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new style element get rid of retaining plate mount direct to chamber. move in bands

OPERATORS MANUAL

Barnstead

STEAM STERILIZER
MODEL C57835

Barnstead | Thermolyne Corporation
2555 Kerper Blvd. • Dubuque, IA 52001 • U.S.A.

350201 LT578X1

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TECHNICAL DATA

Cabinet Size	16W x 18H x 23L inches (406W x 457H x 584 l mm)
Chamber Size	10" diameter x 15-1/2" Usable Depth (254mm dia. x 393mm Usable Depth)
Tray Sizes	One 15-1/4" x 9" x 1-1/4" (387mm x 228mm x 32mm)
	One 14" x 6-1/4" x 7/8" (356mm x 155mm x 22mm)
Weight	70.5 lbs. (32 kgs.)
Heater Wattage:	
Processing	750 + 750 = 1500
Drying	15% of 1500 (225)
Electrical Rating	115/230 VAC, 50/60 Hz., 12/6.0 Amps
Maximum Rated Operating Pressure	45 psi (310 kPa)
Reservoir Capacity	4000ml (Approx. 4 qts)

TEMPERATURE		PRESSURE	
°C	°F	PSI	kPa
121	250	15-18	103-124
135	275	30-33	207-228

STERILIZING TEMPERATURE/PRESSURE
COMPARISON CHART

RECOMMENDED TIME/TEMPERATURE CHART

LOAD	STERILIZING			DRYING
	TIME	TEMP.		TIME
Unwrapped Instruments	3 min.	135°C	275°F	0
Wrapped Instruments	5 min.	135°C	275°F	15 min.
Fabrics & Dressings	30 min.	121°C	250°F	As Req'd.
Solutions under 250ml	20 min.	121°C	250°F	0
Solutions over 250ml	30 min.	121°C	250°F	0

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SEQUENCE OF OPERATION

CYCLE STATUS	STARTING ACTION	CYCLE FUNCTIONS
Power On	Main Switch ON	Power Supply PCB energized. Cooling Fan ON.
Controls OFF Door open	Fill Reservoir	Fill reservoir (**P-2**), with distilled or deionzed water to fill mark in Cover (**P-1**).
Controls ON	Turn Controls ON. Door open or closed	Control Panel energized, digital display ON. Vent Solenoid Valve (**P-3**) energized (opened).
Conditioning Phase	Door closed. Cycle start. Chamber filling.	On all models the Data Logger printer begins to record cycle data. The Fill/Drain Solenoid Valve (**P-4**) energizes (opens), water drains from reservoir (**P-2**) into chamber (**P-5**). Heater (**P-7**) is energized to begin heating chamber. After approximately 45 seconds, Fill/Drain Solenoid Valve (**P-4**) de-energizes (closes).
Air Removal		Chamber continues to heat, producing steam, expelling air thru open vent valve (**P-3**) and raising chamber temperature. Approximately two (2) minutes after chamber reaches 98°C, Vent Solenoid Valve is de-energized (closed) allowing pressure in chamber (**P-5**) to increase until set temperature is reached.
Exposure	Set Temperature reached.	Heater is energized and de-energized to maintain set temperature for set time duration.
Venting (dry goods) Venting (liquids)	Set Exposure time expires.	Heater (**P-7**) is de-energized. Fill/Drain Solenoid Valve (**P-4**) is energized (opened), allowing steam and water to exhaust thru solenoid into reservoir (**P-2**). Heater (**P-7**) is de-energized. Fill/Drain Solenoid Valve (**P-4**) is energized and de-energized intermittently to produce a gradual venting (approximately 2.5 psi per minute), until 102°C is reached.
Cycle Complete	Venting Complete	At 102°C, the Fill/Drain Solenoid Valve (**P-4**) is de-energized to prevent water from draining into chamber. Vent Solenoid Valve (**P-3**) is energized (opened) to remain open until Controls are turned off or another cycle is activated. Audible tone will sound for approximately 3 seconds.
Emergency Over-Pressure of Chamber	Chamber pressure exceeds 45 psi (310 kPa)	Pressure Relief Valve (**P-6**) opens releasing excess pressure thru vent tubing in bottom plate.
Overheat	Temperature of Chamber excessive	Low Water Cut-Off Switch (**P-8**) opens. All valves remain closed, electrical power to heater is turned OFF. Control Panel stays ON. OH appears on display.

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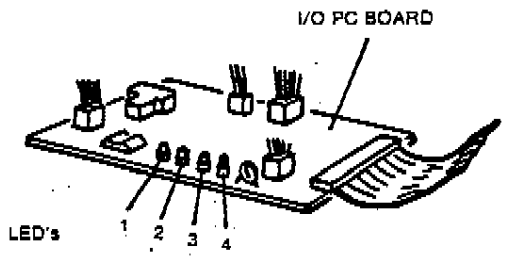
TROUBLESHOOTING CHARTS

NOTE

Four LED's (Light Emitting Diodes), located on the Input/Output PC Board, light to indicate a signal is being transmitted from the microprocessor to a major component. If an LED is lit, but the corresponding component does not function, the problem is at the component. If the LED does not light at the designated time, a malfunction of the control PC Board or the Input/Output PC Board can be suspected.

LED number component designation

LED #1 — Overheat Relay
LED #2 — Heating Element
LED #3 — Vent Solenoid Valve
LED #4 — Fill/Drain Solenoid Valve



PROBLEM	POSSIBLE CAUSE	REMEDY
Cycle Ends Prematurely. (OH Appears on Display Panel).	1. Insufficient water in chamber (see page 4-5). a) Air lock in fill tubing.	1a) Double Fill Chamber after reservoir has been drained and refilled (see Operators Manual — inform operator of procedure).
	b) Reservoir empty or low on water.	b) Fill reservoir to "FILL" mark in fill funnel.
	c) Reservoir Filter or Chamber Screen clogged.	c) Clean Reservoir Filter and/or Chamber Screen. (Refer to filter and screen cleaning procedure in Adjustment and Repair Section).
	d) Sterilizer not level.	d) Be sure sterilizer is setting on a level surface. Unlevel surface will provide poor distribution of water in chamber, causing Overheat.
	e) Fill/Drain Solenoid Valve not opening.	e) If LED #4 is lit for approximately 45 seconds after "CYCLE START" has been pressed, insufficient water enters the chamber after filters and tubings have been checked for restrictions, the Fill/Drain Solenoid Valve could be defective. • Check operation of Solenoid Coil. (Refer to Adjustment & Repair Section). • Sluggish valve operation or excessive leakage indicates cleaning required. If internal parts are corroded or rubber seats are spongy or crusted, rebuild or replace valve.

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TROUBLESHOOTING CHARTS (Cont'd.)

