Pumps

STAT*IM* units have been manufactured using two different pumps. Before servicing you must first determine which of the two models of pump the unit contains (See Figure 1).

Make sure that there is sufficient steam-process distilled water in the reservoir prior to testing STAT*IM* pumps.

Fluid-O-Tech Pump

The Fluid-O-Tech pump is a small rectangular pump with a diode plug attached to the top. The pump rests on a vibration-damping pad on the bottom of the chassis and is held in place with a wire bracket. The pump is secured to the bracket by a cable tie at each end.

The black lead is attached to Controller Board J1-5 (LINE) and the white lead is attached to Controller Board J1-6 (NEUTRAL).

SciCan Pump

The SciCan pump has a similar footprint to the Fluid-O-Tech pump. The diode is now integral to the pump. The pump is mounted on two vibration damping rubber brackets. Each bracket is secured to the chassis with two screws.

The black lead is attached to Controller Board J1-5 (LINE) and the white lead is attached to Controller Board J1-6 (NEUTRAL).

Fluid-O-Tech Pump with diode connector

SciCan Pump with terminal connectors

Figure 1

Pumps

Testing Fluid-O-Tech or SciCan Pumps

To test a pump, follow these steps (see Figure 2):

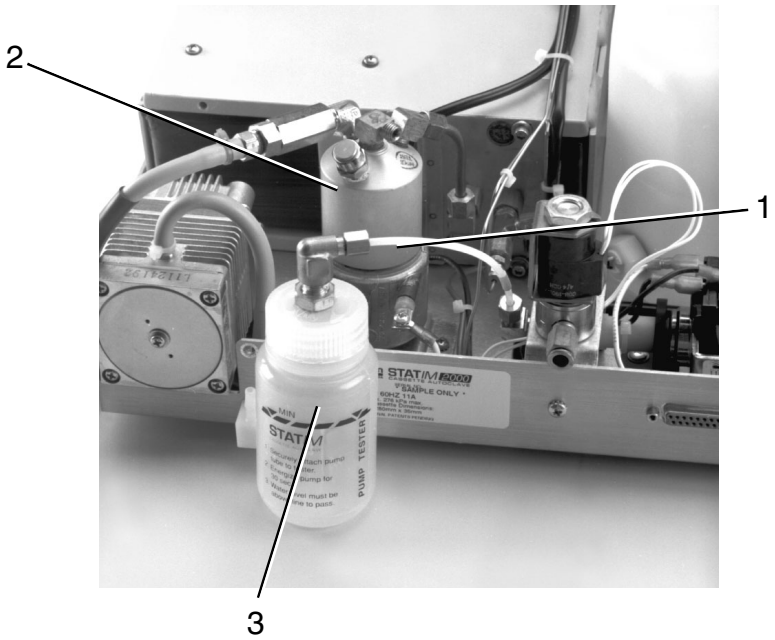
1. Disconnect the Teflon™ steam generator inlet tube (1) from the top of the steam generator (2) using a 3/8-inch wrench.

2. Connect the disconnected end of the steam generator inlet tube to the pump tester (3). **Do not cross thread the fittings. Do not overtighten**.

3. Activate the pump for 2 seconds to purge any air that is trapped in the fittings. Empty any water that enters the pump tester. Recap the pump test bottle. The pump tester MUST be empty before starting the pump test.

4. Be prepared to record the time it takes for the water level displayed on the pump tester to reach the top of the line marked MIN (see Figure 7). Activate the pump using the Control Box.

5. If the water level reaches the top of the line marked MIN within the time allotted in Pump Test Parameters, the pump is good. If the water level reaches the top of the line marked MIN in less than that time or if the water level does not reach the top of the line marked MIN within the allotted time, follow pump recovery repair procedures.



1. steam generator inlet tube
2. steam generator
3. pump tester

Figure 2

Pumps

Fluid-O-Tech Pump Removal and Replacement

Removing the Fluid-O-Tech Pump Assembly

To remove the Fluid-O-Tech pump follow these steps (see Figure 3):

1. Remove the diode plug screw (1) and diode plug (2) from the top surface of the pump (3). If the diode is functioning, retain for reassembly. If not, replace with SciCan Part # 01-104159S. See Testing the Fluid-O-Tech Pump Diode for diode orientation.

