valve. The valve is shut when the handle is at RIGHT-ANGLES to the pipe.

This should be arranged to allow the chamber to be drained regularly. It may be plumbed into a

**KEEP DRAIN VALVE CLOSED DURING USE &
DO NOT OPEN WHEN HOT OR
PRESSURIZED.**

F] STEAM INLET..

Steam Heated Models Only

This is a 3/8" BSP Screw Gun-Metal Union. The steam supply should be connected to the gunmetal union.

Pressure Reducing Valve

The autoclave is **NOT** fitted internally with a **PRV**, and steam supply pressure must be reduced to 3.04 Bar maximum. [44 P.S.I.G /304 kPa) with a suitable Pressure Reducing Valve before reaching the autoclave.

It is important to fit a pressure gauge into this supply line, after the pressure reduction valve, which will indicate actual steam pressure available to the machine .

A condensate draining steam trap must be fitted between the PRV & Autoclave, immediately upstream of the **Autoclave**, to **remove all condensate as Free Water will stop Sterilizing action.**

Steam Supply Problems;-

A common fault with installations is that long pipe runs, poor layout or poor steam quality fill the autoclave Chamber up with water. This will be avoided if attention is paid to Condensate separation. Ensure that the steam supply flow is adequate to feed the machine when operating - The steam pressure in the line will fall when the machine is HEATING UP or FREESTEAMING.

F] SUPPLY CONDENSATE RETURN

Steam Heated Models Only

The steam Supply line must be properly installed. If provision is not made to automatically drain off the condensate that forms in the supply line the autoclave will draw in large quantities of water. & this will stop the Sterilising action, and may cause damage.

Warning ; On new steam systems or those that have cooled beware condensate build-up in lines which may cause water hammer & damage valves and instruments. Correct installation and Steam Trap arrangements will avoid this.

H] STEAM DRAIN OUTLET

Steam Heated Models Only

(Chamber Condensate)

On Steam Heated Models the Chamber is fitted with an Automatic Chamber Drain. The outlet from this is arranged in to ways

Either-

A the small diameter COPPER pipe at the bottom rear of the machine. It should be connected to a suitable building drain capable of carrying steam condensate (at up to 134C) Connection into the boiler-house condensate return is not advisable due to the possible bacteriological contamination of returned condensate if any of the load contaminates the inside of the machine. This outlet should be connected via an air-break to prevent back-suction.

Or B linked into the exhaust outlet- no special arrangements are required.

J] DRIP-TRAY DRAIN

This is a separate plastic pipe 13mm internal bore, emerging from the rear of the machine. This carries away water that trickles into the drip tray beneath the door. It should be led to a suitable drain (Below the level of the Drip tray.) Do not connect to the Autoclave drain, without a trap or suitable U-Bend or similar, as this may cause hazardous blow-backs if pressure develops in the drain . As this water is generally fairly clean, a simple loose connection to a separate drain will suffice or a bucket or container may be adequate if drainage cannot be arranged..

K] MAINS WATER INLET

AUTOFILL option

WATER-COOLING option

EXHAUST QUENCH SYSTEM option

This is a Plastic washing-machine type Hose with a 3/4 BSP (3/4 RP) Female Threaded tap connector as for a Washing Machine Inlet.

This should be connected to a Cold Water Mains Supply ,

Minimum 0.3 Bar , Maximum 6 Bar pressure. Max Flow rate required 20 litres/minute.

This supply Must be provided with a Shutoff Valve (eg a Washing-Machine-Isolator Valve).

L] AUTOFILL TANK OVERFLOW (warning pipe)

AUTOFILL option

This is a White Polypropylene 20mm pipe or on some models a 22 mm copper pipe which projects from the rear of the machine .

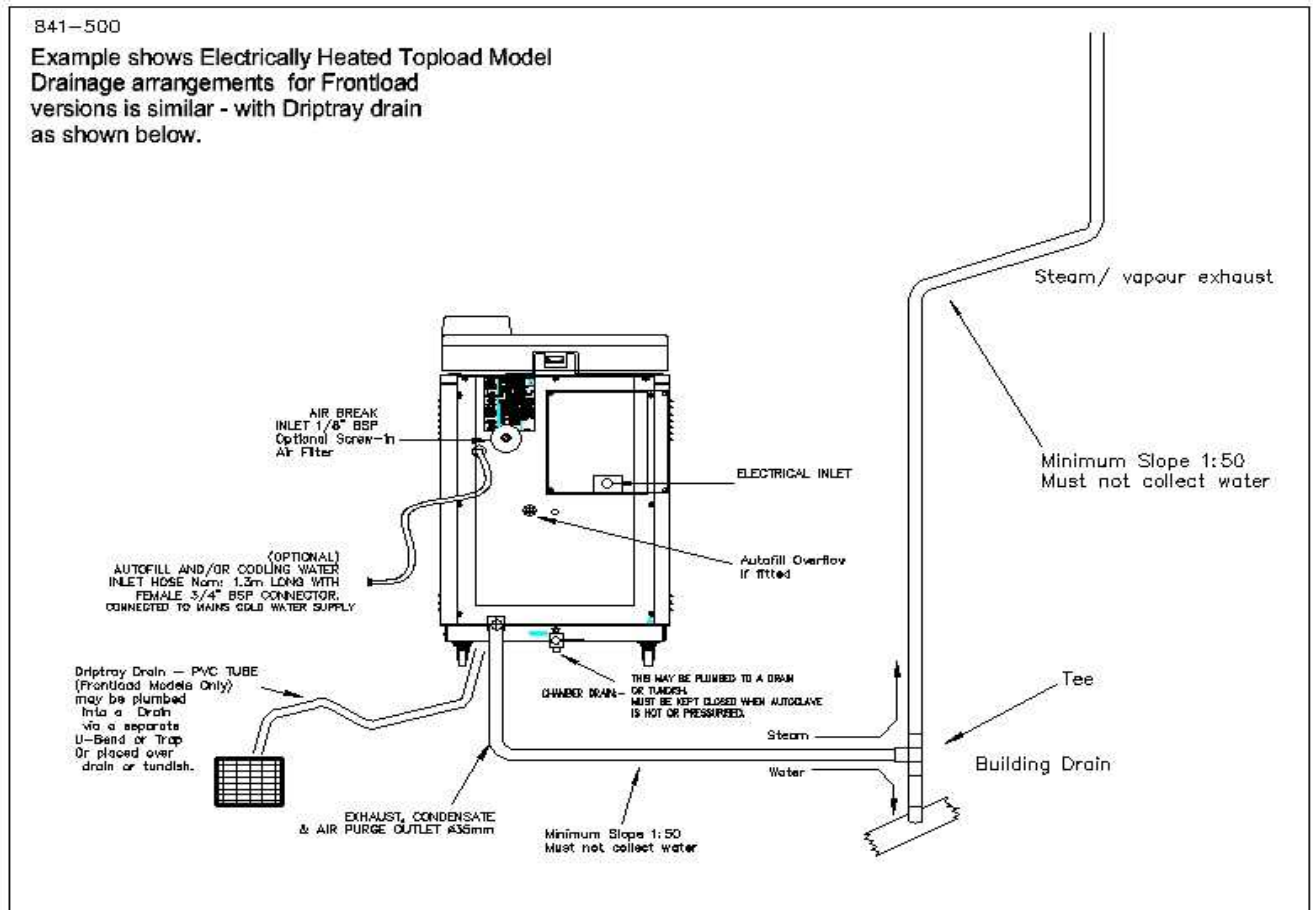
This will carry overflow water if the Level in the Autofill tank is too high. It should be fed to an visible open Tundish or drain.:- U.K. Water Research Council and the U.K. water byelaws require Warning pipe outlets to be visible to the operator.

PIPEWORK INSTALLATION NOTES 1

AUTOCLAVES 80-300 Litres Electrically Heated Top loading and Front-loading models

The correct performance of this machine requires that it is installed in accordance with the instruction manual provided. This information is supplied for additional guidance.

The autoclave shown is an example only & does not represent any particular model.
All pipework positions are typical only and may differ from model to model.
All connections are labelled for identification.



EXHAUST VENT

This MUST be routed to the outside of the building or to a purpose-designed extraction system to remove the steam outflow. It must be free-venting & installed with a slope minimum 1:50 so that it is self-draining along the whole length to prevent blockage by water.

Where an outside wall is not available, it is acceptable to install an extraction hood and fan over the autoclave and to lead the Vent pipe up into this hood. This extraction system must be rated to accept steam and extract at a rate which prevents steam penetration back into the room.

DRIPTRAY DRAIN

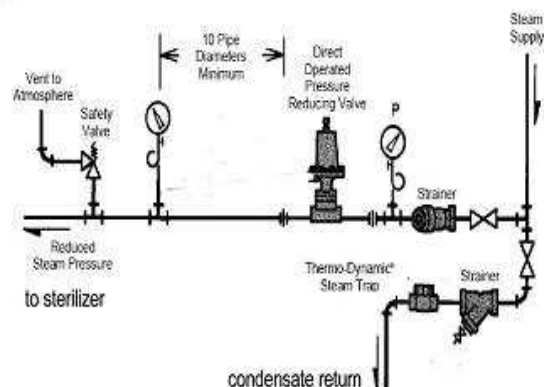
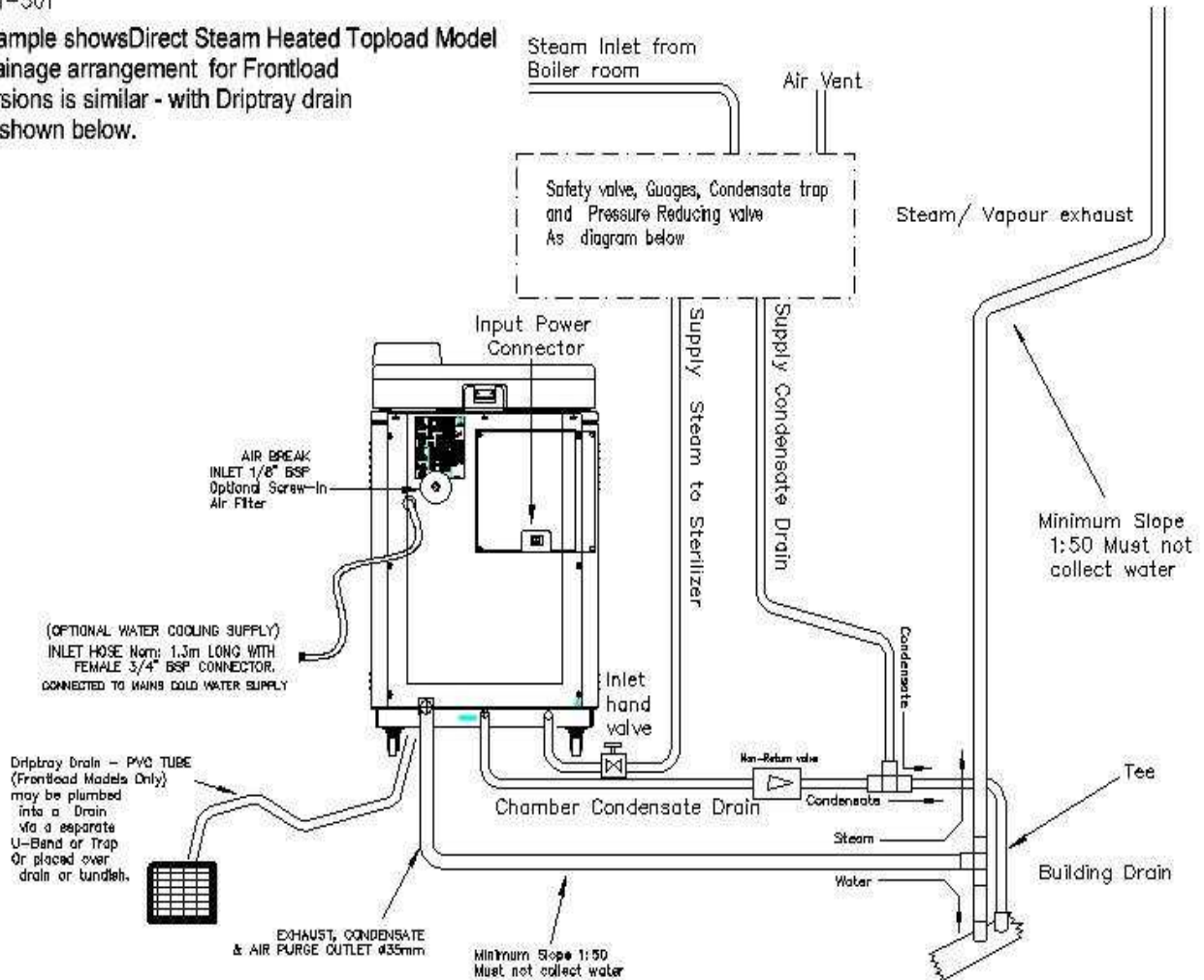
This carries the driptray waste which may collect from runoff from the door inside surface when the door is opened. It should be routed to a building drain. Where this is the same drain as the exhaust a u-bend or trap must be fitted in line with this pipe to prevent steam pressure in the drain causing backflow up to the driptray.

PIPEWORK INSTALLATION NOTES 2

AUTOCLAVES 80-300 Litres Direct Steam Heated Top loading and Front-loading models

841-501

Example shows Direct Steam Heated Topload Model
Drainage arrangement for Frontload versions is similar - with Driptray drain as shown below.



1 The distance from PR-valve to the Sterilizer input should ideally not exceed approx 3 metres . Longer lengths here must use larger diameter pipes to avoid steam flow restriction.

2 For longer lengths a second Condensate return and Trap should be fitted immediately before the sterilizer. Without this condensed water will build up in the supply line when machine is off and will be injected into the chamber.

3 Where the steam quality is very wet a Steam Separator may be required between the PR-valve and the sterilizer.

POWER SUPPLY

POWER SUPPLY INLET INLET CABLE

These machines have two SEPARATE power supplies for each machine. These are independant

The STERILIZER has been tested in the configuration in which it is delivered from the factory. Details of the Supply Voltage and the Current rating, etc are given on the Serial-Number - Rating Plate attached to the machine.

Cable Alteration

Should it be necessary to Fit or alter the supply cable to suit local regulations or arrangements , the new power supply cable should be arranged in flexible conduit or use similar suitably protected power cable rated to carry the Maximum Current per Phase as specified on the Rating plate. Use 3-phase 5-core (or for single phase 3-core) mains supply cable ideally provided with a standard -type Industrial High-Current plug. The Cable should preferably be of the heavy-duty SY type, Double-Vinyl covered and protected by a woven metal braid.

The connections are made to Terminals in the Power Input Box. The Cable should pass through the cutout provided in the lower edge of the Power Input Box, allowing the panel to be removed for access. Steam Heted models may use a connection to a CEE22 power inlet connector.

This machine must be wired with a protective earth.

RECORDER POWER FEED

The recorder options include an optional automatically controlled 240 Volts 1 Amp power outlet via a CEE22 Outlet connector. This is intended to power ONLY an Astell approved Recorder System. Instructions for use are provided with the Recorder option. Some versions may use a different connector and the output may also include remote control low-voltage signals.

Do Not Connect Any Other Equipment To This Outlet .

VOLTAGE RATING PLATE

Before attempting an installation, consult the SERIAL NUMBER / RATING PLATE fitted to the machine which gives supply type and voltage requirements

Consult the SERIAL-No./ VOLTAGE RATING PLATE Sited at the rear of the machine, or on some models , near the front to one side. The STERILIZER is normally delivered with the supply arrangement to suit the voltage and supply specified at the time of ordering. Should the Power supply need to be altered, from 1 to 3-phase etc the drawings at the back of this manual show how the 1 or 3-phase supply is connected to the terminals in the power input box.

Several models are available, With different Heaters and Supply wiring. Check the Power Rating on the Rating Plate and refer to the details below:

PLEASE NOTE ..

ALL Voltages are measured phase-to-phase.

SWITCHED FUSED SUPPLY ISOLATOR

The Power must be fed from an EXTERNAL SWITCHED FUSED ISOLATOR .

This must be sited within 1 Metre of the machine.

Wiring Drawings

The drawings at the rear of this manual give Electrical connection details.:-

367-500 =3 phase

or 367-501 = single phase

RCCD /RCD residual Trips & EARTH-LEAKAGE TRIPS

The type of heater used in this machine means that Operation from a RCCD residual or earth-leakage trip may cause tripping problems ., This may occur especially if the machine is not operated for some time and is due to moisture ingress to the Inconel-Sheathed heaters. If this happens connect to a non- protected supply and run for 5-10 cycles. Then revert to Protected supply. If the tripping then continues please consult the manufacturer.

Uk Regulations & PAT testing

Please note that this equipment does not count as PORTABLE in the definitions for Pat safety testing and as such it does NOT need to be Pat Tested. If Pat Testing is to be carried out this unit MUST be classified as Computer/IT equipment and the test regime for IT equipment must be implemented.