PROBLEM	POSSIBLE CAUSE	REMEDY
Cycle Ends Prematurely. **(OH Appears on Display Panel).** (Continued)	f) Overheat Switch defective.	f) *After extended cooling period* (30 minutes) turn controls OFF and ON. If OH indication remains on display, the overheat switch is probably defective. To check, turn OFF power, remove switch from bracket and check continuity thru switch. No reading, replace switch. (**NOTE:** *switch will automatically* reset when cooled sufficiently.
	g) Control PC Board defective.	g) If LEDS #3 & 4 do not light when Cycle Start is pressed, Control PC Board is defective — replace *Control PC Board.*
	h) Input/Output PC Board defective.	h) LEDS #3 & 4 light when Cycle Start is pressed — replace I/O PC Board.
	i) Vent Solenoid Valve not opening. (Back pressure in chamber, prevents fill).	i) LED #3 ON - check Solenoid Valve. LED #3 not ON - check I/O PC Board and/or Control PC Board.
Cycle Ends Prematurely. (Display Panel Blank).	1. Power Source Failure	1. • Check electrical supply at source — restore. • Be sure Main Switch on back of unit is on.
	2. Microprocessor Malfunction.	2. Voltage surge causing microprocessor to shut down, turn Main Switch on back of unit OFF, then ON to reset *microprocessor.*
	3. Fuse Blown.	3. Remove left side (facing unit) panel and replace fuse on base of cabinet.
Control Panel Display will not light.	1. Main Switch OFF.	1. Turn Main Switch on back of Sterilizer ON.
	2. Power Failure.	2. Restore Power.
	3. Fuse Blown.	3. Remove left side (facing unit) panel and replace fuse on base of cabinet.
	4. Power Supply PC Board.	4. Be sure Voltage Selector Switch is positioned for the proper supply voltage. If Voltage Selector Switch is set at 115V and power source is 230V, the **Power Supply PC board will be damaged.** To check Power Supply

Continued . . .

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TROUBLESHOOTING CHARTS (Cont'd.)

PROBLEM	POSSIBLE CAUSE	REMEDY
Control Panel Display will not light. (Continued)		PC board Set voltmeter for 20VDC range. Check voltages at pins on connector J9 on I/O PC board. Pin Nos. Voltage 5 & 1 = 12 VDC 5 & 2 = 5 VDC 5 & 3 = 5 VDC 5 & 4 = 0 Volts (Minimum voltage reading)
Will not go into Sterilization Heating Mode.	1. Door not fully latched. 2. a) Heater Malfunction b) I/O P.C. Board 3. Low output from Power Supply PC board. 4. Control PC Board	1. Close and Latch Door completely. 2. a) LEDS #1 & 2 ON, Extended time to heat chamber to exposure temperature. Check heater circuit, (see Heater Continuity Test, page 4-4). b) LEDS #1 & 2 ON - Extended time to exposure temperature — check for line voltage at J4 & J5 on I/O PC Board. 3. Check the D.C. voltage reading between pins 5 & 2 and 5 & 3 at J9 on the I.O. PC board. Voltage reading at both test points should be 5 VDC to 5.2 VDC. To increase, turn potentiometer (R-18) clockwise. (see Adjustment & Repair Section). 4. No Light on LEDs #1 and/or #2 when CYCLE START is pressed indicates no signal to I/O PC board and heater. Replace Control PC Board.
No Pressure or Low Pressure in Chamber After 30 Minutes.	1. Door Gasket not sealing. 2. Solenoid Valve open. 3. Heater Malfunction.	1. Clean or replace door gasket. 2. • If chamber is over filled with water (water runs out of chamber when door is opened), Fill/Drain Solenoid Valve sticking open. Clean or replace internal parts of valve. • Gurgling or steam escaping from vent port in side of reservoir, and chamber temperature will not go above 100°C, indicates that the Vent Solenoid Valve is not closing. Clean or replace internal parts of valve. 3. See "Will not go into Sterilization Heating Mode"

Continued . . .

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TROUBLESHOOTING CHARTS (Cont'd.)

PROBLEM	POSSIBLE CAUSE	REMEDY
No Pressure or Low Pressure in Chamber After 30 Minutes. (Continued)	4. Gauge defective.	4. If display and/or data logger tape indicate proper selected temperature and sterilization monitor shows a sterile load at completion, REPLACE PRESSURE GAUGE.
Load does not dry.	1. Wet Load In.	1. If Load is excessively wet when placed in sterilizer, the load will be wet when removed. Heaters will not dry wet loads.
	2. Heater not ON.	2. Actuate dry cycle, if LED #1 is "ON" and #2 flashes rapidly, check heater circuit, (see "HEATER CONTINUITY TEST", below).
	3. Controls PC Board.	3. If LED #1 & 2 do not light, Control or I/O PC Board is defective. Replace.
Data Logger Does Not Print.	1. Paper Improperly Installed.	1. Paper installed upside down, refer to Operators Manual.
	2. Printer Head Jammed.	2. Carefully remove paper and any torn pieces, re-feed paper into printer.
	3. Printer Head defective.	3. Replace data logger printer.
	4. Data Logger PC Board.	4. Replace.
Will Not Advance to Exposure Phase.	1. Heater Malfunction.	1. LEDs #1 & 2 ON. Check heater circuit, (see "HEATER CONTINUITY TEST", below).
	2. Control PC Board.	2. LEDs #1 & 2 do not light when cycle start is pressed. Control or I/O PC Board defective. Check Control PC Board calibration (page 5-2).
	3. Temperature Probe.	3. Temperature Probe open circuit. Turn off power, disconnect connector from J7 Temperature Sensor on I/O PC Board. Check continuity thru probe leads.

HEATER CONTINUITY TEST

The following procedure can be used to check the continuity of the elements in the heater without disconnecting leads.

1. Disconnect the electrical power to the sterilizer and turn off the Main Switch on the back of the sterilizer.
2. Check the resistance (ohms) reading between J4 & J5 on the I/O PC Board.

For units with Voltage Selector Switch set for 115 Volts the reading should be approximately 9 ohms. For units set for 230 Volts the reading should be approximately 36 ohms.

A reading other than specified indicates a defective heater, Voltage Selector Switch or faulty wiring in the heater circuit.

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TO CHECK WATER LEVEL IN CHAMBER

To check for the proper amount of water in the chamber, the Sterilizer MUST BE LEVEL.

1. Open the Sterilizer door and remove trays and rack.
2. Be sure there is no water in the chamber.
3. Close door.
4. Press Cycle Start and wait approximately 45 seconds until water stops filling chamber.



CHAMBER IS BEGINNING TO GET HOT.

5. Press Controls "OFF" then "ON" .
6. Open door.
7. Water should be approximately 2 inches from the front of the chamber opening.

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GENERAL DESCRIPTION

This Barnstead Tabletop Sterilizer has been designed for use in medical and dental offices, hospitals, clinics, laboratories and other facilities where a variety of materials require processing.

Your Barnstead Sterilizer can be used for wrapped or unwrapped instruments, linen packs, liquids, test tubes and petri dishes.

The Data Logger tape print-out provides a permanent record of actual exposure times and temperatures.



Do not use the sterilizer for processing volatile substances and material which could cause toxic or explosive conditions that could cause injury to personnel.

