ALFA Your Sterilizer Experts

Manufacturing - Distribution - Maintenance - Guaranteed!

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Sentry Operation Manual

1. Fill reservoir with distilled water.
2. Plug sterilizer into grounded outlet.
3. Put instruments on tray and into chamber.
4. While door open, turn bottom switch to 'fill' position, and leave at that position for about 50 seconds, until water reaches the front rim of the chamber. Please be sure timer is set on zero.
5. Close door.
6. Make sure the middle knob is turn all the way clockwise. This will ensure 270f. By turning the middle knob counterclockwise...you will be reducing the temperature.
7. Turn timer to 15 minutes + appropriate time (look at table below).
8. Turn the bottom switch to 'sterilize' position.
9. Both red & orange light will come on.
10. At end of cycle, the timer and both orange & red lights will be turned off and the pressure will be vented automatically.
11. When pressure gauge shows 'zero', you may open the door.
12. If you want the instruments to be dryer than they are...leave the door slightly open, and turn the bottom switch to vent position and set the timer to 10-15 minutes.

* Important notice - Please do not attempt to adjust the front legs. They have been **intentionally** set this way.

General Guidelines*

Unwrapped instruments.....121c	**250f**	**15psi**	**15min**	
	132c	**270f**	**30psi**	**3min**
Lightly wrapped.....121c	**250f**	**15psi**	**20min**	
	132c	**270f**	**30psi**	**9min**
Heavily wrapped..... 121c	**250f**	**15psi**	**25min**	
	132c	**270f**	**30psi**	**11min**

- **It is our recommendation that you consult your instrument manufacturer for accurate temperature & time schedule best suited for the instruments you are sterilizing.**
- **For the health & safety of your patients and staff, sterilizers must be biologically monitored (spore tested) to meet CDC, ADA and OSHA.**
- **Use Sterilizer Cleaner weekly (Alfa Clean p/n AME-AC16).**

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Last revised 9/14/01

SENTRY® STERILIZER

PREPARATION OF MATERIALS FOR STEAM STERILIZATION

INSTRUMENTS – Clean thoroughly, wrap in muslin and place on trays.

SYRINGES AND NEEDLES – Take syringe apart, wash thoroughly. Wrap each part separately in muslin. Cover entire tray with double thickness muslin cover.

FABRICS AND DRESSINGS – Fold into convenient packets. Always fold loosely. Avoid making multiple layers and never roll. Never use canvas as a covering. Canvas will not allow proper steam penetration for sterilization. Wrap in muslin on tray. Do not overload chamber.

UTENSILS AND GLASSWARE – Lay all jars or vessels on sides. Fabrics may be sterilized in enamelware or glass jars. Ensure the container is turned on side and the cover fits loosely.

SOLUTIONS – Fill flask no more than two-thirds full. Close end of flask with cotton or paper cups.

LOADING THE CHAMBER

WARNING: Do not overload or crowd chamber or allow material to come in contact with door or sides of chamber. Separate thick packs and loosely woven packs into separate loads.

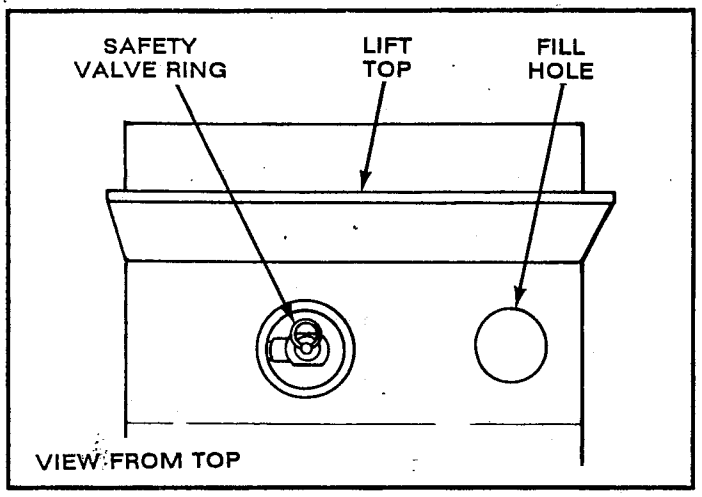
RECOMMENDED PERIODS OF EXPOSURE

Material to be Sterilized vs. Time in Minutes	STEAM HEAT			
	PSA	15	20	25
	kPA	103	138	172
	F°	250	260	267
	C°	121	127	131
Fabrics–Loosely woven–Wrapped in muslin		30	20	–
Fabrics–Tightly woven		40	30	–
Instruments–In Tray–Muslin cover		15	10	3 7
Instruments–Individually wrapped in muslin		30	15	10
Syringes and needles		15	10	7
Drums–Loosely woven contents		30	20	–
Drums–Tightly woven contents		40	30	–
Utensils–Loosely woven contents		30	20	10
Rubber Gloves–In muslin packs		15	–	–
Rubber Covers–In muslin packs		15	–	–
Brushes & Miscellaneous Articles – Wrapped		15	–	–
Solutions–1000 cc flasks		30	25	–
MATERIAL vs. MINUTES				

CARE AND MAINTENANCE

CLEANING OUTSIDE – All outside parts are either plastic or baked enamel finish. Use only mild detergent and water for cleaning.

The safety valve should be activated every three months to ensure that mineral deposits or other obstructions are not holding the valve closed. Pull the safety valve ring (located under the lift top) to operate the valve manually while chamber is under pressure.



WARNING: When ring is pulled on safety valve with unit under pressure, steam is discharged from the chamber at a high temperature. Keep clear of steam discharge path to avoid burns. Use of a hot pad or instrument to pull ring is suggested.

