STAT*IM* 5000/5000S/5000 G4

CASSETTE AUTOCLAVE™

Service Manual

SciCan | Your Infection Control Specialist™

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About this Service Guide

This STAT*IM* service manual was created to act as reference for the service and repair of the STAT*IM* brand. In the interest of providing one comprehensive global service manual, this book references both the STAT*IM* 5000 and the STAT*IM* 5000S models. Because of this, you will note that there are chapters and sections that do not apply to the STAT*IM* unit that you may have, or are repairing.

If you have a question about the unit you are repairing, please do not hesitate to contact your local SciCan representative for confirmation.

Hazardous voltages are accessible when the cover is removed. Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STATIM when the work is completed and after the cover has been returned to the unit.

The STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying the units.

Use only steam-process distilled water in the STAT*IM*.

The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.

Ensure that there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.

Safety Compliance

When a STAT*IM* is serviced, the safety criteria as specified by applicable international safety standards and applicable national, state, provincial, and regional laws and regulations must be observed and maintained.

The following symbols appear in the margins of this book.		A potential hazard to the operator.		A situation which may lead to a mechanical failure.	! Important information

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Identifying STAT*IM* 5000 Units

There are two main types of STAT*IM* 5000 units, the G4 touchscreen version and STAT*IM* classic with keypad. Each of these two versions have a North American specification or “non S” unit, and the European specification or “S” unit. In the classic series, they are labeled respectively as “STAT*IM* 5000” and “STAT*IM* 5000S”. Though it does not use the “S” designation in its model names, the G4 series has S-class units for distribution in markets requiring these cycle types, and non S-class for the North American market.

There are many mechanical identifiers to differentiate between the set types, (e.g., pressure transducer for ‘S’ class, no pressure transducer for the non ‘S’ class). The details in the matrix further below will help you identify units based on their factory specifications.

Identifying Software Versions

To identify a unit’s software version, power it OFF and back ON again. During start up, a number is briefly displayed in the upper right-hand corner of the LCD that indicates which software is installed (See Figure 1). This number is also printed on the label attached to the U14 microprocessor and the U8EEPROM device on the controller board (See Figure 2).

The software version number is the character to the immediate right of the R as indicated by:

Figure 1

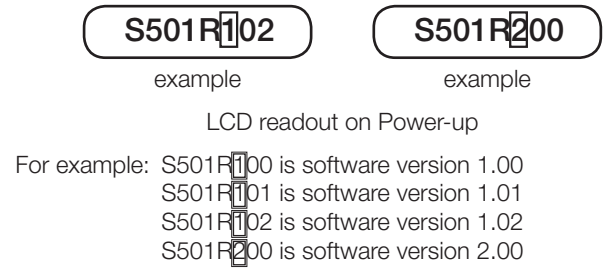
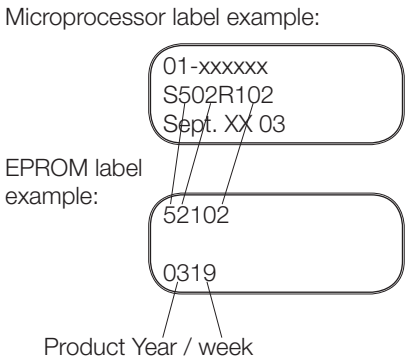


Figure 2



Software Versions and Corresponding Calibration Procedures

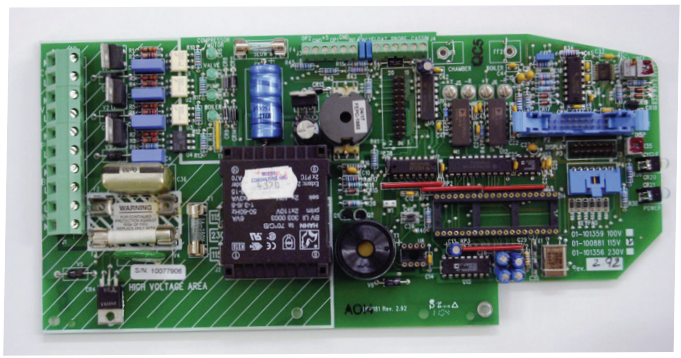
Model	Approx. Year of Manufacture	Software Revision	Steam generator Type	PCB Revision	Pump	Compressor	Pressure transducer	Validation thermocouple	Calibration procedure
5000	1995 - 2004	S502R1xx S502R2xx	Aluminium Internal	2.x/5.x	✓	✓	N/A	N/A	2
5000	2004 - 2005	S502R4xx	Stainless Steel	6.x	✓	✓	N/A	N/A	3
5000	2005 - 2007	S502R5xx	Aluminium Internal	6.x	✓	✓	N/A	✓	3
5000	2007 →	S502R6xx	Aluminium External	7.x	✓	✓	N/A	✓	4
G4 5000	2010 →	S501R7xx	Aluminum External	7.x	✓	✓	N/A	✓	8
5000S	1995 - 2004	S5S2R1xx S5S2R2xx	Aluminium External	2.x/5.x	✓	✓	✓ (60 p.s.i.)	N/A	5
5000S	2004 - 2005	S5S2R4xx	Stainless Steel	6.x	✓	✓	✓ (68p.s.i.)	N/A	6
5000S	2005 - 2007	S5S2R5xx	Aluminium External	6.x	✓	✓	✓ (68p.s.i.)	N/A	6
5000S	2007 →	S5S2R6xx	Aluminium External	7.x	✓	✓	✓ (68p.s.i.)	N/A	7
G4 5000S	2010 →	S5S2R7xx	Aluminum External	7.x	✓	✓	✓ (68p.s.i.)	N/A	9

Identifying Controller Board Types

There are three different types of controller boards that may be encountered in STAT*IM* 5000/ 5000S/5000 G4 type units (See 'PCB revision' above). They can be identified as below (Figure 3):

Figure 3

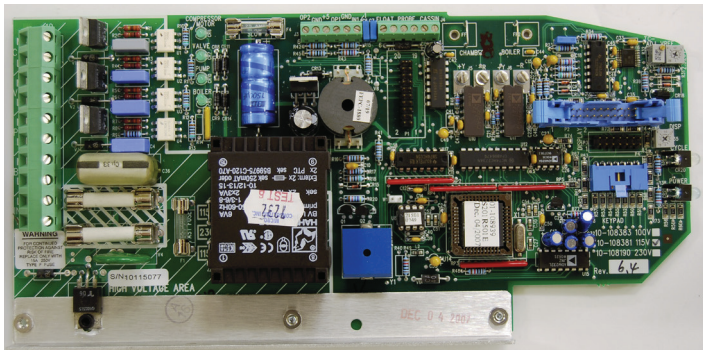
Revision 2.x/5.x type board (1995 – 2004):



Typical features:

- Revision number bottom right hand side.
- Rectangular microprocessor plus EPROM
- 'W1' jumper for calibration
- Blue 'pressure interface/printer' connector

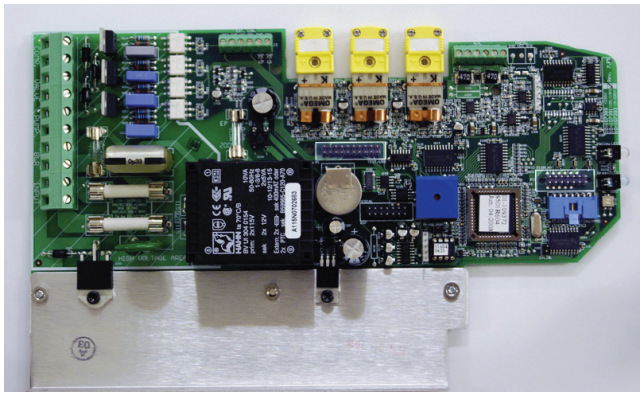
Revision 6.x type board (2004 - 2007):



Typical features:

- Revision number bottom right hand side.
- Square microprocessor plus EPROM
- 'W1' jumper for calibration
- Blue 'pressure interface/printer' connector

Revision 7.x type board (2007 to present):



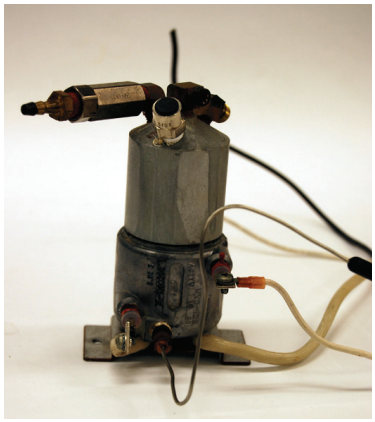
Typical features:

- Up to revision 7.30, the revision number is on the top right hand side (printed vertically)
- From revision 7.4 onwards, the revision number is on the bottom left hand side (printed horizontally) under the connector J1
- Square microprocessor plus EPROM
- NO 'W1' jumper for calibration
- NO Blue 'pressure interface/printer' connector
- All components integrated on single board
- Surface mount type component.
- 'Push in' yellow thermocouple connectors.

Identifying Steam Generator Types

There are three different types of steam generator (boiler) that may be encountered in STAT*IM* 5000/5000S/5000 G4 units. They can be identified as below (Figure 2):

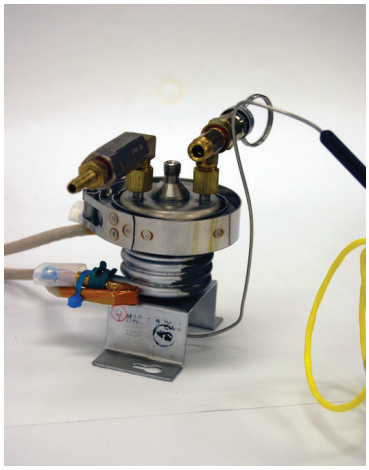
Aluminum steam generator with internal thermocouple (1995 – 2004):



Typical features:

- 70 p.s.i. pressure relief valve (PRV) (no ring pull)
- Thermocouple embedded in side of steam generator
- Software required to drive this steam generator = R1xx/R2xx (revision 2.x/5.x PCB)

Stainless steel steam generator (2004 – 2005):



Typical features:

- Software required to drive this steam generator = R4xx (revision 6 PCB only)

Aluminum steam generator with external thermocouple, a.k.a. 'ALEX' boiler (2005 – present):

Typical features:

- 43.5 p.s.i. pressure relief valve (PRV) (ring pull on S models, no ring pull on non S models)
- Thermocouple clamped to underside of steam generator
- Blanking plug in the side of steam generator in original thermocouple position
- Software required to drive this steam generator is R5xx for revision 6 PCB and R6xx for revision 7 PCB

WARNINGS AND PRECAUTIONS

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EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Tools, Maintenance Schedules, Procedures and Testing

Tools

STAT*IM* specific items from SciCan

Before a STAT*IM* can be serviced, the following special tools are required in addition to your service tool kit. These tools are available from SciCan or your nearest service depot:

1.	Control box	SciCan Part # 01-103141S
2.	Pump tester	SciCan Part # 01-100713S
3.	Water conductivity tester	SciCan Part # 01-103139S
4.	Solenoid plunger tube wrench	SciCan Part # 01-103471S
5.	9/64” ball-end allen-key (hex) screwdriver	SciCan Part # 01103469S
6.	Calibration cassette, SciCan 5000 Non S models only	SciCan Part # 01-103087S
7.	Calibration cassette, SciCan 5000 All models	SciCan Part # 01-106366S

Generic reference devices for calibration

8. Calibrated digital thermometer with ‘K’ type probe
9. Calibrated digital voltmeter with accuracy of 0.001 Volts
10. Calibrated digital pressure meter, 0 – 400 kPa absolute/0 – 7 bar absolute

More details on recommended devices can be found in section ‘Recommended Reference Meters’

Electrical safety test devices

11. Hi-Pot tester
12. Ground continuity tester
13. Static strap
14. Static bags

General tool list

- Phillips screwdriver
- Flat-blade electrician’s screwdriver
- Potentiometer trimmer
- Needle nose pliers
- Wire cutters
- Wrench 3/8” A/F
- Wrench 7/16” A/F
- Wrench 9/16” A/F
- Wrench 11/16” A/F
- Wrench 7/8” A/F

Note: This tool list is a guide and suggests what is the minimum required to remove and replace components in the STAT*IM*. Other tools may be required as an aid to servicing at the discretion of the individual service engineer.

Sample equipment set up for calibration of a non-S unit

1. Calibration cassette with detachable thermocouple
2. Digital voltmeter
3. Digital thermometer
4. (no pressure meter required)
5. Control box
6. 2x7 ribbon cable, LCD connector (connect to Controller Board header P3)
7. 1x7 cable, keypad connector (connect to Controller Board header P4)
8. 2x10 molded socket, test connector (connect to Controller Board header P1)

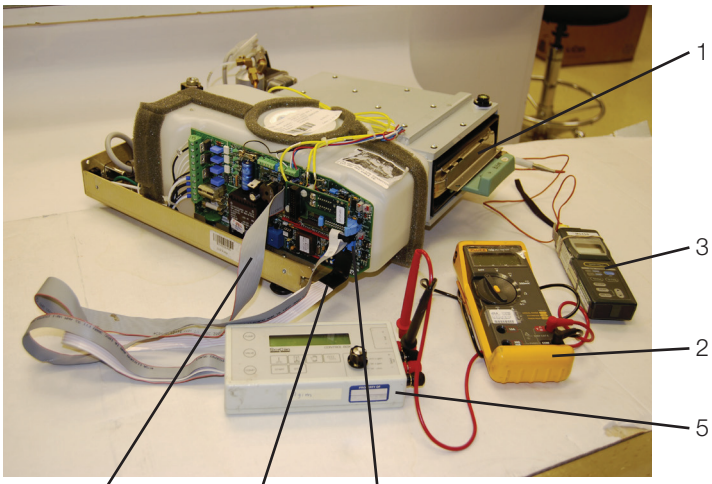


Figure 1

Sample equipment set up for calibration of S unit

1. Calibration cassette.
2. Digital voltmeter
3. Digital reference thermometer with thermocouple. (Fluke 51 with 80PK-26 probe shown)
4. Digital reference pressure meter (S only) (Druck DPI 750 R shown)
5. Control box
6. LCD connector cable (connect to Controller Board header P3)
7. Keypad connector cable (connect to Controller Board header P4)
8. Test connector cable (connect to Controller Board leader P1)

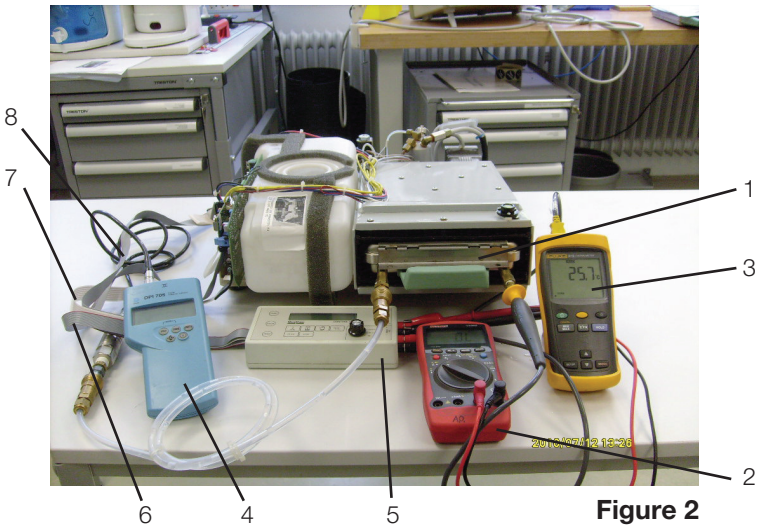
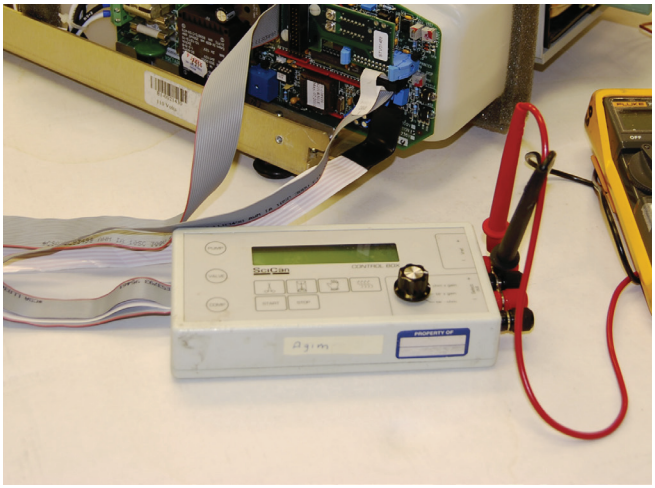


Figure 2

NOTE: The following section describes in greater detail the equipment depicted in Figures 1 and 2.

The Control Box

Figure 3



NOTE: Late model STAT*IM*s with Rev.7 boards can be calibrated with the cover on using the unit's software and keypad, making use of the Control Box as an option. For older models, use of a control box is required.

The Control Box (5) is a service tool that allows a technician to operate the unit while it is being serviced. There are two kinds of Control Boxes you may encounter: one uses toggle switches, the other uses a membrane keypad arrangement similar to the keypad on the unit.

When connecting the Control Box connectors to the Controller Board note the positions of Pin number 1 of the Control Box test connectors and Pin number 1 of the Controller Board headers.

The Control Box has a display (LCD) and a variety of control switches that allow the technician to:

1. Operate the unit independently of the keypad mechanism, to manually activate the pump, valve or compressor, or run cycles.

2. Make frequently used Controller Board measurements by providing a common output and rotary switch for signal selection during calibration. See the Calibration Instructions in chapters 4 and 5 of this service manual.

If only the display and button functions are being used, connect the LCD cable (6) to Controller Board connector P3, the keypad cable (7) to Controller Board connector P4 and power the STAT*IM* ON.

If the override or measurement functions are being used, connect the test connector cable (8) to connector P1 of the Controller Board in addition to the other cables.

When using a toggle switch model of the Control Box, turn the switch to the ON position to activate the desired device. To turn the device OFF, turn the switch to the AUTO position. To select, start and / or stop a cycle, activate the appropriate push-button switch on top of the Control Box.

Calibration uses the Select out +, Select out - jacks and a setting on the Rotary Switch to set the calibration operation desired for Revision 3.x/4.x Controller Boards (for STAT*IM* 2000 units only). See Calibration Procedure 1 or chapter 4 of this service manual.

When using a keypad model of the Control Box, the keypad switch must be held down to turn the desired device ON. Vref measurements use test leads, the Vref + and Vref - jacks and a voltmeter hooked up in series. Calibration uses the Select out + and Select out - jacks, test leads and a setting on the Rotary Switch to set the calibration operation desired for Rev. 3.x/4.x Controller Boards (for STAT*IM* 2000 units only). The keypad of this Control Box provides the same features as a STAT*IM* keypad. Note: The Control Box is for use with STAT*IM* products ONLY.

Calibration Cassettes and Reference Meters

Specially designed calibration cassettes allow technicians to take readings from within the cassette while the unit is in operation. In addition, calibration also requires the use of certain reference meters. Use the table below to identify the meters you will require.

Sterilizer type	Part Number	Description	Meter types required
STAT*IM* 2000 (non S)/ 2000 G4	01-103087S	Calibration cassette STAT*IM* 2000	Temperature only
STAT*IM* 5000 (non S)/ 5000 G4	01-103088S	Calibration cassette STAT*IM* 5000	Temperature only
STAT*IM* 2000S/ 2000S G4	01-103088S	Calibration Cassette 2000S B	Temperature and pressure
STAT*IM* 5000S/ 5000S G4	01-106367S	Calibration Cassette 5000S C	Temperature and pressure

Calibration Cassettes

Figure 4

The cassette of the STAT*IM* unit is effectively a fixed volume chamber that contains instruments during sterilization. Saturated steam at a specific temperature and pressure is introduced to produce the correct conditions for sterilization. The cassette is part of a sealed system designed to contain the pressurized steam. To calibrate the unit's temperature and pressure (if appropriate) monitoring devices, a special calibration cassette must be used. The calibration cassette allows a technician to independently monitor the temperature and pressure inside the cassette, ensuring the unit is operating in accordance to its original specifications and to national/international standards.

The relevant cassette types are detailed in the chart above, and the following important information should be noted before choosing the appropriate cassette to use.

- Non S unit cassettes require a 1.6mm (1/16") temperature probe and cannot be used with a 3.2mm (1/8") temperature probe. (See meter details for probe diameter).
- S unit cassettes have temperature fittings (one fitted and one in the cassette accessories supplied) that will allow the use of both 1.6mm (1/16") and 3.2mm (1/8") temperature probe. (See meter details for probe diameter).
- S unit cassettes are designed for both temperature and pressure reference meters and are suitable for all models, S and Non S. If these cassettes are acquired, the non S, single port cassette is not required.
- The non S unit cassettes should not be used to calibrate S class units.
- Please note that when calibrating non-S units with an S unit cassette that the pressure meter will not be required and the test port will require the pressure tube supplied with the cassette to be connected to the pressure fitting to prevent steam leakage.

Reference Meters

Calibration reference meters are important for accurately setting the STAT*IM* unit so that the correct sterilization conditions (temperature and pressure) occur in accordance with the original specifications of the unit and national/international standards.

When ordering any digital thermometer and temperature probe, ensure that the supplier is aware that the area where the most accuracy is required is between 130°C and 140°C.

Temperature meters and probes should always be calibrated as a matched pair.

Test equipment should be calibrated on a regular basis based on the manufacturer's recommended calibration interval.

Calibration of reference equipment used with autoclaves should ALWAYS be to national or international standards by a certified calibration laboratory.

A number of meters are recommended by SciCan and are referenced as follows:

For non-S unit calibration

The following reference meters are recommended for use with 01-103087S and 01-103088S test cassettes:

- Omega HH81A single channel multifunction digital thermometer (www.omega.com)
- Omega TJ36-CASS-116G-6-SMP-M Temperature Probe (with SMP-M miniature male connector).

Note: the above probe is 1.6mm (1/16") diameter.

For S unit calibration

The following options are recommended for use with 01-106366S and 01-106367S test cassettes:

- A set of two independent meters, one pressure and one temperature.
- An integrated hand-held pressure and temperature calibrator.

Note: The thermocouple entry fitting on the S class cassette will need to be changed from the 3.2mm (1/8") diameter fitting to the 1.6mm (1/16") diameter fitting if using the Omega meter.

The two independent meters have been included where the user may already have an Omega meter for non-S use who is upgrading to S class use, when only a pressure meter will be required.

They are also the lower cost options over the integrated device.

Recommended separate temperature and pressure meters for S unit calibration

temperature

- Fluke 51 Series II Digital Thermometer.
- Fluke 80PK-26 SureGrip Tapered Temperature Probe.

Notes:

- The flexible thermocouple included with the Fluke digital thermometer will not be used for calibrating SciCan sterilizers. If you wish to use the flexible thermocouple in the future, SciCan advises you to consult the digital thermometer's manual for setting a temporary offset, if required.
- The above probe is 3.2mm (1/8") diameter.
- Technicians already in possession of the Omega HH81A or equivalent, and the associated probe can use this meter as a replacement for the Fluke 51 and 80PK-26 probe. Note that the probes are of different diameter and a cassette compression fitting change may be appropriate.

Pressure

- Druck DPI 705R Absolute Pressure Meter with external 0 - 7 bar absolute pressure transducer with ¼" NPT female thread.

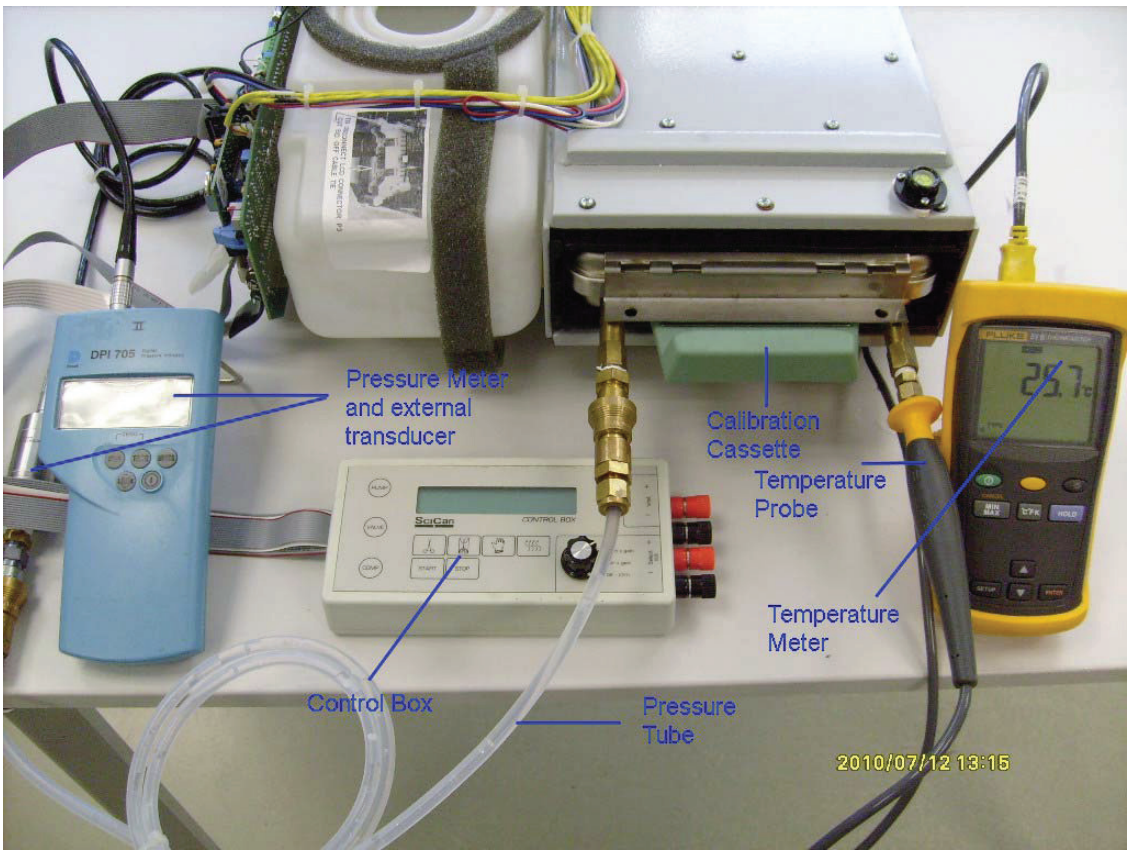


Figure 5

Combined Temperature and Pressure Meter

- Heise PTE-1 Handheld LCD digital calibrator complete with temperature and pressure modules, and PT100 probe as follows:
  - Meter (without data logging capabilities) — **PTEC = X X 4 4A**
  - Pressure Module — **HQS2 B A A 400 kPa A**
  - Temperature Module — **HQS RT1 PT-100**
  - RTD Probe Pt-100 — **PT5**

Notes:

- **These product references are very specific, and the local supplier of Heise equipment (see www.heise.com) should be consulted prior to confirming order codes.**
- **The meter above is of the non data logging variety. If data logging is required, please consult order code variations from Heise data sheet.**
- **The above probe is 3.2mm (1/8in) diameter.**

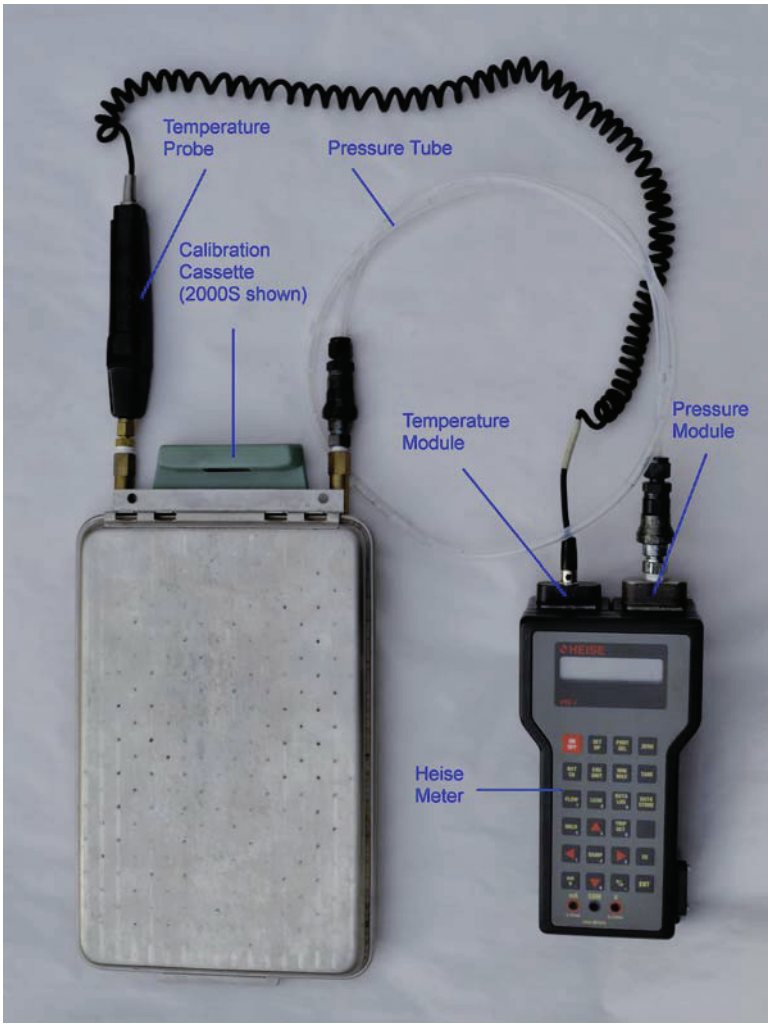


Figure 6

Setting Up your Reference Meters

With certain meter types, some sub-assembly procedures will need to be undertaken to connect the device to your Statim calibration cassette. All cassettes are supplied with the necessary accessories to enable you to convert your meter of choice from those recommended above, to the appropriate fitting on the cassette.

01-103087S and 01-103088S cassettes (non S calibration) with Omega HH81A reference meter and TJ36-CASS-116G-6-SMP-M Temperature Probe.

No sub-assembly required.

To insert the temperature probe (thermocouple) into the compression fittings, loosen the clamp nut attached to the cassette extension fitting and insert the probe into the fitting as far as it will go. A slight resistance will be felt as the probe passes through the seal. Tighten the clamp nut until a steam/air tight seal is achieved. **DO NOT OVERTIGHTEN**.

NOTE: The non S calibration cassette fitting is NOT compatible with the Fluke and Heise 1/8" (3.175mm) temperature probes.

01-106366S and 01-106367S cassettes (S-class calibration) with ALL recommended reference meters

S-class calibration cassette kits contain a number of accessories for use with various recommended reference meters and will need to be set up to suit the appropriate meters before use.

Contents of calibration cassette kit:

- Cassette (2000S or 5000S as appropriate) with 'generic' pressure and temperature fittings attached (see Figure 7 below)
- Accessories as follows: (inside the cassette)

    1 x Pressure tube

    2 x Male Swagelok B-QC4-S-2PM 'Quick Connect' fittings.

    1 x 1/8 NPT female to ¼ NPT male adaptor

    1 x 1/8" (3.175mm) probe fitting.

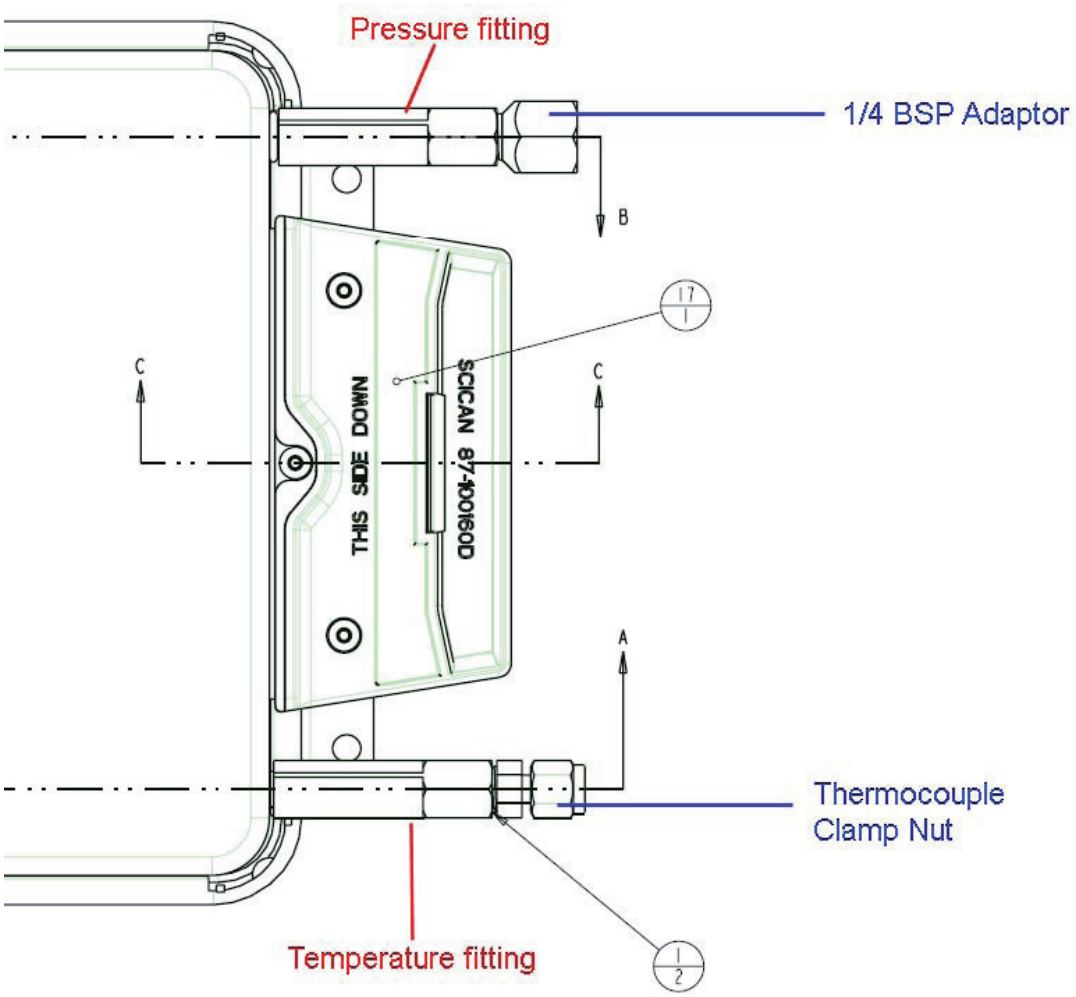


Figure 7. S-class 'generic' fitting configuration (2000S cassette shown)

Setting up the temperature fittings for use with the recommended temperature reference meter(s)

The temperature fitting (right hand fitting when facing the front of the cassette) is fitted with a compression fitting that consists of a body, clamp nut and conical compression washer. (See Figure 8)

There are two fittings supplied with the cassette, one for a 1/8" (3.175mm) temperature probe and one for a 1/16" (1.6mm) temperature probe.

NOTE: The 1/16" fitting is attached to the cassette when supplied and the 1/8" fitting is in the pack of accessories supplied with the cassette.

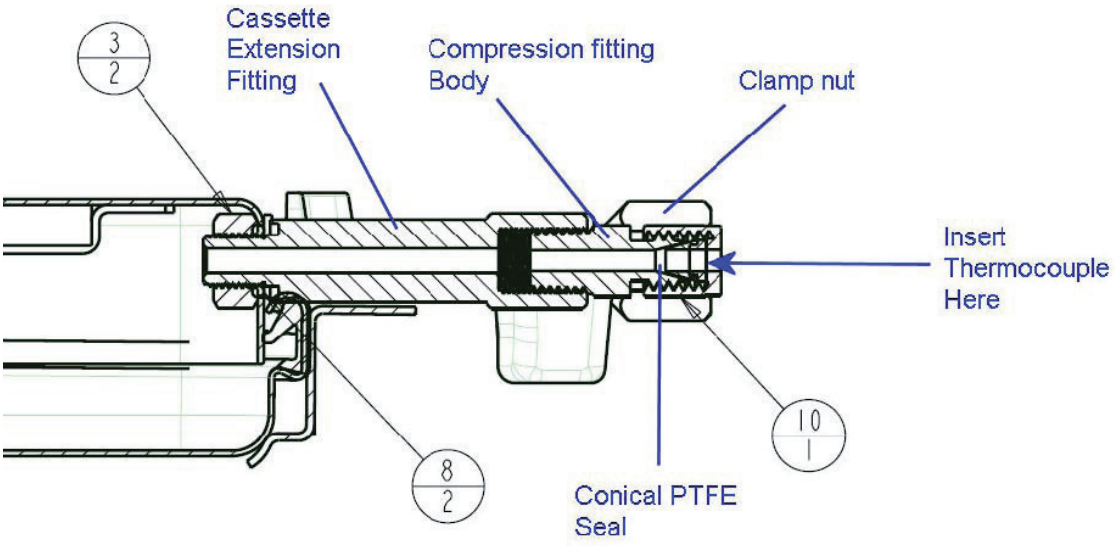


Figure 8. Temperature fitting cut-away

If you have the SciCan supplied **Omega HH81A** type temperature reference meter with the **1/16" (1.6mm) temperature probe** (normally used with the Non S-class type calibration cassette) then the compression fitting attached to the S class cassette is correct and does **NOT** have to be removed.

If you have either the **Fluke 51** type temperature reference meter, or **Heise PTE1** type combined temperature and pressure reference meter then the 1/16" (1.6mm) compression fitting (complete) will need to be removed from the extension piece attached to the cassette and replaced with the 1/8" (3.175mm) compression fitting from the accessory kit, as both of these meters have 1/8" (3.175mm) thermocouple probes.

NOTE: PTFE tape should be used when assembling these parts to ensure a steam tight seal.

To insert the relevant temperature probe (thermocouple) into either of the appropriate compression fittings, loosen the clamp nut and insert the probe into the fitting as far as it will go. A slight resistance will be felt as the probe passes through the conical seal. Tighten the clamp nut until a steam/air tight seal is achieved. **DO NOT OVERTIGHTEN**.

Setting up the pressure fittings for use with the recommended pressure reference meter(s)

NOTE: The pressure fitting (left hand fitting when facing the front of the cassette) is fitted with an adaptor to attach ¼" BSP devices such as hypodermic pressure fittings. (See Figure 9 below). This adaptor is not used with the standard SciCan pressure tube and should be removed from the cassette extension fitting before attaching the pressure tube.

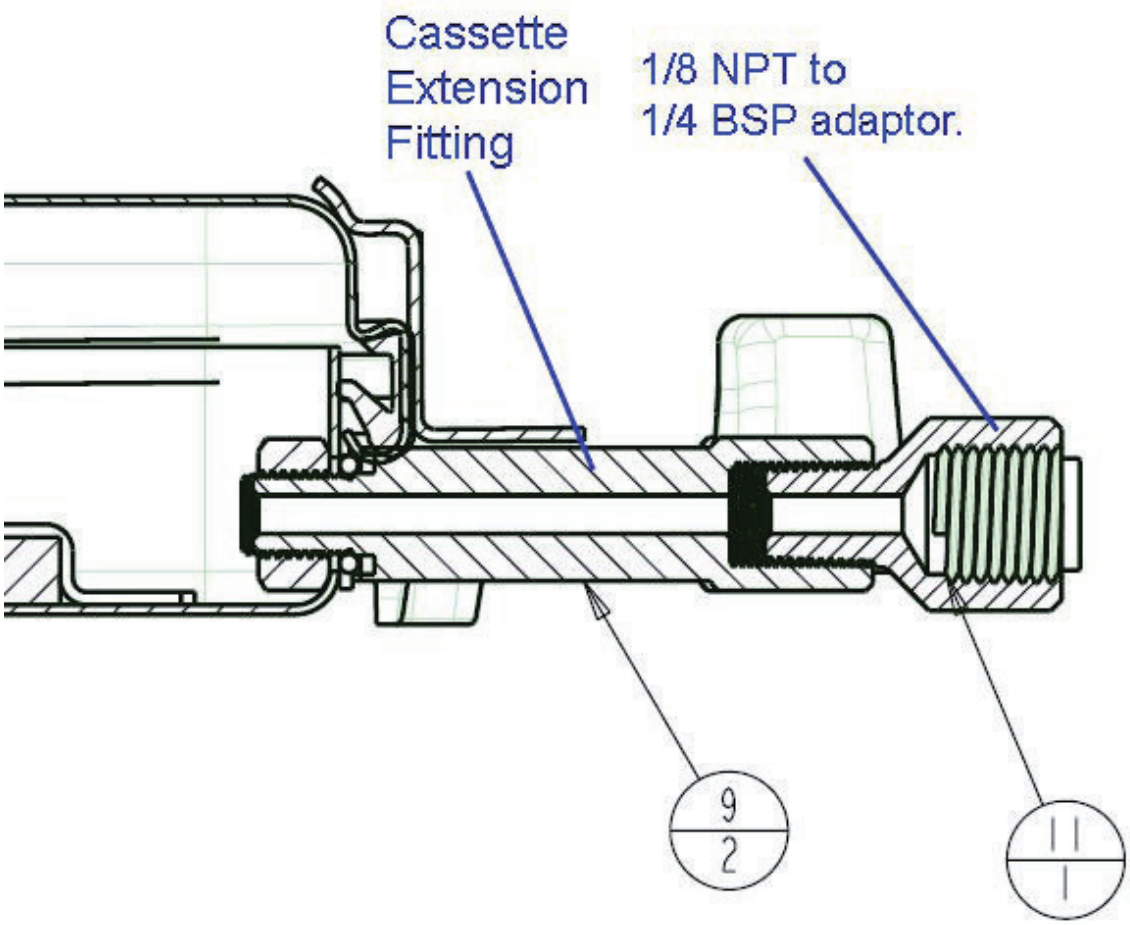


Figure 9. Pressure fitting cut-away

To set up the cassette for use with the recommended **Druck DPI705R** and **Heise PTE1** pressure reference meters, proceed as follows:

Remove the 1/8 NPT to ¼ BSP adaptor. (The accessories for the cassette include 2 male Swagelok 'Quick connect' fittings (see Figure 10).

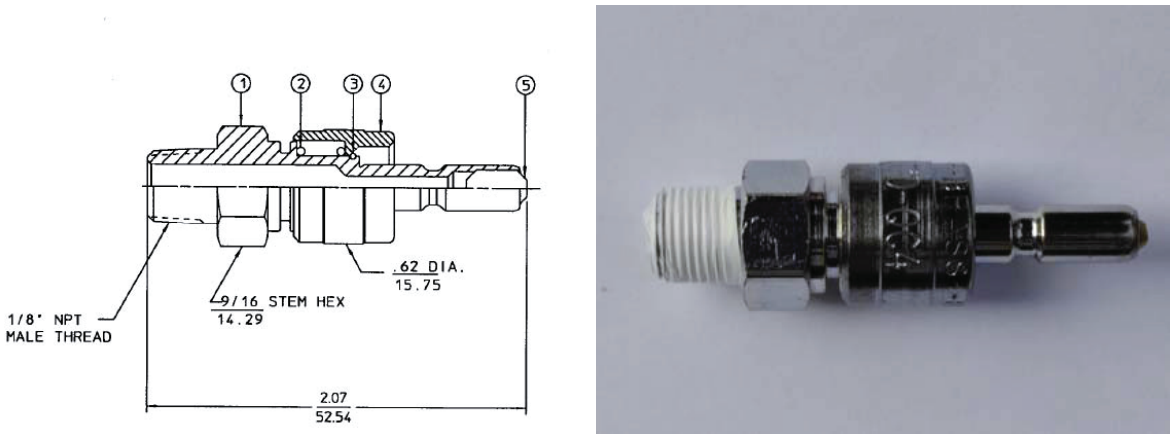


Figure 10. Male Swagelok B-QC4-S-2PM 'Quick Connect' fitting.

Attach and tighten the 'Quick Connect' fitting to the cassette extension fitting in place of the 1/8 NPT to ¼ BSP adaptor (see Figure 11).

NOTE: PTFE tape should be used when assembling these parts to ensure a steam tight seal.

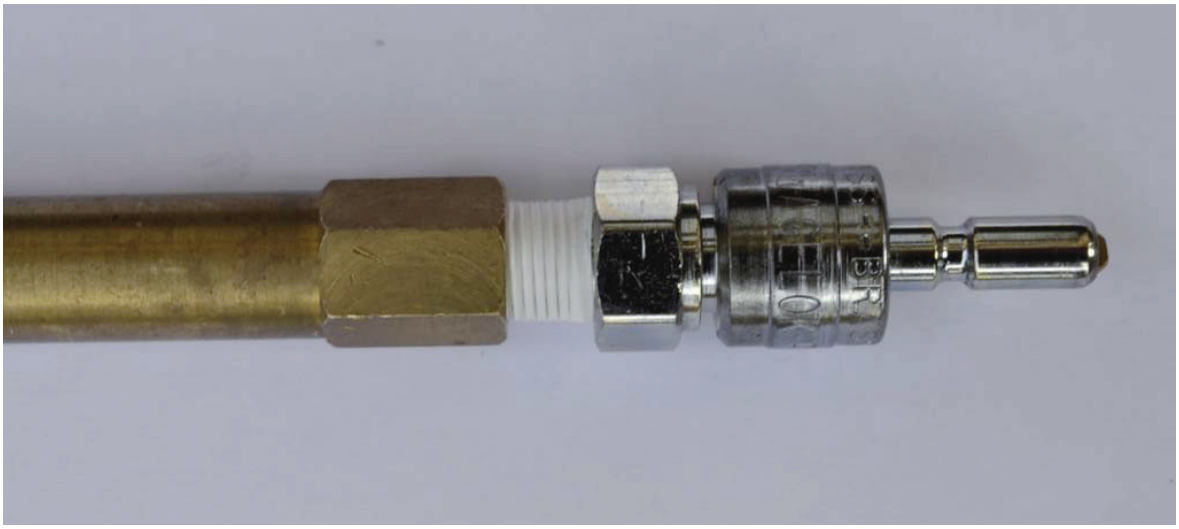


Figure 11. Male Swagelok 'Quick Connect' fitting and cassette extension fitting assembly.

Attaching the pressure tube to the cassette

The pressure tube (see Figure 12) supplied with the calibration cassette is designed to insulate the pressure transducer used with the pressure reference meter from the high temperatures experienced during sterilization, which may damage the transducer.

Figure 12

The tube is fitted with a Swagelock, self sealing ‘Quick Connect’ QC4 female connector (see Figure 13) on either end. These connectors attach to the male ‘Quick Connect’ fitting shown in Figure 10 above.

Figure 13. Swagelock ‘Quick Connect’ QC4 female connector

To attach the pressure tube to the cassette (via the male Swagelok connector), press the male and female fitting together until a ‘click’ is heard and the couplings are firmly attached. (See Figure 14)

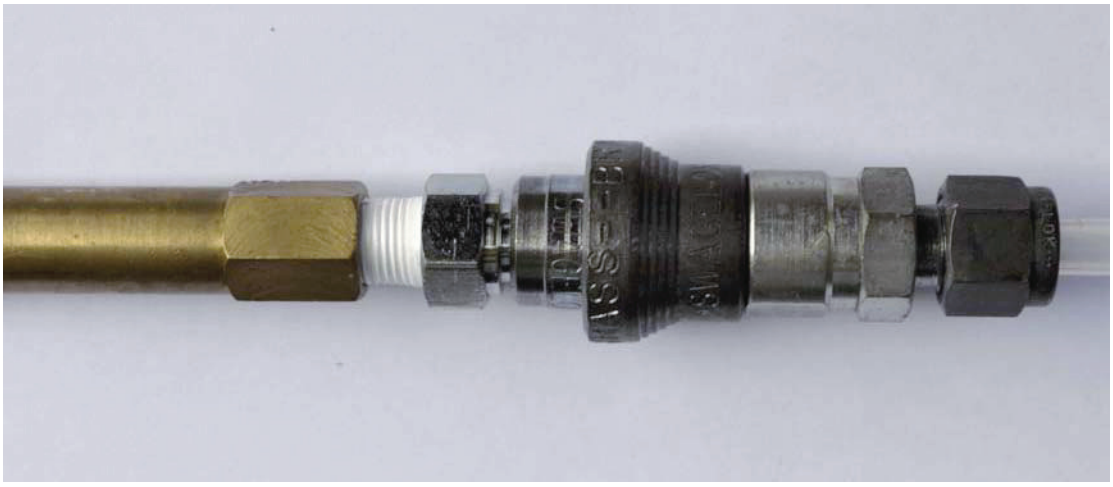


Figure 14. Assembled male fitting, female fitting and cassette extension fitting

Attaching the pressure tube to the recommended pressure reference meter (s)

Important notes:

- Attaching the pressure tube to the reference meter is achieved using the second male Swagelok b-qc4-s-2pm fitting supplied with the cassette.
- Attaching the tube to the connector is as described in the section above, however, the second male fitting will need to be installed onto the pressure reference meter prior to attempting this.
- How the second male fitting is attached will depend on the type of reference meter used.

Assembling the Swagelok b-qc4-s-2pm 'quick connect' fitting to the Druck dpi 705r absolute pressure meter external 0 - 7 bar absolute pressure transducer with ¼" NPT female thread.

NOTE: To complete this assembly you will need to locate the 1/8 NPT female to ¼ NPT male adapter supplied with the S-class calibration cassette. (See Figure 15 for assembly) .

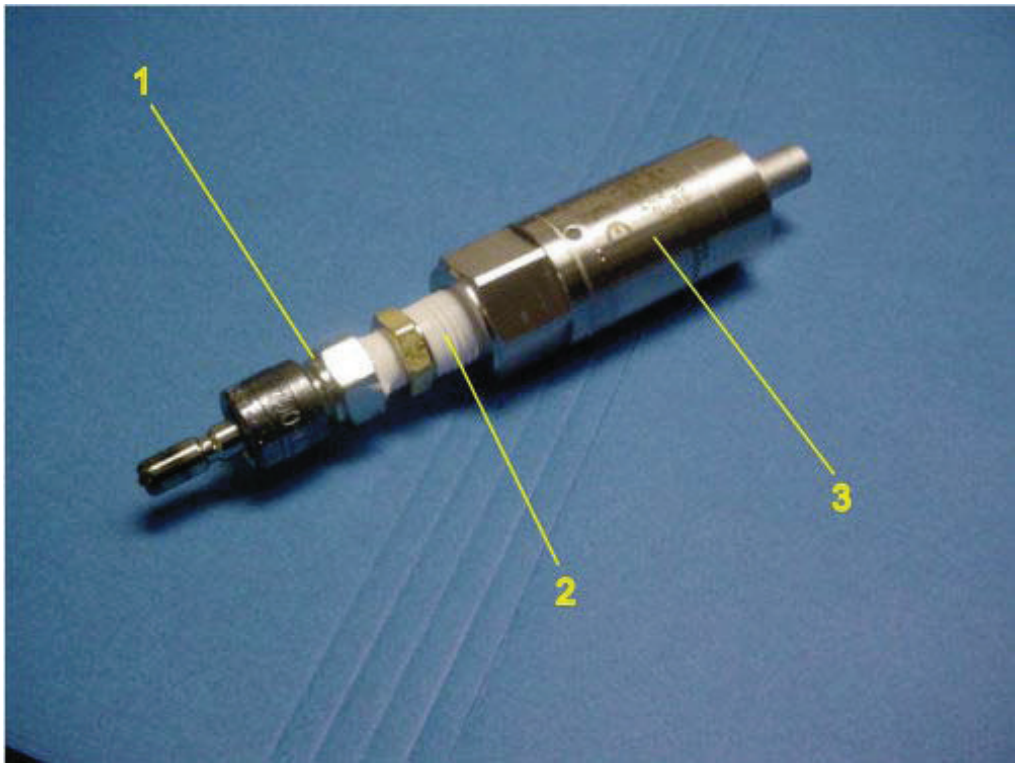


Figure 15. Pressure transducer with adapter and Swagelok connector attached.

Install Swagelok connector (1) onto adaptor fitting (2) **DO NOT OVERTIGHTEN FITTING.**

NOTE: The use of P.T.F.E. tape as shown is essential to ensure the connection is free from steam leaks. If the joint leaks, steam can enter the transducer and damage the unit internally.

Install assembly (from previous step) onto external pressure sensor (3) supplied with the Druck DPI 705R. **DO NOT OVERTIGHTEN FITTING.**

NOTE: The use of P.T.F.E. tape as shown is essential to ensure the connection is free from steam leaks. If the joint leaks, steam can enter the transducer and damage the unit internally.

The pressure tube can now be attached to the pressure transducer.

Figure 16, below, shows the meter, pressure transducer and pressure tube attached to a calibration cassette.

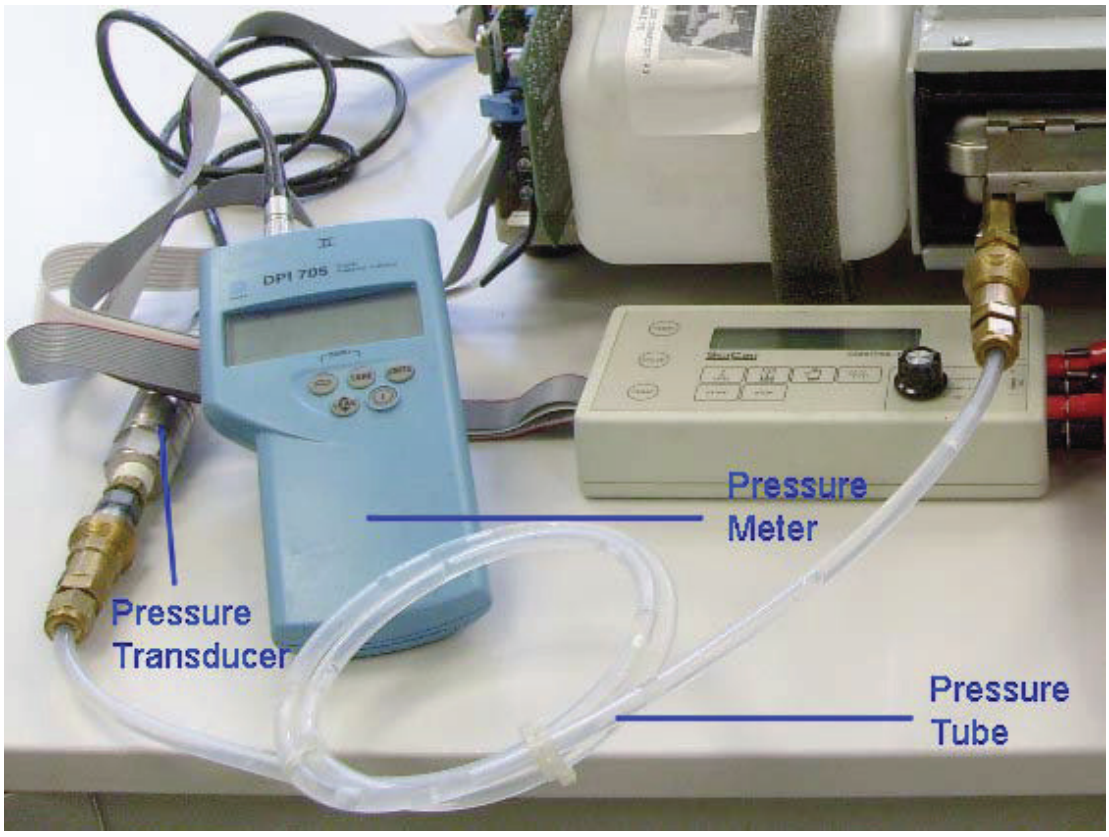


Figure 16

Assembling the Swagelok B-QC4-S-2PM 'Quick Connect' fitting to the internal pressure module supplied with the Heise hand held calibrator.

NOTE: You do NOT need the 1/8 NPT female to ¼ NPT male adaptor for this device. (see Figure 17 for assembly).

Figure 17. Heise meter with Swagelok fitting attached to pressure module.

Insert and tighten the Swagelok fitting into the 1/8 NPT female thread of the pressure module. **DO NOT OVERTIGHTEN FITTING.** NOTE: The use of P.T.F.E. tape as shown is essential to ensure the connection is free from steam leaks. If the joint leaks, steam can enter the module and damage the unit internally.

The pressure tube can now be attached to the pressure module.

Figure 18, below, shows the meter with temperature probe and pressure tube ready to attach to a calibration cassette.

Figure 18. Heise hand held calibrator with temperature module, pressure module, PT 100 temperature probe and pressure tube.

Annual Service Requirements

Important notes:

- The following schedule is designed as a guide for SciCan approved trained service engineers and applies to all STAT*IM* 2000/5000/G4 models.
- The operations contained in this guide are for use during standard service intervals on functioning machines. Any operations or components required over and above this guide will be at the discretion of the service engineer and the customer and additional to the requirements outlined below.
- Components other than the routine annual service components may require changing due to wear and tear or failure but only require changing as and when degradation or failure occurs and should not need to be changed routinely on an annual basis. These may be identified during service and changed as appropriate.
- Consumable items such as seals and filters may require changing at more frequent intervals outside of normal service intervals dependent on the frequency of use of the unit.

SERVICE SCHEDULE	
Standard service parts required for STAT*IM* 2000/2000S and G4 variants:	
Part Number	**Description**
01-100028S	Seal and Lubricant kit A/B
01-100207S	Filter for air compressor, STAT*IM* 2000/2000S **(where fitted)**
01-102119S	Filter Biological, B/C **(where fitted)**
01-100574S	Check valve, B
01-100998S	Repair, Solenoid valve (Honeywell) A/B/C/D

Standard service parts required for STAT*IM* 5000/5000S and G4 variants:	
Part Number	**Description**
01-101649S	Seal and Lubricant kit C
01-101652S	Filter for air compressor, STAT*IM* 5000/5000S **(where fitted)**
01-102119S	Filter Biological, B/C **(where fitted)**
01-101627S	Check valve, C
01-100998S	Repair, Solenoid valve (Honeywell) A/B/C/D

SERVICE PROCEDURES
Main unit
With cover on
Run cycle on unit to check for leakage or faulting.
Check unit's overall condition, including exhaust tube and bottle. Clean bottle, tighten fittings and check for kinks in exhaust tube as appropriate.
With cover off
Check internal condition of unit, pay particular attention to corrosion.
Check water reservoir for contamination. If necessary, disconnect and remove reservoir, clean and rinse with warm distilled water. **Do not use any chemicals. Refit reservoir.**
Check and clean probes if required.
Remove and fit new bacteriological filter. (where fitted)
Remove and fit new compressor filter. (where fitted)
Remove and fit new solenoid plunger and associated parts.
Remove and fit new check valve.
Cassette
Remove cassette seal.
Clean process residue from all surfaces of cassette. (Use chlorine-free soap and scrub with cleaning pad designed for Teflon.)
Check cassette for corrosion under seal seat.
Check cassette for damage. Note: pay particular attention to the rear hinge and rear wall of the base as damage in this area may cause steam leakage even if a new seal is fitted.
Fit new cassette seal.
Diagnostics and Testing
Note: • **Control box, appropriate test cassette (with temperature and pressure port for 'S' units and temperature port only for non 'S' units), appropriate reference meters (temperature and pressure for 'S' units and temperature only for non 'S' units) and voltage meter are required for this section.** • **For correct diagnostics and calibration of 'S' units, both temperature AND pressure meters MUST be used.**
Check running function of pump, solenoid valve and compressor (control box buttons). Cassette must be disconnected from probes.
Check pump flow in accordance with steam generator type and correct as required.
Check reference voltage as appropriate to board type and adjust as required. **Not required on revision 7 units.**
Switch off machine and switch on in calibration mode as appropriate to model.
Check steam generator thermocouple calibration as appropriate to board type. **Note: steam generator calibration is not required for software revision numbers XXXXR4XX onwards.**
During the above cycle, check pipe work and fittings for steam leaks.

Check and adjust chamber thermocouple calibration as appropriate to board type. **Note: on 'S' class units, *pressure transducer calibration* using the pressure reference meter must be done during this phase. Software revision XXXXR4XX onwards requires this to be done at barometric pressure at the start of the cycle. Previous software variants require this to be done during the sterilization phase.**
When set, and during the running cycle, check that the chamber temperature matches the reference meter and that actual and theoretical pressure are within 1 kPa. **This is important for the efficient balance of the control and validation circuits. Failure to achieve this may result in unnecessary cycle failures.**
Re-check steam generator thermocouple calibration as appropriate to board type. • **Note 1: steam generator calibration is not required for software revision numbers XXXXR4XX onwards.** • **Note 2: if the initial steam generator calibration offset and final steam generator caibration offset are > 8 hexadecimal values apart, the steam generator MAY be compromised and further investigation should be undertaken.**
After completion of calibration, run a standard cycle to check temperature and pressure values.
Reinstall cover, and check all cycles are available.
Insert customer's cassette and run standard cycle. Check for leaks.
For revision 7 units ONLY: Enter service mode and activate 'Back up NVRAM'.

Routine Maintenance Schedule and Procedures

To maintain the STAT/*M* in good order between annual services, follow these guidelines:

DAILY
Water Reservoir
• Replace water as needed. • For opthalmic use, drain at the end of every workday, leave empty, and refill at the start of the next workday.
Water Bottle
• Empty the waste bottle every time you refill the reservoir. • Fill with water, up to MIN line marking. You may also add some chlorine-free disinfectant.
WEEKLY
Cassette
• Wash the interior of the cassette with dishwashing soap or a mild detergent that does not contain chlorine. • Scrub the inside with a cleaning pad designed for use with Teflon™-coated surfaces. • After removing all traces of the detergent, treat interior surfaces of the cassette with the STAT-DRI™ Plus drying agent to enhance the drying process. Order more STAT-DRI™ Plus from SciCan quoting 2OZPLUS, 8OZPLUST, or 32OZPLUS. Please note that STAT-DRI drying agent is not be to used with the U.S. G4 models (G4-121101 and G4-201103).
Biological and/or Air Filter
• Check the filter for dirt and moisture. Replace if dirty. Call for service if wet.
Water Reservoir Filter
• Check the water reservoir filter every week and clean if necessary. Replace only if necessary.
EVERY 6 MONTHS
Cassette Seal
• Replace every 500 cycles or six months (whichever is first), or whenever necessary.
Biological and/or Air Filter
• Replace every 500 cycles or six months (whichever is first).

Draining the Reservoir

If you have to service the reservoir, ship the STAT*IM*, or move the unit more than a short distance, the reservoir will need to be drained to prevent potential water damage to the internal components (particularly the electronic and electrical components) of the unit.

Also, in some regions of the world, local or national guidelines recommend routine draining and cleaning of the reservoir to reduce the potential of the accumulation of contaminants in the feed water.

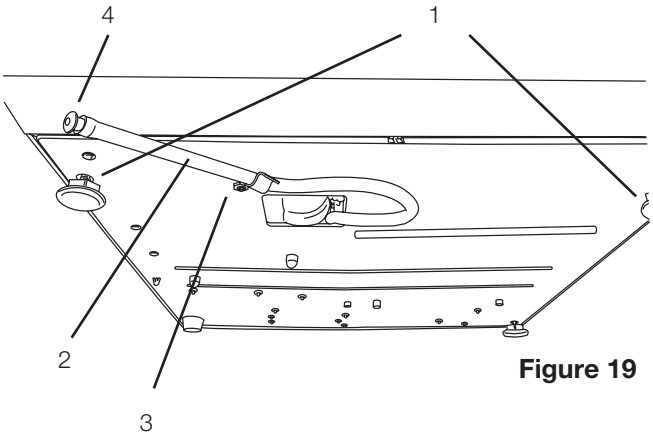


Figure 19

To drain the water from the reservoir, carefully move the STAT*IM* to the edge of the work surface and proceed as follows (see Figure 19):

- The front leveler feet (1) should be approximately 12 mm (1/2 inch) from the edge so the unit remains securely seated on the work surface.
- Lift the front left corner of the STAT*IM* upward and remove the drain tube (2) from the clip (3) located on the underside of the unit. Gently pull the tube out as far as possible so the free end can be positioned over a container when the unit is lowered back to the work surface.
- Remove the stopper (4) from the end of the drain tube and allow the water to drain from the reservoir.
- When water no longer drips from the drain tube, replace the stopper.
- Lift the front left corner of the STAT*IM* upward and re-insert the tube into the clip on the underside of the unit. Push the excess length of tubing back into the unit.

Cleaning the Cassette

Keeping the STAT*IM* cassette clean is good clinical practice and assists in the proper functioning of the unit. SciCan recommends that the interior surface be cleaned at least once a week. Cleaning the inside of your cassette is very important if you regularly sterilize lubricated instruments.

Use dish washing soap or a mild detergent that does not contain chlorine. Scrub the inside of the cassette with a cleaning pad designed for use with Teflon™ coated surfaces. After scouring, rinse thoroughly with water to remove all traces of the detergent.

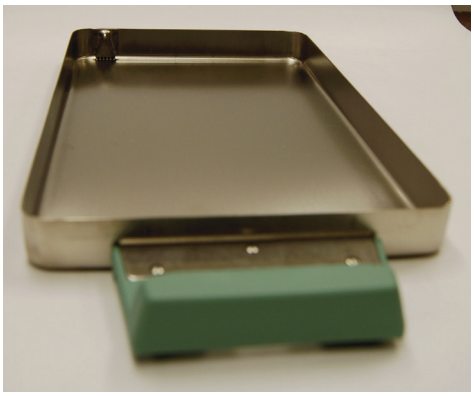


Figure 20

Coating the entire inside surface with STAT-DRI drying agent induces water to form an even coat on the inside surface, without beading. The water in contact with the hot cassette surfaces also evaporates much more efficiently. Spotting is minimized and instruments dry much better.

STAT-DRI should be applied every 10 cycles, and after every cassette cleaning.

STAT-DRI is available from your SciCan Dealer. Please note that STAT-DRI drying agent is not be to used with the U.S. G4 models (G4-121101 and G4-201103).

Cleaning the Water Reservoir Filter (where fitted)

This water reservoir filter should be cleaned at least once a week or when required. The filter can easily be removed and cleaned by placing the filter upside down under running water to wash away the particles until clean, and then placed back into the reservoir opening. Replacement water reservoir filters are available from you SciCan dealer.

Figure 21

Cleaning the Water Reservoir

Check the reservoir for dirt or particles. The reservoir may be cleaned by draining followed by cleaning and rinsing with steam process distilled water ONLY. Use of chemicals or cleaning agents is not recommended and could cause damage to the unit.