OPERATIONAL FEATURES

- Sterilize cycle starts after exposure time and temperature has been selected, the door closed and fully latched and the cycle start button depressed.
- The proper amount of water automatically enters the chamber when the cycle start button is pressed.
- Steam pressure from within the chamber seals the door gasket.
- Exposure time count-down begins only after the selected exposure temperature has been reached.
- Steam pressure exhausts automatically when cycle is complete.
- To guard against equipment damage, a low water cut-off switch prevents the sterilizer from operating if water in chamber is insufficient.
- Water in chamber exhausts with steam at the end of the cycle to recondition chamber for drying goods.

STERILIZER NOMENCLATURE

Following is a description of selected components and their function:

Selector/Indicator Panel - The Selector/Indicator Panel is the portion of the upper front of the sterilizer containing the operating indicators and selectors.

CYCLE PHASE INDICATORS



CONDITIONING:

- Water enters chamber.
- Chamber is heated to selected exposure temperature, changing water to steam.



EXPOSURE:

Steam processes load at selected time and temperature.



VENTING:

Steam is removed from the chamber.



COMPLETE:

Processing cycle is complete.



DRYING:

Load is drying for selected time.

TOUCHPAD SWITCH SELECTORS



CONTROLS OFF:

Turns OFF the Selector/Indicator Panel. All cycle selections are turned off when the Controls OFF Switch is pressed. Any cycle in progress will be immediately aborted.



CONTROLS ON:

Turns ON the Selector/Indicator Panel. The Controls ON Switch must be ON to make any selections.



LIQUID/NON-LIQUID CYCLE:

When Indicator Light in the corner of the switch is ON, Liquid Sterilize Cycle is selected. Press switch to activate; press switch again to deactivate. When Indicator Light is **NOT** ON, the normal non-liquid cycle is activated.



CYCLE START:

Pressing the Cycle Start Switch actuates the selected processing cycle (sterilize or drying).

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EXPOSURE TIME:

Sets the desired time that the load is to be exposed to steam at the selected exposure temperature. Pressing the up or down switch will increase or decrease the time by one minute each time switch is pressed. Depressing and holding switch will change digits in rapid succession. The last Exposure Time selected will remain in the memory until changed, even if the Controls OFF Switch is turned off.



EXPOSURE TEMPERATURE:

Sets the desired temperature that the load is to be processed at the selected time. Pressing the up or down switch will increase or decrease the temperature setting by one (1) degree celsius each time the switch is pressed. Depressing and holding the switch will change the digits in rapid succession. The last exposure temperature selected will remain in the memory until changed, even if the Controls OFF Switch is turned off.



If unit is programmed to display temperature in Fahrenheit scale the display will increase approximately two (2) degrees each time the switch is pressed.



DRYING TIME:

Sets the desired time a load is to be dried. Pressing the up or down switch will increase or decrease the selected drying time.

DATA LOGGER:

The Data Logger feature on some models is a solid state printer that records each cycles' performance. Refer to Page 16 for detailed information.

PRESSURE GAUGE:

The pressure gauge located in the center of the door indicates pressure inside the chamber.



Pressing any of the six selector switches during a cycle will display that cycles selected settings.

DOOR HANDLE:

Slides handle UP to OPEN and DOWN to LOCK the door.

DOOR SWITCH:

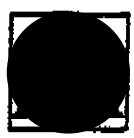
Actuated by the door handle. The switch prevents operation in a sterilize cycle until the door is fully closed and locked.

MAIN POWER ON-OFF SWITCH:

Located on the back of the sterilizer. The Power ON-OFF Switch controls the input of electrical power to the sterilizer.

VOLTAGE SELECTOR SWITCH:

Located on the back of the sterilizer, this switch programs the sterilizer to function from a 115 volt or 230 voltage supply.



This switch MUST be positioned to match the supply source BEFORE the unit is connected to the power source. Damage to electronic components could occur if switch is not set for proper voltage.

PRESSURE RELIEF VALVE:

Protects the coded vessel from exceeding rated pressure. Steam is released by the valve which is located at the rear of the chamber should the pressure exceed 45 PSIG (310 kPa). Released steam is directed out the bottom of the cabinet. An access hole is located in the back panel for periodic relief valve operational check.

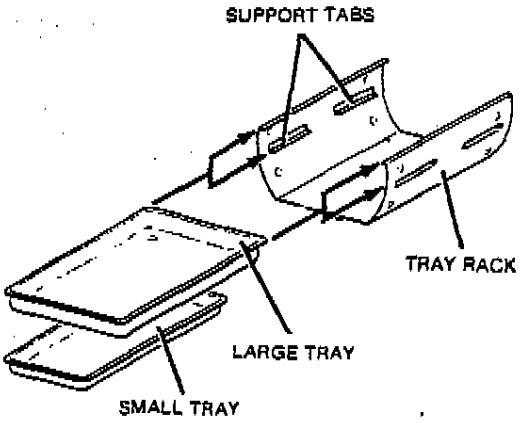
RESERVOIR DRAIN

The drain tube is provided to empty the reservoir. The reservoir drain tube and plug is located at the lower (facing unit) right of the chamber opening on the front of the sterilizer. The drain tube can be pulled out from the sterilizer approximately six inches to permit easier drainage into a container when the screw-in plug is removed.

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TRAYS AND TRAY RACK

A rack is provided for inside the sterilizer chamber to hold the instrument trays. The rack simply slides out of the chamber for periodic cleaning of the chamber and rack.

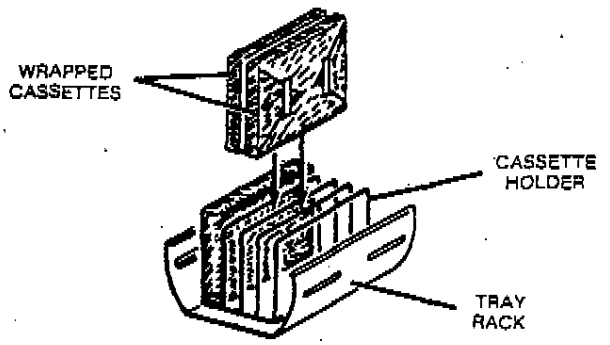


One large and one small tray can be placed into the rack or the rack can be used with only one tray or no trays. Tall items can be sterilized by removing both trays and placing items on the bottom surface of the rack. Refer to "LOADING THE STERILIZER CHAMBER" on page 11 of this manual.

CASSETTE HOLDER

A holder is available to retain three sterilization cassettes in an upright and separated position within the sterilizer chamber. Clean instruments are placed in the cassettes, the cassettes wrapped and processed. The cassettes with sterilized instruments can then be removed and stored for use later.

To use the cassette holder, remove any trays from the tray rack; the tray rack remains inside the sterilizer chamber. Slip the wrapped cassettes (3 max.) into the holder as shown and place the holder and cassettes toward the front of the tray rack in the sterilizer chamber. Process the load in the normal manner.