When cleaning the sterilizer, be sure to include reservoir, tubing and chamber. All parts will be cleaned by running a 20 minute cycle using Pelton & Crane's Omni-Cleaner. Do not use this cleaner while instruments are being sterilized. Omni-Cleaner is a mildly alkaline concentrate used to clean autoclaves. Regular weekly cleaning will promote increased sterilizer life and trouble-free operation.

NOTICE – Minerals, especially chlorides, are corrosive to any stainless steel. It is strongly recommended that the autoclave be cleaned at least weekly with Omni-Cleaner. Use distilled or deionized water to clean the autoclave weekly. When sterilizing saline solutions, it is imperative that the autoclave be cleaned after each use. Unless cleaning instructions are followed, long life should not be expected.

Draining Reservoir – Reservoir may be drained by rotating the drain tube so that a container may be placed under its end when cap is unscrewed. Be sure to replace and tighten drain cap when draining is complete.

Cleaning Chamber –

1. Mix three ounces (89 mL) of Omni-Cleaner per quart (.95 L) of water. **It is important to use Omni-Cleaner since it is specially formulated to inhibit corrosion of stainless steel.**
2. Drain reservoir and fill with cleaning solution. For extremely dirty sterilizers, solution may be increased to 4 ounces (118 mL) per quart (.95L) and may require two cleaning cycles.
3. Run one 20 minute cycle in normal manner. Instruments should not be sterilized while cleaning sterilizer.
4. Drain cleaning solution from reservoir. Rinse thoroughly with fresh water. Fill sterilizer again and run one cycle for fifteen minutes. Do not use cleaning solution for rinse cycle; use fresh water.
5. Drain rinse solution, remove tray rest and wipe out inside of boiler and tray rest. When cleaning chamber, do not damage thermistor located in rear.
6. Refill reservoir with distilled or deionized water and sterilizer is ready for use.

(SEE OTHER SIDE)

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SENTRY REPAIR MANUAL

CONTENTS PAGE

1. OPERATING CAPABILITIES

FEATURES

1.01 Pressure Gauge indicates pressure inside chamber.

1.02 Temperature Gauge indicates steam-sterilizing temperature. Gauge sensor is located in steam discharge line and controlled by air valve.

1.03 POWER-ON Lamp indicates Autoclave is switched on and power is available to heating elements.

1.04 HEAT-ON Lamp indicates temperature controller is applying power to the heating elements. Full 'On-Time' equals 100%; one half 'On-Time' equals 50%; etc.

1.05 Timer—The mechanical timer (indicates time **only**) rings a bell at end of cycle and is not connected to power in any way. It must be manually started.

1.06 Solid State Controller—Operates by sensing chamber temperature through the thermistor and maintaining a constant temperature by turning the heating element on and off (indicated by **heat-on** lamp). The control rheostats, which allow adjustment to the temperature settings, are set for 270° maximum.

1.07 Control Knob

- **POWER OFF** turns off power to Autoclave.
- **FILL** allows water from previously filled reservoir to be admitted to chamber.
- **STERILIZE** closes valves to stop water flow and to turn on main heating element when door is closed.
- **VENT** returns steam to reservoir through condensing coil.

NOTE: With control in FILL or VENT positions and door open, the side heating element is connected to line voltage and draws 85 watts. When control is in STERILIZE position with door closed, the center element is connected to line voltage and draws 1,200 watts.

1.08 Cams on the **valve** shaft are actuated by the control knob. When knob is in **FILL** position, the rear cam opens valve #2 and allows water to flow from the reservoir into the chamber. When knob is in **STERILIZE** position, neither valve is opened, but the front cam depresses the function switch arm and causes the bottom element to be connected for maximum power when the door is properly closed. When knob is in **VENT** position, the front cam opens valve #1 and allows pressure inside chamber to force unused water and steam back into the reservoir. When knob is in **POWER-OFF** position, both valves are closed. The rear cams depress arms on power switches and cuts off power to the Autoclave.

1.09 Air Valve operates by releasing air from chamber prior to sterilizing cycle. Valve will continue to release small amounts of steam throughout sterilizing cycle.

1.10 Safety valve is factory set for 35 psi to eliminate over-pressure inside chamber.

1.11 Heating Elements consist of two separate elements secured by steel pressure plate and removable stainless-steel straps.

1.12 Overheat Protector thermostat is located at heating elements under boiler and is connected to center heating element only. Protects boiler from over-heating should the control thermostat fail or if Autoclave is turned to **STERILIZE** without water in chamber, and control thermostat fails to sense heat rapidly enough.

NOTE: "Heat-On" light is not operated by this thermostat. However, with the solid state control, the "Heat-On" light will be off if the overheat protector is open.

1.13 Door Locking Mechanism—A groove on the door bolt engages with a shoulder in the catch which locks door. Before door can be opened, it must be pushed inward to disengage this groove while bolt is moved to the left. Any pressure in the chamber exerts a force on the door (preventing it from being pushed inward by hand), therefore, all steam must be vented before door can be opened.

1.14 Door interlock switch—The door bolt actuates a switch lever, located in the door catch, that will not allow the main heating element to be energized unless the door is properly locked.

NOTE: For complete operating instructions, refer to Sentry Wall Card YL2-094085.

