STOCK™

MAINTENANCE MANUAL

RETORT
MODEL SA-146

SERIAL NUMBER(S):

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101 Green Trace Ct.
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IMPORTANT!

THE FOLLOWING MANUAL SHOULD BE KEPT IN A PLACE OF EASY ACCESS AND ALL ITS OPERATORS AND MAINTENANCE PERSONNEL SHOULD HAVE KNOWLEDGE OF IT.

BEFORE OPERATING THE RETORT, READ THE INSTRUCTIONS CAREFULLY AND RESPECT ITS INDICATIONS OF USE.

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MAINTENANCE.

PERIODIC MAINTENANCE OPERATIONS

Take into consideration the following precautions when repairing or conducting routine maintenance on the retort:

- Make sure the retort cannot accidentally be switched on before performing any maintenance and/or repair work on the retort. Use padlocks to lock the door and to lock the main switch on the electric panel
- Use the PPE specified in your company's health and safety plan. Wear protective footwear, helmets, hearing devices and safety goggles at all times during the maintenance and/or repair activities
- When very large or heavy objects must be handled, use hoisting/lifting equipment, such as bridge cranes and/or forklifts that can handle these weights
- Only use spare parts or repair methods that authorized by Stock America, LLC when replacing or repairing parts of the retort. If needed, please contact Stock America, LLC before making repairs.
- The retort must be installed correctly to guarantee the correct operation of the unit
- Check the facility and installation to ensure area(s) are safe to work in after carrying out maintenance tasks or repairs
- Make sure the maintenance tasks are carried out by qualified staff.

The following tasks must be carried out according to the frequency established below, with the purpose of guaranteeing the retort is operating optimally:

- **Daily**
  - Inspection of the door gasket. Replace the gasket when needed (Stock recommends replacing once a year)
  - Make sure the safety cylinder is operating correctly
  - Make sure there are no pneumatic leaks in instruments with air. Reconnect the connections as required.
  - Make sure the door opens, closes and locks correctly
  - Make sure the door lock is in optimal condition (perpendicular to the safety cylinder) so the door lock is correct
  - Clean hose for safety latch lock
  - Inspect all sensors to ensure they have been fixed and fitted correctly. Tighten as needed.
  - Inspect all control valves to ensure they are operating properly. Calibrate as needed.

- **Weekly**
  - Safety valve opening
  - Inspect the control panel and pneumatic panels. Make sure there are no water leaks
  - Inspect and clean the cage inlet guides

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- **Monthly**
  - Clean the interior and exterior filters and collector
  - Clean the distribution tray
  - Inspect all electrical terminals in panels and motors. Tighten as needed.
  - Inspect all sensors to ensure they have been fixed and fitted correctly. Tighten as needed.
  - Check all air connections have been connected correctly and there are no air leaks. Reconnect the connections as required.
  - Check all spliced joints. Replace the gasket if needed
  - Inspect the pump seal. Replace if needed
  - Check for leaks in the Heat exchanger. Replace the gaskets if needed
  - Check the pneumatic valves open correctly

- **Annually**
  - Check the safety valves function at the loading pressure
  - Check the general condition of the control panel
  - Check the welds of the pressure equipment. In particular, check the doors, plate of the cylindrical body and tubes inserted into the cylindrical body.
  - Inspect the steam inlet tube. Clean as needed.
  - General pump maintenance
  - Remove the lower level cover and clean

CLEANING OPERATIONS AND PREVENTIVE MAINTENANCE

Retort maintenance can be simple, and basically consists of cleaning various components:

- Clean the spray nozzle
- Clean the valves
- Clean the filters and the inside of the retort
- Clean the recirculation water distribution tray
- Clean the recirculation circuit
- Inspect the basket loading and unloading chain. (in the case of automatic loading retorts)
- Open security valves
- Clean water level
- Clean the collector

Before conducting these tasks, please read your company's procedures for "Confined Space Entry" and "Proper Sanitation Procedures"

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CLEANING SPRAY NOZZLES

Due to their small cross section they are positioned to distribute the water uniformly. If you have conducted a quality water analysis and you find you have "hard water", the nozzles can be blocked (i.e. lime) and the water will not distribute correctly.

To avoid this, at least 1 time each 6 months (in stop period) take off the pipes of the nozzles (Unscrew the showers and place in a slightly acid solution bath. Contact your water quality company for recommendations.