Changing the air filter and bacteria retentive filter (where fitted)

Never re-use an old filter. Never run the unit without a clean filter in place.

After each sterilization cycle, the compressor forces air through the cassette to rid it of steam and to dry the instruments. The air is drawn into the compressor through one or two filters located at the back of the unit, depending upon which unit is being serviced.

Note: that some units may not have both or either filters fitted depending on age, unit type, compressor type, or if a compressor is fitted.

Filters on the STAT*IM* 2000/2000S/2000 G4

The STAT*IM* 2000 type units draw air into the compressor (where fitted) through a circular foam air filter located behind a cover plate on the rear of the compressor. This plate can be accessed from the rear of the unit with the cover still attached. The air is then directed to the steam generator and cassette, by the compressor, through a bacteria-retentive air filter (where fitted) which is held in a bracket attached to the rear cover of the unit. If both filters are present, always change both filters at the same time.

To change the filters, proceed as follows (see Figure 22):

Bacteria Retentive Filter

1. Disconnect the inlet tube (1) from the bacteria-retentive filter (3) and remove the filter from the filter bracket (4). Note the orientation of the Arrow mark on the filter and bracket.
2. When the filter is free of the bracket, carefully disconnect the outlet tube (2) from the filter. Do not pull on this tube.
3. Before installing the replacement bacteria-retentive filter check that the arrow mark on the filter matches the direction of the arrow on the bracket. Push the left hand filter fitting into the outlet tube.
4. Gently press the replacement filter into the filter bracket. The arrow mark on the filter is facing out and pointing to the left.
5. Re-connect the inlet tube to the right-hand filter fitting.

Compressor Filter

1. Remove the screw (5) holding the compressor plate (6) to the back of the compressor (7).Remove the plate.
2. Remove and discard the old filter.
3. Install the new filter (8), and secure the compressor plate to the rear of the compressor using the screw retained from disassembly.

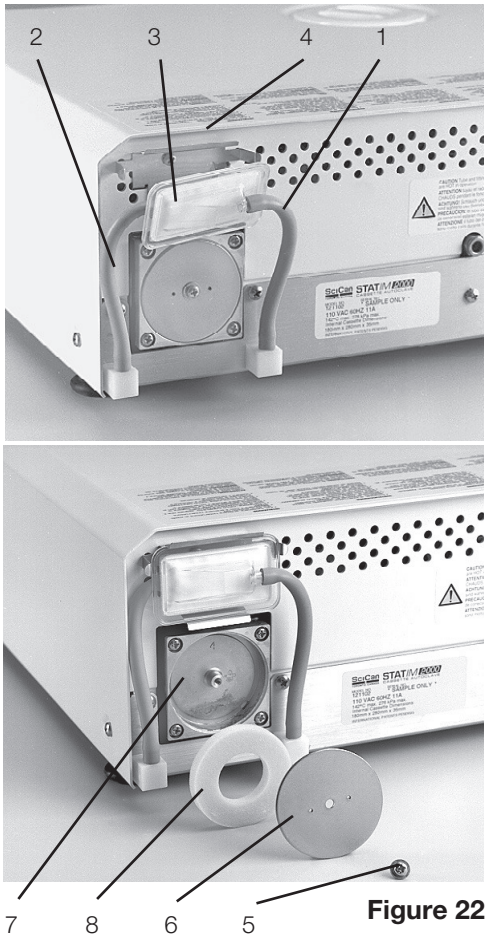


Figure 22

Filters on the STAT*IM* 5000/5000S/5000 G4

The STAT*IM* 5000 type unit draws air into the compressor via a tube connected to a cylindrical air filter located on the chassis behind bacteria retentive filter bracket. **Note: On certain 5000 models (dependent on compressor type) this filter may not be fitted.** The air is then directed to the steam generator and cassette, by the compressor, through a bacteria-retentive air filter which is held in a bracket attached to the rear cover of the unit. If both filters are present, always change both filters at the same time (see diagram below).

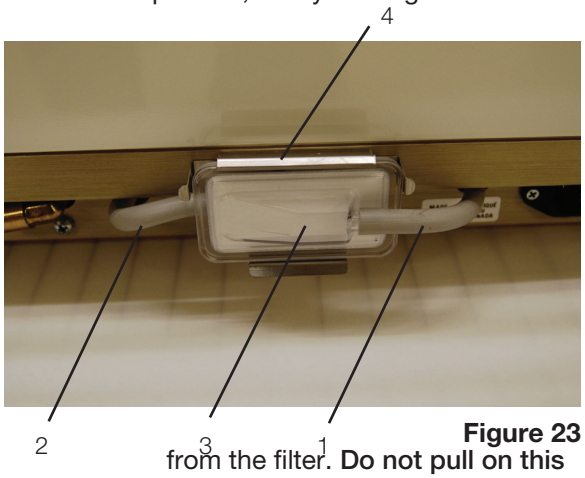


Figure 23

To change the filters (where fitted), proceed as follows (see diagram above):

Bacteria-Retentive Filter

1. Disconnect the inlet tube (1) from the bacteria-retentive filter (3) and remove the filter from the filter bracket (4). Note the orientation of the arrow mark on the filter and bracket.
2. When the filter is free of the bracket, carefully disconnect the outlet tube (2) from the filter. **Do not pull on this**

tube.

3. Before installing the replacement bacteria-retentive filter check that the arrow mark on the filter matches the direction of the arrow on the bracket. Push the left hand filter fitting into the outlet tube.
4. Gently press the replacement filter into the filter bracket. The arrow mark on the filter is facing out and pointing to the left.
5. Re-connect the inlet tube to the right hand filter fitting.

Compressor Filter

1. To enable access to the compressor filter, disconnect the inlet tube (4) from the bacteria-retentive filter (2) and remove the filter from the filter bracket (3). Note the orientation of the arrow mark on the filter and bracket.
2. When the filter is free of the bracket, locate and remove compressor filter (5) by unscrewing anti-clockwise using thumb and forefinger. Note: the filter should only be finger tight.
3. Install new compressor filter by screwing clockwise using thumb and forefinger. The filter should ONLY be finger tight. Tightening the filter using mechanical means may damage the filter or filter housing.
4. Gently press the bacteria retentive filter back into the filter bracket. The arrow mark on the filter is facing out and pointing to the left.
5. Re-connect the inlet tube to the right hand filter fitting.

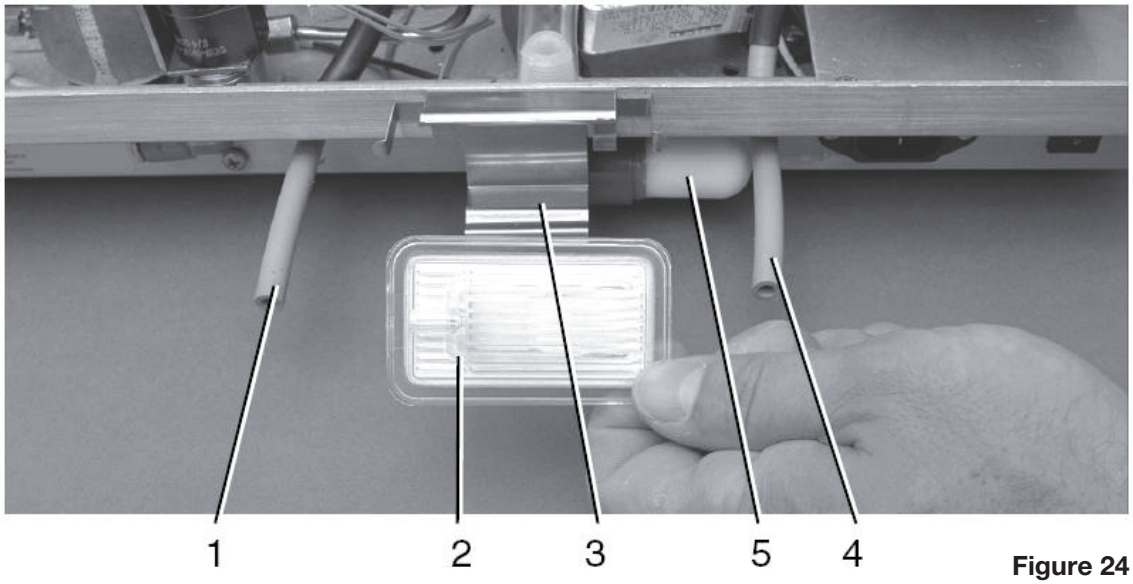


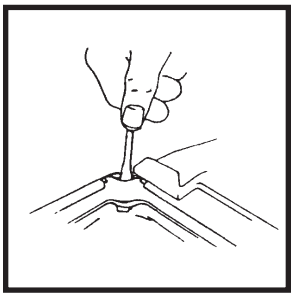
Figure 24

Replacing the Cassette Seal

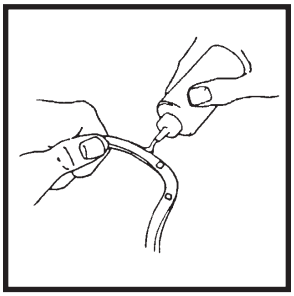
To ensure optimum performance of your STAT*IM* cassette autoclave, change the cassette seal every 500 cycles or every six months, whichever comes first. Replacement seals are available from SciCan (order number 01-100028S for STAT*IM* 2000 and 01-101649S for STAT*IM* 5000).

To change the cassette seal, follow these steps:

Place the cassette lid and the new seal on a clean work surface. Examine the position of the old seal in the cassette lid and arrange the new seal in the same orientation, next to the lid.

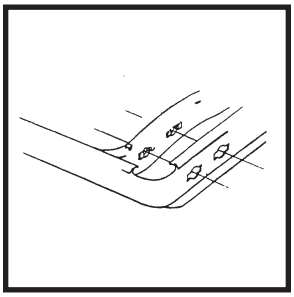


Remove the old seal by gently easing one corner of the seal out of the seal channel with a small screwdriver or similar device and then pull the remaining seal from the channel by hand. Ensure there are no sharp edges on the removal device that may damage the seal channel. Discard the old seal. Clean any residue out of the seal channel and flush out the channel with distilled water.



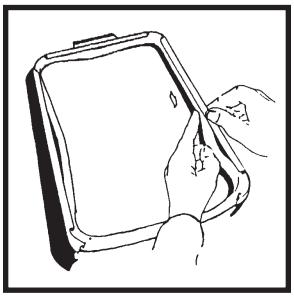
Lubricate the new seal with the liquid seal lubricant provided. Do not use an excess amount of liquid, only use sufficient liquid to lubricate the seal. **Note: the seal will appear to be slightly larger in length and width than the seal channel. This is intentional as the seal compresses into the channel when fitted to ensure the correct pressure on the base of the cassette when closed.**

Locate and align the steam inlet holes in the seal by inserting under the lip of the seal channel in the cassette lid and in line with the corresponding holes in the lid. The holes should be concentric to one another and the square tabs adjacent to the holes should be located evenly in the cut-outs in the cassette lid. Ensure seal sits firmly against the back of the channel.



Locate each corner of the seal under the lip of the seal channel in the cassette lid in the corresponding corners of the seal channel. At each corner, the two square tabs should be visible and located on the edges of the corner cut outs in the cassette lid.

Working from the centre position outwards on each side, locate the sides of the seal by inserting under the lip of the seal channel in the cassette lid and pushing the bottom section in until the seal sits firmly against the back of the channel. Ensure the seal is completely inserted. Running the thumb along the seal applying light pressure will allow you to feel any irregularities and evenly distribute the seal in the channel.



Note: During the first cycle after changing the seal, steam may appear between the lid and the tray as the seal seats. If this persists, remove the cassette and check that the seal is correctly installed.

Figure 25

Be careful. The metal parts will be hot, and the cassette may contain hot steam.

Cleaning the Cover

Use a soft cloth moistened with a mild cleaning solution or a mild disinfectant to clean all outside surfaces. Do not use solvents or harsh chemicals.

Shipping the unit

If you must ship your STAT*IM*, follow these directions:

1. Drain the reservoir. See Draining the Reservoir.
2. Screw in each leveler foot completely.
3. Repack your STAT*IM* in the original packing materials.
4. Specify heated and insured shipping.

Upgrading the firmware on STAT*IM* G4 units

Upgrading the Interface Software can be done from a USB drive (similar to the process currently used for the Datalogger firmware update), a MicroSD card or a web site. The easiest and fastest method is to use a USB drive.

To upgrade the firmware using a USB drive, proceed as follows:

1. Download new firmware. The firmware will be made available on MySciCan or emailed from SciCan upon request. It will be packed into a zip file (e.g. SL00R100.zip is the name of the current revision file, but the number will change with every revision) and must be extracted to a USB drive.
2. Check that you have the following files on the USB Drive:
   - firmware.ini
   - Firmware (Folder)
   - SL00R100_4_100_CAA29608.sci
   - cp.bat
   - firmware.ini

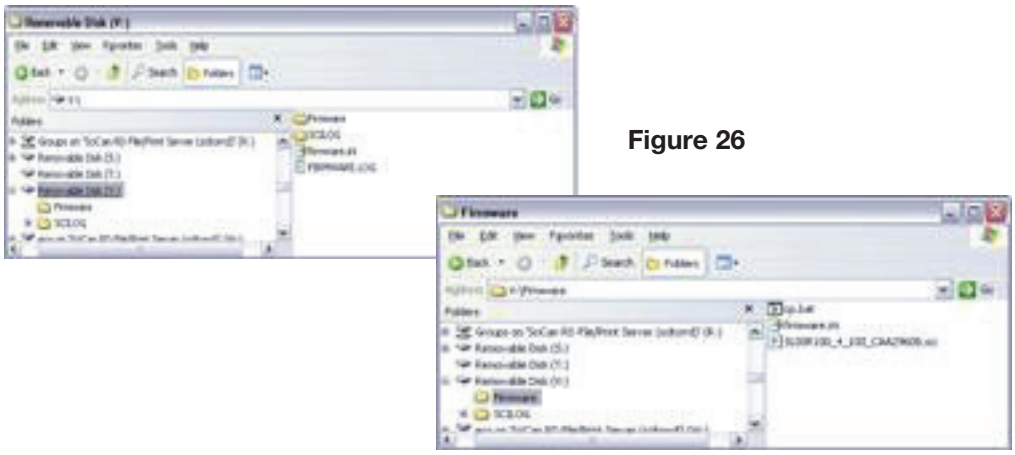


Figure 26

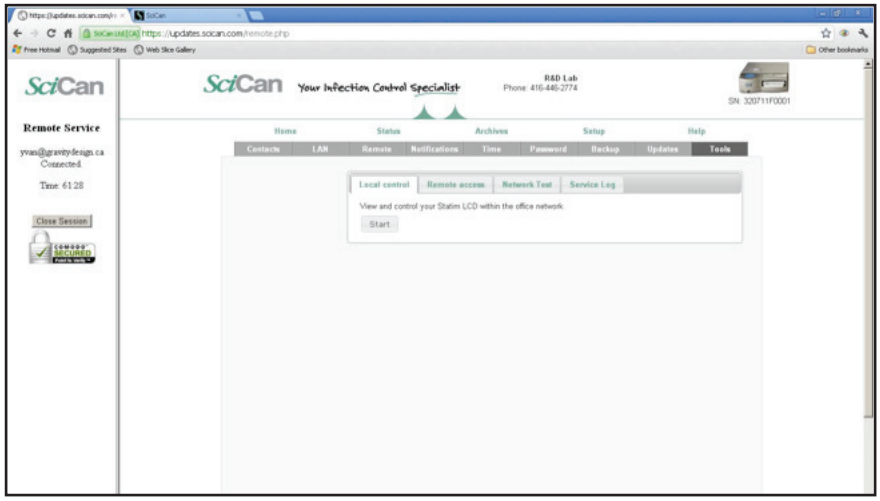
3. With the unit powered OFF, insert the USB drive loaded with the firmware update.
4. Power ON the unit. The firmware will be updated automatically using the USB drive. This should take approximately 6 minutes. NOTE: The USB icon on the LCD touchscreen will flash green while it is active. Do not remove the USB key while it is active.
5. When it is complete, the “Firmware.log” file on the USB drive will include the result of the upgrade (file name, upgrade OK, or upgrade failed, and for what reason).
6. Whether the upgrade is successful or unsuccessful, the “firmware.ini” file on the USB drive will be automatically deleted.
7. To retry or upgrade another unit, insert the USB drive into the PC’s USB port (**NOTE** there is currently no Mac version) and double-click the “cp.bat” file in the Firmware folder.Then remove the USB drive and repeat Steps 2 to 5.

Using the STAT*IM* G4 remote access function

Users can allow offsite technicians to remotely access the LCD touchscreens and web portals of STAT*IM* G4 units connected to a network.

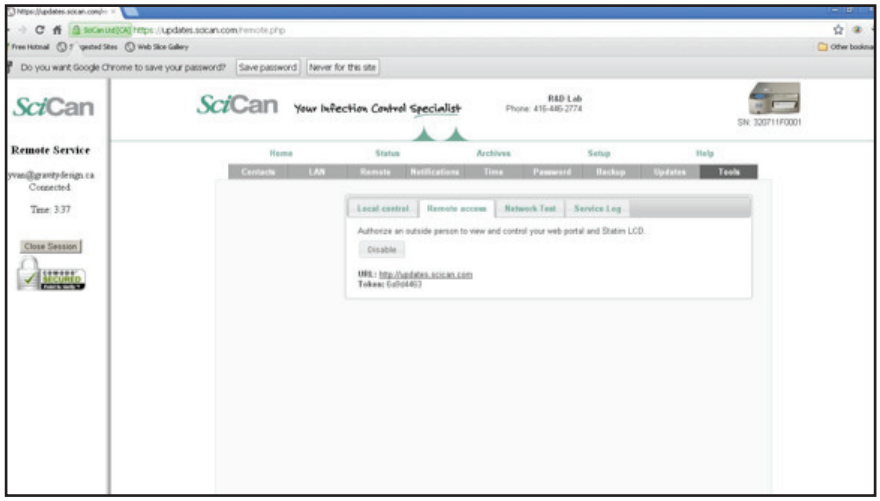
For local network remote access, proceed as follows:

1. From the TOOLS page, click on the LOCAL CONTROL tab.
2. Click on the start button to start a local connection. It will open up a page that mirrors your STAT*IM* unit's touchscreen so that it can be controlled remotely within your local network.

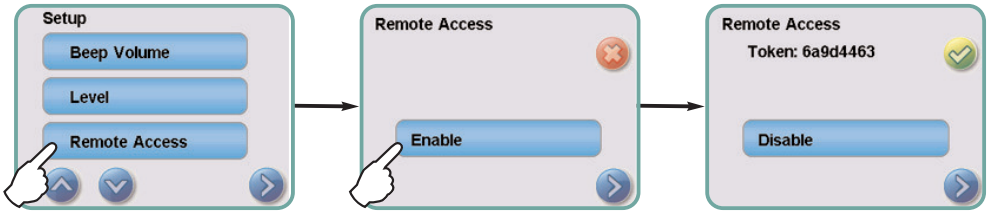


For remote access of a STAT*IM* web portal or touchscreen from outside a local network, proceed as follows:

1. Someone onsite with the unit or from within the network must provide access to an outside user by generating a 'token' (or code).
   - To generate a unique token using the web portal, go to the TOOLS page and click on the REMOTE ACCESS tab.



- To generate a unique token using the unit's LCD touchscreen, go to the Settings menu and scroll to Remote access and follow the prompts to enable remote access.



2. The technician attempting to access the G4 from outside the network will need to go to the following URL: http://updates.scican.com and enter their registered email address, password, token and STAT*IM* Serial Number (optional).

   To create a new account to enable remote access for a STAT*IM*, click on the CREATE NEW ACCOUNT link, complete the form, and click on the SUBMIT FORM link. The system will send a confirmation email to verify the account. Once confirmed, the account will be ready to use.

   With a valid user name, password and token, a technician can remotely access the STAT*IM* G4 unit's web portal page.

3. Go to SETUP. Another username and password prompt will appear.

   To access the web portal only, use the following default values:
   User name: scican
   User password: scican (user can change this password)

   To access the web portal and remote access the LCD touchscreen, use the following default values:
   User name: scican
   User password: s23can173

4. Upon authentication, go to TOOLS and click on REMOTE ACCESS. A page will open that mirrors the STAT*IM* unit's touchscreen so that it can be controlled remotely from outside its local network.

Electrical safety testing

Dielectric Strength Test (Hi-Pot)

When mains electrical components are serviced or replaced and when the unit cover is removed and reinstalled following servicing, the dielectric strength of the electrical insulation between the mains and user-accessible conductive parts must be tested to ensure continued compliance of the unit with applicable international safety standards.

Exercise caution while performing this test. Hazardous voltages are present. Do not touch the unit, or allow the unit to touch any conductive surfaces during the test.

Perform the test using a dielectric strength (hi-pot) tester operated in accordance with the manufacturer's written instructions using the following parameters:

STAT*IM* Classic 5000 units
W-Ramp: 2 Seconds
W-Volt: 1500 V
Dwell Time: 2 Seconds
W-High: 3.5mA
W-Low: 0.05mA
Frequency: 60 HZ
Continuity: OFF

STAT*IM* G4 5000 units
W-Ramp: 2 Seconds
W-Volt: 1500 V
Dwell Time: 2 Seconds
W-High: 6.0mA
W-Low: 0.05mA
Frequency: 60 Hz
Continuity: OFF

Connection Points:
A. Unit chassis
B. Live and neutral terminals of the mains plug connected together.

For the unit being tested to pass, there must be no breakdown of the insulation or any flashover.

Protective Bonding Impedance Test (Ground Continuity)

Applicable international safety standards require that the impedance between the protective conductor terminal of the power entry connector and any user-accessible conductive parts must not exceed 0.1 ohms. If any components of the protective earthing system are changed or any connections of that system are broken and remade, the impedance of the protective bonding must be tested and verified as being less than 0.1 ohms using test equipment and procedures in compliance with applicable International safety standards and national, state, provincial, and regional laws and regulations.

Water Conductivity Testing

Water conductivity testing determines the amount of dissolved solids in the steam-process distilled water used in the STAT*IM* unit. Use only steam-process distilled water having 5 ppm or less dissolved solids or a conductivity of less than 10 µS / cm. Follow the manufacturer's instructions to test water conductivity using SciCan conductivity meter, part #01-103139S, or any other equivalent Meter.

Temperature has a significant effect on conductivity readings, therefore the water being tested should be at room temperature.

Water Conductivity Measurement

Figure 27

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Diagnostics and Troubleshooting

When a STAT*IM* unit fails to function correctly it is designed to 'fail safe' so that if sterilization conditions are not met, a message or cycle fault will appear on the display to inform you of the failure.

Depending on the age, type and controller variant of the machine, there are a number of things you can do to understand the problem. The following chapter contains guidance on what can be done on the various unit types.

Basic mechanical diagnostics

If the immediate cause of the problem is unknown and a cycle fault is unavailable, the following functional checks are recommended:

- Inspect the unit for external damage.
- Remove the cover and inspect the unit for internal damage.
- Attach a control box and power ON the unit (if possible) and run a cycle to see if the problem can be replicated.
- While the unit is running, check for steam leaks in the pipe work, cassette or check valve.
- Visually inspect the bacterial filter and compressor filter for signs of contamination.
- Perform component tests to determine the operational status of the solenoid valve, pump and compressor (if fitted).
- Perform a pump flow check.
- Check calibration status of the unit.

Using software as a diagnostic tool

Depending on the software in the problem unit there are a variety of things you can do to gather information to help with diagnosis. This varies from unit to unit and you will find that the newer the unit, the more options are available.

For units with revision 2.x/5.x and 6.x controllers (no service menu)

For the above controller boards with version 2.xx and higher software it is possible to print out the last complete or incomplete cycle as a diagnostic tool. If the unit does not have a printer or if the printer was not connected when the fault occurred, a STAT*IM* printer can still be used as a diagnostic tool, however the time and date printed on the report may not be valid.

To print the last cycle information, proceed as follows:

1. Turn the STAT*IM* OFF and remove the cover.

2. Install a calibration jumper on controller board header W1 located to the left of the microprocessor. Connect a control box and printer to the controller board and enable the printer.

3. Turn the STAT/*M* ON. The unit is now in calibrating mode.

4. For version 2 and 3 software without selecting a cycle, press the START button. For other versions of software press the “Wrapped” button.

5. The printer will print the last complete or incomplete cycle. This information can be useful in diagnosing intermittent problems when the cycle fault code has not been recorded.

For units with revision 7.x controllers (with service menu), including G4

All revision units fitted with revision 7.x controllers have a service menu which is designed to:

- Provide information on the setup of the machine.
- Allow the changing or resetting of various machine parameters.
- Operate various aspects of the unit with the cover on as opposed to using a control box.

Certain information provided in this menu may be used to assist in diagnostics.

Using the service menu on the STATIM Classic (Rev. 7 controller board)

The service menu can be displayed on the LCD screen of any STAT/*M* Classic with a Rev. 7 board by leaving the cover on, or using the LCD screen of the control box if the cover is removed and detached from the unit.

- To enter the Service Menu, power ON the STAT/*M* while holding down the “Unwrapped” and “Wrapped” keys.
- You will then be prompted to enter the service password to allow you to enter the service menu.
- The default password is entered by pressing the “Unwrapped”, “Wrapped”, “Rubber and Plastics” and “Stop” keys in that order.
- The service technician can change this password. In case the changed password is lost or has been changed by another technician, a backdoor password can be used (which can not be changed) by pressing the “Unwrapped”, “Wrapped”, “Unwrapped”, “Wrapped” keys in this order.

The following menu is now available and the display on the LCD screen of the unit or control box will be a two-line display as highlighted by the **bolded** box in the following table.

>Calibration Time/Date setup	
Language setup	
Unit ID setup	
Set cycle counter	
Lock cycles	For S class units only
Conductivity setup	
Water. cnd tmp. comp	
Last printout	
Stored CF printouts	
Clear CF printouts	
Display last CF#	
Devices test On/Off	
Temperature offset	
Press. atm. offset	For S class units only
Press. ster. offset	For S class units only
Press. sensor type	For S class units only
Validation offset	For non-S class units only
Voltage calibration	
Voltage setup	
Repeater mode	
RS232	
End of line CR/LF	
Serial port bitrate	
Printer user ß char	
Factory default	
Change password	
Backup NVRAM	
Restore NVRAM	
Save and exit	
Exit	
Water pump type	
Production cycle	

Note that to navigate the menu you can use the keypad buttons that will operate the following selections:

“Unwrapped” button - Selects the next item in the menu (down)
“Wrapped” button - Selects the previous item in the menu (up)
“Rubber and Plastics” button - Enters the indicated sub-menu item (as indicated by the cursor “>”)
“Stop” button - Exits the menu and returns the unit to operational mode

NOTE: For some functions (depending on the function of the sub menu), pressing the "Stop" button may NOT save the changes. When changes made to unit values are NOT saved after pressing the STOP button and the unit returns to the service menu, always select SAVE AND EXIT if you wish to save any new values.

Sub Menu items (Activated by the "Rubber and Plastics" button when the cursor ">" is next to the description):

>Calibration

This will display the calibration screen relevant to the specific revision 7 unit and allow you to perform calibration operations. For calibration information, refer to calibration procedure 4 in Chapter 4 of this manual (non S class) or calibration procedure 7 in Chapter 5 of this manual (S class).

>Time/Date Setup

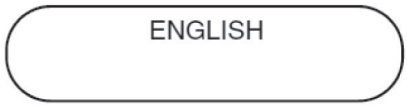
Display when setting the Date / Time

There are 5 selectable items (fields), hours, minutes, date, month and year. After entering the menu, the 'hour' value will be highlighted.

Using the cycle buttons to select and change the selected field's value.

1. To increase a field's value, press the UNWRAPPED cycle button. Holding the button down will increase the value until released.
2. To decrease the value, press the WRAPPED cycle button.
3. To select the next field, press the RUBBER & PLASTICS cycle button.
4. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
5. To quit without making changes, power the STAT*IM* **OFF**.

>Language Setup



Display when scrolling through languages

There are many languages available in the STAT*IM*, which will display the operating information on the LCD in the respective language chosen.

The default language in all units is ENGLISH, and on entering the language setup sub-menu, alternative languages can be accessed as follows:

1. Press the UNWRAPPED cycle button to scroll to the next language (down).
2. Press the WRAPPED cycle button to scroll to the previous language (up).

3. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
4. To quit without making changes, power the STAT*IM* **OFF**.

>Unit ID Setup

Display when assigning unit number

This function allows the user to assign a unique, 3-digit number to a STAT*IM* unit if they have more than one. This allows traceability of recorded data (printed or electronic) to individual units.

On entering the ID sub menu, the first digit will be highlighted and can be changed as follows:

1. The UNWRAPPED button will increase the selected value (0, 1, 2, 3, etc.) and the WRAPPED cycle button will decrease it (0, 9, 8, etc).
2. To move to the next digit, press the RUBBER & PLASTICS button.
3. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
4. To quit without making changes, power the STAT*IM* **OFF**.

>Set Cycle Counter

Screen display when in set cycle counter sub menu.

This function allows the technician to change the cycle count of the unit. This is designed to be used when a complete controller change is necessary and the customer needs to have continuity of the cycle count on their records. A new controller will display 000000, but the ‘old’ cycle number can be re-introduced.

On entering the Set Cycle Counter sub menu, the first digit will be highlighted and can be changed as follows:

1. The UNWRAPPED button will increase the selected value (0, 1, 2, 3, etc.) and the WRAPPED cycle button will decrease it (0, 9, 8, etc).
2. To move to the next digit, press the RUBBER & PLASTICS button.
3. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
4. To quit without making changes, power the STAT*IM* **OFF**.

>Lock Cycles (S class units ONLY)

‘S’ class STAT*IM* units with revision 6.x and 7.x controllers boards have 7 sterilization cycles available as opposed to 3 (pre 2004 2000S units) or 4 (pre 2004 5000S units) sterilization cycles. This means that unlike the earlier (pre 2004) units, each cycle selection button (except extra drying) has 2 or 3 cycles per button as opposed to the single cycle on earlier units. These multiple cycles

per button can be accessed by pressing any specific button repeatedly until the desired cycle is selected. This cycle is automatically the first cycle to show on the display the next time the cycle button is pressed.

Note that units with Revision 6.x controller boards (rev 4.xx/5.xx software) DO NOT have a service menu, so the locking/unlocking procedure is different.

If you do not require some of the extra cycles, each button can have the redundant cycles 'locked out' to simplify cycle selection. **Note that in 'locked' mode, each cycle button will only have one cycle available. Single buttons cannot be locked, it must be all or none.**

The cycles available on all 'S' class units mentioned above are as follows:

Button	Cycle name	Sterilisation temperature	Sterilisation time (minutes)
	SOLID UNWRAPPED	134°C	3:30
	HOLLOW UNWRAPPED	134°C	3:30
	HOLLOW UNWRAPPED	134°C	18:00
	HOLLOW WRAPPED**	134°C	3:30
	HOLLOW WRAPPED	134°C	18:00
	RUBBER/PLASTIC	121°C	15:00
	RUBBER/PLASTIC	121°C	30:00
	AIR DRYING ONLY	Not a sterilisation cycle	

- Solid Unwrapped 134ºC/3.5 min (N)
- Hollow Unwrapped 134ºC/3.5 min (S)
- Hollow Unwrapped 134ºC/18 min (S)
- Hollow Wrapped 134ºC/3.5 min (S)
- Hollow Wrapped 134ºC/18 min (S)
- Rubber and Plastics 121ºC/15min (S)
- Rubber and Plastics 121ºC/30min (S)

Locking procedure for revision 6.x controller boards/software revision R4xx and R5xx

1. Turn the unit **ON**.
2. Press "Unwrapped" button repeatedly until the desired cycle is displayed.
3. Press "Wrapped" button repeatedly until the desired cycle is displayed.
4. Press "Rubber and Plastics" button repeatedly until the desired cycle is displayed.
5. Turn the unit **OFF**.
6. Install a calibration jumper on Controller Board pins marked W1.
7. Keep button "Rubber and Plastics" pressed and turn the unit **ON**. The unit will enter "Cycle lock/unlock mode"

8. Upon entering this mode the display will show the following for a short time:

Cycle UNLOCKED Available cycles

And then, it will display **all of the available** cycles (7 cycles).

9. Press the “Unwrapped” button and the unit will **“lock in”** the cycles selected at steps 2, 3 and 4, and **“lock out”** the unselected cycles. The display will show for a short time:

Cycle LOCKED Available cycles

And then, it will display **only** the cycles selected (3 cycles + drying) at steps 2, 3 and 4 plus the drying cycle.

10. Please note that if the “Unwrapped” button is pressed again the cycles will be unlocked and so on.
11. Turn unit off and remove calibration jumper. The changes will be saved **automatically**.
12. For unlocking the cycles on a unit with locked cycles, follow steps 6 and 7. Upon entering locking/unlocking mode the display will show:

Cycle LOCKED Available cycles

And display only the selected cycles.

13. Press the “Unwrapped” button to unlock the cycles.
14. The display will now show the following, for a short time:

Cycle UNLOCKED Available cycles

And then, it will display all of the available cycles (7 cycles).

15. Turn unit off and remove calibration jumper. The changes will be saved **automatically**.

Locking procedure for revision 7.x controller boards/software revision R6xx

1. Turn the unit **ON**.
2. Press “Unwrapped” button repeatedly until the desired cycle is displayed.
3. Press “Wrapped” button repeatedly until the desired cycle is displayed.
4. Press “Rubber and Plastics” button repeatedly until the desired cycle is displayed.
5. Turn the unit **OFF**.
6. Press and hold the “Unwrapped” and “Wrapped” buttons together and switch the unit **ON**.
7. You should now have entered the ‘Service Menu’ and you will be asked for a password. The default unit password is entered by pressing the “Unwrapped”, “Wrapped”, “Rubber and Plastics” and “Stop” buttons.
8. The display should now show the following:

>Calibration Time/Date Setup

9. Using the “Unwrapped” and “Wrapped” buttons, scroll down or up the service menu list until the sub menu title **“Lock Cycles”** appears next to the “>” cursor.
10. Now press the “Rubber and Plastics” button to enter the **Locking** sub menu.
11. Upon entering this menu the display will show the following for a short time:

Cycle UNLOCKED Available cycles

And then, it will display all of the available cycles (7 cycles).

12. Press the “Unwrapped” button and the unit will **“lock in”** the cycles selected at steps 2, 3 and 4, and **“lock out”** the unselected cycles. The display will show for a short time:

Cycle LOCKED Selected cycles

And then, it will display **only** the cycles selected (3 cycles + drying) at steps 2,3 and 4 plus the drying cycle.

13. Please note that if the “Unwrapped” button is pressed again the cycles will be unlocked and so on.
14. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
15. To quit without making changes, power the STAT*IM* **OFF**.

16. For unlocking the cycles on a unit with locked cycles, follow steps 6 to 10. Upon entering locking/unlocking mode the display will show:

Cycle LOCKED Selected cycles

And display only the selected cycles.

17. Press the “Unwrapped” button to unlock the cycles.
18. The display will now show the following for a short time:

Cycle UNLOCKED Available cycles

And then, it will display all of the available cycles (7 cycles).

19. To save changes and return to the regular operating mode, press the STOP button. The changes will be saved **automatically**.
20. To quit without making changes, power the STAT*IM* **OFF**.

>Conductivity Setup

CD=xx.xuS/NNN/y.yppm L=LL.L H=HH.H G=G.GG

Screen display when in Conductivity setup sub menu.

STAT*IM* units monitor water quality using conductivity. The default settings are based on the minimum level required to detect water in the unit (except units fitted with a float – see below) and the maximum level required to protect the internal components from damage due to mineral deposits (e.g. Calcium) on the internal surfaces.

This function allows the technician to adjust the water conductivity threshold. This may be required after a change of sensor and should be checked after a controller or software change.

Up to 2008, all units used the water sensor to detect both water quality and water level. In 2008, all units were upgraded with a float in the chamber to detect level, which allowed the sensor just to monitor quality.

The default conductivity setup is as follows:

Note that these settings should NOT be changed to suit water used as damage MAY occur to the components of the STAT*IM*.

Units with sensor but WITHOUT float

- **LL.L** (Lower value threshold / No water threshold. Values lower than this triggers "Refill reservoir empty waste bottle" error) = **0.3uS**
- **HH.H** (Upper value threshold / Bad water quality threshold. Values higher than this triggers "Water quality unacceptable" error) = **10.0uS**
- **G.GG** Water conductivity circuit gain. Default value **1.00**

Units with sensor and WITH float

- **LL.L** (Lower value threshold / No water threshold. Values lower than this triggers "Refill reservoir empty waste bottle" error) = **FLOAT**
- **HH.H** (Upper value threshold / Bad water quality threshold. Values higher than this triggers "Water quality unacceptable" error) = **10.0uS**
- **G.GG** Water conductivity circuit gain. Default value **1.00**

On entering the Conductivity setup sub menu, the first digit will be highlighted and can be changed as follows:

```
CD=xx.xuS/NNN/y.yppm
L=LL.L H=HH.H G=G.GG
```

The flashing value indicates the currently selected field.

The values shown on the screen are as follows:

xx.x – Actual water conductivity in uS (micro-Siemens) as read by the unit software.

NNN - Water conductivity in ADC (Analog to Digital converter) counts (0…255)

y.y - Water quality in ppm (parts per million) as read by the unit software.

LL.L - Lower value threshold / No water threshold/Float status.

HH.H - High value threshold / Water quality threshold.

G.GG - Water conductivity circuit gain

Note that xx.x, NNN and y.y are for information only as measured by the unit software and can not be changed.

Changes to the threshold value may be changed as follows:

1. The UNWRAPPED button will increase the selected value and the WRAPPED cycle button will decrease it.
2. To move to the next value, press the RUBBER / PLASTIC button.
3. To save changes and return to the regular operating mode, press the **STOP** button. The changes will be saved **automatically**.
4. To quit without making changes, power the STAT*IM* **OFF**.

>Water.Cnd Tmp. Comp

Screen display when in Water.Cnd Tmp. Comp sub menu.

Electrical conductivity can change with temperature and as a result provide a false reading possibly causing the unit to show a water quality/level fault when the water is in fact good. To overcome this, revision 7 STAT*IM* units have water conductivity temperature compensation built in to the software to overcome this potential problem.

The default setting on all STAT*IM* units is **ON**. To change this (NOT recommended) or to reset this condition should it change as a result of a software or controller change, follow these steps:

1. The UNWRAPPED or WRAPPED keys will switch the screen display to "**ON**" or "**OFF**" depending on the opening display.
2. The RUBBER & PLASTICS key will save the change and return the unit to the service menu.
3. Pressing the STOP key will exit without saving and return the unit to the operational menu.

>Stored CF Printouts

When this function is activated, this sub menu will send saved Cycle Faults to a printer or SciCan Data Logger. The unit will then default back to the normal operational menu.

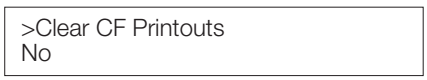
Note that the saved CF printouts will ONLY be sent to the printer or Data Logger when either one is attached and configured.

The following types of errors are saved:

- Cycle Faults (CF)
- Water quality or Water level low errors
- Cycle interrupted due to errors (##)

Pressing the STOP key will exit and return the unit to the operational menu.

>Clear CF Printouts



Screen display when in Clear CF Printouts sub menu.

This function will reset the cycle fault list. The options are "**YES**" (clear the list) or "**NO**" (do not clear the list.

The default setting on all STAT*IM* units is **NO**. To clear the list, proceed as follows as follows:

1. The UNWRAPPED or WRAPPED keys will switch the screen display to "**YES**" or "**NO**" depending on the opening display.
2. The RUBBER & PLASTICS key will save your selection and return the unit to the service menu condition.
3. Pressing the STOP key will exit without changes and return the unit to the operational menu.

>Display last CF number (#)

```
>Display last CF#
## (######)
```

Screen display when in Display last CF# sub menu.

This sub menu is for information only.

This function will allow you to observe the last fault condition of the unit for diagnostic purposes.

1. The display will show the CF number (## above) and the cycle number when the fault occurred ((######)).
2. Pressing the RUBBER & PLASTICS key will return the unit to the service menu.
3. Pressing the STOP key will return the unit to the operational menu.

>Devices Test ON/OFF

```
>Devices Test On/Off
Pump Off
```

Screen display when in Devices Test ON/OFF sub menu.

This function on revision 7 STAT*IM* units allows the technician to activate a number of components for diagnostic purposes.

The list of components is as follows:

- Pump (water)
- Solenoid Valve (cassette must be disengaged)
- Compressor
- Yellow LED (cycle LED)
- Extra 1L (latched digital output – 7000 only - not used in 2000/5000)
- Extra 2L (latched digital output – 7000 only - not used in 2000/5000)
- Drawer relay (STAT*IM* 900 units only – not used on 2000/5000)

When in the service menu (and unit in standby), the default condition of these components is **OFF**.

Activating (and de-activating) components is achieved as follows:

1. Using the UNWRAPPED (down) or WRAPPED (up) buttons will scroll through the sub menu to the next component in the list.
2. Pressing the RUBBER & PLASTICS button will activate (switch on) and deactivate (switch off) the chosen component.
3. Pressing the STOP key will return the unit to the service menu.

>Temperature Offset

```
>Temperature Offset
##
```

Screen display when in Temperature Offset sub menu.

This sub menu is for information only.

= unit chamber thermocouple offset value.

This allows the chamber thermocouple offset value to be read without entering calibration mode. No changes can be made to the offset value in this sub menu.

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Press. Atm.Offset – (S class units ONLY)

```
>Press. Atm. Offset
##
```

Screen display when in Press. Atm.Offset sub menu.

This sub menu is for information only.

= unit pressure sensor (transducer) offset value at atmospheric pressure.

This allows the pressure sensor atmospheric offset value to be read without entering calibration mode. **No changes can be made to the offset value in this sub menu.**

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Press. Ster.Offset – (S class units ONLY)

```
>Press. Ster. Offset
##
```

Screen display when in Press. Ster. Offset sub menu.

This sub menu is for information only.

= unit pressure sensor (transducer) offset value for sterilisation conditions.

This allows the pressure sensor sterilisation offset value to be read without entering calibration mode. **No changes can be made to the offset value in this sub menu.**

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Press. Sensor Type – (S class units ONLY)

```
>Press. Sensor Type
68PSI
```

Screen display when in Press. Sensor Type sub menu.

This sub menu is for information only.

All S class STAT*IM* units are fitted with a pressure transducer that actively measures the pressure in the chamber. Two types of transducer were fitted (**60** p.s.i. and **68** p.s.i.) depending on the age and controller type of the unit.

Both transducers are visually the same but they are **NOT** interchangeable between units as each transducer requires type specific software for the unit to operate correctly.

Notes on how to identify the different types can be found in Chapter 9 of the service manual, but units with revision 7 controllers (including upgraded older units with the correct software) will show the pressure transducer type in this sub menu.

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Validation Offset – (Non S class units ONLY)

```
>Validation Offset
##
```

Screen display when in Validation Offset sub menu.

This sub menu is for information only.

= unit validation thermocouple offset value.

This allows the validation thermocouple offset value to be read without entering calibration mode. **No changes can be made to the offset value in this sub menu.**

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Voltage Calibration.

```
>Validation Calibration
V = VVV VCal. =CCC
```

Screen display when in Validation Offset sub menu.

This sub menu is for STAT*IM* 7000 units ONLY and is not used on 2000/5000 units.

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Voltage Setup

```
>Voltage setup
115V
```

Screen display when in voltage setup sub menu.

This sub menu is for information only.

This allows the unit voltage value to be read. **No changes can be made to the value in this sub menu.**

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Repeater Mode

```
>Repearer Mode
On
```

Screen display when in Repeater mode sub menu.

Repeater mode allows you to run a selected cycle continuously for bench testing. The cycle selected will run, vent and then dry for 2 minutes before re-setting and repeating.

The default setting on all STAT/*IM* units is **OFF**. To activate repeater mode, proceed as follows:

1. The UNWRAPPED or WRAPPED keys will both switch the screen display to "**ON**" (or "**OFF**" depending on the opening display).
2. The RUBBER & PLASTICS key will save the change and return the unit to the service menu condition.
3. Pressing the STOP key will exit without saving and return the unit to the operational menu.

>RS232

>End of Line CR/LF

>Serial Port Bitrate

>Printer uses º char

At this point in the service menu you will see a repeat of the items in the user menu used for setting up data recording devices such as printers and Data Logger. For details on setting up these items refer to the user manual or Chapter 12 of the service manual.

>Factory Default

```
>Factory default
No
```

Screen display when in factory default sub menu.

This function will reset the NVRAM (Non Volatile Random Access Memory) to the factory default settings.

Important Note: Any changes made to the chamber and voltage calibration offsets and conductivity settings will be reset.

The cycle counter will not be reset.
The default setting on all STAT/*M* units is **NO**.

The alternative is **YES, RESET NVRAM**.

To activate a reset, proceed as follows as follows:

1. The UNWRAPPED or WRAPPED keys will switch the screen display to "**YES, RESET NVRAM**".
2. The RUBBER & PLASTICS key will action your selection and return the unit to the service menu condition.
3. Pressing the STOP key will exit without changes and return the unit to the operational menu.

>Change Password

This function will allow you to change the default password (Unwrapped, Wrapped, Rubber and Plastics, Stop) to a new key/button sequence.

When entering this sub menu, the unit will prompt you as follows:

- The unit will ask you to enter a new 4-key password.

```
Type New Password
****
```

- Enter the new password.
- The unit will then ask you to re-enter the new password.

```
Retype New Password
****
```

- Re-enter the password.
- The unit will confirm that the password has been changed, or if changing the password failed, the unit will again ask you to enter a new 4-key password.

```
Password Changed
```

>Backup NVRAM

```
>Backup NVRAM
No
```

Screen display when in Backup NVRAM sub menu.

This function will allow the backup of any revised unit settings after calibration for example.

The default setting on all STAT/*M* units is **NO**.

The alternative is **YES**.

To activate NVRAM backup, proceed as follows:

1. The UNWRAPPED or WRAPPED keys will both switch the screen display to "**YES**".
2. The RUBBER & PLASTICS key will action your selection and return the unit to the service menu condition.
3. Pressing the STOP key will exit without changes and return the unit to the operational menu.

>Restore NVRAM

```
>Restore NVRAM
No
```

Screen display when in Restore NVRAM sub menu.

This function will allow the stored (backed up) unit settings to be restored if operational settings are lost for any reason.

The default setting on all STAT*/M* units is **NO**.

The alternative is **YES**.

To activate NVRAM restoration, proceed as follows:

1. The UNWRAPPED or WRAPPED keys will both switch the screen display to "**YES**".
2. The RUBBER & PLASTICS key will action your selection and return the unit to the service menu condition.
3. Pressing the STOP key will exit without changes and return the unit to the operational menu.

>Save and Exit

Allows any changes made in the sub menus (where the STOP button does not action save) to be saved and the unit will then exit to the operational menu.

To activate save and exit, press the RUBBER & PLASTICS button.

>Exit

Allows you to exit the service menu WITHOUT saving changes other than those changes saved by activating the STOP button.

To activate exit, press the RUBBER & PLASTICS button.

>Water Pump Type

```
>Water Pump Type
Ulka
```

Screen display when in Press. Sensor Type sub menu.

This sub menu is for information only.

This allows you to identify the type of water pump fitted to any revision 7 unit without removing the cover. **No changes can be made to the pump type in this sub menu.**

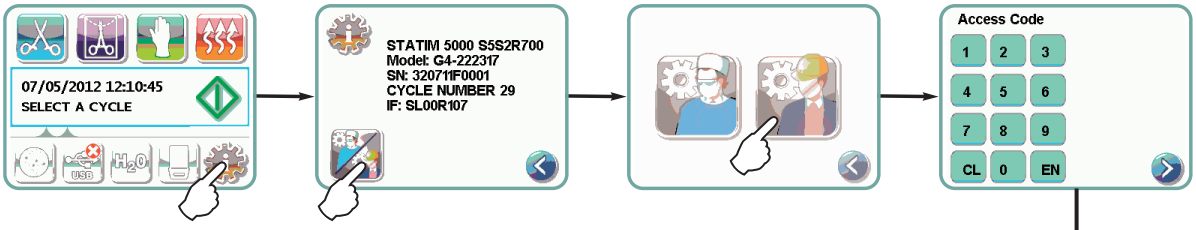
There are two specific pump types identified by this sub menu, the ULKA pump (fitted to later machines) and the INVENSYS or SCICAN pump (fitted to earlier units).

The pumps are **NOT** interchangeable between units as the each pump requires type specific software for the unit to operate correctly.

1. To return to the service menu, press the RUBBER & PLASTICS button.
2. To return to the operational menu, press the STOP key.

>Production cycle

This function is for manufacturing use only.



- Calibration
- Conductivity Setup
- Water Cnd Tmp. Comp.
- Devices Test On/Off
  - Test On/Off
  - Pump
  - Valve + Compressor
  - Drawer Relay
  - Extra 2L
  - Extra 1L
  - Yellow LED
  - Compressor
  - Valve
- Stored Printouts
- Clear CF Printouts
- Display Last CF#
- Calibration Offsets
- Repeater Mode
- Cycle Number
- Set Serial No.
- Model No.
- Factory Default
- Lock Cycles
- Firmware Upgrade
- NVRAM Tools
- Water Pump Type
- Time
- Date
- DST On/Off
- Recent Printouts
- Time 12/24
- Date Format
- Language
- Unit No.
- Water Quality
- Serial Number
- Printer Type
- Baud Rate
- End of Line CR/LF
- Printer user° char
- Process Enforced
- User
- Themes
- Screensaver
- LCD Contrast
- Network Setup
- Button Beep
- Beep Volume
- Steri. End buzzer
- Level
- Air Drying (available to non-S units only)
- Reset
- Local Control Quality
- Remote Access
- Instructions
- Country
- Dealer ID

Troubleshooting Cycle Faults

There are three types of cycle fault formats that can be seen on all STATIM 2000 and 5000 Classic and G4 units. They are as follows:

1. Cycle fault numbers and descriptions appropriate to **ONLY STAT*IM* 2000 non S units with revision 3.x and 4.x type controller boards.**

    - Typically, these will show a number preceded by "**Check Cassette**".
    - The display on the LCD screen will NOT show any software revision and will display "**SELECT A PROGRAM**" when switched on.

2. Cycle fault numbers and descriptions appropriate to **ALL STAT*IM* 2000 and 5000 units with revision 2.x/5.x/6.x and 7.x type controller boards** with revision 1.xx/2.xx/4.xx/5.xx and 6.xx software as appropriate.

    - These units will show a number preceded by "**CF**".
    - When the unit is switched on, a **software revision number** will be displayed for a short time on the top, right hand side of the LCD display (for example **S2S2R415**), depending on type (2000/5000), model (S or non S) and controller type.

3. Cycle fault **descriptions only** with no fault number. These are generic faults that do not necessarily occur as the result of a mechanical or electrical failure of the STAT*IM* unit but of a process error.

After identifying the unit you are trying to diagnose, refer to the following **troubleshooting guides** to assist in the diagnosis.

Cycle Fault Numbers and descriptions on units with revision 3.x and 4.x type controller boards

CF number	Description of Error Message	Probable Cause of Error Message
Check Cassette #1	The cassette temperature failed to reach 95°C in 3 minutes.	This error message occurs only during warm up. The most probable causes are: 1. Steam generator does not heat up. No power to steam generator. Blown thermal fuse. 2. Check for a large cassette leak or a large load.
Check Cassette #2	The cassette temperature failed to increase from 95°C to 100°C within 1 minute 20 seconds.	Most probable causes are a faulty cassette seal, miscalibration, a damaged cassette, improperly adjusted or failed microswitch allowing unit to function when cassette is not fully inserted. Occasionally, a low pressure weather system in higher altitude sites will alter the boiling temperature significantly and trigger this fault. Verify Vref to be 4.0V.
Check Cassette #3	The cassette has failed to pressurize and achieve a temperature of 110°C within 70 seconds of pressurization.	This may be caused by a faulty or worn cassette seal, a faulty or dirty solenoid valve, a damaged cassette or a faulty exhaust tube, leaky check valve or pressure relief valve.
Check Cassette #4	The cassette has failed to achieve sterilization conditions within 10 minutes of the chamber first reaching 102°C.	Several conditions may cause this: a damaged or worn cassette seal, a faulty solenoid valve, improperly installed copper tubing, cassette thermocouple misalignment or damage, a faulty steam generator pressure relief valve or a faulty check valve on.
Check Cassette #5	The software causes the pump to activate while between 2 minutes 44 seconds and 2 minutes 24 seconds remaining in the cycle. If a request to pump water occurs outside of 2 minutes 44 seconds, Check Cassette #5 occurs.	This indicates a substantial steam leak from the cassette, a contaminated steam generator or a weak pump.
Check Cassette #6	The steam generator temperature is more than 5°C higher than the chamber temperature.	Most probable causes are a blocked duct, a blocked solenoid valve, miscalibration or a pinched exhaust tube.
Check Cassette #7	The cassette temperature has dropped below 130.5°C during the sterilizing phase of the UNWRAPPED or WRAPPED Cycle, or below 117.5°C during the sterilizing phase of the RUBBER & PLASTIC Cycle.	Most probable cause is a faulty solenoid valve.
Check Cassette #8	The chamber temperature is more than 5°C higher than the steam generator temperature.	Most probable causes are thermocouple miscalibration or very strong pump delivery.
Check Cassette #9	This is a special error message for the U.K. market. The chamber temperature has exceeded 139°C during the UNWRAPPED/ WRAPPED Cycle, or has exceeded 126°C during the RUBBER & PLASTIC Cycle.	Most probable causes are a blocked or faulty solenoid valve or a pinched exhaust tube.
Service Needed	The steam generator temperature has exceeded 170°C, chamber temperature has exceeded 147°C, or the thermocouple is faulty.	Most probable causes are a blocked or faulty solenoid valve, a pinched exhaust tube, a broken thermocouple lead, an open, disconnected or defective thermocouple, a weak pump or a contaminated steam generator.
Check Cassette (without a number)	The cassette temperature has failed to drop to 103°C within a timeout period at the end of a cycle.	Most probable causes are a blocked exhaust duct in the cassette, a blocked or faulty solenoid valve or a pinched / kinked exhaust tube.

Cycle Fault Numbers and descriptions on units with revision 2.x/5.x/6.x and 7.x type controller boards (1.xx/2.xx/4.xx/5.xx and 6.xx software)

Tips for using this guide.

Unlike the previous guide (rev 3.x and 4.x controller boards) where all cycle fault numbers and descriptions are common to those specific controller board revisions irrespective of software, the following guide has been generated to cover all units from the introduction of controller board revision 2.x and have been standardized across the unit range of all STAT*IM* units irrespective of controller board or software revision.

There will be some cases of course where because of the unit type, a particular fault will not be appropriate (e.g. pressure faults on non S units where a pressure transducer is not fitted) so establishing the following criteria before looking up a fault reference will assist in easier diagnosis.

Note also that the 'probable cause(s)' of any fault shown in the following chart are a GUIDE only. There may be multiple faults and the fault displayed may be either the first problem the software has identified or as the result of a different but related issue. For example, a blown thermal fuse is only symptomatic of a boiler overheat, and not necessarily the cause of the failure, which may be through poor water delivery, so it would be useful to undertake an assessment of the unit as described earlier in this chapter under: "Basic mechanical diagnostics."

Before referring to the following guide, establish the following where possible:

- **STAT*IM* type (2000/5000)**
- **Model type ('S' or non 'S')**
- **Controller board revision (2.xx/5.xx etc.)**
  - **TIP:** this is usually found on the bottom right hand corner of the controller board except for revision 7 board where it may be located top right or bottom left depending on manufacturing revision. If in doubt, refer to Chapter 1 of this manual.
- **Software revision. (S2S2R415 for example, the R415 being the important part)**
  - **TIP:** this is usually found on the main microprocessor label, but the easiest method is by powering up the unit. On all of the revisions refered to in this chart, this will appear on the top right hand corner of the LCD display for a few seconds after power up. If in doubt, refer to chapter 1 of this manual.
- **Cycle Fault number.**

Note that there may be more than one of the same cycle fault which may be the same, but have different causes depending on the derivative of the unit, so when you have established these details, go to the CF number and use the 'unit type' and 'software revision' guide to establish if this particular CF is relevant (✓) or not (✖) as the case may be.

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
1	✔	✔	✔	✔	✔	✔	The cassette temperature failed to reach 95ºC within a time-out period.	• Large cassette leak • Overloaded cassette • Poor pump delivery • Blown thermal fuses • Contaminated steam generator • Failed steam generator triac • Steam generator fault (open circuit).
2	✔	✔	✔	✘	✘	✘	The cassette temperature failed to increase from 95°C to 100°C within a time-out period.	• Major steam leak • Overloaded cassette • Incorrect chamber calibration
3	✔	✔	✔	✔	✔	✔	The cassette has failed to pressurize and achieve a temperature of 110ºC within a time-out period.	This may be caused by a • Faulty cassette seal • Damaged cassette • Steam circuit leak (tubing) • Incorrect probe alignment • Sticking solenoid valve (open) • Check valve leak • PRV leak Check Vref is 2.520V± 0.001V (all software revisions OTHER THAN revision 6.xx)
4	✔	✔	✔	✔	✔	✔	The cassette has failed to achieve sterilization conditions within a timeout period.	This may be caused by a • Faulty cassette seal • Damaged cassette • Steam circuit leak (tubing) • Incorrect probe alignment • Sticking solenoid valve (open) • Check valve leak • PRV leak Check Vref is 2.520V± 0.001V (all software revisions OTHER THAN revision 6.xx)

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
5	✔	✔	1.xx only	✖	✖	✖	The software causes the pump to activate at predetermined times. If a request to pump water occurs outside of the predetermined time Cycle Fault #5 occurs.	• Leaky cassette • Kinked pump tube • Leaking solenoid valve • Poor pump delivery • Overloaded cassette

6 (i)	✔	✔	2.xx only	✔	✖	✖	The software has detected the filtered steam generator temperature 6°C greater than the chamber during the sterilizing phase of a cycle.	• Obstruction caused by:
								  ○ Seal misalignment
								  ○ Foreign material in the seal channel
								• Calibration imbalance (boiler thermocouple to chamber thermocouple)
								• Contaminated steam generator

6 (ii)	✖	✔	✖	✖	✔	✔	The software has detected the Validation thermocouple temperature to be 5°C greater than the chamber during the sterilizing phase of a cycle.	• Cassette steam leak • Sticking solenoid • Obstructed exhaust tubing (kink) • Calibration imbalance (validation thermocouple to chamber thermocouple) Check Vref is 2.520V± 0.001V (all software revisions OTHER THAN revision 6.xx)
7	✖	✔	✔	✔	✔	✔	During the sterilization phase of the cycle the cassette temperature has dropped below a threshold value.	• Sticking solenoid valve (open) • Cassette leak • Check valve leak • PRV leak

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
8 (i)	✱	✔	2.xx only	✔	✱	✱	The software has detected the filtered steam generator temperature 6°C less than the chamber during the sterilizing phase of a cycle.	• Contaminated steam generator • Failed steam generator • Calibration imbalance (boiler to chamber) • High pump flow
8 (ii)	✱	✔	✱	✱	✔	✔	The software has detected the Validation Thermocouple temperature to be 5°C less than the chamber temperature during the sterilizing phase of a cycle.	• Calibration imbalance (validation thermocouple to chamber thermocouple) • High pump flow • Blocked cassette exhaust duct • Sticking solenoid valve Check Vref is 2.520V± 0.001V (all software revisions OTHER THAN revision 6.xx)
9							Not used	
10	✔	✔	✔	✔	✔	✔	During conditioning (purging), the cassette temperature has failed to drop to115°C during the Unwrapped or Wrapped Cycle OR the temperature has failed to drop to 110°C during the Rubber and Plastics Cycle.	• Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Sticking solenoid valve (closed) • Failed solenoid coil
11	✔	✔	✔	✔	✔	✔	The cassette temperature has failed to drop to 102°C within a timeout period of the end of a cycle during venting.	• Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Sticking solenoid valve (closed) • Failed solenoid coil
12	✔	✔	✔	✔	✔	✔	This indicates a problem with the temperature measuring system.	• Broken or faulty thermocouple • Circuit failure on PCB
13							Not used	
14	✱	✔	✔	✱	✱	✱	The steam generator temperature is above 171°C during the sterilization phase of a cycle.	• Poor pump delivery • Calibration imbalance (boiler thermocouple to chamber thermocouple) • Failed water sensor (level)

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
15	✔	✔	✔	✔	✔	✔	The cassette temperature rose above the high threshold during the sterilization phase of a cycle or above 138.6°C during conditioning or pressurizing phase of the cycle	• Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Sticking solenoid valve (closed) • Failed solenoid coil
16	✔	✔	✔	✔	✔	✔	The steam generator temperature went above a threshold value. (overheat)	• Blocked pump filters • Weak pump • Blocked or kinked pump tube • Failed pump • Failed pump triac • Failed steam generator triac • Sticking solenoid valve (closed) • Failed solenoid coil • Faulty seal installation
17 - 18							Not used	
19	✱	✔	✔	✔	✔	✔	For software rev. R1xx, R2xx and R4xx the steam generator calibration is invalid. For software rev. R5xx and R6xx the validation thermocouple calibration is invalid.	• This occurs when a new controller board or microprocessor has been installed. This may also happen when the unit has been subjected to a strong static discharge corrupting the memory. • In both cases a new steam generator or validation thermocouple calibration is required.
20	✱	✔	✔	✱	✱	✱	The pump has failed to pump water into the steam generator during a pre-vent pump time-out. The steam generator temperature was greater than 140°C for 3.6 seconds after the pump was activated to pump water to cool the steam generator.	• Blocked pump filters • Weak pump • Blocked or kinked pump tube • Failed pump • Failed pump triac • Failed steam generator triac • Sticking solenoid valve (closed) • Failed solenoid coil • Faulty seal installation • Failed water sensor (level)
21 - 24							Not used	

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		

25	✔	✔	✔	✔	✔	✔	The software has failed to detect a need to pump water within 90 seconds of the start of the cycle.	• Blown thermal fuse (check the following)
								  ○ Pump delivery
								  ○ Steam generator triac
								• Steam generator fault (open circuit).

26 (i)	✱	✔	✔	✔	✱	✱	The sterilization phase has failed to start within 3 minutes of the cassette reaching the sterilization temperature. **Note: for rev 4.xx software only, the unit has to fail on 3 consecutive cycles for CF26 to display.**	• Calibration imbalance (boiler thermocouple to chamber thermocouple) • Poor pump delivery • Sticking solenoid valve • Check Vref is 2.520V± 0.001V
26 (ii)	✱	✔	✱	✱	✔	✔	The sterilization phase has failed to start within 3 minutes of the cassette reaching the sterilization temperature. **Note: the unit has to fail on 3 consecutive cycles for CF26 to display. "Cycle Interrupted" displayed for the first 2 occurrences.**	• Calibration imbalance (validation thermocouple to chamber thermocouple) • Poor pump delivery • Sticking solenoid valve • Check Vref is 2.520V± 0.001V **(rev 6.xx ONLY)**
27	✔	✔	✔	✔	✔	✔	The temperature of the steam generator failed to drop bellow a set-point temperature (150°C or 165°C) in a timeout period or during a panic pump situation.	• Poor pump delivery • Failed water sensor (level) • Contaminated steam generator
28	✔	✱	✔	✔	✔	✔	The cassette pressure rose above a ceiling value.	• Pressure measurement failure. • Calibration imbalance (pressure transducer to chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Blockage or restriction in pressure transducer tube
29							Not used	

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
30	✔	✱	✔	✔	✔	✔	The cassette temperature failed to reach the sterilization temperature within 15 seconds of the theoretical cassette temperature calculated from the measured cassette pressure reaching the sterilization temperature.	• Poor air removal during conditioning (exhaust blockage). • Calibration imbalance (pressure transducer or chamber thermocouple) • Blockage or restriction in pressure transducer tube
31 - 49							Not used	
50	✔	✱	✔	✔	✔	✔	For the Rubber and Plastics cycle, the chamber temperature dropped below the sterilization temperature, allowing for measurement error (i.e. Tchm < 121°C).	• Poor air removal during conditioning (exhaust blockage). • Not able to generate steam • Steam leak in the system
51	✔	✱	✔	✔	✔	✔	For the Rubber and Plastics cycle, the chamber temperature rose more than 4 C° above the sterilization temperature, allowing for measurement error (i.e. Tchm > 125°C).	• Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink)
52	✔	✱	✔	✔	✔	✔	For the Rubber and Plastics cycle, the theoretical chamber temperature as calculated from the measured chamber pressure was more than 2°C below the measured chamber temperature, allowing for measurement error.	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal
53	✔	✱	✔	✔	✔	✔	For the Rubber and Plastics cycle, the theoretical chamber temperature as calculated from the measured chamber pressure was more than 2°C above the measured chamber temperature, allowing for measurement error.	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
54	✔	✘	✔	✔	✔	✔	For the Rubber and Plastics cycle, the theoretical cassette temperature calculated from the measured cassette pressure was below the sterilization temperature, allowing for measurement error (i.e. Pchm < 204.8 kPa).	• Calibration imbalance (pressure transducer or chamber thermocouple) • Poor air removal during conditioning (exhaust blockage). • Not able to generate steam • Steam leak in the system
55	✔	✘	✔	✔	✔	✔	For the Rubber and Plastics cycle, the theoretical cassette temperature calculated from the measured cassette pressure was more than 4°C above the sterilization temperature, allowing for measurement error (i.e. Pchm > 232 kPa).	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal
60	✔	✘	✔	✔	✔	✔	For a 134°C cycle, the chamber temperature dropped below the sterilization temperature, allowing for measurement error (i.e. Tchm < 134°C).	• Poor air removal during conditioning (exhaust blockage). • Not able to generate steam • Steam leak in the system
61	✔	✘	✔	✔	✔	✔	For a 134°C cycle, the chamber temperature rose more than 4 C° above the sterilization temperature, allowing for measurement error (i.e. Tchm > 138°C).	• Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink)
62	✔	✘	✔	✔	✔	✔	For a 134°C cycle, the theoretical chamber temperature as calculated from the measured chamber pressure was more than 2°C below the measured chamber temperature, allowing for measurement error.	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
63	✔	✱	✔	✔	✔	✔	For a 134°C cycle, the theoretical chamber temperature as calculated from the measured chamber pressure was more than 2°C above the measured chamber temperature, allowing for measurement error.	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal
64	✔	✱	✔	✔	✔	✔	For a 134°C the theoretical cassette temperature calculated from the measured cassette pressure was below the sterilization temperature, allowing for measurement error (i.e. Pchm < 304 kPa).	• Calibration imbalance (pressure transducer or chamber thermocouple) • Poor air removal during conditioning (exhaust blockage). • Not able to generate steam • Steam leak in the system
65	✔	✱	✔	✔	✔	✔	For a 134°C cycle, the theoretical cassette temperature calculated from the measured cassette pressure was more than 4°C above the sterilization temperature, allowing for measurement error (i.e. Pchm > 341.2 kPa).	• Calibration imbalance (pressure transducer or chamber thermocouple) • Sticking solenoid valve (closed) • Failed solenoid coil • Blocked cassette exhaust duct • Obstructed exhaust tubing (kink) • Poor air removal
66 - 69							Not used	
70	✔	✱	✔	✔	✔	✔	The time maintained by the internal timer of the processor didn't match the time maintained by the external real-time clock.	• Transient electromagnetic disturbance (problem won't repeat). • Damaged microprocessor or crystal (STATIM Controller Board). • Damaged real-time clock or crystal
71	✔	✱	✔	✔	✔	✔	Pressure reading is outside the possible range	• Misconnected, disconnected or damaged pressure sensor. • Disconnected or damaged Pressure Sensor Interface Board (not rev 7.xx).