2. TROUBLESHOOTING PROCEDURES

SYMPTOM	TROUBLE	REMEDY
	CONTROL OF STERILIZING PRESSURE	
2.01 Erratic control of pressure and temperature.	a. Overheat thermostat set low.	a. Reset overheat thermostat. (Refer to Procedure for Setting Overheat Protector, YL8-094440.)
	b. Thermistor defective.	b. Replace thermistor.
	c. Solid state controller defective.	c. Replace solid state controller.
2.02 Will not build up to sterilizing pressure.	a. Door not in locked position.	a. Ensure door is properly locked.
	b. Door switch not adjusted properly or is defective.	b. Check door switch for adjustment and/or continuity.
	c. Autoclave not level.	c. Ensure autoclave is installed on a level surface.
	d. Not enough water admitted on **FILL** cycle.	d. Fill reservoir 2-1/2" below top. (Fill line should be visible.) When chamber is properly filled, water level will be over fill plate on tray rest.
	e. Debris in fill or vent valve. As pressure is developed, water in chamber is returned to reservoir.	e. Drain reservoir. Turn autoclave on left side and remove both knurled valve caps and springs. Remove buttons and check Teflon seats for scoring or lodged debris. If Teflon is scored, replace buttons. Remove any debris from inside valve. Re-assemble and check. **NOTE: Debris in vent valve (#1) is indicated by excessive water coming out of condenser tube in reservoir or short sterilizing time. Debris in fill valve (#2) is indicated by water bubbling up from bottom of reservoir with pressure in chamber.**
	f. Function switch not activated by main valve cam.	f. Adjust position of function switch (front switch on valve block) or switch arm so switch arm is depressed and switch is in closed position when valve knob is in **STERILIZE** position. Listen for click when switch operates.
	g. Rocker arm hitting push rod causing valve button to be slightly depressed.	g. Check visually for clearance. Flatten cam shaft if necessary.
	h. Rheostat on solid state controller set low.	h. Readjust rheostat. Refer to Adjustment Instructions YL3-095262.
	i. Center heating element open.	i. Check resistance of element which should be approximately 10 ohms. Replace if necessary.

SYMPTOM	TROUBLE	REMEDY
	j. Overheat protector set too low or defective.	j. Adjust or replace overheat protector. Refer to Procedure for Setting Overheat Protector YL8-094440.
	k. Thermistor defective.	k. Replace thermistor.
	l. Defective front rheostat.	l. Replace rheostat.
	m. Defective solid state controller.	m. Replace solid state controller.
2.03 Excessive pressure and temperature.	a. Pressure exceeds 35 psi.	a. Reset controller by adjusting rheostat on solid state controller. Refer to Adjustment Instructions, YL3-095262.
	b. Heat remains on, causing temperature and pressure to rise until safety valve goes off or overheat protector is activated.	b. Defective solid state controller Replace.
	c. Wiring grounded.	c. Inspect wiring to ensure it is not touching any part of chassis.
2.04 Sterilizing time less than one hour.	a. Slow leak in valves caused by debris.	a. See Remedy 2.02e.
	b. Air valve open too wide.	b. See paragraph 3.02.
	c. Insufficient water in chamber.	c. See Remedy 2.02c, 2.02d.
	d. Rocker arm touching and holding valve button partially open.	d. See Remedy 2.02g.
2.05 Pressure builds up too slowly or not at all. (More than 12 minutes on initial start-up or more than 5 minutes on repeat cycles.)	a. Defective or incorrectly adjusted overheat protector cuts off power to sterilizing heating element. (See paragraph 1.12.)	a. Replace or adjust overheat protector. See paragraph 2.01a.
	b. Low line voltage	b. Check line voltage. Start-up time based on 117 volts at Autoclave.
	c. Defective rheostat.	c. Replace rheostat.
	d. Defective thermistor.	d. Replace thermistor.
	e. Defective solid state controller.	e. Replace solid state controller.
	f. Defective heating element.	f. Replace heating element.
DOOR		
2.06 Door gasket leaks.	a. Dirt on seating surface causes steam to leak (spitting or hissing noise).	a. Remove door gasket from door. Clean front face of chamber, seating surface and groove of door with non-chlorinated detergent. Replace gasket.
	b. Scratches in gasket.	b. Inspect silicone gasket. If scratched or torn, replace with new gasket.
2.07 Door bolt difficult to slide in door.	a. Needs Pelton & Crane high temperature lubricant.	a. Remove door handle, unscrew mounting studs and remove bolt. Clean bolt and inside of bolt hole. Using a fine grit emery cloth, polish door bolt. Check inside of bolt hole for burrs. Apply high temperature lubricant to bolt and reassemble.
	b. Burr or dirt on bolt or door bolt hole.	b. Same as above.

SYMPTOM	TROUBLE	REMEDY
CORRELATION OF PRESSURE GAUGE AND THERMOMETER		
2.08 Thermometer reads more than 4° F **below** required temperature at given pressure.	a. Air valve closed too far. b. Defective thermometer. c. Defective pressure gauge. d. Debris in air valve.	a. Refer to paragraph 3.02. b. Replace thermometer. c. Replace pressure gauge. d. Clean air valve housing.
2.09 Thermometer reads more than 4° F **above** required temperature at given pressure.	a. Defective thermometer. b. Defective pressure gauge.	a. Replace thermometer. b. Replace pressure gauge.
CONTROL KNOB		
2.10 Control knob does not position positively.	a. Weak spring on locating arm.	a. Remove casing. Remove locator arm on valve bracket. Force spring arms together to make spring tighter. Reassemble or replace spring.
	b. Knob screw loose.	b. Tighten set screw securely.
PILOT LIGHTS		
2.11 Bulbs are slow to light when Autoclave is turned on. (There is a natural delay occasionally when bulb is first ignited.)	a. Low line voltage. b. Defective lamp.	a. Check line voltage. b. Replace lamp (snap out of panel).
TIMER		
2.12 Timer bell will not ring at end of timed cycle.	a. Defective timer. b. Timer installed upside down.	a. Replace timer. b. Remove knob and mounting nut. Rotate until **TOP** (marked on front of timer) is at top of Autoclave.
	c. Brass bell off center.	c. Loosen screw on back of timer and center bell.
2.13 Timer does not time accurately.	a. Defective timer.	a. Replace timer.
RESERVOIR		
2.14 Water bubbles out of reservoir with control in **VENT** position.	a. Condenser coil discharge end pointed straight down into water, causing water to splash out during venting. b. Autoclave dirty, causing water to foam.	a. Bend condenser coil discharge end so water and steam are directed down and against side of reservoir. b. Clean chamber as shown in Operating Instructions. Remove condenser from reservoir and clean both with detergent and water. Use a bottle brush or sponge mop.
	c. Air valve open too far.	c. Check bellows and seat for lodged debris. Condenser drip rate should be about one drop per second.