LOADING CASSETTE HOLDER

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OPERATING INSTRUCTIONS

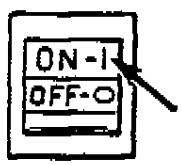
INITIAL START-UP

Be sure the Voltage Selector Switch, located on the back of the sterilizer cabinet, has been set to the same voltage that is supplied at the power cord connection plug. Improper voltage selection could damage the sterilizer.



Main Power ON-OFF Switch

Push the Power ON-OFF Switch, on the back of the sterilizer cabinet, to the ON position. The sterilizer **will not operate** unless this switch is in the ON position.



IMPORTANT

AT INITIAL START UP OR AFTER RESERVOIR HAS BEEN DRAINED AND REFILLED.

When sterilizer is put into service, initially when new or after reservoir has been drained and refilled, the first cycle run may go into "OVERHEAT" because of insufficient water in the chamber. To avoid this problem, a double fill should be applied to the first cycle only.

To Double Fill: (sterilizer door closed)

Press CYCLE START (wait approx. 1 minute).

Press OFF .

Press ON .

Press CYCLE START once again.

FILLING RESERVOIR

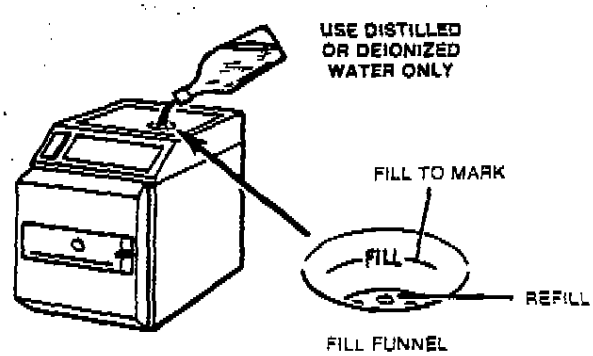
CAUTION

USE ONLY DISTILLED OR DEIONIZED WATER. Failure to use distilled or deionized water will cause serious deterioration and premature failure of the stainless steel chamber. Normal tap water contains minerals, especially chlorides, which have corrosive effects.

DO NOT OVERFILL THE RESERVOIR. Overfilling of the reservoir could cause spillage and restricted operation of the sterilizer.

Fill

Fill the reservoir with distilled or deionized water until water level reaches the "Fill" line em-bossed in the side of the fill funnel in the top of the reservoir cover. The reservoir will hold approximately 4 liters (4.2 quarts) of water. DO NOT OVERFILL.



Refill

WARNING

DO NOT ADD WATER to reservoir while sterilization cycle is in progress. A sudden overflow of hot water could occur when cycle ends and steam and water vent back into the reservoir, resulting in possible burns to personnel.

When the water level reaches the bottom of the fill funnel refill the reservoir to the "FILL" line in the fill funnel.

A refill schedule may be determined depending on the pattern of operation in your facility. The number of cycles that can be run before reservoir refill is necessary will vary according to frequency of operation, duration between cycles, type of cycle, etc.

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GENERAL OPERATING SEQUENCE

BASIC OPERATING STEPS

Five basic steps are required to initiate a sterilizing cycle after the load has been placed in the chamber and the door closed and latched.

(1) Depress the Controls "ON" switch.

(2) Select Exposure Time.

(3) Select Exposure Temperature.

(4) Select the type of load (liquid or dry goods).

(5) Depress Cycle Start.

Once a cycle has been selected, the data will remain in the microprocessor memory until changed by the operator or electrical power is disconnected from the sterilizer.

With the controls "ON," any subsequent cycle can be run at the same setting by pressing the Cycle Start selector. Turning the controls "OFF" at the control panel will not cancel the previous cycle settings.

If Drying time is desired, at the completion of the sterilize cycle, the door must be opened slightly and the drying phase started by the operator.

Drying time can be set at the beginning or at the end of the sterilize cycle; however, the drying phase will not start automatically after the sterilize cycle —it must be started by the operator.

A drying cycle can not be operated from a cold sterilizer chamber. Chamber temperature must be at least 30°C (86°F) for the drying cycle to operate. A sterilize cycle must be run before activating a drying cycle to heat the chamber. Initiating a drying cycle on a cold chamber will light the drying indicator and time display, but cycle will not function or time out.



Cycle selections CAN NOT be changed once the Cycle Start has been pressed. To change a setting, the cycle must be aborted (press Controls "OFF" then Controls "ON"). At that time the previous parameters will appear in the display and can be changed as desired.

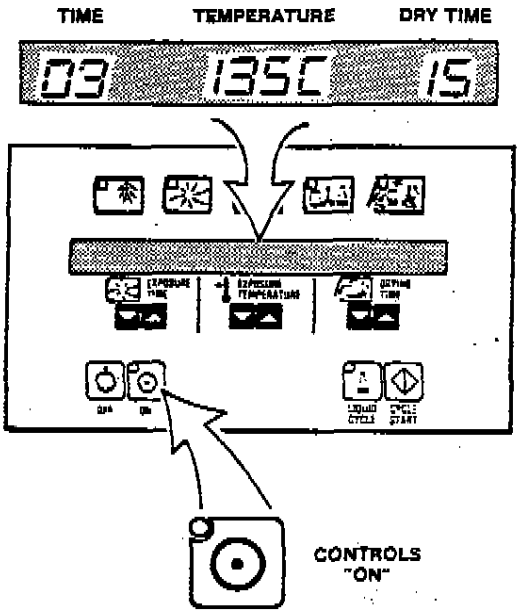
REFER TO THE FOLLOWING PAGES FOR DETAILED SELECTION PROCEDURES.

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OPERATION

Press CONTROLS ON ⊙ **Switch.**

- The Selector/Indicator Panel will turn ON.
- The Exposure Time, Temperature and Drying Time from the previous cycle will be displayed.



Load the Sterilizer Chamber.

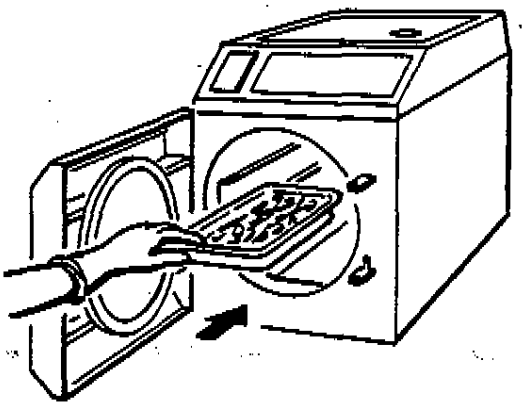
Loading Capability - Wrapped or Unwrapped Instruments, Linen Packs, Glassware and Liquids

WARNINGS

When processing wrapped goods, fabrics and dressings, always place items in the large tray in the upper position in the chamber. Items processed in the lower positions could result in wet packs and possible unsterile goods.

DO NOT use this equipment for sterilizing volatile substances or for any purpose other than its intended design. Failure to observe this warning could result in burns and toxic or explosive conditions.