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
72	✗	✓	✗	✗	✓	✗	There is a communication error between the microprocessor and the Temperature Adapter Board (TAB). (Note: Verify that the capacitor C12 was removed from the main PCB prior to installation of the TAB when used in conjunction with the PCB Adapter Controller Rev 2.x, 5.x).	• Check the connection between the square microprocessor and the Printed Circuit Board (PCB). • If an adapter board is used check the connection between the adapter board and the PCB. (Look for bent or broken pins.) • Verify that Temperature Adapter PCB (TAB) is properly inserted and secured on the main Statim PCB.
80	✓	✗	✓	✗	✗	✗	The boiler calibration offset routine is Being executed at the wrong time. This routine should only run when in Boiler calibration mode.	• This may occur if the microprocessor operates erratically, due to electrical noise.
81	✓	✗	✓	✗	✗	✗	The state buffer pointer (print data storage buffer) is invalid.	• Corruption of pointer is usually due to electrical noise.
82	✓	✗	✓	✗	✗	✗	The calibration buffer pointer (blr-chm data storage buffer) is invalid.	• Corruption of pointer is usually due to electrical noise.
83	✓	✗	✓	✗	✗	✗	The EEPROM SIGNATURE string is corrupted. This 16 byte string is located at 0-$0F in the EEPROM. It should not change unless the EEPROM gets corrupted.	• The EEPROM can be corrupted if electrical noise corrupts pointers and counters in RAM, or causes other erratic operation of the microprocessor.
84	✓	✗	✓	✗	✗	✗	The boiler chamber value just calculated is not in the range 8C to FF.	• Bad or miscalibrated temperature measurement circuitry. • Thermocouple defective or out of tolerance. • The boiler is old or not conditioned properly. • Calibration routine is running at the wrong time due to noise.
85	✓	✗	✓	✗	✗	✗	Unexpected Serial Interrupt	• Interference (electrical noise)

CF No.	Unit type		Software revision				Description of Fault	Probable Cause (or causes) of Fault
	S	Non S	1.xx/ 2.xx	4.xx	5.xx	6.xx		
86	✔	✱	✔	✱	✱	✱	Unexpected SPI Interrupt.	• Interference (electrical noise)
87	✔	✱	✔	✱	✱	✱	Unexpected IRQ Interrupt	• Interference (electrical noise)
88	✔	✱	✔	✱	✱	✱	The buffer pointers and sample counter are initialized incorrectly.	• This occurs if the boiler calibration routine is executed when it was not expected to, (caused by electrical noise or ESD.)
89	✔	✱	✔	✱	✱	✱	The software state machine has detected incorrect input parameters.	• Usually caused by noise and ESD.
90	✔	✔	✱	✱	✱	✔	Corrupted or not initialized chamber calibration value	• This occurs when a new controller board or microprocessor has been installed. • This may also happen when the unit has been subjected to a strong static discharge corrupting the memory. • **Re-calibrate the chamber thermocouple.**
91	✔	✱	✱	✱	✱	✔	Corrupted or not initialized pressure calibration	• This occurs when a new controller board or microprocessor has been installed. • This may also happen when the unit has been subjected to a strong static discharge corrupting the memory. • **Re-calibrate the pressure sensor.**
94	✔	✔	✱	✱	✱	✔	CF_EEPROM_ERROR	• Failure to read EEPROM messages from 4C512 EEPROM (EEPROM not programmed)
95	✔	✔	✱	✱	✱	✔	CF_COMM_ERROR	• The LCD controller PCB failed to receive messages from the Rev 7 PCB. • No connection between Colour LCD Controller and Rev 7PCB; Check cable / connection. • Verify that MCU is properly inserted into the socket on the Rev 7 PCB. • Verify that 5V is available on the Rev 7 PCB (Green LED ON)
98	✔	✔	✱	✔	✔	✔	Microcontroller fails to communicate with ADC (Analog to Digital Converter)	• Hardware failure. • MCU not inserted properly in the socket • Damaged ADC converter, replace PCB. • If a PCB adapter is used, verify that PCB adapter is properly secured in the socket and that there are no bent pins
99	✔	✱	✔	✱	✱	✱	The microprocessor's internal watchdog timer has tripped.	• Incorrect operation of the software, usually noise or ESD related.

Cycle Fault	Description and Probable Cause of Fault
"NO CONFIGURATION EEPROM"	**Lack of communication between microcontroller and EEPROM** • Hardware failure. • MCU not inserted properly in the socket, extract MCU, and verify pins are shorted. • Damaged wrongly inserted or missing EEPROM, replace software kit. • Damaged controller PCB. • If a PCB Adapter is used, verify that PCB adapter is properly secured in the socket and that there are no bent pins.
Message "PRINTER FAULT" (If optional printer is installed)	**Printer is not printing.** This may be caused by a paper jam, a failed printer or failed printer electronics. Check that power is ON, check connector attachments. (See also section 12 of this manual)
"CYCLE ABORTED"	This error message is displayed on the printout only, followed by the message "NOT STERILE", as a result of the operator pressing the STOP button to stop the cycle or as a result of any other abnormal cycle termination, including CYCLE FAULT errors.
"CYCLE INTERRUPTED"	This error is displayed on power-up following a power failure occurs during a cycle or whenever the power is turned OFF after an error occurred without pressing the STOP button to reset. (Rev. R200 level code) This message is displayed when the sterilization phase has failed to start within three minutes of the cassette reaching the sterilization temperature. If it occurs in three consecutive cycles Cycle Fault #26 is displayed. (Software Rev. R4xx, R5xx and R6xx)
"PRESS STOP TO RESET"	This message is displayed for all error faults. The user MUST press the STOP button on the keypad to reset the unit; otherwise the user will be unable to initiate another cycle.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

STAT*IM* 5000 Calibration

NOTE: Calibration Procedure 1: for Rev 3.x or 4.x Boards applies ONLY to STAT*IM* 2000 non S units.

Calibration Procedure 2: for Rev 2.x or 5.x Boards, Software R1.xx or R2.xx

This calibration procedure is for STAT*IM* 2000/5000 non S units (1995-2005) with revision 2.x or 5.x controller boards and revision 1.xx or 2.xx software.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **Do not place the digital reference thermometer in direct sunlight, on the armature or on any other hot surfaces. This may cause improper values on the temperature readout.**
- **There are specific error messages (cycle faults) for these board/software types, which can be found in the *Troubleshooting Cycle Faults* section.**
- **In calibration mode, no error messages are displayed.**

Calibration Procedure

Calibration of these boards should be done in the following order:

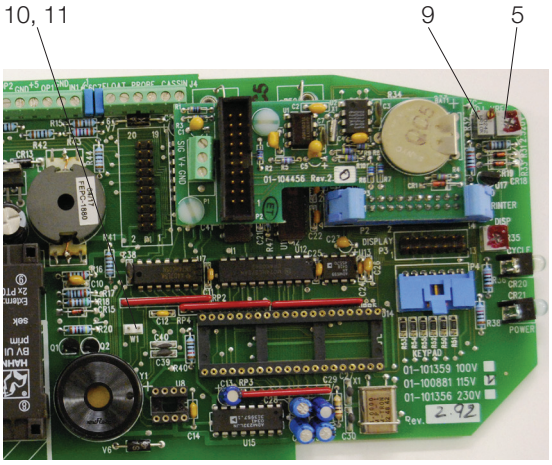
1. Reference voltage verification / adjustment
2. Steam generator thermocouple calibration (automatic)
3. Chamber thermocouple calibration
4. Steam generator re-calibration (automatic)

Required equipment:

- Control box - 01-103141S
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Potentiometer trimmer
- Calibration jumper
- Digital thermometer

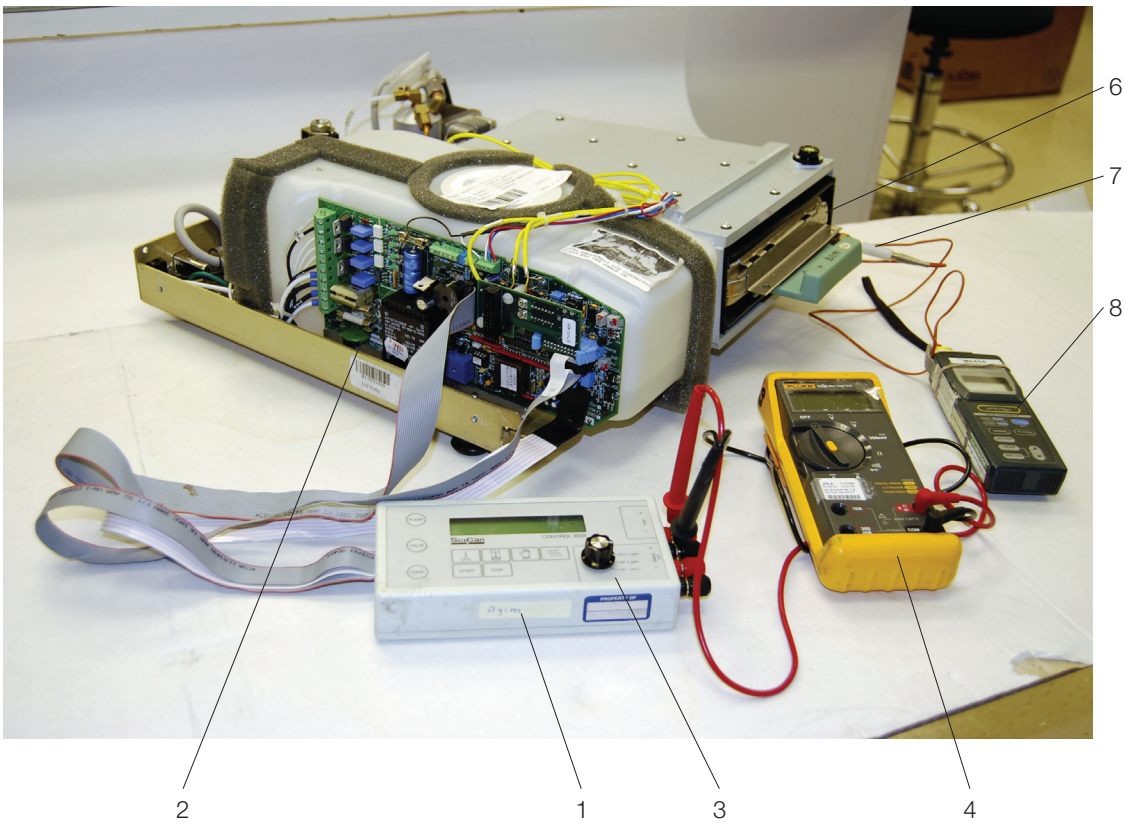
Setting up the unit for calibration:

- Before starting calibration, turn the STAT*IM* OFF and remove the cover.
- Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette (6) is correctly engaged in the STAT*IM*.
- Install the thermocouple (7) into the cassette and attach the digital thermometer (8).
- Ensure that the thermocouple and digital thermometer have matched serial numbers.
- Install the calibration jumper (11) to controller board pins marked W1 (10).



1. Control box
2. Controller board
3. SELECT knob
4. Digital voltmeter
5. Vref potentiometer
6. Calibration cassette
7. Thermocouple
8. Digital thermometer
9. TC-ADJ potentiometer
10. Calibration jumper connection
11. Calibration jumper (not shown)

Figure 1
(Note: STAT*IM* 2000 shown)

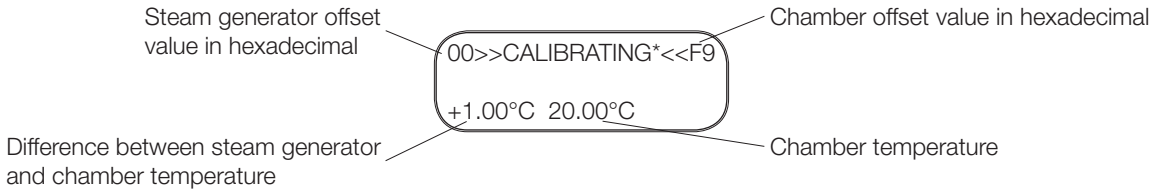


1. **Reference voltage verification / adjustment**
   To verify / adjust the reference voltage:

   1. Turn the unit **OFF.**
   2. Connect the Control Box (1) to the Controller Board (2).
   3. Connect the digital voltmeter (4) to the Vref terminals on the control box.
   4. Set the voltmeter to read DC Volts with a resolution of 1mV.
   5. Power the unit **ON**.
   6. Adjust the Vref potentiometer until Vref is 2.520 V ± 0.001.
   7. Once Vref is adjusted, apply a drop of non-conducting lacquer or nail polish to the adjustment screw of the potentiometer.

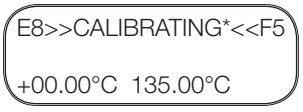
2. **Steam generator thermocouple calibration**
   To calibrate the steam generator thermocouple:

   1. Turn the unit **OFF** and install a calibration jumper on Controller Board header W1.
   2. Turn the unit **ON**. The LCD should appear and be similar to the diagram below:



   3. To start a steam generator (self-calibrating) cycle, **press and hold** the UNWRAPPED cycle button on the control box and press the **START** button. An asterisk * will appear next to the message 'CALIBRATING'.
   4. If the asterisk * does not appear, press the **STOP** button on the control box twice to reset the unit. Turn the power switch **OFF** then **ON** again.
   5. Hold down the UNWRAPPED cycle button on the control box and press the **START** button to start the self-calibration again.
   6. During the steam generator warm up (before the cassette temperature reaches 100°C), check that the displayed chamber temperature matches the reading on the digital thermometer to within 2°C.
   7. If the value is greater than 2°C adjust the TC-ADJ potentiometer (9) so that they match.
   8. As the cycle proceeds, the chamber temperature reaches the sterilization temperature, drops to 115°C and then regains sterilization temperature.
   9. After 20-40 seconds, a long beep will sound indicating that steam generator calibration is complete.
   10. The number in the upper left-hand corner of the LCD has changed to display the new steam generator offset value.

Example

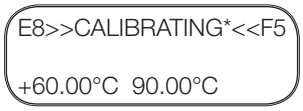


11. Press the STOP button on the control box to end the steam generator calibration cycle and to depressurize the cassette.
12. Press STOP a second time to reset the unit.

3. Chamber Thermocouple Calibration

To calibrate the chamber thermocouple:

1. Turn the power switch to **OFF**. Ensure the calibration jumper is in place and turn the power switch **ON**. The LCD will read (for example):



2. To start a chamber calibration cycle, **press and release** the UNWRAPPED cycle button on the control box and then press the **START** button. The STAT*IM* will run a regular UNWRAPPED cycle, but continue to show calibration information on the LCD.
3. Wait for the chamber to reach the sterilization temperature of 134 °C.
4. The temperature displayed on the LCD needs to match the temperature displayed on the digital thermometer.
5. To change the temperature display on the LCD, adjust the TC-ADJ potentiometer (9) on the Controller Board. Continue adjusting TC-ADJ until the temperatures are within ±0.25°C.
6. Observe the temperatures displayed on the LCD and the digital thermometer for 30 seconds. The temperatures registered should remain within ± 0.25°C of one another. Adjust TC-ADJ if not.
7. Press the **STOP** button on the control box when finished. Wait for the beeps to signal that the cassette may be removed.

4. Steam Generator Thermocouple Re-calibration

Repeat the steam generator thermocouple calibration procedure in section 2, *Steam Generator Thermocouple Calibration*, above.

5. Switch off the unit and remove all calibration equipment.

Calibration Procedure 3: for Rev. 6.x Board, Software Rev. 4.xx and 5.xx

This calibration procedure is for STAT*IM* 2000/5000 non S units (2005-2007) with revision 6.x controller boards and revision 4.xx or 5.xx software.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **Do not place the digital reference thermometer in direct sunlight, on the armature or on any other hot surfaces. This may cause improper values on the temperature readout.**
- **There are specific error messages (cycle faults) for these board types. These can be found in the *Troubleshooting Cycle Faults* section.**
- **IMPORTANT – REVISION 4.XX SOFTWARE IS FOR OPERATING UNITS WITH THE STAINLESS STEEL BOILER AND REVISION 5.XX SOFTWARE IS FOR OPERATING THE ALUMINIUM EXTERNAL (ALEX) BOILER. CALIBRATION, HOWEVER, IS THE SAME FOR BOTH.**
- **Neither boiler requires calibration as these units are fitted with a separate validation thermocouple.**
- **This calibration procedure may also be used on earlier revision 2.x and 5.x controller boards that have been upgraded to ALEX steam generator (R5.xx software).**

Calibration Procedure

Calibration of these boards should be done in the following order:

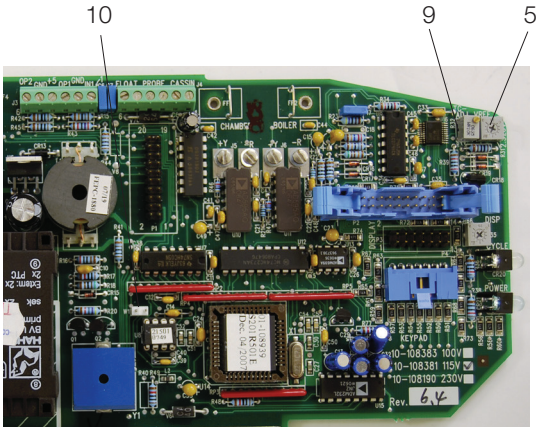
1. Reference voltage verification / adjustment
2. Chamber thermocouple calibration
3. Validation thermocouple calibration (automatic)

Required equipment:

- Control box - 01-103141S
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Potentiometer trimmer
- Calibration jumper
- Digital thermometer

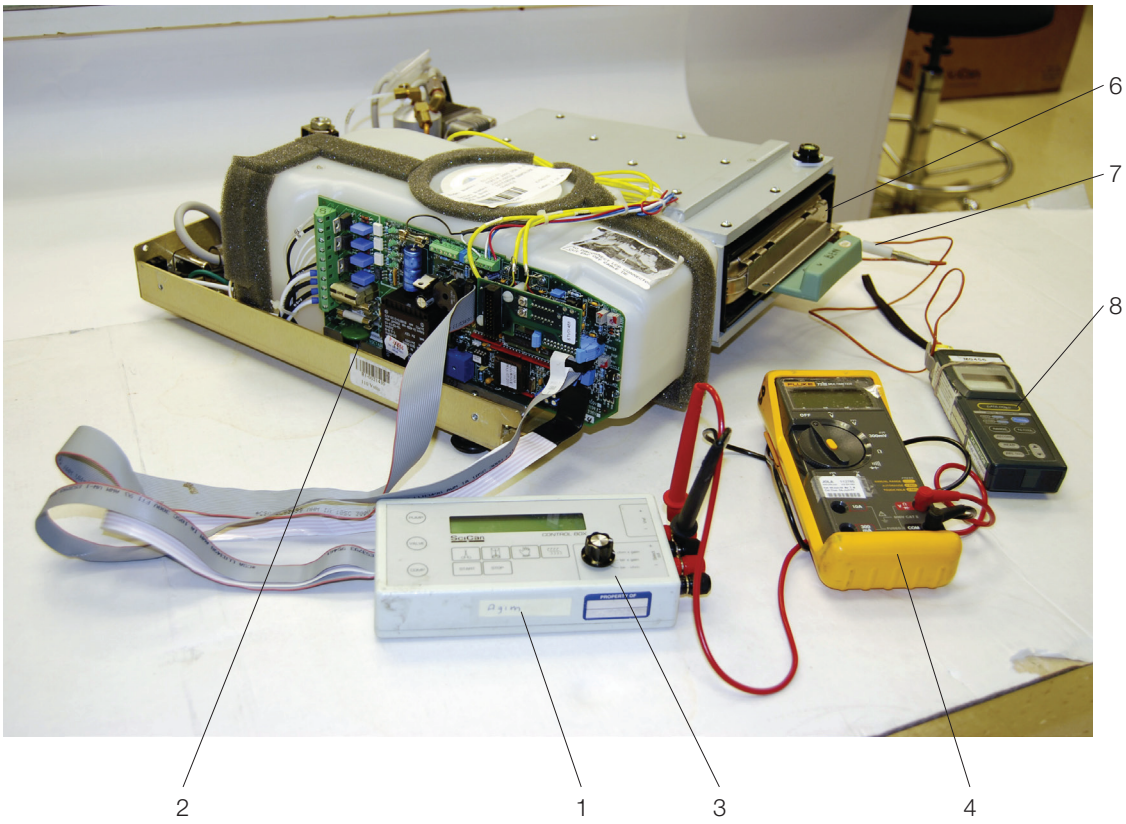
Setting up the unit for calibration:

1. Before starting calibration, turn the STAT*IM* OFF and remove the cover.
2. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette (6) is correctly engaged in the STAT*IM*.
3. Install the thermocouple (7) into the cassette and attach the digital thermometer (8).
4. Ensure that the thermocouple and digital thermometer have matched serial numbers.
5. Install the calibration jumper (11) to Controller Board pins marked W1 (10).



1. Control box
2. Controller board
3. SELECT knob
4. Digital voltmeter
5. VREF potentiometer
6. Calibration cassette
7. Thermocouple
8. Digital thermometer
9. TC-ADJ potentiometer
10. Calibration jumper connection
11. Calibration jumper (not shown)

Figure 2
(Note: STAT*IM* 2000 shown)



1. **Reference voltage verification / adjustment**

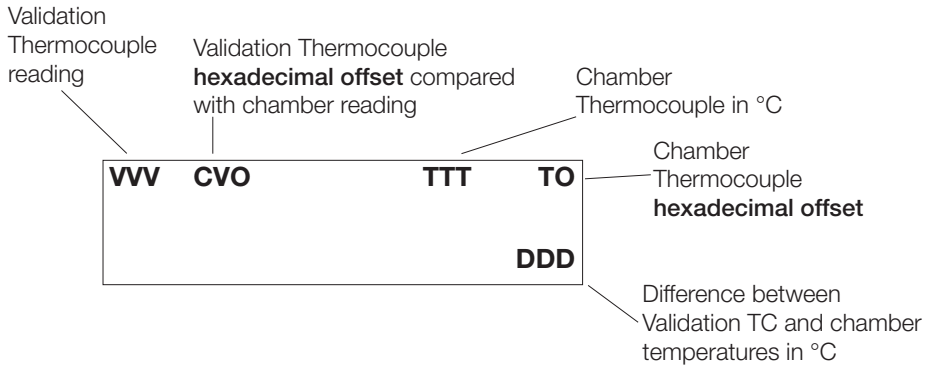
   To verify / adjust the reference voltage:

   - Ensure the unit is **OFF.**
   - Connect the control cox (1) to the controller board (2).
   - Connect the digital voltmeter (4) to the Vref terminals on the control box.
   - Set the voltmeter to read DC Volts with a resolution of 1mV.
   - Power the unit **ON**.
   - Adjust the Vref potentiometer until Vref is 2.520 V ± 0.001.
   - Once Vref is adjusted, apply a drop of non-conducting lacquer or nail polish to the adjustment screw of the potentiometer.

2. **Chamber thermocouple calibration**

   To calibrate the chamber thermocouple:

   - Turn the power switch to **OFF**. Ensure the calibration jumper is in place and turn the power switch **ON**. The LCD will read (for example):



   - To start a chamber calibration cycle, **press and release** the UNWRAPPED cycle button on the control box and then press the **START** button. The STAT*IM* will run a regular UNWRAPPED cycle, but continue to show calibration information on the LCD.
   - Wait for the chamber to reach the sterilization temperature of 134 °C (TTT).
   - The temperature displayed on the LCD needs to match the temperature displayed on the digital thermometer.
   - To change the temperature display on the LCD, adjust the TC-ADJ potentiometer (9) on the controller board. Continue adjusting TC-ADJ until the temperatures are within ±0.2°C.
   - Observe the temperatures displayed on the LCD and the digital thermometer for 30 seconds. The temperatures registered should remain within ± 0.2°C of one another. Adjust TC-ADJ if not.
   - Press the **STOP** button on the control box when finished.

3. **Validation thermocouple calibration**

   To calibrate the validation thermocouple:

   - Turn the power switch to **OFF**. Ensure the calibration jumper is in place and turn the power switch **ON**.
   - To start a validation thermocouple (self-calibrating) cycle, **press and hold** the UNWRAPPED cycle button on the control box and press the **START** button. An asterisk * will appear next to the validation thermocouple offset value (CVO) to indicate that a validation assembly calibration cycle is running.
   - If the asterisk * does not appear, press the **STOP** button on the control box twice to reset the unit. Turn the power switch **OFF** then **ON** again.
   - Hold down the UNWRAPPED cycle button on the control box and press the **START** button to start the self-calibration again.
   - This calibration will take approximately 6 minutes.
   - Allow the self-calibration to complete.
   - The temperature within the chamber will rise to the sterilization temperature. Wait until sterilization phase of the calibration cycle ends automatically.
   - The offset value in the upper left-hand corner of the display (CVO) may have changed to a new offset value.
   - Press the **STOP** button on the control box when finished.

4. **Switch off the unit and remove all calibration equipment.**

Calibration Procedure 4: for Rev. 7.x Board, Software Rev. 6.xx

This calibration procedure is for STAT*IM* 2000/5000 non S units (2007 on) with revision 7.x controller boards and revision 6.xx software.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **Do not place the digital reference thermometer in direct sunlight, on the armature or on any other hot surfaces. This may cause improper values on the temperature readout.**
- **There are specific error messages (cycle faults) for these board types. These can be found in the *Troubleshooting Cycle Faults* section.**
- **Boiler calibration is not required as these units are fitted with a separate validation thermocouple.**
- **These units may be calibrated with the cover in place OR using the control box.**
- **There is NO reference voltage adjustment in these machines.**

Calibration Procedure

Calibration of these boards should be done in the following order:

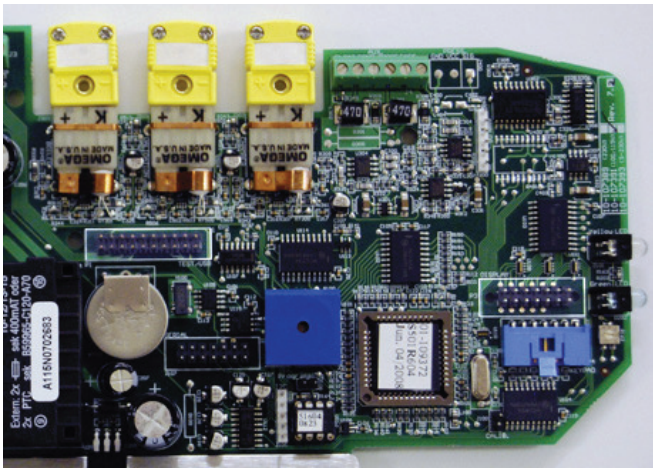
1. Chamber thermocouple calibration
2. Validation thermocouple calibration (automatic)

Required equipment:

- Control box - 01-103141S
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Digital thermometer

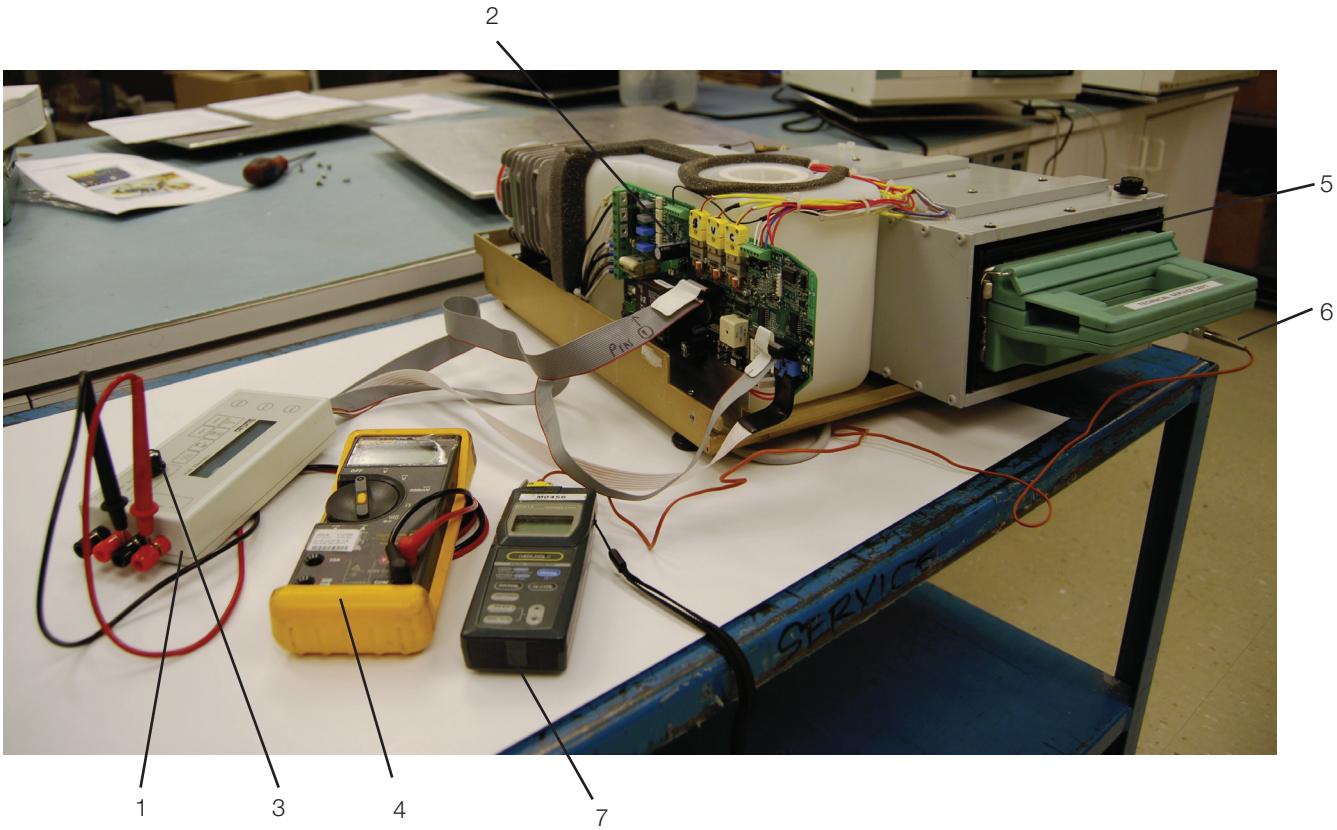
Setting up the unit for calibration:

1. Before starting calibration, turn the STAT*IM* OFF.
2. The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover on as all adjustments to the calibration offsets are undertaken using the keypad on the unit/control box.
3. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette (5) is correctly engaged in the STAT*IM*.
4. Install the thermocouple (6) into the cassette and attach the digital thermometer (7).
5. Ensure that the thermocouple and digital thermometer have matched serial numbers.



1. Control box
2. Controller board
3. SELECT knob
4. Digital voltmeter
5. Calibration cassette
6. Thermocouple
7. Digital thermometer

Figure 3



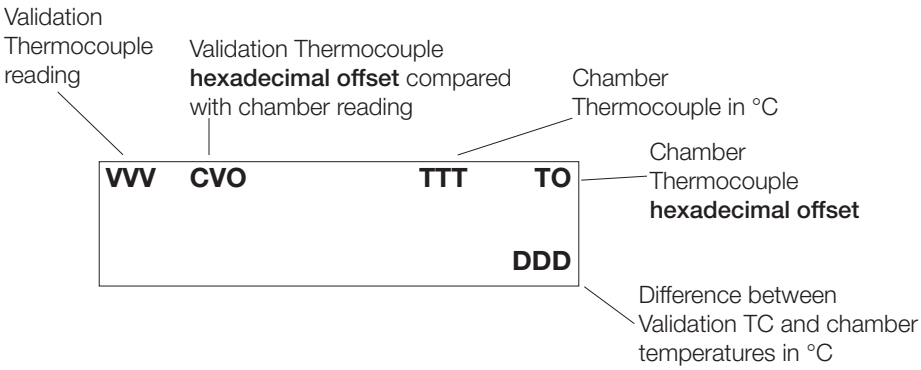
NOTE: The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover on as all adjustments to the calibration offsets are undertaken using the keypad on the unit.

6. Turn ON the unit while keeping Unwrapped and Wrapped button pressed to enter STAT*IM* **Service Mode**.
7. This **Service Mode** is password protected, enter password to continue (default password is: Unwrapped, Wrapped, R&P and Stop keys pressed in this order).

Keypad functions at this time will be:

- **Unwrapped Key:** Select next item in the menu.
- **Wrapped Key:** Select previous item in the menu.
- **Rubber and Plastics Key:** Enter current selection
- **Toggle** using keypad through the menu selection to reach Calibration option and press R&P key.

The display should be similar to the diagram below:



1. Chamber thermocouple calibration

To calibrate the chamber thermocouple:

8. To start a chamber calibration cycle, press and release the UNWRAPPED cycle button on the keypad/control box and then press the START button. The STAT*IM* will run a regular UNWRAPPED cycle, but continue to show calibration information on the LCD.
9. Wait for the chamber to reach the sterilization temperature of 134 °C (TTT).
10. The temperature displayed on the LCD needs to match the temperature displayed on the digital thermometer.
11. To change the temperature display on the LCD, adjust the unwrapped/wrapped keys until the temperatures are within ±0.2°C.

Keypad functions at this time will be:

- Unwrapped Key: **increases offset**
- Wrapped Key: **decreases offset**

Observe the temperatures displayed on the LCD and the digital thermometer for 30 seconds. The temperatures registered should remain within ± 0.2°C of one another. Adjust unwrapped/ wrapped keys if not.

12. Press the **STOP** button on the control box when finished.

2. **Validation thermocouple calibration**

   To calibrate the validation thermocouple:

   1. Turn the unit off **OFF**.
   2. Turn ON the unit while keeping Unwrapped and Wrapped button pressed to enter STAT*IM* **Service Mode**.
   3. This **Service Mode** is password protected, enter password to continue (default password is: Unwrapped, Wrapped, R&P and Stop keys pressed in this order).
   4. Toggle using keypad through the menu selection to reach Calibration option and press R&P key.
   5. The display should show the calibration screen as before
   6. To start a validation thermocouple (self-calibrating) cycle, **press and hold** the UNWRAPPED cycle button on the keypad/control box and press the **START** button. An asterisk "*" will appear next to the validation thermocouple offset value (CVO) to indicate that a Validation Assy. calibration cycle is running.
   7. If the asterisk "*" does not appear, press the **STOP** button on the control box twice to reset the unit. Turn the power switch **OFF** then **ON** again.
   8. Hold down the UNWRAPPED cycle button on the control box and press the **START** button to start the self-calibration again.
   9. This calibration will take approximately 6 minutes.
   10. Allow the self-calibration to complete.
   11. The temperature within the chamber will rise to the sterilization temperature. Wait until sterilization phase of the calibration cycle ends automatically.
   12. The offset value in the upper left-hand corner of the display (CVO) may have changed to a new offset value.
   13. Press the **STOP** button on the control box when finished.

3. Switch off the unit and remove all calibration equipment.

Calibration Procedure 8: for non-S G4 units with Rev. 7.x Board, Software Rev. 7.xx, SL 00R1.xx

This calibration procedure is for STATIM 2000/5000 G4 non S units with revision 7.x controller boards and revision 7.xx software, SL00R1.xx
Important:

- Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.
- Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.
- Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.
- Do not place the digital reference thermometer in direct sunlight, on the armature or on any other hot surfaces. This may cause improper values on the temperature readout.
- There are specific error messages (cycle faults) for these board types. These can be found in the Troubleshooting Cycle Faults section.
- Boiler calibration is not required as these units are fitted with a separate validation thermocouple.
- These units may be calibrated with the cover in place OR using the control box.
- There is NO reference voltage adjustment in these machines.

Calibration Procedure

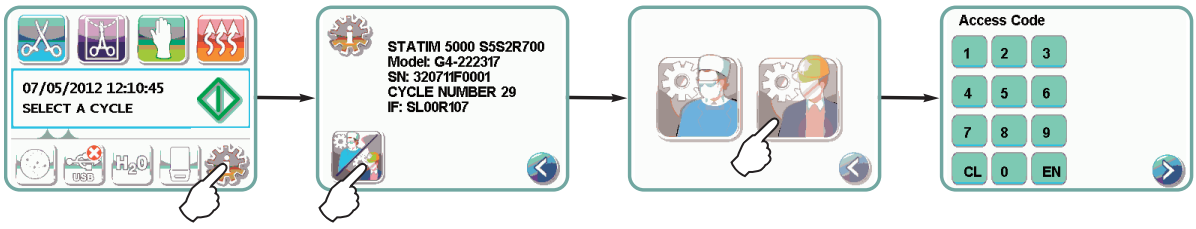
Calibration of these boards should be done in the following order:
1. Chamber thermocouple calibration
2. Validation thermocouple calibration (automatic)

NOTE: Use of control box is optional. Calibration can be completed using touchscreen.
Required equipment:

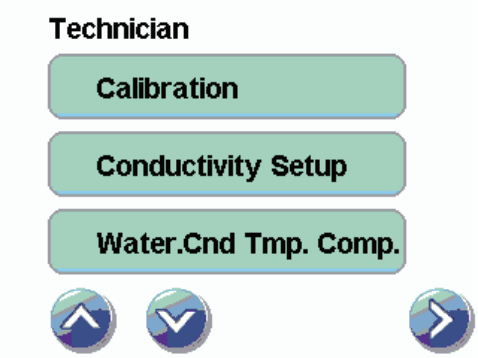
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Digital thermometer

Setting up the unit for calibration:

1. Before starting calibration, turn the STAT*IM* OFF.
2. The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover on as all adjustments to the calibration offsets are undertaken using the touchscreen.
3. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette is correctly engaged in the STAT*IM*.
4. Install the thermocouple into the cassette and attach the digital thermometer.
5. Ensure that the thermocouple and digital thermometer have matched serial numbers.
6. Turn ON the unit and access the service menu in the following manner:



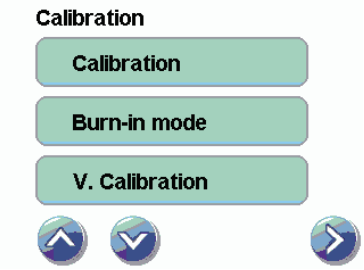
7. This Service Mode is PIN protected, enter password to continue (default password is: 7919).
8. From the service menu, select Calibration.



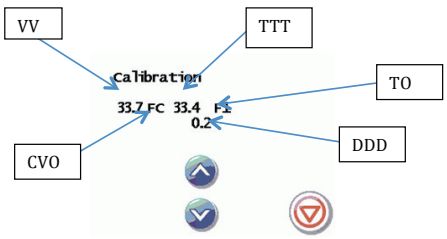
1. Chamber thermocouple calibration

To calibrate the chamber thermocouple:

1. To start a chamber calibration cycle, select Calibration in the Calibration submenu and calibration with start automatically



The STATIM will run a regular UNWRAPPED cycle, but continue to show calibration information on the LCD.



(VVV) Validation thermocouple reading
(CVO) Validation thermocouple hexadecimal offset compared with chamber reading
(TTT) Chamber thermocouple in °C
(TO) Chamber thermocouple hexadecimal offset
(DDD) Difference between validation TC and chamber temperatures in °C

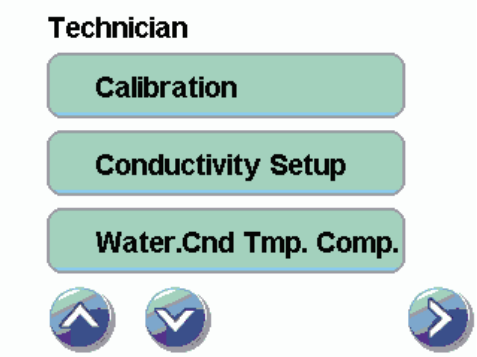
2. Wait for the chamber to reach the sterilization temperature of 134 °C (TTT) and for the ADJUST TEMP! message to appear

3. The temperature displayed on the LCD needs to match the temperature displayed on the digital thermometer.
4. Use the arrow keys to change the temperature display on the LCD until the temperatures are within ±0.2°C. Observe the temperatures displayed on the LCD and the digital thermometer for 30 seconds. The temperatures registered should remain within ± 0.2°C of one another. If not, make adjustments using the arrow keys.
5. Press the STOP button on the touchscreen when finished.

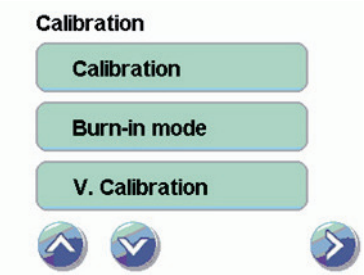
2. Validation thermocouple calibration

To calibrate the validation thermocouple:

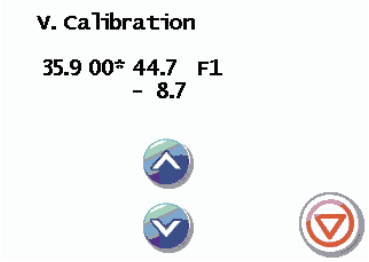
1. Access the service menu as described above.
2. From the service menu, select Calibration.



3. To start a validation thermocouple calibration cycle, select V. Calibration in the Calibration submenu. The STATIM will run a Validation Assy. calibration cycle.



4. This calibration will take approximately 6 minutes.



5. Allow the self-calibration to complete.
6. The temperature within the chamber will rise to the sterilization temperature. Wait until sterilization phase of the calibration cycle ends automatically.

7. The offset value in the upper left-hand corner of the display (CVO) may have changed to a new offset value.
8. Press the STOP button when finished.

3. Switch off the unit and remove all calibration equipment.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

STAT*IM* 5000S Calibration

Calibration Procedure 5: for Rev 2.x or 5.x Boards, Software R1.xx and R2.xx

For S-class STAT*IM* 5000 (1995 - 2005) with revision 2.x or revision 5.x type controller boards and software revisions R1.xx or R2.xx.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **S-Class units contain electronic components that may be damaged or destroyed by electro-static discharge (ESD). Observe appropriate safeguards when calibrating.**
- **There are specific error messages (cycle faults) for these board/software types. These can be found in the *Troubleshooting Cycle Faults* section.**
- **In calibration mode, no error messages are displayed.**

Calibration Procedure

Calibration of these boards should be done in the following order:

1. Reference voltage verification / adjustment
2. Steam generator thermocouple calibration (automatic)
3. Chamber thermocouple and pressure transducer calibration
4. Steam generator thermocouple re-calibration (automatic)

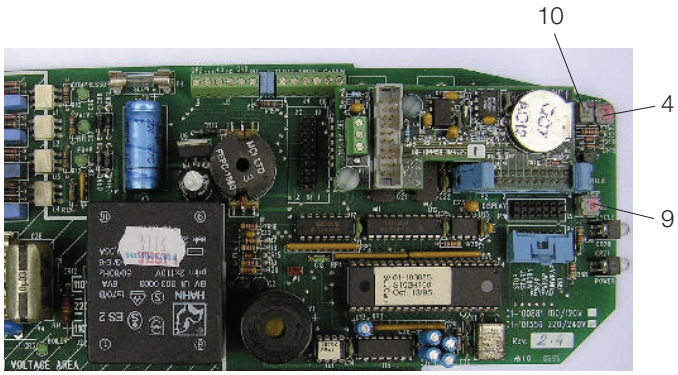
Required equipment:

- Control box - 01-103141S
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Potentiometer trimmer
- Calibration jumper
- Digital thermometer
- Digital pressure meter

Setting up the unit for calibration:

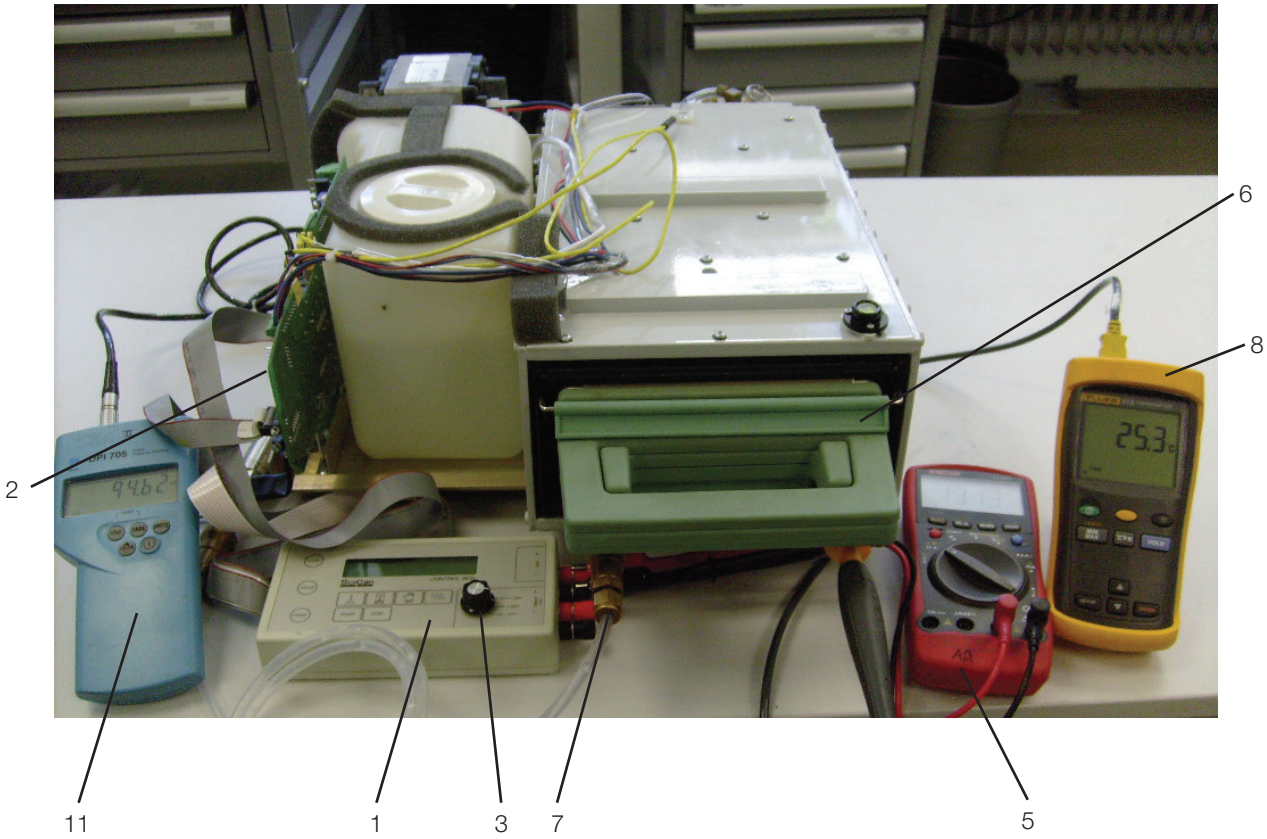
1. Before starting calibration, turn the STAT*IM* **OFF** and remove the cover.
2. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette (6) is correctly engaged in the STAT*IM*.
3. Install the thermocouple (7) into the cassette and attach the digital thermometer (8).

4. Ensure that the thermocouple and digital thermometer have matched serial numbers.
5. Attach the pressure reference meter to the pressure tube and the pressure tube to the test cassette. (Self locking couplings).
6. Install the calibration jumper to Controller Board pins marked W1.
7. Locate TC ADJ and Vref potentiometers.



1. Control box
2. Controller board
3. SELECT knob
4. VRH potentiometer
5. Digital voltmeter
6. Calibration cassette
7. Thermocouple
8. Digital thermometer
9. TC-BLR potentiometer
10. TC-CHM potentiometer
11. Pressure meter

Figure 1



1. **Reference voltage verification / adjustment**

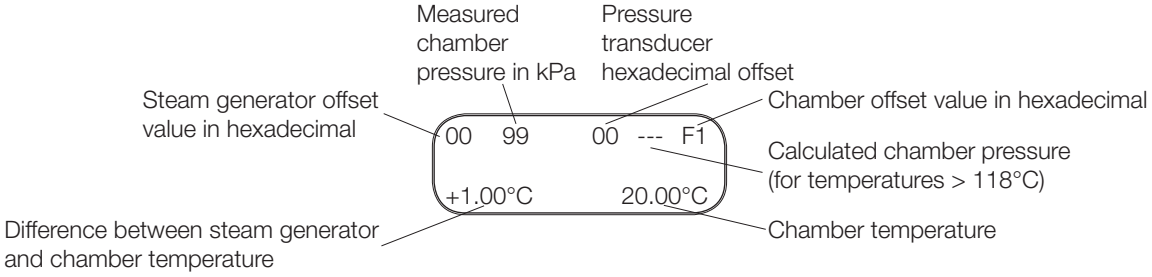
   To verify / adjust the reference voltage:

   1. Ensure the unit is **OFF**.
   2. Connect the control box (1) to the controller board (2).
   3. Connect the digital voltmeter (5) to the Vref terminals on the control box.
   4. Set the voltmeter to read DC Volts with a resolution of 1mV.
   5. Power the unit **ON**.
   6. Adjust the Vref potentiometer until Vref is 2.520 V ± 0.001.
   7. Once Vref is adjusted, apply a drop of non-conducting lacquer or nail polish to the adjustment screw of the potentiometer.

2. **Steam generator thermocouple calibration**

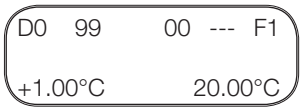
   To calibrate the steam generator thermocouple:

   1. Turn the unit **OFF** and check that there is a calibration jumper on controller board header W1.
   2. Turn the unit **ON**. The LCD should appear and be similar to the diagram below:



   3. To start a steam generator (self-calibrating) cycle, **press and hold** the UNWRAPPED cycle button on the control box and press the **START** button. An asterisk "*" will appear next to the steam generator offset value.

The LCD appears:



example

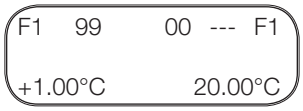
   4. If the asterisk "*" does not appear, press the **STOP** button on the control box twice to reset the unit. Turn the power switch **OFF** then **ON** again.
   5. Hold down the UNWRAPPED cycle button on the control box and press the **START** button to start the self-calibration again.
   6. If the controller board is new and has never previously been calibrated, adjust the TC-ADJ potentiometer (8) until the chamber thermocouple offset reads F5. If the controller board has previously been calibrated this adjustment is not necessary.
   7. As the cycle proceeds, the chamber temperature reaches the sterilization temperature, drops to 115°C and then regains sterilization temperature.
   8. After 20 - 40 seconds, a long beep will sound indicating that steam generator thermocouple calibration is complete. The number in the upper left-hand corner of the LCD has changed to display the new steam generator offset value.

9. Press the **STOP** button on the control box to end the steam generator calibration cycle and to depressurize the cassette.
10. Press **STOP** a second time to reset the unit.

3. Chamber thermocouple and pressure transducer calibration

To calibrate the chamber thermocouple and pressure transducer:

11. Turn the power switch to **OFF**. Ensure the calibration jumper is in place and turn the power switch **ON**. The LCD will read (for example):



12. With the calibration cassette removed and the pressure tubing disconnected at both ends, compare the measured chamber pressure reading on the LCD to the pressure displayed on the reference meter. The difference between them is the pressure transducer offset.
13. Fully insert the calibration cassette and connect the pressure calibration tubing.
14. To start a chamber thermocouple / pressure transducer calibration cycle, press and release the UNWRAPPED cycle button and then press **START**. The STAT*IM* 5000S will run a regular UNWRAPPED cycle, but continue to display calibration information on the LCD.
15. Immediately after pressing the **START** button, use the UNWRAPPED and WRAPPED cycle buttons to make the measured chamber pressure reading displayed on the LCD equal to the reference meter reading. Note that once the boiler begins producing steam the pressure cannot be accurately zero-adjusted to atmospheric pressure. **TIP**: The offset for the measured chamber pressure is increased or decreased in 0.5 kPa steps. Each press of the UNWRAPPED button adds 0.5 kPa and each press of the WRAPPED button subtracts 0.5 kPa.
16. Allow the chamber to reach the sterilization temperature. As pressure builds in the chamber check for leaks in the cassette, associated piping and fittings. A steam leak in the system will introduce errors in the measurement and will result in improper calibration and may compromise sterilization conditions.
17. Once the unit has reached sterilization and the temperature and pressure are in equilibrium compare the chamber temperature displayed on the LCD with the temperature displayed on the temperature reference meter. Adjust the TC-ADJ potentiometer on the controller board until the LCD temperature matches the reference temperature to within ± 0.25°C.
18. Wait ten seconds after the water pump turns off to allow the pressure and temperature readings to stabilize before making any adjustments.
19. **IMPORTANT NOTE:** When the initial pressure and temperature readings have been adjusted, and to ensure equilibrium of the calibration, compare the measured chamber pressure and the calculated chamber pressure displayed on the LCD. They should be within 1 kPa of each other during equilibrium. If not, adjust the pressure offset using the membrane keypad by ONE UNIT ONLY. If the readings still differ by more than 1 kPa, using the TC-ADJ potentiometer adjust the chamber offset by ONE unit. If the readings still differ by more than 1 kPa abort the cycle and retry the chamber thermocouple / pressure transducer calibration.

20. During sterilization and after all necessary adjustments have been made, the measured chamber pressure indicated by the reference meter and the STAT*IM* 5000S LCD should not differ by more than 6 kPa.
21. A consecutive failure to achieve the above conditions after adjustment indicates that one or more of the following components may be faulty:

- Chamber thermocouple
- Pressure sensor
- Pressure interface board
- Controller board (Thermocouple amplifier or A to D converter).

22. When the calibration is complete, press the **STOP** button on the control box and wait for the beeps to signal that the cassette may be removed. Press the **STOP** button again to reset the unit.

4. Steam generator thermocouple re-calibration

Repeat the steam generator thermocouple calibration procedure in section 2 described above.

5. Switch off the unit and remove all calibration equipment.

Calibration Procedure 6: for Rev 6.x Boards, Software R4.xx and R5.xx

For S-class STAT*IM* 5000 (2005 - 2007) with revision 6.x type controller boards and revision 4.xx and 5.xx software.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **S-Class units contain electronic components which may be damaged or destroyed by electro-static discharge (ESD). Observe appropriate safeguards when calibrating.**
- **There are specific error messages (cycle faults) for these board/software types. These can be found in the *Troubleshooting Cycle Faults* section.**
- **In calibration mode no error messages are displayed.**
- **IMPORTANT – REVISION 4.XX SOFTWARE IS FOR OPERATING UNITS WITH THE STAINLESS STEEL BOILER AND REVISION 5.XX SOFTWARE IS FOR OPERATING THE ALUMINIUM EXTERNAL (ALEX) BOILER. CALIBRATION, HOWEVER, IS THE SAME FOR BOTH STATIM UNITS.**
- **The boiler thermocouples for both boiler types do not require calibration.**

Calibration Procedure

Calibration of these boards should be done in the following order:

1. Reference voltage verification / adjustment
2. Chamber thermocouple and pressure transducer calibration

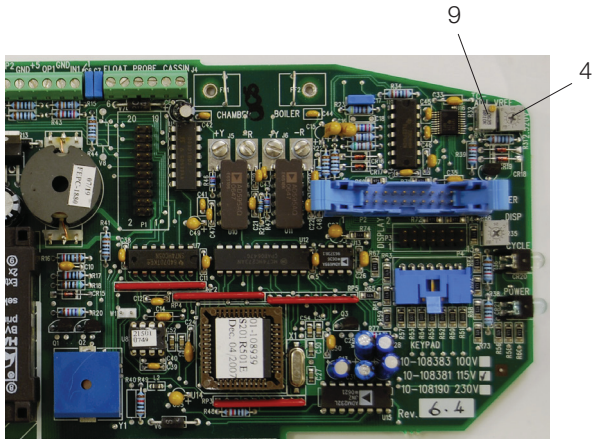
Required equipment:

- Control box - 01-103141S
- Digital voltmeter
- Calibration cassette (appropriate to model)
- Potentiometer trimmer
- Calibration jumper
- Digital thermometer
- Digital pressure meter

Setting up the unit for calibration:

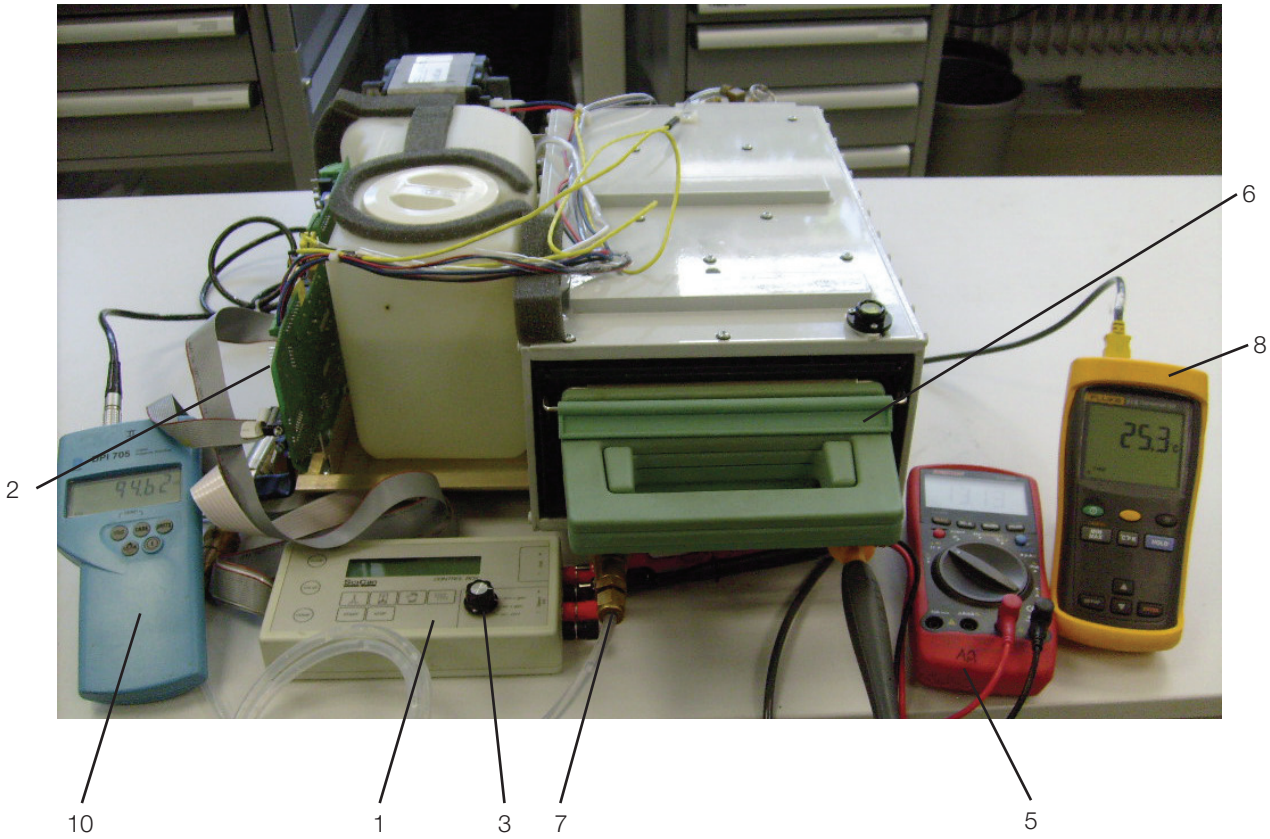
1. Before starting calibration, turn the STAT*IM* **OFF** and remove the cover.
2. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette (6) is correctly engaged in the STAT*IM*.
3. Install the thermocouple (7) into the cassette and attach the digital thermometer (8).
4. Ensure that the thermocouple and digital thermometer have matched serial numbers.

5. Attach the pressure reference meter to the pressure tube and the pressure tube to the test cassette. (Self locking couplings).
6. Install the calibration jumper to controller board pins marked W1.
7. Locate TC ADJ and Vref potentiometers.



1. Control box
2. Controller board
3. SELECT knob
4. VREF potentiometer
5. Digital voltmeter
6. Calibration cassette
7. Thermocouple
8. Digital thermometer
9. TC-ADJ potentiometer
10. Pressure meter

Figure 2



1. **Reference voltage verification / adjustment**

To verify / adjust the reference voltage:

1. Ensure the unit is **OFF**.
2. Connect the Control Box (1) to the Controller Board (2).
3. Connect the digital voltmeter (5) to the Vref terminals on the control box.
4. Set the voltmeter to read DC Volts with a resolution of 1mV.
5. Power the unit **ON**.
6. Adjust the VRH potentiometer until Vref is 2.520 V ± 0.001.
7. Once Vref is adjusted, apply a drop of non-conducting lacquer or nail polish to the adjustment screw of the potentiometer.

IMPORTANT NOTE: remember – the steam generator thermocouple does NOT require calibration.

2. **Chamber thermocouple and pressure transducer calibration**

To calibrate the chamber thermocouple and pressure transducer:

1. Turn the power switch to **OFF**. Ensure the calibration jumper is in place and turn the power switch **ON**. The LCD will read (for example):

Where

- PPP.P = actual chamber pressure in kPa.
- PO = chamber pressure hexadecimal offset value.
- TTT.T = theoretical pressure calculated from the actual chamber temperature.
- CO = chamber temperature hexadecimal offset value.
- CCC.C = actual chamber temperature in °C.

2. To start the calibration cycle, **press and release** the UNWRAPPED cycle button on the control box and then press the **START** button. **Adjust Press!** will appear in the display.

3. By using the Unwrapped key (+) and Wrapped Key (-) the pressure offset PO (at atmospheric pressure) can now be adjusted until the reading on the LCD display (as displayed in the PPP.P field) matches the external pressure reference meter's reading. The PO field will then show the new pressure offset. **NOTE**: This has to be done within 30 seconds.
4. After 30 seconds, the calibration cycle will continue by entering the heating up phase.
5. During calibration the unit will run a normal cycle.

6. Allow the chamber to reach the sterilization temperature. As pressure builds in the chamber check for leaks in the cassette, associated piping and fittings. A steam leak in the system will introduce errors in the measurement and will result in improper calibration and potentially non-sterile instruments.
7. **IMPORTANT NOTE: For units fitted with a Stainless Steel steam generator (revision 4.xx software)**, at the beginning of the holding phase (sterilization phase) all the devices are turned off for approximately 10 seconds to facilitate the calibration process. This will happen ten times in succession. During these periods chamber temperature could go down to 131°C which is quite normal. After these ten "calm" periods the unit will resume normal operation. **This DOES NOT happen on units fitted with aluminium external (ALEX) steam generator (revision 5.xx software).**

TIP: To check that the calibration has been done correctly on Stainless Steel/Rev 4.xx units, look at the external temperature reference meter. When it shows 136.5°C you should hear the solenoid valve 'click'. (In this type of unit the software is set to open the solenoid valve at 136.5°C)

8. When **Adjust Temp!** appears on the display, (see below) and you are confident that the readings are stable, the chamber thermocouple offset CO can now be adjusted using the TC-ADJ potentiometer until the reading on the LCD display (as displayed in the CCC.C

field) matches the external temperature reference meter's reading. The CO field will then show the new chamber temperature offset.

IMPORTANT NOTE: When the initial pressure and temperature readings have been adjusted, and to ensure equilibrium of the calibration, compare the measured chamber pressure (PPP.P) and the calculated chamber pressure (TTT.T) displayed on the LCD. They should be within 1 kPa of each other during equilibrium.

9. If they are not, then the unit may be fine tuned as follows:
    - These units have a two stage pressure offset and the upper offset can be modified during the sterilization phase of the calibration. This will NOT effect the lower offset value BUT if you subsequently change the lower value after the unit has vented then you will lose the upper value as this will be reset to the same value as the lower offset.
    - If the actual chamber pressure reading on the LCD (PPP.P) is different by more than 1 kPa from the pressure reference meter reading then this can be adjusted using the wrapped and unwrapped keys.
    - If this adjustment corrects the PPP.P reading to within 1 kPa of the TTT.T reading then the unit is now in equilibrium.
    - If these readings are still not within 1 kPa of each other then further adjustment may be undertaken as follows:
        - The theoretical pressure reading (TTT.T) and actual chamber temperature reading (CCC.C) are directly related and when the actual temperature value is increased or decreased, the theoretical pressure value will also increase or decrease respectively.
        - Adjust the theoretical chamber pressure (TTT.T) using the TC-ADJ potentiometer (remember that the theoretical pressure is related to the ACTUAL temperature which is adjusted using the TC-ADJ potentiometer) until PPP.P and TTT.T are within 1 kPa of each other.

- IMPORTANT – now re-check the actual temperature reading (CCC.C) with the reading on the temperature reference meter. The readings need to be stable, so allow sufficient time to compare them.
- If you are confident that the temperature readings are still within ±0.25°C, then the unit is in equilibrium and the calibration has finished.
- If the readings are outside of the ± 0.25°C tolerance then further diagnostics may be required prior to re-calibration.