2. Clip and remove the three cable ties (4); one at each end of the pump mounting bracket (5) and one holding the inlet tube (6) to the pump inlet fitting (7). Do not nick the tubing while cutting the cable ties. Remove the rubber tube from the inlet fitting and clamp or stop the end of the tube securely.

3. Using a 3/8 inch wrench, remove the compression nut (8), attached to the Teflon™ tube (9), from the inlet fitting (11) on the top of the steam generator (10).

4. The pump assembly is secured to the base with the pump mounting bracket. Pull the pump assembly out of the mounting bracket and away from the steam generator.

Pumps

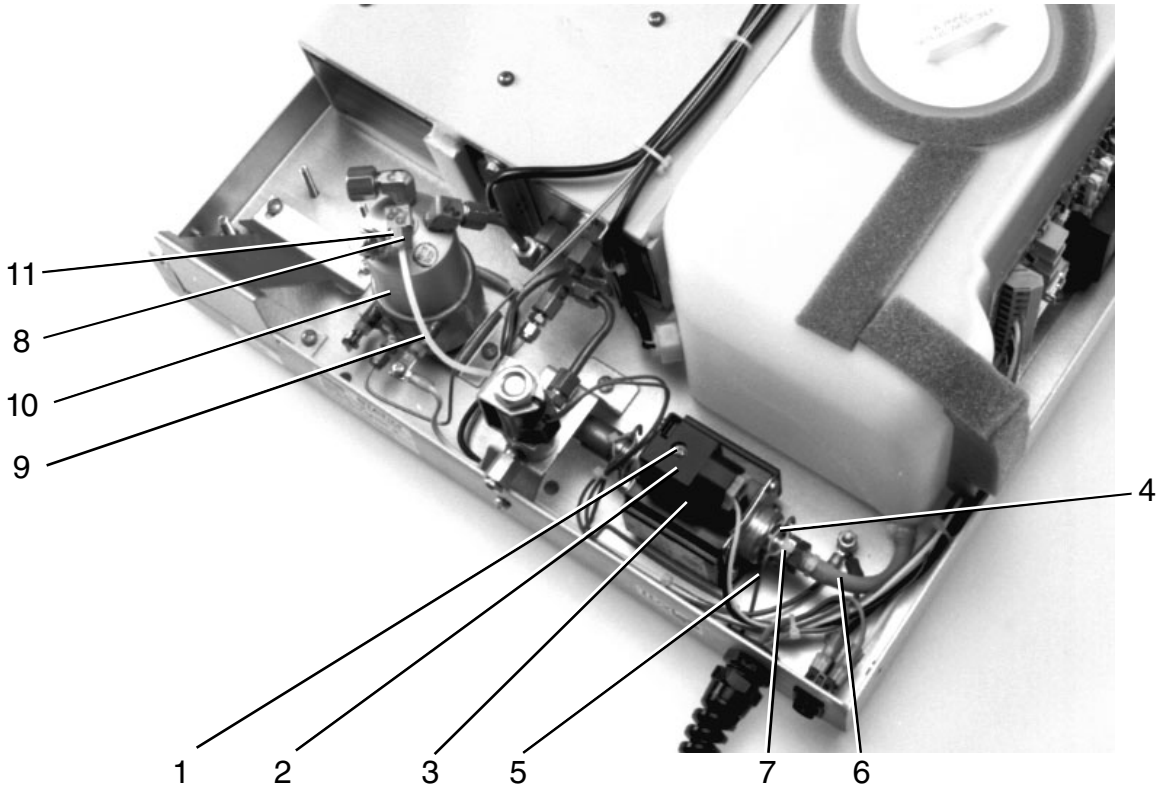


Figure 3

1. diode plug screw
2. diode plug
3. pump
4. cable ties
5. mounting bracket
6. pump inlet tube
7. pump inlet tube fitting
8. compression nut
9. Teflon™ tubing
10. steam generator
11. inlet fitting

Pumps

Installing the Fluid-O-Tech Pump Assembly

To install the pump assembly follow, these steps (see Figure 3):

