

Steam Generator

There are two types of steam generator you may encounter while servicing a STATIM 5000 / 5000S unit, one is aluminum and the other is stainless steel. The aluminum steam generator also has two versions, one with a set of four stand-offs on the bottom for positioning the thermal fuse and the other with two sets of four stand-offs on the bottom. See *Steam Generator Thermal Fuse*.

Removing the Aluminum Steam Generator

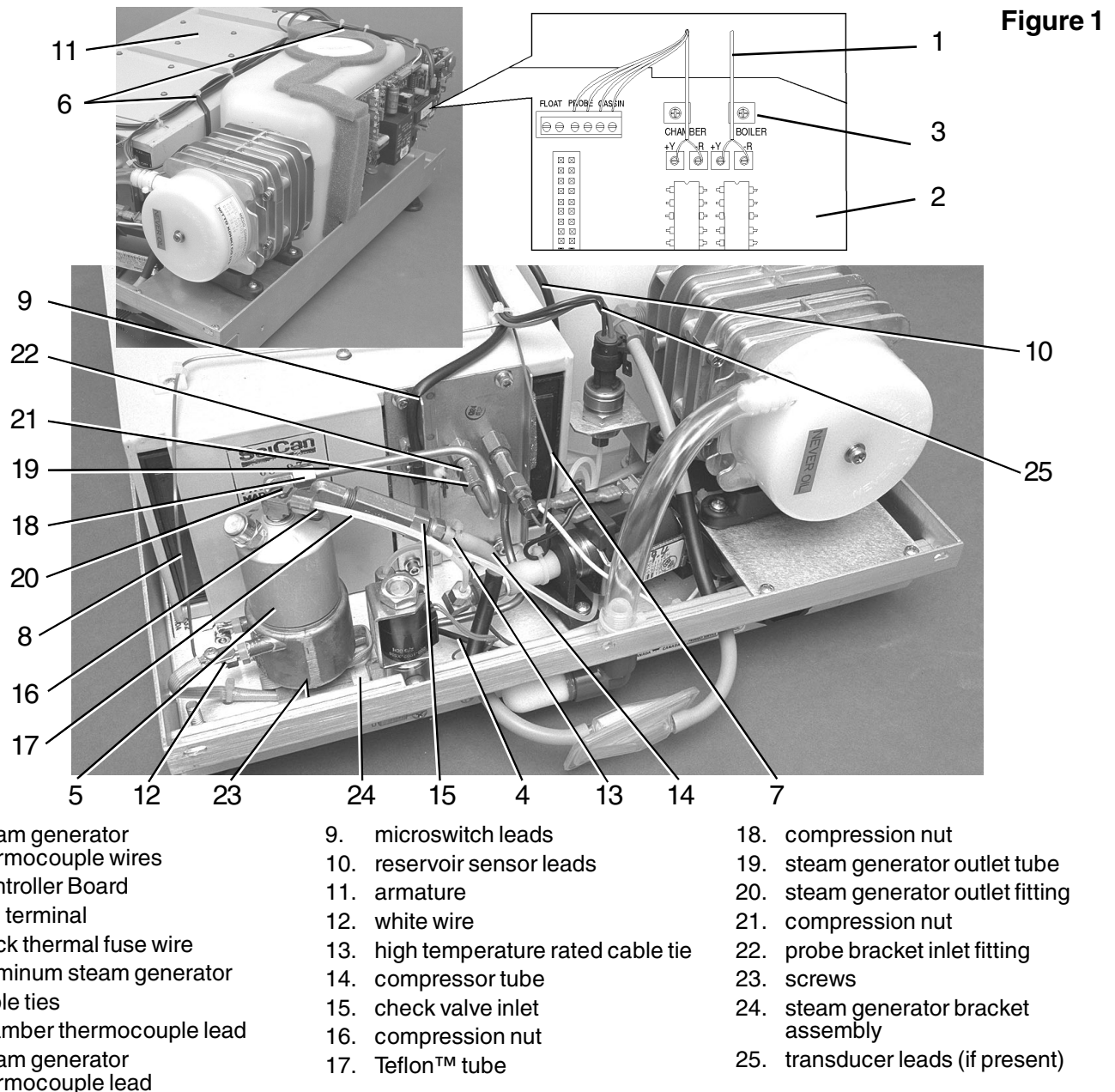
CAUTION: The steam generator may be hot if the unit has been operating. Guard against burns.