Mains Lead Wire Colours

3-Phase STERILIZERS

Connect	Harmonised colours
Earth	Green/Yellow
Phase1	Brown
Phase2	Black
Phase3	Grey
Neutral	Blue

Single-Phase STERILIZERS & Steam Heated Sterilizers

Connect	Harmonised colours
Earth	Green/Yellow
Phase1	Brown
Neutral	Blue

Where fitted the Screening/Braid of any Armoured cable is earthed at the STERILIZER end. If the cable is shortened, Cut the Plug end . Leave the STERILIZER end untouched or restore earthed Braid connection.

Fuse or Contact-Breaker Ratings-

The Supply ratings of the Electrically Heated models are given on the RATING PLATE at the rear of the sterilizer. . If You are unsure please contact ASTELL or the supplying agent.

Power Supply Suppression

Inside the Power Input Box are Suppressors and capacitors essential to the EMC performance of the control system electronics which must not be modified or removed.

When installing, any wiring work must be carried out with care to avoid damaging or displacing these suppression components.

ELECTRICAL RATING PLATE

NOTE

The rating plate on the rear of the cabinet gives the electrical specifications for this machine. Please refer to the data on this plate before connecting your sterilizer.

UK or EUROPEAN POWER SUPPLIES

380/440 VOLT 3-PHASE SUPPLY

These machines use 230v heaters connected in STAR formation between the 3 Phases and Neutral.

The three pairs of Heater wires are brought to the terminal block in the POWER INPUT BOX , labelled as follows:

Wires No10, 11, 12 blue = (RETURNS)#1,2,3
Wires No 7,8,9 = Heater (FEEDS)#1,2,3

CONNECTIONS 380-440 Volt 3-Phase:

10 Kw models

Power Supply is connected as shown in drawing 367-500 at the back of this manual

The Three Phase Supply must be a balanced 3-phase type. 2-phase and single phase supplies must not be used.

The NEUTRAL line must be connected to a valid supply NEUTRAL.

The neutral line must not have a fuse or trip in the circuit.

UK or EUROPEAN POWER SUPPLIES**Continued....****DIRECT STEAM HEATED MODELS**

External-Steam Heated Machines normally have a CEE22 type Hot Condition Power Inlet cable and plug.

The hot-condition cable plugs into the rear of the power inlet box at the back of the machine.

It should be connected to a Switched & Fused socket with a supply rated at 230Vac. 5Amps.

The Power Supply for this option is internally connected as shown in drawing "Install03"/ 367-352 . however no internal wiring is required by the installer as this specification unit is delivered pre- connected ready for use.

230V SINGLE PHASE SUPPLY**7 KW SINGLE-PHASE**

Applies to models with internal heaters up to equivalent of 10 Kw 3 phase and model capacities below 170 Litres

The 380/440 volt 3-phase 10kW models may be arranged to operate at reduced power {7Kw} from a 220/240 volt 30/32 amp single-phase supply .

The Power Supply is connected as shown in drawing 367-501 at the rear of this manual

If specified at the time of order the power supply will be connected for single-phase 230 Volt operation. If the specification needs to be changed this may also be done by the installer without affecting the warranty.

The earth, live and neutral feed cables should be capable of carrying 32 amps, and be fed from an EXTERNAL SWITCHED, FUSED ISOLATOR, with fuses rated at 30 or 32 AMPS.

This equipment must be earthed...

The neutral line should not be fused unless local electrical standards specify this.

USA –TYPE 208V POWER SUPPLIES

Includes
Model USB270TDV
and
Model USB260TDV

Export Models For Countries Where Domestic Supply Is 110v Line - Neutral

This Voltage Operation may also be denoted by Order Code AAN110 or AAN111.

Typically called “3-phase 208Volts.”

This machine will operate from voltages between 200 and 240Volts at 50 or 60Hzac.

200/240 V (208V) 3-PHASE SUPPLY

Power Cable is connected as shown in drawing **367- 500** at the rear of this manual

In these models the heaters are the standard (230 volt), 3.3, KW types, wired to operate in 3-phase DELTA formation. The heater wires are brought to the Contactor in the Power Input Box.

The Heaters are wired in the factory Phase-To-Phase as in drawing 367-353 available from Astell Scientific on request

The Three Phase Supply must be a balanced 3-phase type. 2-phase or single phase supplies must not be used.

The NEUTRAL line must be connected to a valid supply NEUTRAL.(unless supplied with a special option to operate without neutral-see below)

The neutral line must not have a fuse or trip in the circuit.

The internal electronics and control actuators operate from 230 volts supplied by a step-up internal transformer between Phase 1 and Neutral. 3-Phase Motors where used are normally dual voltage, wired in delta formation for 200-220v. or Single-phase 230V motors wired between two phases with fuses in each supply.

200-220v 3-PHASE SUPPLIES WITHOUT NEUTRAL

This is option AAN111 . It is similar to option AAN110 , but requires no Neutral supply. Connect as described above but you omit the Neutral connection.

The internal electronics uses a 220V supply derived from two Phases @ 200-220v via a different spec of Isolating Transformer.

CONVERSION

It is possible to convert from 380-440 v to 200-220 v supplies or in reverse.

However- please note that this requires the fitting of a special transformer unit and significant detailed wiring changes, and requires the services of a factory-trained qualified engineer.

DIRECT STEAM HEATED MODELS key Operating differences

Direct Steam heated models have no heaters in the chamber. They are heated by a supply of steam from an external source such as a Building Steam Supply or an external steam generator.

In these instructions all the operating and maintenance aspects of the machines are similar to models with Autofill and Internal Heaters, but Please refer to the list of differences below.

A Water Filling instructions.

There is no need to add water or to have the unit connected to a supply to fill the chamber. Please note - A supply of water will be required if the system is provided with the ASSISTED WATER COOLING OPTION

B Low Water indications

Please disregard all items in this manual regarding these indications on the display "Charging With Water" and "WATER LEVEL" in any fault displays

C Starting

When you press START the system will heat immediately - there is no "Charging With Water" stage

D Pump Out At End (HTM2010 option) Option not available

E Chamber DRAIN

On these models this is NOT a Drain for cleaning the chamber, but it is a Condensate Drain. This discharges the condensed steam to the drainage system.

F Fuses

FS10,11,12 are not fitted in the power input box. FS05 is the mains input protection fuse.

G Overtemperature

As standard There is no Overtemperature cutout on Directly Heated machines. Generally these cannot heat above the temperature of the incoming steam so that this and Boil-dry protection, is not required.

H Cleaning

Cleaning requirements are exactly as for the standard model.

Note that there is no Drain valve to drain wash water from the chamber. When washing out the chamber simply leave any surplus wash water inside and run a cycle. The water will be discharged automatically to drain during the cycle.

J Pressure Reducing Valve

When installing to the Steam supply please note that a Pressure Reducing Valve is required. Please see the drawing at the rear of this manual.

~ End of notes on Direct Steam Models ~

INITIAL POWER UP

Make sure the power supply is turned on and then "Power On" the autoclave by turning and releasing the "Emergency Stop" button.

Then the system displays the Computer Booting as the software loads, with a message

Booting- Please wait

Then the Astell logo is displayed;-



The system then goes to "Operator / Standby Screen"

BUTTONS AND DISPLAYS

Below are a selection of the Buttons and Displays that you will see on the Touchscreen in normal use. Full details - see later in this manual .

Door OPEN Button Press to OPEN door
[Manual Door models Press to UNLOCK
then slide door open]



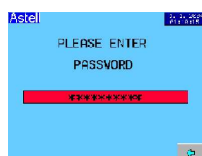
Door Close Button Press to Close door
[Manual Door models no function]



ALARM button - displays all system alarms.
Note: this button flashes if an alarm is activated.
After the alarm icon has been touched, the Password is used to cancel alarms .

PASSWORD SCREEN

Allows the Supervisor to enter their password



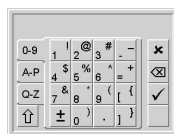
MENU button- takes you to the next menu



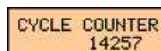
RETURN button - return from selected screens back to the start screen.



Up & Down buttons - moves up and down through lists
Eg.- to select a cycle .

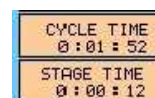


Alphanumeric Keypad - to enter numbers and text.



Cycle Count - The is displayed on various screens and indicates how many cycles the autoclave has run.
This is not re-settable.

Cycle Time = Time into Current Cycle
Stage Time = Elapsed time in Stage

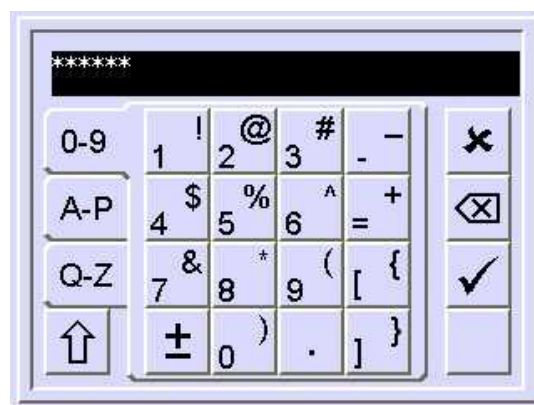


The temperature and pressure channels selected are displayed



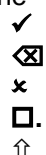
Date and Time is in the top right corner of the screen .

ALPHANUMERIC KEYBOARD



Type the Text entry
Then Press ✓ [Enter]

The keypad covers 3 ranges of characters, selected by the "TAB" keys [0-9],[A-P] & [Q-Z]




CASE)

Enter
Backspace
Cancel
Space
SHIFT (NEXT CHARACTER UPPER

SWIFTLOCK "Secure-Touch+" AUTOFILL STERILIZER

QUICK REFERENCE OPERATION GUIDE

Cycles Without Load Sensing Timing

1. Check that display Power is On
2. If display shows "Tank water level low", add water to Tank
3. Press "Door" Button. 
The bolt will unlock.
4. Turn Handle, & open door.
5. Check Gasket is correctly seated and inspect for damage.
6. LOAD STERILIZER.
7. CLOSE Cover and rotate handle to lock.
8. Select Cycle
9. Press [START] Button.
Cycle will begin.
10. When Display Shows "COMPLETE" at end of cycle,

press [DOOR]



- 11 Door unlocks
rotate handle & Open door.

AFTER USE

After unloading Sterilizer always leave Cover slightly open when not in use to avoid compressing gasket.

Do not add water when cycle is running.

- 12 Open door fully & unload chamber.

- 13 If [DOOR] button is pressed and Door is not opened it will cancel after 10 seconds, and will re-lock. After this, to OPEN, just press [DOOR] button again.

Notes-

If Door is closed by accident, press [Door] key To Open.

If handle is rotated to LOCKED position with door open, press [DOOR] button and return handle to "unlocked" position


CLEANING


Clean chamber and wash out the tank regularly, as water contaminated with spilt load contents will cause failure and may burn out heaters or block pipework, valves or drains.

SWIFTLOCK "Secure-Touch+ " AUTOFILL STERILIZER

QUICK REFERENCE OPERATION GUIDE

Cycles With Load Sensing Timing

1. Check that display Power is On
2. If display shows "Tank water level low", add water to Tank
3. Press "Door" Button. 
The bolt will unlock .
4. Turn Handle, & open door.
5. Check Gasket is correctly seated and inspect for damage.
6. **LOAD STERILIZER.**
If the Cycle requires use of LOAD SENSING Place Load Sensing Probe in position in centre of load
If cycle does NOT require use of the Load Sensing probe, place the probe safely to one side of the load .
7. **CLOSE Cover & rotate handle to lock.**
8. **Select Cycle**
9. Press [START] Button.
Cycle will begin.
10. When Display Shows "COMPLETE" at end of cycle,

press [DOOR] 
11. Door unlocks
rotate handle & Open door.
12. Open door fully & unload chamber.
13. If [DOOR] button is pressed and Door is not opened it will cancel after 10 seconds, and will re-lock. After this , to OPEN , just press [DOOR] button again .

Notes-

If Door is closed by accident, press [Door] key To Open .

If handle is rotated to LOCKED position with door open , press [DOOR] button and return handle to "unlocked" position.

AFTER USE

After unloading Sterilizer always leave Cover slightly open when not in use to avoid compressing gasket.
Do not add water when cycle is running.

CLEANING

Clean chamber and wash out the tank regularly, as water contaminated with spilt load contents will cause failure and may burn out heaters or block pipework, valves or drains.

OPERATING INSTRUCTIONS

The following Sections provide Operating instructions in both a fully detailed version and Short-form which can be copied and fixed to the wall near to the Sterilizer .

Full details of the **Cycle Entry Procedure** and further technical details are provided in a separate **PROGRAMMING & CONTROL SYSTEM MANUAL** part no **MXN782**

Other options such as the RS232 Communications option are detailed in separate instruction manuals.

INFORMATION ON APPROVED USE

This equipment is not designed for use other than as a medical / laboratory / general steam sterilizer for use within the temperature and pressure ratings of the chamber design.

Any alternative use or method of operation not covered and specified within this and associated instruction manuals is specifically excluded and may be hazardous. The manufacturer does not approve such alternative use and under no circumstances will the manufacturer or his agents accept responsibility for loss, damage, or injury, consequential or otherwise, as a result of such alternative use.

The manufacturer reserves the right ,in certain cases, to reassess &/or amend the design or specification, and provide individual written instructions detailing an alternative use that is considered acceptable.

This Sterilizer Is designed and intended for a very wide range of loads and process cycles. It is not possible in this manual to encompass every possible cycle or load requirement that may be encountered.

General principles are provided , with a selection of examples and explanations. It is to be expected that a certain amount of experimentation may be required before the most suitable process cycle or method of loading can be arrived at.

Astell Scientific and approved agents are able to offer advice and assistance in setting up and commissioning this sterilizer. Please consult Astell Scientific or your supplier if necessary

SECURITY PASSWORDS

The System protects from unauthorised use by security Password codes

The Factory Set numbers are –

Operator	111111
Supervisor	222222
Site Engineer	333333
Astell Engineer	444444-

If in doubt Consult Your Supplier

TOUCHSCREEN CONTROL SYSTEM TECHNICAL SYSTEM OVERVIEW

The **SecureTouch Colour+** controller provides an LCD full colour display with an LED backlight system.

The Front of the display is covered by a Glass touchscreen which is sensitive to the touch of a finger or blunt stylus.

The system is able to detect the position on the screen that has been touched and can interpret this as if it was a "Button-Press".

The controller system is arranged to show a number of different screen layouts of information, together with the required "Buttons" -(shown on the screen as rectangles with bevelled corners) When a screen shows a button, then a press on the button will select that item.

SCREEN CONTRAST

The Screen contrast is adjustable

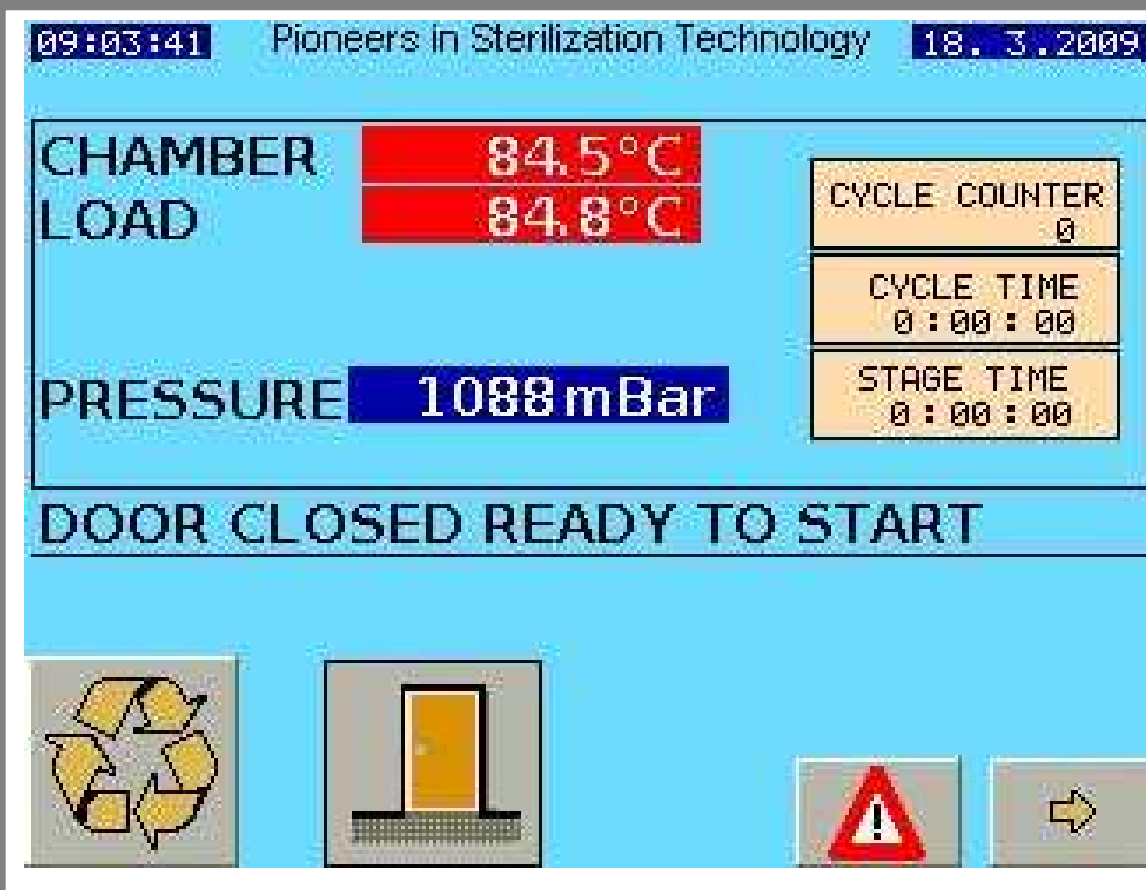
There is a **+/-** contrast adjustment available in the **Main Menu** screen System info (See Programming manual)

If the screen has lines or is smudged please advise your Service Engineer.