TROUBLE	SYMPTOM	REMEDY
	d. Leak in main valves.	d. If front (#1) valve is leaking, condenser drip will be excessive and brass pipe routed from side of chamber up to reservoir will be excessively hot. If rear (#2) valve is leaking, bubbles can be seen coming out bottom of reservoir. Replace valve buttons or clean shaft.
	e. Rich Solution of Omni-Cleaner.	e. Dilute and rinse chamber thoroughly.
	f. Reservoir filled beyond capacity.	f. Lower water level to WATER FILL line.
OTHER		
2.15 Function or power switch shorted in either **STERILIZE** or **VENT** position.	a. Function or power switch may be blown if there is a short in the Autoclave. The contacts will short in one position (or the other) and no click can be heard.	a. Check for shorts and replace switch.
2.16 Safety valve leaks.	a. Safety valve is factory set for 35 psi. If this pressure has been exceeded and safety valve has opened, it occasionally will not perfectly reseat.	a. Reactivate valve by hand. If it does not seat properly, replace safety valve.

3. HOW TO . . .

WARNING: BEFORE SERVICING, DISCONNECT POWER PLUG FROM OUTLET

3.01 Clean Main Valve or Replace Valve Buttons

A. Drain reservoir, turn Autoclave on side, unscrew two knurled caps in bottom opening. Remove springs and valve buttons. When replacing caps, ensure O-rings are in grooves.

3.02 Replace Air Valve

A. Remove casing.

WARNING: ENSURE NO PRESSURE IS IN CHAMBER.

B. Remove air valve by unscrewing large knurled cap on front side of reservoir.

C. Install new air valve. Ensure O-ring is in groove.

D. Operate Autoclave and check for steam leaks around air valve.

E. Replace casing.

3.03 Replace Safety Valve

A. Remove casing.

WARNING: ENSURE NO PRESSURE IS IN CHAMBER.

B. Remove safety valve located in upper section of chamber.

C. Install new safety valve into chamber. Use Teflon pipe sealant on connection to eliminate any possible leakage. Re-use 3" nipple on safety valve.

D. Replace casing. Activate valve periodically to ensure proper function.

3.04 Replace Timer

A. Install timer with **TOP** mark on front of timer at top of Autoclave. Check to ensure bell operates properly.

3.05 Check Heating Elements

A. With control knob on **STERILIZE,** Sentry should draw approximately 10.3 amps or 1,200 watts at 117 V. With control knob on **VENT,** Sentry should draw approximately 0.73 amps or 85 watts at 117 volts. The only sure way to check the heating elements is to check across each one with an ohmmeter or continuity tester. With power plug disconnected, check wiring by connecting one lead of an ohmmeter to AC line and one lead to **red** wire of triac. With control knob set on **STERILIZE,** reading should be approximately 10 ohms—if reading is zero, re-check wiring. Move lead from triac to door switch—reading should be about 150 ohms. If reading is zero, re-check wiring.

3.06 Replace Heating Elements

A. Remove casing.

B. Turn Autoclave upside down and remove bottom plate.

C. Remove wires attached to heating element terminals.

D. Remove straps securing heating elements.

E. Remove defective elements and replace. Ensure copper shim is in place.

F. Replace pressure plate and **attach** (but do **not** tighten) three stainless straps.

G. Center the heating elements under pressure plate. Tighten straps. If elements shift, loosen straps and reposition elements. Retighten.

H. Connect wires to proper terminals on heating elements (Refer to Section 4, Wiring Diagram). Ensure connections are tightened securely and terminals are **not** touching metal.

I. Replace casing.

3.07 Replace Thermistor

A. Remove casing.

B. Disconnect thermistor at plug and socket.

WARNING: ENSURE NO PRESSURE IS IN CHAMBER.

C. Remove thermistor assembly located in rear of chamber.

D. Install new thermistor assembly into chamber. Use Teflon pipe sealant to eliminate any possible leakage.

NOTE: Use caution in handling thermistor assembly because probe is easily damaged.

E. Perform procedure in 3.08F.

F. After temperature is set, replace casing. Autoclave is ready for use.

3.08 Replace Solid State Controller

A. Remove casing.

B. Disconnect both wire harness plugs.

C. Remove two mounting screws securing controller heat sink to base and remove controller assembly.

D. Install new controller and replace two mounting screws.

E. Use small screwdriver to set rheostat in center of range.

F. Operate Autoclave through steam cycle with temperature control knob at 270° F. When **HEAT ON** lamp begins cycling, allow temperature to reach the final setting. Calibrate controller by turning calibration knob clockwise to increase temperature and counterclockwise to decrease temperature. After each correction of calibration knob, allow temperature to stabilize. (Refer to Adjustment Instructions, YL3-095262.)