To remove the steam generator, follow these steps (see Figure 1):

1. Turn the power switch **OFF**, and unplug the unit.
2. Disconnect the steam generator thermocouple wires (1) from Controller Board (2) terminal positions BOILER +Y and -R and disconnect the flag terminal (3) from the position marked BOILER directly above the terminals. Leave the screws with contact washers in the terminals.
3. Disconnect the black thermal fuse (4) wire from Controller Board connector terminal block J1-3. See *Steam Generator Thermal Fuse*.
4. Trace the path of the black wire back to the base of the steam generator (5). Carefully cut all cable ties holding the black wire.
5. Carefully cut the cable ties (6) securing the steam generator thermocouple lead (8) and other wires to the armature (11).
6. Disconnect the white wire (12) attached to the terminal on the lower half of the steam generator.
7. Carefully cut the cable tie (13) holding the compressor tube (14) onto the check valve inlet (15) and pull the tube off the valve.
8. Using a 3/8-inch wrench, disconnect the compression nut (16) holding the Teflon™ tube (17) from the top of the steam generator.
9. Using a 7/16-inch wrench, disconnect the compression nut (18) holding the steam generator outlet tube (19) to the steam generator outlet fitting (20).

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10. Disconnect the compression nut (21) holding the steam generator outlet tube to the probe bracket inlet fitting (22).
11. Remove the two screws (23) holding the steam generator bracket assembly (24) to the chassis and remove the steam generator. See *Steam Generator Thermal Fuse*.



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Replacing the Aluminum Steam Generator

To replace the steam generator, follow these steps (see Figure 1):

1. Make sure the power switch is **OFF**, and the unit is unplugged.
2. Carefully install the steam generator bracket assembly (24) to the chassis using two screws (23). Start the screws into the tapped holes but do not tighten the screws.

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Be careful not to bend the thermocouple leads too sharply (min. bend radius - 3/16-inch / 5 mm). Retain the protective sleeve on the controller board end of the thermocouple leads as long as possible. Do not crush or pinch the thermal fuse lead.

3. Connect the compression nut (18) holding the steam generator outlet tube (19) to the top of the steam generator outlet fitting (20) and the compression nut (21) holding the steam generator outlet tube to the probe bracket inlet fitting (22). Thread the nuts finger tight, then tighten using a 7/16-inch wrench. **Do not overtighten.**

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4. Tighten the two screws holding the steam generator bracket assembly to the chassis.

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5. Connect the compression nut (16) holding the Teflon™ tube (17) to the top of the steam generator. Thread the nut finger tight, then tighten using a 3/8 inch wrench. **Do not overtighten.**

6. Reconnect the white wire (12) to the terminal on the lower half of the steam generator using the retained screw with lockwasher. If the terminal appears blackened, clean it using fine grit sandpaper. If the terminal threads strip, use a nut on the other side of the terminal to hold the screw.

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7. Route the black thermal fuse wire (4) from the fuse assembly along the back of the chassis with the other wires, and connect it to Controller Board (2) terminal J1-3.
8. Carefully bend and route the new steam generator thermocouple lead (8) alongside the chamber thermocouple lead to the Controller Board. The leads must not touch the cover when the cover is assembled to the chassis.

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- Carefully remove the protective sleeve from the end of the un-insulated steam generator thermocouple leads. Pre-bend both leads to achieve the required shape. Reconnect the flag terminal to the threaded lug marked BOILER on the Controller Board.