10. Press the **STOP** button on the control box when finished.

3. Switch off the unit and remove all calibration equipment.

Calibration Procedure 7: for Rev 7.x Boards, Software R6.xx

For S-class STAT*IM* 5000 (2007 - present) with revision 7.x type controller boards and revision 6.xx software.

Important:

- **Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.**
- **Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.**
- **Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.**
- **S-class units contain electronic components which may be damaged or destroyed by electro-static discharge (ESD). Observe appropriate safeguards when calibrating.**
- **There are specific error messages (cycle faults) for these board/software types. These can be found in the *Troubleshooting Cycle Faults* section.**
- **In calibration mode no error messages are displayed.**
- **Boiler calibration is not required on these units.**
- **These units may be calibrated with the cover in place OR using the control box as all adjustments are made with the WRAPPED or UNWRAPPED keys on the relevant keypad.**
- **There is NO reference voltage adjustment in these machines.**

Calibration Procedure

Calibration of these boards should be done in the following order:

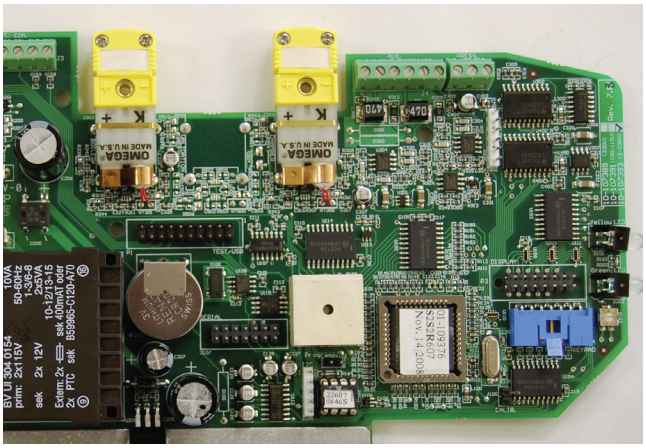
1. Chamber thermocouple/pressure transducer calibration

Required equipment and tools:

- Control box - 01-103141S
- Calibration cassette (appropriate to model)
- Digital thermometer
- Digital pressure meter
- Digital voltmeter

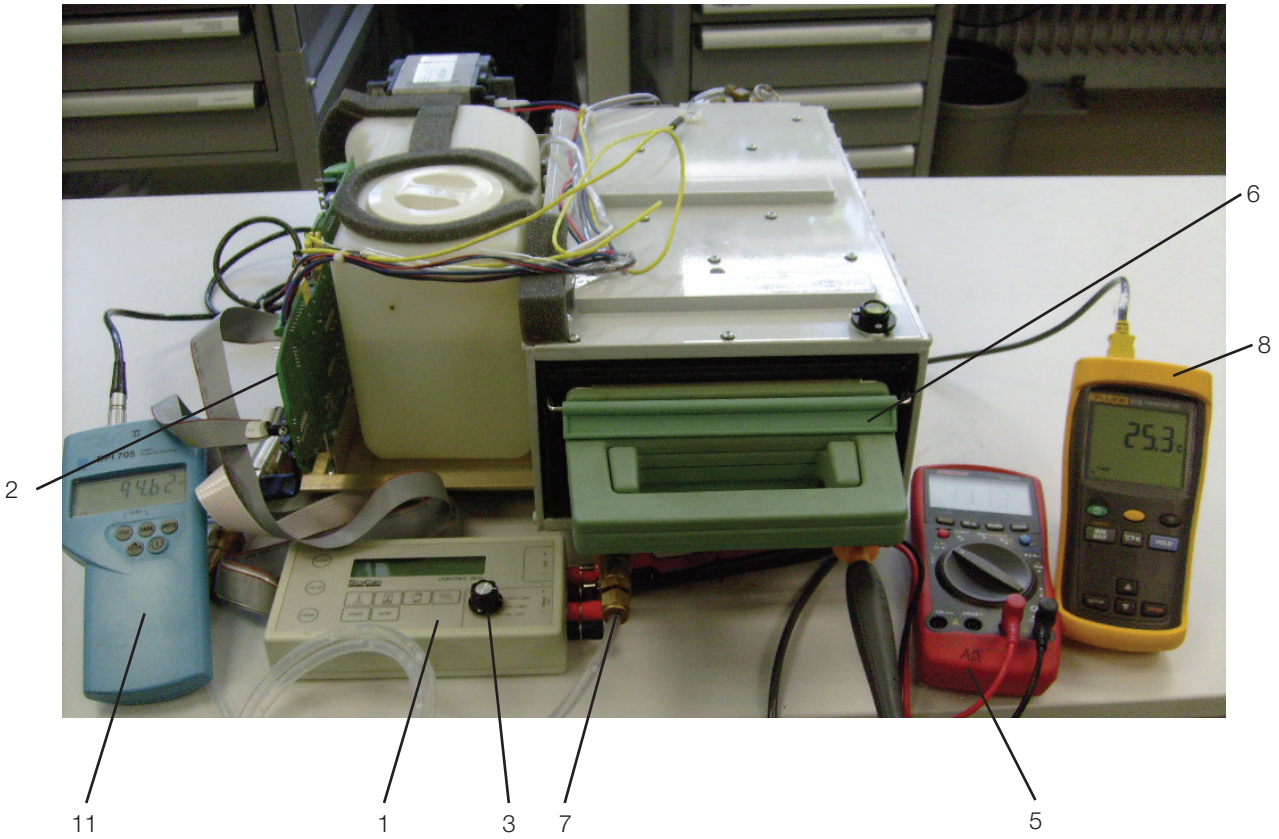
Setting up the unit for calibration:

1. Before starting calibration, turn the STAT*IM* **OFF.**
2. The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover on as all adjustments to the calibration offsets are undertaken using the keypad on the unit.
3. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette is correctly engaged in the STAT*IM*.
4. Install the thermocouple into the cassette and attach the digital thermometer.
5. Ensure that the thermocouple and digital thermometer have matched serial numbers.
6. Attach the pressure reference meter to the pressure tube and the pressure tube to the test cassette. (Self locking couplings).



1. Control box
2. Controller board
3. SELECT knob
4. Digital voltmeter
5. Calibration cassette
6. Thermocouple
7. Digital thermometer
8. Pressure meter

Figure 3



Note: The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover on as well as adjustments to the calibration offsets are undertaken using the keypad on the units.

7. Turn ON the unit while keeping Unwrapped and Wrapped button pressed to enter STAT*IM* **Service Mode**.
8. This **Service Mode** is password protected, enter password to continue (default password is: Unwrapped, Wrapped, R&P and Stop keys pressed in that order).

   Keypad functions (Unit LCD or Control Box) at this time will be:

   - **Unwrapped Key:** Select next item in the menu.
   - **Wrapped Key:** Select previous item in the menu.
   - **Rubber and Plastics Key:** Enter current selection
   - **Toggle** using keypad through the menu selection to reach Calibration option and press R&P key.

     The display should be similar to the diagram below.

     Where

     - PPP.P = actual chamber pressure in kPa.
     - PO = chamber pressure hexadecimal offset value
     - TTT.T = theoretical pressure calculated from the actual chamber temperature.
     - CO = chamber temperature hexadecimal offset value
     - CCC.C = actual chamber temperature in °C

   IMPORTANT NOTES:

   - Remember – the steam generator thermocouple does NOT require calibration.
   - The VREF does not need adjustment.

1. Chamber Thermocouple and Pressure Transducer Calibration

To calibrate the chamber thermocouple and pressure transducer:

9. To start the calibration cycle, **press and release** the UNWRAPPED cycle button on the control box / display and then press the **START** button. **Adjust Press!** will appear in the display and the PO value will flash. The PO value can only be adjusted while it is flashing.

10. By using the Unwrapped key (+) and Wrapped Key (-) the pressure offset PO (at atmospheric pressure) can now be adjusted until the reading on the LCD display (as displayed in the PPP.P field) matches the external pressure reference meter's reading. The PO field will then show the new pressure offset. **NOTE**: This has to be done within 30 seconds.
11. After 30 seconds, the calibration cycle will continue by entering the heating up phase **and the PO will STOP flashing and the CO value will flash**. The CO value can **only** be adjusted while it is flashing.
12. During calibration the unit will run a normal cycle.
13. Allow the chamber to reach the sterilization temperature. As pressure builds in the chamber, check for leaks in the cassette, associated piping and fittings. A steam leak in the system will introduce errors in the measurement and will result in improper calibration and may compromise sterilization conditions.
14. When **Adjust Temp!** appears on the display, (see below) and you are confident that the readings are stable, the chamber thermocouple offset CO can now be adjusted using the wrapped and unwrapped keys until the reading on the LCD display (as displayed in the CCC.C field) matches the external temperature reference meter's reading. The CO field will then show the new chamber temperature offset.

IMPORTANT NOTE: When the initial pressure and temperature readings have been adjusted, and to ensure equilibrium of the calibration, compare the measured chamber pressure (PPP.P) and the calculated chamber pressure (TTT.T) displayed on the LCD. They should be within 1 kPa of each other during equilibrium.

15. If they are not, then the unit may be fine tuned as follows:
    - **These units have a two-stage pressure offset** and the upper offset can be modified during the sterilization phase of the calibration. This will NOT effect the lower offset value BUT if you subsequently change the lower value after the unit has vented then you will lose the upper value as this will be reset to the same value as the lower offset.
    - If the actual chamber pressure reading on the LCD (PPP.P) is different by more than 1 kPa from the **pressure reference meter** reading then this can be adjusted using the wrapped and unwrapped keys.
        - Press the Rubber and Plastics key.
        - **The CO value will now STOP flashing and the PO value will now flash.**
        - Use the wrapped and unwrapped keys to correct the upper PO value.
    - If this adjustment corrects the PPP.P reading to within 1 kPa of the TTT.T reading then the unit is now in equilibrium.

- If these reading are still not within 1 kPa of each other then further adjustment may be undertaken by modifying the TTT.T value.
- The theoretical pressure reading (TTT.T) and actual chamber temperature reading (CCC.C) are directly related and when the actual temperature value is increased or decreased, the theoretical pressure value will also increase or decrease respectively.
- Adjust the theoretical chamber pressure (TTT.T) and actual chamber temperature readings (CCC.C) as follows:
  - Press the Rubber and Plastics key.
  - **The PO value will now STOP flashing and the CO value will now flash.**
  - Use the wrapped and unwrapped keys to correct the TTT.T value so that it is within 1 kPa of PPP.P.
- **IMPORTANT** – now **re-check** the actual temperature reading (CCC.C) with the reading on the temperature reference meter. The readings need to be stable, so allow sufficient time to compare them.
- If you are confident that the temperature readings are still within ±0.25°C, then the unit is in equilibrium and the calibration has finished.
- If the readings are outside of the ± 0.25°C tolerance then further diagnostics may be required prior to re-calibration.

16. Press the **STOP** button on the control box when finished.

2. Switch off the unit and remove all calibration equipment.

Calibration Procedure 9: for S-class G4 Units with Rev. 7.x Board, Software Rev. 7.xx, SL 00R1.xx

This calibration procedure is for S-class STATIM 2000/5000 G4 units with revision 7.x type controller boards and revision 7.xx software, SL00R1.xx
Important:

- Incorrect or inaccurate calibration may cause unsuccessful sterilization of instruments.
- Always calibrate the thermocouples after a thermocouple replacement, thermocouple bend or disconnect, controller board replacement or microprocessor / EEPROM replacement, steam generator replacement or probe bracket replacement.
- Make sure that there is sufficient steam-process distilled water in the unit prior to starting calibration.
- S-class units contain electronic components which may be damaged or destroyed by electro-static discharge (ESD). Observe appropriate safeguards when calibrating.
- There are specific error messages (cycle faults) for these board/software types. These can be found in the Troubleshooting Cycle Faults section.
- In calibration mode no error messages are displayed.
- Boiler calibration is not required on these units.
- These units may be calibrated with the cover in place OR using the control box as all adjustments are made using the touchscreen.
- There is NO reference voltage adjustment in these machines.

Calibration Procedure

Calibration of these boards should be done in the following order:
1. Chamber thermocouple/pressure transducer calibration

Required equipment and tools:

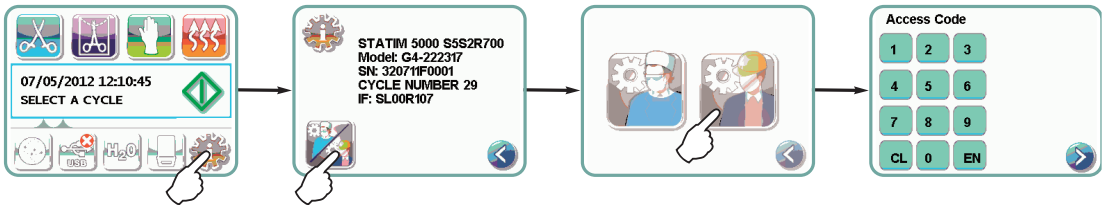
- Calibration cassette (appropriate to model)
- Digital thermometer
- Digital pressure meter
- Digital voltmeter

NOTE: Use of control box is optional. Calibration can be completed using touchscreen.

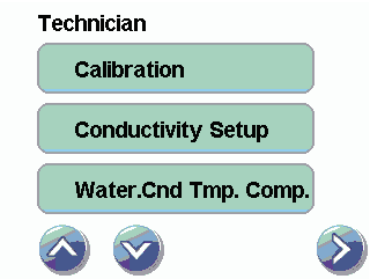
Setting up the unit for calibration:

1. Before starting calibration, turn the STAT*IM* OFF.
2. The cover MAY be removed and the control box attached if deemed appropriate, but the unit can be calibrated with the cover using the touchscreen.
3. Check that there is sufficient steam process distilled water in the reservoir, and that the calibration cassette is correctly engaged in the STAT*IM*.
4. Install the thermocouple into the cassette and attach the digital thermometer.
5. Ensure that the thermocouple and digital thermometer have matched serial numbers.
6. Attach the pressure reference meter to the pressure tube and the pressure tube to the test cassette. (Self-locking couplings).

7. Turn ON the unit and access the service menu in the following manner:



8. This Service Mode is PIN protected, enter password to continue (default password is: 7919).
9. From the service menu, select Calibration.



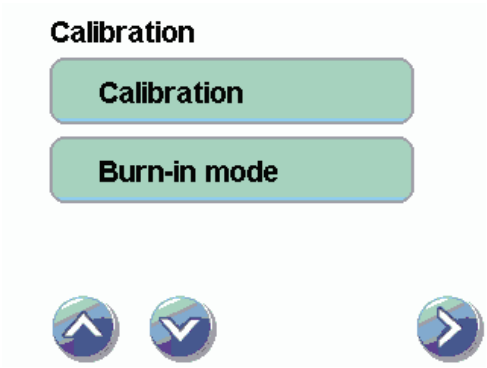
IMPORTANT NOTES:

- Remember – the steam generator thermocouple does NOT require calibration.
- The VREF does not need adjustment.

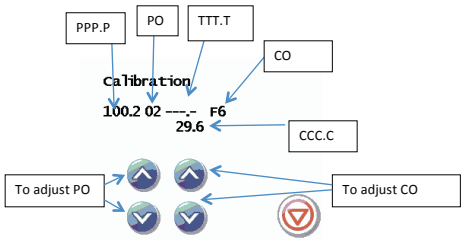
1. Chamber Thermocouple and Pressure Transducer Calibration

To calibrate the chamber thermocouple and pressure transducer:

1. To start the calibration cycle, select Calibration in the Calibration submenu and calibration will start automatically



1. Adjust Press! will appear in the display and the PO value will flash. The PO value can only be adjusted while it is flashing.



(PPP.P) Actual chamber pressure in kPa.
(PO) Chamber pressure hexadecimal offset value
(TTT.T) Theoretical pressure calculated from the actual chamber temperature.
(CO) Chamber temperature hexadecimal offset value
(CCC.C) Actual chamber temperature in °C

2. By using the lefthand arrow keys, adjust the pressure offset PO (at atmospheric pressure) until the reading on the LCD display matches the external pressure reference meter's reading. The PO field will then show the new pressure offset.
   NOTE: This has to be done within 30 seconds.
3. After 30 seconds, the calibration cycle will continue by entering the heating up phase and the PO will STOP flashing and the CO value will flash. The CO value can only be adjusted while it is flashing.
4. During calibration, the unit will run a normal cycle.
5. Allow the chamber to reach the sterilization temperature. As pressure builds in the chamber, check for leaks in the cassette, associated piping and fittings. A steam leak in the system will introduce errors in the measurement and will result in improper calibration and may compromise sterilization conditions.
6. When Adjust Temp! appears on the display, (see below) and you are confident that the readings are stable, the chamber thermocouple offset CO can now be adjusted using the using the righthand arrow keys below it until the reading on the LCD display (as displayed in the CCC.C field) matches the external temperature reference meter's reading. The CO field will then show the new chamber temperature offset.

IMPORTANT NOTE: When the initial pressure and temperature readings have been adjusted, and to ensure equilibrium of the calibration, compare the measured chamber pressure (PPP.P) and the calculated chamber pressure (TTT.T) displayed on the LCD. They should be within 1 kPa of each other during equilibrium.

7. If they are not, then the unit may be fine-tuned as follows:

    - These units have a two-stage pressure offset and the upper offset can be modified during the sterilization phase of the calibration. This will NOT affect the lower offset value BUT if you subsequently change the lower value after the unit has vented then you will lose the upper value as this will be reset to the same value as the lower offset.
    - If the actual chamber pressure reading on the LCD (PPP.P) is different by more than 1 kPa from the pressure reference meter reading then this can be adjusted using the lefthand arrow keys. If this adjustment corrects the PPP.P reading to within 1 kPa of the TTT.T reading then the unit is now in equilibrium.
    - If these readings are still not within 1 kPa of each other, further adjustment may be undertaken by modifying the TTT.T value.
    - The theoretical pressure reading (TTT.T) and actual chamber temperature reading (CCC.C) are directly related and when the actual temperature value is increased or decreased, the theoretical pressure value will also increase or decrease respectively.
    - Adjust the theoretical chamber pressure (TTT.T) and actual chamber temperature readings (CCC.C) using the righthand arrow keys to correct the TTT.T value so that it is within 1 kPa of PPP.P.
    - IMPORTANT – now re-check the actual temperature reading (CCC.C) with the reading on the temperature reference meter. The readings need to be stable, so allow sufficient time to compare them.
    - The unit is in equilibrium and the calibration is complete when you are confident that the temperature readings are still within ±0.25°C.
    - If the readings are outside of the ± 0.25°C tolerance, further diagnostics may be required prior to re-calibration.

8. Press the STOP button when finished.

2. Switch off the unit and remove all calibration equipment.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Cover Assembly

For STATIM 5000 Classic

Removing the Cover

To remove the cover, proceed as follows (see Figure 1):

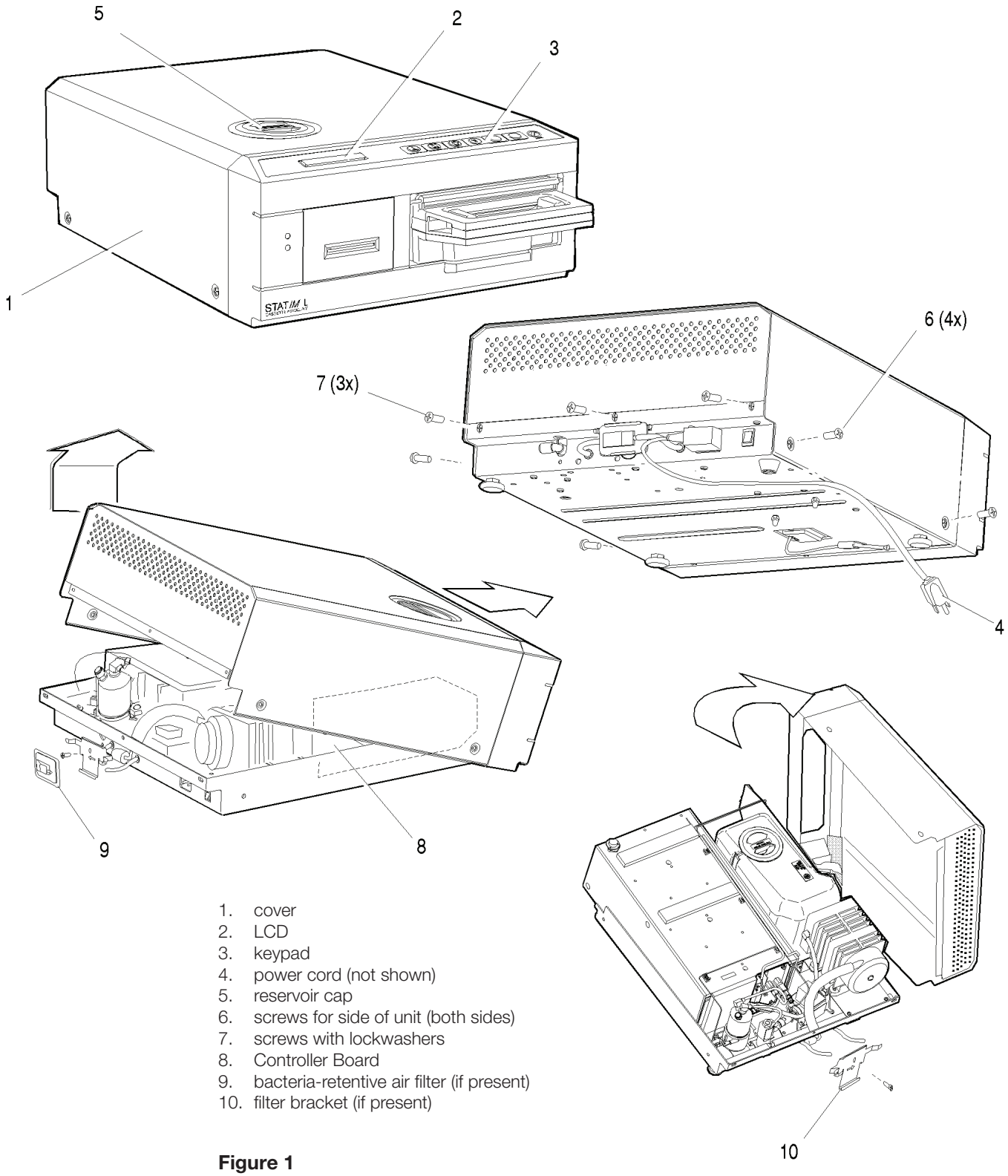
1. Inspect the cover (1) to ensure that it has not been damaged in transit. Position the unit on the bench so the front leveller feet are securely on the work surface and the front cover extends past the work surface edge.
2. Check that the LCD (2) and keypad (3) function. This requires that the unit be powered ON.

Note: Check for symptoms of the failure to ensure that no further damage occurs.

3. Unplug the power cord (4) from the wall outlet and remove the cassette from the unit.
4. Remove the reservoir cap (5) from the top of the unit.
5. Remove seven screws from the cover; first remove two on each side (6) and then three with lockwashers (7) at the rear of the unit, using a #2 Phillips screwdriver. Some STAT*IM* 5000 units are manufactured with a bacteria-retentive air filter (9) attached to the rear of the unit by a single screw. This filter must be disconnected and the bracket (10) removed before the cover can be removed. If the bacteria-retentive air filter is present proceed as in section 2. Filters on the STAT*IM* 5000/5000S and remove the single screw securing the bracket first. Remove the screws on either side and remove the bracket. Retain the filter, screw and bracket for re-assembly.
6. Slowly, lift the rear portion of the cover upwards. When the cover is clear of the internal components, carefully slide the entire cover forward to clear the front of the armature and unsupported controller board (8). Slowly pivot the cover the same way a book opens and place it next to the unit. The keypad and LCD are still accessible and the internal components are exposed.

Note: The controller board is unsupported at the front of the unit. Be careful. The keypad and LCD cables are still attached to the controller board.

7. Observe the orientation of the ribbon cable connections: disconnect the printer connector from controller board header P2 (if optional printer is present), the LCD connector from controller board header P3, and the keypad connector from controller board header P4.
8. Replace the reservoir cap onto the top of the reservoir.



1. cover
2. LCD
3. keypad
4. power cord (not shown)
5. reservoir cap
6. screws for side of unit (both sides)
7. screws with lockwashers
8. Controller Board
9. bacteria-retentive air filter (if present)
10. filter bracket (if present)

Figure 1

Reinstalling the Cover

To reinstall the cover, proceed as follows (see Figure 1).

1. Inspect the armature gasket located on the inside front portion of the cover. If it is damaged or fails to adhere to the surface of the cover, it must be replaced. See, Replacing the Armature Gasket below.
2. Remove the reservoir cap (5) from the top of the reservoir.
3. Rest the cover (1) beside the left side of the unit. Reconnect the keypad connector to controller board header P4, the LCD connector to controller board header P3, and the printer to controller board header P2 (or to the pressure interface board if installed), if the optional printer is installed.
4. Reconnect the power cord and power the unit ON to check that the LCD, keypad and printer are functioning. If the amber LED on the front cover is flashing, or the solenoid valve is activated repeatedly, the LCD connector is incorrectly installed. Check that the keypad connector is properly plugged onto the header. Select a cycle and wait for the proper display messages. After checking, turn the power switch OFF and unplug the power cord.
5. Carefully lift the cover from the work surface. While rotating the cover slide it forward until the fascia clears the Controller Board and the front of the armature.
6. Tilt the front of the cover down and the rear of the cover upwards. Carefully reposition the front portion of the cover back over the front of the controller board (8) and armature. BE CAREFUL OF THE LEDs at the front left hand corner of the unit. These fit into the clearance holes in the cover. BE CAREFUL NOT TO PINCH THE RIBBON CABLES.
7. When the front of the cover is in place, lower the rear portion of the cover, and gently push backwards. Carefully realign the screw holes and re-insert three screws with lockwashers (7) across the rear of the unit.

   If the STAT*IM* 5000/5000S being serviced has a bacteria-retentive air filter (9), re-insert the screws with lockwashers (7) on either side of the center screw hole before reinstalling the filter bracket (10). Follow the steps described in 2. Filters on the STAT*IM* 5000/5000S to reinstall the biological filter.
8. Re-insert the four remaining screws (6), two on each side. Press firmly on the top of the cover to compress the gaskets and partially re-insert the screws as the holes align. When in place, tighten all the screws. Do not over tighten the screws.
9. Place the reservoir cap (5) back onto the reservoir.
10. Reconnect the power cord (4).

Removing and Replacing the Armature Gasket

To remove the armature gasket, remove the cover to access the inside of the fascia and peel the existing armature gasket from the fascia.

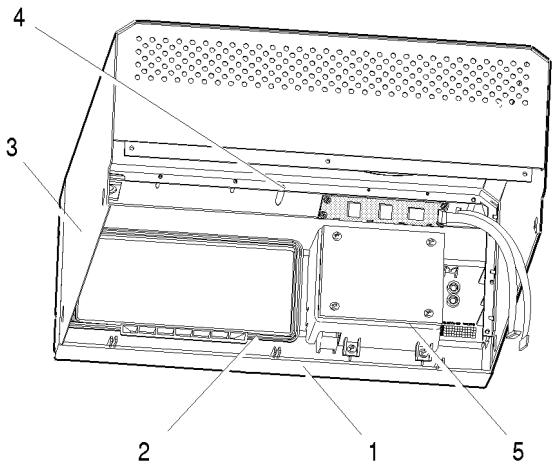
To replace the armature gasket proceed as follows (see Figure 2).

1. Remove all traces of the gasket and gasket adhesive from inside the fascia (1). The fascia is manufactured of polycarbonate plastic. DO NOT USE AROMATIC SOLVENTS ON THE FASCIA. This will damage the fascia. To prepare for installation of the new gasket (2), roughen the inside surface of the fascia using a fine grit sand paper.
2. Leave the carrier paper on the adhesive side of the gasket and perform a trial fit. Note that the widest part of the gasket fits at the bottom of the opening and that the gasket does not protrude into the opening.
3. Remove the carrier paper from the adhesive side of the gasket.Carefully install the gasket making sure it is seated firmly in place.

Removing and Replacing the Fascia

To remove the fascia (1), proceed as follows (see Figure 2):

1. The fascia is attached to the cover (3) using seven plastite screws (4). Remove and retain the screws.
2. A bead of silicon was used to provide a water-tight seal between the facsia and cover during manufacturing. Remove the fascia and any silicon residue remaining on the cover.



1. fascia
2. armature gasket
3. cover
4. plastite screw
5. printer module

Figure 2

3. If a printer module (5) is installed it must be removed from the fascia. See, 12. Printer - Removing and Replacing the Printer.
4. Discard the old fascia. The fascia is made of recyclable polycarbonate. Please recycle wherever possible.

To replace the fascia (1), proceed as follows (see Figure 2):

1. If a printer module (5) was previously installed it must be reinstalled in the fascia. See, Removing and Replacing the Printer.
2. Apply a bead of silicon between the facsia and cover (3) to provide a water-tight seal.
3. Install the new fascia using the seven screws (4) retained from the disassembly procedure.
4. Reinstall the cover. See, Cover Removal and Replacement, above. Verify that the keypad, LCD and printer (if installed) function correctly.

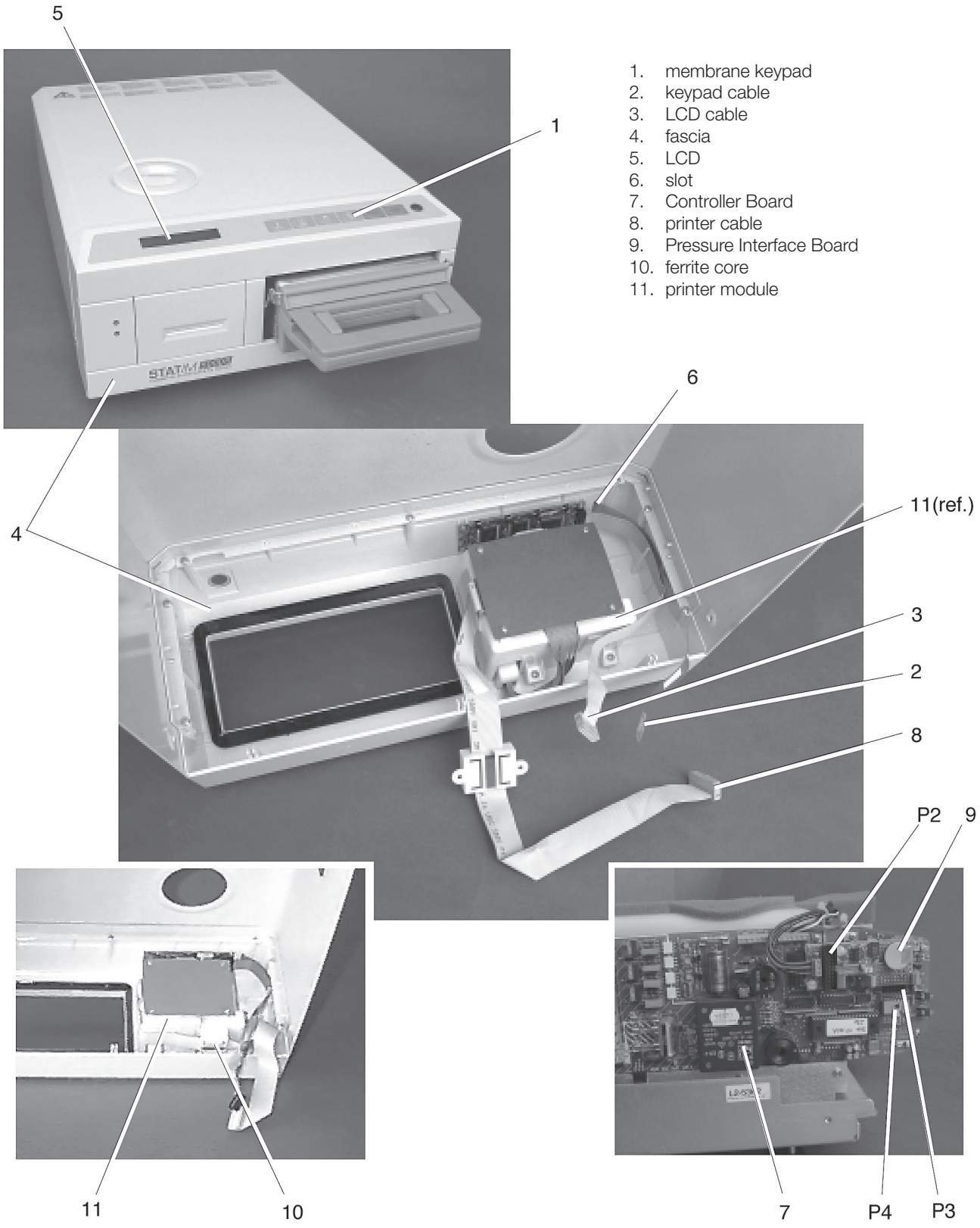
Removing and Replacing the Membrane Keypad (LCD overlay)

To remove the membrane keypad (1), proceed as follows (see Figure 3):

1. The keypad flexible cable (2) and the LCD ribbon cable (3) are secured together with double sided adhesive tape. Carefully separate the cables.
2. Using a sturdy sharp instrument, carefully lift one corner of the membrane keypad and CAREFULLY peel the membrane keypad away from the fascia (4). USE CAUTION, there may be adhesive on the edges of the LCD (5). Pass the connector through the slot (6) in the fascia.
3. Remove any residual adhesive or membrane from the recessed keypad area of the fascia.

To replace the membrane keypad (1), proceed as follows (see Figure 3):

1. The replacement membrane keypad has carrier paper on the back to protect the adhesive. With the carrier paper in place, feed the keypad cable (2) connector through the slot (6) in the fascia (4).
2. Remove the carrier paper and align the bottom edge of the membrane keypad with the bottom edge of the recessed area on the fascia. Carefully lower the membrane into place while continuing to draw the keypad cable connector through the slot. With finger pressure only, press the membrane into place, eliminating air pockets under the membrane.
3. Secure the keypad cable and LCD cable together using dual sided adhesive tape.
4. Connect the keypad cable connector to controller board (7) P4.
5. Connect the right angle LCD cable connector to controller board P3.
6. Connect the printer cable (8) connector, if present, to controller board P2 or pressure interface board (9) connector P2, if present. The printer cable in Figure 3 shows a ferrite core (10). This core may or may not be present. If present, the core must be attached to the wall of the printer module before replacing the cover.
7. Plug in the power cord and power the unit ON. To test each button on the keypad ensure that the cassette is not engaged, or that it is out of the unit. Select a cycle and press the START button. The LCD message reads, “INSERT CASSETTE”. Repeat this step for each cycle to ensure the keypad is functioning properly. To test the STOP button select a cycle. The LCD message indicates which cycle is selected. Press the STOP button. The LCD message reads, “SELECT A CYCLE”.
8. Reinstall the cover. See Cover Removal and Replacement, above.



1. membrane keypad
2. keypad cable
3. LCD cable
4. fascia
5. LCD
6. slot
7. Controller Board
8. printer cable
9. Pressure Interface Board
10. ferrite core
11. printer module

Figure 3

Removing and Replacing the LCD

To remove the LCD (1) from the fascia (2), proceed as follows (see Figure 4):

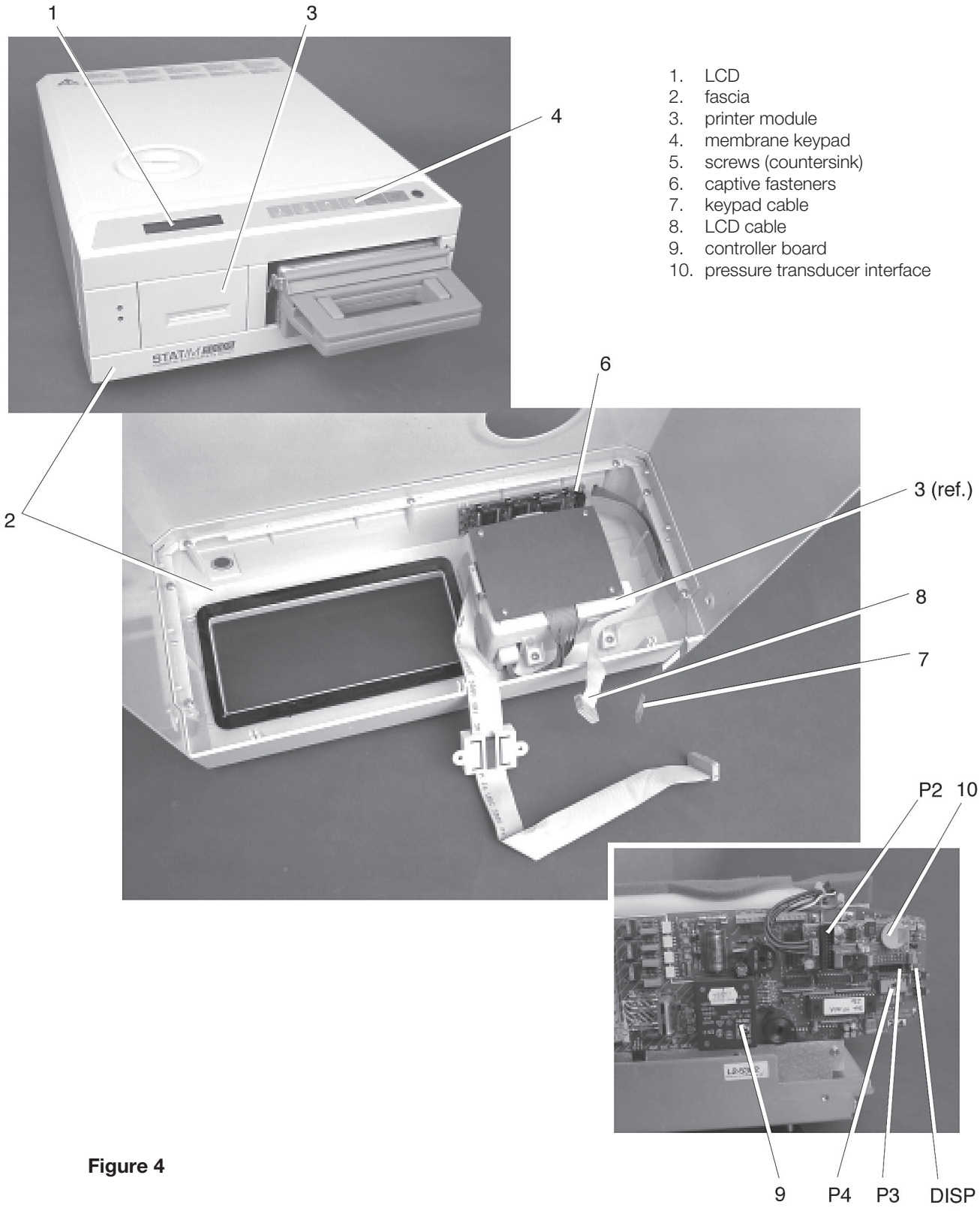
1. If present, remove the printer module (3). See section 12. Printer, Removing the Printer Module.
2. Carefully remove the membrane keyboard (4) from the fascia. See Membrane Keypad Removal and Replacement, above.
3. Using a Phillips screw driver remove and retain the four countersink screws (5) securing the LCD to the fascia. Each screw is held by a captive fastener (6) which is integral to the LCD assembly.
4. The keypad cable (7) and the LCD cable (8) are secured together with double sided adhesive tape. Carefully separate the harnesses and remove the LCD.

To replace the LCD (1), follow these steps (see Figure 3):

1. Align the captive fasteners (6) on the LCD with the four clearance holes in the fascia (2) and reinstall the LCD using the four countersink screws (5) retained from disassembly. The LCD cable (8) and the keypad cable (7) are on the same side of the cover.

Note: Do not press down in the middle of the LCD assembly. Apply pressure in the areas immediately adjacent the mounting holes only.

2. Carefully reinstall the membrane keyboard (4) on the fascia. See Membrane Keypad Removal and Replacement, above.
3. If present, reinstall the printer module (3). See section 12. Printer, Replacing the Printer Module.
4. Secure the cables together using double sided adhesive tape.
5. Connect the keypad connector to Controller Board (9) P4.
6. Connect the LCD connector to Controller Board P3.
7. Connect the printer connector (if present) to controller board P2 or pressure interface board (10) connector P2, if present.
8. Power the unit ON. If the LCD fails to display the “select a cycle” message, the microprocessor is improperly installed or the LCD intensity pot is not adjusted correctly. If the amber LED on the front cover is flashing, or the solenoid valve is activating repeatedly, the LCD connector is incorrectly installed.
9. If the LCD intensity or contrast is not suitable, adjust the pot labeled either DIS or DISP, on the controller board.
10. Reinstall the cover. See Cover Removal and Replacement, above.



1. LCD
2. fascia
3. printer module
4. membrane keypad
5. screws (countersink)
6. captive fasteners
7. keypad cable
8. LCD cable
9. controller board
10. pressure transducer interface

Figure 4

For STATIM 5000 G4

Removing the STAT*IM* 5000 G4 Cover

To remove the cover, follow these steps (see Figure 5):

1. Inspect the cover (1) to ensure that it has not been damaged in transit. Position the unit on the bench so the front leveller feet are securely on the work surface and the front cover extends past the work surface edge.
2. Check that the colour LCD functions. This requires that the unit be powered ON
   NOTE: Check for symptoms of the failure to ensure that no further damage occurs.
3. After checking the LCD, turn the unit OFF, unplug the power cord from the unit's line filter (2) and remove the cassette from the unit.
4. Remove the reservoir cap (3) from the top of the unit.
5. Remove seven screws from the cover; first remove two on each side (4) and then three with lockwashers (5) at the rear of the unit, using a #2 Phillips screwdriver. Note that the center screw on the rear of the unit also attaches the bracket for the bacteria-retentive air filter (6). This filter must be disconnected and the bracket (7) removed before the cover can be removed.
6. Slowly, lift the rear portion of the cover upwards. When the cover is clear of the internal components, carefully slide the entire cover forward to clear the front of the armature and of the unsupported controller board (8). Slowly pivot the cover the same way a book opens and place it next to the unit. The colour LCD should still be accessible and the internal components exposed.
   Note: The controller board is unsupported at the front of the unit. Be careful. The LCD cable and LCD DC power source cable are still attached to the unit.
7. Disconnect the LCD connector (9) from controller board header P3, and the LCD DC power source cable (10) from from the controller board
8. Replace the reservoir cap onto the top of the reservoir.

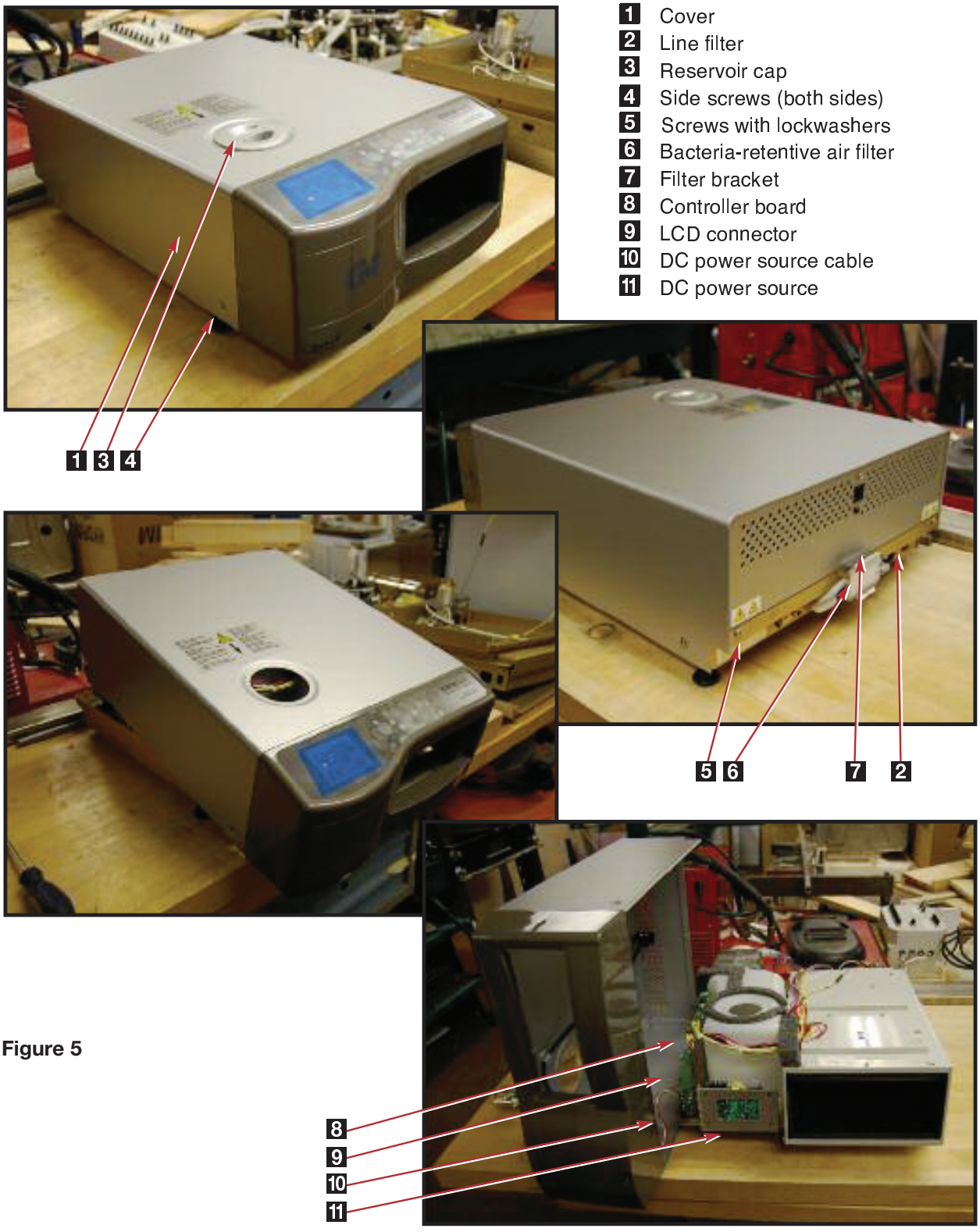

1 Cover
2 Line filter
3 Reservoir cap
4 Side screws (both sides)
5 Screws with lockwashers
6 Bacteria-retentive air filter
7 Filter bracket
8 Controller board
9 LCD connector
10 DC power source cable
11 DC power source
1 3 4
5 6 7 2
8 9 10 11

Figure 5

Reinstalling the STAT*IM* 5000 G4 Cover

To reinstall the cover, follow these steps (see Figure 5).

1. Inspect the armature gasket located on the inside front portion of the cover. If it is damaged or fails to adhere to the surface of the cover, it must be replaced. See, *Replacing the Armature Gasket* following.
2. Remove the reservoir cap (3) from the top of the reservoir.
3. Rest the cover (1) beside the left side of the unit. Reconnect the LCD connector (9) to controller board header P3, and the LCD's DC power source cable (10) to the LCD controller board (11) located in the fascia.
4. Reconnect the power cord (2) and power the unit ON to check that the LCD is functioning. After checking, turn the power switch OFF and unplug the power cord.
5. Carefully lift the cover from the work surface. While rotating the cover slide it forward until the fascia clears the controller board (8) and the front of the armature.
6. Tilt the front of the cover down and the rear of the cover upwards. Carefully reposition the front portion of the cover back over the front of the controller board and armature. **BE CAREFUL NOT TO PINCH THE RIBBON CABLE.**
7. When the front of the cover is in place, lower the rear portion of the cover, and gently push backwards. Ensure the three tabs at the bottom of the fascia are properly lined up with the three holes in the front of the chassis. Carefully realign the screw holes at the back and re-insert three screws with lock washers (5) across the rear of the unit (TIP: start with the rear center screw).
8. Re-insert the four remaining screws (4), two on each side. Press firmly on the top of the cover to compress the gaskets and partially re-insert the screws as the holes align. When in place, tighten all the screws. Do not over tighten the screws.
9. Place the reservoir cap (3) back onto the reservoir.
10. Reconnect the power cord.

Removing and Replacing the STAT*IM* 5000 G4 Armature Gasket

To remove the armature gasket, remove the cover to access the inside of the fascia and peel the existing armature gasket from the fascia.

To replace the armature gasket follow these steps (see Figure 6).

1. Remove all traces of the gasket (1) and gasket adhesive from inside the fascia (2). The fascia is manufactured of polycarbonate plastic. **DO NOT USE AROMATIC SOLVENTS ON THE FASCIA**. This will damage the fascia. To prepare for installation of the new gasket, roughen the inside surface of the fascia using a fine grit sandpaper.
2. Leave the carrier paper on the adhesive side of the gasket and perform a trial fit. Note that the widest part of the gasket fits at the bottom of the opening and that the gasket does not protrude into the opening.
3. Remove the carrier paper from the adhesive side of the gasket. Carefully install the gasket making sure it is seated firmly in place.

1 Armature gasket
2 Fascia
3 Cover

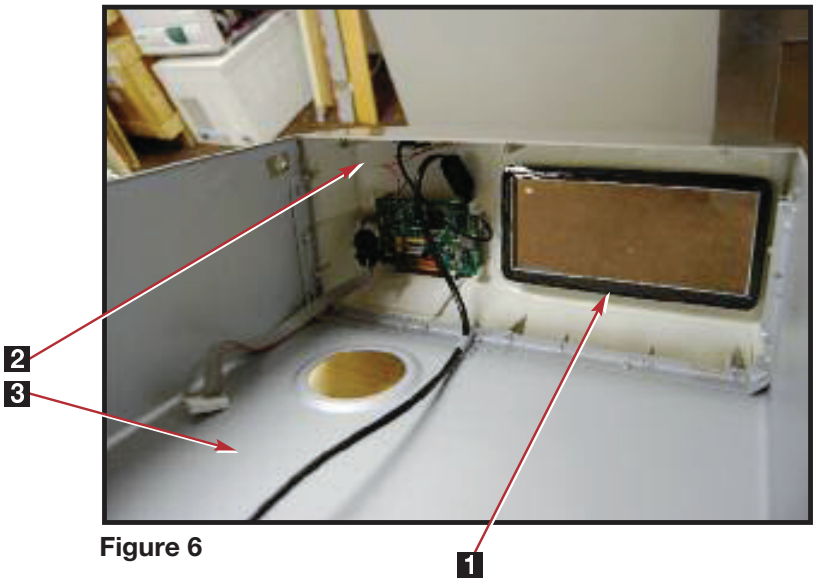


Figure 6

Removing and Replacing the STAT*IM* 5000 G4 LCD Overlay

To remove the LCD overlay, follow these steps (see Figure 7):

1. Using a sturdy sharp instrument, carefully lift one corner of the LCD overlay (1) and CAREFULLY peel it away from the fascia (2). USE CAUTION, there may be adhesive on the edges of the LCD overlay.
2. Remove any residual adhesive or membrane from the recessed area of the fascia.

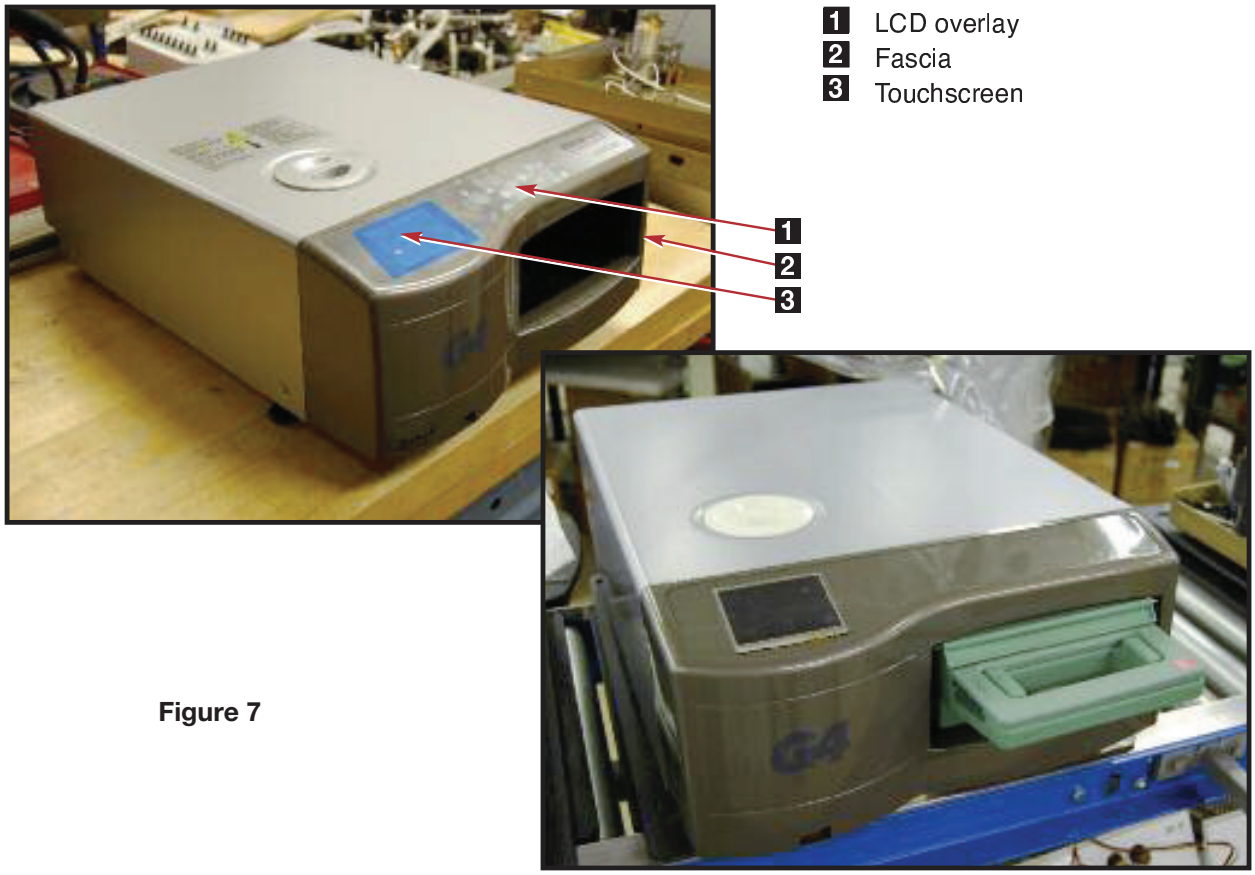


Figure 7

To replace the LCD overlay, follow these steps (see Figure 7):

1. The replacement colour LCD overlay has carrier paper on the back to protect the adhesive. Remove the carrier paper and align the bottom edge of the overlay with the bottom edge of the recessed area on the fascia. Carefully lower the overlay into place. With finger pressure only, press it into place, eliminating air pockets under the overlay.
   NOTE: Do not press down in the middle of the colour LCD assembly. Apply pressure around the frame of the LCD.
2. Reconnect the power cord. Power the unit ON and test the touchscreen (3).
3. Reinstall the cover.

Removing and Replacing the STAT*IM* 5000 G4 Colour LCD Touchscreen

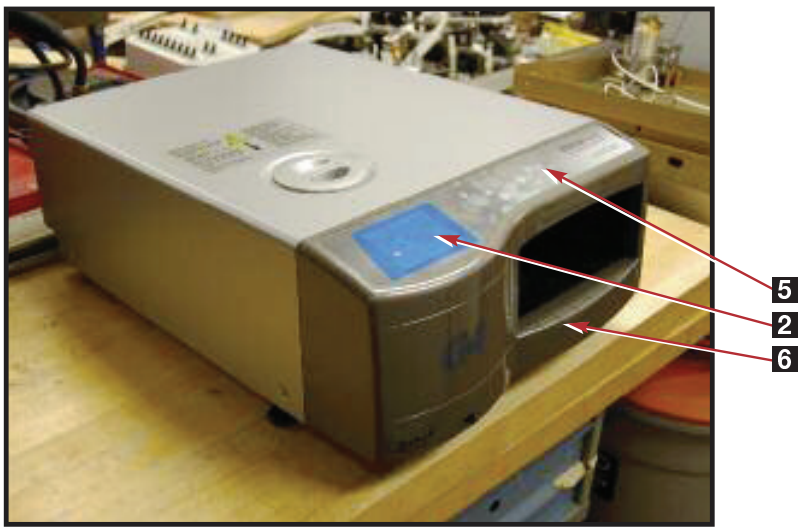
Note: To replace the colour LCD touchscreen you will also need a new LCD overlay.

To remove the colour LCD touchscreen LCD overlay and remove the cover to access the inside of the fascia (see Figure 8).

1. With the cover upside down on a work surface, disconnect the flexible PCB connector (1) cable connecting the colour LCD (2) to the LCD controller board (3). It is connected to the LCD controller board using a hinged catch (4). With your fingernail, pull on the door of the hinged catch to release the flexible PCB connector.
2. Turn the cover right side up and carefully remove the LCD overlay (5) from the fascia (6) and discard it.
3. The colour LCD touchscreen is held in place with two-sided adhesive tape. If it does not come off easily, put a small screwdriver in the PCB connector cable slit and push upwards.

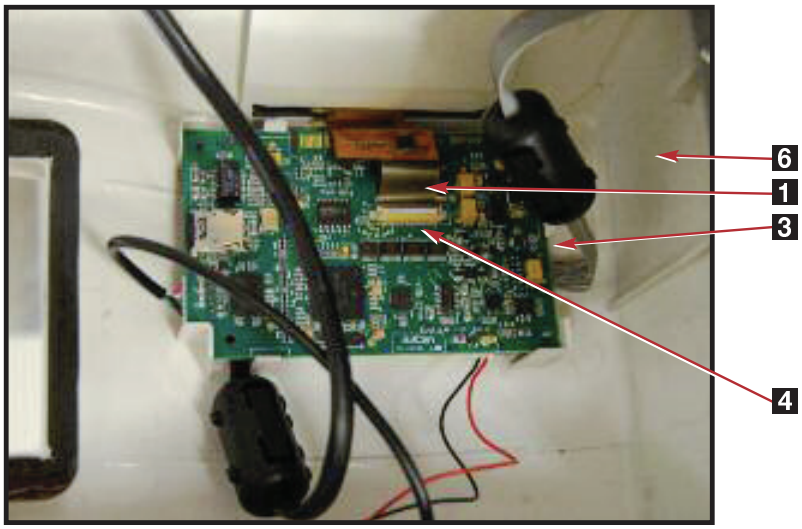
To replace the colour LCD touchscreen, follow these steps:

1. Align the colour LCD touchscreen in the recessed area in the fascia.
   NOTE: Do not press down in the middle of the colour LCD assembly. Apply pressure around the frame of the LCD.
2. Replace the LCD overlay with a new overlay.
3. Turn the cover upside down to access the inside of the fascia.
4. Connect the flexible PCB connector, pushing it down into position and closing the hinged connector. Give the flexible PCB connector a gentle tug to ensure it is properly held in position.
5. Connect the LCD controller board power cable to the DC power source and plug in the unit.
6. Power ON the unit to test the colour LCD touchscreen.



1 Flexible PCB connector
2 Colour LCD touchscreen
3 LCD controller board
4 Hinged catch
5 LCD overlay
6 Fascia

Figure 8



Removing and Replacing the STAT*IM* 5000 G4 Fascia

To remove the fascia, follow these steps (see Figure 9):

1. Place it right side up on a worksurface and remove the LCD overlay and the colour LCD touchscreen (see Removing LCD overlay and removing Colour LCD touchscreen)
2. Turn the cover upside down and remove the colour LCD controller board, speaker, Ethernet port and USB port (See removing LCD controller board, speaker, Ethernet port and USB port).
3. The fascia is attached to the cover (1) using seven plastite screws (2). Remove and retain the screws.
4. A bead of silicone was used to provide a water-tight seal between the fascia and cover during manufacturing. Remove the fascia and any silicon residue remaining on the cover.
5. Discard the old fascia. The fascia is made of recyclable polycarbonate. Please recycle wherever possible.

To replace the fascia, follow these steps (see Figure 8):

1. Apply a bead of silicon between the fascia and cover (1) to provide a water-tight seal.
2. Install the new fascia using the seven screws (2) retained from the disassembly procedure.
3. Reinstall the colour LCD touchscreen and LCD overlay.
4. Turn it upside down and reinstall the colour LCD controller board, speaker, USB and Ethernet ports.
5. Reinstall the cover.
6. Verify that the colour LCD functions correctly.