DISPLAY SCREEN DAMAGE

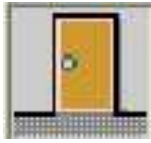
As with Computer screens generally, this screen is made of thin glass layers. These are easily damaged if they are impacted by a heavy object or excess pressure is applied to the glass. In this case the glass will crack and the display will have to be replaced. Note that this will not normally be covered within the warranty.

Typical View of Controller in Standby mode



DOOR CONTROLS

OPEN



Touch "Closed Door" button on the display screen to Unlock the door.

Press to UNLOCK then rotate handle to physically unlock and open

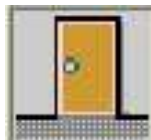
If this icon button does not show on screen then the system will not allow you to open the door. Eg;- this is not possible or unsafe at this stage

The door will open only if the safety conditions are all satisfied and no alarms are present.

CLOSE

CLOSE AND lock the door

The Icon will change to "Door Closed"



SYSTEM CONTROLS

POWER ISOLATOR SWITCH

Turns on AC Mains Power to the system
This is fitted inside the Power Inlet Compartment ,
for service isolation only.

EMERGENCY STOP SWITCH

On Front panel

This is a **KEYRESET** Emergency Stop Switch

Press in to **TURN OFF**,
Turn Key to Release & **TURN ON**

COOL LOCK THERMOSTAT

This is sited behind the cabinet.

Senses chamber temperature . to restrict opening with hot fluids.

See "safety interlocks" section

OVERTEMPERATURE THERMOSTAT .

This is sited behind the cabinet.

This takes over control of the heater in the event of water loss or overheating. It resets automatically when the temperature falls.

OVERHEAT SAFETY CUTOUT.

This is fixed- (not user adjustable)

This is sited inside the cabinet & cuts out the heater in the event of excessive temperature rise (typically >150C). It is only resettable by manual operation when the covers have been removed.

INSTRUMENTATION

The function of conventional "Instruments" is taken by computer sensors and displays shown on the LCD display. These readouts are only displayed when necessary in the cycle.

CHAMBER Temperature Readout

At top - left of display during running Cycles.
(Accuracy better than +/- 1.0 Deg C)

LOAD SENSED Temperature Readout

Alternates with Time on display during running Cycles. (Accuracy better than +/- 1.0 Deg C)

PRESSURE Readout

At top - right of display during running Cycles.
(Accuracy Better than +/- 0.04 Bar)

PRESSURE Gauge Dial Bourdon pressure gauge at front of machine. (Accuracy Better than +/- 5%)

TIMING

Various timing functions are displayed on the screen in Mins:Secs

INSTRUMENTATION CHECK

In Standby/Ready state - with door shut- the system displays the current measured variables.

FAULTS

Should there be an instrumentation problem a monitor system detects out-of-range values and reports them via the FAULT system

ALARM INDICATIONS AND FAULTS

If there be an instrumentation or sensor problem the monitor system reports them via the **ALARM** system .

IF an ALARM is ACTIVE
the ALARM button **FLASHES RED**



You should then go to the **ALARM Page** to check on the problem.

Press the **ALARM** button ;-



Login with your Username and Password

This will take you to the ALARMS page



Most recent alarm is At the top.

Use the up & Down buttons to scroll through the Alarm List

The example below is for the case where the most recent fault is the door is detected as **"Not Bolted "** (ie a problem has been detected with the locking bolt during a cycle run.)



"ACK"

Button Flashes
Red While Alarm
is still active

Locate the cause of the problem.

When this has been fixed or the cause removed, Press the ACK Button to Clear the Alarm

When the source of the Fault is gone & you Press the ACK button , the button changes from Flashing to continuous GREY



If the button will not change to GREY you have not removed the source of the alarm! Try again...

OPERATION - STARTING A CYCLE

POWER ON , STARTING UP , OPENING

POWER-ON

Turn ON the power to the machine at the mains Isolator. Using the Key release the EMERGENCY STOP button at the front of the machine.

Check that display Power is On

When power is applied the system goes through a START-UP PROCEDURE which displays the system Title and software issue

Then it shows the main system screen .

If the Door is CLOSED & LOCKED



Icon shows door CLOSED & LOCKED

If the Door is OPEN or UN-LOCKED



Icon shows door OPEN

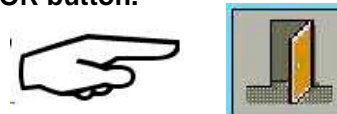
With the door **SHUT AND LOCKED** and all the facilities available and OK, the system is then "ready to Go..."

In this mode we can do the following:

- | | |
|-----------------|-------------------------|
| ❖ Door | Open / Close the Door |
| ❖ Select | Select a Program to run |
| ❖ Start | Start a cycle |
| ❖ Menu | Go to Main Menu |

OPEN THE DOOR

Press the DOOR button.



Hold the handle and slide the door downwards as far as it will go.

CLOSE THE DOOR

Hold the handle and slide the door upwards until the Bolt latches into place.

Door Status Indication

OPEN



CLOSED & Locked



DOOR Icon Changes to show state of the door

WATER SYSTEM - ELECTRICALLY HEATED AUTOFILL MODELS

This machine takes water in from the water inlet supply - Untreated tap water should normally be used - see below "WATER QUALITY"

The machine is fitted with a Conductivity Sensing Water detection system

Demineralised	<input checked="" type="checkbox"/>	Distilled water	<input checked="" type="checkbox"/>
Tap-water	<input checked="" type="checkbox"/>	Softened water	<input checked="" type="checkbox"/>

WATER QUALITY

Untreated tap water of drinking quality is satisfactory in this Sterilizer although the use of treated or partially demineralised water is acceptable, particularly in extreme hard water areas. This will help reduce furring on the elements the water must be conductive , requiring ionic content.

DEIONISED OR DISTILLED-water is not acceptable

The water used must be conductive, ie have an ionic content. DEIONISED OR DISTILLED- water will not work in this sterilizer unless a suitable ionic salt is added. Please consult your dealer for advice if you wish to use treated water

SOFT WATER

Water that has been chemically softened is usually satisfactory but rain-water or water that is from a naturally soft source may not work.

WARNING

Many service callouts are due to inappropriate water quality, which is outside the control of Astell Scientific. Installation or operation with inadequate water quality and any consequences or service visits involved are not covered under the manufacturer's warranty.

The system senses the conductivity of the water via a "High level" probe. The probe is at a Reserve level to which the chamber will be filled, to ensure sufficient water to complete a Sterilize Cycle , and is valid whenever the machine is NOT running, i.e. when the Cover is open, or before Pressing "START". This Water Reserve Level is set to permit an adequate AIR-PURGE period .

LOW WATER INDICATION

If the **TANK WATER LEVEL** is low the display shows ;-

TANK WATER LEVEL LOW

This means that the internal water tank is low on water . The water inlet supply is turned off, or not connected. Please see installation pages for details of water supply inlet.

In normal operation the Tank is maintained full of water automatically and this message is not shown.

WATER SYSTEM – DIRECT STEAM HEATED MODELS

The machine takes a supply of steam from the external supply. No water is required for the steam generation.

*****HOWEVER models with WATER COOLING require a cold water supply

HANDLE LOCKED WITH DOOR OPEN

If the door is open and you move the handle accidentally to the LOCKED position it will lock in that position.

To restore normal operation-

Press the [DOOR] button



Then rotate the handle to the Unlocked position

.

LOAD STERILIZER.

Make sure that the load is correctly made up and in the correct containers to suit the program cycle to be used.

Your Machine will have been set up and configured for different types of load , each with a specific cycle. It is important that the Cycle matches the Load type or the load will not be sterilized.

Please see section on LOADING

Load Sensed Timing Option

If this option is fitted;-

A If the Cycle requires use of LOAD SENSING
Place Load Sensing Probe in position in centre of load

B If cycle does NOT require use of the Load Sensing probe, place the probe safely to one side of the load .

Do NOT place probe to one side if cycle requires load sensing or cycle will fail – it MUST be in the load.

When you are ready- Close the Door

The Number & Names of cycles available depends on the machine specification -

SELECTING A PROGRAM

(note temperatures and times may vary from those examples shown here)



Press "CYCLE SELECT" button



This will take you to a screen where you can select any one of the available programs.



SCROLL UP

SCROLL DOWN

Back to last screen

Touch on the name of the selected Cycle
(Here we will assume "INSTRUMENTS")

The display changes to show that a CYCLE has been selected and loaded



Changes Colour
to show
Cycle Selected

"FILE" Icon shows file
loaded .
(Press To Change The
Cycle Selection)

CHANGE CYCLE

If you wish to select another
Cycle press the Button



Then select a different cycle

WARNING!

The NEXT press
on the Button

Will START the Cycle!!



STARTING CYCLE (Delayed Start)

Select the chosen Cycle



Press button to **START** cycle



"CYCLE TIME" (shown above as 00:XX:XX.X) will
start to count the elapsed cycle time

This continues until the water reaches the sensor in
the chamber.

**Then the system begins the HEATING stages
and the cycle continues**

STARTING A CYCLE

The Chamber Closure Door /Cover must be
closed and locked

Select the chosen Program Cycle, as above

Press button to **START** cycle



DELAYED START OPTION

*IF DELAYED START is NOT SELECTED
in "Settings" . the Cycle Starts immediately*

CYCLE COMPLETE -- PASSED

The **STERILISE CYCLE** is now **Completed**.
You may unload and use the contents



Press the **DOOR** button.

The **LOCKING BOLT** withdraws Releasing the door

OPEN THE DOOR and Unload

CYCLE COMPLETE -- -FAILED

If the cycle has failed for some reason the final stage is "CYCLE COMPLETE -- -FAILED" below



The **STERILISE CYCLE** is over BUT Load may not be sterile..You will need to sort out the reason for the cycle Failure.

Press the **ALARM** button - go to the alarms page so you can investigate, then correct & reset the alarm
You will need the Supervisor Level password or higher.

Clear the Alarm and then return from the alarm page. (see ALARMS section)

You will then & be able to press the "DOOR" button to open the door

If the Sterilize stage has been set to "Sterilise the load again" then the you cannot open the door but you can Restart the Cycle .

IS THE LOAD SAFE??

After a failed cycle, you can carefully unload the chamber but a microbiological assessment is needed before use of the load ; - You will need to judge whether the load has undergone sufficient processing to be sterilised enough to be safe or satisfactory to use.

IF SAFE open door and unload chamber.

If [DOOR] button is pressed and Door is not opened it will cancel after 10 seconds, and will re-lock. After this , to OPEN , just press [DOOR] button again .

SECURITY ACCESS & PASSWORDS

The security system splits the users of this machine into the following groups

**OPERATORS
SUPERVISORS
SITE ENGINEERS
ASTELL ENGINEERS
DEVELOPERS**

In each group there can be several individuals each known by name, and each with a Different Security Password Number (sometimes-called a PIN)

ENTERING PASSWORDS

Press the Button



for MAIN MENU

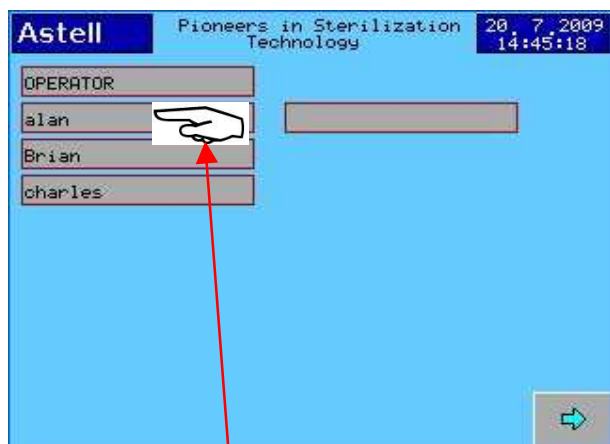
On the MAIN SETTINGS MENU :-

NOTE- THERE MAY BE A "JUMP" MENU IF THE CYCLE IS RUNNING



For example- Press the SETTINGS button.

Now you have to LOG IN with your PASSWORD

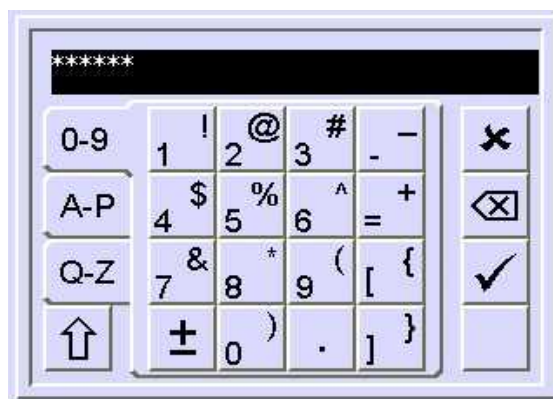


Touch your User name;-

OR , touch the ➡ button to display the other groups, eg Supervisor, Site Eng;-



Touch on the PASSWORD Bar;-



Type your Password ;-,

Enter 6 Characters , then [✓] (Enter)

The keypad covers 3 ranges of characters, selected by the "TAB" keys [0-9],[A-P] & [Q-Z]

- ✓ Enter
- ⊗ Backspace
- x Cancel
- Space
- ↑ Shift (Next Character upper case)

If you enter the incorrect password you are returned to the Main Menu

TO CHANGE YOUR PASSWORD

Log in as described above

Example- we will log in as "Operator"



Press EDIT PASSWORDS

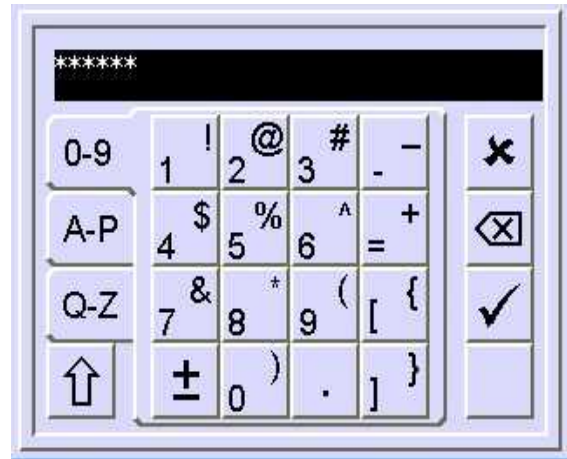


Press CHANGE Your PASSWORD

We will change password to 123456



Touch the PASSWORD bar




Key in the required PASSWORD.

Eg "123456"

Then Press [✓] (Enter)

Confirm the new password when asked

Then Press [✓] (Enter)

Press  twice for the Main Menu

TO CHANGE or ADD USER NAME

SUPERVISORS
SITE ENGINEERS
ASTELL ENGINEERS
DEVELOPERS

The Passwords and Names for all levels of users are added and edited in the same way ;-

You can ONLY change the Security Settings of a user who is at a lower level of access than you are,

SUPERVISORS can change OPERATOR codes

SITE ENGINEERS can change SUPERVISORS & OPERATOR codes

ASTELL ENGINEERS can change the SITE - ENGINEERS , SUPERVISORS & OPERATOR codes

DEVELOPERS can change all codes

Log In as a SUPERVISOR (or higher)] using a appropriate password.



We will ADD an Operator Name ;- David



Touch the screen



Touch a blank line on the screen.