1. Slide the pump assembly, inlet side of the pump away from the steam generator, into the mounting bracket and snap it into place. **Do not kink the teflon™ tube (9)**.
2. Push the open end of the rubber inlet tube (6) extending from the water reservoir on to the pump inlet fitting (7) as far as it will go. Secure the tube to the fitting using a cable tie (4).
3. Attach the compression nut (8) on the Teflon™ tube to the inlet fitting (11) on top of the steam generator (10) **finger tight**. Tighten this nut using a 3/8-inch wrench. **Do not overtighten**.
4. Re-attach the diode plug (2) using the diode plug screw (1).
5. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) **must** be performed on the Statim unit.See *Required Information, Tools and Routine Maintenance*.
6. Make sure there is sufficient steam-process distilled water in the reservoir and activate the pump using the Control Box for 5 seconds to ensure that the pump is functioning.
7. Fasten one cable tie to each end of the pump mounting bracket.
8. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
9. Reinstall the cover. See *STATIM Cover Removal and Replacement*.

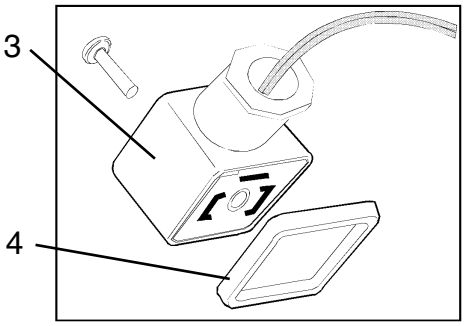
Pumps

Testing the Fluid-O-Tech Pump Diode

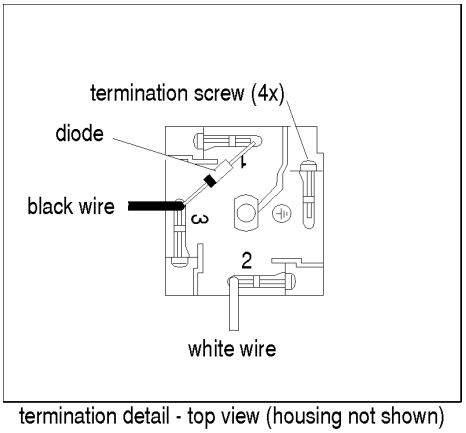
To test the pump diode, follow these steps (see Figure 4):

1. Remove the center screw (1) from the diode plug (2), and retain for reassembly.
2. Detach the diode plug from the pump body.
3. Remove the rubber boot (4) from the diode plug.
4. Using a small screwdriver or similar instrument, pry away the black cap (3) from the plug.
5. Test the diode using the diode test setting on a multimeter.

Figure 4



1. center screw
2. diode plug
3. black cap
4. rubber boot



termination detail - top view (housing not shown)

Pumps

SciCan Pump Removal and Replacement

Removing the SciCan Pump Assembly

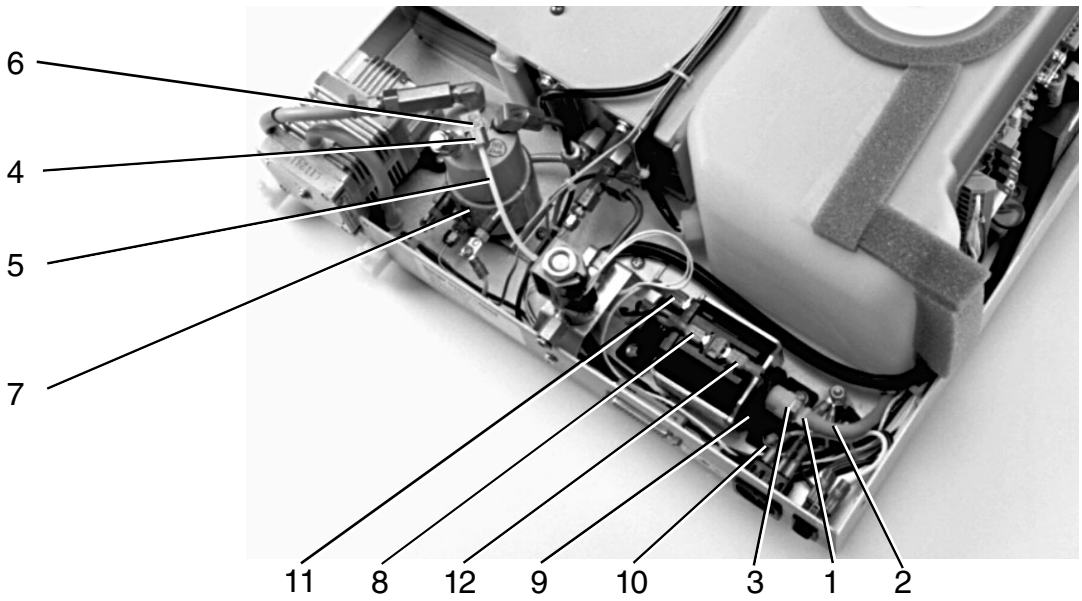
To remove the pump assembly follow these steps (see Figure 5):