EXERCISE CAUTION: The thermocouple leads at the board end are very fragile

One lead is colour coded: the unmarked lead is positive, +Y. The red lead is negative, -R. Connect the unmarked lead to the terminal marked +Y on the Controller Board. Connect the red lead to the terminal marked -R on the Controller Board. Make sure there is extra lead length so that the wires do not break as the screw is tightened. Ensure that the wires are seated securely behind the respective washers (see Figure 1 detail).

The two leads must not touch one another or any other component. Do not calibrate a thermocouple until it is properly installed and positioned in the unit.

- Bundle the chamber thermocouple lead (7), the new steam generator thermocouple lead, microswitch leads (9), transducer leads (25) and reservoir sensor leads (10) together using nylon cable ties (6), approximately every 2-3 inches. Secure the wires to the top of the armature using the cable anchors provided.
- Carefully push the compressor tube (14) onto the check valve inlet (15) and secure the tube to the valve using a high temperature rated cable tie (13).
- Calibrate the steam generator thermocouple (for non S units only). See, *Thermocouple Calibration*.
- 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, Safety Compliance*.
- Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
- Reinstall the cover. See *STATIM Cover Removal and Replacement*.





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Inspecting and Replacing the Steam Generator Check Valve

CAUTION: The steam generator and check valve may be hot. Guard against burns.

The steam generator check valve is found on STAT/IM/ STAT/IM5000 units.

To inspect the check valve, turn **ON** the compressor using the Control Box, and allow the unit to run for a few minutes. See *Required Information and Tools, the Control Box*. Allow the unit to cool to the touch. Remove and inspect the air filter, the bacteria retentive filter (if present) and the compressor. See *Compressor Removal and Installation*. If there is evidence of water in the bacteria retentive filter, replace the steam generator check valve and the filter. If there is evidence of water in the compressor or if the compressor filter is wet, replace the steam generator check valve, compressor and filters. See *Required Information, Tools and Routine Maintenance, Air Filters and Compressor, Replacing the Compressor*.

To Replace the Steam Generator Check Valve (See Figure 2):

1. Turn the power switch **OFF**, and unplug the unit.
2. Carefully cut the cable tie (1) holding the compressor tube (2) onto the check valve (3) inlet and pull the tube off the valve.
3. Using a 9/16-inch wrench remove the check valve. Apply the wrench to the part of the valve closest to the steam generator (6). Use a 7/16-inch wrench to hold the right angle brass fitting so that it does not move. Clean any Teflon™ pipe fitting tape from the threads in the right angle valve fitting.
4. Prepare the right angle (4) fitting by wrapping the threads with Teflon™ pipe fitting tape (minimum one complete wrap).
5. Thread the new valve onto the right angle valve fitting in the top of the steam generator (6). Using a 9/16-inch wrench on the end of the valve closest to the fitting, tighten the valve **SNUG**. **Do not overtighten the new valve**. Use a 7/16-inch wrench to hold the right angle brass fitting so it does not move.