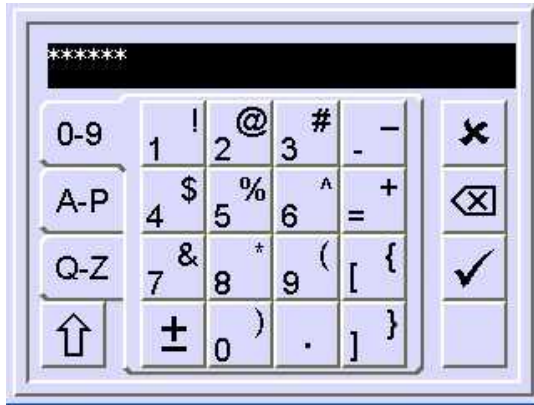


Press Here



Touch the BAR and enter the Name.

Type the Name - eg David



Then Press ✓ [Enter]

The keypad covers 3 ranges of characters, selected by the "TAB" keys [0-9],[A-P] & [Q-Z]


- ✓ Enter
- ⊠ Backspace
- x Cancel
- . Space
- ↑ Shift (Next Char. upper case)



Enter the new Password for that user

Confirm the new password when asked

Then Press [✓] (Enter)

Press  twice for the Main Menu

Notes-

- A All Passwords must be different.
- B If you make an error in the password the system will skip back to the previous menu.

ALARMS

If any of the functions monitored for faults are triggered then the system will ensure that a safe condition is generated.

This may stop the cycle early and then go to "Cycle Complete - failed"

The ALARM button FLASHES RED

Press the ALARM button
For the ALARM LIST

Login with your Username and Password

The example below is for the case where the most recent fault is the door is detected as "Door Not Bolted" (during a cycle.)



ACK
Button Flashes
While Alarm is still
active

Use Up and Down arrow
buttons to select Alarm

**Check the cause of the problem has
gone away , or Investigate & Remove it .
Then press ACK Button to Clear Alarm**

*When the source of the Fault is gone & you press
the ACK button , the button changes from Flashing
to continuous GREY*



*If the button will not change to GREY you have
not removed the source of the alarm!.*



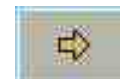
Cancelled



Still active

MANUALLY JUMP STAGES

**At any point during the cycle
you can press the Button**

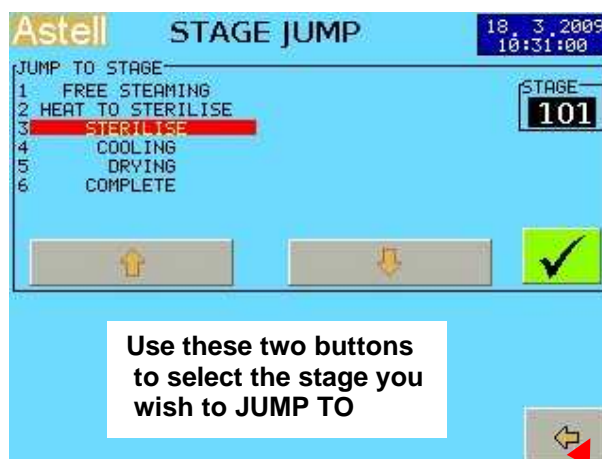


This will take you to the MAIN MENU



Press the STAGE JUMP button.

Now LOGIN with your User Name and password
as described earlier



Then press the



button

Or



to Exit



Answer the ARE YOU SURE? Question

STAGE JUMP & SECURITY LEVELS

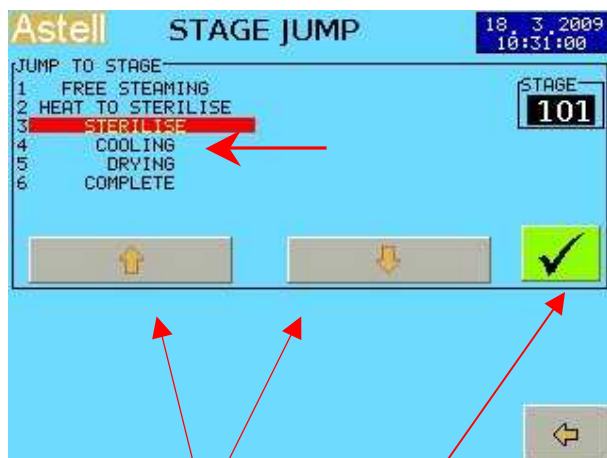
- The STAGE JUMP facility is not available to the OPERATOR LEVEL.
- AStELL Engineer level can jump all stages.
- Stage changes allways result in a "failed" cycle.

MANUALLY STOP CYCLE

Press the Button
for MAIN MENU



Select



Use buttons
to select stage;-
eg COOLING

Then press the
 button

Answer **ARE YOU SURE?**

This will change the stage
Result depends on the selected program type

- Fluid loads will cool down and eventually go to CYCLE COMPLETE-*FAILED*
- Drying loads will vent any water and once pressure has gone, go to stage CYCLE COMPLETE-*FAILED*

(The door cannot be opened)



Then press ALARM button
Go to the ALARMS page and Clear
the Alarm "Jump Stage Used"
Then you can open the door **

** see "CYCLE COMPLETE- FAILED" section

INTERNAL WATER SYSTEM

ELECTRICALLY HEATED MODELS ONLY

The machine is fitted with a Conductivity Sensing Water detection system

Demineralised	✗	Distilled water	✗	
Tap-water	✓	Softened water	✓	

WATER QUALITY

Untreated tap water of drinking quality is satisfactory in this Sterilizer although the use of treated or partially demineralised water is acceptable, particularly in extreme hard water areas. This will help reduce furring on the elements the water must be conductive, requiring ionic content.

DEIONISED OR DISTILLED-water is not acceptable

The water used must be conductive, ie have an ionic content. DEIONISED OR DISTILLED- water will not work in this sterilizer unless a suitable ionic salt is added. Please consult your dealer for advice if you wish to use treated water

SOFT WATER

Water that has been chemically softened is usually satisfactory but rain-water or water that is from a naturally soft source may not work.

WARNING

Many service callouts are due to inappropriate water quality, which is outside the control of Astell Scientific. Installation or operation with inadequate water quality and any consequences or service visits involved are not covered under the manufacturer's warranty.

Water level Sensor faults

An example fault here is that the system starts without taking on water. ***This occurs if the water level sensor is already FALSELY detecting sufficient water present.***

A correctly installed & functioning system cannot start to heat until the correct water level is present in the chamber, but it is important that the sterilizer is installed with the feet on a horizontal surface. On frontload models the front of the machine is higher than the rear so the chamber is tipped backwards.

The usual cause for this is that The water is not entering at the start to the correct level because the chamber water level sensor has been damaged or is missing or is being touched by some other conductive object.

Inspect the **water level sensor** fitted thro the rear or on top-load models, through the side at the base of the chamber. This is the 3mm thick brass strip approx 20mm wide, pointing down towards the water. When the water reaches the tip of this it makes contact and the electrical conductivity of the water completes the circuit to the boiler which is sensed to measure the water level.

A That the sensor strip is bent and touching something metal

B The load Supports are defective and a metal load container or shelf is touching and shorting out the sensor.

C The sensor is dirty – congealed effluent from the load has coated the insulator shorting the sensor out to the boiler wall.

Check that nothing is touching the sensor and that it and the insulator are clean. A Scotch-brite pad is useful for this. If the problem continues service attention will be required

SAFETY INTERLOCKS

PRESSURE INTERLOCK

Preset to [less than +0.15 Bar] this is an independent electrical interlock operated by a precision pressure switch preventing the electrical release of the Closure lock if the chamber is pressurised.

OVERPRESSURE CUTOUT

This is preset to approx 3.00 Bar. Above the safety valve point, & operated by the electronics control software. If the pressure sensed by the controller pressure transducer exceeds this level, which suggests safety valve problems, then the heating is shut down, a warning shown and a fault condition generated.

TEMPERATURE INTERLOCKS

STARTING- INTERLOCK .

Prevents starting a cycle with a dangerously hot or pressurised chamber.

COOLING LOCKS

There are two Cooling Locks to prevent the Sterilizer being opened with a Liquid Load under unsafe conditions.

There are two cooling lock systems :-They remain electrically LOCKED until the load has cooled to a safe handling temperature COOLING LOCKS operate for FLUIDS and DESTRUCT Cycles .

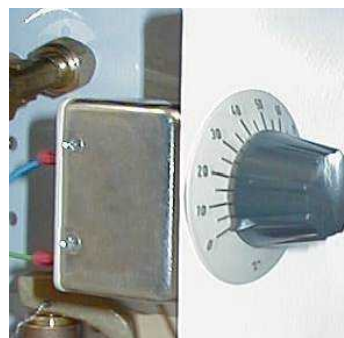
WARNING- THE COOLING LOCKS CAN PRESENT A HAZARD IF INCORRECTLY SET.

They should be adjusted by the supervisor, or a person trained in Sterilizer use & the setting of safe sterilizer cycles.

PRESET COOLING LOCK THERMOSTAT

This is a thermostat with Dial & scale calibrated in Deg. ,0-100C, behind the cabinet side cover panel or at the rear.

It measures temperature of the Chamber outer Wall, with sufficient thermal mass for a reasonable match between the Load Temperature and the Cooling Lock Set temperature , .



Typical View of Cooling Lock Thermostat

NOTE;-The temperatures will not be quite the same, due to differing thermal inertia.between the Chamber Wall and the Load. Normally the Chamber wall & Cooling Lock sensor attached to it will cool down faster than the load.

CYCLE COOLING LOCK.

The STANDARD SYSTEM Operates when LOAD SENSING option is NOT fitted or NOT selected.

This uses a Cooling-Lock-Temperature set by the user within each Cycle Profile which is compared with the Chamber Internal Temperature Sensor reading (the same temperature as appears on the Temperature display). When the CHAMBER temperature is above this "CYCLE" cool-lock temperature the lock is active (engaged) and Completion is inhibited preventing the door from unlocking..

NOTE;- The Chamber-Sensor detects the temperature within the steam space & it will normally Cool faster than the Load &/or the chamber Wall.

Load Sensed Cooling Lock

(if LOAD SENSED COOLING OPTION is fitted & selected for that Cycle)

In this case the Cooling Lock Temperature set for the Cycle is **not** compared with the Chamber Temperature but instead **the Temperature measured by the flexible LOAD sensor**. When this Load-sensed temperature is falling but still above the "CYCLE" cool-lock temperature the lock is active (engaged) and Completion is inhibited , so the door cannot be unlocked.

AS the LOAD SENSING PROBE detects the temperature within the LOAD itself , it will always represent the actual load temperature., assuming it has been correctly placed in the load.

DUAL COOL- LOCKS

Both Cooling locks must be satisfied for them to release the door.

The temperature of LOAD and CHAMBER must BOTH be below the two separately-set cool-lock temperatures to allow the cycle to complete.

COVER CLOSURE SYSTEM INTERLOCKS.

The cover is prevented from being opened by a solenoid locking bolt pin. This Locking Bolt pin engagement and Cover Position are sensed by high-reliability Micro-switches. The system cannot be started unless the closure is fully secured and locked.

There are two alternative systems;-

Multibolt Closure

The Closure interlock system uses multiple sliding bolts that engage in holes in lugs around the chamber opening. The system senses the position of at least 2 of the sliding bolts that hold the cover shut, and also detects the "engaged" position of the solenoid locking pin that prevents the handle being moved.

Swiftlock Rotary Closure

The Closure interlock system senses the position of the rotating ring which has the interlocking "Dogs". The Ring is held in the LOCKED position by a solenoid -operated spring-return BOLT that extends into a hole in a block on the ring periphery, preventing the rotation of the ring and prevents the handle being moved.. The system also detects the "engaged" position of the locking Bolt

The Cover can not be opened if:-

1 Chamber Temperature is above selected Cooling Lock setting (liquid/fluid Cycles only), and Pressure is above approx. 1.5 p.s.i. /0.2 Bar.(for all Cycles)

2 (The Programmable Cooling Lock Temperature is set within each Cycle. But the PRESET cool lock temperature is a single setting applying to all Cycles.)

The Cover is also Locked if POWER is OFF.

3 There is a delay of typically 5 seconds after pressing the [DOOR] button before the locking pin retracts , and during this the VENT VALVE is open to atmosphere.

4 The Cover can only be opened by pressing the [DOOR] button and waiting for the bolt to unlock.

NOTE- The [DOOR] button will NOT open the Cover if it is prevented by the Cooling Locks or the pressure interlock .

5 The system will only start and run cycles if the Cover is fully CLOSED & LOCKED.

It is not possible to pressurize the chamber with the Cover Unlocked.

HEATING SYSTEM:

Electric heat

Steam is generated from water held in the base of the chamber .The Electric Heating system uses an electrical immersion heater and a water level Conductivity sensor acts at "Filling" level . Water is supplied to the chamber automatically from a water tank .An Overtemperature thermostat limits heater temperature rise if the system should fail or boil dry.

Direct-Steam Heated Models

Steam is admitted to the chamber from an external supply, controlled by a solenoid valve or Pneumatic actuated valve.

AIR-PURGEING SYSTEM

Note; "Airpurgeing" is the Term used here to describe an initial period of STEAM FLUSHING at atmospheric Pressure which uses the steam to displace the air from the chamber. This may also be called **FREESTEAMING** .The Cycle Profile control provides an adjustable period of 'AIRPURGE' to ensure steam penetration in loads such as Petri dishes, sample tubes, etc. with large numbers of trapped air spaces.

The temperature at which this starts is close to boiling point. This can be adjusted to allow for altitude effects.

TEMPERATURE CONTROL SYSTEM :

The Chamber Temperature Is measured by a PT100 precision sensor. This is compared with the Sterilize Temperature - the "SETPOINT" stored in the Cycle Profile, and the controller acts to keep the chamber at or about that temperature by switching the heat source. Control of temperature does not rely on steam pressure.

The actual temperature that the control system tries to attain for will be varied automatically at different parts of the cycle . This does not require user attention during the cycle .

STERILIZE TIMING SYSTEMS :

a] Standard Timing System;-

This operates if LOAD SENSED TIMING option is not fitted, or if fitted but it is not selected for this Sterilise Timing starts when chamber reaches set temperature, and terminates at end of set period. Temperature and Time are set within the Cycle.

b] Load Sensed Timing System;- (Optional Extra)

LOAD SENSED TIMING is selectable (on or off) within each of the Cycles.
Please see LOAD SENSED TIMING section

COOLING

Cooling action operates whenever appropriate in the Cycle and only works for Cycle types that do not permit DRYING, eg Fluids cycles At the end of Sterilize for Liquid /Fluid Cycles , initially convection *ambient* cooling cools the chamber to a preset pressure threshold . When this temperature is reached the water is discharged and the chamber then continues to cool until the Cooling Lock(s) are satisfied.

FAN COOLING

If the COOLING FAN option is fitted the fans will start at an appropriate temperature , normally preset to just above 100C, which may be adjusted if required.

WATER COOLING

If the Water Cooling option is fitted water flow will start at a set temperature , normally preset to just above 100C, which may be adjusted if required.

At the end of the cycle the cooling water is shut off when no further worthwhile cooling effect is happening , to save water.

At the start of the cycle residual water is expelled from the tubing system through the exhaust.

FAST MANUAL EXHAUST OF STEAM

(not available)

Please note that this machine design does NOT allow the operator to Exhaust steam at the end of a sterilize period or any other time.

All controls of Cooling and Steam exhaust are built-in to the Cycle Profiles and optimised. Nothing would be gained by having this Override Manual Control but many factors count against this.

This provision has been present on other makes of machine with older simpler control systems , with a valve allowed the user to exhaust the steam.

Astell machines are designed to operate in compliance with the EU directives on safety , including the PED and EN 61010. These preclude the use in this manner.

The amount of steam produced when a chamber pressurised to 120C+ is exhausted is large and can constitute a serious hazard.. Unless special high temperature exhaust pipework is installed in the building to take this exhaust away to a safe discharge . Also the steam produced would get into the inside of the case and condense on the electronics systems. This would cause damage very quickly.

If the loads contains fluids then the action of exhausting the steam would cause the fluid load to violently boil over & empty the load contents into the chamber, which quickly will "gum-up" the valves and pipework. Also if such a load was removed even after it had appeared to stop boiling over , then it would be very likely to flash-boil again into the face of the user carrying the load.

Health and safety requirements in the EC require that generally such a load is not handled at a temperature above 80C.

PRESSURE SWITCH INTERLOCK

Should the Fault system indicate a Pressure switch fault This usually indicates a Pressure bad adjustment or Drift , and is seldom a Pressure switch Failure.

The Pressure switch should release at approx + 0.15 Bar Gauge. Due to age or stress this setting may drift.

The system monitors this switch as a safety feature to prevent opening the chamber if the pressure exceeds 0.15Bar.

Observe the Pressure and Temperature displays.

If

A the Pressure displayed is close to Atmospheric pressure (eg around 0Bar)

And

B the temperature is near to room temperature

And

the display still shows the fault as above

, then ;-

the Pressure switch may be out of adjustment.

It may resolve itself if left for 1-2 hrs to cool down .