1. Clip and remove the cable tie (1) holding the inlet tube (2) to the pump inlet fitting (3). Do not nick the tubing while cutting the cable tie. Remove the rubber tube from the inlet fitting and clamp or stop the end of the tube securely.

2. Using a 3/8 inch wrench, remove the compression nut (4) attached to the Teflon™ tube (5), from the inlet fitting (6) on the top of the steam generator (7).

3. Disconnect the fast-on terminal connectors (8) from the pump. Observe the position of each terminal before removal.

4. The pump assembly is secured to the chassis by rubber brackets (9) and four shoulder screws (10). Remove the four shoulder screws and retain for re-assembly. Remove the pump assembly from the chassis.



1. cable tie
2. pump inlet tube
3. pump inlet fitting
4. compression nut
5. Teflon™ tube
6. inlet fitting
7. steam generator
8. fast-on terminal connectors
9. rubber brackets
10. shoulder screws
11. white wire
12. black wire

Figure 5

Pumps

Installing the SciCan Pump Assembly

To install the pump assembly follow, these steps (see Figure 5):

1. Slide the pump assembly, inlet side of the pump away from the steam generator, onto the chassis. Position the rubber brackets (9) so that the mounting holes align with the threaded holes in the chassis. Secure the four shoulder screws (10) using Locktite® Threadlock Perma-lock compound LM113 or equivalent. **Do not kink the Teflon™ tube**.

2. Push the open end of the rubber pump inlet tube (2) extending from the water reservoir on to the pump inlet fitting (3) as far as it will go. Secure the tube to the fitting using a cable tie (1).

3. Thread the compression nut (4) on the TeflonTM tube (5) to the inlet fitting (6) on top of the steam generator (7) **finger tight**. Tighten this nut using a 3/8-inch wrench. **Do not overtighten**.

4. Connect the fast-on terminal connectors (8) to the pump. The white wire (11) is connected to the pump body, the black wire (12) to the thermal fuse.