To prevent the possibility of injury from liquids boiling over and/or containers exploding, use only self-venting automatic sealing stoppers recommended by manufacturer when processing all liquids or media.



- Place absorbent paper or linen towel on bottom of tray to be used.
- Unwrapped goods to be processed may be placed on trays or directly on the rack.
- Liquids must not exceed 75% of capacity of flask — use vented caps.

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- Clean items thoroughly before placing in sterilizer.
- Total specified weight should not be exceeded for any sterilizing cycle.

Hard Goods — 8 lbs. Soft Goods — 1.4 lbs.

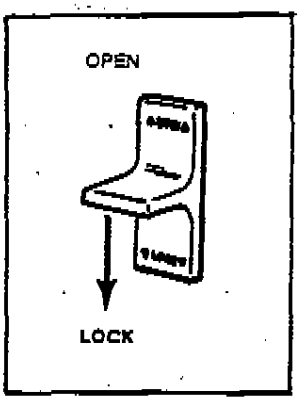
- **Do Not Overload**. Steam penetrates loosely packaged loads best.
- Open all hinged instruments.
- Do not allow packs to touch chamber walls.
- Uncover empty containers and place them on their side.
- Use a process indicator in each load. Weekly use of a biological monitor is recommended.

Close and Lock the Sterilizer Door

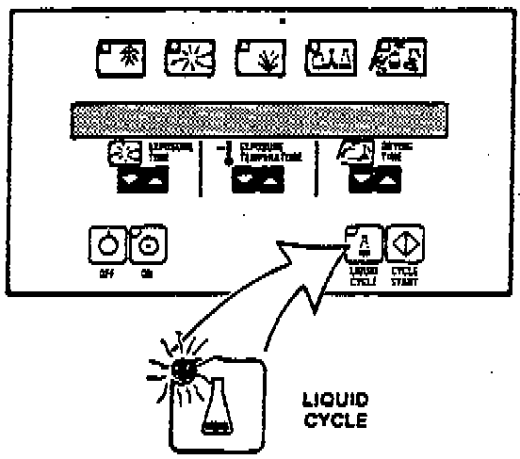
Sterilize cycle will not operate if door is not fully closed and fully locked.



When running a sterilize cycle, BE SURE THE DOOR LOCKING HANDLE IS FULLY DEPRESSED (LOCKED). If the handle is not fully locked, the dry cycle, instead of the sterilize cycle will run. The load will not be sterile and must be reprocessed.



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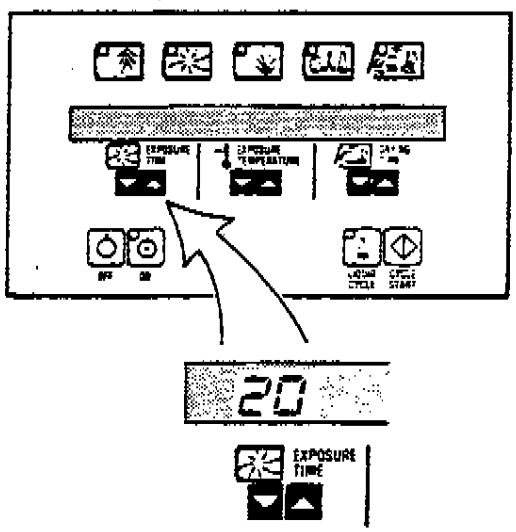


Select Processing Cycle

Dry Goods & Hard Goods (No Indicator Light)

— OR —

Liquid Cycle (Indicator Light ON)



Select Exposure Time

- Pressing the Up or Down arrow switch will increase or decrease the selected time setting by one (1) minute each time the switch is pressed. Pressing and holding the switch will change the digits in rapid succession.
- The selected time will be displayed above the Time Selector Switch on the Selector/Indicator Panel.

WARNING

Processing goods at less than recommended time/temperature could result in unsterile goods.

TIME/TEMPERATURE CHART

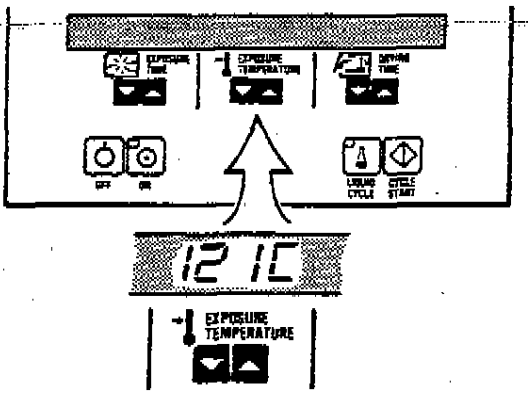
LOAD	TIME	TEMP.	
Unwrapped Instruments	3 min.	135°C	275°F
Wrapped Instruments	5 min.	135°C	275°F
Fabrics & Dressings	30 min.	121°C	250°F
Solutions under 250ml	20 min.	121°C	250°F
Solutions over 250ml	30 min.	121°C	250°F

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Select Exposure Temperature

(Refer to Time/Temperature Chart)

- Operation of the switches is the same as "Exposure Time Selector" above.
- The Temperature setting will increase or decrease by one (1) degree celsius each time the switch is pressed.



NOTE

If unit is programmed to read fahrenheit, the setting will increase or decrease by two (2) degrees.

- The selected temperature will be displayed above the selector switches on the Selector/Indicator Panel.
- Maximum selectable temperature for liquid cycle is 121°C (250°F).

WARNING

Processing goods at less than recommended Time/Temperature settings could result in unsterile goods.

TIME/TEMPERATURE CHART

LOAD	TIME	TEMP.	
Unwrapped Instruments	3 min.	135°C	275°F
Wrapped Instruments	5 min.	135°C	275°F
Fabrics & Dressings	30 min.	121°C	250°F
Solutions under 250ml	20 min.	121°C	250°F
Solutions over 250ml	30 min.	121°C	250°F

Press Cycle Start ◈ Switch to begin the automatic processing cycle.

NOTE

The Drying phase WILL NOT automatically start at the completion of the Sterilize cycle. (Refer to "DRYING PHASE OPERATION" on Page 16.)

Processing will occur automatically after the Cycle Start switch ◈ is pressed. The Conditioning Indicator will light and remain on until the temperature in the chamber reaches the selected exposure temperature.

When selected temperature is reached, the Exposure Indicator will light and the exposure time will begin to count down. The selected exposure temperature will be maintained throughout the exposure phase.

When the exposure time is complete, the Venting Indicator will come on and the chamber will be vented of all steam and water back into the reservoir.

When venting is complete and the pressure inside the chamber has been reduced to zero, the Cycle Complete Indicator will light and an audible tone will sound for approximately 3 seconds.

The load can now be dried or removed from the unit.

NOTE

Be sure any printed Data Logger paper is not hanging down over the sterilizer door when the door is opened at the end of the cycle. Residual steam could darken the heat sensitive paper making cycle record unreadable.