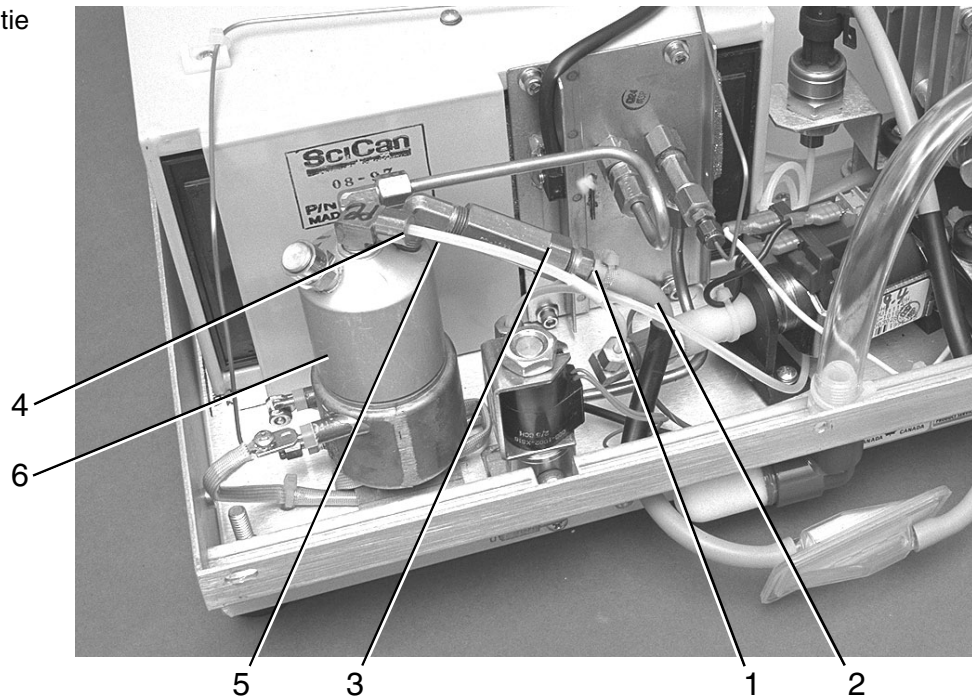


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6. Carefully push the compressor tube (2) onto the check valve (3) and secure the tube to the valve using a high temperature application cable tie (1).
7. Install replacement filters as required.
8. Reinstall the cover. See *Cover Removal and Replacement*.

1. high temperature rated cable tie
2. compressor tube
3. check valve
4. right angle brass fitting
5. Teflon™ tube
6. aluminum steam generator

Figure 2



Removing the Stainless Steel Steam Generator Assembly (see Figure 3)

1. Turn the power switch **OFF** and unplug the unit.
2. Remove cover. See *Removing Cover*.
3. Using a 7/16 wrench on the compression nut connected to the steam generator outlet tube and a 3/8 wrench on the T-fitting, disconnect steam generator outlet tube. When the nut is unscrewed completely, pull the tube apart gently to disengage it from the fitting.
4. Disconnect the water pump tube (Teflon™ tubing) by loosening the nut at the top.
5. Disconnect the compressor tube (Silicone tube) by pulling off its fitting.

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6. Disconnect the electrical connections at the PC board. Look for the connections on the left side of the board marked "BL". Disconnect wire N and wire L of the "BL" set.
7. Loosen the mounting screws holding the compressor bracket to the chassis and gently lift the compressor to trace the path of the black and white wire to the steam generator and cut all the cable ties holding the black wire and the white wire.
8. Disconnect steam generator thermocouple at the PC board. The connection on the board is located behind the pressure transducer board, which is held into place by a blue bracket.
 - 8.1 To disconnect the steam generator thermocouple you must remove the pressure transducer board.
 - 8.2 Do this by unclasping the latches on either side of the blue bracket and removing the board.
 - 8.3 Disconnect the wires marked BOILER and trace the wire back to the steam generator, carefully cutting the cable ties to free the wire.
9. Loosen the mounting screws that hold the bracket adapter to the chassis and remove the steam generator with the adapter together.

Replacing the Stainless Steel Steam Generator Assembly

1. Bring the steam generator into position aligning the bracket adapter's mounting holes with the mounting holes in the chassis using screws, but do not tighten.
2. Reconnect the steam generator outlet tube by pushing it together as far as it will go and finger tighten.
3. Tighten the mounting screws holding the steam generator with the bracket adapter to the chassis.
4. Tighten the compression fitting nut into place – make sure to use two wrenches, one on the T-fitting and the other on the nut.
5. Reconnect the water pump by tightening the nut with the Teflon™ tubing all the way into position.