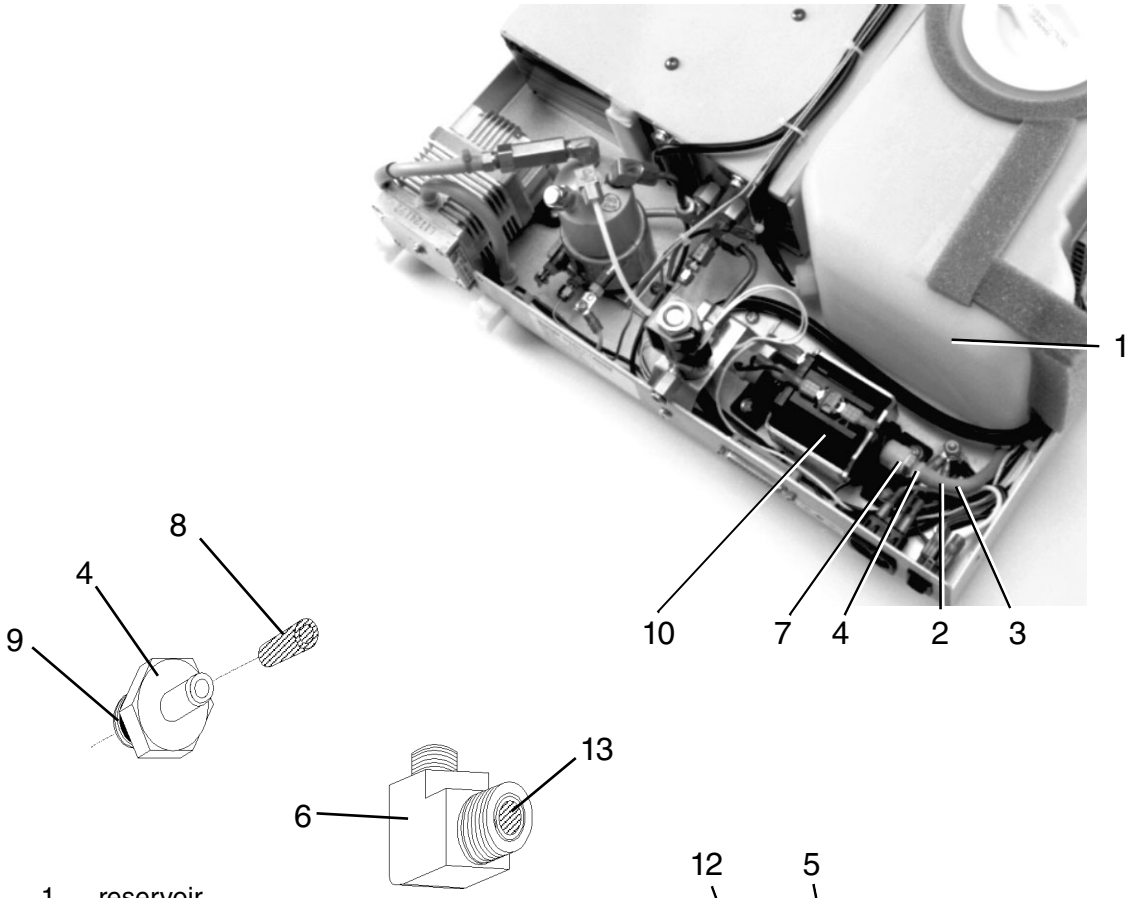
5. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) **must** be performed on the STAT*IM* unit. See *STATIM Required Information, Tools and Routine Maintenance*.

6. Make sure there is sufficient steam-process distilled water in the reservoir and activate the pump using the Control Box for 5 seconds to ensure that the pump is functioning.

7. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

8. Reinstall the cover. See *STATIM Cover Removal and Replacement*.

Pumps



1. reservoir
2. cable tie
3. pump inlet tube
4. pump inlet fitting
5. TeflonTM tube
6. right angle pump outlet fitting
7. pump body fitting
8. mesh filter, integral to item 4
9. rubber seal, integral to item 4
10. pump
11. pump body outlet fitting (obscured)
12. steam generator
13. insert with mesh filter, integral to item 6

Figure 6

Pumps

Water Pump Recovery Repair Procedure

A pump assembly may become defective due to foreign material caught inside the assembly, blockage of an orifice or mechanical wear of internal parts. Before replacing a pump that is performing poorly, attempt to recover the unit by cleaning the filter(s) and/or resizing the pump tube.

Pump Filter Cleaning

The inlet fitting of the pump contains a mesh filter. Most SciCan pumps also have a filter in the outlet fitting. To clean pump components that may have scale or mineral deposits, soak the components in a mild solution suitable for removing scale or mineral deposits (ie. vinegar) until the deposits have been dissolved. Rinse with clean water. To remove and clean the filters follow these steps (see Figure 6):

1. Drain the reservoir (1). Cut the cable tie (2) holding the pump inlet tube (3) to the pump inlet fitting (4). Disconnect the tube. See, *Required Information, Tools and Routine Maintenance, Draining the Reservoir*.

2. Using a 3/8-inch wrench disconnect the white Teflon™ tube (5) from the pump outlet fitting (6). Soak the tube until any deposits have been dissolved. Rinse with clean water.

3. Using a 9/16-inch wrench on the pump inlet fitting (4) and a 9/16-inch wrench on the pump body inlet fitting (7), unscrew the inlet fitting.

4. There is a mesh filter (8) inside the pump inlet fitting and a rubber seal (9) on the outside threaded end of the fitting. From the threaded end of the fitting, insert a blunt instrument and gently push the filter out. If the filter does not come out, soak the fitting until the deposits have been dissolved. Rinse with clean water.

5. Inspect the filter and remove any debris. If the filter is damaged, replace the pump inlet fitting (4). If not, soak the fitting until the deposits have been dissolved. Rinse with clean water.

6. Insert the filter and reassemble the inlet fitting to the pump body inlet fitting. Ensure that the rubber seal is in place. Tighten the fitting finger tight and using a 9/16-inch wrench, tighten one half turn.