1 Cover
2 Plastite screws
3 LCD controller board

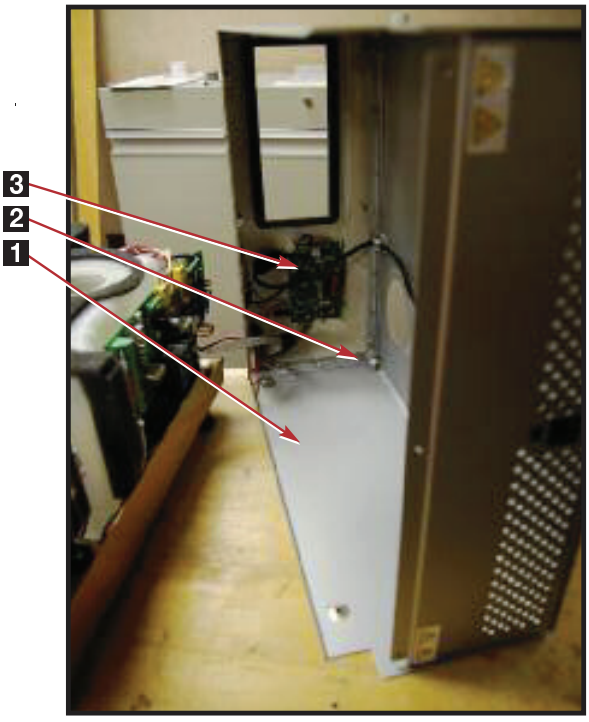


Figure 9

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

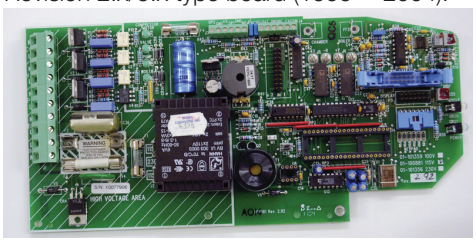
Electrical and Electronic Components

Controller Board

Identifying the Controller Board Type

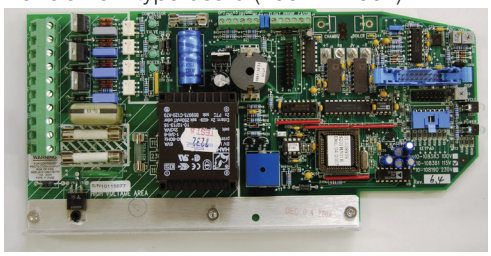
There are different types of controller boards which may be encountered while servicing STAT*IM* 5000 / 5000S type units (see 'PCB revision' chart in Chapter 1. Identifying Your STAT*IM*). They can be identified as below (Figure 1):

Revision 2.x/5.x type board (1995 —2004):



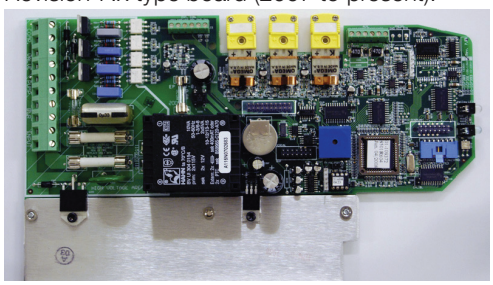
Typical features:
- Revision number bottom right hand side
- Rectangular microprocessor plus EPROM
- 'W1' jumper for calibration
- Blue 'pressure interface/printer' connector

Revision 6.x type board (2004 —2007):



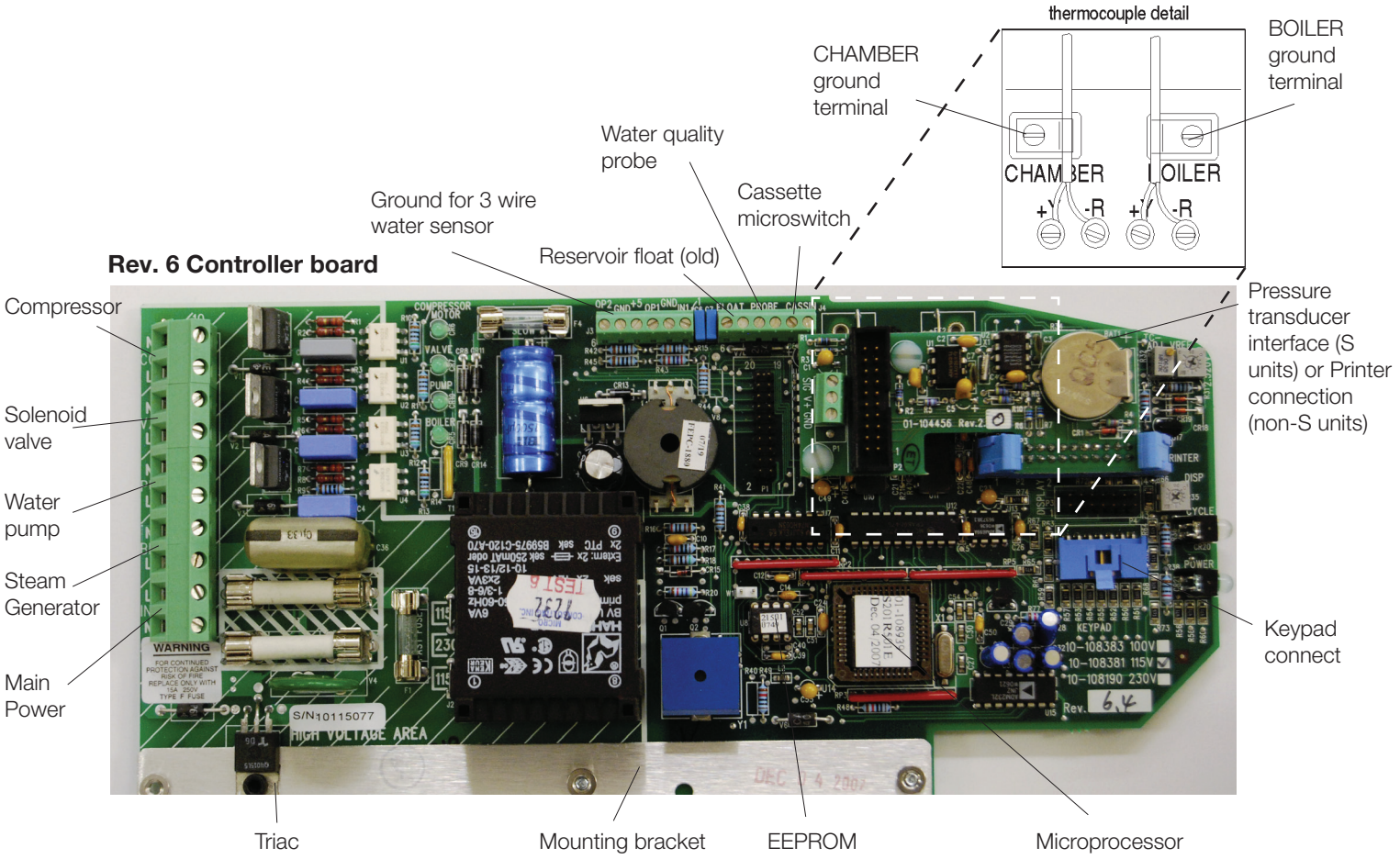
Typical features:
- Revision number bottom right hand side
- Square microprocessor plus EPROM
- 'W1' jumper for calibration
- Blue 'pressure interface/printer' connector

Revision 7.x type board (2007 to present):



Typical features:
- Up to revision 7.30 the revision number is on the top right hand side printed vertically
- From revision 7.40 onwards, the revision number is on the bottom left hand side (printed horizontally) under the connector J1
- Square microprocessor plus EPROM
- NO 'W1' jumper for calibration
- NO Blue 'pressure interface/printer' connector
- All components integrated on single board.
- Surface mount type component.
- 'Push In' yellow thermocouple connectors

Figure 1


thermocouple detail
CHAMBER ground terminal
BOILER ground terminal
Water quality probe
Ground for 3 wire water sensor
Cassette microswitch
Reservoir float (old)
Rev. 6 Controller board
Compressor
Solenoid valve
Water pump
Steam Generator
Main Power
Pressure transducer interface (S units) or Printer connection (non-S units)
Keypad connect
Triac
Mounting bracket
EEPROM
Microprocessor

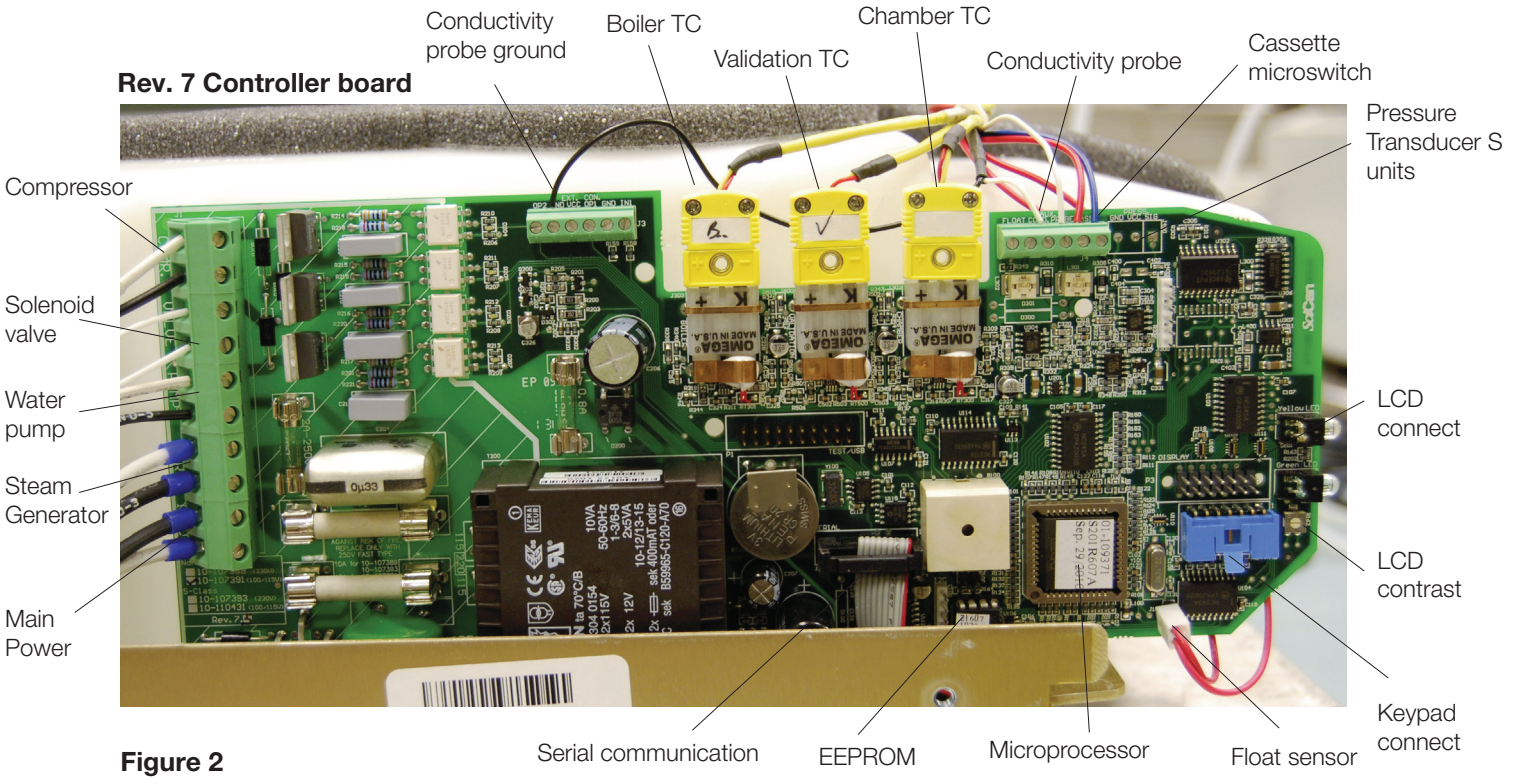

Conductivity probe ground
Boiler TC
Validation TC
Chamber TC
Conductivity probe
Cassette microswitch
Rev. 7 Controller board
Compressor
Solenoid valve
Water pump
Steam Generator
Main Power
Pressure Transducer S units
LCD connect
LCD contrast
Keypad connect
Serial communication
EEPROM
Microprocessor
Float sensor

Figure 2

Removing the controller board assembly

To remove the controller board assembly, proceed as follows:

NOTE: Exercise extra caution. The thermocouple leads at the board end are very fragile.

1.

b. **For all boards up to and including Rev. 6.x —**

- Detach pressure interface board (1) to access thermocouple wires (S class units only), or if a validation thermocouple is present (later or upgraded non S units) detach the validation thermocouple interface board. **Note that on some non S units where no validation thermocouple is present, there may be a printer cable attached in this socket. Remove this if present.**

- Disconnect the steam generator thermocouple wires (2) from controller board terminal positions BOILER +Y and -R.
- Disconnect the chamber thermocouple wires (4) from controller board terminal position CHAMBER +Y and -R.
- Disconnect the ground terminal (3) from the position marked BOILER. Disconnect the ground terminal (5) from the position marked CHAMBER. Retain the ground terminal screws. Leave the screws with contact washers in the terminals. Carefully bend the leads so they do not contact the controller board when it is removed.

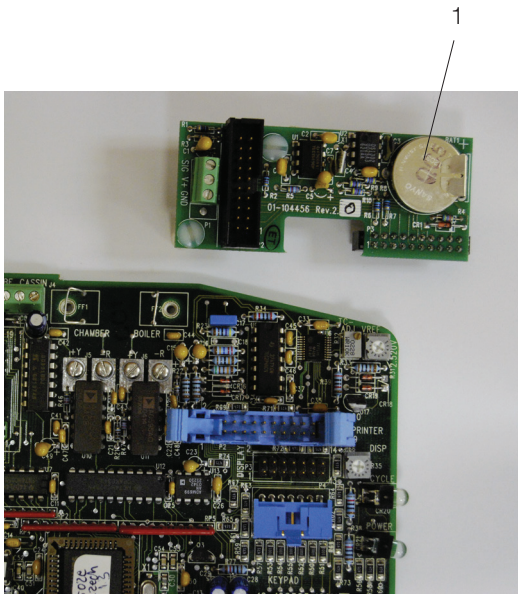


Figure 3

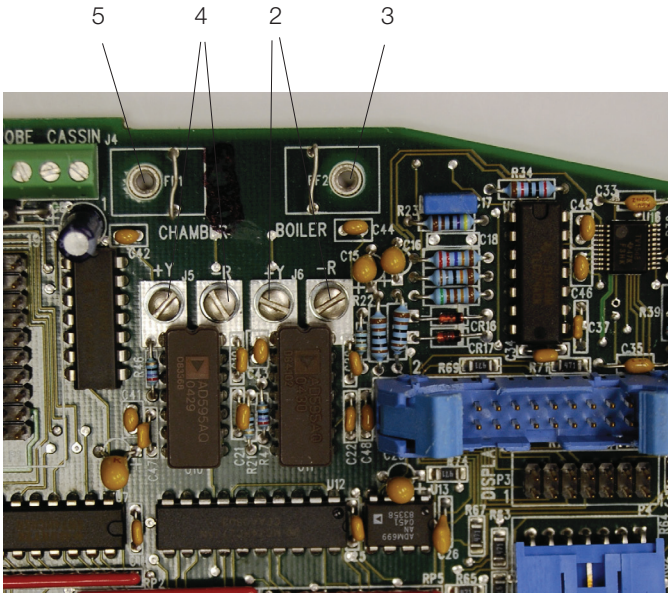


Figure 4

1. Pressure transducer interface
2. Steam generator terminals
3. Boiler ground terminals
4. Chamber thermocouple terminals
5. Chamber ground terminals

c. For all boards Rev. 7.x onwards —

- Unplug the thermocouple connectors (6). There are three from non S ('boiler', 'chamber' and 'validation') and two for S class ('boiler' and 'chamber').
- Unplug the float connector (7) on units where the water quality and float reservoirs are fitted.

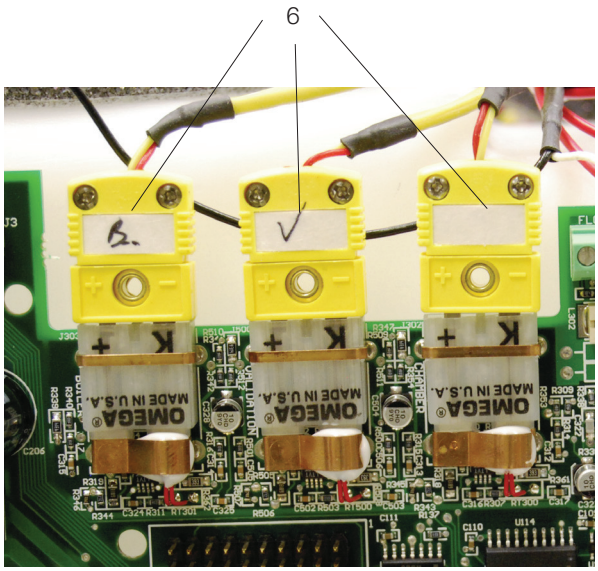


Figure 5

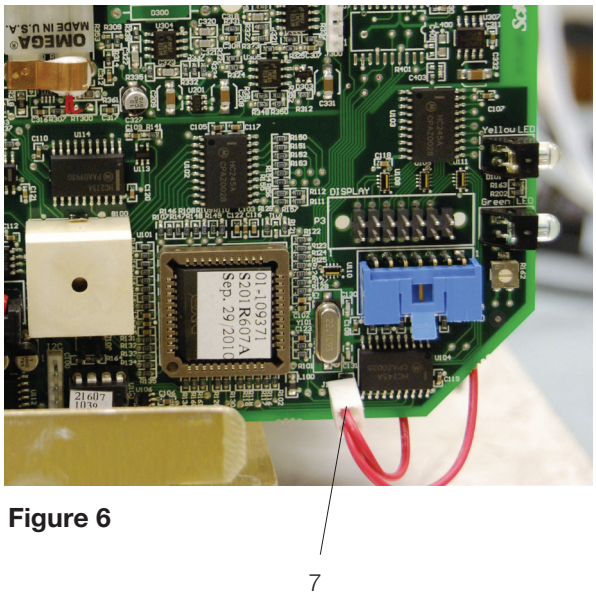


Figure 6

6. Thermocouple connectors
7. Float connector

All Boards

2. Remove the microswitch leads from controller board header terminal positions labeled CASSIN (8).
3. Remove the water quality sensor leads (if present) from controller board terminal positions labeled PROBE (9) or the float sensor leads (if present) from terminal positions labeled FLOAT (10). **Note that on later units a third, ground wire (11) may be present as well as the two PROBE wires.**
4. Disconnect all high voltage leads from controller board block terminal J1 (12).
5. Remove and retain the three screws (13) with washers that secure the controller board assembly to the chassis.

8. CASSIN Terminal
9. PROBE Terminal
10. FLOAT terminal
11. Groundwire (some units)
12. J1 terminal block
13. Screws to chassis

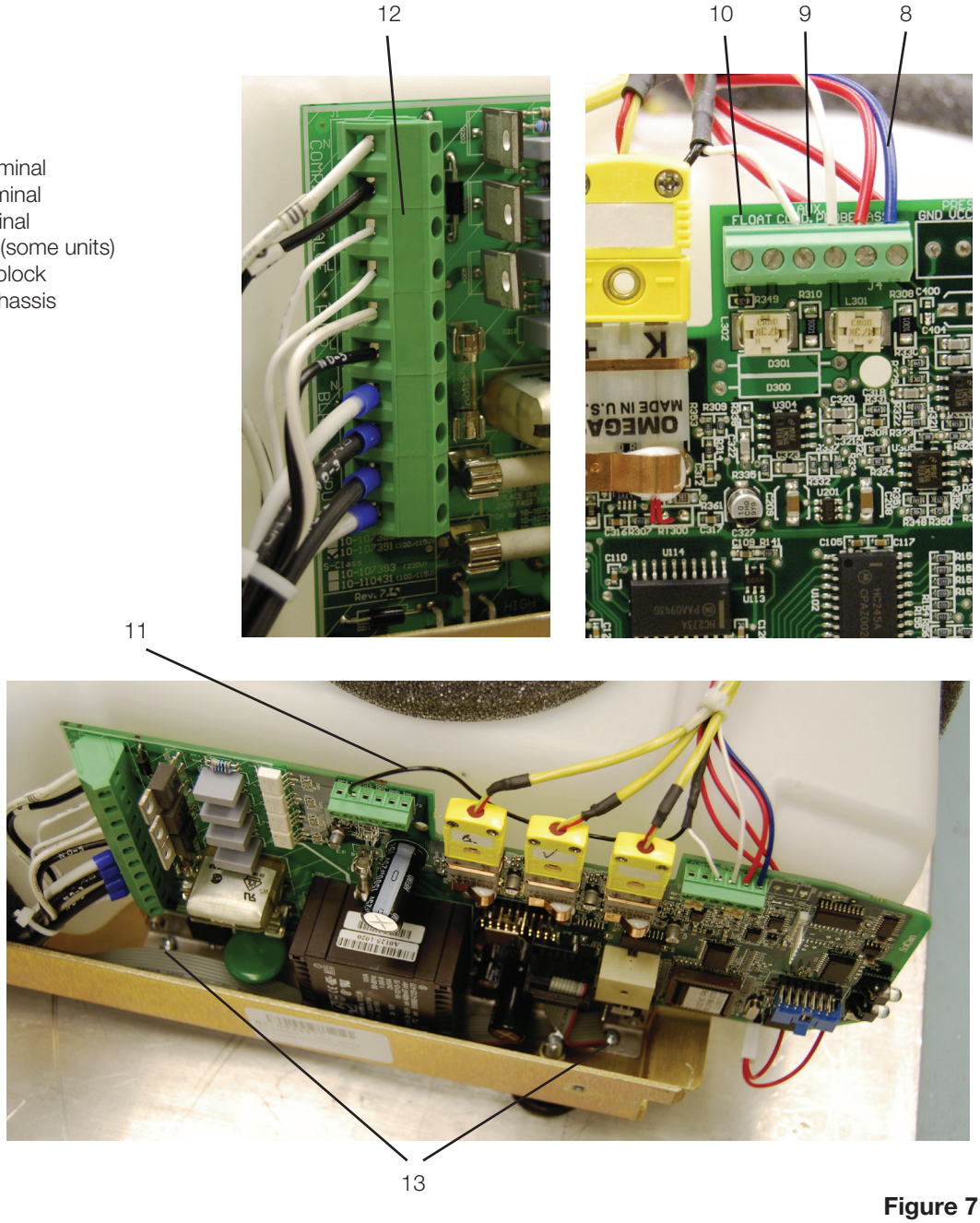


Figure 7

Replacing/Refitting the Controller Board Assembly

To replace/refit the controller board assembly, proceed as follows:

1. Visually inspect the controller board assembly to ensure that there is sufficient thermal compound on the mounting bracket directly below the steam generator triac.
2. Install the controller board assembly using the three screws (13) with washers retained from removal (or fit new if replacing with a new board).
3. Connect the high voltage leads from the power switch, steam generator, pump, solenoid valve and compressor to controller board J1 terminal (12). Each lead is numbered with a corresponding J1 designation. See Table B.

TABLE B: CONTROLLER BOARD HIGH VOLTAGE J1 CONNECTOR

Marking	Fuse Value	Device	Signal	Wire Colour
COMP	J1-10 J1-9	COMPRESSOR	N L	WHITE BLACK
VALVE	J1-8 J1-7	SOLENOID VALVE	N L	WHITE or RED WHITE or RED
PUMP	J1-6 J1-5	PUMP	N L	WHITE BLACK
BLR	J1-4 J1-3	STEAM GENERATOR	N L	WHITE BLACK
INPUT	J1-2 J1-1	POWER SWITCH	L N	BLACK WHITE

4. Connect the microswitch leads to controller board header positions labeled CASSIN (8).
5. Connect the water quality sensor leads (if present) to controller board positions labeled PROBE (9) or the float sensor leads (if present) to terminal positions labeled FLOAT (10). Note that on later units a third, ground wire may be present as well as the two PROBE wires.

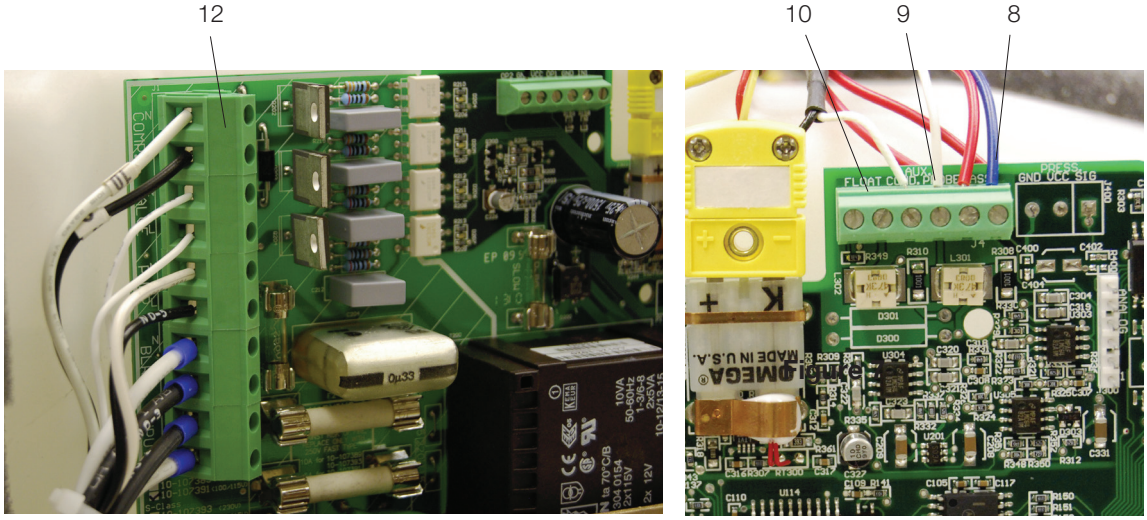


Figure 8

6.

a. **For all boards up to and including Rev. 6.x —**

- Check the pre-bend on both thermocouple leads to ensure that they are the required shape to go under the washers on the connections without touching anything other than the terminal.

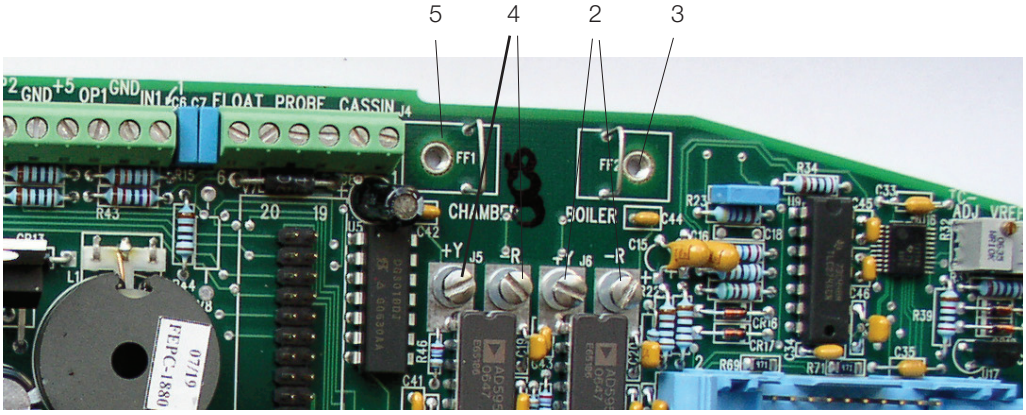


Figure 9

- **Note: 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 the wires are seated securely behind the respective washers.**
- Reconnect the steam generator thermocouple wires to the controller board terminal positions BOILER +Y and -R (2).
- Reconnect the chamber thermocouple wires to the controller board terminal positions CHAMBER +Y and -R (4).
- Reconnect the ground terminal from the position marked BOILER (3). Reconnect the ground terminal from the position marked CHAMBER (5).

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.

b. **For all boards Rev. 7.x onwards —**

- Plug in the thermocouple connectors. There are three for non S (‘boiler’, ‘chamber’ and ‘validation’) and two for S class (‘boiler’ and ‘chamber’) (6).

- Plug in the float connector on units where the water quality + float reservoirs are fitted (7).

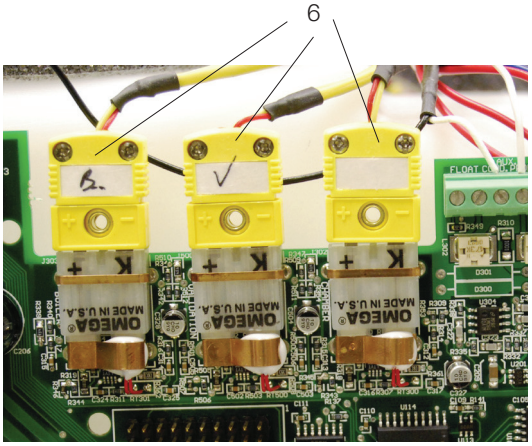


Figure 10

The chamber and steam generator thermocouples MUST be recalibrated. Do not calibrate a thermocouple until it is properly installed and positioned in the unit.

Reattach the pressure interface board, (S class units only), or if a validation thermocouple is present (later or upgraded non S units) the validation thermocouple interface board. **Note that on some non S units where no validation thermocouple is present, a printer cable is attached in this socket. Replace this if present. Rev.3.x/4.x units DO NOT have this socket.**

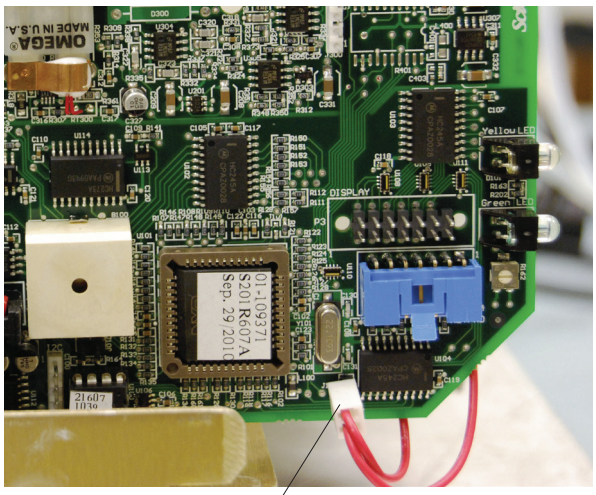


Figure 11

8. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity should be performed on the STAT*IM* unit at this stage.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.

Controller Board Fuse Values

Always replace blown fuses with a fuse of the same size and value as indicated directly on the controller board.

STAT*IM* 5000 G4 Electronics

Removing and Replacing the STAT*IM* 5000 G4 LCD Controller Board

NOTE: After replacing the LCD controller board, the bubble level must be calibrated. Follow bubble level calibration instructions below.

To remove the LCD controller board, remove the cover to access the inside of the fascia (see Figure 12).

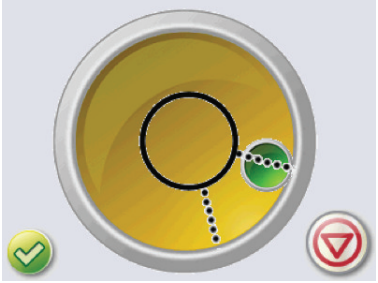
1. Disconnect the LCD controller board (1) from the P3 connection on the main controller board and disconnect the LCD's DC power source cable (2) from the DC power source (3) located at the back of the unit.
2. Place the cover upside down on a work surface and disconnect the flexible PCB connector (4) cable connecting the colour LCD to the LCD controller board. To do this, slide your fingernail into the centre of the hinged catch (5) and pull away from the board. Once open, the hinge will release the connector.
3. To remove the LCD controller board, start by freeing it from the bottom and right clips (6) and lift it out. Remove the cable ferrites from the holding clamps.
4. Disconnect the USB cable (7).
5. Disconnect the Ethernet port cable (8).
6. Disconnect the wires to the speaker (9).

To replace the colour LCD controller board, follow these steps (see Figure 5).

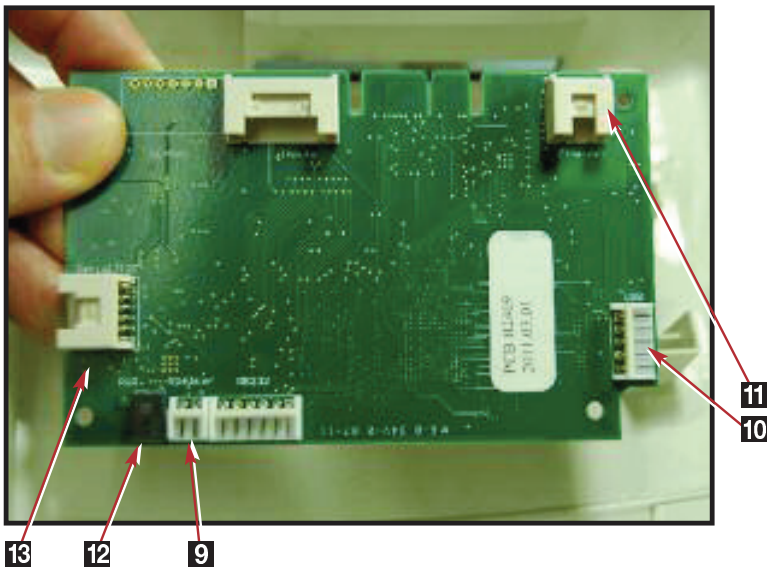
1. Re-connect the wires to the speaker (9).
2. Re-connect the Ethernet port cable (8).
3. Re-connect the USB cable (7).
4. Clip the logic board back into position. NOTE: Be certain the board is properly clipped into position. An improperly seated board will affect the functioning of the level.
5. Connect the flexible PCB connector, pushing it down into position and closing the hinged connector. Give the flexible PCB connector a gentle tug to ensure it is properly held in position.
6. Connect the LCD controller board to the P3 connection on the main controller board, connect the LCD DC power cable to the DC power source and plug in the unit.
7. Power ON the unit to test the colour LCD touchscreen

To calibrate the bubble level, proceed as follows:

1. Set the unit on a flat surface. Use a bubble level placed on the cover of the unit to ensure the unit is level.
2. Access the service menu as described in Chapter 3 in the section titled Using the service menu on the STATIM G4.
3. Scroll to the Bubble level calibration screen.

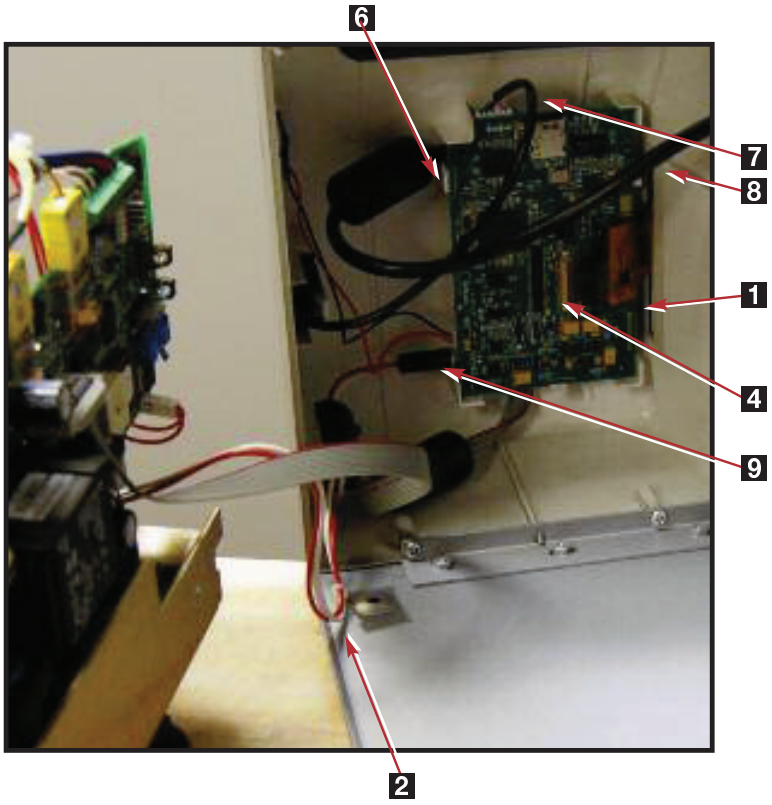


4. Press the check mark until the bubble is properly centered in the middle of the circle (wait a few seconds after pressing to allow it to reset).
5. When the bubble stays within the screen's center circle, the bubble level is calibrated. Press STOP to exit.



1 LCD controller board
2 DC power source cable
3 DC power source
4 PCB connector
5 Hinged catch
6 Clips
7 USB cable
8 Ethernet port cable
9 Speaker connect
10 USB connect
11 Ethernet connect
12 Power connect
13 Main controller board connect

Figure 12



Removing and Replacing the STAT*IM* 5000 G4 USB Port

To remove the USB port, first remove the cover to access the inside of the fascia and remove the LCD controller board.Then follow these steps (see Figure 13):

1. Disconnect the USB port cable (1) from the LCD controller board (2).
2. Lift the tab holding the USB port assembly (3) and pull the assembly out.

To replace the speaker, reverse the removal instructions.

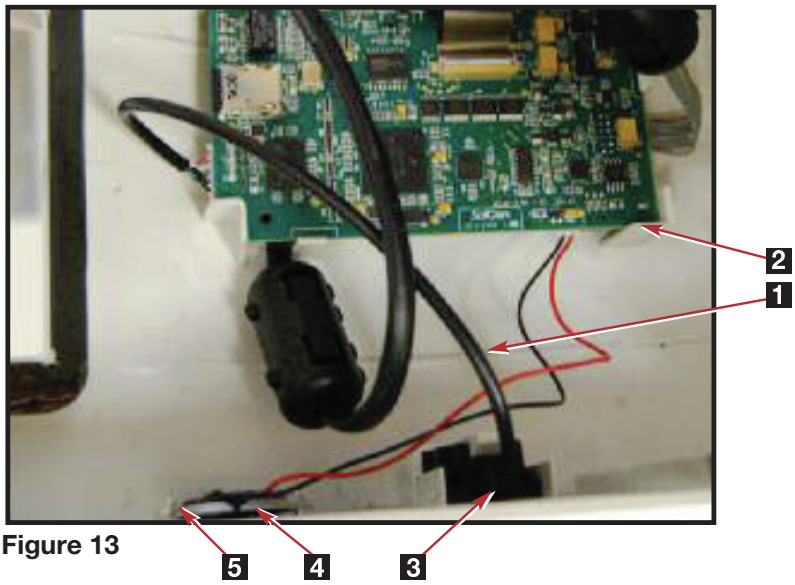


Figure 13

1. USB port cable
2. LCD controller board
3. USB port assembly
4. Speaker
5. Tabs

Removing and Replacing the STAT*IM* 5000 G4 Speaker

To remove the speaker, first remove the cover. Remove the LCD controller board and place the cover upside down on a worksurface. Then follow these steps (see Figure 13):

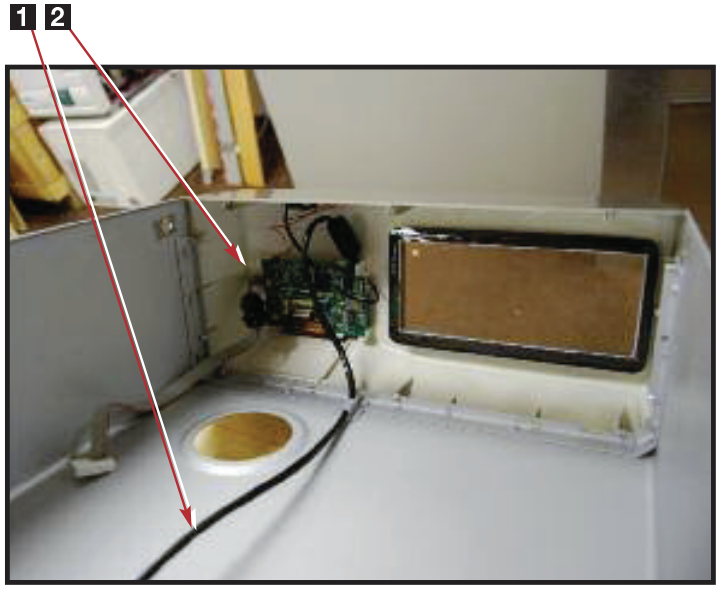
1. Disconnect the speaker (4) from the LCD controller board (2).
2. The speaker is hot-glued into the tabs. You will have to remove the glue to pull it out. To replace the USB port, reverse the removal instructions (use hot glue to secure speaker).

Removing and Replacing the STAT*IM* 5000 G4 Ethernet Port

To remove the Ethernet port, first remove the cover and place it upside down on a worksurface. Remove the LCD controller. Then follow these steps (see Figure 14):

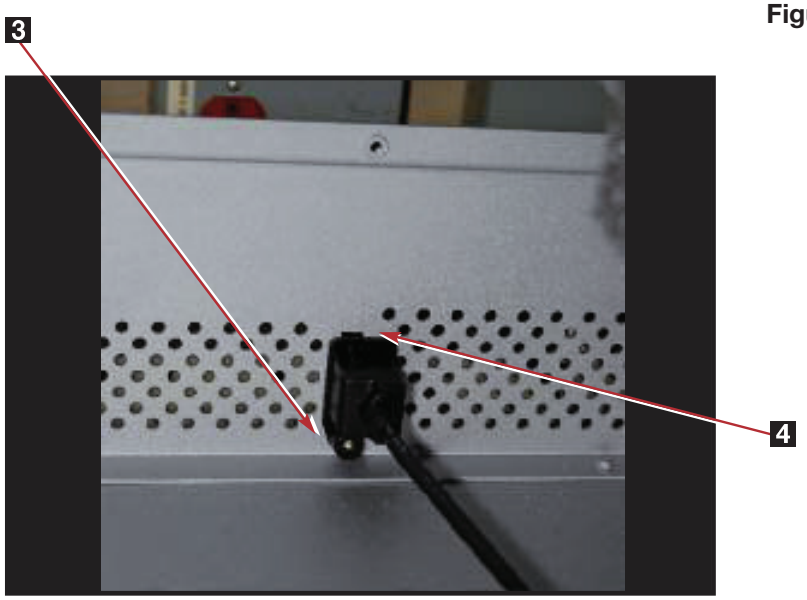
1. Disconnect the Ethernet port cable (1) from the LCD controller board (2).
2. On the inside rear of the cover, remove the fastening screw (3) holding the Ethernet port assembly in place.
3. Unhook the Ethernet port assembly tab (4) from the rear of the cover and remove cable by cutting the cable tie.

To replace, reverse the removal instructions.



1 Ethernet port cable
2 LCD controller board
3 Screw
4 Ethernet port assembly tab

Figure 14



Microprocessor

Microprocessors are not interchangeable between controller boards of different part numbers and/or revision, unless otherwise indicated.

Processor Types

Note: a visual guide to the location on the controller board can be found in the section 'Identifying Controller Board Types'

Revision 2.x/5.x, 3.x/4.x controller boards all have the following main processor configuration.

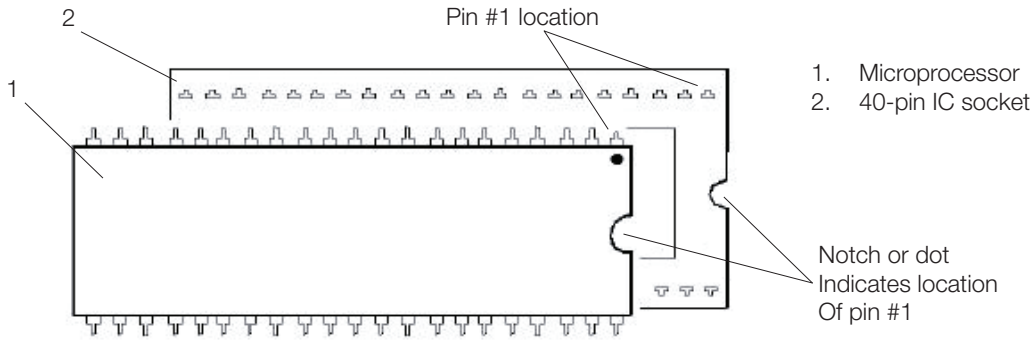


Figure 15

Revision 2.x/5.x controller boards also have a supplementary EEPROM located near to the main processor. (Rev. 3.x/4.x DO NOT have this supplementary device).

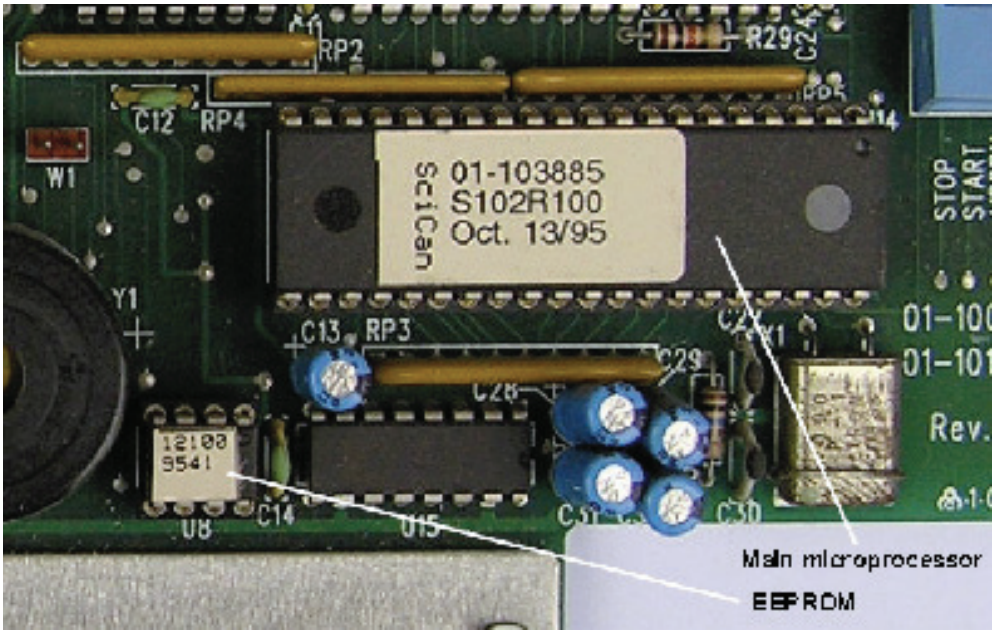
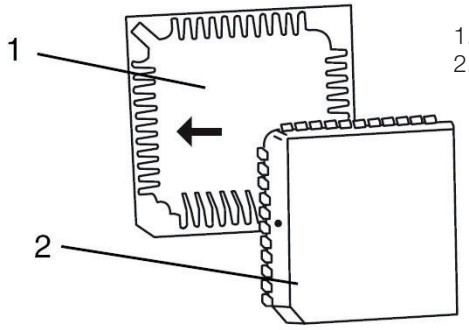


Figure 16

The microprocessor and EEPROM devices are a matched pair set. These devices are supplied together and must be installed together. Any attempt to substitute either device on its own will result in a continuous beeping tone.

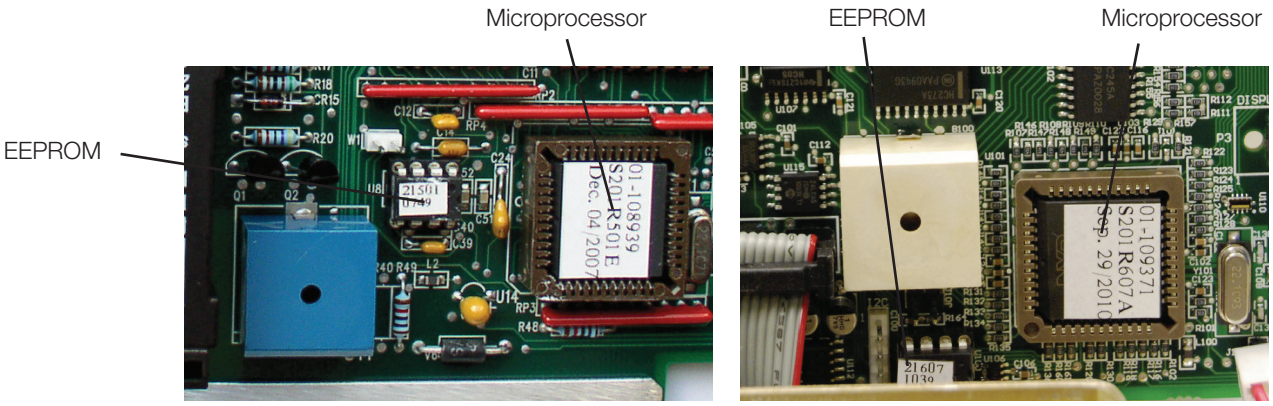
Revision 6.x and 7.x controller boards all have the following main processor configuration.



1. Microprocessor
2. 44-pin PLCC socket

Figure 17

Both Revision 6.x and 7.x of controller boards also have a supplementary EEPROM located near to the main processor.



Rev. 6.x Rev. 7.x

Figure 18

Removing the Microprocessor (and Pre-Programmed EEPROM where fitted).

Before removing or replacing the devices observe appropriate electrostatic discharge precautions for the work area and technician. Ensure that the unit is powered OFF.

To remove the Microprocessor and pre-programmed EEPROM device if present, proceed as follows:

1.

b. **For revision 2.x/5.x, 3.x/4.x controller boards —** Remove the microprocessor from Controller Board socket using a 40-pin IC puller. Remove the EEPROM device from Controller Board socket using an 8-pin IC puller.

DISCARD the microprocessor and EEPROM devices.

Note: The orientation of Pin 1 of the socket and Pin 1 of the EEPROM

c. **For revision 6.x and 7.x controller boards AND units with adaptor boards installed as part of an Alex steam generator upgrade —** Remove the microprocessor from Controller Board Socket using a 44-pin PLCC IC puller. Remove the EEPROM device from Controller Board socket using an 8-pin IC puller.

DISCARD the microprocessor and EEPROM devices.

Replacing/refitting the Microprocessor (and Pre-Programmed EEPROM where fitted).

The microprocessor and EEPROM devices are a matched pair set. These devices must be ordered and installed together. An attempt to substitute either device singly results in a continuous beeping tone.

Note: **The orientation of the various main microprocessor types (see Figures 17 and 18 above) to ensure correct alignment. Ensure that the device pins are fully inserted into the socket. Incorrectly installed IC devices may cause damage to the unit.**

ALL EEPROM devices are notched in a similar manner to the 40-pin microprocessor.

To replace/retrofit the microprocessor, proceed as follows:

1. Determine the part number and revision of the installed controller board. (This number appears on the component side of the board in the lower right-hand corner.) Determine the rated voltage of the unit by examining the serial number label. Use this information to find the appropriate microprocessor replacement kit.
2.
   a. **For revision 2.x/5.x, 3.x/4.x controller boards, use an insertion tool to install the microprocessor into controller board socket. Note the orientation of pin #1 of the socket and microprocessor.**
   b. **For revision 6.x and 7.x controller boards AND units with adaptor boards installed as part of an Alex steam generator upgrade, the microprocessor can be inserted into controller board socket by hand. Note the orientation of pin # 1 of the microprocessor and align it with the notch in the PLCC socket.**
3. **For all controller boards where an EEPROM is fitted, using an insertion tool, insert the EEPROM device into controller board socket. Note the orientation of pin #1 of the socket and EEPROM.**
4. Connect the keypad connector to controller board.
5. Connect the LCD connector to controller board.
6. Connect the printer connector to controller board, if present.
7. Power the unit ON. Ensure that the version number displayed briefly when the unit is first powered (not Rev. 3.x/4.x) matches the version number printed on the microprocessor. If the LCD fails to display the “select a cycle” message, review the wiring connector placement and check that the microprocessor and EEPROM are positioned properly in the sockets.
8. Calibrate the unit after the installation of a new microprocessor.

Microswitch

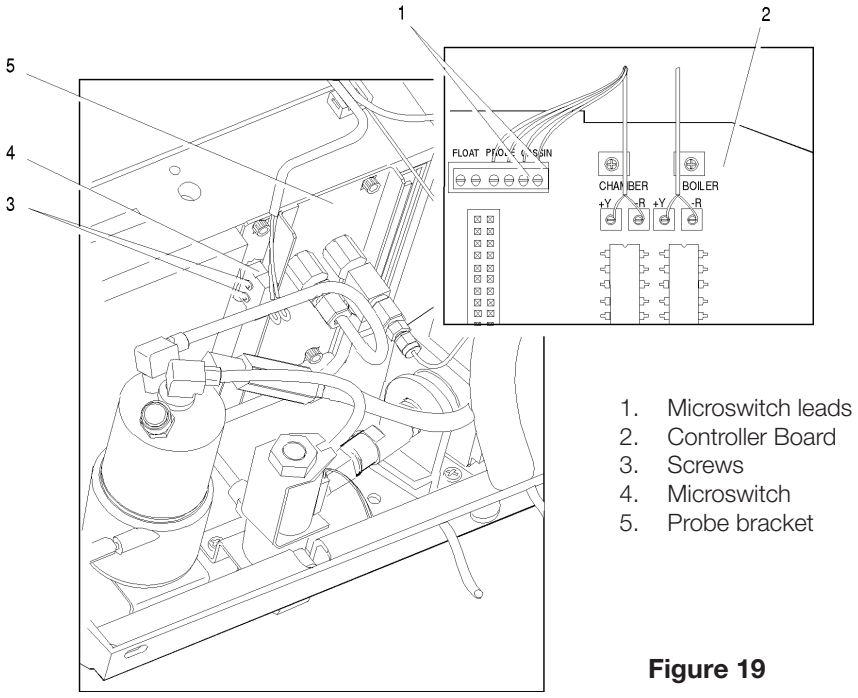
The function of the microswitch is to sense the presence of the cassette when it is inserted in the armature. When the cassette activates the switch, it is possible to start the unit. With the cassette out, the unit will not start.

Failure of the switch will produce the following symptoms:

- Failed 'ON' — the unit may start WITHOUT the cassette being engaged.
- Failed 'OFF' — the unit will not start even with the cassette fully engaged.

Removing the Microswitch

To remove the microswitch, proceed as follows (see Figure 19):



1. Microswitch leads
2. Controller Board
3. Screws
4. Microswitch
5. Probe bracket

Figure 19

1. Turn the power switch OFF, and unplug the unit.
2. Disconnect the microswitch leads (1) from the controller board (2) terminal block positions labelled CASSIN J4-1 AND J4-2 (J3-1 and J3-2 on Rev. 3.0 boards) and carefully cut the cable ties securing the microswitch leads to the wiring harness.
3. There may be RTV silicone sealant on the heads of the two screws (3) securing the microswitch (4) to the side of the probe bracket (5). Trim away the excess RTV silicone and remove the screws. Retain these for assembling the replacement microswitch to the probe bracket.
4. Remove the microswitch.
5. Remove all RTV silicone residues from the probe bracket surface.

Replacing the Microswitch

To replace and refit the microswitch, proceed as follows (see Figure 19):

1. Using the two screws (3) retained from the removal procedure, attach the microswitch to the probe bracket with the hinge end of the switch arm up and facing towards the front of the unit.
2. Connect the microswitch leads (1) to controller board (2) block terminal positions labelled CASSIN. The red wire is inserted into CASSIN J4-1 (J3-1) for Rev 3.0 boards), the blue wire is inserted into CASSIN J4-2 (J3-2 for Rev 3.0 boards). Secure the leads.
3. Route the microswitch leads back into the wiring harness and secure the complete harness using cable ties every 2-3 inches. Secure these to the top of the armature using the clamps provided.
4. There are two methods of testing the microswitch.
    a. Plug-in the power cord and turn the power switch ON. When the unit is powered ON and the cassette is inserted, the solenoid valve is activated. Carefully insert the cassette. If the solenoid valve “clicks” before the cassette is fully inserted, the microswitch needs to be adjusted. If the solenoid valve does not “click” after the cassette is fully inserted, the microswitch needs to be adjusted or it is defective.
    b. Using a multimeter set at continuity, touch the meter probes across controller board terminal positions labelled CASSIN. If continuity is achieved before the cassette is fully inserted, the microswitch needs to be adjusted. If continuity is not achieved after the cassette is fully inserted the microswitch needs to be adjusted or it is defective, see Adjusting the microswitch.
5. Once installed and functioning, apply a thin bead of RTV silicone sealant along all edges of the microswitch that are in contact with the probe bracket. Allow the silicone to cure per manufacturer’s instructions.
6. Run a sterilization cycle and observe the area around the microswitch for leaks.

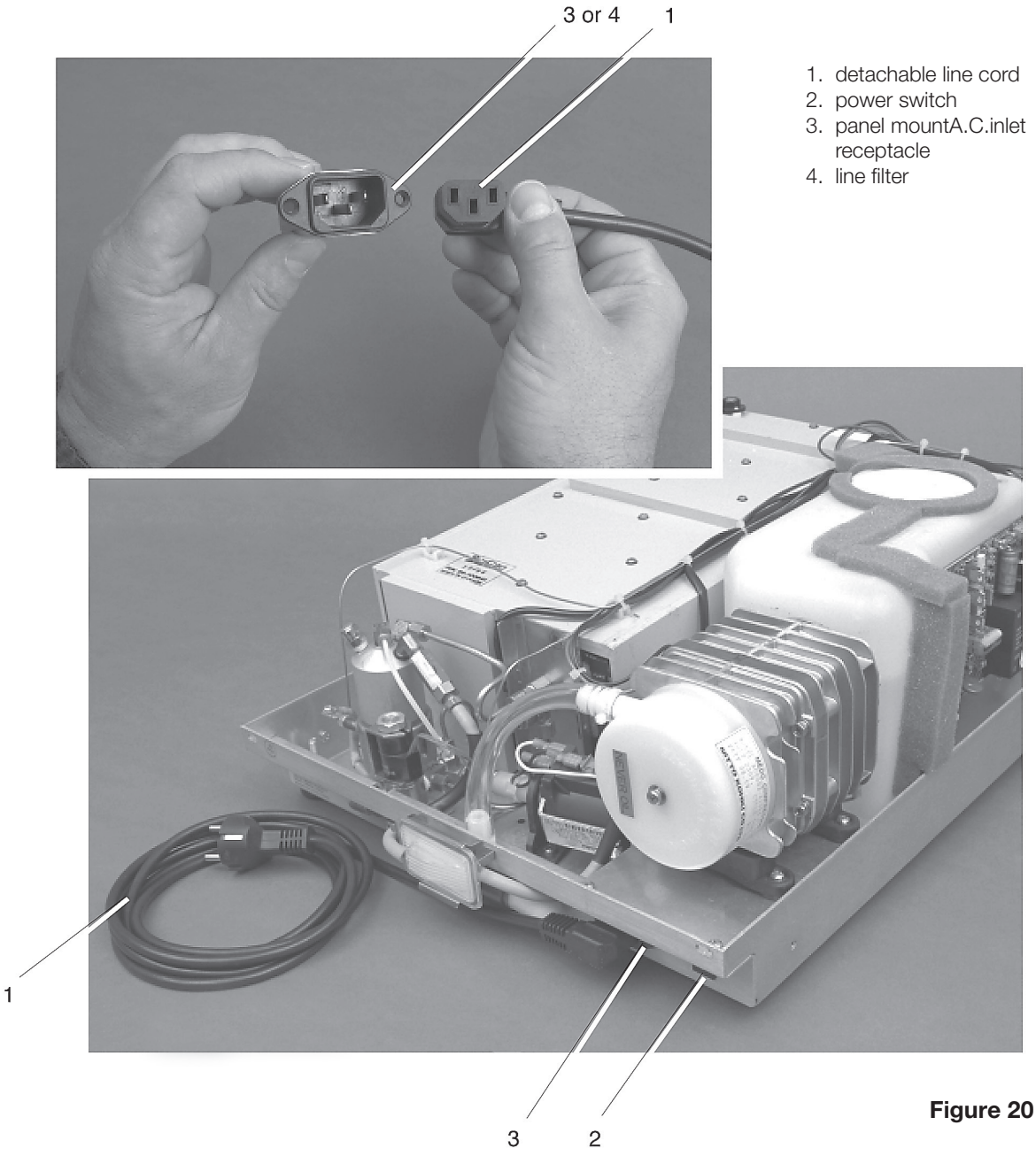
Adjusting the Microswitch

1. If adjustment is required, power the unit OFF. Remove the screws securing the microswitch to the probe bracket and remove the microswitch. Using fine needle-nose pliers, adjust the activation point of the switch by carefully bending the microswitch arm. Reinstall and re-test the switch.

Mains Components

Power Cords

STAT*IM* 5000 units are fitted with detachable power cords, which are modular and plug into a panel mounted A.C. inlet receptacle or receptacle / line filter in the back of the chassis.



1. detachable line cord
2. power switch
3. panel mountA.C.inlet receptacle
4. line filter

Figure 20

Removing a Detachable Power Cord

To remove a detachable power cord (1) connected to the unit through a panel mount A.C. inlet receptacle, proceed as follows (see Figure 20):

1. Turn the power switch (2) OFF, and unplug the power cord from the wall outlet.
2. Disconnect the power cord from the panel mount A.C. inlet receptacle (3).

Replacing/refitting a Detachable Power Cord

Use replacement cords with appropriate safety agency ratings and approvals only.

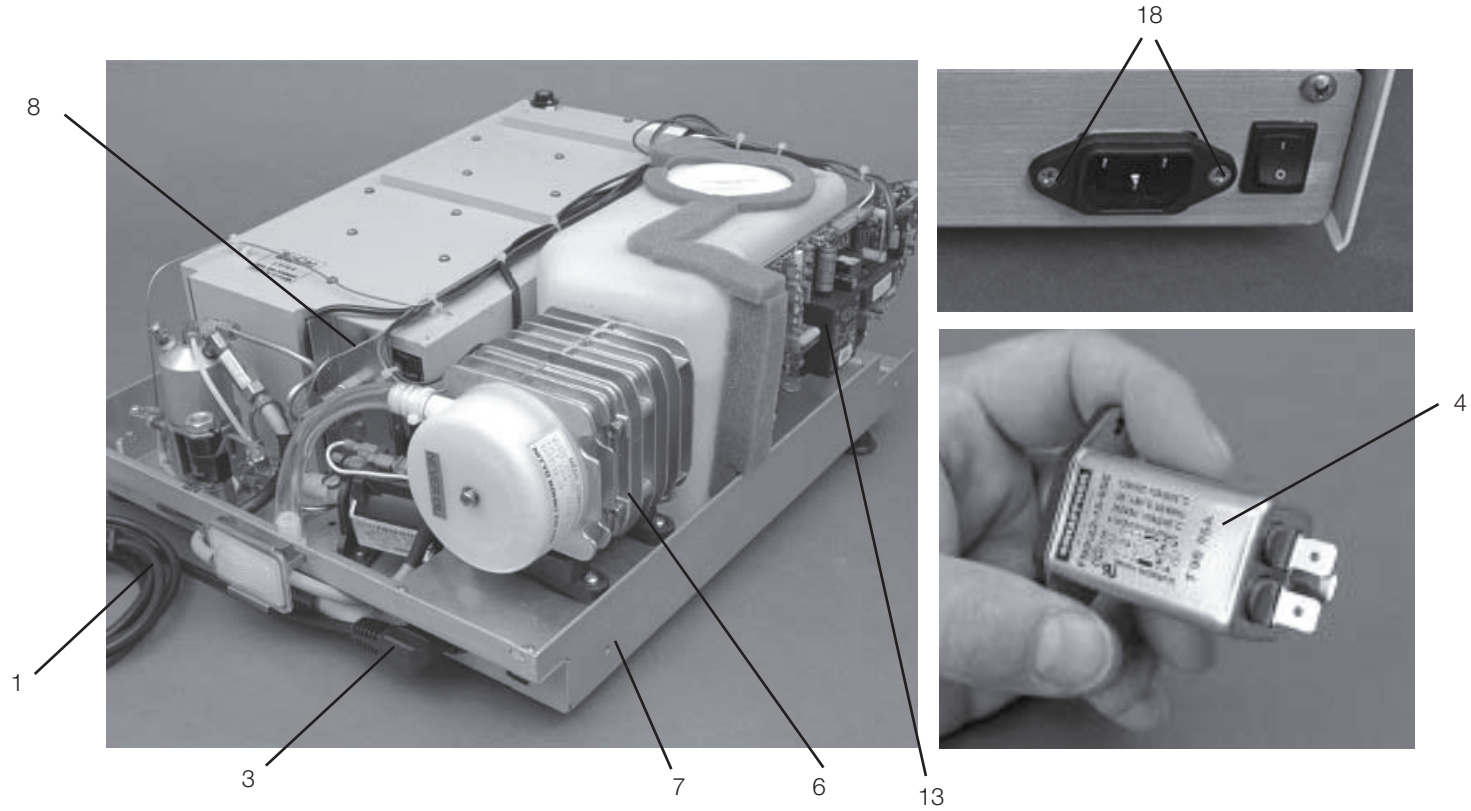
To replace/reinstall a detachable power cord (1), proceed as follows (see Figure 20):

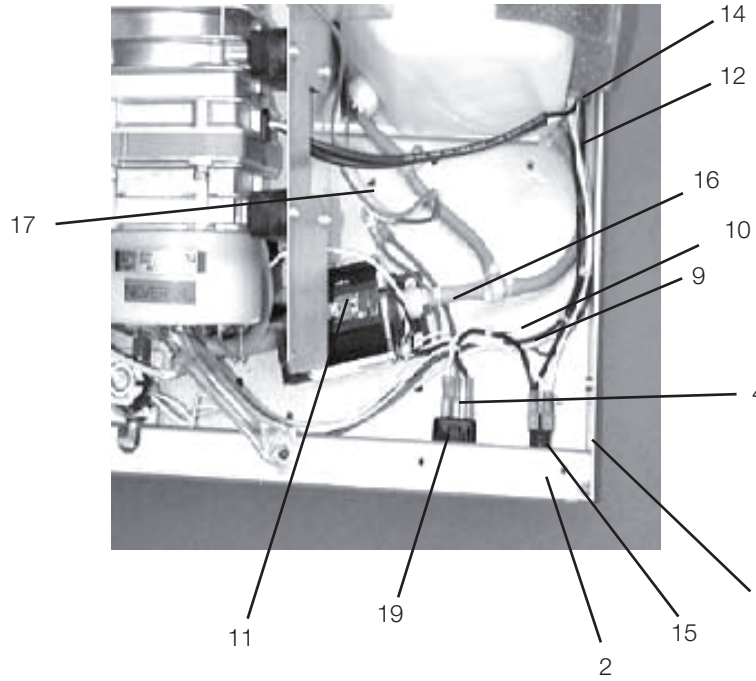
1. Select the appropriate replacement cord from the spare parts list.
2. The A.C. inlet receptacle (3) is keyed. Note the shape of the cord connector and the corresponding shape of the receptacle. Plug in the connector.
3. Plug the cord into the wall receptacle and turn the power switch (2) ON. Observe the LCD and indicator lights to determine that power is present.

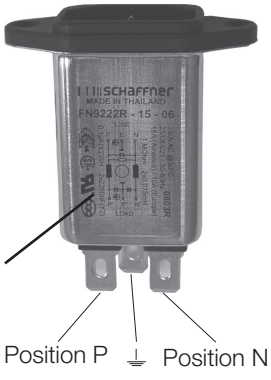
Power (on/off) Switch

Removing the Power Switch

To remove the power switch (2), proceed as follows, (See Figure 21):







1. detachable line cord (not shown)
2. power switch
3. A.C. inlet receptacle
4. line filter
5. four screws (obscured)
6. compressor assembly
7. chassis
8. thermocouple leads
9. white wire
10. black wire
11. pump
12. white wire (J1-1)
13. Controller Board
14. black wire (J1-2)
15. power switch tabs
16. green wire
17. ground post
18. two screws
19. A.C. inlet receptacle tabs

Figure 21

1. Turn the power switch OFF, unplug the line cord from the wall outlet and remove the detachable line cord (1) from the unit.
2. Remove the four screws (5) holding the compressor bracket (6) to the chassis (7) and rest the compressor to one side. Do not bend the thermocouple leads (8). See, Compressor.
3. Disconnect the leads from the A.C. inlet receptacle (3) or line filter (4) to the power switch. Disconnect the white wire (9) from the upper spade terminal, labelled 1, and the black (10) wire from the upper spade terminal, labelled 2, nearest the pump (11).
4. Disconnect the white wire (12) extending from Controller Board (13) terminal J1-1 to the lower power switch spade terminal labelled 1a and the black wire (14) extending from Controller Board terminal J1-2 to the lower power switch spade terminal, labelled 2a, nearest the pump.
5. The panel mount style switch is held into the panel with tabs. Compress the tabs (15) and push the disconnected power switch out of the chassis wall.

Replacing/refitting the A.C. Power Switch

To replace the power switch (2), follow these steps, (See Figure 21):

1. From a position at the rear of the unit, orient spade terminals 1a and 2a downwards and press the power switch into the clearance hole in the chassis (7). Apply pressure evenly top and bottom until the bezel rests against the chassis wall.
2. Connect the white wire (12) extending from Controller Board (13) terminal J1-1 to the lower right-hand power switch spade terminal labelled 1a and the black (14) wire extending from Controller Board terminal J1-2 to the lower left-hand power switch spade terminal, labelled 2a.
3. Connect the white wire (9) from the line filter (3) or the A.C. inlet receptacle (4) to the upper right-hand power spade terminal labelled 1, and the black wire (10) from either the attached power cord or the A.C. inlet receptacle to the upper left-hand spade terminal labelled 2, nearest the pump (11).
4. Reinstall the compressor assembly (6) using the four screws (5) retained from disassembly. Do not bend the thermocouple leads (7).
5. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

Receptacle / Line Filter

It is difficult to determine whether a line filter has failed or not. If the unit blows mains fuses in the service panel, there may be a short in the line filter. Disconnect all leads from the mains input and output and test for short circuits.

Removing the Receptacle / Line Filter

To remove a line filter (3), proceed as follows, (See Figure 21):

1. Turn the power switch (2) OFF, and unplug the power cord (1) from the wall outlet.
2. Remove the power cord from the unit. See, Removing a Detachable Power Cord.
3. Remove the four screws (5) holding the compressor assembly (6) to the chassis (7) and rest the compressor to one side. Do not bend the thermocouple leads (8). See, Compressor.
4. Disconnect the white wire (4a) from receptacle line filter position N, the black wire (4b) from line filter position P and the green wire (4c) from line filter position. If access to the back of the line filter is impeded, disconnect the pump inlet tube.
5. Remove the screws (18) holding the filter to the chassis (7) and remove the filter.

Replacing/refitting the Receptacle / Line Filter

To replace/refit a line filter (4), proceed as follows, (See Figure 21):

1. Insert the line filter in the opening in the chassis (7). The P and N fast-on spade terminals should face up, and the ground terminal should face down.
2. Insert and tighten the screws (18) holding the line filter, using Loctite in the threaded holes in the chassis.
3. Connect the white wire (4a) from the power switch to line filter position N and the black wire (4b) from the power switch to line filter position P.
4. Connect the green wire (4c) from the ground post to line filter position.
5. If the pump inlet tube was moved, reinstall the tube.
6. Reinstall the compressor assembly (6) using the four screws (5) retained from disassembly. Do not bend the thermocouple leads (7). See, Compressor.
7. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
8. Plug the power cord (1) into the line filter and the wall receptacle and turn the power switch (2) ON. Observe the LCD and indicator lights to determine that power is present.

LCD DC Power Source for STAT*IM* 5000 G4

Removing and Replacing the STAT*IM* 5000 G4 LCD DC Power Source

To remove the LCD DC power source, remove the cover and place it on its side next to the unit. Then follow these steps (see Figure 22):

1. Disconnect the LCD DC power source wires (1) from the LCD controller board (2) located inside the unit fascia (3).
2. Remove the two screws (4) holding the LCD DC power source bracket (5) to the chassis (6).

To replace the LCD DC power source, reverse the removal instructions.