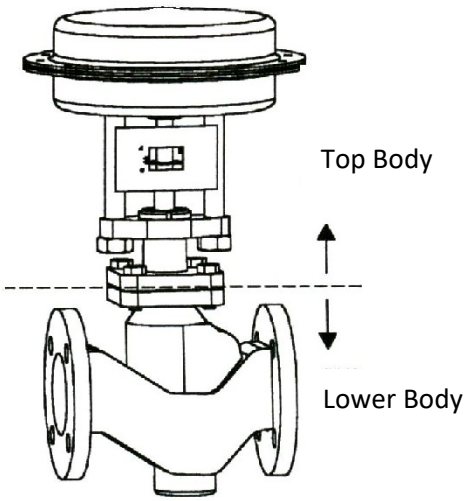
When the nozzles and the pipes are dry, they should be struck lightly with rubber mallet in an effort to loosen any lime which may be present. Reinstall as needed taking into account how the nozzles were removed.

CLEANING THE VALVES.

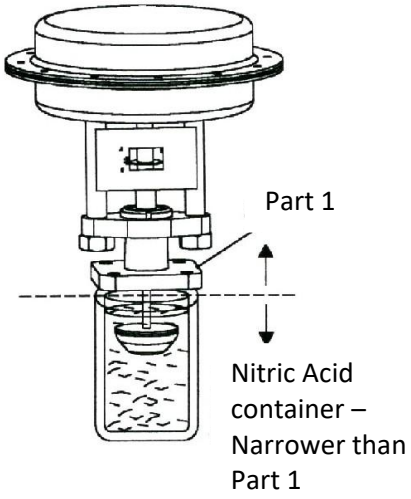
Pneumatic valves may become partially or totally obstructed due to lime or small particles carried through the pipes. Follow these steps for their cleaning (see illustration for details):

- STEP 1. Unscrew the 4 screws which join the lower body and the top body. Once done, pull up the top body and separate from the lower body.
- STEP 2. Insert the upper body into a container with nitric acid as shown in the drawing below for 10 to 15 minutes. Make sure to not submerge below the point indicated by the dotted line. The nitric acid container must be narrower than "part 1". Once finished, rinse the mechanism submerged in nitric acid several times with clean water in order to neutralize the acid.
- STEP 3. With a brush dipped in nitric acid, coat the seating inside the lower body as shown in point B. Repeat this several times until the seating is completely clean and then rinse with clean water.
- STEP 4. Once the two parts of the valve are clean, reassemble the two parts of the valve.

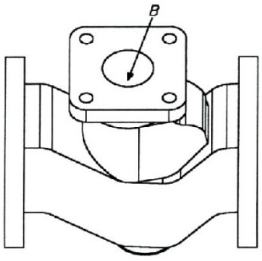
STEP 1



STEP 2



STEP 3



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CLEANING THE FILTERS INSIDE OF THE RETORT.

It is necessary to clean the bottom inside of the retort once every work day and preferably at the end of the last shift or between two shifts if operating 24 hours a day. To do this, press the outlet valve button on the control panel (manual mode) and clean the walls and especially the back of the retort with a hose or a pressurized spray pistol. This is necessary in order to rinse out as much residue as possible, preventing it from passing through the filter.

INSIDE FILTERS: Stock America recommends cleaning the filters once a month. To do this, an operator must remove the top screws from each of the filters, remove them from the retort and clean them thoroughly with a pressurized spray gun (or a hose). Return the filter to its original positions and tighten the screws.

OUTSIDE FILTER: located before the recirculation pump. Stock America recommends to clean once a week. To do this, a operator will have to unscrews the screws on the flange of the filter, remove the filter and clean by pressure water pistol. Return the filter to its original positions and tighten the screws.

CLEANING THE RECIRCULATION WATER DISTRIBUTION TRAY.

It is necessary to clean the distribution tray approximately once every 15 days. To do this, unscrew the screws found at tray level behind the door. Stock America recommends leaving a basket inside the retort as a support and to aid the operator in removing the tray. Once outside the retort, clean with pressurized water (or a hose).

The cleaning frequency may vary according to the water used and the cleanliness of the containers as they enter the retort. It is not recommended to put off these tasks. Cleaning less often than what is recommended by Stock America may void warranty.

CLEANING THE RECIRCULATION WATER CIRCUIT.

During our long experience in sterilizer technology, Stock America does not believe any extra cleaning is necessary due to the fact the filters prevent unnecessary residue deposits.

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REVISION OF THE BASKET LOADING AND UNLOADING TRACK.