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Processed load and inner surfaces of sterilizer will be HOT at completion of cycle and could cause burns if touched without wearing proper protective clothing.



ALWAYS stand to the side (behind door) when opening sterilizer door. Open door slowly and only partially to protect against steam being expelled from chamber, or boiling liquids or exploding flasks.

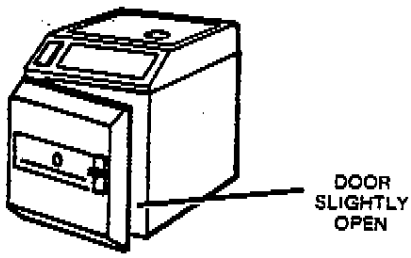


If the sterilizer is manually TURNED OFF at the end of a cycle or at any time after the chamber has heated up, BE SURE TO OPEN THE CHAMBER DOOR to prevent trapped chamber pressure or vacuum from making it impossible to open the door.

IF DOOR WILL NOT OPEN: Press the Controls "ON"  *switch to vent the chamber and the door can then be opened.*

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DRYING PHASE OPERATION



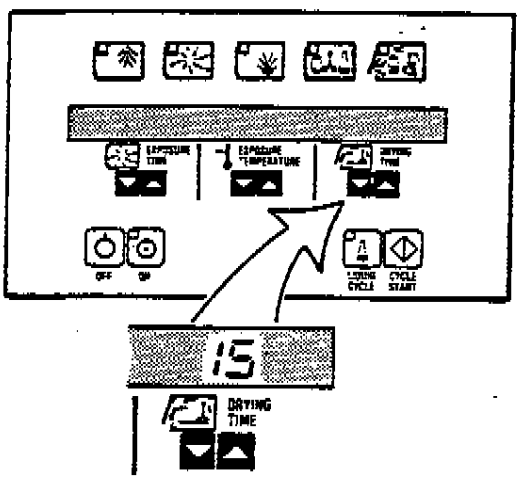
The door must be opened approximately 1/4 inch to operate the drying cycle.



After opening the door, prevent the possibility of steam burns after sterilizing cycle by allowing residual steam to dissipate from the chamber before reaching over the door to activate the drying cycle.

Unlock and open the door slightly, lower handle so locking pin rests against locking ears, holding door slightly open.

Select the desired drying time as described above, if the drying time has not been previously set.



DRYING TIME

LOAD	MINUTES
Unwrapped Instruments	0
Wrapped Instruments	15
Fabrics & Dressings	As Req'd.
Solutions under 250ml	0
Solutions over 250ml	0

Select Drying Time

Drying time can be selected at the beginning of the cycle or after the processing cycle is complete (Drying time will not function on the liquid cycle.).

- Operation of the drying time selector switches is the same as Exposure Time on Page 13.

Press the Cycle Start Switch.

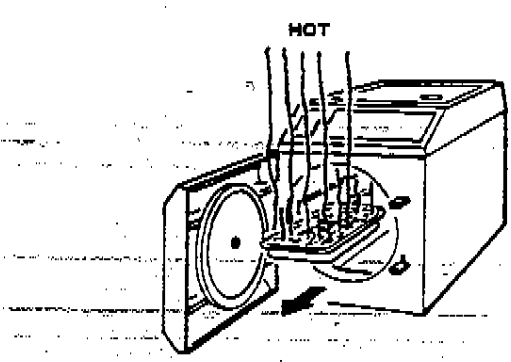
The Drying Indicator will light up and low heat in the chamber will begin.

The selected drying time will begin to count down.

At the conclusion of the drying time, a five second audible sound will be heard.



Processed load and inner surfaces will be HOT at completion of cycle and will cause burns if touched without proper protective clothing.



The load can now be removed from the chamber.

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DATA LOGGER

The Data Logger is a solid state printer that provides a paper tape record for future reference. The printed paper tape is verification of sterilizer performance, load control identification and quality assurance checks for each cycle.

The Data Logger printer operates from electronic impulses on special paper and requires no ribbon and therefore no ribbon changing.

The Data Logger is located at the left end of the Control Panel on the front of the sterilizer.

Data Logger Access Door

The access door swings open right to left and provides a protective cover over the Data Logger. Printed paper tape is fed through the slot provided, in the access door, for easy exit and monitoring of the printed tape. The slot also acts as a paper tear off to remove printed portions of paper tapes.

Paper Advance Button

A paper advance button is located beneath the Data Logger Access Door. Depressing the paper advance button, when printer is idle, will advance the paper through the Data Logger. The paper advance button is used for installing replacement paper rolls and to advance a printed tape for tear off removal.

Paper Roll

Factory authorized paper rolls, Part No. 578X19 (carton of 10 rolls) should be used in the Data Logger (Refer to Maintenance section of this manual for paper roll installation.).

The paper used in the Data Logger is a special heat sensitive paper. The Data Logger will not print on rolls of plain paper.

At the end of each day, remove the Data Logger tape for that day and date it. Place the tape in one of the black plastic storage bags supplied with the tapes.

Each day, place the day's tape in the plastic bag until the roll of tape is used up, then fold the top of the bag and seal it with a label showing the start and finish dates of the tapes in that bag.



Do not allow the paper to be exposed to the residual steam that rises from the opening when the door is opened or the fill funnel when steam is vented into the reservoir. The heat from the steam will make the paper turn black in color, making the tape unreadable.



A colored border along the edge of the paper indicates that the paper roll is nearing the end of the roll and should be replaced. Approximately 18 inches of paper remains, enough for 2 to 3 cycles.

Storage:

The paper is sensitive to light when exposed for extended periods of time in storage. Black plastic envelopes are provided with the paper rolls, in which to place paper tapes for storage. To be sure the data on the tapes will remain preserved, it is important to store the printed tapes properly.

1. Record the dates covered on the tape on the label supplied.
2. Place the tape inside the black plastic bag provided and fold the top of the bag over.
3. Seal the bag closed with the label.

The carton in which the paper rolls are packaged can be used for storage of the plastic bags of tapes. A label has been placed on the end of the carton to document the tapes in the carton.

Continued . . . . . .

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CONDITIONAL INSTRUCTIONS

EMERGENCY OFF (Cycle Abort)

PRESSING THE CONTROLS "OFF" ⏻ SWITCH WILL TURN THE STERILIZER OFF.



LIQUID LOADS: *To prevent boil over of liquids in chamber, allow sterilizer to cool slowly until the pressure gauge is at zero before opening door.*

NON-LIQUID LOADS: Pressing the Controls ON ⏻ immediately after the Controls OFF has been pressed will vent steam and water from the chamber back into the reservoir.

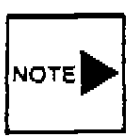


DO NOT ATTEMPT TO OPEN THE STERILIZER DOOR until the pressure gauge in the center of the door reads zero (0). Pressure within the chamber could cause the door to open with extreme force causing possible personnel injury.



Re-process goods to achieve sterility when sterilizing cycle has been terminated prematurely. Failure to do so may result in non-sterile goods.