1. LCD DC power source wires
2. LCD controller board (not shown)
3. Fascia (not shown)
4. Screws
5. DC power source bracket
6. Chassis

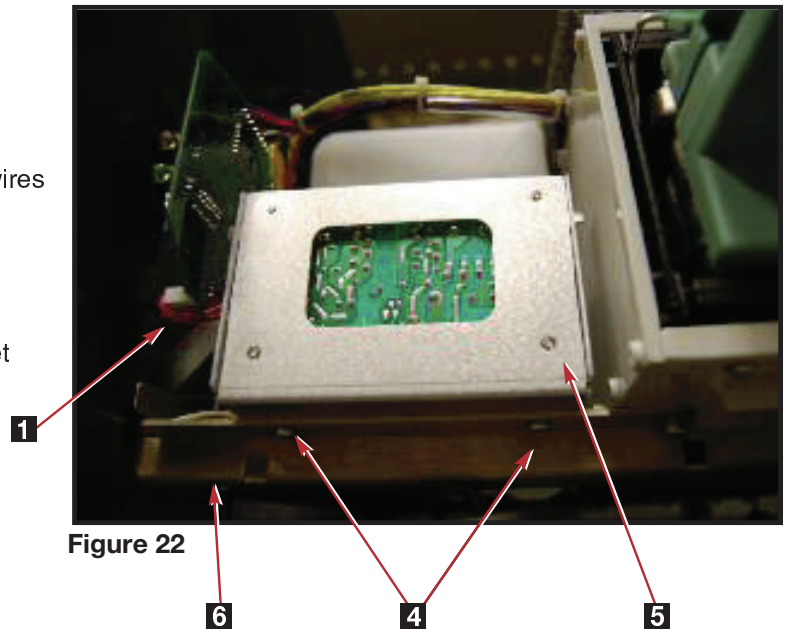


Figure 22

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

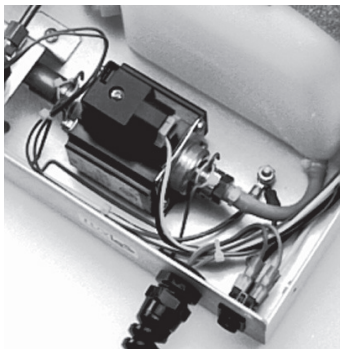
Pumps, Reservoir, and Compressor

Water Pumps

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

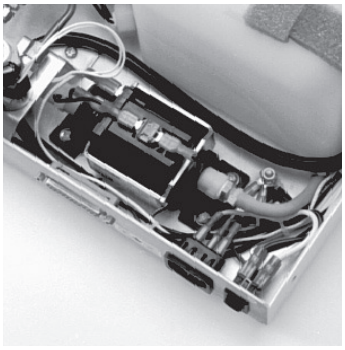
Important Note: Always make sure that there is sufficient steam-process distilled water in the reservoir prior to testing STAT*IM* pumps.

Identifying Pump Types



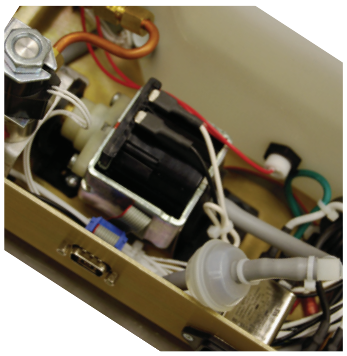
Fluid-O-Tech Pump

The Fluid-O-Tech pump is generally factory fitted to older units with revision 3.x/4/x controller boards up to approximately 1994-1995. It 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 is generally factory fitted to units with revision 2.x/5.x/6.x and some early 7.x controller boards from 1995 up to mid 2008. It has a similar footprint to the Fluid-O-Tech pump, however the diode is now integrated into 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).



Ulka Pump

The Ulka pump is factory fitted to units with revision 7.x controller boards only from mid 2008 onwards. It is slightly smaller than the SciCan pump and can be identified by the configuration of the wires on top of the pump. The two visible connections are located adjacent and parallel to each other whereas the two visible connections on the SciCan pump are opposing each other and have a thermal switch connecting them. 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).

Figure 1

Note: Important information on pump interchangeability:

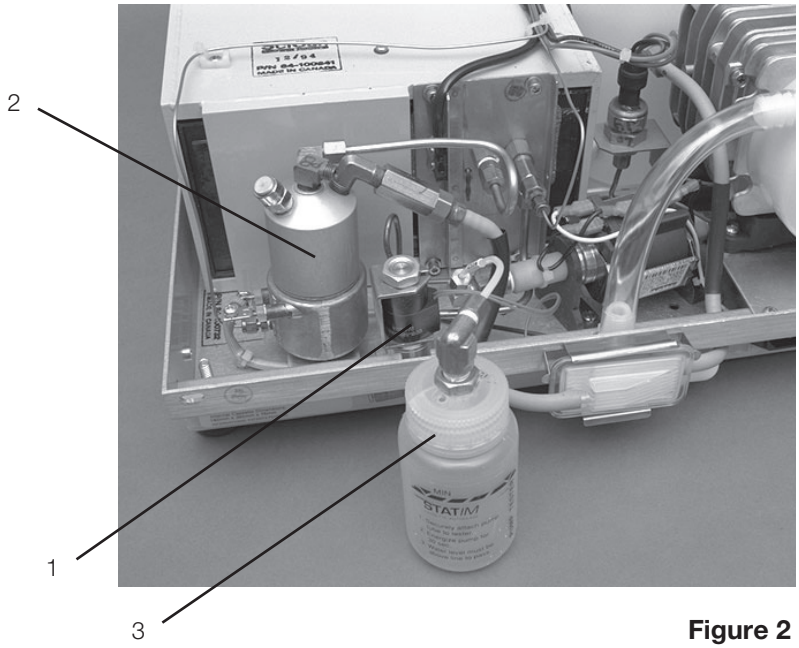
- **The Fluid-O-Tech pump is no longer available, but units with this pump can be retrofitted with the SciCan pump ONLY.**
- **The SciCan pump and Ulka pump are NOT interchangeable. They are both still available. If replacing the pump during maintenance or servicing, the same pump must be fitted to ensure the unit works correctly.**

Testing pump flow (for all types)

To test a water pump, proceed as follows (see Figure 2):

The control box should be attached to the unit, or select 'pump' in the device test sub menu of the revision 7.x controller board service menu (if cover is removed but still connected). The unit should be powered on with the cassette removed.

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. Using the button on the control box or appropriate keypad button (revision 7.x controllers), 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 below). Activate the pump.
5. If the water level reaches the top of the line marked MIN within the time allotted in the Pump Flow Parameters chart (below), the pump is performing correctly. **If the water level reaches**



1. Steam generator inlet tube
2. Steam generator
3. Pump tester

Figure 2

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 the Pump Recovery Repair procedures described later in this chapter.

Pump flow parameters

The following pump parameters are valid for this procedure.

Unit Voltage Rating	100 V 50Hz		100 V 60 Hz		110 V 60 Hz		230 V 50 Hz	
For units fitted with alluminum steam generators, the following times apply.								
Pump type	min.	max.	min.	max.	min.	max.	min.	max.
Fluid-O-Tech Pump	21.5	23	23	25	N/A	N/A	21.5	23
SciCan Pump	18.5	20	21.5	23	21.5	23	21.5	23
Ulka Pump								
For units fitted with Stainless Steel steam generators, the following times apply.								
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.

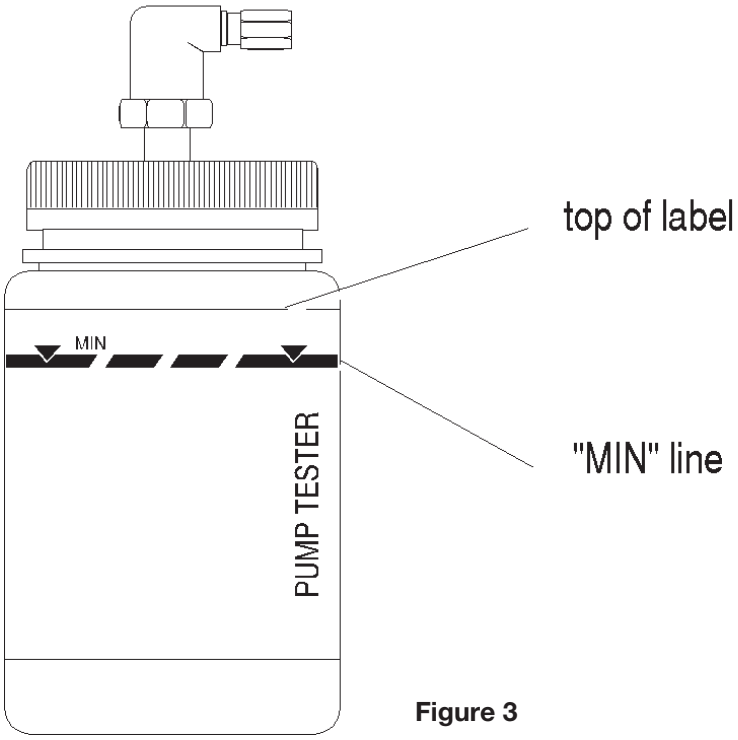


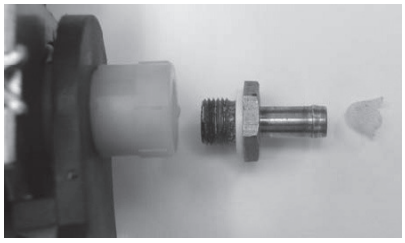
Figure 3

Water Pump Recovery Repair Procedure

Pump performance may be compromised because of 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.

Performing Filter Maintenance

Early STAT*IM* 5000 / 5000S units fitted with SciCan pumps have a coarse mesh filter in the inlet fitting and a fine mesh filter in the outlet elbow fitting located internally in the pump.



Filter in the inlet fitting prior to Jun '07

Filter on the outlet fitting prior to Jun '07

Figure 4

In 2007, SciCan removed these two filters due to the implementation of the water reservoir filter in 2006 and subsequent introduction of the in-line filter in 2007.

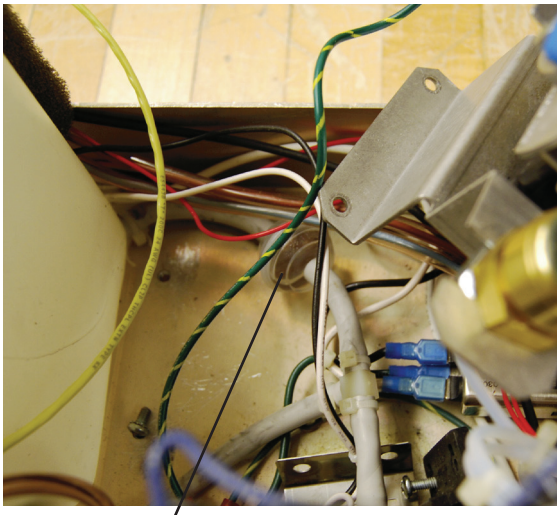


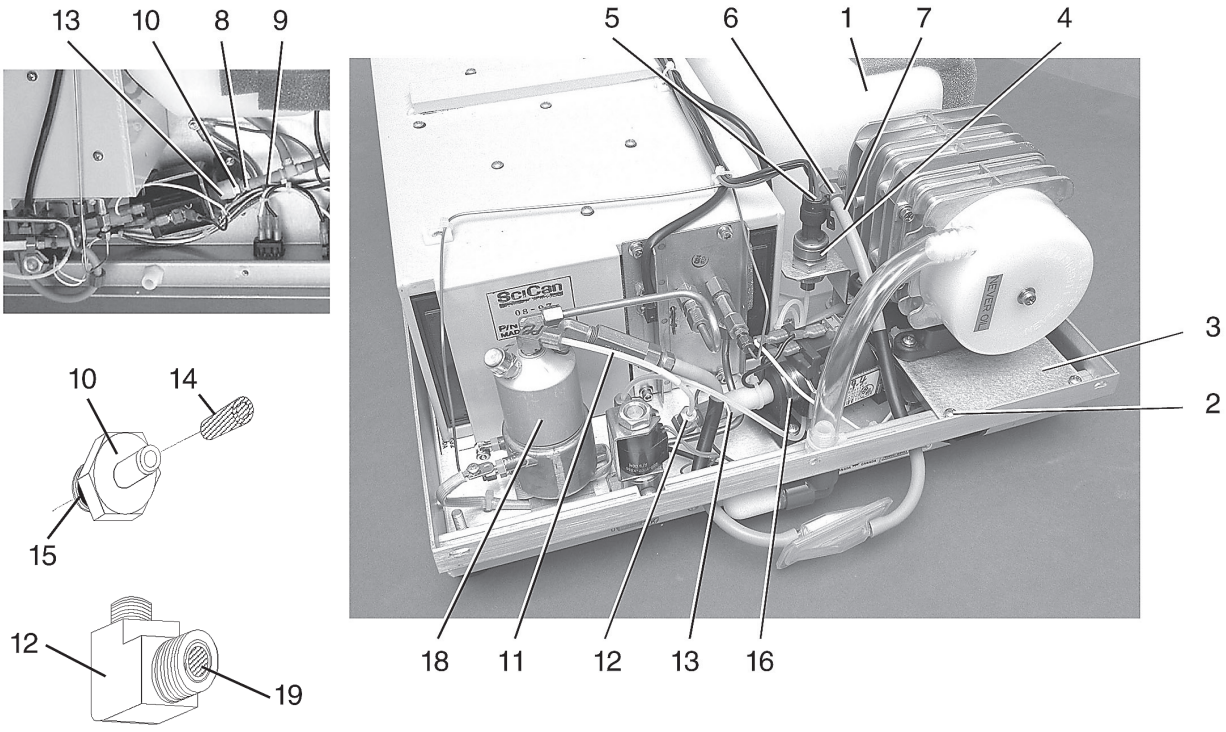
Figure 5

The in-line filter was added between the water reservoir and the water pump inlet to address the issue of customers not using the reservoir filter. The purpose of this in-line filter is to stop debris from entering the STAT*IM* plumbing system when the reservoir filter is not used. The in-line filter kit is available as part # 01-106637S and includes the filter and all necessary tubing. This filter should be replaced every 2000 cycles or every two years.

Performing internal pump filter maintenance

For filter maintenance on internal filters located in the pump, proceed as follows (see Figure 6):

Tip: This can be undertaken with the pump in place, but it is easier if the pump is removed from the unit.



1. reservoir
2. screws with washers
3. compressor / bracket assembly
4. pressure transducer
5. transducer connector
6. compressor compression nut
7. compressor output tube
8. cable tie
9. pump inlet tube
10. pump inlet fitting,
11. Teflon™ tube
12. right angle pump outlet fitting
13. pump body fitting
14. mesh filter, integral to item 10
15. rubber seal, integral to item 10
16. pump
17. pump body outlet fitting (same as 12)
18. steam generator
19. insert with mesh filter, integral to item 6

Figure 6

1. Drain the reservoir (1). See, Tools, Maintenance Schedules, Procedures and Testing.
2. Remove the four screws with washers (2) securing the compressor / bracket assembly (3). See, Compressor.
3. If the pressure transducer (4) is present disconnect the transducer connector (5). See PressureTransducer.
4. Remove the compression nut (6) holding the compressor output tube (7) to the compressor and disconnect the tube.
5. Rest the compressor / bracket assembly to one side to access the pump.

6. Cut the cable tie (8) holding the pump inlet tube (9) to the pump inlet fitting (10). Disconnect the tube.
7. Using a 3/8-inch wrench disconnect the white Teflon™ tube (11) from the pump outlet fitting (12).
8. Using a 9/16 inch wrench on the pump inlet fitting and a 9/16 inch wrench on the pump body inlet fitting (10), unscrew the inlet fitting.
9. There is a mesh filter (14) inside the pump inlet fitting and a rubber seal (15) 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.
10. Inspect the filter and remove any debris. If the filter is damaged, replace the pump inlet fitting. If not, soak the fitting until the deposits have been dissolved. Rinse with clean water.
11. 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 ONLY so as not to damage the internal thread of the plastic pump fitting.
12. Using a 7/16 inch wrench, disconnect the right angle fitting and collar sub assembly while holding the pump body outlet fitting (17) with a 9/16 inch wrench and clean the threads of any debris. Note the orientation of the fitting relative to the steam generator (18).

Tip: Draw a black line through the three parts on the output side of the pump to ensure correct orientation when re-assembling.

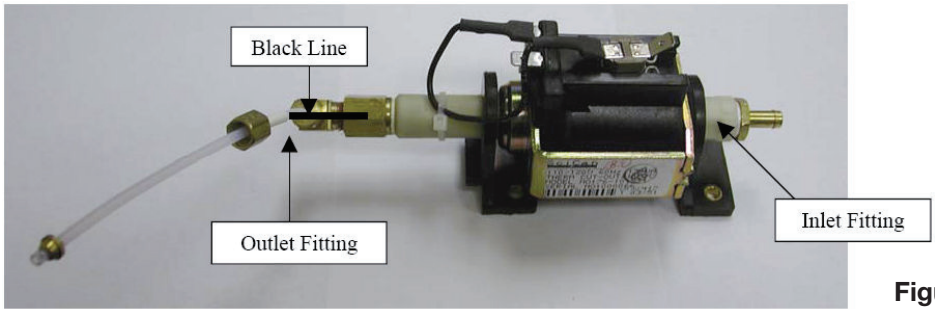


Figure 7

13. Clamp the right angled filter fitting using an adjustable wrench or a vice if available, and unscrew the collar with a 9/16 inch wrench.

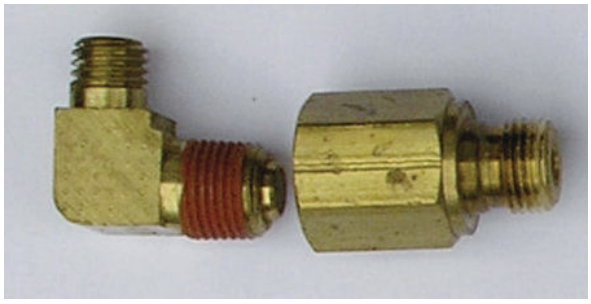


Figure 8

Filter fitting and collar assembly (dis-assembly)

14. There is an insert (19) containing a fine mesh filter in the end of the right angle fitting. This filter cannot be removed from the fitting. If there are any deposits on the mesh, clean off with a stiff, non-metallic brush. If available, an air line can be used to purge the debris from the filter

if appropriate. If there is any scaling on the fitting, it can be removed by soaking the fitting and filter in a mild solution suitable for removing scale or mineral deposits (i.e. vinegar). Rinse thoroughly with clean water.

15. If the outlet fitting has become damaged beyond use, then the in-line filter should be removed, and the outlet fitting replaced with replacement fitting 01-111115S, which has no filter. The unit should be upgraded with an in-line filter and reservoir filter, if appropriate.
16. If replacing the outlet fitting or re-fitting when the components are clean, apply a small amount of Teflon™ tape or pipe thread compound on to the external thread of the fitting and reassemble the right angle fitting to the collar ensuring the correct orientation of the two components.
17. Apply a small amount of Teflon™ tape or pipe thread compound to the external thread of the collar and insert the fitting/collar sub assembly into the pump body outlet fitting. Finger tighten only at this stage, then using a 9/16-inch wrench, tighten one half turn ONLY. Ensure that the Teflon™ pump tube will reach and the outlet assembly is orientated correctly.
18. Reconnect the pump tube to the pump outlet. Do not kink the Teflon™ tube.
19. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

Performing water reservoir filter maintenance

For maintenance of units where no internal filters are fitted and a water reservoir filter is installed, proceed as follows:

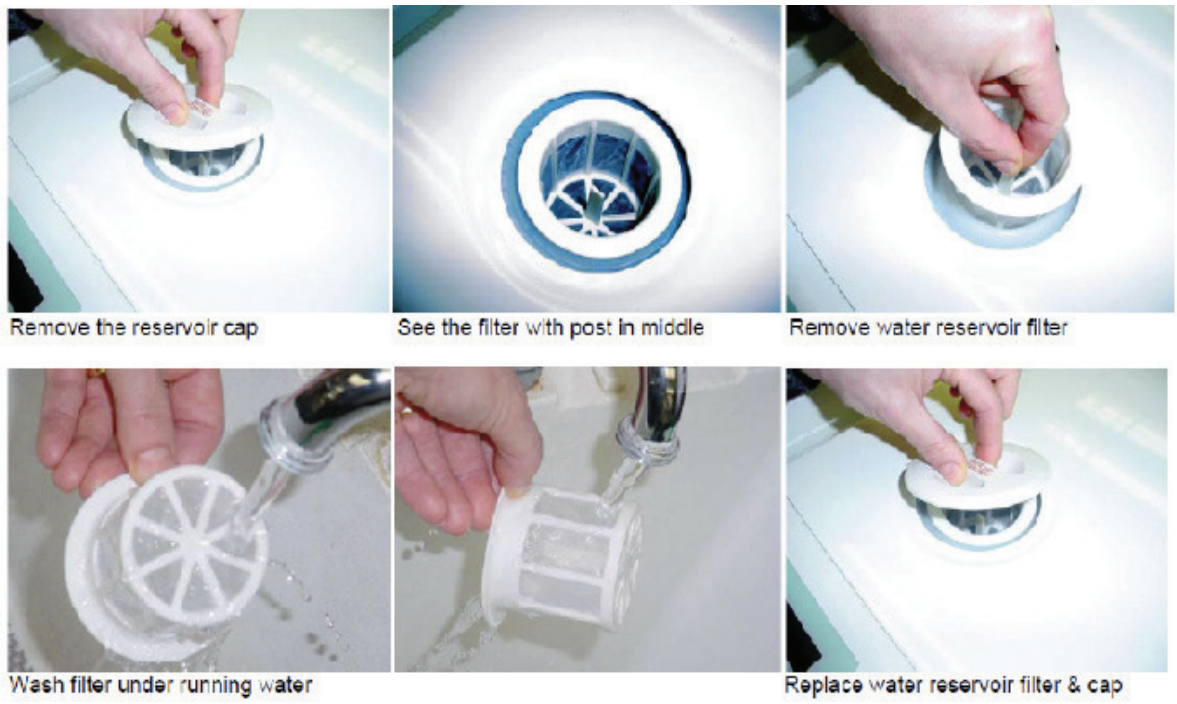


Figure 9

Where a reservoir filter is not installed, it can be retro-fitted, but note the filter will not work with old reservoir caps and therefore ordering a new reservoir cap is recommended to upgrade existing field units. All replacement caps will come with a new water reservoir filter. Spare Part Kit Numbers are: Reservoir Cap # 01-101783S, Water Reservoir Filter # 01-109300S.

Performing inline filter maintenance

For maintenance of units with in-line filters, proceed as follows (See Figures 6 and 10):

This filter should be replaced every 2000 cycles or every two years.

1. Drain the reservoir (1). See, Tools, Maintenance Schedules, Procedures and Testing.
2. Remove the four screws with washers (2) securing the compressor / bracket assembly (3). See, Compressor.
3. If the pressure transducer (4) is present disconnect the transducer connector (5). See PressureTransducer.
4. Remove the compression nut (6) holding the compressor output tube (7) to the compressor and disconnect the tube.
5. Rest the compressor / bracket assembly to one side to access the pump.
6. Cut and remove the cable ties (8) connecting the filter and inlet/outlet tubes.
7. Remove the filter (20) from the tubes.

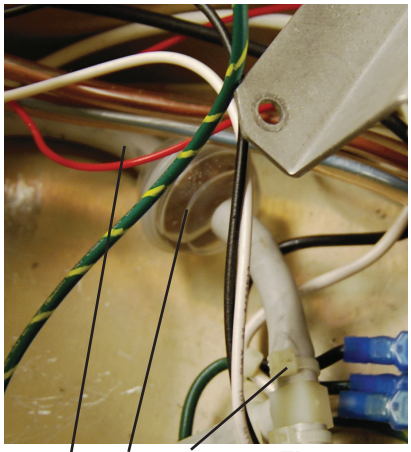


Figure 10

8. Cable tie
9. Inlet tube
20. In-line filter

Note: the filter is directional, so check the orientation of the filter before removing.

8. Insert the new filter in to the inlet and outlet tubes. Check the flow orientation of the filter.
9. Secure the tubes to the filter with new cable ties.
10. Run a sterilization cycle and observe filter and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
11. The in-line filter kit can be retro-fitted and is available as part # 01-106637S and includes the filter, all necessary tubing and installation instructions.

Performing Pump Tube Replacement

The pump tube located between the pump and the steam generator is designed to control the flow of water into the steam generator so that it receives the precise amount of water required at specific points in the sterilization cycle. The tube is directional (pump to steam generator) and contains a precision orifice tube inside the main tube that has a precise diameter that controls the volume passing through into the steam generator. The orifice tube is located at the steam generator end of the main pump tube. The diameter of the fitting is represented on the outside of each pump tube by a numeric value. The larger the value, the larger the diameter of the orifice.
If the filters are clean and the pump flow parameters are not correct, then it may be possible to recover the correct water delivery by the replacement of the pump tube with one of larger or smaller diameter as appropriate.

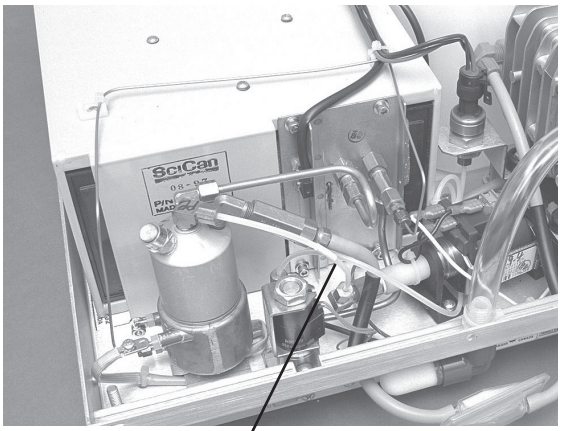
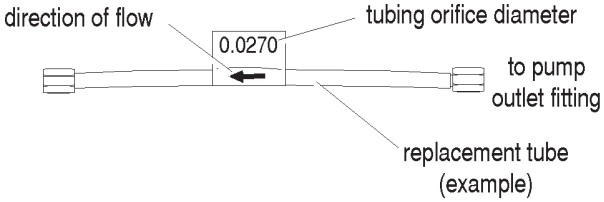


Figure 11



Single pump tubes are available in a large number of diameters from 0.0210” diameter to 0.0290” diameter in 0.0005” increments.

Note: The number as it appears on the tube may only be represented by 3 digits, e.g. a 0.0245” tube will be represented by ‘245’.

As a guide to the tube size required if changing the tube is considered, the nominal tube sizes for STAT*IM* 5000 models as fitted during production should be as follows:

Unit / Voltage Rating	Nominal Tubing
*STAT*IM* 100 V	0.0270
*STAT*IM* 115 V	0.0255
*STAT*IM* 230 V	0.0245

Note: These are for aluminium boilers only. If a unit is fitted with a stainless steel steam generator, the value will likely be in the region of a difference of 0.0040” larger. For example, a 0.0245” tube fitted to an aluminium steam generator may be 0.0285” on a stainless steel steam generator.

1. Steam generator inlet tube
2. Steam generator
3. Pump outlet fitting
4. Replacement tube
5. Fitting (pump test bottle)
6. Pump test bottle

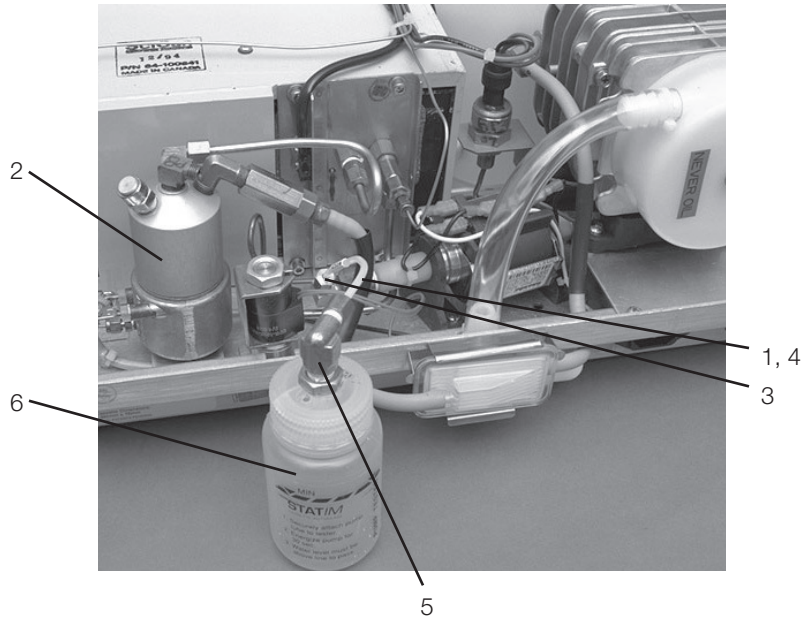


Figure 12

If, as a result of a failed pump flow check after a filter maintenance, the tube may be changed as follows (see Figure 12):

1. Turn the unit OFF.
2. Using a 3/8-inch wrench disconnect the pump tube (1) from the top of the steam generator (2) or pump test bottle (6) as appropriate, and disconnect the other end from the pump outlet fitting (3). Record the orifice diameter and discard the tube.
3. Select a smaller or larger size tube (depending on whether pump is over or under delivering).
   Note: There is no prescribed formula over which diameter to select. Selection will need to be based on perception of the under or over delivery amount.

4. Connect the pump end of the new 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) until finger tight. Do not cross thread the fittings. **Do not overtighten.**
6. Using the button on the control box or appropriate keypad button (revision 7.x controllers), activate the pump for 2 seconds to purge any air that is trapped in the fittings. Empty any water that enters the pump tester by removing the bottle from the cap. Recap the pump test bottle. The pump tester MUST be empty before starting the pump test.
7. 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 13). Activate the pump.
8. If the water level reaches the top of the line marked MIN within the time allotted in the Pump Flow Parameters chart, the pump is performing correctly. 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, remove the tube and try a different size, repeating the test procedure until the correct size is established.
9. If flow requirements cannot be met using the largest or smallest diameter tubes, pump replacement will be necessary.
10. If 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 or appropriate keypad button (if using revision 7.x controllers) for 5 seconds to ensure that the pump is functioning and observe for leaks.
12. If the pump is replaced, a dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
13. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

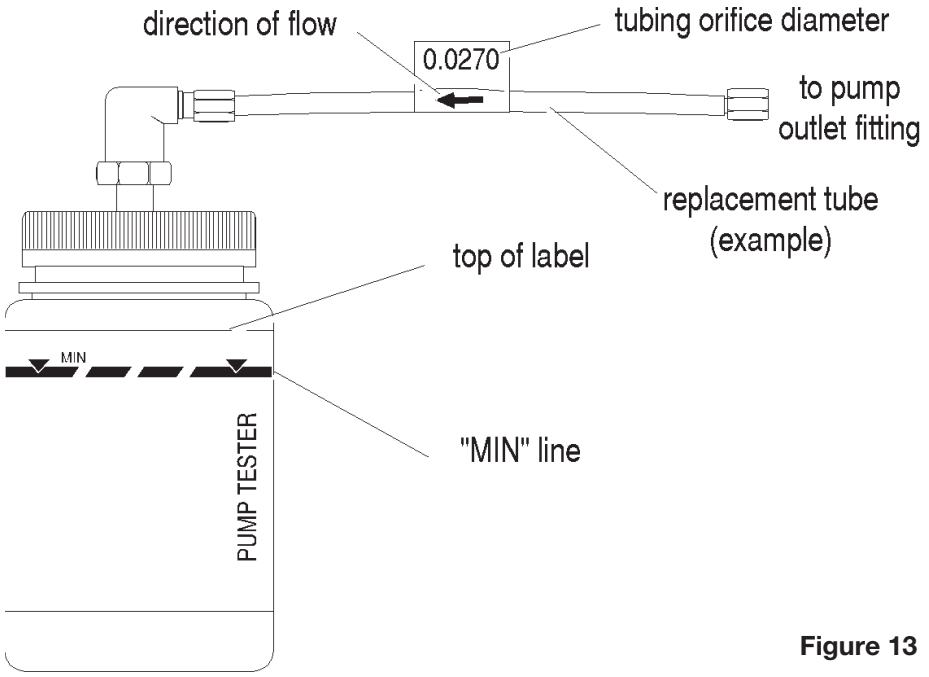
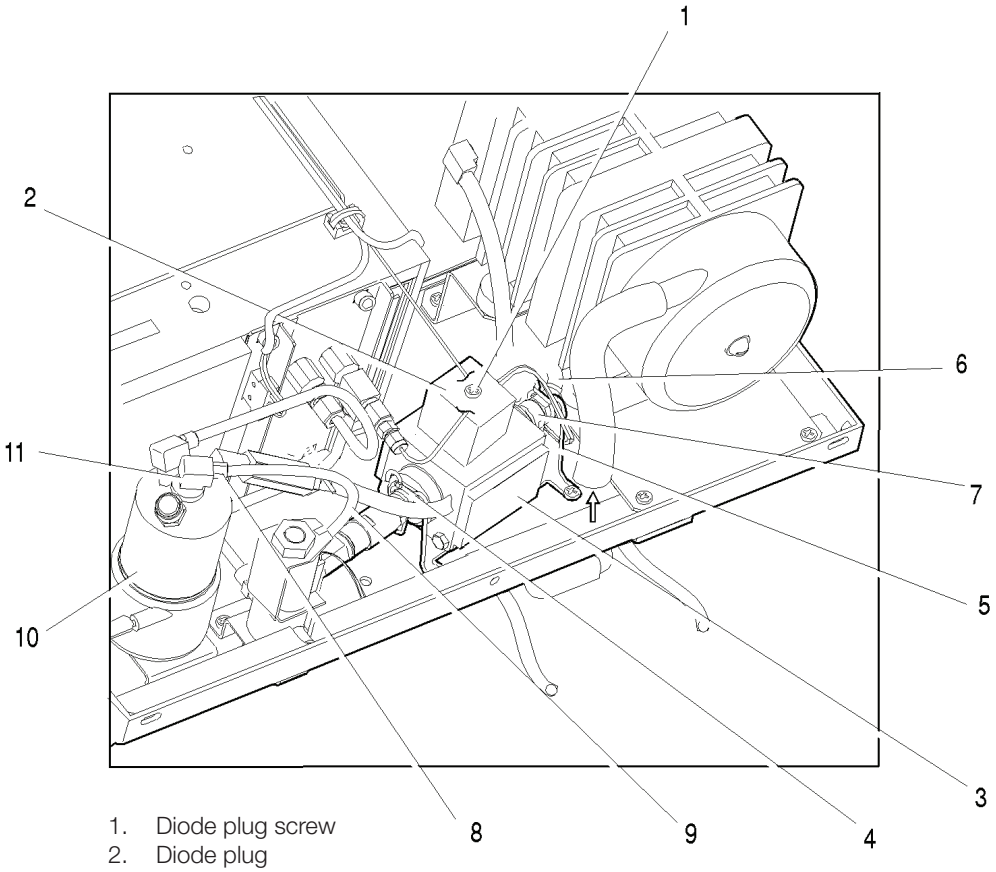


Figure 13

Removing the Fluid-O-Tech Pump Assembly

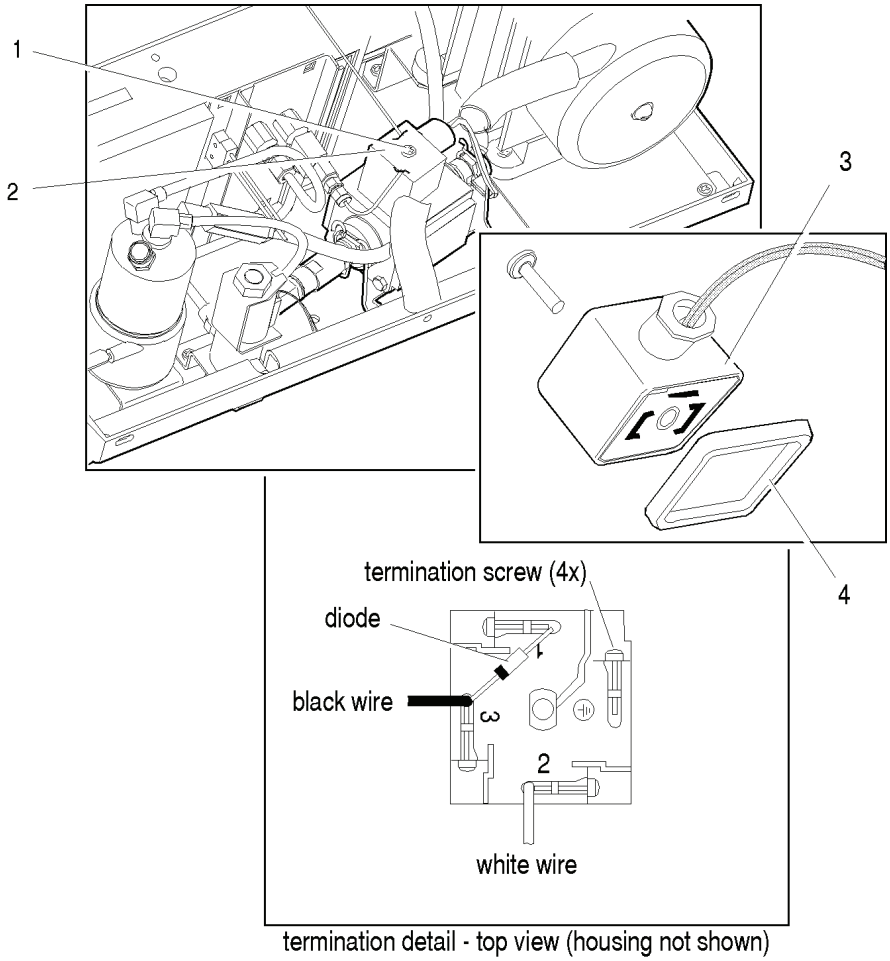
To remove the Fluid-O-Tech pump, proceed as follows (see Figure 14):



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

Figure 14

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* in the following section for diode orientation.
2. Cut 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. Lift the pump assembly out of the mounting bracket and clear of the unit.



1. Center screw
2. Diode plug
3. Black cap
4. Rubber boot

Figure 15

Testing the Fluid-O-Tech Pump Diode

To test the pump diode, proceed as follows (see Figure 15):

If the pump has not been removed:

5. Remove the center screw (1) from the diode plug (2), and retain for reassembly.
6. Detach the diode plug from the pump body.

If the pump has been removed, or after detaching the diode plug:

1. Remove the rubber boot (4) from the diode plug.
2. Using a small screwdriver or similar instrument, pry away the black cap (3) from the plug.
3. Test the diode using the diode test setting on a multimeter.

Reinstalling the Fluid-O-Tech Pump Assembly

To reinstall the pump assembly, proceed as follows (see Figure 14):

1. Slide the outlet side of the pump under the solenoid valve bracket, locate the pump assembly 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) should be performed on the STAT*IM* unit at this stage.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
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.

Removing the SciCan or Ulka Pump Assembly

To remove the pump assembly follow these steps (see Figure 16):

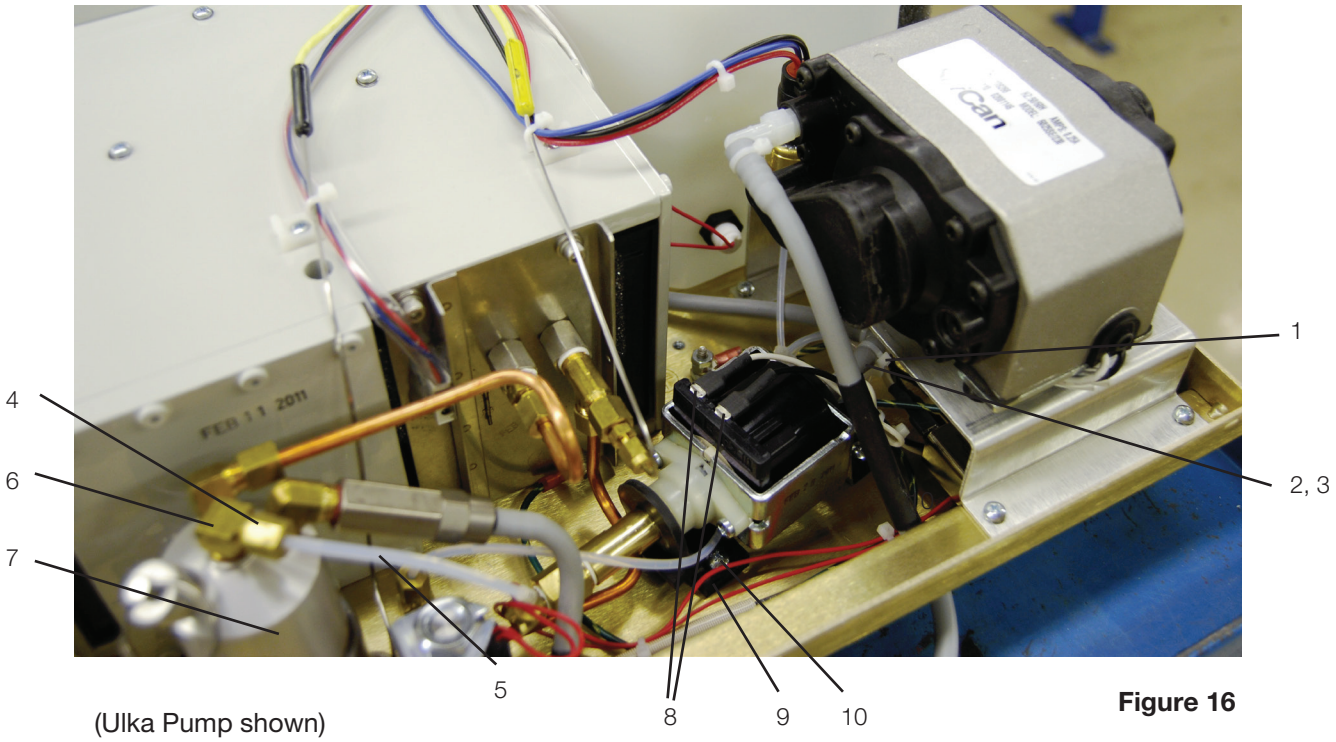


Figure 16

(Ulka Pump shown)

1. Cable tie
2. Inlet tube
3. Pump inlet fitting
4. Compression nut
5. Teflon tube
6. Inlet fitting
7. Steam generator
8. Terminal connectors
9. Rubber brackets
10. Screws

1. Remove the four screws with washers securing the compressor / bracket assembly. See, Compressor.
2. If the pressure transducer is present, disconnect the transducer connector. See, STAT*IM* Pressure Transducer.
3. Remove the compression nut holding the compressor output tube to the compressor and disconnect the tube. Rest the compressor bracket assembly to one side to access the pump.
4. 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.
5. 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).
6. Disconnect the fast-on terminal connectors (8) from the pump. Observe the position of each terminal before removal.
7. 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.

Reinstalling the SciCan Pump Assembly

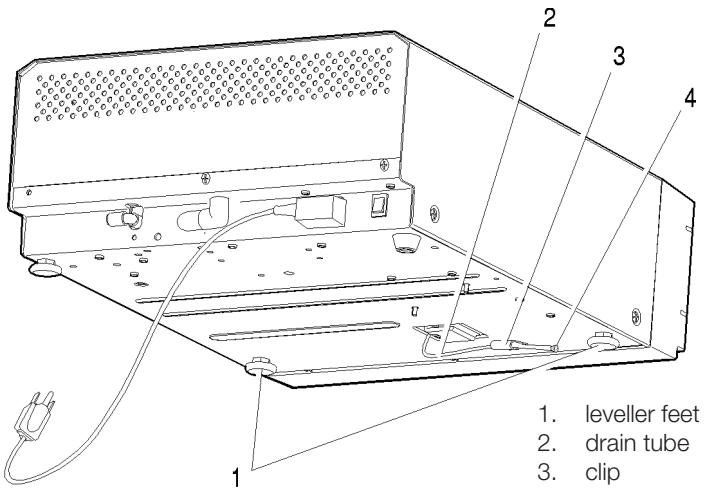
To install the pump assembly follow, these steps (see Figure 16):

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 Permalock 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 Teflon™ 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. Reinstall the compressor assembly and (if present) the pressure transducer.
6. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) **must** be performed on the STAT*IM* unit.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
7. 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.
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 STAT*IM* Cover Removal and Replacement.

Priming STAT*IM* 5000 / 5000S Pumps

To prime a STAT*IM* 5000 / 5000S pump, follow these steps (see Figure 17):

1. Be sure there is steam process distilled water in the reservoir.
2. Move the STAT*IM* unit to the edge of the work surface. The front leveller feet (1) should be approximately one half inch from the edge so the unit remains securely seated on the work surface.
3. Lift the front left corner of the unit upward and remove the drain tube (2) from the clip (3) located on the underside of the unit. Gently pull the tube out as far as possible so the free end can be positioned over a water container after the unit is lowered back to the work surface.



1. leveller feet
2. drain tube
3. clip
4. stopper

Figure 17

4. Remove the stopper (4) from the end of the drain tube and allow the water to drain from the reservoir. Allow a strong steady stream to flow into the container for a minimum of 30 seconds.
5. Replace the stopper.
6. Lift the front left corner of the STAT*IM* unit upward and re-insert the tube into the clip on the underside of the unit. Push the excess length of tubing back from where it came.

Reservoir and Water Sensors

STAT*IM* 5000 / 5000S reservoirs have been installed in two different configurations with regard to water sensors. The reservoir moulding however is the same in all cases.

On units from 1995 to 2008 with revision 2.x/5.x/6.x and 7.x with software up to revision R604, the reservoir contained a water quality sensor with two exposed probes (2), which detect the water level AND quality in the reservoir by conductivity.

(cut-away)

On units from 2008 onwards with revision 7.x controller boards with software R605 and upwards, the reservoir contained a water quality sensor with two exposed probes that ONLY detects the water quality in the reservoir by conductivity, AND a float assembly that ONLY detects the water level (3).

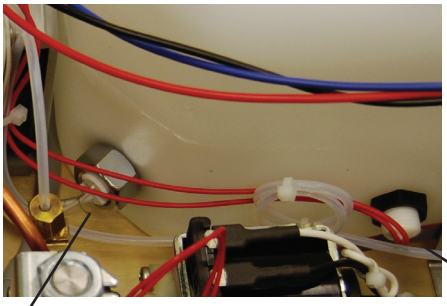


Figure 18

Removing the reservoir

To remove the reservoir (1), proceed as follows (see Figure 19):

The unit should be disconnected from the electricity supply before performing this procedure as the unit needs to be turned on it's side to detach the reservoir securing screw.

1. Drain the reservoir.
2. Remove the compressor / bracket assembly (3). See, Compressor. Retain all screws.
3. Cut the necessary cable ties (6) and remove the reservoir sensor leads from controller board terminal positions.

TIP: Note the terminal positions on the controller board so that the sensors may be re-connected correctly. Positions can vary depending on the controller type.

4. Cut the cable tie (4) securing the reservoir supply tube (7) to the "T"-fitting (8) located beneath the compressor / bracket assembly and remove the tube from the fitting.
5. Tilt the unit on its side so that the Reservoir and PCB are at the top of the unit. Locate and remove three nylon cap nuts with washers (9) on the bottom of the chassis securing the reservoir. Retain the cap nuts and washers.

6. Place the unit back on its feet and carefully remove the reservoir from the chassis. BE CAREFUL NOT TO DAMAGE THERMOCOUPLE LEADS.

Reinstalling the reservoir

To reinstall the reservoir, follow these steps (see Figure 19):

1. Carefully place and secure the reservoir (1) in the chassis taking care not to damage the wiring.
2. Tilt the unit on its side so that the reservoir and PCB are at the top of the unit. Locate and install the three retained nylon cap nuts with washers (9)on the bottom of the chassis securing the reservoir. Do not pinch or obstruct the drain tube.
3. Place the unit back on its feet.
4. Reconnect the reservoir supply tube (7) to the “T”-fitting (8). Secure the tube using a cable tie (4).
5. Fill the reservoir with steam-process distilled water.

TIP: Touch the leads of the water quality sensor assembly to an earthed point to discharge any static electric charge which may have built up on the reservoir during shipping. This reduces the chance of damaging the controller board with ESD.

6. Connect the water quality sensor leads (4) to controller board (5) terminal positions labeled PROBE J4-3 and J4-4.
7. Reinstall the compressor / bracket assembly (3). See, Reinstalling the Compressor.
8. Bundle the reservoir sensor leads, the microswitch leads and the thermocouple leads together and secure them using cable ties every 2-3 inches. Secure the bundle to the top of the armature using the clamps provided.
9. Reinstall the cover.
10. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STATIM when the work is completed and after the cover has been returned to the unit.

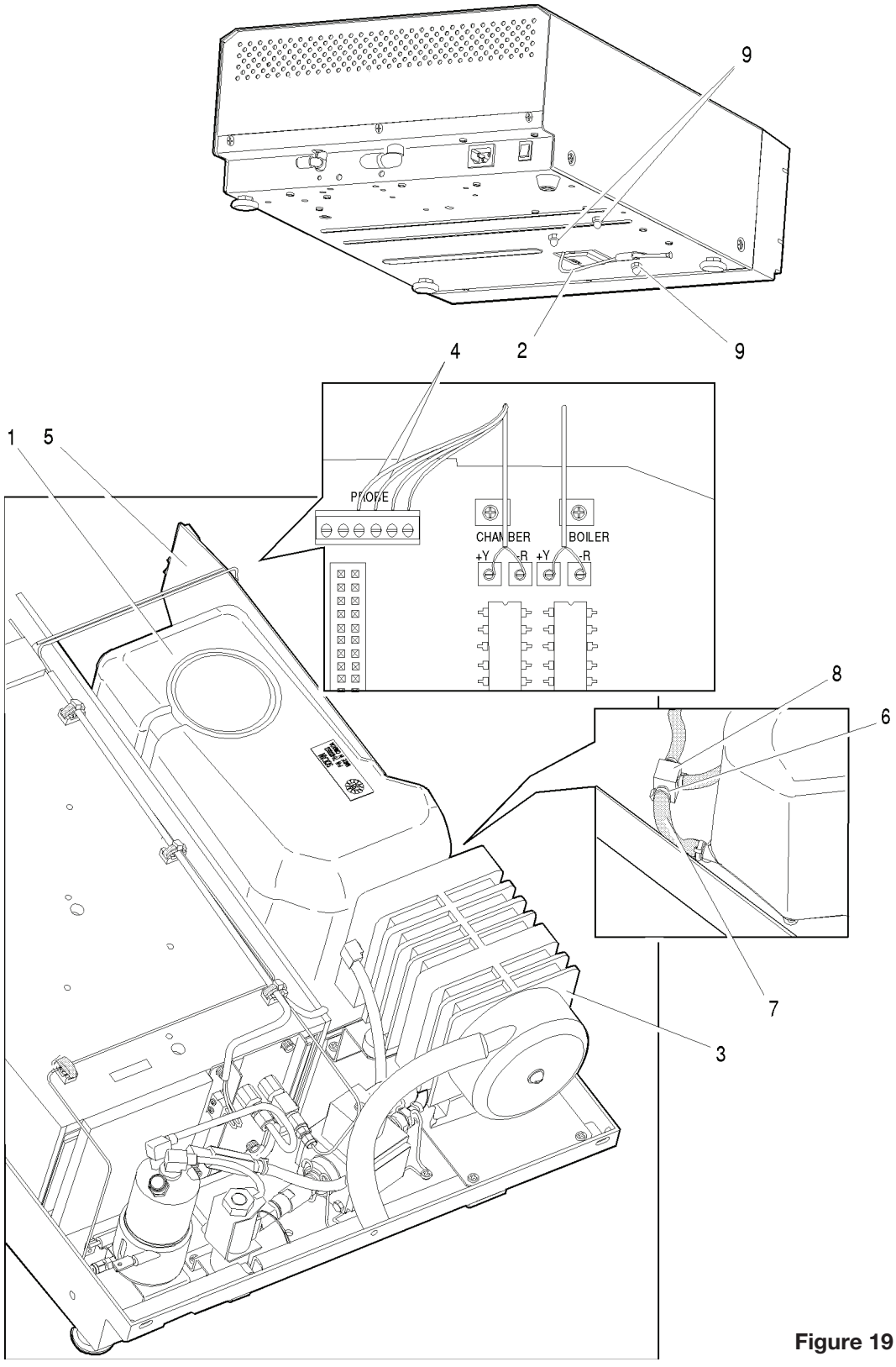


Figure 19

Troubleshooting reservoirs with water quality sensor only

Diagnosing conductivity sensor problems

Before starting diagnostic procedures check that:

14. The reservoir is free of any debris and the conductivity sensor is clean.
15. The reservoir is filled with good quality steam distilled process water so that the conductivity sensor is completely submerged. If in doubt about water quality, drain the reservoir and refill with steam-process distilled water containing less than 5 ppm total dissolved solids or having conductivity of less than 10 µS/cm.
16. The leads of the conductivity sensor are securely connected to controller board. Nothing is connected to controller board terminal positions labeled 'FLOAT'.
17. The controller board is clean and dry (both sides). Pay particular attention to the terminal block where the sensor is connected and any components on the upper right hand portion of the board.
18. For rev 2.x, 5.x and 6.x controller boards, measure the negative voltage across test connector header positions P1-1 and P1-3. If the voltage reading is not within -8.4V to -9.7V, replace the controller board.

Checking the conductivity sensor

To check the conductivity sensor, proceed as follows:

1. Power the unit OFF and disconnect the sensor leads from controller board connector positions J4-3 and J4-4.
2. Power the unit ON and start an Unwrapped cycle.
3. If a "REFILL RESERVOIR, EMPTY WASTE BOTTLE" message appears on the LCD, proceed to step 4. If the cycle starts when the sensor leads are disconnected, the controller board is at fault and should be replaced.
4. Short circuit (bridge) controller board connector positions J4-3 and J4-4 together and start a cycle. If the unit displays a "WATER QUALITY NOT ACCEPTABLE" message, proceed to step 5. If no message is displayed then the controller board is at fault and should be replaced.
5. Remove the short from J4-3 and J4-4 and short controller board connector positions J4-5 and J4-6 together. If the unit displays a "SELECT A CYCLE" message, it is unlikely that the controller board is damaged.
6. If problems persist, leave the unit powered ON to allow internal components to warm up for a period of time (some failures are temperature dependent). Then start any sterilization cycle and repeat steps 1 through 6.
7. To test the conductivity sensor, short the sensor posts in the reservoir using a long handle screwdriver. The measured resistance across the unconnected sensor leads should be less than 1.0 ohm. If the reading is other than that the sensor is likely damaged. Replace the sensor.

Troubleshooting "WATER QUALITY NOT ACCEPTABLE" message

Where water quality is known and measured in the reservoir to be below 5 ppm totally dissolved solids or conductivity of less than 10 µS/cm, but the above message is displayed, proceed as follows.

In some STAT*IM* units fitted with water quality sensors, (typically with revision 2.x/5.x controller boards), there may be a case where electro magnetic interference (when the unit/pump gets older) affects the accuracy of the sensor and the "WATER QUALITY NOT ACCEPTABLE" message appears in the LCD display even though nothing is actually wrong with the water. This is rare, but can occur in units prior to those with revision 6.x controller boards onwards. After this, a grounding spring was fitted to the pump and shielding was fitted to the sensor cabling which alleviated the problem.

If this situation occurs, there are three things that can be done:

Option 1. Reverse the polarity of the pump by switching the black and white power leads on the pump side.

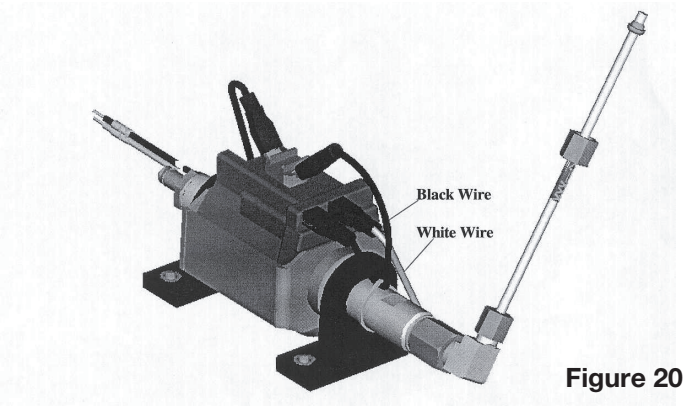


Figure 20

Option 2. Fit a grounding spring to the pump.

To fit a grounding spring, proceed as follows (see Figure 20):

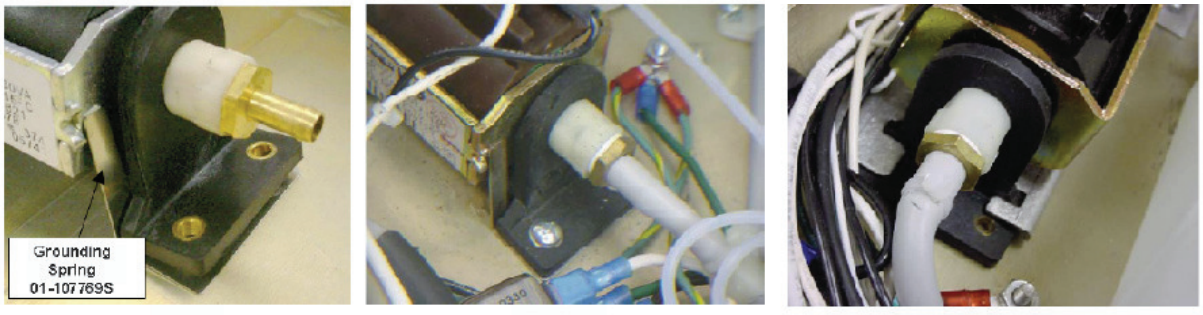


Figure 21

Please Note:
The Spring Pump Ground Assembly is not required for older units that have the metal mounting bracket affixed below

1. Remove the pump as described in the section above “Removing the SciCan or Ulka Pump Assembly”.
2. Insert the grounding spring on the inlet side of the pump as per picture one in figure 10 above.
3. Re-install the pump as described in the section above “Installing/reinstalling the SciCan or Ulka Pump Assembly”. The spring positioning should appear as per picture two in figure 10 above.

Option 3. Upgrade the water quality sensor to the later type (01-103571S).

The original water quality sensor had two wires coming from it whereas the upgraded part has three wires that require attaching as per the configuration below.

- single white wire to J4 pin#3,
- second white wire (sheathed with the black wire) to J4 pin#4, and
- black wire to J3 pin#5.

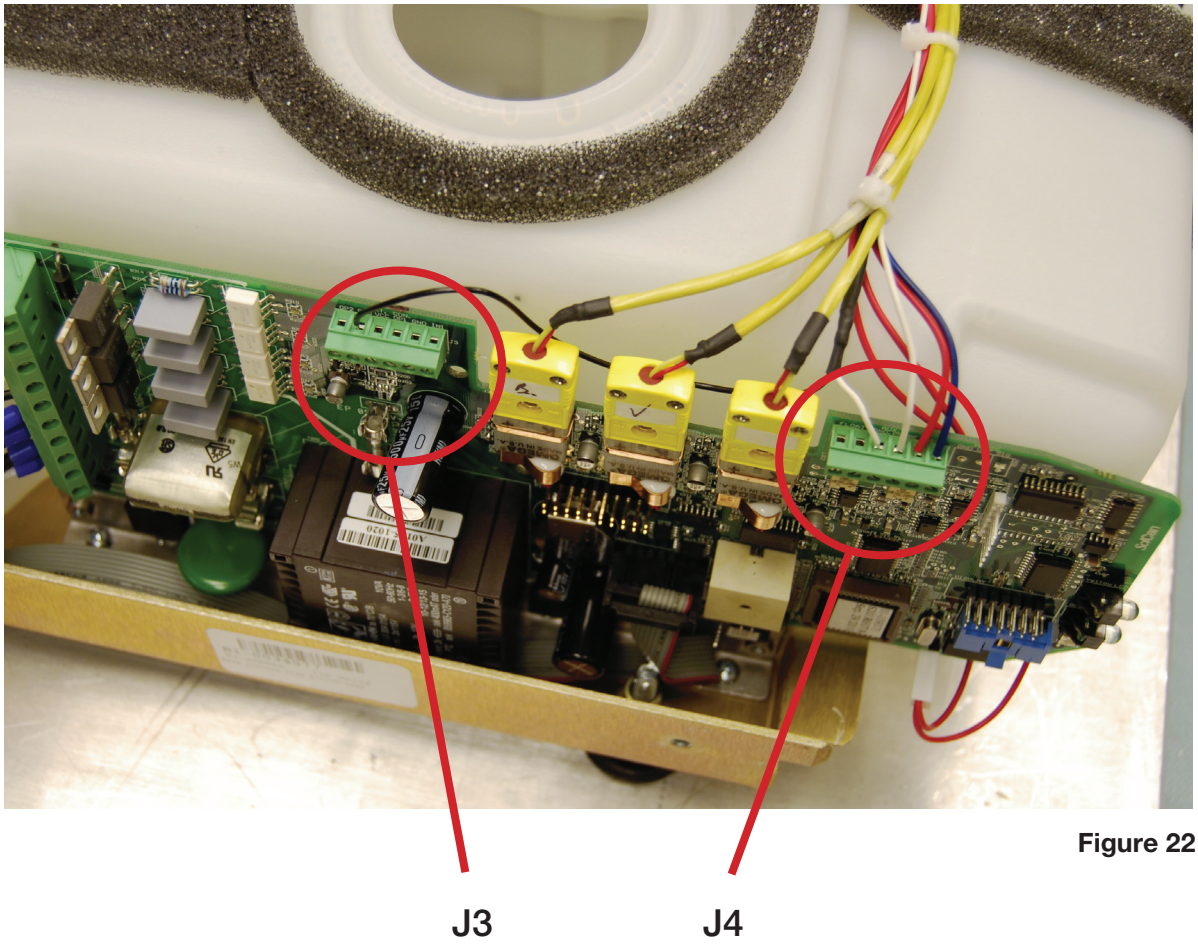


Figure 22

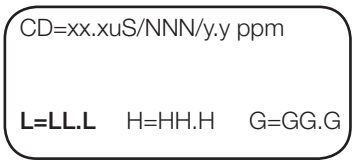
Troubleshooting reservoirs with float and water quality sensors

In 2008, SciCan introduced a new type of water reservoir fitted with a water quality sensor AND a float switch. In the past, the low water level indication was performed by the water conductivity sensor. If the sensor measured the conductivity to be between 0.0 and 0.3 µS/cm, (the minimum default setting in the software is 0.3 µS/cm) the unit would notify the user to "REFILL RESERVOIR" even though the reservoir was in fact filled above the sensor.

As the water quality of many water suppliers has improved of late, some Rev. 7.x controller STAT*IM* users may find this "REFILL RESERVOIR" message appear, and as the conductivity sensor in the unit cannot be set to 0.0 µS/cm, as the unit would run even without water, the float was introduced to enable extremely pure water to be used without an error message.

To determine if your STAT*IM* unit has a water reservoir float switch, enter the Service Menu and proceed to the "CONDUCTIVITY SETUP" option and observe the L= value.

The display should be similar to the example below.



Screen Representation

xx.x	=	Water conductivity in µS.
NNN	=	Conductivity measurement in ADC (Analog to Digital) counts (0…255)
y.y	=	water conductivity in ppm (parts per million).
LL.L	=	Numerical threshold in uS below which the unit thinks it is out of water OR float identifier (see below).
HH.H	=	High valve threshold (Bad water threshold - values larger than this trigger "Water Quality Not Acceptable" error.
G.GG	=	Water conductivity circuit gain

If the **L=** value reads "**FLOAT**", the unit has a water float switch.

If the **L=** is a numerical value (e.g. **0.3 uS**) then the unit has no water float switch.

The float sensor in this reservoir will ONLY work with STAT*IM* 2000/5000 units with revision 7 controller board or higher AND have the following software revisions or higher:

- S201R605, S202R605, S2E2R605, S2S2R605, S2S9R605
- S5S2R605, S501R605, S503R605, S502R605, S5S2R605, S5S9R605

If replacing a reservoir for a unit **without** a revision 7 controller board, the reservoir **without** float (with water conductivity sensor) can be ordered.

If replacing a reservoir on a unit **with** a revision 7 controller board and software lower than as listed above, the reservoir with float switch (and water quality sensor) can only be used if the software is upgraded to the latest revision.

If the unit is being upgraded with the new style reservoir and the choice has been made to upgrade the software to the latest version, the conductivity set-up in the service menu will need to be modified.

Modifying the conductivity set up in the service menu

To modify the conductivity set up, proceed as follows:

1. Enter Service Menu.
2. Select “Conductivity Setup”. (Pressing the Unwrapped button will allow you to scroll through the menu).
3. When “Conductivity Setup” is on the top line of the LCD, press the Rubber or Plastic to enter the sub menu. The display should be similar to the example below.

CD=xx.xuS/NNN/y.y ppm

L=LL.L H=HH.H G=GG.G

4. The **L=** value at this point SHOULD be a numerical value (e.g. **0.3 uS**). Press the Wrapped button to change the **L=** value to “**FLOAT**”.
5. Press the Stop button. This will save and exit out of the Service Menu.

Removing and replacing the float sensor

To remove and replace the float sensor, proceed as follows (See Figure 23)

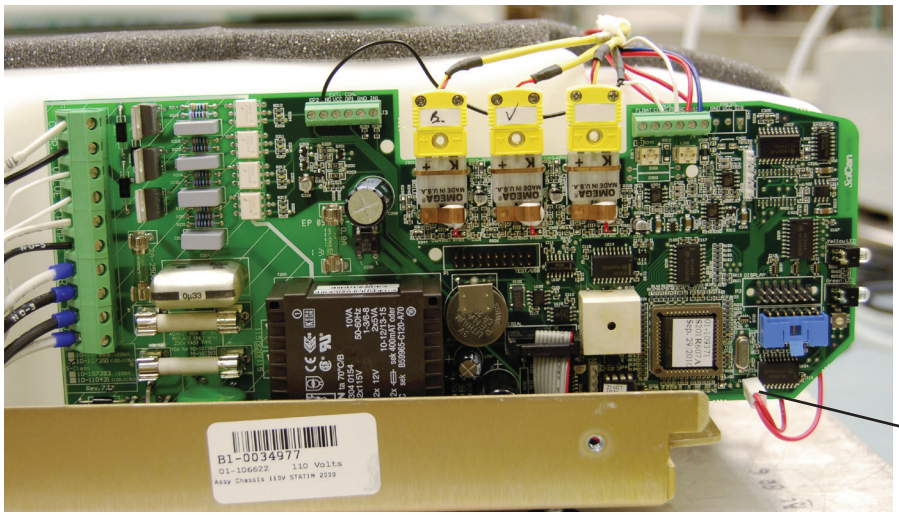


Figure 23

1. Cut the appropriate cable ties holding the float sensor wires in the wiring harness and disconnect the connector from the controller board (see below). Release the wires from the harness so that they are free to be removed from the unit with the sensor.
2. Remove nut from float sensor.