The automatic basket loading chain and its track do not require lubrication. They have been designed to operate in damp environments and at extreme temperatures. The chain track should be kept clean of foreign objects. Following the standard recommended cleaning procedures from Stock America will prevent any issues.

On a weekly basis, it will be necessary tightened the chains to prevent wear of the sprocket. An operator will have to fit the tensile placed in the front part of the retort.

OPENING SECURITY VALVES IS VERY IMPORTANT!

The security valves, located on the top of the machine, must be opened at least once a week to prevent them from seizing up (as a result of retort inactivity) in the event they are needed. To do this, move the valve levers up and down several times.

CLEANING WATER LEVEL.

It is not necessary to clean the cylinder, although it is recommended once a year. To do this, remove it and let water flow through each of its inlet lines, allowing it to drain out from the output line.

CLEANING THE COLLECTOR.

In case the collector is bridled on the ends, and interior cleaning is required. For this, it is necessary to take off both ends of the collector and spray water for one of the ends to allow the water to exit from the other end. This is recommended to be done at least once a year.

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SANITATION PROCEDURES.

Stock America recommends cleaning the bottom inside of the retort once every work day preferably at the end of the last shift or between two shifts if operating 24 hours a day.
For this, all that is required is one cycle with water only.
If there is excess dirt and is necessary to include detergents, these will have to be neutral. In this case, a cycle of cleanliness will be done by the detergent and then three cycles of water only.

When inside the retort, some containers may brake and product and contains may be seen within the retort. If this occurs, please take the following steps:

1. Stop the machine and process by corresponding Safety Procedure for Entering a confined space
2. Open all the drain valves in manual mode from the control panel
3. With special cleaning equipment (pressure and manual cleaning) take out the liquid and solid waste

The exterior of the machine must be in optimal condition

TROUBLE SHOOTING

The most common problems detected in the retort are:

HEATING TEMPERATURE DEVIATIONS

Issue:

1. The RTD temperature (temperature resistor) does not match with the reading of the digital calibrated thermometer (DTG)
2. Incorrect temperature shown on the HMI display
3. The temperature is not maintained in the retort
4. The temperature in the meter does not match with is shown on the HMI (value on the display).

Solution:

1. Make sure that the digital thermometer (DTG) has been calibrated and has its calibration certificate:
   a. During the process maintenance phase, when the temperature is constant, use the “zero” adjustment of the RTD transmitted on the panel so the value matches with the digital thermometer.
   Note: - Make sure the process regulations of the plant's quality assurance department are observed in relation to the calibration of the temperature. Otherwise, unfinished product can be sterilized incorrectly.

2. The RTD probe is faulty – Replace the probe
   a. The resistor of the temperature probe maybe faulty – Replace the probe and check the connection
   b. Check that the RTD transducer has a 4-20 mA output. Check the temperature transducer. If the problem is not solved after replacing the temperature probe, adjust and correct the deviation of the probe.

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3. Insufficient supply of steam – Check the input pressure to ensure it is set to a minimum of 85 psi of steam entering the heater.
   a. Check to make sure the steam modulating valve is opened 100%. Make sure the check valve is not blocked.
   b. Make sure there are no obstructing elements at the condensate outlet and the condensate flows freely.
   c. If the RTD probe has been calibrated correctly, with the digital thermometer, adjust the input compensation parameter in the meter to make it match with the value shown on the HMI.

COOLING TEMPERATURE DEVIATIONS

Issue:

1. Cooling time exceeded and alarms

Solution:

1. On the HMI, check the cooling water inlet valve which controls the temperature. If there is an error in the process variable, check the connections. Note: this must only be performed by qualified staff.
   a. If the cooling valve is operating correctly, inspect the plates of the heat exchanger and check for accumulated materials; if found, clean/replace as needed
   b. Check the input pressure of the water of the cooling tower and it returns correctly to the cooling tower
   c. Check the temperature of the cooling water, comparing it with historical data and confirm the range is acceptable

CONTROL PRESSURE DEVIATIONS

Issue:

1. Incorrect control pressure
2. The reading of the pressure meter does not match with the pressure reading on the HMI
3. Pressure is not maintained in the retort (too low)
4. Pressure is not maintained in the retort (too high)

Solution:

1. Check the analogue pressure gauge of the retort and compare the pressure with the reading displayed on the HMI. If the process variable is incorrect, the analogue input must be adjusted. Adjust in the "Internal Setup" screen. Note: this must only be performed by qualified staff.
2. Check the pressure on the HMI is 0 psi when the door is opened. Check the deviation does not exceed 0.73 psi (50mbar). If this is the case, replace or calibrate the pressure transducer.
3. Check the input air pressure to ensure that a minimum of 85 psi is supplied to the air vessel supply source.
   a. Manually check the modulating valves open (25-50-75-100 %).
   b. Check for leaks in the air inlet valve– recalibrate/repair if needed.
4. Check the transmitter deviations
   a. Check for leaks in the over-pressure valve of the retort when loading at pressure (perform this operation with the door closed, locked and with safety devices activated)

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SPECIFIC VALVE FAULT

Issue:

1. The valve/actuator does not open/close correctly
2. There is a short-circuit in the actuator of the modulating valve
3. The actuator does not generate the adequate torque
4. The valve with the positioning device is jammed
5. The valve is mechanically blocked
6. Worn actuator gaskets and no torque is generated
7. Erratic valve control
8. The valve does not respond
9. The process control deviates from the adjustment point
10. The valve is leaking through the gasket, with no instrument signal
11. The valve is leaking through the rod

Solution:

1. Start on the HMI cancellation screen and try to move the valve manually (25-50-75-100%)
2. Check the blown fuse indicator on the panel to detect short-circuits
3. Check the input air pressure to ensure 85 psi (6 kg/cm2) is supplied to the valve controller
4. Confirm the air is being supplied from the valve collector with a positioning device on the panel towards the valve actuator
5. Remove the valve actuator to remove the mechanical locking element of the valve. Try to repair the lock with care, ensuring the valve seat is not scraped/damaged.
6. Check the actuator when leaks through the gasket are detected – replace/repair as required
7. The valve is leaking through the rod
8. Start on the HMI cancellation screen and move the valve in different positions manually to check the calibration of the positioning device as compared with the reading shown on the display of the HMI.
9. Check the pneumatic signal sent towards the power supply of the instrument of the positioning device on the transducer screen. Replace if needed.
    a. Check the 4-20Ma signal used to power the I/P with a multimeter
    b. Inspect the condition of the cables between the control panel and valve
    c. NOTE: This operation must be carried out by qualified staff
10. The valve requires adjustment (only by qualified staff)
11. Worn or deteriorated valve seat. Replace/repair as needed. Tighten the gland to make sure it does not leak. Do not tighten excessively, which can cause the valve to seize.

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FLOW REDUCTION

Issue:

1. Water filters clogged inside the retort
2. The pump is not operating
3. The pump is operating, but is cavitating
4. Differential pressure switch error
5. Flow discharge system blocked

Solution:

1. Remove the baskets from the retort and continue to follow the safety procedures to disconnect the retort and access the vessel, in accordance with the plant's procedures. Inspect all filters on the lower part and make sure that all waste has been removed. Clean/replace the filters as needed.
2. The control panel is receiving no power:
   a. Inspect the pump's motor guard (make sure there are no thermal faults)
   b. Current overload of the pump not connected - restore and control the current readings to the correct range
   c. Make sure that the pump start-up device is not failing
3. The water level is too low - check the water level sensor
   a. If the water level is correct, inspect the pump rotor
   b. Make sure the level of consumption of the pump is correct and that there are no motor failures
4. Read the screen and make sure the indicator of the differential pressure switch is active
   a. The differential pressure switch must be adjusted
   b. Differential pressure switch obstructed with waste; its connections must be cleaned
5. The discharge valve is clogged. Clean as necessary

LEVEL CONTROL DEVIATIONS

Issue:

1. The water level is too high
2. The water level is too low

Solutions:

1. Check and make sure the level and height adjustment sensors are working properly – replace/repair as needed
   a. Check and make sure that the water filling valve of the retort is working properly – replace/repair as needed
   b. Make sure the tube on which the water level is installed is clean
   c. Check the rod is clean and it has no build-up
2. Check and make sure the level and height adjustment sensors are working properly – replace/repair as needed.
   a. Inspect the water filling valve of the retort to see if it is blocked. – remove any obstruction(s)
   b. Check the drain valve on the retort and make sure it closes properly - replace/repair, as needed
   c. Check the rod is clean and it has no build-up

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RECOMMENDED SPARE PARTS LIST:

PART DESCRIPTION:	PRICE:
Door Seal	
Pump Seal Kit	
Check Valve 2"	
Packing Gland Seal	
Check Valve 1.5"	
Circulation Loop Strainer DN125	
Circulation Loop Strainer DN100	
Spray Nozzle (qty 10)	
Positioner	
Trolly Lock Sensor	
Trolly Pressent Sensor	
Door Lock Sensor	

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