Pumps

7. Using a 7/16 inch wrench, disconnect the right angle fitting (6) while holding the pump body outlet fitting (11) with a 9/16 inch wrench and clean the threads of any debris. Note the orientation of the fitting relative to the steam generator (12).

8. There is an insert (13) containing a fine mesh filter in the end of the right angle fitting. Soak the fitting and filter in a mild solution suitable for removing scale or mineral deposits (ie. vinegar). Rinse thoroughly with clean water.

9. If the filter is damaged, replace the outlet fitting (6). When the components are clean, apply a small amount of Teflon™ tape or pipe thread compound and reassemble the right angle fitting to the pump body outlet fitting. Tighten the fitting finger tight and using a 7/16 inch wrench, tighten one half turn. Ensure that the Teflon™ tube will reach the top of the steam generator. **Do not kink the Teflon™ tube**.

10. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

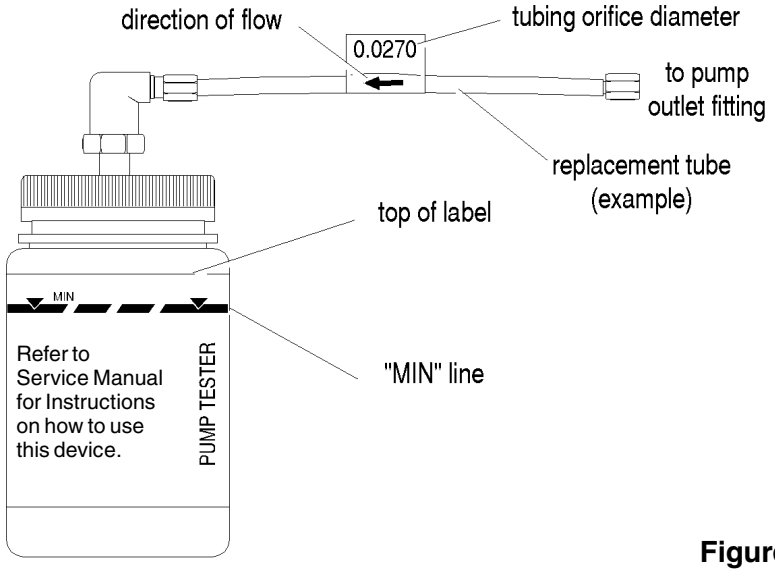


Figure 7

Pumps

1. steam generator inlet tube
2. steam generator
3. pump outlet fitting
4. replacement tube
5. fitting (pump test bottle)
6. pump test bottle

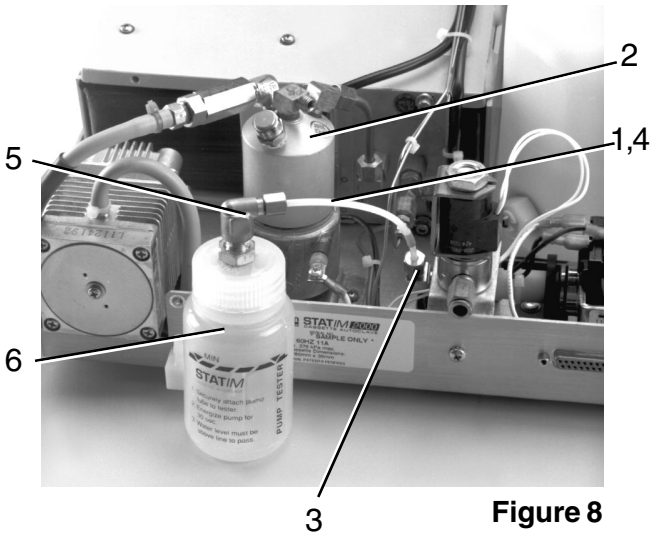


Figure 8

Replacement Tube Kits - Chart A

(*STAT*IM* - information in this chart applies to STAT*IM* / STAT*IM* 1000 / STAT*IM* 2000 units)

Unit / Voltage Rating	Nominal Tubing	Tubing Range	Kit Number
*Statim 100 V	0.0270	0.0290-0.0250	01-104312S
*Statim 115 V	0.0255	0.0275-0.0235	01-104313S
*Statim 230 V	0.0245	0.0265-0.0225	01-104314S