3. Position the new float sensor on a flat surface and mark sensor threads as shown in the picture below. The mark indicates the top of the sensor.

Figure 24

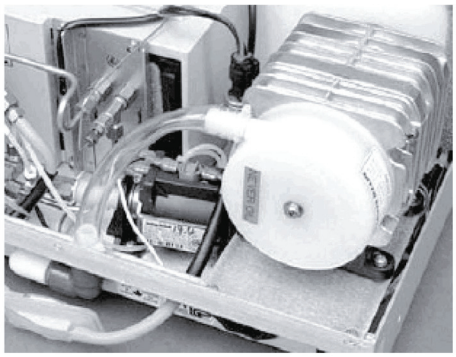
4. From inside the reservoir, pull the old sensor complete with its wires from the reservoir.
5. Insert new sensor (reverse removal instructions).
6. Ensuring the mark on the sensor thread is facing up, install the nut that was removed in step 1. Using a torque wrench tighten the nut to 7 in-lb. Inspect and confirm the mark on the threads is still facing up.
7. Re-route the float sensor wires in the appropriate position in the wiring harness and reconnect the float sensor. Ensure the wire is run behind the PCB and make the smallest loop possible without causing the wires to kink or bend sharply.
8. Cable tie the float sensor wires to the wiring harness.

Compressor

Over the years, the STAT*IM* 5000 / 5000S units have been manufactured using two compressor types, the MEDO compressor and the THOMAS (or SciCan) compressor. Before servicing or replacing the compressor, you must determine which model the unit contains.

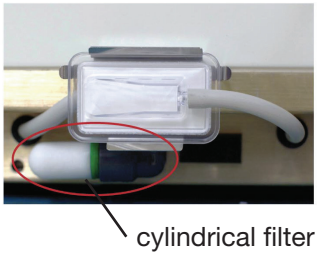
Identifying Compressor Types

MEDO Compressor – 1995 to 2003, 2011 onwards (approximate dates only)

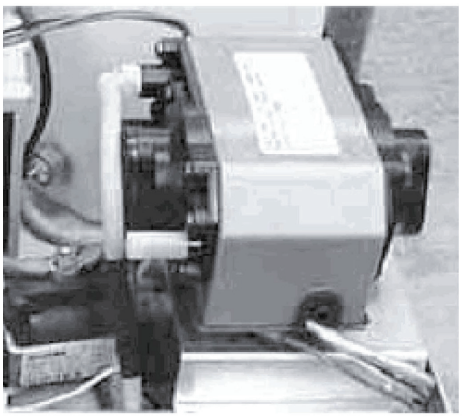


The MEDO Compressor draws air through the cylindrical air filter at the back of the unit and into the compressor, then pushes the air through the bacteria-retentive air filter and check valve into the steam generator.

To establish if a 5000 / 5000S unit is fitted with a MEDO compressor without removing the cover, you will see a plastic inlet filter below the biological filter on the rear of the unit.

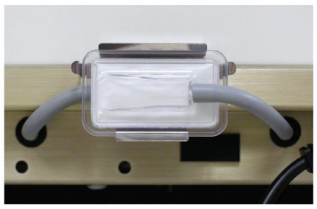


THOMAS Compressor – 2003 to 2011 (approximate dates only)



The THOMAS (or SciCan) Compressor draws air directly into the compressor from inside the unit and then pushes the air through the bacteria retentive filter and check valve into the steam generator.

To establish if a 5000 / 5000S unit is fitted with a THOMAS (SciCan) compressor without removing the cover, you will note that there is NO plastic inlet filter below the biological filter on the rear of the unit. See chart below for the replacement compressor that each STAT*IM* 5000 model uses.



When replacing these compressors with the same type, the following part numbers should be ordered. Note that the compressor is the same for both 5000 and 5000S models.

STAT*IM* 5000 models (voltages)	THOMAS compressor	MEDO compressor
100V	01-101758S	01-112422S
115V	01-101619S	01-112423S
220V	01-101771S	01-112424S

Removing and Reinstalling the Medo compressor

Removing the Medo Compressor

To remove the compressor, follow these steps (see Figure 26):

1. Turn the power switch OFF, and unplug the unit.

With the cylindrical air filter only:

2A. Locate the silicone rubber tube (5) which extends from the compressor (2) to the steam generator check valve (3). Disconnect the compression nut (4) securing the tube to the compressor and remove the tube from the fitting.

With the additional bacteria-retentive filter:

2B. Locate the rubber tube (5) which extends from the compressor (2) to the input side of the bacteria-retentive filter (6). Disconnect the compression nut (4) securing the tube to the compressor and remove the tube from the fitting.

3. Remove the transparent rubber tube (7) which extends from the compressor intake fitting to the air fitting (8). Cut the cable tie (9) securing the tube to the compressor and remove the tube from the fitting.
4. Remove the four screws (10) that attach the compressor bracket (11) to the chassis (12). Retain the screws. Some compressor brackets may appear slightly different then the bracket you are servicing. Use the bracket that accompanies the replacement compressor.
5. Disconnect the leads from controller board (13) terminal block positions J1-9 LINE and J1-10 NEUTRAL, and carefully cut the cable ties (14) securing the compressor leads (15).
6. If present, remove the pressure transducer. See Chapter 9, Pressure Transducer.
7. Disconnect the ground wire (18) from the compressor body and remove the compressor from the unit.

Reinstalling the Medo Compressor

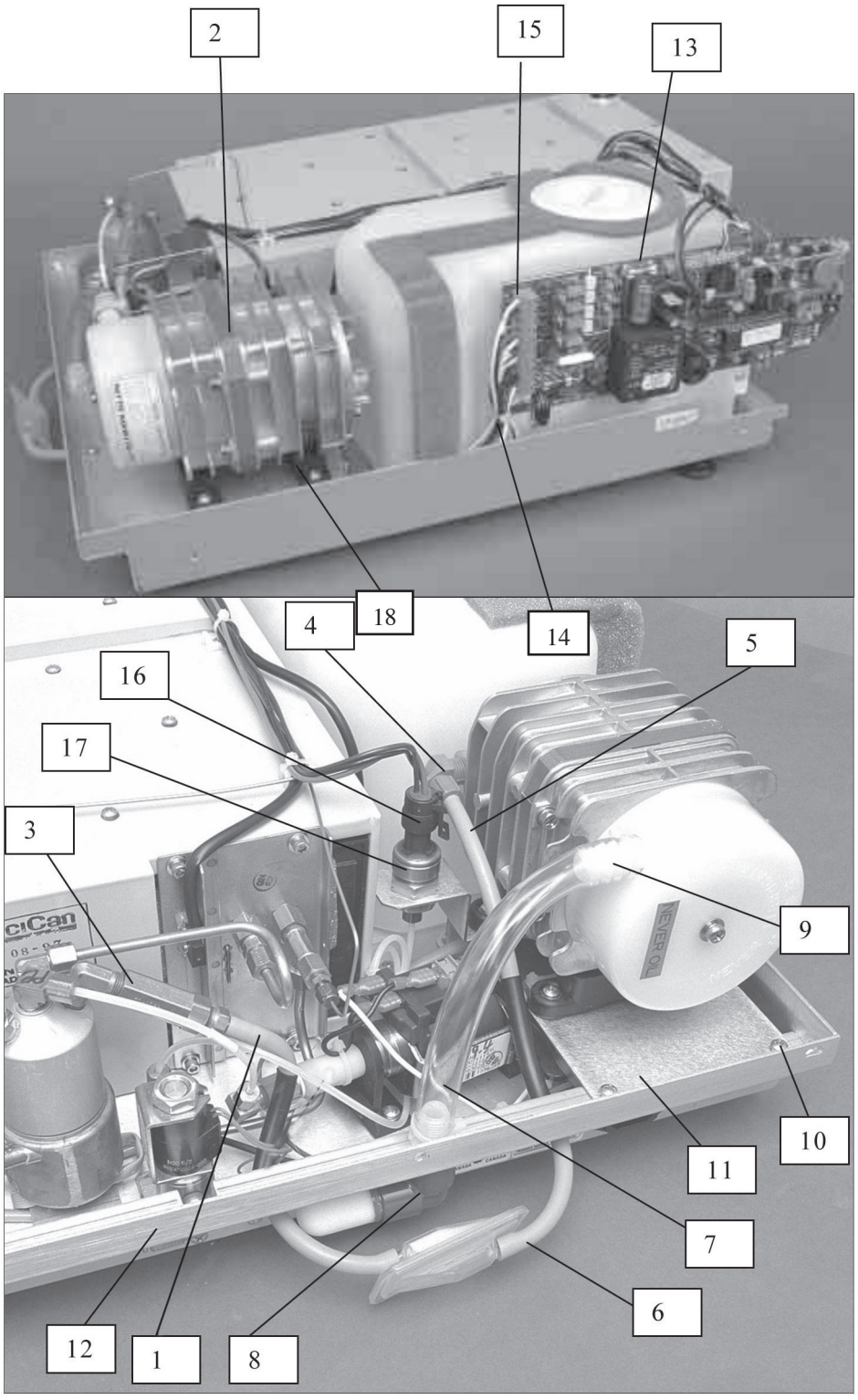
SciCan recommends that the check valve be replaced when the compressor is replaced. See Chapter 11, Steam Generator Removal, Cleaning and Replacement, the Steam Generator Check Valve.

To replace the compressor, follow these steps (see Figure 26):

1. Connect the ground wire (18) to the compressor body.
2. Position the compressor / bracket assembly (11) in the chassis (12). Route the compressor leads (15) with the bundle of wires leading to the controller board (13). Connect the lead to controller board terminal block position J1 - 9 LINE and the wire to terminal block position J1-10 NEUTRAL.
3. Bundle the wires together and secure them using nylon cable ties (14) every 2 - 3 inches.
4. Reinstall the four screws (10) retained during disassembly. Do not crush wires or tubes.
5. Reinstall the pressure transducer (17), if present. See, Pressure Transducer.
6. Connect the transparent rubber tube (7) which extends from the compressor intake fitting to the air filter fitting (8). Secure the tube using a nylon cable tie (9).

With the cylindrical air filter only:

7A. Connect the rubber tube (5) which extends from the top of the compressor (2) to the steam generator check valve (3). Secure the tube using the plastic compression nut (4).



1. Rubber Tube (cylindrical air filter only)
2. Compressor
3. Steam Generator Check Valve
4. Plastic Compression Nut
5. Rubber Tube (with bacteria-retentive air filter)
6. Bacteria-retentive Filter Input
7. Transparent Rubber Tube
8. Air Filter and Fitting
9. Cable Tie
10. Mounting Screws
11. Compressor Bracket
12. Chassis
13. Controller Board
14. Cable Ties
15. Compressor Leads
16. Transducer Connector
17. Transducer
18. Ground Wire

Figure 26

With the additional bacteria-retentive filter:

7B. Connect the rubber tube (5) which extends from the top of the compressor (2) to the input side of the bacteria-retentive filter (6). Secure the tube at the compressor end with the plastic compression nut (4).

8. Test the compressor by activating the compressor using a control box or key pad, as appropriate.

9. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

Removing and Reinstalling the Thomas Compressor

Removing the Thomas Compressor

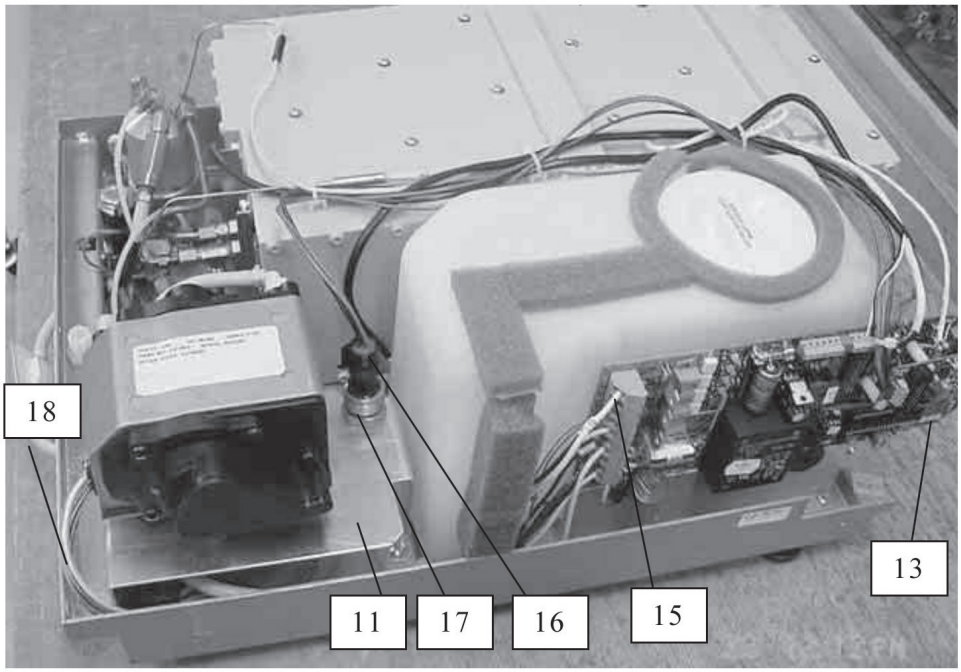
To remove the Thomas (or SciCan) Compressor, follow these steps: (see Figure 27):

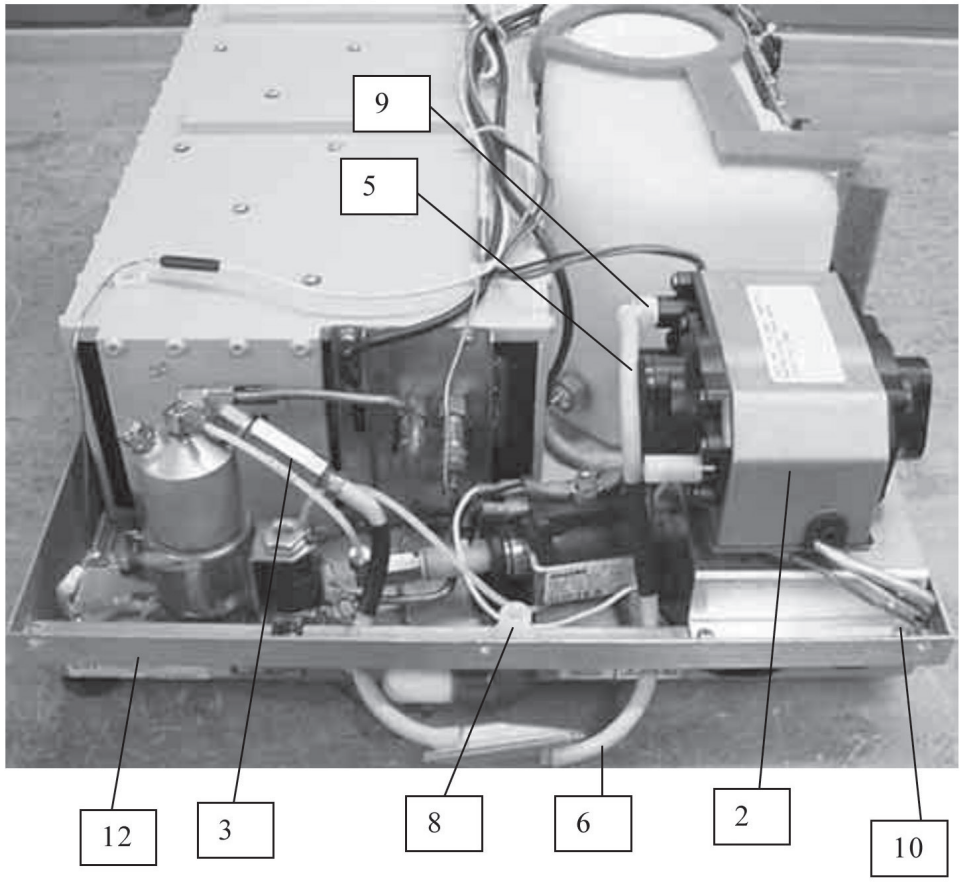
1. Turn the power switch OFF, and unplug the unit.
2. Disconnect the leads from controller board (13) terminal block positions J1-9 LINE and J1-10 NEUTRAL, and carefully cut the cable ties (14) securing the compressor leads (15).
3. Cut the cable tie on the Teflon tubing connected to the top of the compressor (2) and leading to the input side of the bacteria-retentive filter.
4. Unscrew the four screws (10) attaching the compressor bracket to the chassis.
5. If there is a pressure transducer (17) attached to the bracket, turn the compressor and bracket assembly over to loosen the fastening nut and remove the pressure transducer.
6. Remove the four screws on the underside of the bracket to separate the compressor from the bracket.
7. Remove the ground wire (18) from the compressor.

Replacing the Thomas Compressor

To replace the Thomas (or SciCan) Compressor, follow these steps (see Figure 3 and 4):

1. Connect the ground wire (18) to the compressor body.
2. Reconnect the pressure transducer connector (16) to the transducer (17), if present.
3. Position the compressor / bracket assembly (11) in the chassis (12). Route the compressor leads (15) with the bundle of wires leading to the controller board (13). Connect the black lead to controller board terminal block position J1 - 9 LINE and the white wire to terminal block position J1-10 NEUTRAL.
4. Bundle the wires together and secure them using nylon cable ties (14) every 2 - 3 inches.
5. Reinstall the four bracket screws (10) retained during disassembly. Do not crush wires or tubes.
6. Connect the Teflon tube (5), which extends from the top of the compressor (2) to the input side of the bacteria-retentive filter (6). Secure the tube at the compressor end with the plastic cable tie (g).
7. Test the compressor by activating the compressor with a control box or key pad, as appropriate.
8. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.





1. Rubber Tube (cylindrical air filter only) (Figure 26)
2. Compressor
3. Steam Generator Check Valve
4. Plastic Compression Nut (Figure 26)
5. Rubber Tube (with bacteria-retentive air filter)
6. Bacteria-retentive Filter Input
7. Transparent Rubber Tube (Figure 26)
8. Air Filter Fitting
9. Cable Tie
10. Mounting Screws
11. Compressor Bracket
12. Chassis
13. Controller Board
14. Cable Ties (not shown)
15. Compressor Leads
16. Transducer Connector
17. Transducer
18. Ground Wire

Figure 27

Upgrading a unit with a Thomas Compressor to a Medo Compressor

These instructions are for the spare part kits 01-112664S, 01-112665S and 01-112666S, intended for the upgrade from Thomas to Medo compressors on STAT*IM* 5000/5000S units in the field.

1. The chassis of units fitted with Thomas Compressors must be modified to accommodate the biological filter of a Medo Compressor. Using the template provided, locate the position of the hole for the Medo filter at 7.41” (188.1 mm) from left wall and 0.50” (12.6 mm) from back wall.

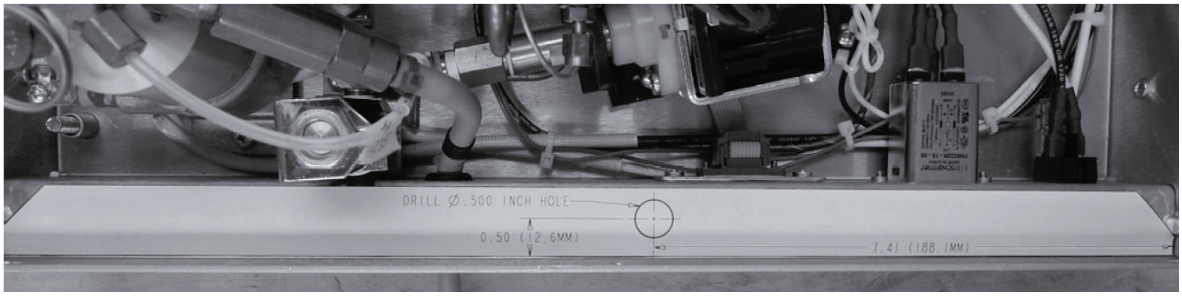


Figure 28

2. With the drill bits provided, drill a 0.500” hole by first drilling a 0.250” pilot. Deburr and remove sharp edges from the hole.

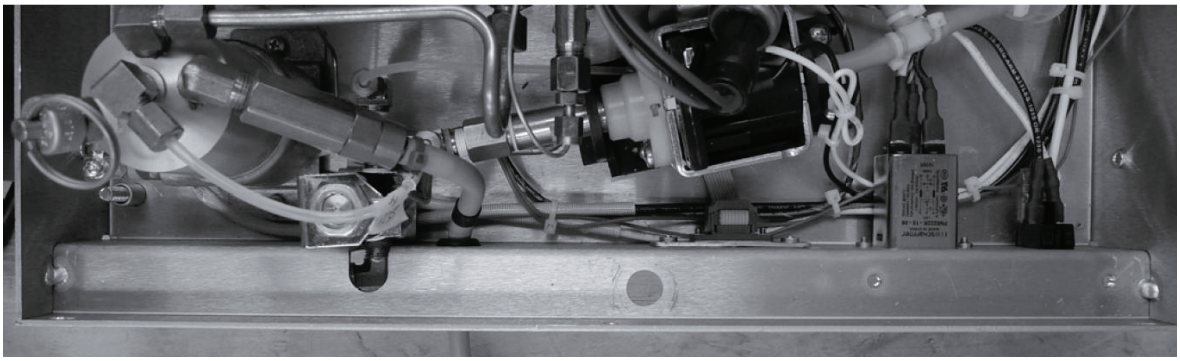


Figure 29

3. Hand-tighten the air pre-filter (80-101274) to the elbow fitting (74-101275), then fasten the connector (74-101306) to the elbow fitting through the drilled hole using an 11/16” wrench, fixing the filter underneath the chassis and pointing away from the compressor.

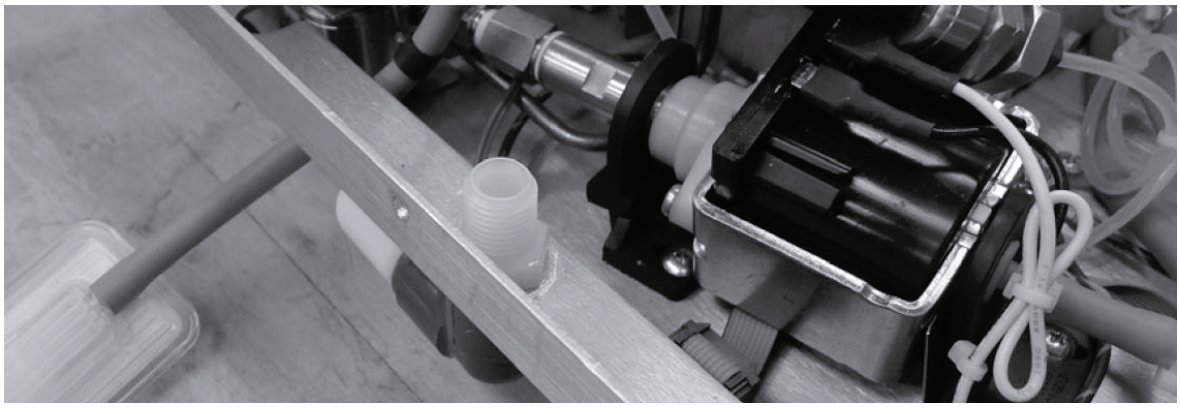


Figure 30

4. Install the compressor with its bracket onto the chassis using the screws provided. On the machine-front side of the bracket, only 2 of the 3 screw holes need to be used.
5. For 5000S units, reinstall the transducer onto slot on the compressor bracket by tightening the nut against the bracket.
6. Connect the compressor wires to the PCB, wire 9 (colored brown or black) to terminal L and wire 10 (colored blue or white) to terminal N. Use 3 cable ties to harness all the wires, ensure that the wires are tucked inside the chassis underneath the foam strip on the reservoir. Connect the ground wire to the ground post on the chassis.
7. Feed silicone tubing through grommet on chassis and attach to biological filter.
8. Attach PVC tubing (74-101305) to the compressor. Apply cable tie (53-100231A). Rotate the head of cable tie so that it is facing down. Attach other end of the tubing to air pre-filter fitting on chassis and apply cable tie.

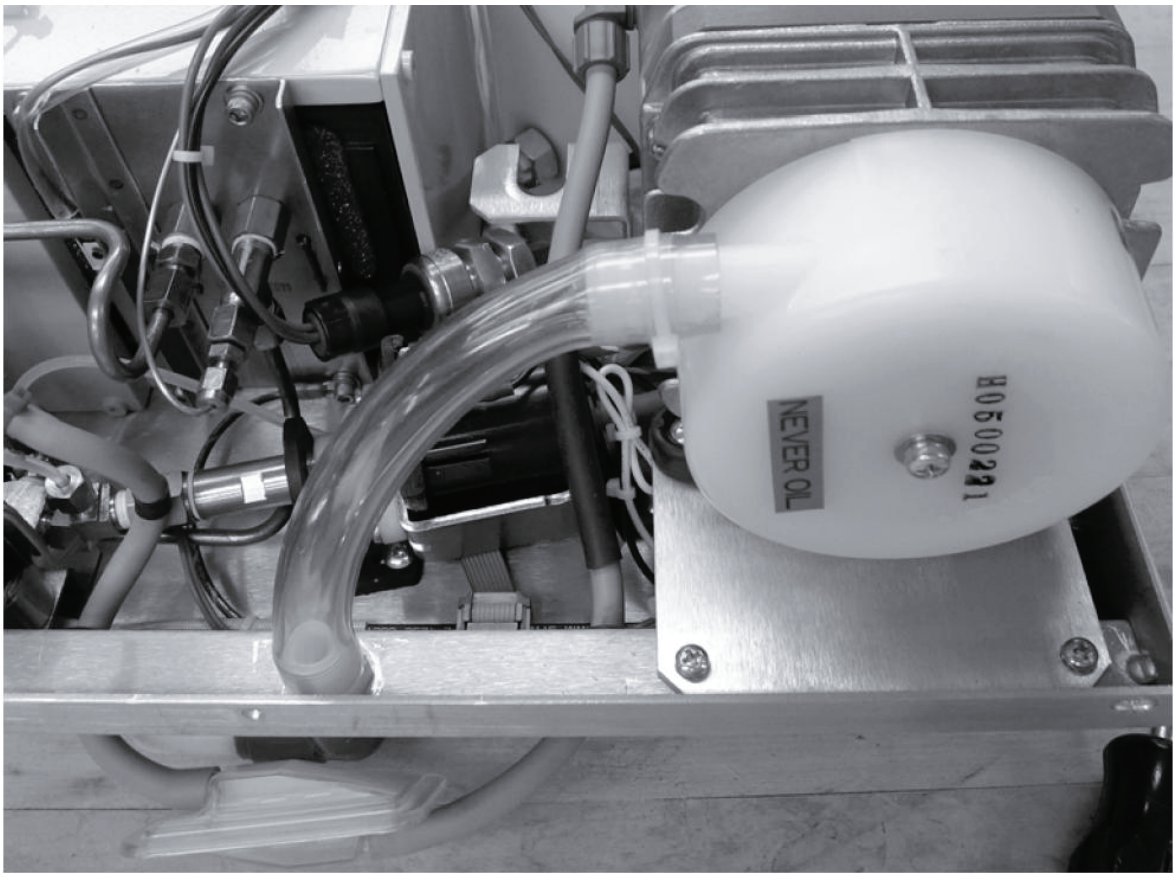


Figure 31

9. Rotate cable tie head away from chassis back wall.
10. Reinstall the cover.
11. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

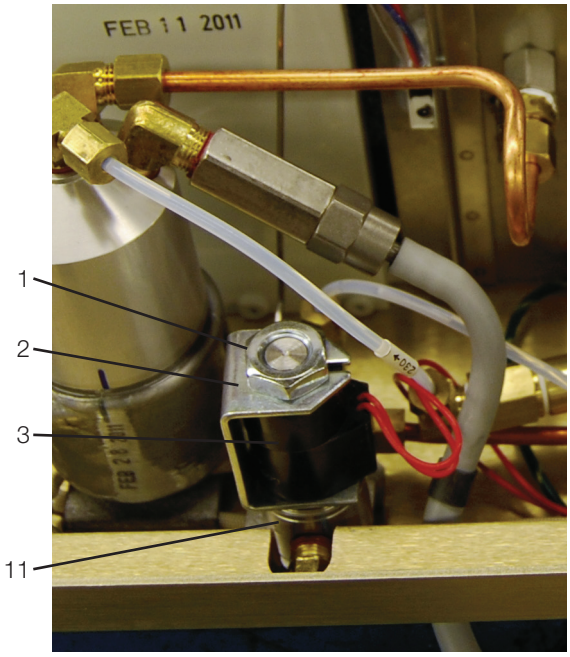
Solenoid Valve and Pressure Transducer

Solenoid Valve

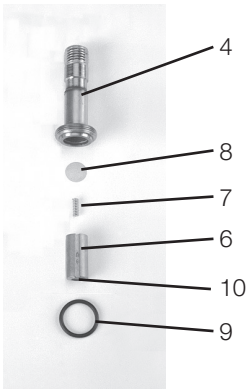
STAT*IM* units have been manufactured using one of two types of solenoid valve:

- Type A is a two part square bodied unit (fitted to very early units).
- Type B is a two part cylindrical bodied unit (see Figure 1).

If a Type A unit requires servicing or has failed, replace it with a Type B solenoid valve ONLY.



Type B Solenoid Valve



1. Nut
2. Yoke
3. Coil
4. Plunger tube
5. Plunger tube wrench (not shown)
6. Plunger
7. Plunger spring
8. Bronze disc
9. O-ring
10. Plunger seal
11. Valve body

Figure 1

Inspecting and Repairing the Type B Solenoid Valve

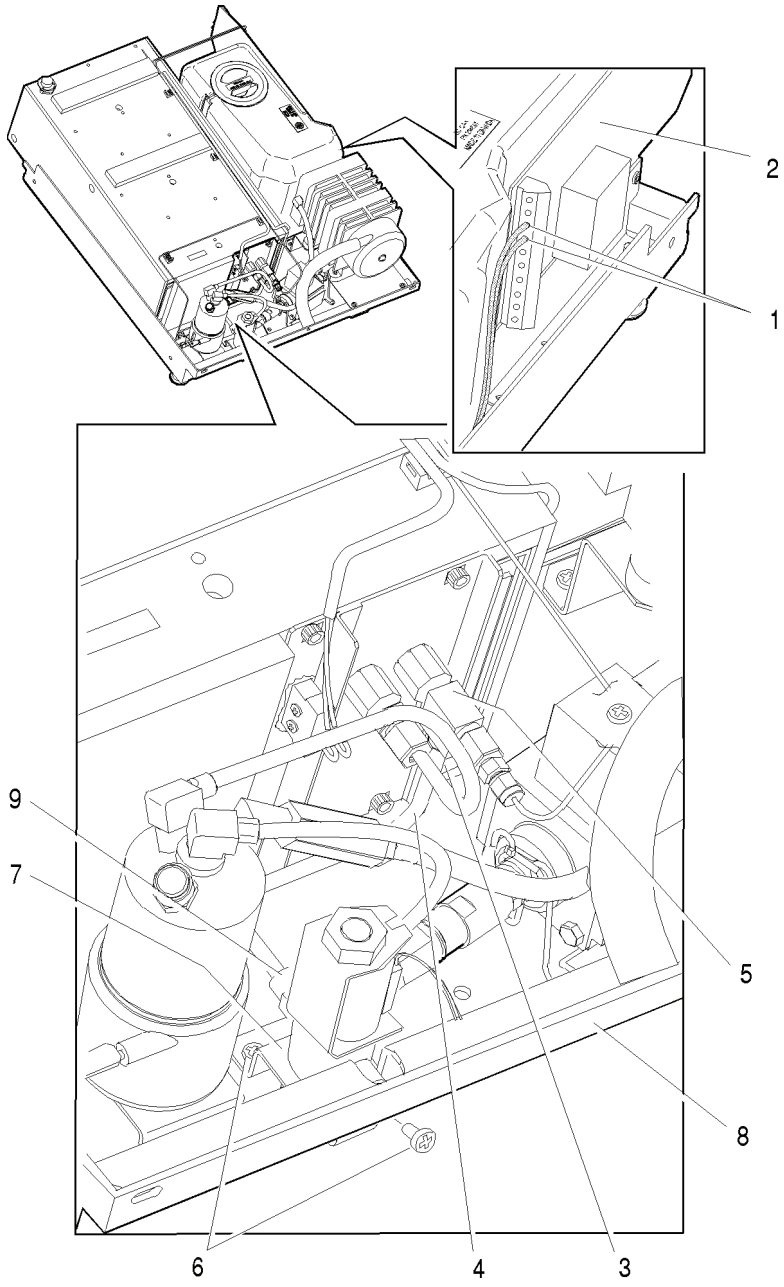
The solenoid valve assembly may be inspected and/or repaired while in the unit. To inspect and/or repair the assembly, proceed as follows (see Figures 1 and 2):

1. To determine that the solenoid is working, test the solenoid valve by using the solenoid valve switch/button on the Control box. When the switch is activated, the sound of the coil energizing can be heard. Note: the cassette must be removed or unseated so that the microswitch is not active, as the solenoid will be permanently energised and will not be affected by the control box switch/button.

TIP: The solenoid may be also be activated by shorting P1-18 to ground on the PCB.

2. Turn the power switch OFF, and unplug the unit. If the solenoid is activated during disassembly, the coil will be damaged.
3. Disconnect the solenoid leads from the Controller Board terminal block positions labelled J1-7 LINE and J1-8 NEUTRAL. Use a multimeter in diode setting to determine whether or not the coil has failed. If the measured values are approximately equal in each direction, the coil has not failed. If there is no measured value or the values are other than approximately equal, replace the coil assembly.
4. Remove the nut (1) from the top of the solenoid valve assembly using an 11/16 inch wrench.
5. Pull the yoke (2) and coil (3) off the plunger tube (4) in an upward direction. Note the orientation of the yoke and coil for reassembly. To allow the coil to rest outside the unit, cut any cable ties required.
6. Unscrew the plunger tube from the valve body using the solenoid plunger tube wrench (5) and a ¾-inch wrench or adjustable wrench.

TIP: When lifting the plunger tube clear of the valve body, place your finger under the plunger before it drops from the tube and lift the complete sub-assembly off the body to retain the plunger in the tube for checking free movement. Check that the plunger is moving freely in the valve body.



1. solenoid leads
2. Controller Board
3. compression nut
4. outlet probe tube
5. outlet fitting
6. screws
7. solenoid valve bracket
8. chassis
9. solenoid valve inlet fitting

Figure 2

7. Remove the plunger (6), plunger spring (7) and bronze disc (8) from the valve plunger tube body.
8. Inspect the o-ring (9) and the plunger seal (10) for nicks, compression set or swelling (the seal should not extend more than 0.010 inches from the plunger body).
9. Inspect the valve body (11) for debris. If the debris appears to be fragments of rubber, inspect the cassette seal for damage.
10. Clean the valve plunger, valve body, and fittings using oil free compressed air to blow debris from the surfaces. If there is residue (e.g. congealed handpiece oil), on the surfaces of the inside of the tube and outside of the plunger they may be cleaned with a moistened cleaning pad designed for use with Teflon™ coated surfaces to remove it. DO NOT USE METALLIC OBJECTS TO REMOVE THE RESIDUE. After cleaning, rinse thoroughly with water to remove all traces of the detergent.
11. Once the valve components have been inspected, determine if the assembly needs cleaning only, a new coil, the repair kit for the solenoid valve or an entire valve assembly replacement.
12. Reinstall or replace; the bronze disc (8), plunger spring (7), plunger (6) and o-ring (9) to the plunger tube (4). (Order SciCan Kit Part # 01-100998S.)
13. Screw the plunger tube into the valve body (11) and tighten using the solenoid tube wrench.
14. Place the coil (3) inside the yoke (2) and place onto the plunger tube.
15. Reinstall the coil retaining nut (1).
16. Connect the leads to controller board terminal block positions labeled J1-7 LINE and J1-8 NEUTRAL. These two wires are interchangeable.
17. Test the solenoid by activating the solenoid switch on the control box

    Note: **the cassette must be remove or unseated so that the microswitch is not active as the solenoid will be permanently energized and will not be affected by the control box switch/button.**
18. If the solenoid valve assembly or the solenoid coil is replaced, a dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) MUST be performed on the unit. **NOTE:** These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
19. Replace any cable ties cut during the procedure.

Removing the Solenoid Valve

To remove the solenoid valve proceed as follows (See Figure 3):

1. Turn the power switch OFF, and unplug the unit.
2. Carefully cut the cable ties holding the solenoid valve leads and disconnect the leads (1) from the Controller Board terminal block positions labelled J1-7 LINE and J1-8 NEUTRAL.
3. Disconnect the compression nut (2) holding the outlet probe tube (3) to the outlet fitting (4) on the probe bracket assembly.
4. Remove the two screws (5) that attach the solenoid valve bracket (6) to the chassis (7): one on the inside of the chassis, one on the outer rear surface of the chassis.
5. Inspect the solenoid valve to determine whether servicing or replacement is warranted.

1. Solenoid leads
2. Compression nut
3. Outlet probe tube
4. Outlet fitting
5. Screw (behind)
6. Solenoid valve bracket
7. Solenoid valve inlet fitting

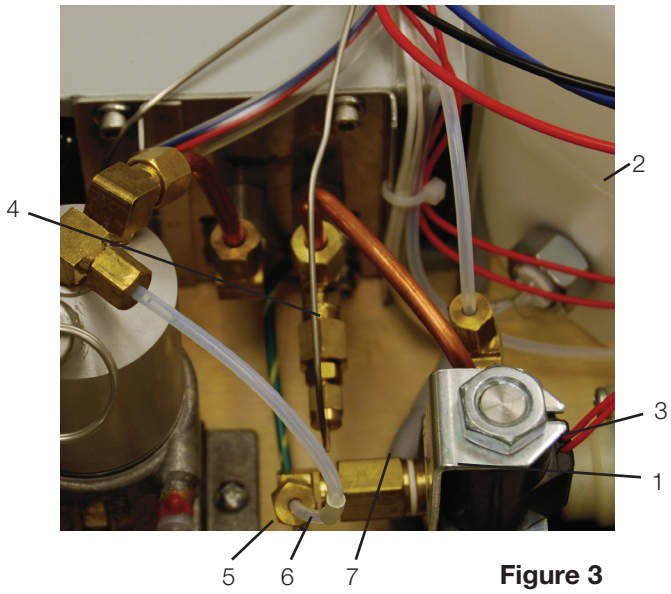


Figure 3

Refitting the Solenoid Valve

To refit the solenoid valve assembly, proceed as follows (see Figure 3):

1. Make sure the power switch is OFF, and the unit is unplugged.
2. Connect a new outlet probe tube (3) to the solenoid valve inlet fitting (8). Thread the compression nut until **finger tight**, on the inlet fitting.
3. Place the solenoid valve assembly in the unit.
4. Connect the other end of the outlet probe tube (3) to the outlet probe fitting on the probe bracket outlet fitting (4). Thread the compression nut until **finger tight**, on the inlet fitting. Tighten the nuts on both ends of the outlet probe tube using a 7/16 inch wrench. DO NOT OVERTIGHTEN.
5. Attach the solenoid valve bracket (6) to the chassis (7) using the two screws (5) retained from disassembly: one on the inside of the chassis, one on the outer rear surface of the chassis.
6. Route the solenoid valve leads (1) together with the bundle of wires extending to the controller board and connect the leads to controller board terminal positions labelled J1-7 LINE and J1-8 NEUTRAL. These two wires are interchangeable.

7. Bundle the wires together and secure them using cable ties every 2 to 3 inches.
8. Test the solenoid by activating the solenoid switch on the Control box. Note: the cassette must be removed or unseated so that the microswitch is not active as the solenoid will be permanently energized and will not be affected by the control box switch/button.
9. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) MUST be performed on the unit.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
10. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

Pressure Transducer

Note: Only 'S' type (EU) STAT*IM* models have pressure transducers.

STAT*IM* 5000S units use a pressure transducer to measure the steam pressure in the unit. The transducer is attached to a bracket located in the right rear corner of the unit. Transducer wires are routed along the top of the armature to a Pressure Interface Board attached to the P2 printer connector on the controller board, (Revision 2.x, 5.x and 6.x controller boards), or direct to the main PCB (Revision 7.x controller boards).

Identifying and checking the Pressure Transducer

Note that there are two types of pressure transducer used on STAT*IM* S models, a 0 - 60 p.s.i. transducer on models up to approximately 2004 and a 0 - 68 p.s.i. transducer on models from 2004 on. The input voltage is the same for both types, but the output voltage is different so **the two types are not interchangeable**.

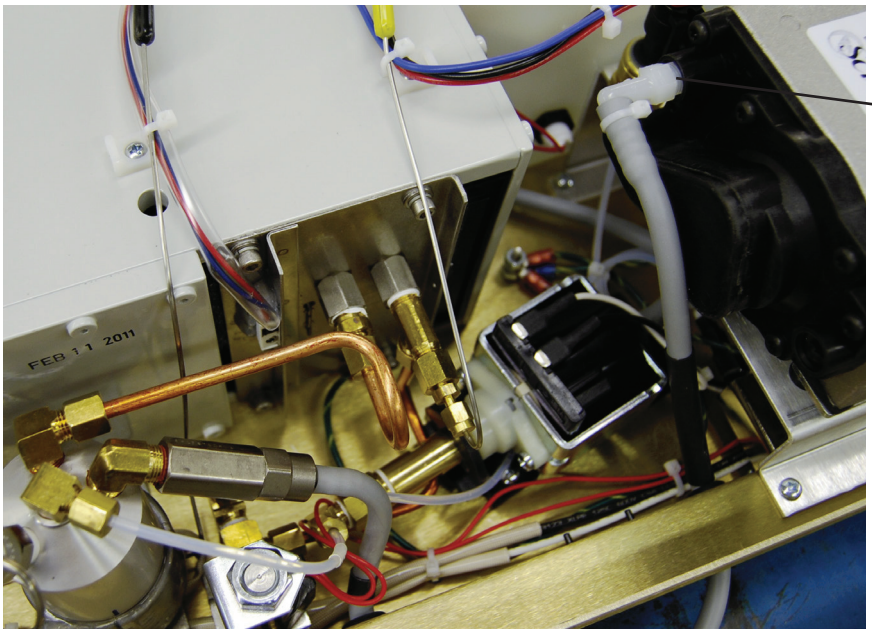


Figure 4

Identifying the transducer type

The pressure transducer may be identified in two ways:

- by the identification code etched on the side of the upper casing of the transducer
- by the voltage output signal

To identify the pressure transducer by identification code, proceed as follows:

Locate the identification code on the side of the transducer casing. Note that there are several lines to the code. The relevant line of code should contain 9 digits, similar to the following example: **0060AEFY1**. The second and third digits in the code identify the pressure range of the transducer and will be **60** or **68**.

Tip: the zero in the identifier has a diagonal line through it. 60 may easily be mistaken for 68, so take care when checking the identifier. A magnification device may help.

To identify the pressure transducer by output voltage, proceed as follows:

To measure the voltage output, power up the machine with out a cassette out (so that the machine is measuring atmospheric pressure). Set a multimeter to 'DC volts' and check the reading across the terminals of the BLUE P1-1 'SIG' (signal) and BLACK P1-3 'GND (ground) wires leading from the pressure transducer, at their terminations on the main PCB (Revision 7) or the interface board (all other PCB revisions). Check the atmospheric pressure reading on an independent reference pressure meter. The voltage reading for the appropriate pressure reading should be approximately the value as shown in the table (Figure 5) below for the relevant pressure transducer.

IMPORTANT: This identification method is only a guide. Performing a voltage comparison may not be accurate if the pressure transducer is damaged, a high offset value has been applied to it as a result of calibration, the reference voltage is incorrect (n/a revision 7 PCB) or if the unit is installed at high altitude. A more accurate reading can be achieved by finetuning the unit as per the instructions below (See Checking the transducer).

Checking output voltage on pressure transducer

Pressure [kPa]	68PSI sensor reading [V]	60PSI sensor reading [V]
93	1.2934	1.3992
94	1.3020	1.4089
95	1.3105	1.4186
96	1.3190	1.4282
97	1.3276	1.4379
98	1.3361	1.4476
99	1.3446	1.4573
100	1.3532	1.4669
101	1.3617	1.4766
102	1.3702	1.4863
103	1.3788	1.4959
104	1.3873	1.5056
105	1.3958	1.5153

Figure 5

Checking the Transducer

The pressure transducers used on STAT*IM* units are electro-mechanical in operation. When pressure is applied to the mechanical components located in the base of the transducer, the movements of the components are translated into a voltage signal in the electronics by modifying a fixed input voltage signal to give a value corresponding to the pressure applied. If you suspect that the transducer is faulty then the function of the transducer can be checked. The unit will need to be set up correctly before checking, and the following must be undertaken prior to diagnosis.

1. Remove the cover of the unit.
2. Attach the control box to the PCB (all models).
3. Power up the unit in calibration mode as appropriate to the software revision (see calibration section).
4. Connect a multimeter to the control box Vref output and check/adjust the reference voltage as appropriate (n/a on revision 7 units).
5. The atmospheric pressure transducer offset value needs to be set at ‘00’ to correct the display pressure reading to perform the following checks. If it is not, then proceed as follows:
    - 5.1. Write down the transducer atmospheric offset reading (e.g. FE).
    - 5.2. Insert a calibration cassette into the unit with the calibrated reference meters (temperature and pressure) attached.
    - 5.3. Start a calibration cycle appropriate to the unit and adjust the pressure transducer offset to ‘00’
    - 5.4. Stop the calibration and release the cassette from the probe bracket to enable the unit and pressure reference meter to read the atmospheric pressure.
    - 5.5. Using a 3/8-inch wrench, disconnect the compression nut (8) holding the coiled transducer tube (6), from the bottom of the transducer (see Figure 4).

TIP: It is always a wise to check the pressure transducer tube for blockages at this time as this may be the source of an incorrect pressure reading or slow transducer response. If the tubing is discoloured, kinked, or of there is debris visible in the tubing, remove the tubing completely for cleaning or fit a new tube.

Now check and record the following values:

Set a multimeter to 'DC volts' and check the reading across the terminals of the BLUE P1-1 'SIG' (signal) and BLACK P1-3 'GND (ground) wires leading from the pressure transducer at their terminations on the main PCB (Revision 7) or the interface board (all other board revisions).

- Compare the reference pressure and the display pressure.
- Compare the voltage reading from the multimeter against the voltage value on the chart above for the relevant pressure reading of the display.

If the transducer is working to manufacturing specifications, the display pressure and reference pressure should be within +/- 4 kPa of each other and the multimeter voltage reading should be close to the value on the chart (Figure 5) taking into account the accuracy/calibration status of the multimeter.

If the voltage readings vary significantly then the electronic components of the transducer may be failing or have failed.

If the pressure readings vary significantly then the mechanical components of the transducer may be failing or have failed.

The pressure transducer is not a serviceable component. It is critical to ensuring the correct conditions occur in the unit during sterilization. If failure has occurred or potential failure is suspected, replacement is recommended.

NOTE: Do not forget to reset the pressure transducer offset back to the original setting or, re-calibrate the unit fully if in doubt.

Removing the Pressure Transducer

CAUTION: the pressure transducer, steam generator and other components may be hot even if the unit has not been operating. Guard against burns.

Check the atmospheric pressure reading on the independent reference pressure meter AND on the unit display.

1. Pressure transducer
2. Power switch
3. Line cord (not shown)
4. Transducer connector
5. Compression nut
6. Coiled transducer tube
7. Solenoid valve inlet “T” fitting
8. Compression nut
9. Nut and washer
10. Transducer bracket
11. Screw and washer
12. Chassis

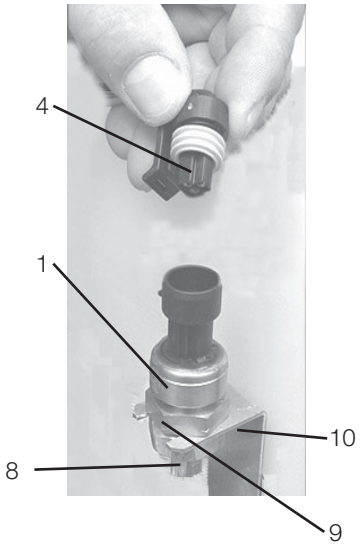
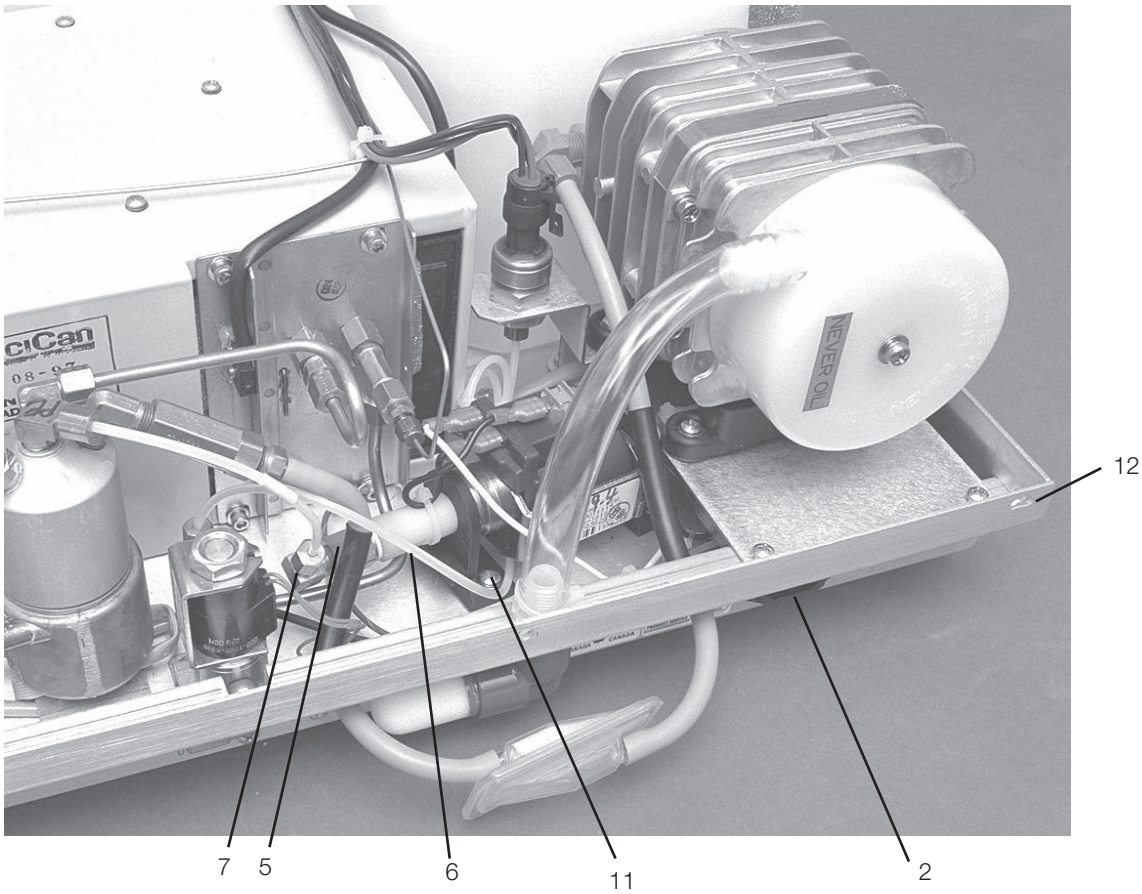


Figure 6



To remove the pressure transducer (1), proceed as follows (see Figure 6):

1. Turn the power switch (2) **OFF**, and unplug the mains power cable (3) (not shown). Allow time for the unit to cool.
2. Disconnect the transducer connector (4) from the top of the transducer.
3. Using a 3/8-inch wrench, disconnect the compression nut (8) holding the coiled transducer tube (6), from the bottom of the transducer.
4. Using a 7/8-inch wrench or an adjustable wrench, remove the transducer nut and washer (9) securing the transducer to the bracket (10).
5. Should removal of the transducer bracket be necessary, remove the screw and washer (11) holding the bracket to the chassis (12).
6. If the transducer is damaged, discard the transducer.

Reinstalling the Pressure Transducer

To reinstall the pressure transducer (1), proceed as follows (see Figure 6):

1. Make sure the power switch (2) is **OFF**, and the unit is unplugged.
2. If the transducer bracket (10) was removed, reinstall the bracket on the chassis (12) using the screw and washer (11) retained from disassembly.
3. Install the transducer in the transducer bracket using the nut and washer (9) retained from disassembly. Tighten with a 7/8-inch wrench or an adjustable wrench.
4. Reconnect the transducer tube (6) to the bottom of the transducer. Thread the compression nut (8) finger tight, and then tighten the compression nut using a 3/8-inch wrench. **Do not over tighten**.
5. If the transducer tube has been removed completely or is being replaced, reconnect the other end of the coiled transducer tube to the solenoid valve inlet “T” fitting (7). Thread the compression nut (5) finger tight, and then tighten the compression nut using a 3/8-inch wrench. **Do not over tighten**.
6. Hold the transducer / bracket assembly with one hand and plug the transducer connector (4) onto the transducer. Make sure the tab on the connector snaps in place.
7. Check that all fittings have been tightened and that all brackets are secured to the chassis. Reconnect the mains electrical cable (3) (not shown) and turn the power switch (2) **ON**.
8. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-out for messages indicating cycle status.

Important note: the pressure transducer performs a critical process monitoring function during the sterilization cycle and must be recalibrated prior to the unit being used to process instruments. Refer to the relevent calibration procedure and re-calibrate the unit upon completion of the repair.

Removing the Pressure Interface Board

NOTE: This is only applicable to Revision 2.x, 5.x and 6.x controller boards. All controller boards from Revision 7 have the pressure circuitry integrated into the main board.

CAUTION: Hazardous voltages are accessible on the controller board when the power is on.

The pressure interface board is a piggyback board assembly, which is attached to the P2 printer connector of the controller board (see note above) using the latch mechanism of the P2 header.

To remove the Pressure Interface Board (1), proceed as follows (see Figure 7):

1. Turn the power switch (2) **OFF**, and unplug the power cord (3) (not shown).
2. Disconnect the printer cable (4) (if present) from pressure interface board connector P2.
3. Disconnect the transducer wires (9) from pressure interface board terminal positions P1-1 'SIG' (blue wire, signal), P1-2 'V+' (red wire V+) and P1-3 'GND' (black wire, ground).
4. Press the ejector latches (10) of controller board (11) connector P2 to unseat the pressure interface board and remove the board.

Reinstalling the Pressure Interface Board

To reinstall the pressure interface board (1), proceed as follows (see Figure 7):

1. Orientate the pressure interface board with the component side of the board facing away from the controller board (11) and the P2 connector on the left-hand side. Gently seat the pressure interface board onto the controller board P2 connector until the ejector latches are in an upright position. Do not crush or pinch the thermocouple leads. Support the controller board to avoid excessive deflection when pressing the interface board onto the connector.
2. Connect the transducer wires (9) to Pressure Interface Board terminal positions P1-1 'SIG' (blue wire, signal), P1-2 'V+' (red wire V+) and P1- 3 'GND' (black wire, ground).
3. Connect the printer cable (4) (if present) to the pressure interface board connector P2. Ensure that Pin 1 of the keyboard cable aligns with Pin 1 of pressure interface board P2.
4. Plug in the power cord (3) (not shown) and turn the power switch (2) **ON**.
5. Run a sterilization cycle and observe LCD read-out for messages indicating cycle status.

Important: the pressure transducer performs a critical process monitoring function during the sterilization cycle, and on later units the calibration data is stored on the interface board. The unit must be re-calibrated prior to the being used to process instruments. Refer to the relevant calibration procedure and re-calibrate the unit upon completion of the repair.

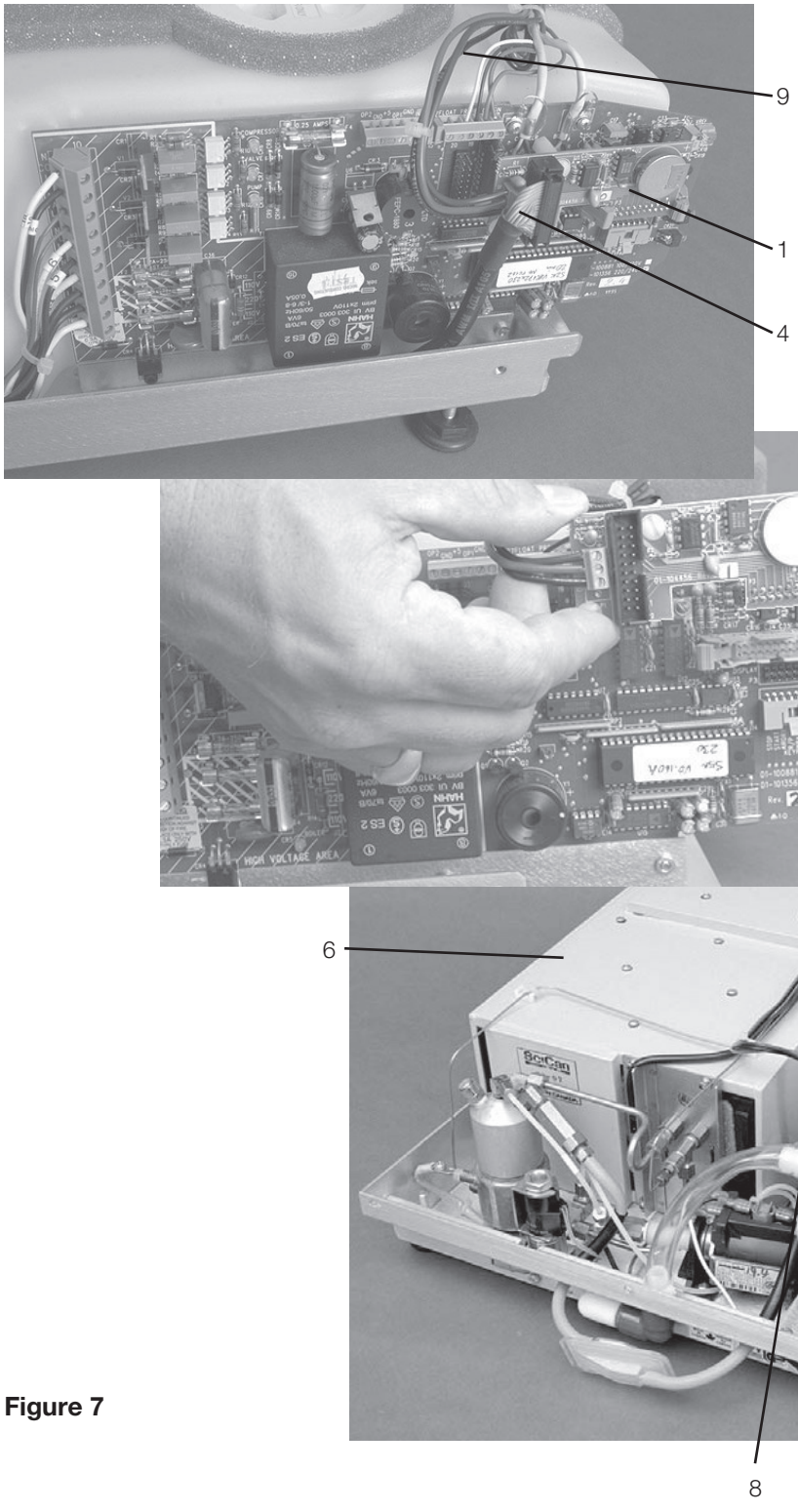

1. Pressure Interface Board
2. Power switch
3. Line cord (not shown)
4. Printer cable
5. Cable tie
6. Armature
7. Transducer connector
8. Transducer
9. Transducer wires
10. Ejector latches
11. Controller Board
12. Battery
9
1
4
12
10
5
9
6
11
4
7
8
2

Figure 7

Removing and Replacing the Battery

Observe appropriate electrostatic discharge safeguards performing this operation.

When installed and a printer attached, the real time clock and battery on the pressure interface board (or main PCB for revision 7 units) replace the clock and battery found in the printer module.

The battery requires replacement if the date / time are not saved when the power is off.

To remove the battery (12), proceed as follows (See Figure 7 and 8):

1. Remove the pressure interface board or main PCB as appropriate to the PCB revision.
2. Carefully desolder BAT1 from the solder side of the board. Note the orientation of the anode and cathode. Always replace the battery with a SciCan battery of equal rating and size. Solder the replacement battery in position BAT1.
3. Discard the old battery. Observe all applicable environmental laws.
4. Replace the Pressure Interface Board or main PCB as appropriate to the PCB revision.

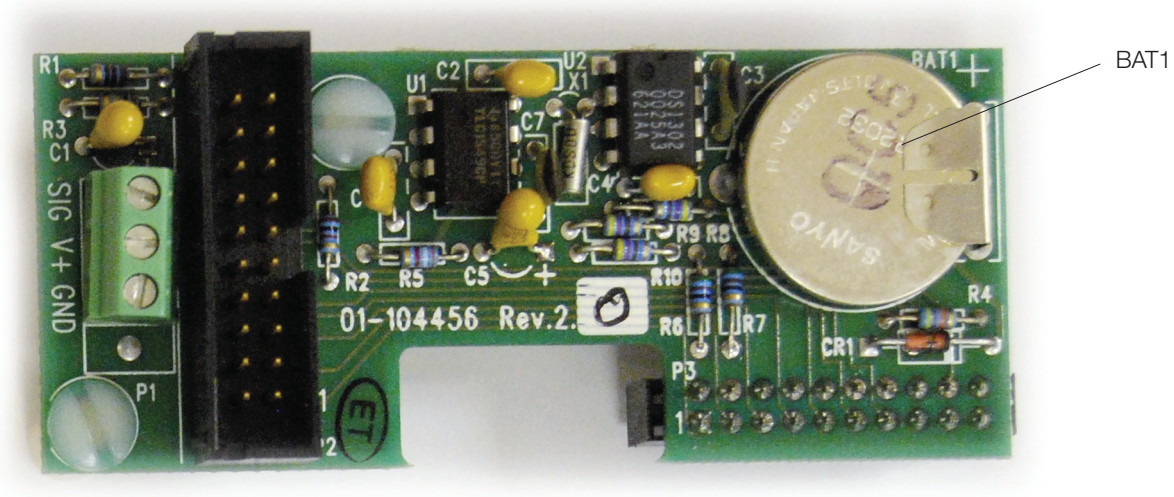


Figure 8

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Armature, Isoplate, and Probe Bracket and Chamber Thermocouple

Armature and Isoplate

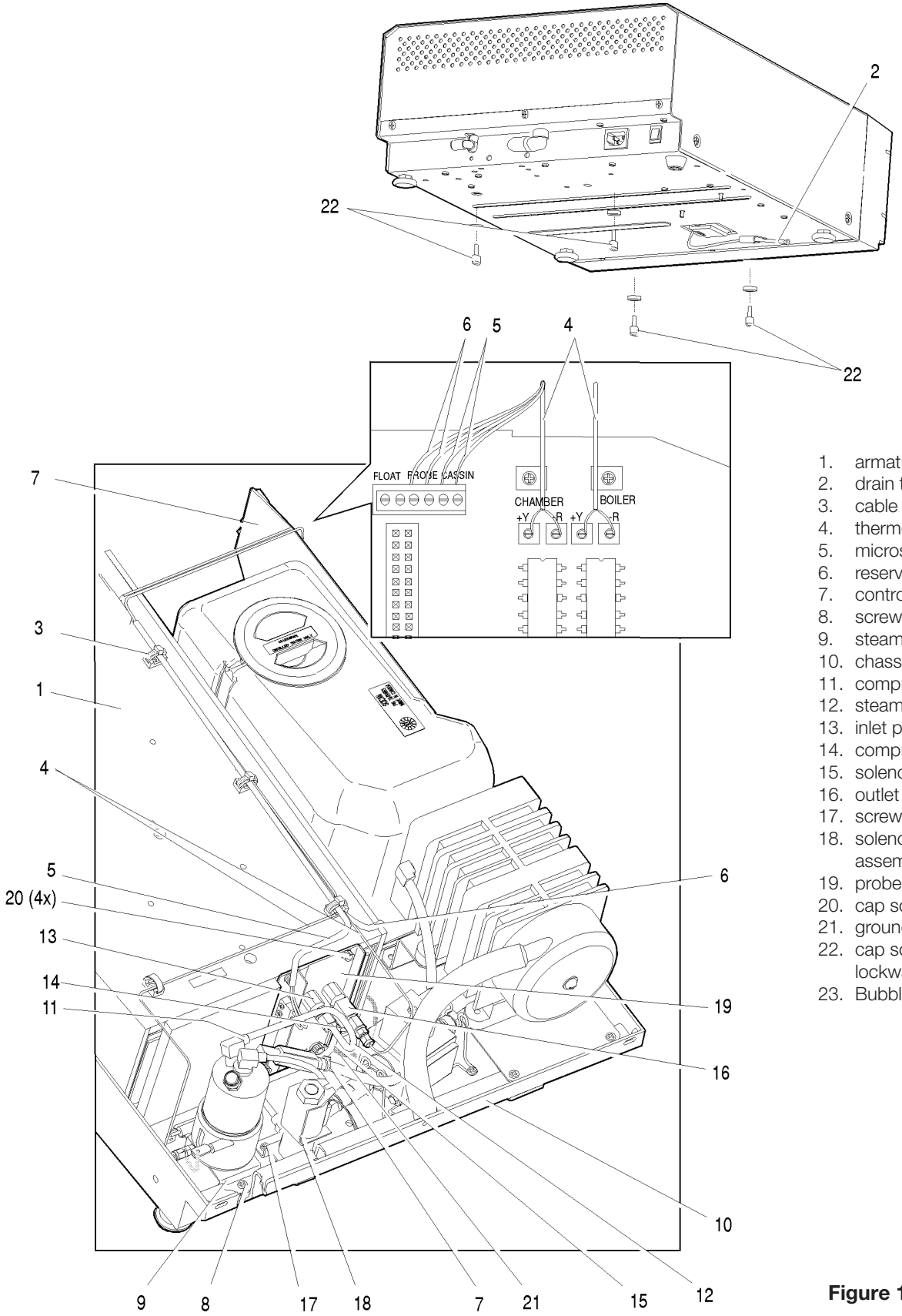
NOTE: Replacement armatures are normally supplied complete with isoplates from the factory. The isoplate is available separately should this be the only component requiring replacement in this subassembly.