OVERHEAT
LOW WATER CUT-OFF



If there is an insufficient amount of water in the reservoir to properly fill the chamber, the chamber will overheat causing a premature abort of the cycle. The letters (OH) will appear on the Selector/Indicator Panel display and the word "OVERHEAT" will print out on the Data Logger tape on units equipped with a Data Logger.

When a new sterilizer is put into service or the reservoir has been drained or has run dry and refilled, the first cycle may go into "OVERHEAT" because of a low water condition caused by an air-lock in the piping. See "INITIAL START UP" on pg. 9.

To Restore Operation:

a. Press the Controls "OFF" ⏻ button.

b. Be sure the pressure gauge is reading zero and open the chamber door.



Do not put water in hot chamber. This could cause a flash generation of steam resulting in burns to personnel.

c. Wait for the chamber to cool (approx. 10-15 minutes).

d. Check the water level in the reservoir (add distilled or deionized water only to FILL mark if necessary).

e. Press Control ON ⏻ Switch.

- If OH does NOT reappear in the display on the Selector/Indicator Panel, close the door and proceed as normal.
- If OH does reappear in the display on the Selector/Indicator Panel, Press Controls OFF and wait an additional time period and Press ON again.

If the OH indicator does not go out after several attempts and chamber has cooled considerably, call for service maintenance.



Re-process goods to achieve sterility when sterilizing cycle has been terminated prematurely. Failure to do so may result in non-sterile goods.

ERRATIC CONTROLS DISPLAY OR OPERATION

Abnormal sterilizer operation or controls display could be caused by an internal or external electrical voltage surge. A voltage surge could be initiated by an momentary electrical surge in the power supply, a nearby lightning storm, or even a static electrical charge from someone walking across a carpet and touching the sterilizer.

This is not a common occurrence and may never happen, and no damage will happen to the equipment if it should occur.

If an abnormal condition should occur the processing cycle in progress must be aborted. (Press the Controls "OFF" selector on the Selector/Indicator Panel.)

Continued

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To realign the microcomputer to resume normal operation, turn the main switch, on the back of the sterilizer cabinet, to OFF. Wait 30 seconds and turn the main switch ON again. The microcomputer is now ready to turn on at the Selector/Indicator Panel and the sterilizing parameter reset. Proceed with normal operation.

POWER FAILURE DURING STERILIZING CYCLE

(All Selector/Indicator panel lights will be off)

LIQUID LOAD: To prevent boil over, allow unit to cool down until pressure gauge is at zero. When pressure reads zero, press "ON" then "LIQUID LOAD" and cycle start to reprocess the load.

NON-LIQUID LOAD: Press "ON" switch, reset parameters and press "CYCLE START" to reprocess the load.

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OPERATORS MAINTENANCE

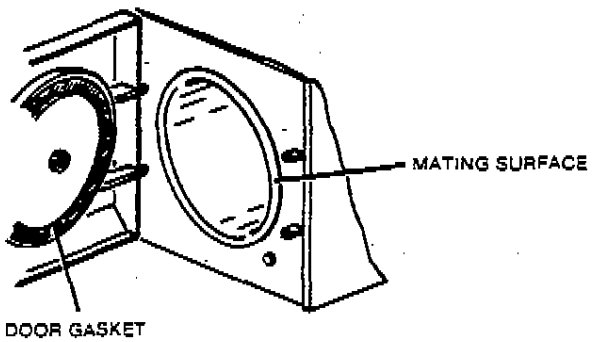
DAILY

WARNING

Prevent the possibility of burns. Be sure sterilizer is cool when cleaning door gasket and mating surface. It is a good practice to clean the gasket and surface before each day's use.

CLEANING DOOR GASKET

The door gasket and the mating surface should be wiped clean each day with a clean damp cloth. Do not use abrasive cleaners on the gasket or mating surface.



The gasket should be examined for cracks or possible damage that could result in a poor pressure seal. If replacement is necessary, refer to the WHEN REQUIRED maintenance section of this manual.

WEEKLY

(More often if necessary)

CLEANING CHAMBER, TRAYS AND RACK

WARNING

Prevent the possibility of burns. Be sure sterilizer is completely cool before cleaning chamber surfaces and components.

CAUTION

Failure to keep the interior of the stainless steel chamber free from mineral deposits or other debris can cause serious deterioration and premature failure of the chamber.

At least once a week the trays and tray rack should be removed from the sterilizer chamber. The trays, tray rack and chamber should be thoroughly cleaned to remove any deposits from the surfaces.

CAUTION

Never use a wire brush, steel wool, abrasives or chloride containing cleaning agents. These materials will damage the metal surfaces of the chamber and components.

Clean the trays, tray rack and inside of the chamber (especially the bottom of chamber) with Castle "Schedule 7" Chamber Cleaner.

Wipe all residue from the surfaces with a dampened lint-free cloth.

CLEANING CHAMBER FILTER SCREEN

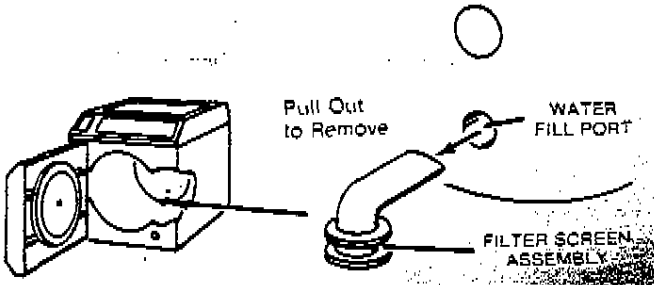
WARNING

Prevent the possibility of burns. Be sure sterilizer is completely cool before servicing.

1. Pull the filter screen assembly out of the water fill port, inside the chamber.
2. Clean any deposits from the screen using a small stiff bristled brush or Ultrasonic Cleaner. Note that the screen is pressed into the rubber boot and can be removed if desired.
3. When clean, be sure screen is in place and push the end of the rubber boot into the water fill port in the chamber, screen downward.

CAUTION

Operating the sterilizer without the filter screen in place could permanently clog the filter in the reservoir.



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MONTHLY

PRESSURE RELIEF VALVE CHECK

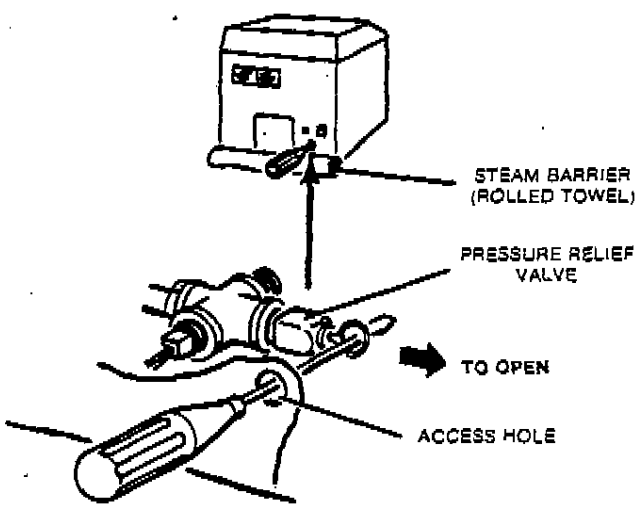
The pressure relief valve must be checked each month by a qualified person to be sure the valve is functioning properly.