If this continues, the Pressure switch should be checked and adjusted - please contact your service agent Or Astell Scientific for advice.

Typical view of Pressure Switch



OVERHEAT FAULT

IF there is a water level problem or a valve sticks open, blowing out the water, & the system goes to Boil Dry then the heater will be exposed and the Overtemperature Thermostat will start to operate. This will take over control and shut down the heater until the temp. falls when it will come back on.. This will cause the temperature to vary very widely up and down as the heater cuts in & out and the Pressure will not match the Temperature (- eg the Chamber might be above 100C but the pressure might be zero or much lower than normal)

Service attention will be required.

SAFETY VALVE TEST

This is a special Supervisor setting to make the testing of the safety valve easier.

Please note that this testing is mandatory in the E.U.. and many other countries.

Selecting this will force system to use a preset set of parameters specifically for testing the safety-valve. This runs at excess temperature and pressure.

As standard, all models have an AUTOMATIC SAFETY VALVE TEST WARNING SYSTEM . Performing a safety valve Test Cycle and getting a PASSED result resets the " SAFETY VALVE TEST OVERDUE" warning message, for the next test period.

Do Not Use This Feature for Sterilization- Safety-valve test ONLY.

Please see the SAFETY VALVE TEST instructions at the beginning of this manual.

CYCLE DETAILS & DISPLAYS

The Sterilizer models covered by this manual are Cycle and the details of the cycles can be changed, the 4 profiles are set at the SUPERVISOR level and not accessible for change by the user on a daily basis.

Instead it is expected that the SUPERVISOR will set up a cycle for each of the daily uses of the machine.

Some items (such as selection of Load Sensed Timing) can be changed only by an engineer or supervisor with the correct PIN no..

For Each Cycle the following are set to provide the desired profile.

Different Cycle types use different sets of settings

Examples are

Airpurge Time
Sterilize Temperature,
Sterilize Time
Cooling Lock setting & Temperature
Cooling start temperature,
Cooling Pressures

STERILIZING AND THE CYCLE SEQUENCE

This sterilizer performs the following stages to achieve a sterilized load;-

The standard "CLASSIC" Cycle is as follows

- A Heat to generate steam. @ about 100C
- B Steam is vented for a timed period to expell air (Airpurge)
- C Chamber is sealed and heats to sterilize temp. (eg 123C) *then Wait for Stabilise time*
- D Timed period --chamber at Sterilize temp.
- E Cool slowly to with Exhaust valve pulsed, chamber sealed, If Assisted cooling fitted start this at Cooling Start temp.
- F Continue to Cool with Exhaust valves Open , allowing air in via optional filter
- G Cool to Cooling lock temperature
- H **Cool Lock temperature Reached**
- J *If Holdwarm selected, maintain chamber temp at chosen HOLDWARM setting Until operator stops Cycle*
- K Cycle is complete- door can be opened

Please note that correct Sterilization is dependent upon the Cycle being suitable for the load and type of processing required.

STERILIZATION PARAMETERS FACTORY SETTINGS #5-10

PARAMETER	instrument	Glassware	Discard	Fluid	Media
Printer**	ON**				
Monitor time	N/A				
<u>AIR PURGE</u>					
Monitor time	60m				
Hold time	5m				
Print interval	1m				
Limit press	1200				
Start temp	95				
HEAT TO STERILISE					
Monitor time	60m				
Print interval	1m				
Stabilize time	1m				
STERILISE					
Monitor time	60m				
Print interval	1m				
Ster temp.	121C				
Ster time	15m				
Probe chamber ***	121=Y	121=Y	121=Y	121=Y	121=Y
Probe load	0=N 121=Y	0=N 121=Y	0=N 121=Y	0=N 121=Y	0=N 121=Y
COOLING					
Monitor time	30m				
Print interval	5m				
Cool fan delay	2m				
Cool time	15				
Cool override time	20m				
Cool temp	80C				
Cool interlock	N	N	N	Y	Y
Start temp	105C				
Cool Press 1	N/A	N/A	N/A	1800	1800
Cool Press 2	N/A	N/A	N/A	1300	1300
Cool Press 3	1050	1050	1050	1050	1050
Cool 1	N	N	N	Y	Y
Cool 2	Y	Y	Y	N	N
HOLDWARM					
Holdwarm*	N/A	N/A	N/A	Y/N	Y/N
Temp				80C	80C
DRYING					
Monitor time	30m	30m	30m	N/A	N/A
Hold time	5m	5m	5m	N/A	N/A
Temp	80C.	80C.	80C.	N/A	N/A

Cells without entry, are as column 2 [instrument

*Requires Holdwarm to be enabled in settings/system/door, holdwarm.

**OFF if not required, when fitted.

*** Same As Sterilise Temperature

STERILIZATION CYCLES NOTES & ADVICE

This information is in addition to the section **STERILIZATION CYCLES NOTES & ADVICE** given in The Programming Manual

INSTRUMENT & GLASS CYCLES

Specific cycles for Instruments and Glass are not available on CLASSIC models

You may sterilize these loads however they will come out WET.

There is no drying system available.

FLUIDS OR LIQUID CYCLE

This is suitable for processing Media or other fluids etc in UNSEALED containers.

FLUID WASTE DESTRUCT Cycle

This is suitable for processing laboratory waste;- petri dishes, tubes, jars, bottles etc. These must be in a shallow open container and not sealed in a plastic bag.

SELECTING AN AIRPURGE TIME

Suggested Airpurge - settings

FLUIDS IN UNSEALED CONTAINERS ;-
Set the Airpurge period between 3 & 15 minutes* *

FLUIDS WASTE DESTRUCT ;-
Set the Airpurge period to 7 - 20minutes * *

* * AIRPURGE TIMES

Airpurge times longer than 15 minutes on an **unloaded or lightly loaded chamber** may cause problems with boiling Dry . Long times are usually only necessary with full loads.

"Open" load containers without drain holes which can collect and trap condensate from draining back down to the chamber base – can retain water causing boiling dry .

Long Airpurge times can mean excessive heating in the condensate bottle and potential hazards from steam and condensation.

Please ensure that the load and containers match the selected cycle.

LOADING & PLASTIC BAGS

Note that the worst loads for air removal are Loads in Plastic bags , Loads with lots of small spaces like PETRI dishes, small bottles etc. These will always need a longer Airpurge period.

Best performance is obtained when Plastic bags are not used.

if it is in a plastic bag this should not be sealed and the top must be opened up completely and ideally rolled down so that the maximum area of the load is exposed to the steam without the top of the bag getting in the way. The container holding the bag must have large holes in the sides to allow steam to enter the container sides and the Plastic bag must be slashed or cut with a knife through these holes so that the steam can get into the bag.

A variety of different special containers are available from ASTELL that contain the load and allow thorough air/steam passage, whilst maintaining integrity and facilitating pouring away liquid residue. Please consult your supplier.

SELECTING STERILIZE TEMPERATURE SELECTING STERILIZE TIME

The U.K. Medical Research Council recommended the following time/temperature relationships for the achievement of sterilizing conditions:-

Minimum Sterilize Temperature	Maximum Sterilize Temperature	Minimum Sterilize Hold Time
134	138	3 min
126	129	10 min
121	124	15 min
115	118	30 min

Lower temperatures or shorter times may have to be used to prevent degradation of bacterial growth media. This may be adequate for culture purposes , but does may not constitute full sterilization. The manufacturer of the media will usually specify the sterilizing temperature.

Temperature Tolerance

Please note that during sterilizing the temperature will normally cycle up and down over a range of approx +/- 0.7C around the set sterilize temperature. Where temperature is specified as "-0 +??" adjust the temperature as shown here.

Specified Settings	Recommended Cycle Settings
134C -0+4 3 mins	135C or 136C ; 3 mins
126C -0+3 10 mins	128C 10 mins
121C -0+3 15 mins	123C or 122C 15 mins
115C-0+3 30 mins	116C 30 mins

LOAD SENSED TIMING

Option- see Load Sensed Timing

Sterilise Time ;

Set the Sterilise Time to the desired "exposure time". At the sterilise temp.

Allowance For Extra Sterilise Time For Load To Reach Sterilise Temp

Fluids Loads normally require an allowance for extra time for heat-up as they suffer from high thermal inertia .If the LOAD SENSED TIMING option is not used an allowance is needed for the time taken for the load to catch up with the chamber temperature. Extra time should be added to the Sterilise time to compensate.

Sterilise Temperature;

Set to the desired Sterilise Temperature .

Stabilise Time

Set to between 1 and 5 minutes

COOLING

The COOL parameter Must be set to COOL1

COOLING LOCK(S)

These will need to be set up for optimum operation however as a Starting Point ;-

Set Cooling Lock Thermostat to 80C for safety.-

Set Cycle Cooling Lock temperature to 80C

Please see SETTING UP AND COMMISSIONING SECTION for more info.

COOLING LOCK SETTING

During cooling inside the chamber, the load cools slower than the chamber temperature and gives up heat to the chamber walls. This means that the chamber will reach 80C before the load so (unless load sensed timing is fitted + on) the cooling lock setting will need to be BELOW the temperature

It is possible to set the cooling locks in a simple way as shown below, but they are ideally set using a thermocouple (t/c) and digital thermometer with the t/c sealed inside the chamber immersed in the liquid load. This is quicker and more accurate but is normally carried out by a service or commissioning engineer requiring use of a Thermocouple entry adaptor, and details are in the Service Manual.

To set the Cooling lock without a thermocouple, a laboratory liquids thermometer reading to 100C is required.

Load the chamber with the desired load, and make a first approximation of cooling lock temperatures . 80C is suggested for both the Cycle and Preset settings. Start the cycle and allow it to complete. Very Carefully remove the load, using insulating gauntlets and suitable face protection in case the load is too hot. Immediately measure the temperature of the liquid in the load container that was nearest the centre.

Record this temperature and compare it with the desired opening temperature (80C suggested). The measured temp. is likely to be higher than the desired temperature. Adjust the Cycle and Thermostat cooling lock settings as required and repeat the cycle with the same load , open, measure and re-adjust if required. Continue until the desired Cooling Lock release temperature is reached.

SETTING CYCLE WITH LOADSENSE TIMING OPTION .

The Load Sensed Timing system detects the Load temperature , and automatically allows for the time-lag caused by the load delay in reaching sterilise temperature.

Set up the system as described above for the system Without Load Sensing, but with the following detail changes .

In STERILISE Stage Cycle Settings;-

- a) Set the STERILISE TIME to the Actual STERILISE TIME.(no extra allowance heat up)
- b) Set the LOAD TEMPERATURE to about 1-2 C below the sterilise temperature

When the load reaches set Load Temperature the Stabilise time will begin , followed by the Sterilizing Timer starting , and the cycle will proceed

MEDIA HOLDWARM

If Media Holdwarm is required at the end of the cycle, then 'HOLDWARM' should be set to ON in the COOL stage CYCLE SETTINGS

The Holdwarm system is designed to allow sterilisation of MEDIA loads ,with a holding stage during the cooling process that maintains the temperature of the load and chamber warm enough to permit pouring of the melted media. The media will be kept warm for up to 48 Hrs . The Autoclave may be set to operate overnight with a Media Load, in the knowledge that it will contain a useable load when opened in the morning.... or later in the day

"Holdwarm" takes place between COOLING and COMPLETE

When the Complete Conditions are met as described above, if selected, the system goes instead to the **HOLDWARM** stage

LOAD SENSED TIMING (Optional extra)

All Sterilizer loads have Thermal Mass. This means that the load will ALWAYS heat up more slowly than the Sterilizer chamber. If this is not allowed for in timing of the sterilize Cycle profile, the load will not be subject to correct sterilizing conditions, ie it will be exposed to the set temperature for too short a time. Load Sensed Timing avoids this problem.

Load Sensed Timing is selected in the CYCLE SETTINGS – Sterilise Stage by setting a LOAD TEMPERATURE.

If set to an appropriate temperature-(such as 121C) then the LOAD SENSED TIMING is ON

If this is set to 0 C then the LOAD SENSED TIMING is OFF

Please see the Programming manual for full details

IMPORTANT

The position of the Load sensing Probe is very important. The probe must be in the same place for running cycles as it was when the Cycle was commissioned.- so you will need to set up a laboratory procedure to ensure it is always placed correctly.

If correctly positioned the LOAD SENSING PROBE detects the temperature within the LOAD and so will ensure that the load experiences the set conditions for the set time,

If it is just put to one side of the chamber instead of in the load then Fluid Loads will experience only a very short time at Sterilise temperature or may not reach Sterilising at all.

SPECIAL LOAD SENSORS

The Load sensor provided with this system is a 5mm/6mm Dia flexible type. This may be too stiff or solid to use for some loads.

Alternative probes May be available. Please consult Service dept. or your dealer

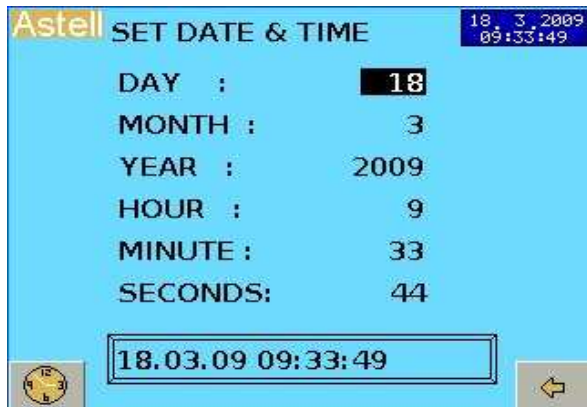
COOLING LOCKS AND LOAD SENSED TIMING

Selection of the LOAD SENSED TIMING function in a LIQUID or WASTE DESTRUCT Cycle also implements a LOAD SENSED COOLING LOCK for that cycle . In this case the COOLING LOCK senses and acts upon the actual Load temperature

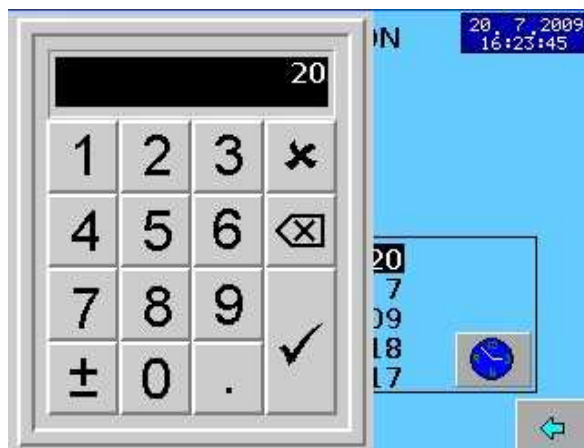
The Cooling Stages operate normally but the "COMPLETE" stage cannot be reached until the load , and hence the LOAD SENSING PROBE has cooled to a temperature below the COOLING LOCK TEMPERATURE set for that Cycle.


Set the Cycle COOLING LOCK TEMPERATURE to the actual Temperature of the LOAD at which the Cooling Lock is to RELEASE and allow the door to be opened. It is advisable to err on the Cooler side , for safety.

SET CLOCK- TIME AND DATE



Eg
To change
the DAY



Type the value you want using the numeric keys
Then Press  [Enter]

When you are happy with the Date and Time shown Press the Time Set Button

To save the changes.



OPTIONAL PRINTERS

PRINTER INDEPENDENCE

Please note that the fitted printer is not independent of the control system & has no separate sensors or intelligence – it records from the control sensors and prints the same data as available on the display..

Three types of Printer are available

A INTERNAL STANDARD PRINTER OPTION

Please see instructions below

B EXTERNAL STANDARD PRINTER OPTION

C EXTERNAL User-supplied Rs232

B & C - Please see separate manual(s) for external printer or RS232 Communications option

INTERNAL PRINTER OPTION



The printer is mounted on the Front face of the machine. The standard printer supplied is the Astell "Clamshell-Load" Type Shown above .

This is a 40 character easy-load dot-matrix impact printer which prints on 58mm wide plain roll paper. It uses a replaceable ink ribbon cartridge and prints in one single colour (Black)

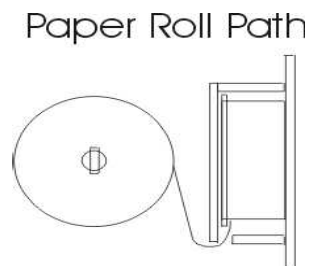
Installing Replacement paper

Open the “Clamshell” front panel,

Remove the old Paper Roll.

**Cut off the end of the new paper
cleanly with scissors**

Feed the cut edge of paper into the printer mechanism and operate the PAPER FEED button.



**For best operation use only Astell Scientific
Supplied paper and ribbons.**

Incorrect loading causes many expensive service call-outs. Please ensure that the paper loading method described here is used . Do not tear-always cut the paper with a sharp pair of scissors- a likely cause of problems is the introduction of paper fragments produced when paper is torn.