G. Replace casing.

3.09 Replace Front Rheostat

A. Remove casing.

B. Remove temperature control knob by loosening set screw. Take the hex nut off shaft of rheostat.

C. Cut blue and brown lead wires soldered to rheostat.

D. Strip ends of blue and brown wires and solder to new rheostat.

E. Install rheostat and screw hex nut onto shaft

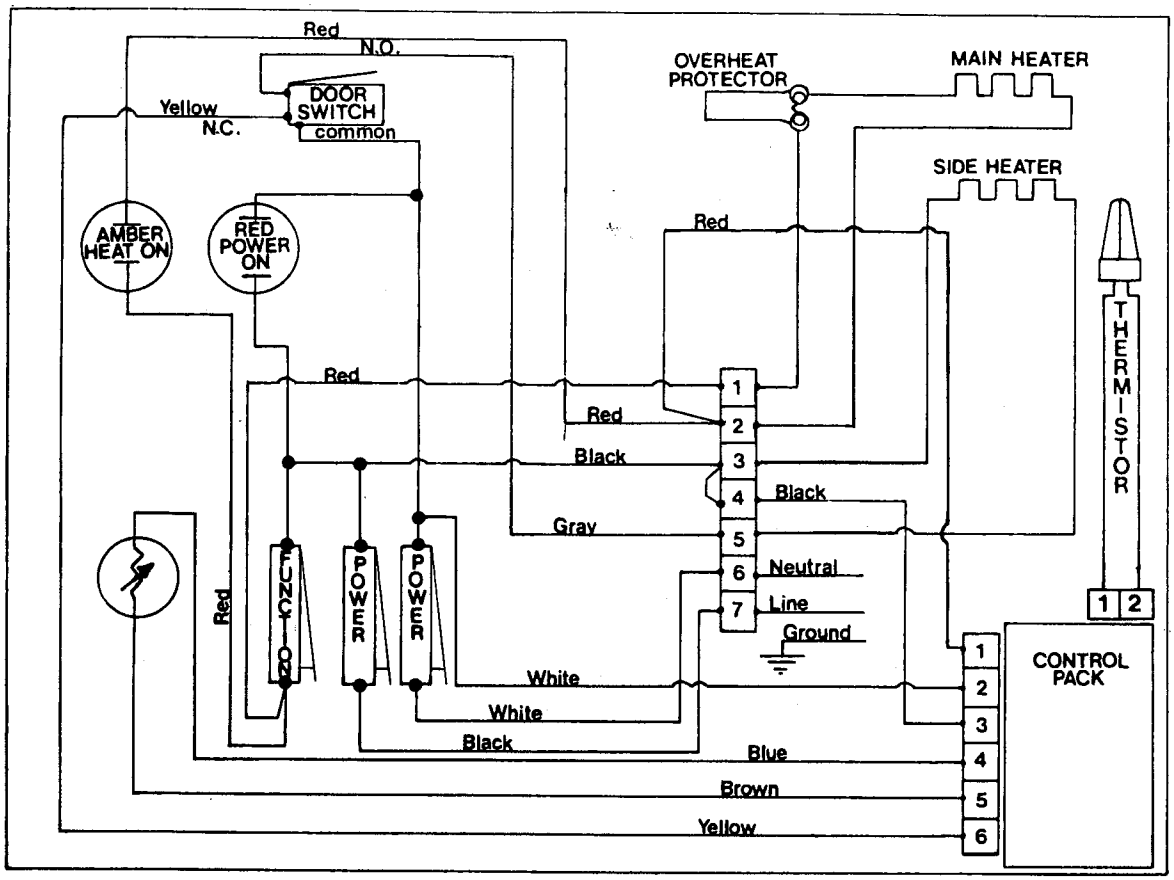
F. Rotate shaft of rheostat to full clockwise position.

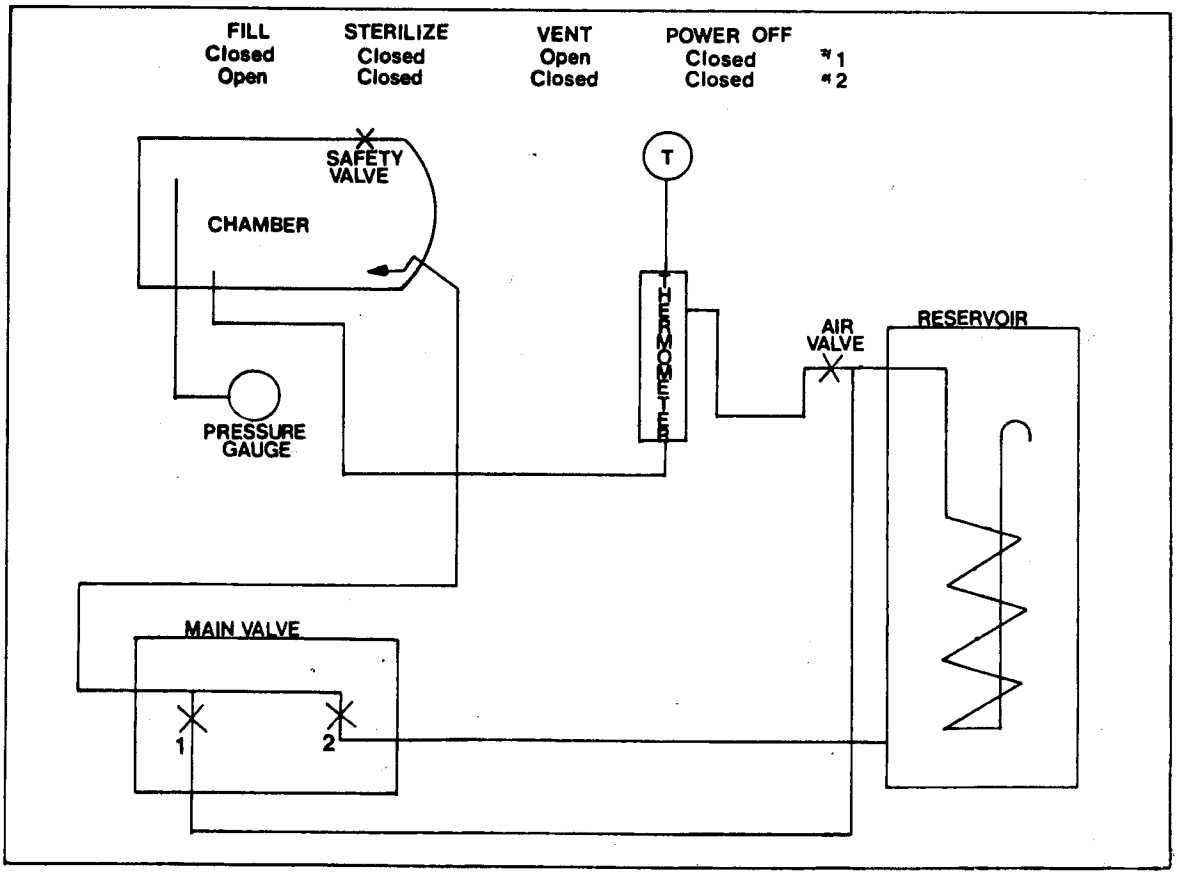
G. Install control knob and tighten set screw so that index mark lines up at 270° F. in full clockwise position.