The pressure relief valve is located inside the cabinet, behind the chamber. A round access hole is provided in the back panel, through which a rod (screwdriver) can be inserted to test the pressure valve.

WARNING

Steam blow-off will be discharged from under the rear of the sterilizer when the ring on the relief valve is pulled. To prevent possible burns to operator, place a steam barrier (rolled towel) around the bottom of the sterilizer.

1. Run a sterilize cycle with no load in the chamber at 135°C (275°F).



2. When pressure gauge reaches 30 psi (206 kPa), insert the rod through the access hole in the back panel into the ring on the pressure relief valve. Pull the valve ring to open for approximately 3 seconds. Steam should freely discharge from beneath the rear of the unit.
3. Release the ring and the steam discharge should terminate completely.
4. If valve malfunctions, the valve must be replaced.
5. Turn the unit off after valve check to prevent overheating.

NOTE

If traces of steam continue to escape through the valve, the valve has not reseated properly. Open and close the valve quickly (several times if necessary) by pulling the ring and letting it snap closed.

CLEANING RESERVOIR

WARNING

Prevent the possibility of burns. Be sure sterilizer is completely cool before cleaning reservoir. The water in the reservoir could be HOT if sterilizer was in use just prior to cleaning reservoir.

Draining the Reservoir

1. The reservoir drain tube is located at the lower right of the chamber opening on the front of the sterilizer. Pull the drain tube outward, unscrew the cap from the drain tube and drain the contents of the reservoir into a container.
2. Replace the cap and push the drain tube back into the front plate.
3. Lift top cover from the sterilizer.
4. Wipe the reservoir out with a clean damp, lint-free cloth, to remove any deposits. DO NOT use abrasive cleaners.
5. Clean the reservoir filter as described below.
6. Replace the reservoir cover and refill the reservoir with distilled water.

Cleaning Reservoir Filter

The filter in the reservoir should be cleaned each time the reservoir is cleaned to guard against an overheat situation due to insufficient water to the chamber.

To clean the filter, unscrew the filter from its fitting and rinse thoroughly with clean water. A stiff bristled brush or Ultrasonic Cleaner is helpful to remove "stuck on" debris. For stubborn, embedded debris, the "back-flush" method is often effective.

To "back-flush" filter:

1. With reservoir empty, replace reservoir cover.
2. Manually fill sterilizer chamber with 350cc (12 oz) of distilled water (until water is 1" from front edge of chamber).

Continued . . . . . .

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3. Run sterilizer through normal sterilization cycle. When cycle vents back into the reservoir through the filter, the clogged debris will be dislodged and blow into the reservoir.
4. Wipe the inside of the reservoir clean, refill with clean distilled water to return the sterilizer to operation.

If none of the above cleaning methods works to effectively clean the filter, replacement may be necessary.

WHEN REQUIRED

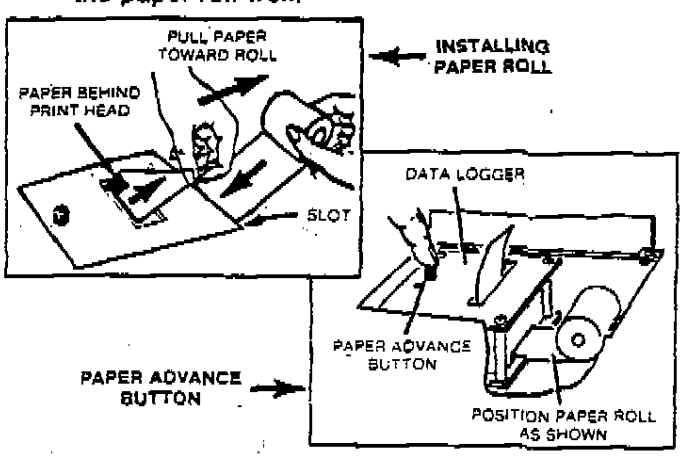
Paper Roll Installation

The paper roll must be positioned and fed into the Data Logger printer as shown. The paper is sensitized for printing on one side only.

1. Cut the lead end of the paper to a long taper as shown in illustration. The point of the cut should be on the side of the paper as shown.



2. Feed the cut end of the paper into the slot at the bottom of Data Logger printer and push the paper through until the tip comes out the top of the printer.
3. While holding the roll in one hand so the paper stays taut, grasp the tip of the paper with the other hand and pull it through until the full width of the paper is under the printer head.
4. *Pull enough paper through to be inserted* through the slot in the cover and place the roll in the paper roll well.

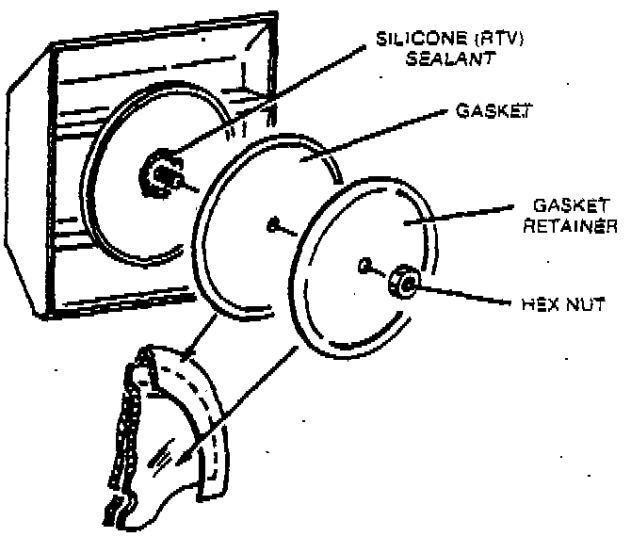


5. Feed the paper through the cover and close the cover.

NOTE ▶ *At the end of each day's use, the printed portion of Data Logger tape should be removed and placed in a black plastic storage bag and sealed with the label containing the date. The Paper Advance Button is provided to manually advance paper through the Data Logger printer.*

DOOR GASKET REPLACEMENT

1. Remove the hex nut in the center of the Gasket *Retainer and remove the gasket and gasket* retainer. Note, gasket will be adhered to door plate.
2. Clean surface of the door plate, new gasket and gasket retainer of any dirt, adhesives or deposits.
3. Apply a generous amount of silicone sealant in a 2" diameter area around the center fitting on the door plate.



DOOR GASKET REPLACEMENT

4. Assemble the Gasket Retainer (formed lip toward gasket) and Gasket with narrow flap on gasket over lip on retainer.
5. Place the gasket and retainer assembly on the center fitting of the door plate as shown and secure with hex nut, finger tight (firm). Do not use wrench.

Allow about an hour for the silicone sealant to set then run a no load cycle to seat gasket.

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