CHANGING PRINTER RIBBON

First remove paper from the printer.

Open the Printer Front panel.

The Printer Ribbon is the small black L-shaped cassette that sits below the paper out slot.

Grasp at both ends and pull firmly away from the printer assy.

To fit the new ribbon

Hold the new Ribbon Cassette by the ends and rotate the small wheel using the tip of a Biro Pen in the direction shown by the arrow on the cassette. This tensions the ribbon.

Place the New Ribbon Cassette in position on the mechanism. Press the Larger end with the Wheel down gently until the clutch engages then press the other end down until seated correctly. The ribbon should fit neatly into the slot

Press "PAPER FEED " button on top front of printer for 5-10 seconds to align the ribbon in the slot. Open front LOWER panel and check ribbon - The ribbon should run neatly in the slot provided. If the ribbon is distorted and above the slot, remove & re-tension the ribbon and repeat the fitting.

Fit paper as described above.

Make sure paper roll is free to rotate and Close top and bottom of case.

OPERATION OF PRINTER

Please note that the print is not visible immediately after printing since the point at which the printing occurs is a few mm inside the case & hence may be out of view.

Printing is automatic whenever it is required by the Cycle .

Cycle Progress is printed automatically as the cycle runs, Or at the end of the cycle depending on how printing is set up.

The printer can also be used to print reports etc.

Paper
(Per 58 mm Roll)

Astell Part No SXP374

Ribbon cartridge

Astell Part No SXP373

PRINTER SPARE PARTS

Printer PROBLEMS

Most Printer Faults are due to the paper or ribbon being incorrectly installed or use of incorrect paper or ribbons.

PRINTING VERY FEINT

Replace Printer Ribbon

CENTRE OF PRINT BLURRED OR MISSING

Ribbon incorrectly installed with ribbon out of slot in centre

PAPER WILL NOT LOAD

The Paper end **MUST** be cut cleanly at the end or it may tear , jam, and clog the printer mechanism Ensure paper roll is fitted correct way up.

RIBBON

Ribbons must be fitted with the ribbon correctly seated in the slot. If the printing becomes faint replace ribbon.

OVERSIZE PAPER

use only Astell-supplied or Astell- approved paper. Alternatives may appear similar but poor paper quality will leave excessive dust which can damage printer or use up ink on ribbon too quickly.

Paper rolls purchased for Adding Machines and Tills are not suitable and are usually too large. They also tend to shed paper fragments into the mechanism and cause premature failures.

WARRANTY

Installation of paper to the printer is outside the manufacturers control. Service calls during the warranty period which (in view of the manufacturer or agent) are caused by the incorrect type, use or fitting of paper or ribbon , may incur service charges.

CLEANING

CHAMBER CLEANING

WATER QUALITY AND CLEANLINESS OF THE CHAMBER ARE VITAL TO THE CORRECT OPERATION OF THE SYSTEM .

This Sterilizer is designed to Heat clean Water in the Chamber. The filling water may become contaminated by unsterile condensate or drainage from the Chamber. If the filling water becomes contaminated with AGAR, BLOOD, FAECES , or solid rubbish it will cause fumes, smells, potential health problems and accelerated machine failure.

The Chamber and all wetted parts should be Cleaned regularly in order to maintain adequate operating conditions. Load Containers should be chosen to minimise loss of the contents into the Sterilizer, e.g.:- do not use plastic bags inside Sterilizer Baskets but use a purpose-made Sterilizer container designed to catch leaking waste. Please ask your supplier for details of containers for your machine.

The Chamber should be cleaned internally to prevent build-up of contaminants , and we would suggest that for a machine in daily use, if used for Fluid Loads or WASTE DESTRUCT the Chamber should be checked once a week and cleaned if necessary, . For other applications Cleaning should be at monthly intervals or more frequently.

- Open the DOOR as you would normally.
- Remove all trays or shelves.
- Clean the base of the chamber with Hot Water. Do not use an abrasive cleaner or one which may leave soluble residues that would remain in the pipework and contaminate the water.
- Take Care not to damage the sensors , or to displace them in any way. This is especially the case with the Over-temperature Thermostat bulb which is fitted onto the heater and connected to the chamber wall by a very thin copper tube.
- Wash the sensors with hot water and a soft cloth.
- Turn on The Chamber Drain Valve to drain water from the chamber. Rinse if required with clean warm water.
- Dry the chamber with Paper or Cotton Towels. Do not leave fragments of paper or lint behind.
- Wipe the Gasket with a wet cloth moistened with a little detergent.

CABINET AND GENERAL CLEANING

The cabinet painted surfaces may be cleaned with a damp cloth moistened with a drop of household detergent.

Do NOT use Abrasives or Chlorine-based cleaners or bleaches on the cabinet or chamber

Cleaning of LABELS & WORKING PARTS Clean Labelling, aluminium parts or working parts with a soft cloth moistened with a little methylated spirits. Do not use Solvents IPA, or Aqueous Cleaners which may remove the printing or melt the plastics.

Cleaning of LCD TOUCHSCREEN :- Clean with a soft cloth moistened with a little water. For best results you can use 2 Spectacle Cleaning Wipes" suitable for Plastic lenses.

If stubborn marks persist use a soft cloth moistened with a very small amount of methylated spirits. Do not use IPA or similar solvents or Aqueous cleaners.as these will damage the transparent window.

SAFETY & DOOR INTERLOCKS - INSPECTION

This Sterilizer is fitted with safety interlocks to prevent the opening of the Cover when the chamber is pressurised, and to prevent pressurization if the Cover is not fully closed.

The U.K. Health and Safety regulations stipulate that the closure system and interlocks shall be inspected at regular intervals by a competent person, and that all operators shall be trained in the use of the Sterilizer controls, operating procedures, and the function of safety devices.

DOOR INTERLOCKS

The door is held in the Locked position by a electrically retracting Solenoid Locking Pin. This is fitted with 2 or 3 sensor microswitches arranged to enable the heating and control system only when the door is closed and the handle rotated into the locked position. With the cover open or not fully locked heating is disabled. The locking Bolt system is continually monitored by the control system.

INSPECTION & TESTING OF DOOR INTERLOCKS

1. Unlock and open the door.
2. Check for smooth Swinging and/or Lifting action with no grating or crunching noises, or looseness.

Inspect the Locking Pins. They should slide freely as the handle is moved

3. Operate the door handle. Observe the operation of the bolts. Operation should be firmly limited by the End Stops, and all bolts must operate in the same manner. Check that Solenoid locking Pin operates when handle is in Fully Locked position..(press [OPEN]to release lock)
4. Close door and hold shut -DO NOT LOCK. display should change to "UNLOCKED"
5. Rotate handle, Lock and check that Locking- Pin functions correctly and prevents unlocking. Display should show the normal display as if ready to start.
6. Use [DOOR] button to unlock.

IF THE DISPLAYS SHOW OUT OF SEQUENCE, ERRATICALLY, OR FAILS TO SHOW, OR IF THE MACHINE FAILS TO COMPLY WITH ANY OF THESE REQUIREMENTS, DO NOT OPERATE AND CONSULT A QUALIFIED ENGINEER IMMEDIATELY.

In the U.K. HSE Guidance Note PM73 requires that such checks are carried out regularly. To Comply With H.S.E. requirements, instructions regarding testing of these interlocks must be permanently displayed close to the Sterilizer Operator Position

OVERTEMPERATURE PROTECTION

This system is intended to protect the Chamber, Controls, and the load, from Thermal Damage but MAY NOT prevent the Water Heaters from damage due to overheating.

The system uses an adjustable HYDRAULIC THERMOSTAT set to about 250C with the Adjustment Knob sited at the back of the cabinet behind a cover.. The thermostat has a sensor bulb mounted in a clamp on the heater at the rear of the chamber. In the event of a temperature rise for any reason above the set Temperature the Thermostat operates, This provides additional boil-dry protection.

Operation of the standard Overtemperature thermostat cuts off the heater.- No Warning indication is provided.,

When the temperature drops, power is restored and the control will continue.(depending upon System Settings)

If this happens, turn off power, allow to cool untouched, then restore power, open and unload.

Isolate and rectify the fault, or Contact the Astell Scientific before operating the machine

Warning

The Manufacturers of this Sterilizer accept no responsibility for damage which may result in a Load processed in this Sterilizer in the event of a overheating fault occurring for any reason. The Overtemperature Cutout is provided to reduce the risk of Fire or consequent damage.

EMERGENCY UNLOCKING

If the door becomes Jammed or in the case of a Power Failure, The Door can be manually unlocked.

WARNING!!!

The Chamber Must be cool- (below 50C is advised) and Pressure on Dial Gauge Zero.

MANUAL UNLOCKING FRONTLOAD MODELS SIZES 120&153 LITRES

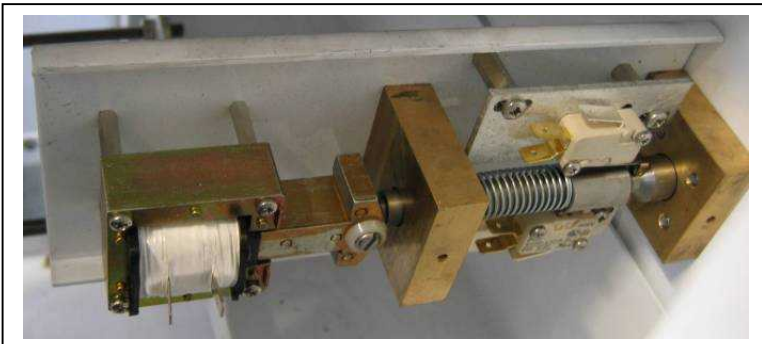
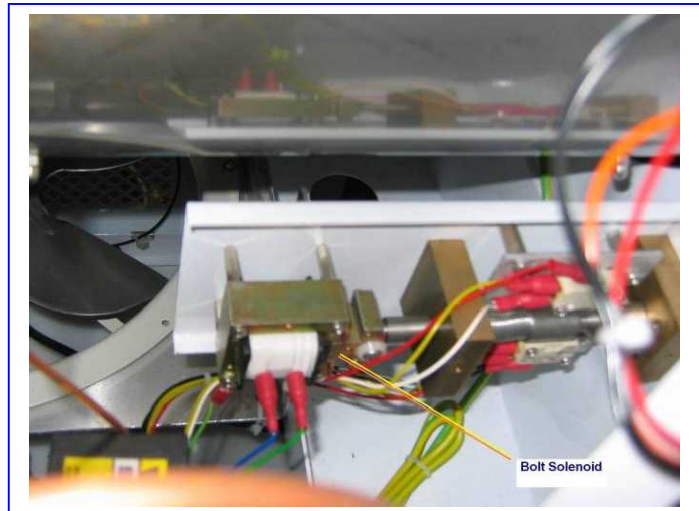
Important- Turn Mains POWER SUPPLY OFF



Locate solenoid-operated
Locking bolt.

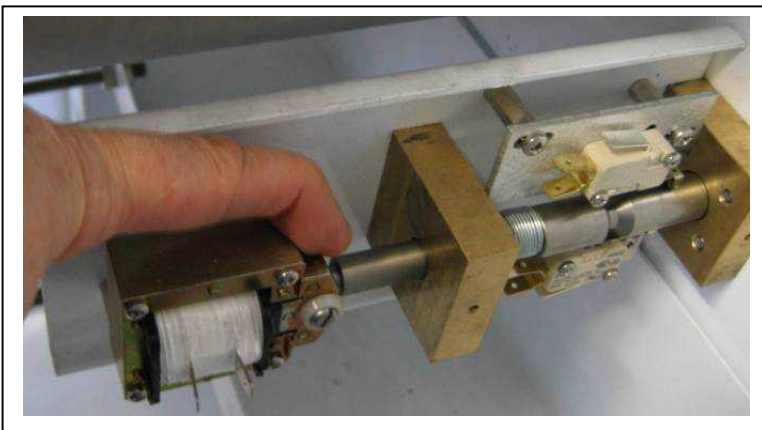
**Remove side Panel on HINGE SIDE of machine or
remove cover plate in that side panel , over
Locking Bolt.**

Typical view of Bolt Mechanism through hatch



View of locking Bolt mechanism -
Actual assembly will have various
wires attached.

**Here the Wiring is removed for
clarity**



Using a finger as shown Pull the
locking bolt **BACK** against the spring
and hold it there

- meanwhile get someone to operate
door handle ,
Open door and Release bolt.

PERIODIC MAINTENANCE

There are very few moving or wearing parts in this sterilizer, HOWEVER, It is essential that the unit is kept clean, especially the water in the tank or Chamber and the Gasket.

A GASKET

Keep the mating surface of the Chamber flange clean. This bears on the gasket to seal the Chamber. If necessary apply a little Silicone Grease.

Check that gasket is not bulging out of the groove and, and that the edge is smooth without any cuts or abrasions.

IMPORTANT- Check that the gasket is fitted correctly - the small "Holes" should be on the outside lip.

Replace Gasket regularly

Astell advise that the Gasket will require replacing at 12 month periods – or 6 months if the machine used intensively or for many high-temp cycles..

B CLEAN CHAMBER

Clean out chamber and inspect for damage to sensors etc

C CLEAN TANK –

Drain water from tank and rinse out with clean hand-hot water. Do NOT use any detergent. Detergent will contaminate the feed water and will cause foaming problems in the tank.

D DOOR INTERLOCK TESTS

Carry out the Door Interlock test described on previous pages.

If necessary lubricate locking pins with a little Disulphide high-temp grease.

E SAFETY VALVE TESTING

ASTELL SCIENTIFIC advise that the safety valve must be regularly tested At intervals of NOT MORE THAN 3 MONTHS

NOTE;- There is a hand-operated actuator on the safety valve which allows it to be manually triggered for testing. This is NOT adequate as a test of the safety valve. This must be done by operating the machine with a suitable Cycle –

Safety Valve Test Quick Reference

IMPORTANT *
THE MACHINE MUST BE ATTENDED AT ALL TIMES UNTIL TEST IS COMPLETED.

TOUCH



SELECT "SETTINGS"

TOUCH



SELECT "SITE ENGINEER"
ENTER "333333"

SELECT "EDIT MACHINE SETTING"

SELECT "TEST CYCLE"
(Background Turns Green)

TOUCH



(3 Times = Return To Main Menu)

CLOSE & LOCK DOOR

TOUCH "START"




SELECT "TEST CYCLE" ON MENU

TOUCH "START"
(To Start Cycle)



TEST CYCLE IS NOW RUNNING

When steam is seen coming from the safety-valve outlet, touch  to advance machine into cooling.

Note- depending on model the safety valve may operate by exhausting a blast of steam or by a continuous steam flow thro the valve

LEAVE UNTIL COMPLETE
& THEN OPEN DOOR

IF THE SAFETY VALVE DOES NOT OPERATE AT THE STATED PRESSURE IT MUST BE CHECKED AND ADJUSTED BY A QUALIFIED ENGINEER.

THERMOCOUPLE ACCESS PORTS

A Screwed Thermocouple access port is provided as standard for Testing Thermocouples

This comprises a **HEX.THERMOCOUPLE PORT COVER CAP** which screws onto a male fitting. There are slots in the sides of the male fitting to allow the wires to emerge under the cap. The cap clamps a 12mm silicone seal against the hole in the male fitting. The seal deforms around the thin thermocouple wires.

Front-Load models;-

The port is fitted at the Left-Hand side of the machine approx on the boiler centre line (Remove the Small cover for access)

Top--Load models;-

The port is fitted at the RH side of the machine on the boiler side . Remove the Small cover for access

Where a blank has been supplied in place of the adaptor, you will need to fit the optional adaptor yourself.

Remove the fitting blank and fit the Astell adaptor.

FITTING THIN-WIRE "TESTING" THERMOCOUPLES

To insert test thermocouples in the fitting release the Cover-cap nut and remove the seals. Pass the thermocouples through the split seal and out one side slot , with the other seal on top. Fit the cover cap nut and tighten to seal..

LOAD SENSING PROBES

As Standard these are PT100 type Connection Sockets are provided connected to the Chamber and/or Load sensing probes.close to the 5/16-in port for the armoured T/C probe.

FITTING REPLACEMENT PROBES

The Flexible Armoured Probe has a short rigid tube at the Chamber Wall end. This is fitted through a threaded Compression fitting in the chamber wall .