H. Calibrate per paragraph 3.08F.

I. Replace casing.

4. WIRING AND PLUMBING DIAGRAM



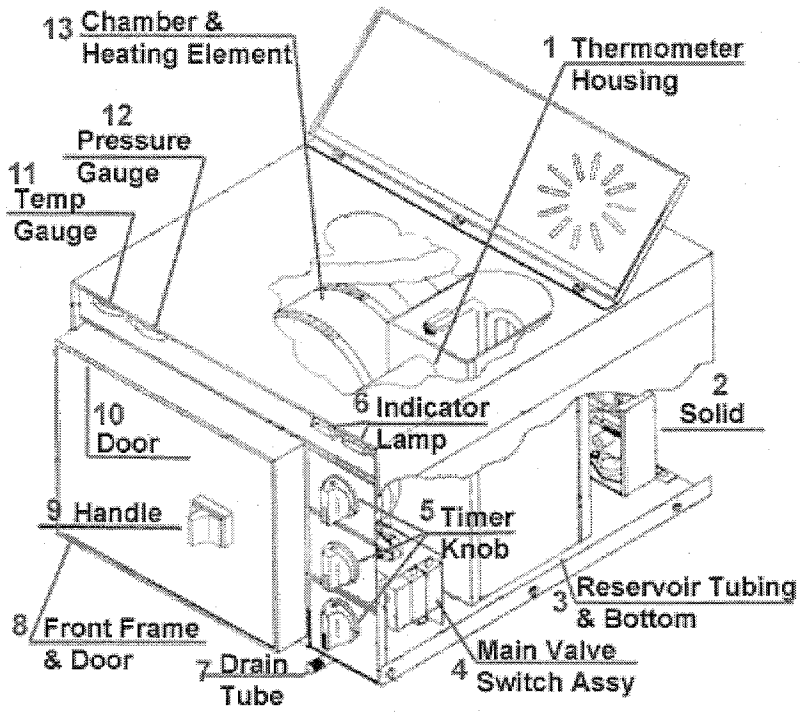


Section 4: Parts List

Pelton & Crane Original Sentry Parts

Other Autoclave Parts | Other Pelton Crane Products | Other Sentry Models

Assemblies: Chamber & Heater | Front Frame & Door | Main Valve | Reservoir Tubing & Bottom



Item Number	Part Number	Description
1	015685	Thermometer Housing
2	024401	Solid
3	Assembly	Reservior Tubing &Bottom
4	Assembly	Main Valve Switch Assembly
5	004112	Timer Knob
6	014141	Indicator Lamp
7	004598	Drain Tube
8	Assembly	Front Frame & Door
9	012753	Handle
10	001197	Door
11	001210	Temp Gauge
12	001212	Pressure Gauge
13	Assembly	Chamber and Heating Element

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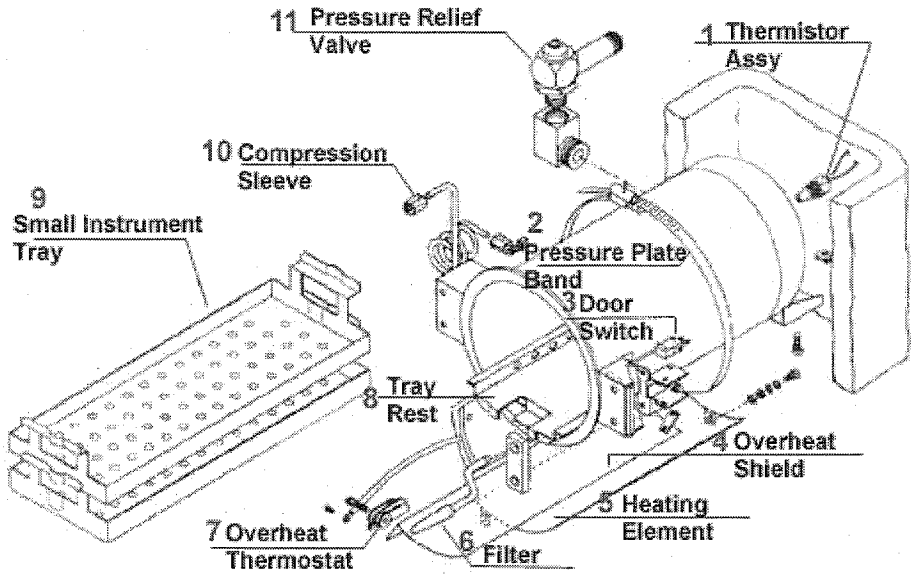
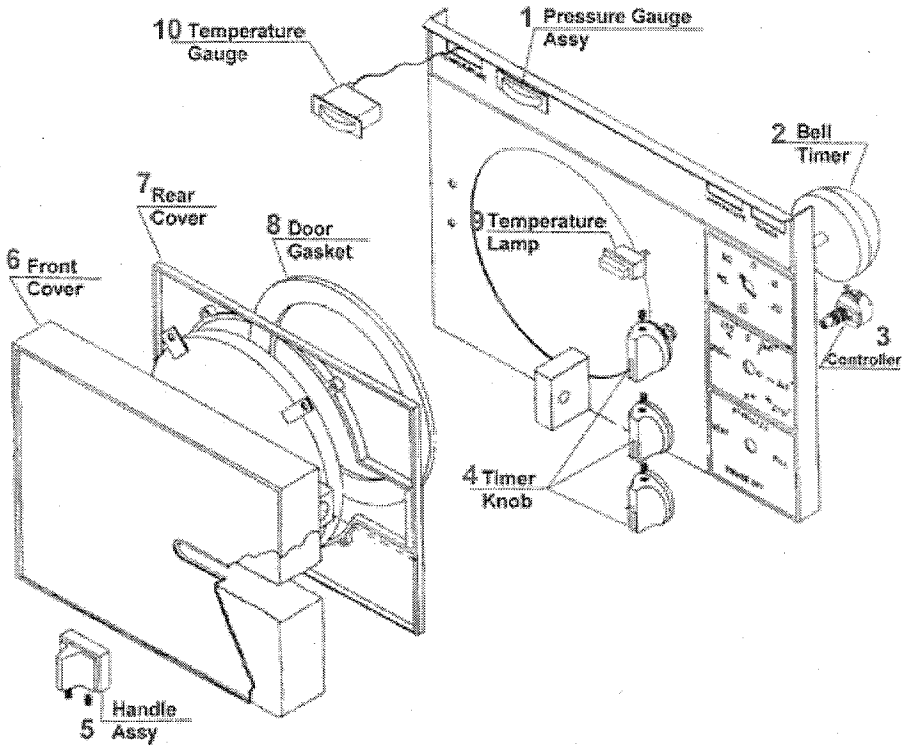
Contact Information