Pumps

Pump Test Parameters - Chart B

(information in this chart applies to STAT*IM* 1000, 2000 units)

Pump Type	Unit Voltage Rating							
	100 V 50 Hz		100 V 60 Hz		110 V 60 Hz		230 V 50 Hz	
	seconds		seconds		seconds		seconds	
	min.	max.	min.	max.	min.	max.	min.	max.
Fluid-O-Tech Pump	23	24	25	26	25	26	23	24
SciCan Pump	20	21	23	24	23	24	23	24

Note: max / min. numbers represent time in seconds required to fill the bottle to the MIN. line.

Pump Test Parameters – Chart C

(information in this chart applies to STAT*IM* 2000S units with Stainless Steel Steam Generator)

Pump Type	Unit Voltage Rating							
	100 V 50 Hz		100 V 60 Hz		110 V 60 Hz		230 V 50 Hz	
	seconds		seconds		seconds		seconds	
	min.	max.	min.	max.	min.	max.	min.	max.
Fluid-O-Tech Pump	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SciCan Pump	N/A	N/A	N/A	N/A	21.5	23	17.0	18.5

Note: max / min. numbers represent time in seconds required to fill the bottle to the MIN. line.

Pumps

Pump Tube Replacement

Disregard the test instructions found on the pump tester.

A replacement tube kit contains 5 tubes, each labelled to show the orifice diameter and flow direction.

If a suitable replacement tube is not found in the tube kit, install a new pump.

Do not kink the Teflon™ tube.

To install and test the pump tube replacement, follow these steps (see Chart A, Chart B, Chart C and Figures 7 and 8):

1. Power the unit **OFF**, remove the cover and connect the Control Box. See, *Required Information and Tools, The Control Box*.

2. Using a 3/8-inch wrench disconnect the Teflon™ steam generator inlet tube (1) from the top of the steam generator (2). Disconnect the other end from the pump outlet fitting (3). Record the orifice diameter if available and discard the tube.

3. Select the nominal size tube from the appropriate kit indicated in Replacement Tube Kits chart.

4. Connect the pump end of the tube to the pump outlet fitting. A label on the tube indicates the tube orifice diameter. An arrow on the label indicates the direction in which the tube must be installed. The arrow **must** point towards the steam generator when installed.

5. Thread the other end of the replacement tube (4) to the fitting (5) on the pump test bottle (6), **finger tight. Do not cross thread the fittings. Do not overtighten**.

6. Power the unit **ON** and activate the pump using the control box for 2 seconds to purge air that may be trapped in the fittings. Empty any water that may enter the pump test bottle and reattach the cap.

7. Activate the pump using the control box and record the time it takes for the water level to reach the line marked MIN (see Figure 7).

Pumps

8. If the water level reached the top of the line marked MIN in less than the minimum allotted time, proceed to test the next smallest tube from the Replacement Tube Kit chart. Follow steps 4 through 7. If flow requirements cannot be met using the smaller diameter tubes provided in the kit, replace the pump.

9. If the water level in the pump test bottle was below the top of the "MIN" line after the maximum allotted time proceed to test the next largest tube from the replacement tube kit. Follow steps 4 through 7. If flow requirements cannot be met using the larger diameter tubes provided in the kit, replace the pump.

10. Once a test proves successful, disconnect the test bottle. Using a 3/8-inch wrench connect the replacement tube to the top of the steam generator.

11. Make sure there is sufficient steam-process distilled water in the reservoir and activate the pump using the Control Box for 5 seconds to ensure that the pump is functioning and observe all affected fittings for leaks.

12. Calibrate the steam generator thermocouple. See, *Steam Generator Thermocouple Calibration*.

13. If the pump is replaced a dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) **must** be performed on the STAT*IM* unit. See *Required Information and Tools*.

14. Run a sterilization cycle and observe all fittings and tubes for leaks. LCD read-outs for messages indicating cycle status.

15. Reinstall the cover. See *STATIM Cover Removal and Replacement*.

Document Change Record

Document 96-104253		Title: Pumps	
Revision	ECO	Notes	Date
2.0	04-0020	Updated chapter as per prEN13060 requirements.	January 16, 2004
1.0	97-069	Initial Release	November 24, 1997