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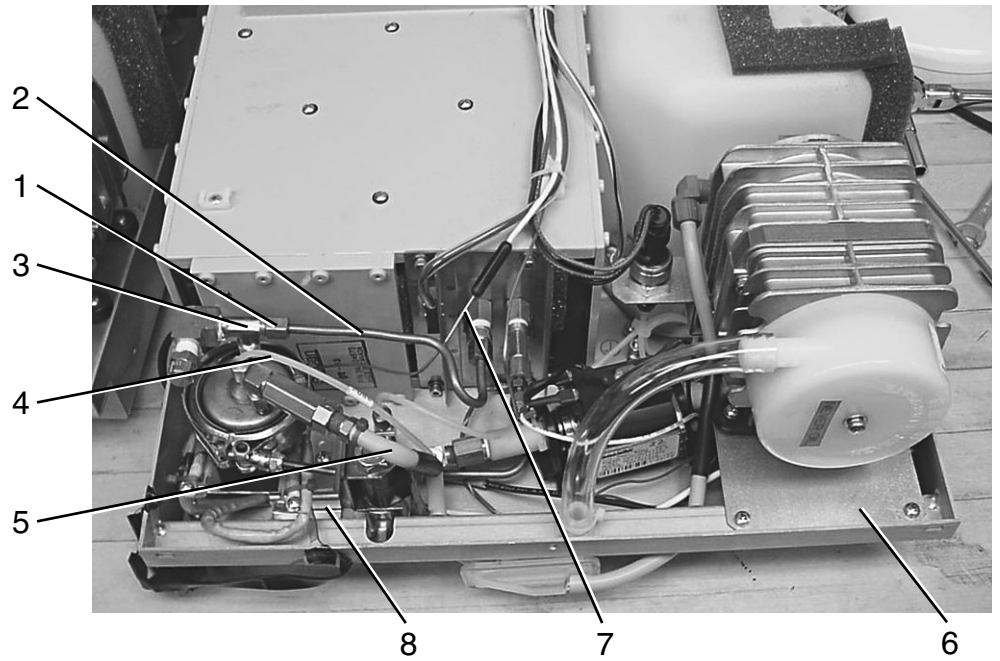
6. Reconnect the compressor (Silicone) tube to its fitting and tighten with a high temperature rated cable tie.
7. Route the black and the white thermal fuse wires and connect these on the left side of the PC board in the BL set; the black wire to the connection marked L and the white wire to the connection marked N.
8. Bundle the loose wires together using nylon cable ties every 2-3 inches.
9. Tighten the mounting screws to secure the compressor bracket to the chassis.
10. Reconnect the steam generator thermocouple to the PC board.
11. Put the pressure transducer board back into place in its bracket.
12. Bundle the chamber thermocouple lead, the new steam generator thermocouple lead, microswitch leads, transducer leads, and reservoir sensor leads together using nylon cable ties, approximately every 2-3 inches. Secure the wires to the top of the armature using the cable anchors provided.
13. 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*.
14. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read outs for messages indicating cycle status.
15. Reinstall the cover. See *Cover Removal and Replacement*.

NOTE: Calibration of stainless steel steam generator thermocouple on S-class units is **NOT** required.

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1. Compression nut
2. Steam generator outlet tube
3. T-fitting
4. Teflon™ tube
5. Compressor tube
6. Compressor bracket
7. Steam generator thermocouple lead
8. Bracket adaptor

Figure 3



Document Change Record

| Document 96-103920 | | Title: Steam Generator | |
|--------------------|---------|---|------------------|
| Revision | ECO | Notes | Date |
| 4.0 | 04-0020 | Updated chapter as per prEN13060 requirements. | January 16, 2004 |
| 3.0 | 99-0059 | Added 5000S | April 14, 1999 |
| 2.0 | 98-0290 | Photos replace line. Text changed to include addition of transducer if present. | December 2, 1997 |
| 1.0 | 96-088 | Initial Release | May 29, 1996 |