Pelton & Crane Sentry Autoclave Parts



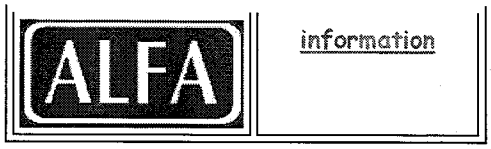
Item Number	Part Number	Description
1	001340	Thermistor Assembly
2	001134	Pressure Plate Band
3	001203	Door Switch
4	004218	Overheat Shield
5	6-1297-1	Heating Element
6	J2573	Filter
7	004108	Overheat Thermostat
8	001204	Tray Rest
9	004040.1	Small Instrument Tray
10	1881098	Compression Sleeve
11	004146	Pressure Relief Vavle

Pelton & Crane Sentry Autoclave Parts



Item Number	Part Number	Description
1	001212	Pressure Gauge Assembly
2	004112	Bell Timer
3	001213	Controller
4	001202	Timer Knob
5	012753	Handle Assembly
6	001197	Front Cover
7	001194	Rear Cover
8	001187	Door Gasket
9	014141	Temperature Lamp
10	001210	Temperature Gauge

Contact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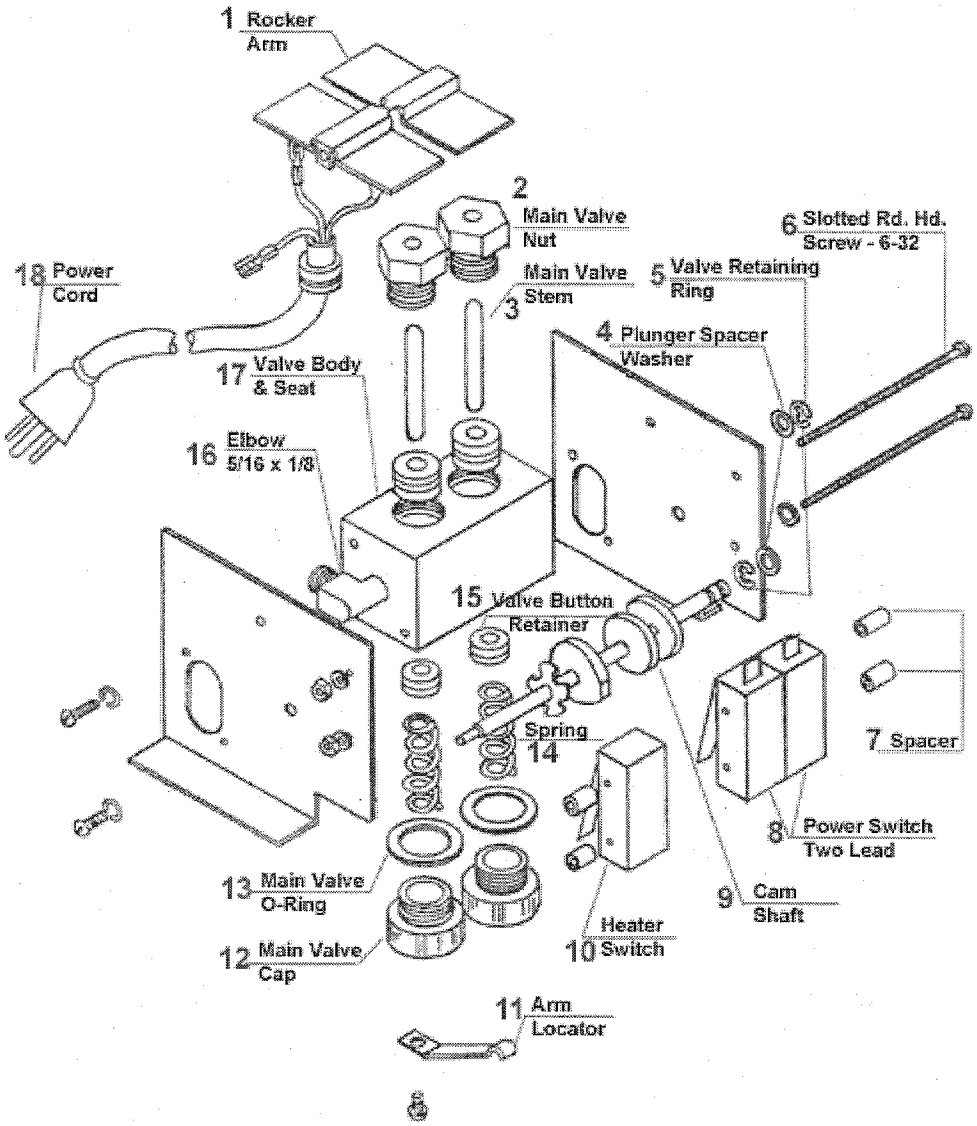
Pelton & Crane Sentry Autoclave Parts