Load Sensing probe replacement;-

- Remove the appropriate cover from the case to give access to the probes.
- **Locate the LOAD SENSE** probe fitting.
- **Hold the probe fitting** and loosen the compression nut on the **INSIDE** of the Chamber- this fitting is fitted the "wrong-way-round" with the compression joint on the **INSIDE**. The Compression-olive will be compressed hard onto the armoured probe tube-end, and this means that the old olive and possibly the Compression nut if ydamaged, must be replaced with new items every time the probe is changed.
- The probe is installed by passing the wire and end-tube through the compression Nut and olive and then through the fitting from the inside, and the compression Nut and olive fitted on the Inside of the chamber .
- **DO NOT pull on the cable** or damage the insulation on the inside of the fitting. Where supplied the silicone sleeved part of the wires should be inside the fitting to act as a cushion against abrasion.
- **Tighten finger-tight** , then tighten further with a spanner.. A little Silicone Joint Compound may be smeared onto the olive beforehand, but **DO NOT** put silicone sealant on the Compression nut or threads.
- **IMPORTANT!! When disconnecting make a note of the plug connections and wire colours and when reconnecting ensure that the plug pins are connected to the correct polarity wires**

FUSES

INTERNAL SYSTEM FUSES / TRIPS-

THERE ARE NO USER-SERVICEABLE PARTS INSIDE & FUSE FAILURE or MCB TRIPPING INDICATES A TECHNICAL PROBLEM WHICH SHOULD BE SOLVED BEFORE THE FUSE IS REPLACED OR TRIP RESET

Low Voltage high current Hazards

The Switch-mode power supply produces 24 volts DC at up to 2 or 5 amps. it is short-circuit protected but during servicing ensure that no fluids or foreign bodies are brought into contact with the circuit boards or damage may be caused.

FUSE REPLACEMENT

Consult manufacturer before replacing fuses

To comply with safety requirements use only manufacturer's recommended fuses . Use only Ceramic HRC fuses in mains power circuits (where specified)

COMMISSIONING AND CYCLE SETTING

This section describes how to derive the settings that you may need to enter for your intended Cycle(s) . The description applies to Media Loads or Discard Loads but a similar approach can be applied to Instrument/Glassware.

A "CYCLE" consists of three process sections plus Cool Lock settings. Each of these is independently selected and adjustable,

- HEATING AND AIRPURGE at around 100C Purges the air from the chamber.
- HEATING AND STERILIZE at Setpoint Temperature for Selected Time
- COOLING LOCKS Set Temperature.

The Cycle Values can be determined by trial-and-error, but as this can be very long and involved, it is best to use a chart recorder to investigate the Temperature - Time behaviour of the load. A number of settings must be made;-

AIRPURGE

The Airpurge Time depends on the nature of the load . Items such as small quantities of Bottled Fluids , Trays or Racks, Solid items, Bowls, etc have low thermal mass & do not trap much air, and will sterilize quite satisfactorily with minimal, typ 5-7 minutes of AIRPURGE TIME. However , larger loads with larger bottles of fluids, boxes of bottles, Phials , Petri dishes, etc have a large thermal mass and trap a great deal of air . These ALWAYS need a longer AIRPURGE time of typically 15 - 30minutes. The **AIRPURGE** time should be set to give at **least 5 minutes of active AIRPURGE during which steam will be visible emerging from the Exhaust**

Insufficient AIRPURGE causes excess pressure in the chamber for the temperature, and higher peak-peak fluctuation in temperature which will trigger the "Chamber (or Load) Temperature Fall " message.

DETERMINING SUITABLE STERILIZE & AIRPURGE TIMES

The chamber will heat-up to sterilize Temperature before the load catches - up, and this time delay must be accounted for to ensure correct sterilization. The LOAD SENSED TIMING OPTION (Where it has been fitted) compensates for the time-lag automatically and only requires the Sterilizing Time to be entered.

If the time-lag for the load to catch up with the chamber is known, or can be adequately estimated then this may be added to the desired Sterilizing Time and the total set as the STERILIZE TIME for the Cycle.

In most cases the behaviour of a load in this arrangement is unknown, so it is necessary to use a chart recorder or multi-thermocouple indicator to monitor the load, and find the ideal AIRPURGE and Sterilize times.

TEMPERATURE RECORDER OR DATA-LOGGER

for COMMISSIONING MEASUREMENTS

Arrange a multi-pen Thermocouple CHART RECORDER or indicator to monitor the temperature in the load and in the chamber.. For a complex load, the steam penetration is slowest into the more enclosed parts , such as the centre of stainless steel buckets. In this case, the very centre of each container should be monitored with the sensor inside a load item (e.g.:- a Petri dish).. Other points throughout the load may be monitored depending on how many thermocouple sensors are available. If desired sterilizing monitor tapes or spore strips may be distributed throughout the load.

LOAD SENSING OPTION

The Process to determine the Time Settings differs if LOAD SENSED TIMING Option is fitted and selected. If it is available on your machine, you must decide whether it is necessary or desirable to use it or to select the simpler timing system You should choose to use this if the heatup time of the load may vary from cycle to cycle, e.g. if the size of loads varies widely. ;-

- LOAD SENSED TIMING SELECTED & FITTED ; Please See later section
- LOAD SENSED TIMING NOT FITTED ; Please follow the instructions below.

SETTING TIMES AND PARAMETERS WITHOUT LOAD SENSED TIMING

1] Select the desired CYCLE and set values as follows:

AIRPURGE TIME

For loads which require long AIRPURGE - 30 min see AIRPURGE above

For loads which DO NOT need a long AIRPURGE - 10 min see AIRPURGE above

STERILIZE TIME 60 minutes

STERILIZE TEMPERATURES ;

For loads which are NOT Temperature Sensitive it is recommended that the temperature is set to approx. 2 to 3 Deg C above the temperature at which sterilizing is required .This will help to speed up the process and to ensure adequate sterilization effectiveness.

For loads which Are Temperature Sensitive e.g. MEDIA it is recommended that the temperature is

set to the temperature at which sterilizing is required as excess temperature may damage the media..

COOLING LOCK (Programmable)

Set Cooling Temp. to 100C

COOLING LOCK – internal preset thermostat

Record any setting for future reference, then Set to MINIMUM (a/cw) on dial.

2] **Start** the Cycle cycle running.

3] Chamber and load temperatures will rise towards 100C,

AIRPURGE timer will start

Note down the Airpurge Time reading shown on the DISPLAY at the time when the "Slowest " Load Testing Thermocouple exceeds 95C. [Call this time display reading "T1".]

4] At this point, press The [STOP] button and select " Stage Change?"

5] **Chamber will heat to Sterilize.**

6] **STERILIZING** Stage will start . The Temperature will control at the set Sterilizing Temperature.

Note down the "STERILIZE TIME" shown on the DISPLAY at the moment when the SLOWEST test thermocouple in the load reaches an acceptable temperature for sterilizing to occur.

[Call this time reading "T2"] Using the Timer Display as a clock wait a further measured period, equal to the desired STERILIZE TIME (For example, this might be 15 minutes.).

7] At this point, press The [STOP] button and select " Stage Change?"

8] 'COOLING' mode will begin, as shown on the display.

9] **PROGRAMMABLE COOLING LOCK.**

You should have Set the PRESET COOL LOCK THERMOSTAT dial to Minimum .

The load will cool down slower than the Chamber Temperature Display; Monitor the load temperatures on the Recorder/Indicator and note down the Displayed CHAMBER TEMPERATURE at the moment when the HOTTEST part of the load has cooled to a temperature safe to handle. Call this "CYCLE COOL-LOCK TEMP"

10] **PRESET COOL LOCK THERMOSTAT**

It is important to Correctly Adjust the PRESET COOLING-LOCK THERMOSTAT. However, it can only be set to One Temperature, which should be that required for the worst-case Cycle from a point of view of operator safety.

Monitor the load temperature as it cools and when it falls below a safe temperature to handle (usually 80C) rotate the PRESET COOLING LOCK

THERMOSTAT KNOB Clockwise very slowly until the display changes to show 'COMPLETE'. The reaction time of the system may be up to 10 seconds so carry out this in small steps of 2C at a time., waiting 10 seconds between steps.

Leave the dial in the finished "COMPLETE" position. Record the reading of the knob on the dial against the scale, for future reference purposes. This will normally be somewhere below 80 C probably around 55C, as the chamber wall cools much faster than the load, but slower than the chamber temperature display.

11] **COMPLETION** of CYCLE

Unload the Sterilizer and submit any test-strips to examination / Incubation, etc ; These should all indicate satisfactory sterilization. If this is not the case, it is possible that steam penetration into the load is restricted by load Packaging (Plastic bags, boxes, or Paper Wraps are possible culprits) or air is remaining in the load .The loading technique may require modification;- Try a smaller number of items per container , different containers, Wrapping or bags, and ensure that any bags have the tops opened before autoclaving, or consult the Manufacturer for advice on improving the steam penetration.

ENTERING THE VALUES THAT YOU HAVE DETERMINED

Enter "Supervisor Mode" and select " Enter Cycle Parameters".

Enter the CYCLE VALUES into the CYCLE Settings determined as follows;-

STERILIZING TEMPERATURE has already been set at the start of the test and does not need to be changed. Leave it as it is

To ensure that sterilizing conditions are met, the temperatures should all be amended as follows to allow for calibration tolerances before setting into the profile :-

AIRPURGE TIME - Set to the time measured, from the start of airpurge Period to all points in the load reaching 95C. (at this moment the display was Recorded as "T1").

AIRPURGE TIME = ((Original Time Set) - T1) minutes

e.g. If "T1" was Display=2.00, then :-

8 min - 2 min = 6 minutes airpurge time to set in Cycle profile

STERILIZE TIME - Set to the total of the time taken for the load to catch-up to sterilize temperature , added to the desired Sterilize Time in minutes.

The Catch-up time is the original set sterilize time , less the reading taken as "T2"

STERILIZE TIME = (set Sterilize time - T2) +
(Desired Sterilize Time) minutes

e.g. If "T2" was Display=51.00, then ;-
(60 min - 51 min) + 15 min = 24
minutes Sterilize time to set in Cycle profile

COOLING LOCK SETTINGS

COOL-LOCK TEMPERATURE ;

Set this Parameter to the Temperature recorded during the test as "CYCLE COOL LOCK TEMP"

NOTE:-If this setting has already been determined for a different Cycle, the Final setting must be left at the LOWEST temperature of those determined for all Cycles.

SETTING PARAMETERS with LOAD SENSED TIMING

SETTING UP WITH LOADSENSE TIMING OPTION FITTED

The Load Sensed Timing system detects the Load temperature , and automatically allows for the time-lag caused by the load delay in reaching sterilize temperature.

Set up the system as described above for the system Without Load Sensing, but with the following detail changes ;-

- Set STERILIZE TEMPERATURE to the temperature at which the load is to be Sterilized . The control system automatically raises the actual initial sterilize temperature a little & causes the Sterilizing Timer to start when the load is equal to the Sterilizing Temperature setting., equivalent to the desired Sterilizing Temp. Then the sterilizing temp returns to normal.
- Set the STERILIZE TIME to the Actual DESIRED STERILIZE TIME.
- COOLING LOCK (PROGRAMMABLE) Set Temperature to 100C
- COOLING LOCK (INTERNAL PRESET THERMOSTAT - Record any setting for future reference, then Set to minimum on dial.
- LOAD SENSING Set To "ON" in Cycle profile

Carry out stages 1 to 5 as described above for normal cycles, "without Load sensing"

In place of stage 6, The Chamber Temperature will heat to the Set Sterilizing Temperature, and will display a message "LOAD HEATING TO STERILIZE". The Sterilizing timer is stopped.

When the load reaches the Sterilizing Temperature the Sterilizing Timer will START , and the cycle will proceed. (It is not necessary to note down any value or time .)

Omit Stage 7 completely (the cycle will proceed under automatic control).

Carry out stages 8,9,10,11 as described above.

Enter "Supervisor Mode" ,select "enter Cycle parameters " and Enter the CYCLE VALUES determined as follows;-

AIRPURGE TIME -

Set to the time measured, from the start of the AIRPURGE Period to all points in the load reaching 95C.

AIRPURGE TIME = ((Initial set AIRPURGE Time) - T1) minutes

STERILIZE TIME - Leave this Set to the time entered as STERILIZING TIME during the above test .

However, If the results of the measurements indicate that , for one or more of the load points measured, the time spent above the "Ideal" sterilizing Temperature would be only just sufficient for sterilization then the Sterilizing time may be increased a little to suit .

SETTING COOLING LOCKS with LOAD SENSED TIMING OPTION

When Load Sense Timing is selected .-

COOLING LOCK TEMPERATURE

The LOAD SENSING option automatically changes the PROGRAMMABLE COOLING LOCK to a mode which detects the Temperature of the Load itself via the LOAD SENSING PROBE , instead of sensing the temperature in the Dummy Load..

Set the Cooling Lock Temperature to the actual Temperature of the LOAD at which the Cooling Lock is to RELEASE and allow the door to be opened. It is advisable to err on the Cooler side , for safety.

Because the lock senses the actual load temperature there is no compromise , estimation or guesswork required to select the cool lock release temperature

FREQUENTLY ASKED QUESTIONS

Q Screen Contrast wrong. The screen is set up for viewing straight on. If viewed at an angle the contrast will change The Screen contrast is adjustable -. See Programming Manual

Q The RCD earth leakage trips in the supply for the machine a keep tripping out.

A The type of heater used in this machine means that Operation from a RCCD residual or earth-leakage trip may cause tripping problems ., This may occur especially if the machine is not operated for some time and is due to moisture ingress to the Inconel-Sheathed heaters. If this happens connect to a non- protected supply and run for 5-10 cycles. Then revert to Protected supply. If the tripping then continues please consult the manufacturer.

Q Why cannot I operate a control and Fast-Exhaust the steam when I want to?

This action would however probably be dangerous and could be in breach of health and safety legislation. Firstly the amount of steam produced when a chamber pressurised to 120C is exhausted is very large and constitutes a serious hazard.. Unless special high temperature exhaust pipework is installed in the building to take this exhaust away top a safe discharge , then this would be unsafe. If the load being processed contained any fluids then the action of exhausting the steam from 120C would cause all the fluid load to flash-boil. This would cause the load to violently boil over & empty the load contents into the chamber, which quickly will "gum-up" the valves and pipework. Also if such a load was removed even after it had appeared to stop boiling over then it would be very likely to flash-boil again into the face of the user carrying the load.

Q I have connected to Deionized water and the unit does not work.

A Please connect to The correct water supply - Not Deionized or Distilled.

Q I have locked the Handle when Open

A Press the DOOR button follow instructions and rotate the handle to the Unlocked position

Q Power On but Display does not light

A Check that the Power Switch is ON For Emergency Stop switches Use the key to release the Button to the ON position. Check that the unit is plugged in and there is power

available at the Mains Socket. If these are all OK call service engineer.

Q Difficult to close Door against gasket (1)

A This could be trapped air expanding. If chamber is still Very hot allow to cool down and try again.

Q Difficult to close Door against gasket (2)

A If gasket is more than 6 months old consider replacement.

Q Steam leaks from around Gasket (1)

A Gasket MUST be fitted correctly into Groove and must have no damage to the edges of the lips or cuts or abrasions. The opposite Sealing face that it touches must be clean with no cuts or damage.

Q Steam leaks from around Gasket (2)

A Possibly Gasket needs replacing -it must be replaced before the silicone rubber loses its sealing properties- any time after 6 months of use.

Q Gasket has been changed but steam leaks

A Gasket MUST be fitted correct way round- there are small holes in the gasket lip
These must be on the OUTSIDE edge.


Q Cycles that are provided pre-set as delivered are not suitable for my loads.

A Consult the sections on selecting Times , temperatures , etc, then in SUPERVISOR level enter the new Cycle values you require.

Q Delayed Start would be useful / is Not Required

A Turn ON or OFF Delayed Start - See *Programming manual*

Q I have started the wrong Cycle

A Press  button ,Enter supervisor Password (222222) & select Stage Jump. Then Select jump to Cooling. Allow to cool, .Clear the alarm then open, close and start correct cycle

Q I have Changed and Forgotten the Passwords (Security Codes)

A There is a way to view or reset these- Consult Astell

Q The Load comes out WET and I need it to be DRY

A This is not possible with this machine- because it does not have a Drying function

Q Cycle Does not offer “Drying Time” setting

A This machine does not have a Drying function

Q “Safety Valve Test Overdue” appears

A You have not carried out a safety valve test. See “Safety Valve testing” section

Q My Printer does not print properly

A See PRINTER FAULTS in the “OPTIONAL PRINTERS” section

Q How Do I Clean the Machine?

A See “Maintenance &Cleaning” section

Q I Need to manually Unlock the door

A Please see the photo-instructions in the section “ Manual Unlocking”

Q My Machine needs to be calibrated

A You will need a Calibration organisation who can carry out the appropriate tests with Known Calibrated Thermometers and Pressure gauges. Astell Scientific or your Agent will be able to assist, and Astell provide a separate manual on calibration -“ Calibration Manual #1”

Q My system starts to heat immediately without taking any water.& Heating is unstable

A The Water level sensor in the chamber are damaged or contaminated- See FAULTS section “ Waterlevel Sensors”

SPARE PARTS AND SERVICE

When ordering spare Parts or requesting Service Assistance please have ready the SERIAL NUMBER and the MODEL NUMBER - both of these to be found on the RATING PLATE fixed at the rear of the machine .