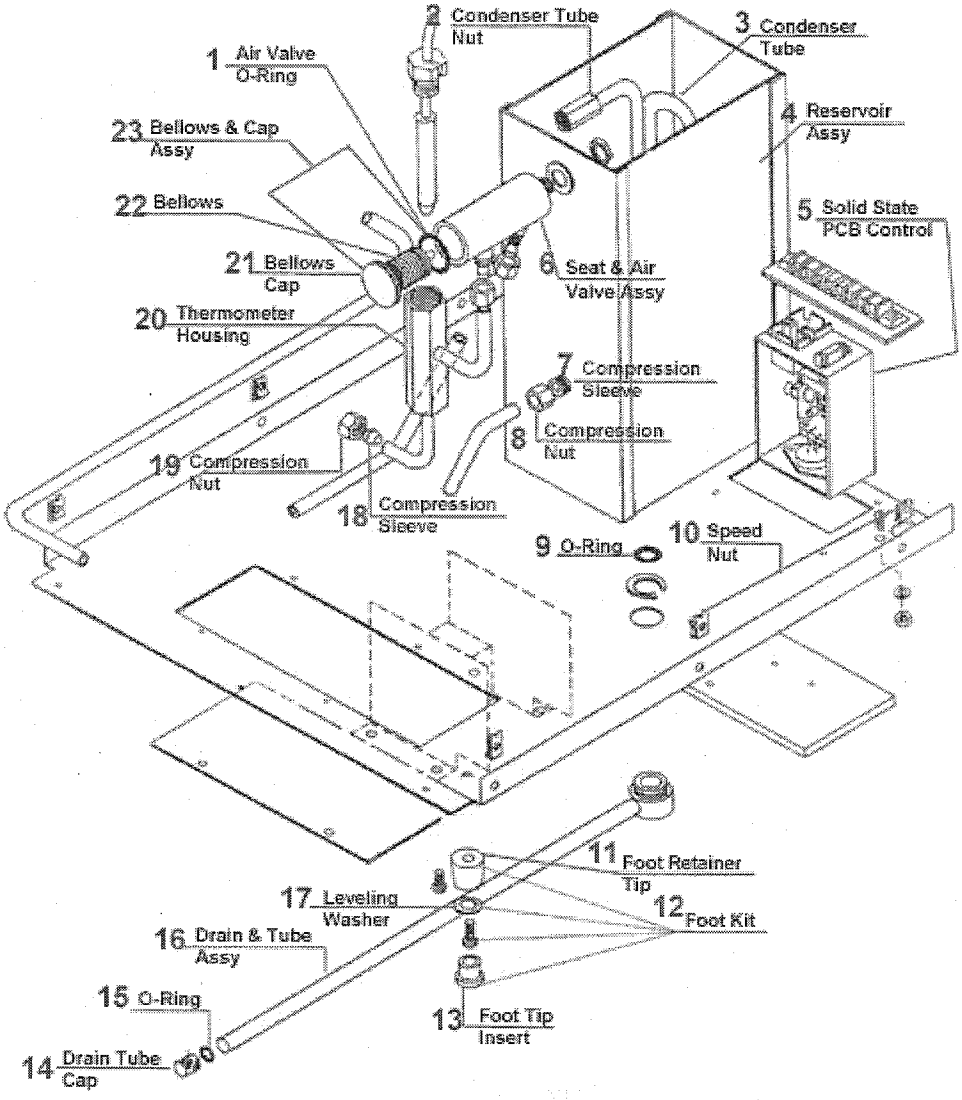


Item Number	Part Number	Description
1	001165	Rocker Arm
2	004027	Main Valve Nut
3	004028	Main Valve Stem
4	004054	Plunger Spacer Washer
5	004001	Valve Retaining Ring
6	090511	Slotted Rd. Hd. Screw 6-32
7	010562	Spacer

8	004073	Power Switch Two Lead
9	001167	Cam Shaft
10	001131	Heater Switch
11	001168	Arm Locator
12	004030	Main Valve Cap
13	004000	Main Valve O-Ring
14	004013	Spring
15	004039	Valve Button Retainer
16	5440610	Elbow 5/16 x 1/8
17	001161	Valve Body & Seat
18	POWER-CORD	Power Cord

ALFA Contact information

Pelton & Crane Sentry Autoclave Parts



Item Number	Part Number	Description
1	004004	Air Valve O-Ring
2	1881080	Condenser Tube Nut
3	004237	Condenser Tube
4	001154	Reservior Assembly
5	024401	Solid State PCB Control
6	n/a	Seat and Air Valve Assembly
7	1881064	Compression Sleeve
8	1881056	Compression Nut

9	001214	O-Ring
10	004076	Speed Nut
11	004120	Foot Retainer Tip
12	004436	Foot Kit
13	004010	Foot Tip Insert
14	004598	Drain Tube Cap
15	011982	O-Ring
16	001157	Drain Tube Assembly
17	004229	Leveling Washer
18	1881064	Compression Sleeve
19	1881056	Compression Nut
20	015685	Thermometer Housing
21	004228	Bellows Cap
22	004048	Bellows
23	001047	Bellows & Cap Assembly