Use only approved ASTELL SCIENTIFIC spare parts , The fitting of Non-Astell-approved Parts will render this machine Non-Compliant with the E.C./ E.U. E.M.C. and L.V. and the P.E.D. Directives and will void any CE mark.

Continued use of a machine which does not comply is an offence under / E.U. law.

SPARE PARTS LIST

For any items not appearing here consult manufacturer or supplier.

Spares numbers to be defined – please consult manufacturer

Part Description	Part Number
Heater 80-150l Frontload 3.3 Kw	ZXA851
Door Gasket 80-150l Frontload	SER291
Locking Solenoid Nt4 230vac All Frontload Models	BXW231
Handle Assy (Metal) All Frontload Models	346010
Solenoid Pin Sense Microswitch (Small/ Long Lever)	SXQ598
Lock-Solenoid Microswitch	SXS212
Door Bolt Microswitch	ZXA987
Door Closed M/Sw	SXS210
Pressure Gauge	RXA056
Solenoid Valve	FXA495
Water Level Insulator Assy	SXA070
Water Level Sensor Strip	Consult supplier
Safety Valve	GXA498
O/T Cutot Stat 0-300c	SXL503
Cool Lock Thermostat	ZXA376
Gas Spring	XXA530
Door Interlock Pressure Switch- Preset	SXP688
PT100 SENSOR ASSY	DXE364
LOAD SENSOR PROBE (ARMoured HEAVY DUTY)	Consult supplier
LOAD SENSOR (PROBE LIGHT DUTY)	Consult supplier
T/C PROBE ENTRY ADAPTOR (normally fitted as standard)	Consult supplier
SECURE TOUCH + Plc control system B&R	Consult supplier
Power supply input output (PSUIO) PCB ASSEMBLY	Consult supplier
Pressure Transducer assy	Consult supplier
Pt100 Chamber Sensor Assy + Cable	Consult supplier
	Consult supplier

Consult supplier = PLEASE CONSULT SERVICE DEPT OR AGENT.

CERTIFICATION

A Certificate of Examination is supplied with every Sterilizer. This meets P.E.D requirements & includes details of Chamber etc. relating to the pressure vessel, specifies the design pressure, the test pressure to which the Chamber was subjected during manufacture, and the date of the Pressure Vessel testing , which will be required by an insurance company..

Please note that this equipment comes under the requirements of the CE Pressure Equipment Directive and your machine will certainly need insurance cover and regular inspections. Most QA systems require a formal maintenance contract in place and regular calibration must be carried out .

It is a statutory requirement of the U.K. Health & Safety at Work Act and in many other countries that Sterilizers be thoroughly inspected by a competent person prior to use (usually an Engineering Surveyor from an Insurance Company) , and at least every 14 months thereafter. (Section 35(5) of the Factories Act 1961.)

The information on the Test Certificates will be required by the Inspector, and you are advised to take good care of your Certificate.

Test certificates for Electrical safety and Calibration of the control system are supplied as standard, Full test analysis results are available to special request.

Pressure Temperature Correlation

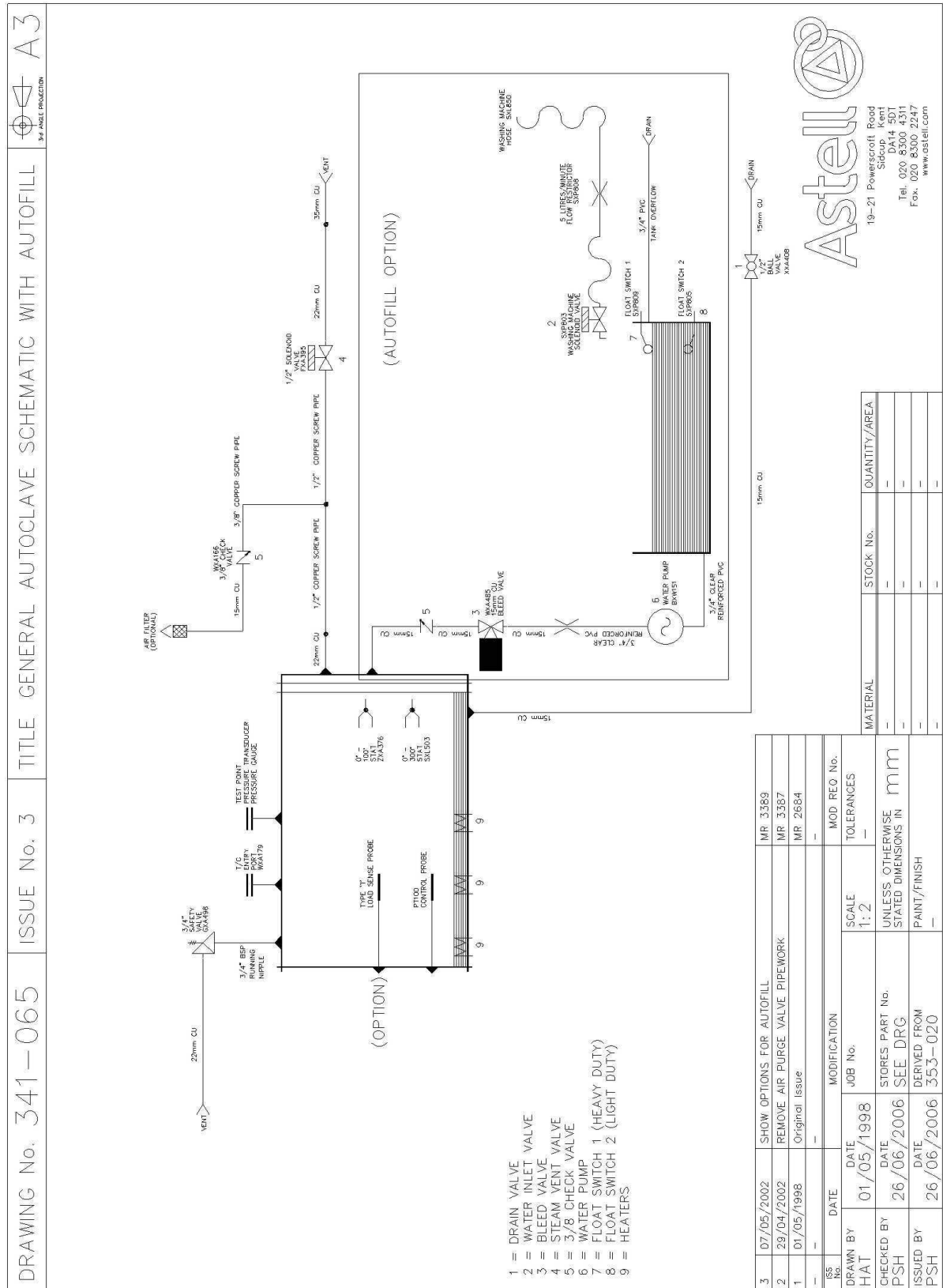
Pressure/Temperature Calibration

This chart shows Pressure and Temperature correlation for Saturated Steam, and the Maximum/Minimum acceptable Temperature display Values for a Correlation Accuracy of +/- 2%. It applies to ASTELL Sterilizers only.

Pressure Bar	Temperature Deg C	Temperature - Min Temp	Tolerance Max temp
0.65	114.51	112.22	116.80
0.70	115.40	113.09	117.71
0.75	116.28	113.95	118.61
0.80	117.14	114.80	119.48
0.85	117.96	115.60	120.32
0.90	118.80	116.42	121.18
0.95	119.63	117.24	122.02
1.00	120.42	118.01	122.83
1.037	121.00	118.58	123.42
1.05	121.21	118.79	123.63
1.10	121.96	119.52	124.40
1.15	122.73	120.28	125.18
1.25	124.18	121.70	126.66
1.30	124.90	122.40	127.40
1.35	125.59	123.08	128.10
1.40	126.28	123.75	128.81
1.45	126.96	124.42	129.50
1.50	127.62	125.07	130.17
1.55	128.26	125.69	130.83
1.60	128.89	126.31	131.47
1.65	129.51	126.92	132.10
1.70	130.13	127.53	132.73
1.75	130.75	128.14	133.37
1.77	131.00	128.38	133.62
1.80	131.37	128.74	134.00
1.85	131.96	129.32	134.60
1.90	132.54	129.90	135.19
1.95	133.13	130.47	135.79
2.00	133.69	131.02	136.36
2.05	134.25	131.57	136.94
2.10	134.82	132.12	137.52
2.15	135.36	132.65	138.07
2.20	135.88	133.16	138.60
2.25	136.43	133.70	139.16

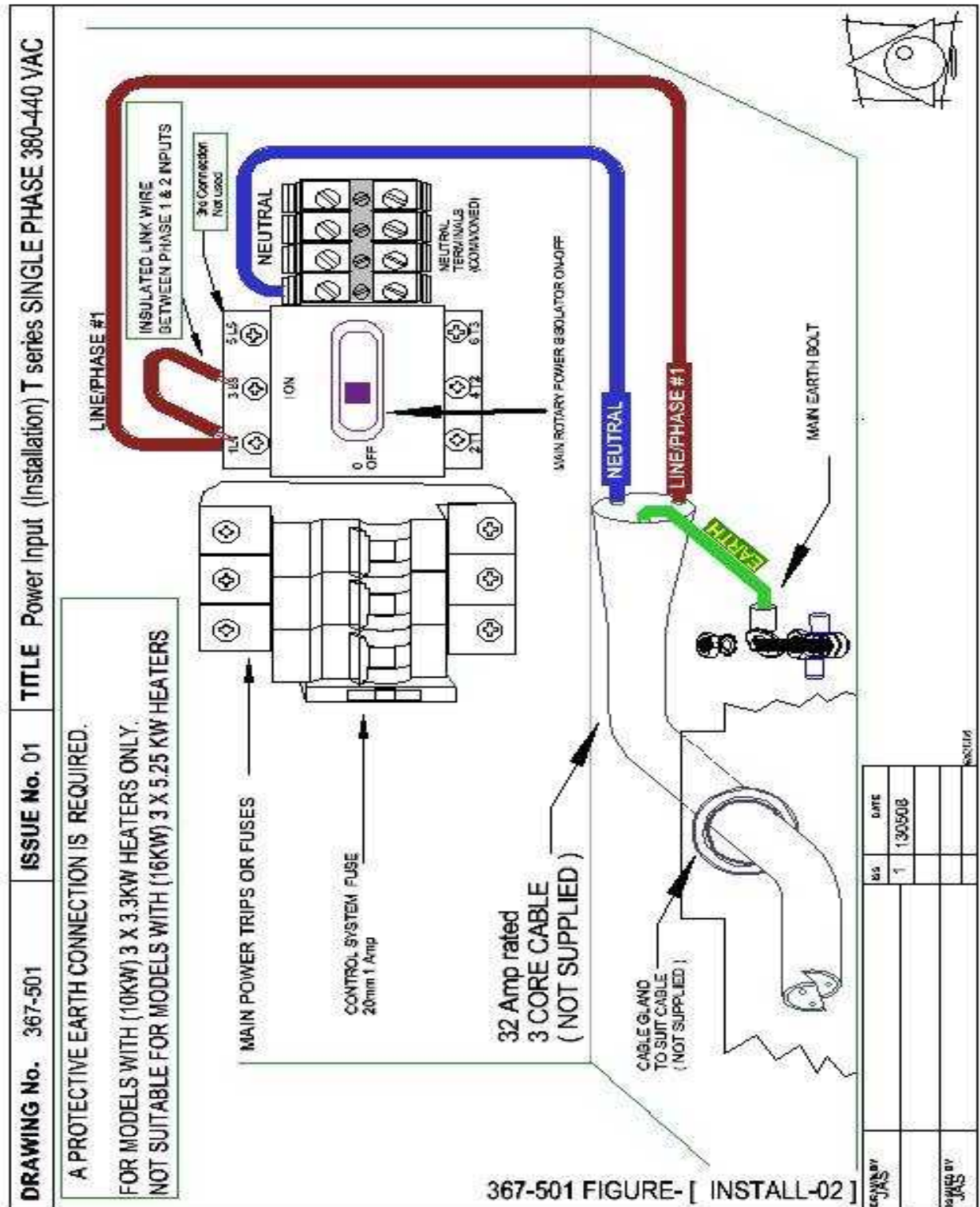
Note:-This chart is for checking Pressure/Temperature Steam Correlation only & is appropriate for Press/ Temp. instruments specified as individually accurate to +/- 1% . It should not be used as a calibration standard for Pressure or Temperature indicators, which must be calibrated in accordance with the Manufacturer's Specifications.

Flow Schematic Electric Heated autofill



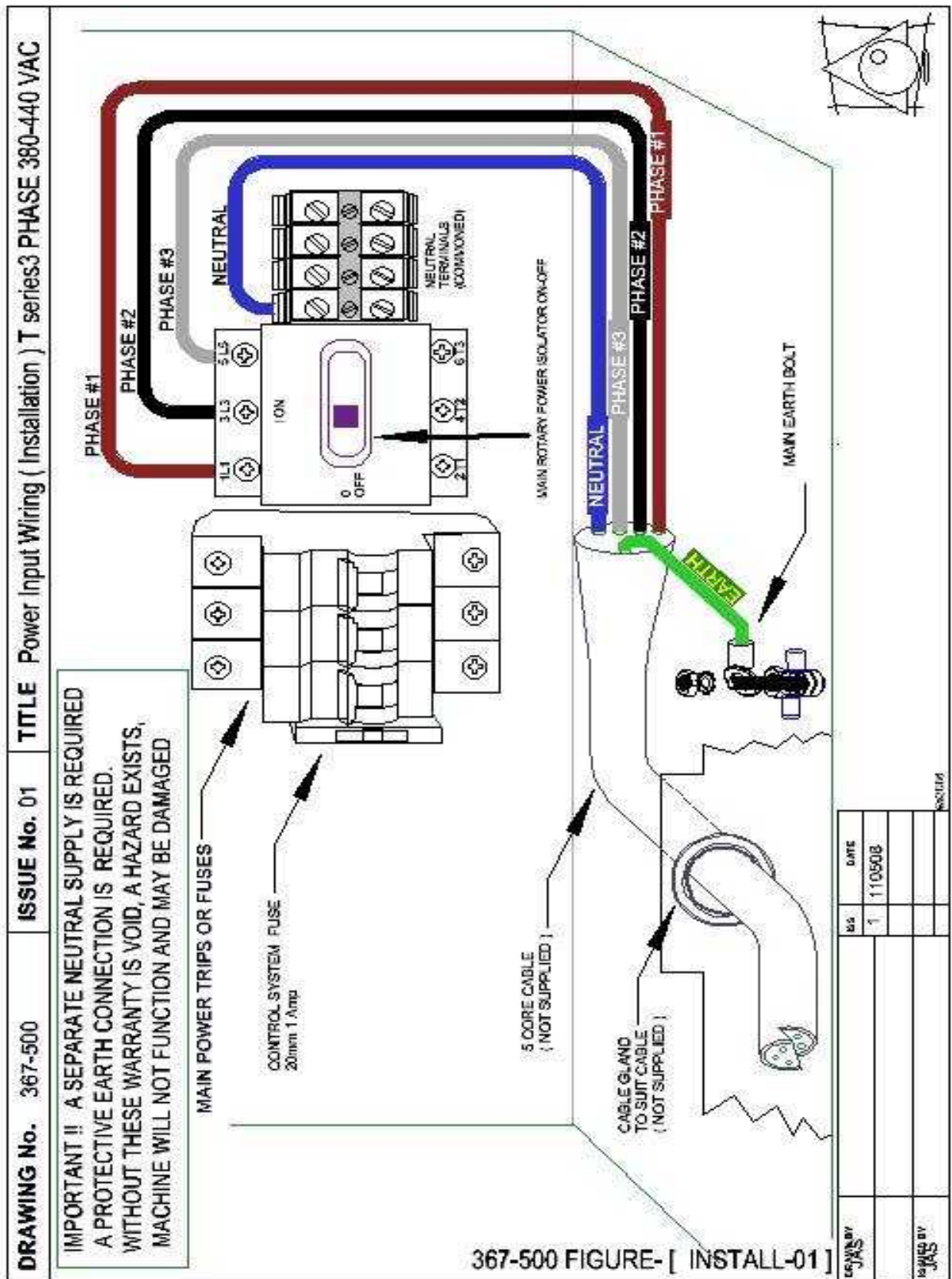
INSTALLATION WIRING DRAWINGS

Single Phase Wiring – 230V ac 32A



3 Phase Wiring 380-440V ac

Power Input Wiring all 3 phase models [dwg367-500]
3 phases, Neutral and Earth 208V 3phase or 380-440V 3 phase



Notes Space

This space is for your own notes on the system