Removing the Armature and Isoplate

To remove the armature (1), proceed as follows (see Figure 1):

The unit should be disconnected from the power supply and the cover removed.

1. Drain the reservoir.
2. Carefully cut the cable ties (3) securing the thermocouple leads (4), the microswitch leads (5) and the reservoir sensor leads (6).
3. Remove the microswitch leads from controller board (7) terminal positions labelled CASSIN J4-1 and J4-2.
4. Loosen the two screws (8) holding the steam generator bracket (9) to the chassis (10).
5. Disconnect the compression nut (11) holding the steam generator outlet tube (12) to the inlet probe fitting (13).
6. Disconnect the compression nut (14) holding the solenoid valve inlet tube (15) to the outlet probe fitting (16).
7. Loosen the two screws (17) that attach the solenoid valve bracket assembly (18) to the chassis.
8. The probe bracket assembly (19) is held by four cap screws with washers. Remove all screws (20) with washers using a 9/64-inch ball end Allen key. Note the ground strap (21) attached to the bottom right of the probe bracket by the cap screw.
9. CAREFULLY bend the thermocouple leads away from the armature.
10. Tilt the unit on its side so that the reservoir and PCB are facing upwards. Remove the four cap screws with spring lockwashers (22) securing the armature to the chassis using an Allen key: two at the front on the bottom of the chassis, and two at the rear on the bottom of the chassis.
11. Lower the unit to the flat work surface and lift the armature from the chassis. Be careful not to damage the thermocouple in the probe bracket assembly.



1. armature
2. drain tube
3. cable ties
4. thermocouple leads
5. microswitch leads
6. reservoir sensor leads
7. controller board
8. screws
9. steam generator bracket
10. chassis
11. compression nut
12. steam generator outlet tube
13. inlet probe fitting
14. compression nut
15. solenoid valve inlet tube
16. outlet probe fitting
17. screws
18. solenoid valve bracket assembly
19. probe bracket assembly
20. cap screws with washers
21. ground strap
22. cap screws with spring lockwashers
23. Bubble level (not shown)

Figure 1

Reinstalling the armature and isoplate

To reinstall the armature (1), proceed as follows (see Figure 1):

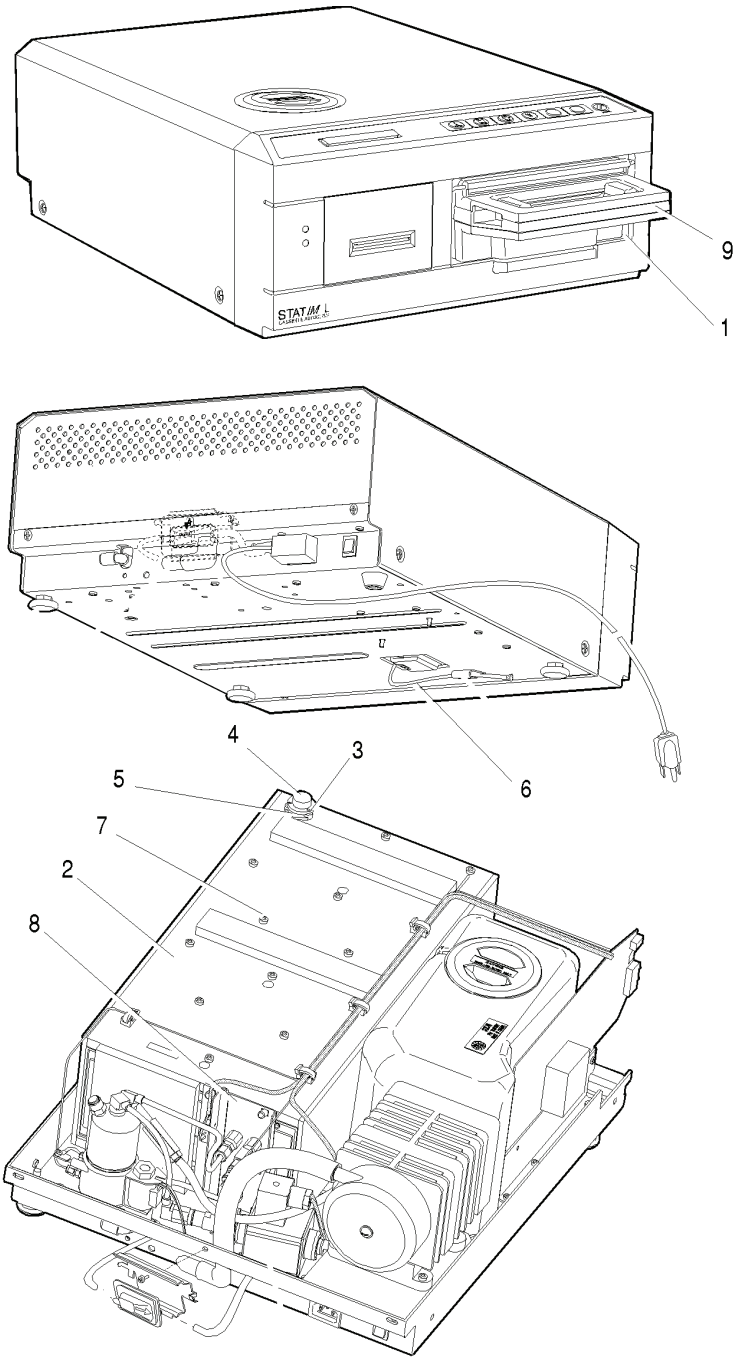
1. Align the armature (1) with the chassis (13). Tilt the unit sideways with the reservoir and PCB facing upwards, insert and tighten the four cap screws with spring lockwashers (22) retained from the removal procedure. Ensure that the armature drain tube exits through the hole in the chassis.

   IMPORTANT: Be careful not to cross-thread the cap screws in the tapped holes of the armature.

   Be careful not to damage the armature drain tube, the thermocouple in the probe bracket assembly, the ground strap or the bubble level (23).
2. Install the probe bracket assembly (19). Partially insert the two bottom cap screws and attach the ground strap (21) to the bottom right hand position of the probe bracket assembly before proceeding.
3. When the lower screws securing the probe bracket assembly are installed, tighten the cap screws with washers holding the armature to the chassis.
4. CAREFULLY bend the thermocouple leads back into position.
5. Complete installation of the probe bracket assembly (19). (See, Probe Bracket and Chamber Thermocouple Subassembly below).
6. Secure the solenoid valve assembly (18).
7. Tighten the two screws (11) holding the steam generator bracket (12) to the chassis (13).
8. Bundle the microswitch leads (5), thermocouple leads (4) and the reservoir sensor leads (6) together using cable ties every 2-3 inches. Secure the wires and thermocouples to the top of the armature using the cable tie anchors provided on top of the armature.
9. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
10. Check that the bubble level (23) on the front right top corner of the armature is not damaged and that the bubble moves freely.
11. Refill the reservoir using steam process distilled water.
12. Calibrate the thermocouples appropriate to the unit type.
13. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

Removing the isoplate from the armature-isoplate

The Isoplate is a plastic box secured inside the armature. It is designed to hold and insulate the



1. Isoplate
2. Armature
3. Three screws for bubble level
4. Bubble level
5. Bubble level base
6. Drain tube
7. Screws with washers
8. Probe bracket gasket
9. Cassette

Figure 2

cassette in the unit during operation.

To remove the isoplate assembly (1) from inside the armature (2) proceed as follows (see Figure 2):

1. If not already undertaken, remove the armature from the chassis and place it on a secure work surface (see above).
2. Remove the three screws (3) securing the bubble level (4) to the bubble level base (5) on the front right corner of the armature. (The bubble level obscures a fastener that must be removed.)
3. The drain tube (6) passes through the bottom of the armature near the probe bracket opening and is attached to the isoplate. Using a pair of pliers, pull the drain tube off and retain.
4. The isoplate is secured in the armature using screws with washers (7) on the top and bottom of the armature. Remove and retain all the screws with washers.
5. When all fasteners are removed, slide the isoplate out of the armature.

Replacing and reassembling the isoplate into the armature

To install the replacement isoplate, proceed as follows (see Figure 2):

1. Slide the isoplate (1) into the armature. This may be easier if the cassette is first inserted into the isoplate. Note the orientation of the probe bracket opening in the back wall of the isoplate. Reinstall the screws with washers (7) but do not tighten the screws. When all the screws are reinstalled, slide the cassette into the isoplate if it is not already installed. Now tighten the screws in an “X” pattern, alternating across the isoplate, from the outside to the center.
2. Install the drain tube (6) and secure using Locktite™ LM113.
3. Reinstall the armature into the chassis (see Armature above).
4. Reinstall the bubble level (4) to the bubble level (5) base using the three screws (3) retained from disassembly.
5. Before reinstalling the probe bracket assembly to the back of the armature, ensure that all traces of the old probe bracket gasket (8) are removed from the bracket. Fit a new gasket as appropriate. Note that a new gasket comes attached to the replacement isoplate and with a replacement probe bracket. It is also available separately.
6. Refit and re-align the probe bracket and chamber thermocouple assembly (see *Aligning the probe bracket and chamber thermocouple assembly below*).
7. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
   NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
8. Refill the reservoir using steam process distilled water.
9. Recalibrate the thermocouples.
10. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

Probe Bracket and Chamber Thermocouple

IMPORTANT INFORMATION:

The probe bracket and chamber thermocouple subassembly is a critical part of the STAT*IM* unit. Extreme care should be taken so that the chamber thermocouple is not damaged.

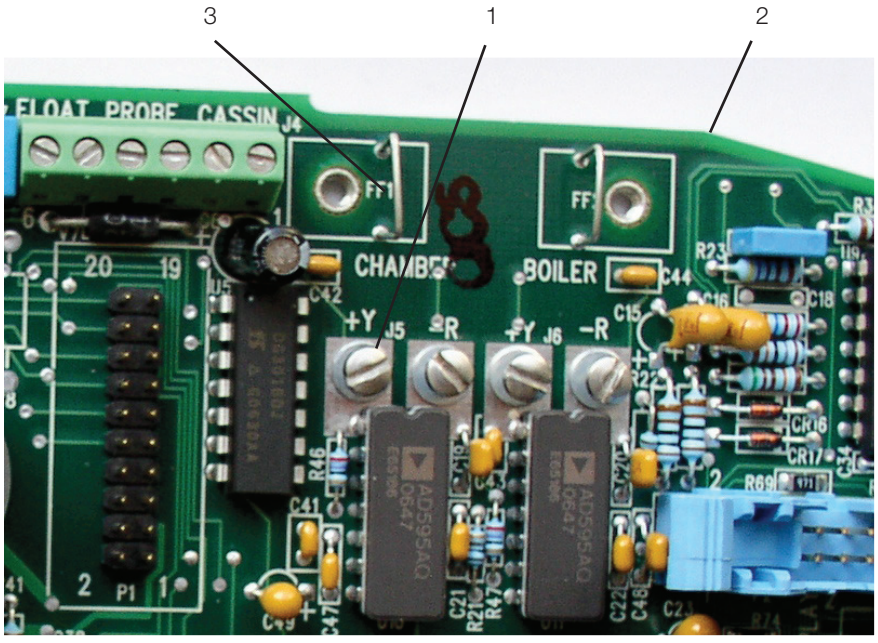
Re-alignment of the assembly in the armature-isoplate subassembly is also critical. It is important that the correct tooling is available to ensure the unit performs as intended.

Note that the probe bracket and chamber thermocouple are NOT available as separate components as the subassembly alignment is set in the factory. They should only ever be replaced as an assembly.

Removing the probe bracket and chamber thermocouple subassembly

To remove the probe bracket assembly, proceed as follows (see Figures 3, 4 and 5):

For revision 6 controller boards and earlier versions



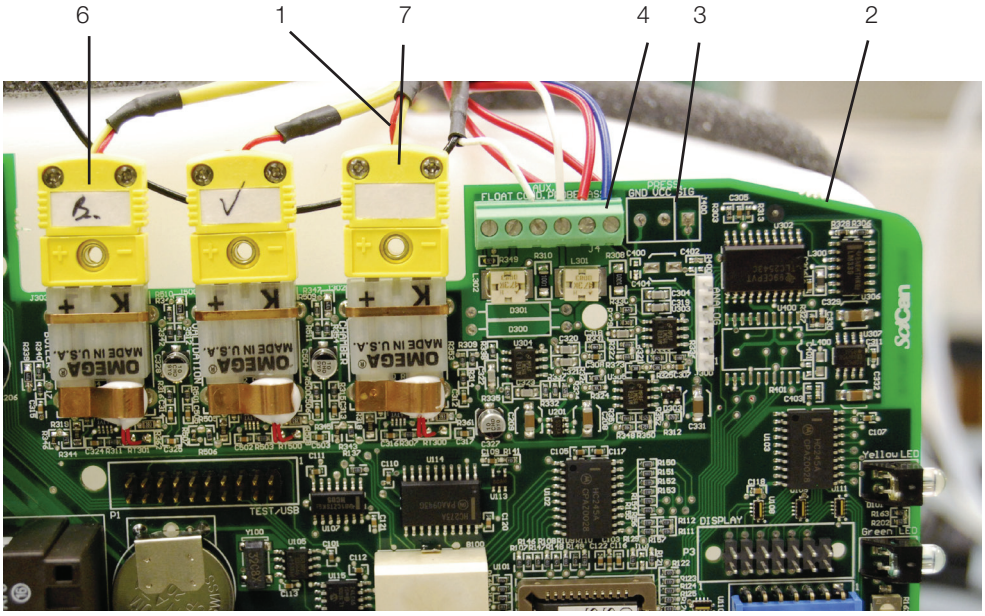
1. Chamber terminal positions
2. Controller board
3. Chamber ground terminal

Figure 3

1.

b. Loosen the screws and disconnect the two fine wires (1) from controller board (2) terminal positions CHAMBER +Y and -R. Disconnect the ground terminal (3) from the position marked CHAMBER directly above the terminals. Leave the screws with contact washers in the terminals.

For revision 7.x controller boards

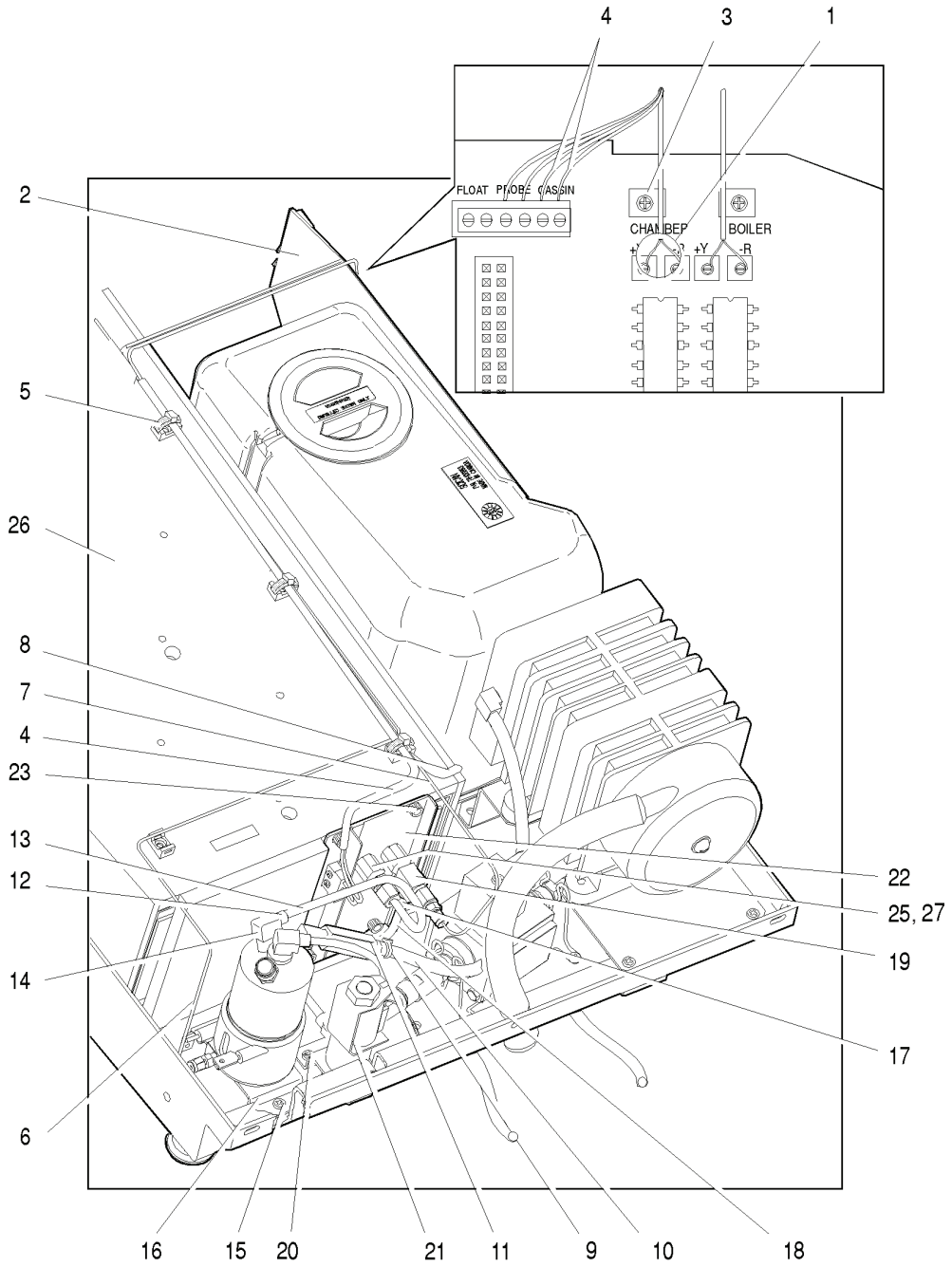


1. Chamber thermocouple leads
2. Controller board
3. Ground terminal
4. Microswitch leads
5. Cable tie
6. Steam generator Thermocouple plug
7. Chamber thermocouple plug

Figure 4

c. Disconnect the chamber thermocouple plug (7) from the socket on the controller board.

2. Remove the microswitch (4) leads from controller board block connector positions labelled CASSIN.
3. Carefully cut the cable ties (5) securing the microswitch leads and other wires to the top of the armature (26).
4. Carefully cut the cable tie (9) holding the compressor tube (10) onto the check valve inlet (11) and pull the tube off the valve.
5. Disconnect the compression nut (12) holding the steam generator outlet tube (13) to the steam generator outlet fitting (14).
6. Remove the two screws (15) holding the steam generator bracket (16) to the chassis.
7. Disconnect the compression nut (17) holding the exhaust tube (18) to the solenoid valve inlet fitting (19).
8. Remove the two screws (20) that hold the solenoid valve assembly (21) to the chassis.
9. The probe bracket assembly (22) is held by four hex socket cap screws with flat washers (23). The bottom of the probe bracket assembly has two mounting slots. The top of the bracket has two mounting holes. Remove the top two screws with an Allen key. Loosen the bottom cap screws to allow the bracket to slide up and out of the chassis. Note the foam probe bracket gasket (24 - not shown) mounted on the plastic end part of the armature (26).
10. Disconnect the compression nut (25) holding the steam generator outlet tube (13) to the probe inlet fitting (27). Remove the steam generator outlet tube (13) and the solenoid valve exhaust tube (18) from the probe bracket assembly. (Discard them if fitting a new bracket).



1. Chamber thermocouple leads
2. Controller board
3. Ground terminal (See Figure 3)
4. Microswitch leads
5. Cable tie
6. Steam generator thermocouple
7. Chamber thermocouple
8. Reservoir sensor leads
9. High temperature rated cable tie
10. Compressor tube
11. Check valve
12. Steam generator outlet tube compression nut
13. Steam generator outlet tube
14. Steam generator outlet fitting
15. Screws for item 16
16. Steam generator / bracket assembly
17. Exhaust tube compression nut (obscured)
18. Solenoid valve exhaust tube
19. Solenoid valve inlet fitting (obscured)
20. Screws for item 21 (one screw obscured)
21. Solenoid valve / bracket assembly
22. Probe bracket assembly
23. Cap screws with flat washers
24. Probe bracket gasket (not shown)
25, 27. Compression nut for probe inlet fitting, probe inlet fitting
26. Armature
28. Armature ground wire (not shown)

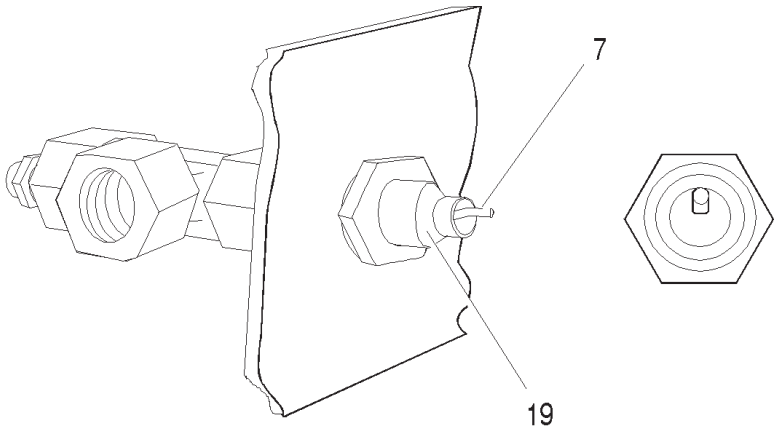
Figure 5

Replacing and reinstalling the probe bracket and chamber thermocouple

To replace the probe bracket assembly, proceed as follows (see Figures 5 and 6):

1. Inspect the probe bracket gasket (24) (not shown) on the back of the armature (26) for wear or adhesive failure. If required, remove the damaged gasket and replace it with a new one. NOTE: The gasket must be fitted.
2. Inspect the exposed portion of the thermocouple (29) that projects from the outlet probe (30). Note the position of the thermocouple and the orientation of the end of the thermocouple.

   NOTE: do not adjust the position of the tip of the thermocouple. The tip is pre-bent during manufacturing to exact specifications.



7. Chamber thermocouple
19. Outlet probe fitting

Figure 6

3. Verify that the microswitch functions properly. (See Chapter 7. Electrical and Electronic Components: Microswitch).
4. Tilt the top of the probe bracket assembly (22) away from the armature and carefully insert the bracket with the bottom two cap screws and flat washers (23) and the armature ground wire terminal (28) in place onto the back of the armature. The washers rest on the outside of the probe bracket assembly. Ensure that the thermocouple leads do not come in contact with the outside of the armature or the probe gasket.

   NOTE: be careful not to bend the thermocouple leads too sharply (min. Bend radius - 3/16 inch / 5mm). Retain the protective sleeve on the end of the thermocouple leads as long as possible.
5. Insert two cap screws with flat washers (23) into the upper mounting holes of the probe bracket. Tighten all four cap screws so that the bracket is held in place, but can still be adjusted up, down and sideways.
6. Install a new copper tube (13) that extends between the steam generator outlet fitting (14) and the probe inlet fitting (27) on the probe bracket assembly (22). Do not tighten the compression nuts.
7. Install a new copper tube (18) that extends between the solenoid valve assembly (21) and the solenoid valve inlet fitting (19) on the probe bracket assembly (22). Do not tighten the compression nuts.

8. Attach the steam generator bracket (16) using the two screws (15) previously removed. Do not tighten these screws.
9. Tighten the compression nut (12) to the steam generator outlet fitting (14), and the compression nut (17) to the probe inlet fitting (25), using a 7/16 inch wrench.
10. Reinstall the solenoid valve assembly (21) using the two screws (20) previously removed. Do not tighten these screws.
11. Tighten the compression nuts to the solenoid valve inlet fitting (19), and the outlet probe fitting (31), using a 7/16 inch wrench.
12. Push the rubber tube (10) extending from the compressor onto the check valve fitting (11) on the steam generator. Secure the tube to the fitting using a high temperature rated cable tie (9).
13. Route the chamber thermocouple leads (7), the microswitch leads (4) and the reservoir sensor leads (8) beside the steam generator thermocouple (6) along the top of the armature over the cable anchors attached to the armature.

For all revision 6 and earlier controller boards...

14.

a. Carefully remove the protective sleeve from the end of the uninsulated chamber thermocouple leads. Pre-bend both leads to achieve the required shape. Reconnect the flag terminal to the threaded lug marked CHAMBER on the Controller Board. NOTE: Be careful, the thermocouple leads at the board end are very fragile.

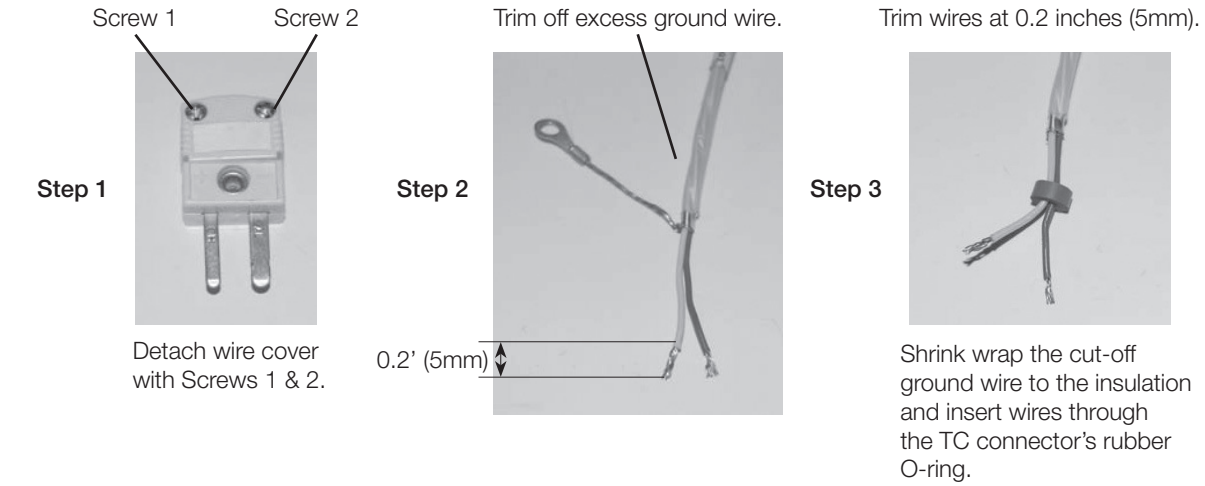
One lead is colour coded: the yellow lead is positive, +Y.
the red lead is negative, -R.

Connect the yellow 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 the wires are seated securely behind the respective washers (see Figure 6).

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

For Revision 7.x controller boards

b. Connect the wires to the thermocouple connector as follows:



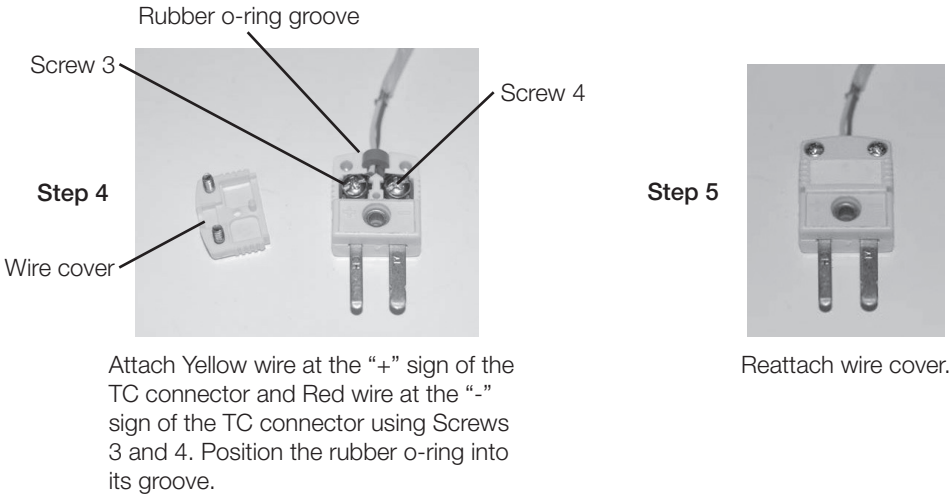


Figure 7

15. Connect the microswitch leads (4) to controller board (2) block terminal positions labelled CASSIN.
16. Bundle the thermocouple leads, microswitch and reservoir sensor leads together using nylon cable ties and secure the wires to the top of the armature using cable ties and the cable anchors attached to the armature. The leads must not touch the cover when the cover is put back on.
17. Align the probe bracket. (See section below).
18. Ensure that all fittings have been tightened and all tubes are properly secured.
19. Use a cable tie to secure the micro-switch leads and reservoir sensor leads to the side of the probe bracket assembly AFTER the probe bracket has been aligned.
20. Check the microswitch for proper operation by inserting a cassette with the power ON and listening for the solenoid valve to click.
21. Calibrate the unit using the appropriate calibration procedure.

Aligning the probe bracket and chamber thermocouple

IMPORTANT NOTE: Aligning the probe bracket is critical to the correct functioning of the STAT*IM* unit. It is strongly recommended that the probe bracket alignment jig is used when performing this operation.

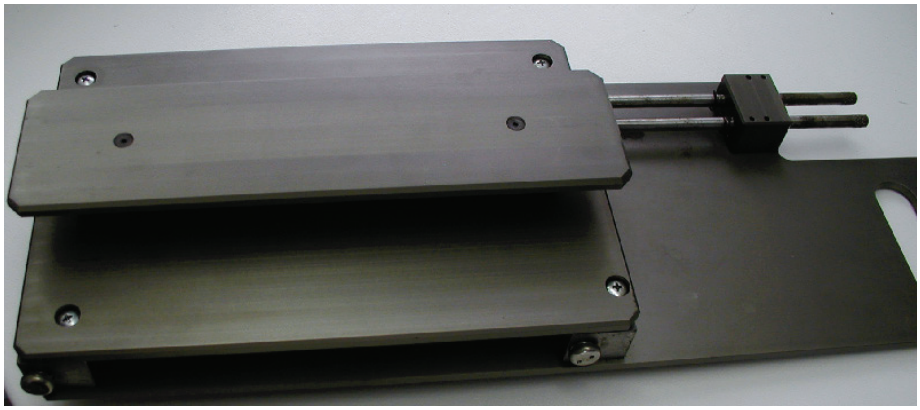


Figure 8

Probe Bracket Alignment Jig – Part number 01-106776S
(Suitable for both 2000 and 5000 models)

To align the probe bracket assembly, proceed as follows (see Figure 5):

1. Be sure that the four cap screws with flat washers (23) are loose enough to allow adjustment of the probe bracket, but there is sufficient friction between the bracket and the armature so that the probe bracket cannot move under its own weight.
2.
    a. **If using the probe alignment jig:**
        1. Insert the jig into the armature until it just touches the probe tips.
        2. Gently push the jig towards the probe bracket while at the same time adjusting the probe bracket until the probe tips enter the openings in the end of the alignment rods of the jig. PERFORM THIS OPERATION WITH CARE. DO NOT BEND THE TIP OF THE CHAMBER THERMOCOUPLE.
        3. Rotate the alignment rods and at the same time finely adjust the position of the probe bracket until the rods rotate, and slide in and out freely.
        4. Using the Allen key, tighten the four cap screws with flat washers in the following tightening pattern: upper left hand corner, bottom right hand corner, upper right hand corner and the bottom left hand corner.
        5. Recheck the alignment rods to ensure that they still rotate and slide in and out freely. Slacken off the screws and repeat the procedure if necessary if the alignment rods are tight.

b. **If the probe alignment jig is NOT being used:**

1. Insert a regular cassette (the cassette normally used by the customer with the unit is preferred) or a calibration cassette into the armature until it just touches the probe tips.
2. Gently push the cassette towards the probe bracket, while at the same time adjusting the probe bracket until the probe tips enter the openings in the cassette lid. PERFORM THIS OPERATION WITH CARE. DO NOT BEND THE TIP OF THE CHAMBER THERMOCOUPLE.
3. Slowly push the cassette to the fully inserted position while continuing to adjust the probe bracket so as to centre the probes in the cassette openings.
4. Withdraw the cassette and repeat steps 2 and 3 as often as required to centre the probes correctly in the openings.
5. Using the Allen key, tighten the four cap screws with flat washers in the following tightening pattern: upper left hand corner, bottom right hand corner, upper right hand corner and the bottom left hand corner.

3. Ensure that all fittings have been tightened and all tubes are properly secured.
4. Plug in the power cord and turn the power switch ON. Start an UNWRAPPED cycle and watch the LCD until the PRESSURIZING or CONDITIONING phase of the cycle is displayed.
5. At this point, turn the power switch OFF. This will close the solenoid valve and should retain pressure in the machine.

Caution: **the steam generator, check valve, probe bracket and associated tubing will be hot. There is steam pressure in the unit so care should be taken when observing the unit. Guard against burns.**

6. Observe the unit and check for visible or audible signs of steam leakage. Note any leaking joints.
7. Turn the unit back on, and allow it to vent.

Caution: **allow the unit to cool sufficiently before attempting adjustments**.

8. Tighten any leaking joints or fine tune the probe bracket alignment as above if appropriate. Repeat steps 4 to 6 as necessary until no leaks are observed.
9. Make sure that all brackets are secured to the chassis and cable ties are installed.
10. Calibrate the unit using the appropriate calibration procedure.
11. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

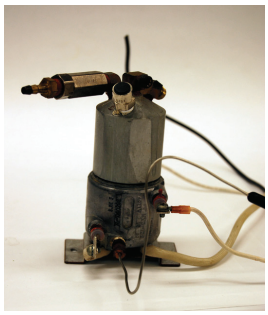
- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Steam Generator, Check Valve, Thermal Fuse and Pressure Relief Valve

Steam Generators

There are four types of steam generator you may encounter while servicing a STAT*IM* 5000/5000S unit.

1st Generation aluminium steam generator with internal thermocouple
First generation aluminium steam generator with embedded (internal) thermocouple. These were factory fitted in units up to the end of 2003 and were associated with Rev. 2.x/3.x./4.x and 5.x controller boards and Rev. 1.xx/2.xx software. Later controller boards may have been retrofitted with the appropriate software on field upgraded units.



Stainless steel steam generator
These were factory fitted from 2004 to 2005 and were associated with Rev. 6.x controller boards and Rev. 4.xx software.

2nd Generation aluminium steam generator with external thermocouple (Alex)
These were factory fitted from 2005 and were associated with Rev. 6.x controller boards plus Rev. 5.xx software, or Rev. 7.x controller boards plus Rev. 6.xx software.

Figure 1

Upgraded 2nd generation Alex steam generator (Boris)
NOTE: This version still operates using Rev. 5.x/6.x software.

In mid 2008, SciCan implemented an O-ring seal design to seal the joint between the cap and base of the boiler assembly to improve the manufacturability of the steam generator assembly. The main difference with regard to servicing is that the cap and base can be rotated slightly relative to each other when the boiler assembly is not mounted in the machine. This new seal system does not affect the performance of the sterilizer in any way.

When STAT*IM* steam generator spare part kits are assembled at the factory, they are wrapped and packaged such that the relationship between cap and base will be maintained. If this relationship is inadvertently changed, it can be returned to the correct position by rotating the cap relative to the base. This should be done such that the vertical marks on the boiler base and the boiler cap line up as defined at the factory (see picture) and the gap from the cap to the base is between 1mm (1/32") and 2mm (1/16").

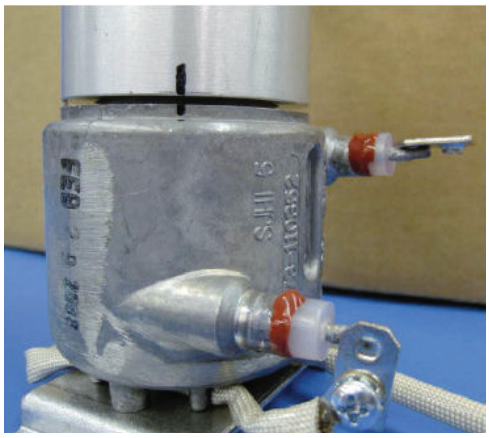


Figure 1 (cont'd)

Replacing 1st generation and stainless steel steam generators

- **These two steam generator types are no longer produced and can ONLY be upgraded with an Alex derived steam generator.**
- **The upgrade may vary from a complete steam generator and PCB replacement to a steam generator and microprocessor replacement (with or without adaptor boards as appropriate) depending on the model and age of the unit.**
- **All units factory fitted with, or upgraded to Alex type steam generators will only need a steam generator replacement.**
- **The following matrix provides the upgrade kit reference numbers and information:**

Model	Current Software Revision	Current Steam Generator Type	Current PCB Revision	Alex Upgrade Kit		Kit Contents — Main Components
5000 110 V	S501R1xx S501R2xx	Aluminium	2.4-2.9x only	01-108997S	05-TSB-201	Alex Boiler, Microprocessor adaptor board, Validation thermocouple, Thermocouple PCB
5000 110 V	S501R4xx	Aluminium	6.x	01-108994S	05-TSB-201	Alex Boiler, Chipset, Validation thermocouple, Thermocouple PCB
5000 110 V	S501R4xx	Stainless Steel	6.x	01-108999S	05-TSB-201	Alex Boiler, Chipset, Validation thermocouple, Thermocouple PCB
5000 230 V	S5O2R1xx S5O2R2xx	Aluminium	2.4-2.9/ 5.0-5.3	01-109001S	05-TSB-214	Alex Boiler, Microprocessor adaptor board, Validation thermocouple, Thermocouple interface PCB
5000S 230 V	S5S2R1xx S5S2R2xx	Aluminium	2.4-2.9/ 5.0-5.3	01-108992S	05-TSB-207	Alex Boiler, Microprocessor adaptor board.
5000S 230 V	S5S2R4xx	Stainless Steel	6.x	01-108990S	05-TSB-207	Alex Boiler, R5xx software chipset, Pump tube set for Aluminium boiler.

Removing the Aluminium Steam Generator (for both 1st generation and Alex versions)

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

To remove the steam generator, proceed as follows (see Figure 2):

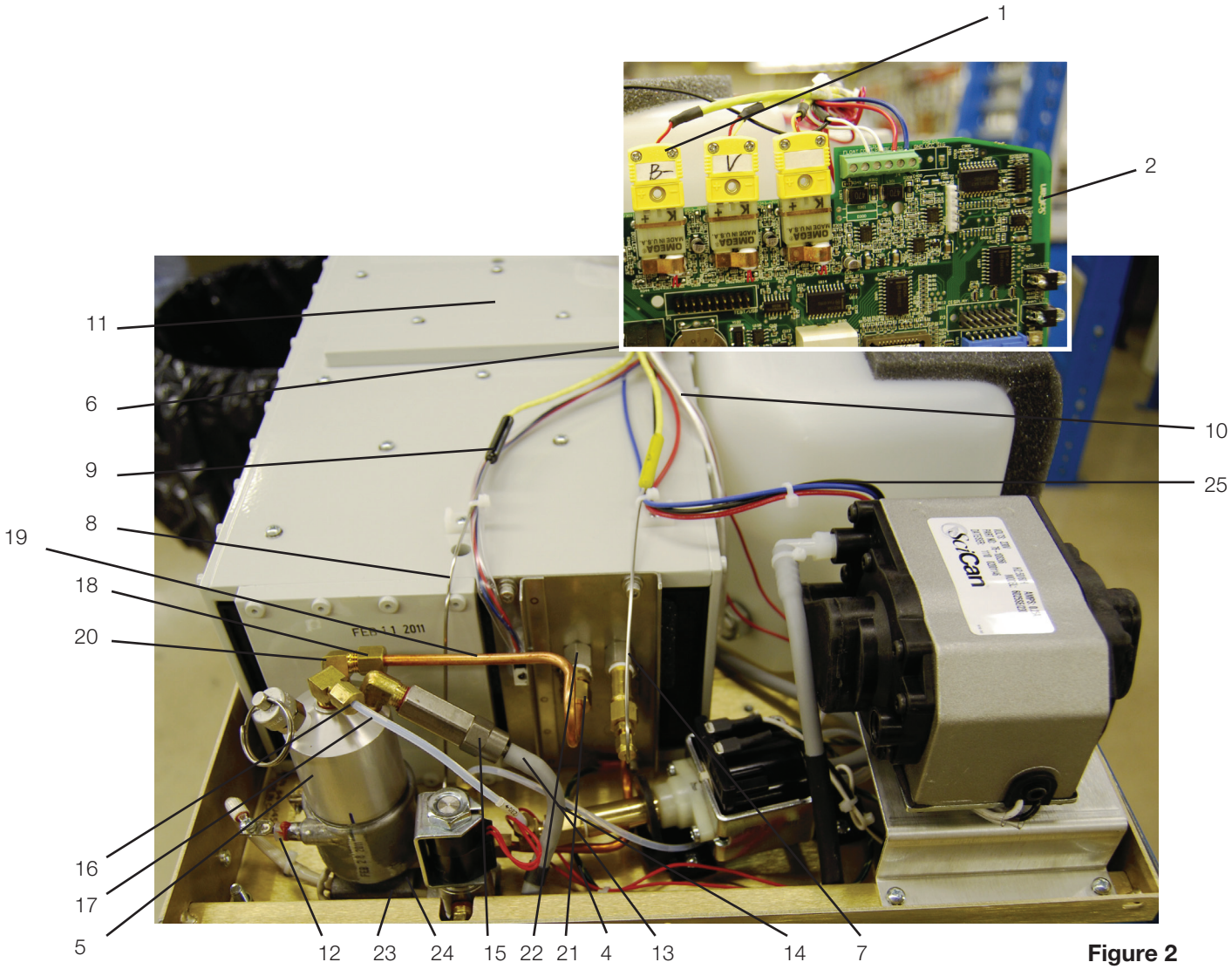


Figure 2

1. steam generator thermocouple wires
2. controller board
3. flag terminal (on Rev 6 and earlier boards)
4. black thermal fuse wire
5. aluminum steam generator
6. cable ties
7. chamber thermocouple lead
8. steam generator thermocouple lead
9. microswitch leads
10. reservoir sensor leads
11. armature
12. white wire
13. high temperature rated cable tie
14. compressor tube
15. check valve inlet
16. compression nut
17. Teflon™ tube
18. compression nut
19. steam generator outlet tube
20. steam generator outlet fitting
21. compression nut
22. probe bracket inlet fitting
23. screws
24. steam generator bracket assembly
25. transducer leads (if present)

1. Turn the power switch **OFF**, and unplug the unit. Remove cover.
2. a. **For all controller boards other than revision 7.x —** Remove the pressure interface board or printer cable (if fitted) from the blue socket and disconnect the steam generator thermocouple wires (1) from Controller Board (2) terminal positions BOILER +Y and -R and disconnect the ground lead terminal (3) from the position marked BOILER directly above the terminals. Leave the screws with contact washers in the terminals.

   b. **For revision 7.x controller boards —** disconnect the chamber thermocouple plug from the socket on the controller board.
3. Disconnect the black thermal fuse (4) wire from controller board connector terminal block J1-3.
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. Disconnect the compression nut (16) holding the Teflon™ tube (17) from the top of the steam generator.
9. Disconnect the compression nut (18) holding the steam generator outlet tube (19) to the steam generator outlet fitting (20).
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.

Reinstalling the Aluminium Steam Generator (for both 1st generation and Alex versions)

NOTE: DO NOT use this section when REPLACING or UPGRADING older 1st generation aluminium steam generators to the newer Alex type. These instructions apply only to RE-INSTALLING an aluminium steam generator (including Alex) that has been removed.

Instructions for UPGRADING to the Alex steam generator vary depending on the status of the unit that is being upgraded (i.e., what controller and software revisions it has) and may also change from time to time. For the most up to date procedures concerning an upgrade, use the table at the beginning of this chapter to find the appropriate kit number and follow the instructions included with the kit.

To reinstall the steam generator, proceed as follows (see Figure 2):

1. Make sure the power switch is **OFF**, and the unit is unplugged.
2. Place the steam generator in to position.
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 and finger tighten, then tighten with a wrench. **Do not over tighten**.
4. Tighten the two screws holding the steam generator bracket assembly to the chassis.

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. Do not over tighten.
6. Reconnect the white wire (12) to the terminal on the lower half of the steam generator using the retained screw with lockwasher. Tip: If the terminal appears blackened, clean it using fine grit sandpaper. If the terminal threads are stripped, use a nut on the other side of the terminal to hold the screw.
7. Route the black thermal fuse wire (4) from the fuse assembly along the back of the chassis along the wiring harness, and connect it to controller board. Re-secure the harness with cable ties.
8. Check the bend and route of the steam generator thermocouple lead (8) and place alongside the chamber thermocouple lead to the controller board. The leads must not touch the cover when the cover is assembled to the chassis.
9. Reconnect the ground lead terminal (3) to the position marked BOILER directly above the thermocouple terminals on the controller board.
10.
    a. **For all controller boards other than revision 7.x.** Check the pre-bend on both thermocouple leads to ensure that they are the required shape to go under the washers on the connections without touching anything other than the terminal.

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

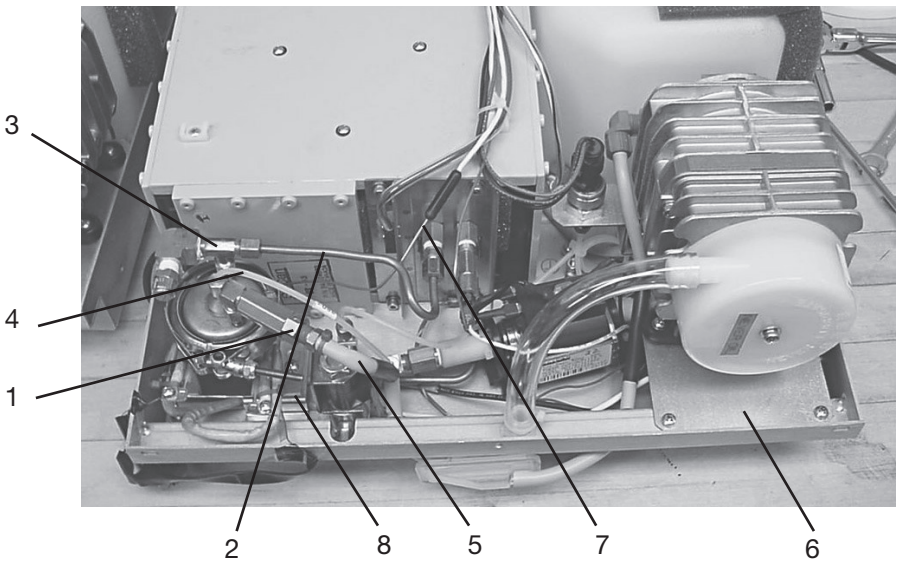
       The unmarked lead is positive, +Y, and red lead is negative, -R. Connect the unmarked lead to the terminal marked +Y on the controller board. Connect the red lead to the terminal marked -R on the controller board. Make sure there is extra lead length so that the wires do not break as the screw is tightened. 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.

    b. **For revision 7.x controller boards.** Reconnect the chamber thermocouple plug to the socket on the controller board (See Figure 1 detail).
11. Bundle the chamber thermocouple lead (7), the steam generator thermocouple lead, the validation thermocouple lead (where fitted), pressure transducer leads (where fitted), micro switch leads (9) 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.
12. Carefully push the compressor tube (14) (where a compressor is fitted) onto the check valve inlet (15) and secure the tube to the valve using a high temperature rated cable tie (13).
13. Replace the pressure interface board or printer cable (if fitted) into the blue socket.
14. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
    NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
15. Refill the reservoir using steam process distilled water.
16. Recalibrate the unit as appropriate.
17. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
18. Reinstall the cover.

Removing the Stainless Steel Steam Generator

To remove the steam generator, proceed as follows (see Figure 3):



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

1. Turn the power switch **OFF**, and unplug the unit. Remove cover.
2. Referring to the PCB inset graphic in Figure 3 above, remove the pressure interface board or printer cable (if fitted) from the blue socket and disconnect the steam generator thermocouple wires (1) from the controller board (2) terminal positions BOILER +Y and -R and disconnect the ground lead terminal (3) from the position marked BOILER directly above the terminals. Leave the screws with contact washers in the terminals.
3. Disconnect the electrical connections of both steam generator power cables 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. Disconnect the black thermal fuse (4) wire from controller board connector terminal block J1-3.
4. Trace the path of the wires to the steam generator and cut the cable ties holding them in place. Separate the wires from the wiring harness.

   Refer back to Figure 4 for the remainder of the procedure.
5. Carefully cut the cable ties securing the steam generator thermocouple lead (7) and other wires to the armature.
6. Carefully cut the cable tie holding the compressor tube (5) onto the check valve inlet and pull the tube off the valve.
7. Disconnect the compression nut (1) holding the Teflon™ tube (4) from the top of the steam generator.
8. Using a 7/16 wrench on the compression nut (1) connected to the steam generator outlet tube and a 3/8 wrench on the T-fitting (3), disconnect steam generator outlet tube (2). When the nut is unscrewed completely, pull the tube gently away from the T-fitting to disengage it from the fitting.
9. Loosen the mounting screws that hold the steam generator bracket to the chassis and, using the bracket’s key slot, slide the steam generator out of position and remove.

Reinstalling the Stainless Steel Steam Generator

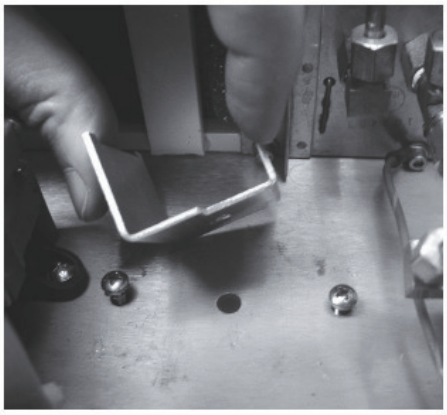
NOTE: This section is NOT for REPLACING or UPGRADING stainless steel steam generators to the newer Alex type. It is only to be used for RE-INSTALLING the stainless steel steam generator that has been removed.

Instructions for UPGRADING to the Alex unit vary depending on the unit that is being upgraded (i.e., what controller and software revisions it has) and may also change from time to time. For the most up to date procedures concerning an upgrade, use the table at the beginning of this chapter to find the appropriate kit number and follow the instructions included with the kit.

To reinstall the steam generator, proceed as follows (see Figures 3, 4, 5, 6 and 7):

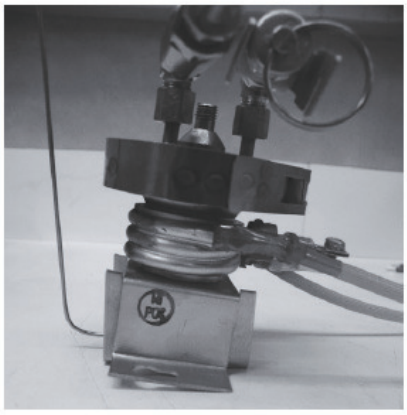
When servicing a STAT*IM* 5000 / 5000S equipped with a stainless steel steam generator, you may encounter one of two steam generator bracket configurations (see Figures 4-7). Type A has a steam generator bracket and a separate bracket adapter. Type B has an integral modified steam generator bracket.

Both scenarios ensure that, when properly installed, the steam generator terminals are angled slightly downward.



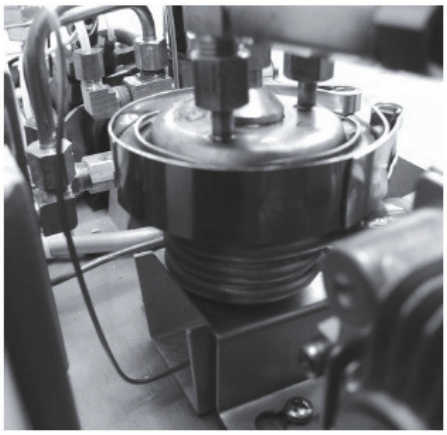
Positioning bracket adapter for Type A

Figure 4



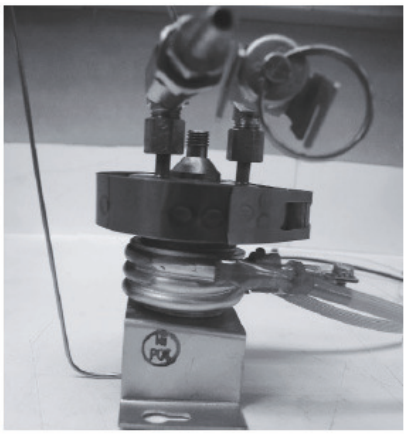
Type A configuration

Figure 5



Type A configuration installed

Figure 6



Type B configuration
(no adapter neccessary)

Figure 7

1. Make sure the power switch is OFF, and the unit is unplugged.
2.
   a. To refit a Type A configuration, place the bracket into position by aligning the dimple on the bottom of the adapter with the hole in the chassis (See Figure 4). Place the stainless steel steam generator on top of the bracket adapter (See Figure 5). Align the bracket's key slots with the screws on the chassis and tighten just enough to keep the assembly in place (See Figure 6).
   b. To refit a Type B configuration (See Figure 7), align the steam generator and integral bracket key slots with the screws on the chassis. But do not tighten yet.

Refer back to Figure 3 for the remainder of the procedure.

3. Reconnect the compression nut (1) on the steam generator tube to the T-fitting (3) on the steam generator. **Only finger tighten at this stage**.
4. When the nut is fully on the fitting, tighten the two screws holding the steam generator bracket assembly to the chassis.
5. Now, using a 3/8 wrench on the T-fitting and a 7/16 wrench on the compression nut, tighten the two together. **Do not overtighten**.
6. Reconnect the compression nut of the Teflon™ tube (4) to the top of the steam generator. Thread the nut finger tight, then tighten. **Do not overtighten**.
7. Carefully push the compressor tube (5) onto the check valve inlet and secure the tube to the valve using a high temperature rated cable tie.
8. Re-route the power cables in the wiring harness along the back of the chassis and connect them to the controller board. The black wire to goes to connection marked L and the white wire to connection marked N. Re-secure the wiring harness with cable ties.
9. Check the bend and route of the steam generator thermocouple lead (6) and place alongside the chamber thermocouple lead to the controller board. The leads must not touch the cover when the cover is assembled to the chassis.
10. Reconnect the ground lead terminal to the position marked BOILER directly above the thermocouple terminals on the controller board.
11. Check the pre-bend on both thermocouple leads to ensure that they are the required shape to go under the washers on the connections without touching anything other than the terminal.

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

    The unmarked lead is positive, +Y, and 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 2 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.
12. Bundle the chamber thermocouple lead, the steam generator thermocouple lead, the validation thermocouple lead (where fitted), pressure transducer leads (where fitted), micro switch leads and reservoir sensor leads together using cable ties, approximately every 2-3 inches. Secure the wires to the top of the armature using the cable anchors provided.
13. Replace the pressure interface board or printer cable (if fitted) into the blue socket.

14. A dielectric strength test (Hi-Pot) and a protective bonding impedance test (ground continuity) should be performed on the STAT*IM* unit at this stage.
    NOTE: These tests must be performed on the STAT*IM* again once the work is completed and the cover has been returned to the unit.
15. Refill the reservoir using steam process distilled water.
16. Recalibrate the unit as appropriate.
17. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
18. Reinstall the cover.

Check Valves

The check valve on STAT*IM* units is basically a non return valve that allows air from the compressor to pass through the steam generator, into the chamber (cassette) to dry the instruments, and exhaust through the solenoid valve to the waste bottle after the unit has vented. It should not allow steam to pass back through the valve and into the compressor. Failure can lead to a drop in pressure in the unit during processing and cause damage to the compressor. Note: As a critical component it is recommended that the check valve is changed annually as part of a routine service.

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

The steam generator check valve is found on STAT*IM* 5000 and 5000S units with compressors.

Testing the Check Valve

There are two options of checking the check valve, either with the unit running or manually with the control box.

Option 1: Checking the valve with the unit running.

To perform this test, the STAT*IM* unit must be running with the cover off and the control box attached as if running as test cycle during servicing. For revision 7.x units, the unit can be run with the cover removed but still connected to the controller.

To inspect the check valve, proceed as follows (See Figure 8):

1. Carefully pull the compressor tube (2) from the check valve barb fitting.
2. Start a normal cycle on the unit and wait for the unit to pressurise.
3. Using a reflective, cold surface (e.g. a dental mirror), place it close to the check valve inlet fitting and observe for condensation.
4. If condensation is apparent, manually inspect the compressor air filter, the bacteria retentive filter (if present) and the compressor.
5. If there is evidence of water in the bacteria retentive filter, replace the 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.

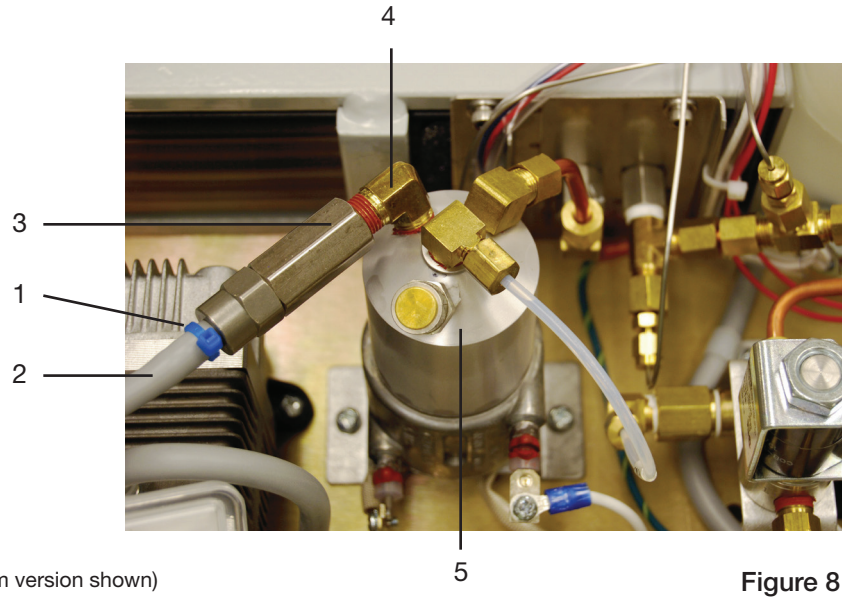
Option 2: Performing a manual valve inspection.

If it is not possible to run the unit, but it can be powered up, proceed as follows:

6. With the power off, remove the cover.
7. Attach the control box to the unit and power on the unit, or for revision 7.x controller board units, power the unit on first and select 'compressor' in the device test sub menu of the service menu (if cover is removed but still connected). The unit should be powered on with the cassette removed.
8. Turn ON the compressor using the control box or keypad as appropriate, and allow it to run for a few minutes. Allow the compressor to cool until it feels cool to the touch.
9. Inspect the compressor air filter, the bacteria retentive filter (if present) and the compressor.
10. If there is evidence of water in the bacteria retentive filter, replace the 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.

Removing and Replacing the Steam Generator Check Valve

To remove and replace the steam generator check valve, proceed as follows (See Figure 8):



1. high temperature cable tie
2. compressor tube
3. check valve
4. right angle brass fitting
5. steam generator (aluminium version shown)

Figure 8

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 ½" wrench remove the check valve. Apply the wrench to the part of the valve closest to the steam generator (5). Use a wrench to hold the right angle brass fitting so that it does not move. Clean any Teflon™ tape or assembly compound from the threads on the right angle valve fitting.

4. Prepare the right angle (4) fitting by wrapping the threads with Teflon™ pipe tape in the rotational direction of the thread. (minimum 4 complete turns).
5. Thread the new valve onto the right angle valve fitting on the top of the steam generator (5). Using a wrench on the end of the valve closest to the fitting, tighten the valve until medium resistance is felt. Do not overtighten the new valve. Use a wrench to hold the right angle brass fitting so it does not move.
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. Run a sterilization cycle and observe for leaks.
9. Reinstall the cover.

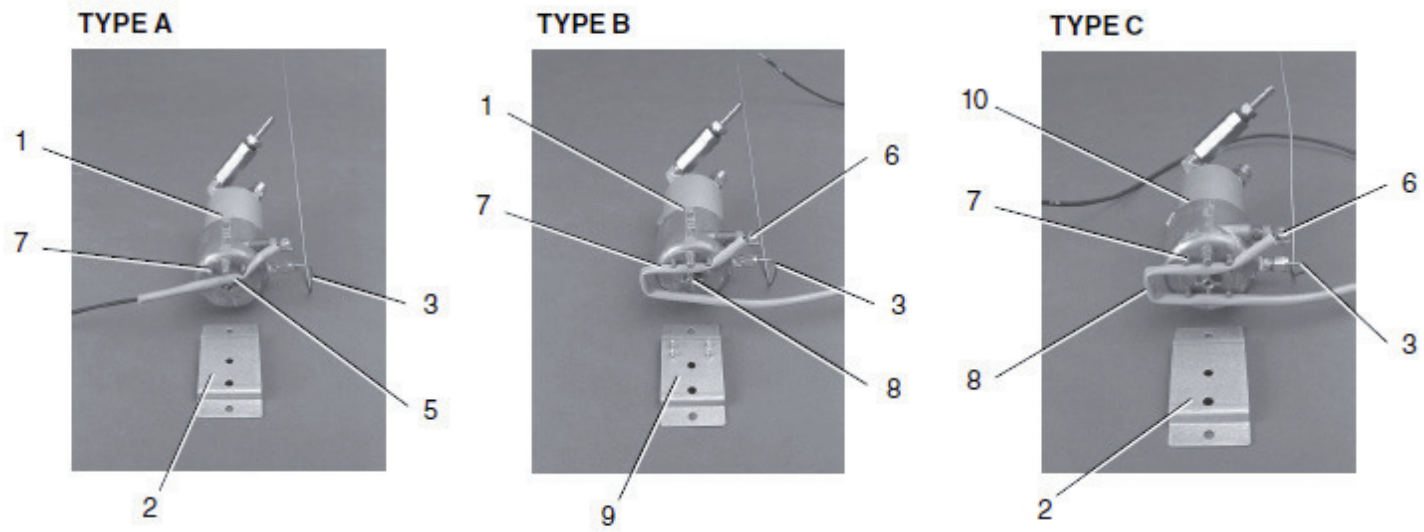
Steam Generator Thermal Fuses

You may encounter four types of thermal fuse configurations on STAT*IM* units. Three for aluminium steam generators and one for the stainless steel generator. Early 1st generation aluminium steam generators had a single thermal fuse located in series in the main power supply line to the generator (the black wire) which was held in place by a mounting bracket on the underside of the steam generator.

This was replaced with a double fuse, again, in series in the main power supply line and sandwiched between the bracket and the steam generator base. Unlike the single fuse, this protected more of the surface area of the underside of the steam generator.

It should be noted that the steam generator bases/brackets may be different, so the appropriate fuse must be obtained for each steam generator.

The three configurations for aluminium steam generators are as follows (see Figure 9):



1. steam generator
2. steam generator bracket
3. thermocouple lead
4. screw (not shown)
5. thermal fuse
6. steam generator electrical terminal
7. spacing stand-offs
8. double thermal fuse
9. modified steam generator bracket
10. modified steam generator

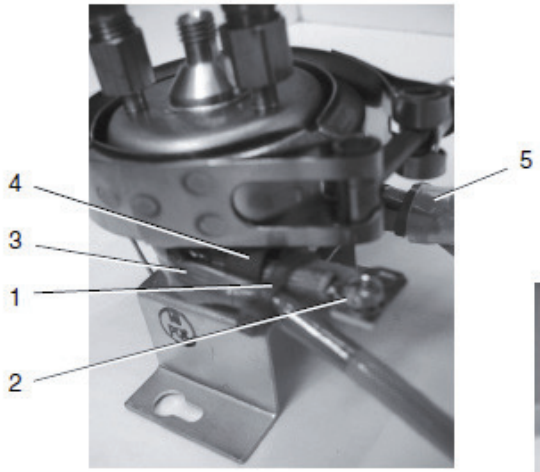
Figure 9

Type A is a single thermal fuse wire (5), steam generator bracket (2) and an unmodified steam generator (1).

Type B is a double thermal fuse wire (8) with a modified steam generator bracket (9) and an unmodified steam generator (1).

Type C is a double thermal fuse wire (8), steam generator bracket (2) with a modified steam generator (10).

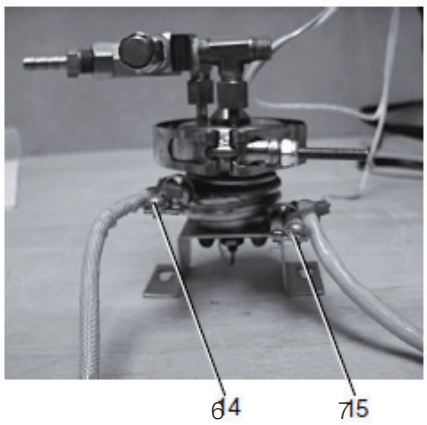
The fuse configuration for stainless steel steam generators is as follows (see Figure 10):



1. High temperature rated cable tie
2. Terminal Screw
3. Thermal fuse wire
4. Hose clamp
5. Insulation sleeving

Figure 10

6. Upper terminal
7. Lower terminal



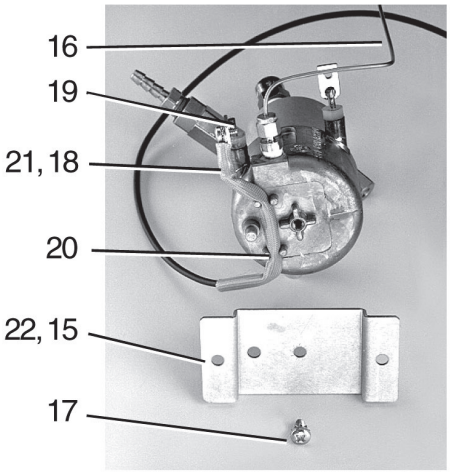
Removing the Thermal Fuse on the Aluminium Steam Generator (for all models)

To remove the thermal fuse(s) located between the steam generator and the steam generator bracket, proceed as follows (see Figure 11):

1. Carefully cut the high temperature rated cable tie (1) holding the compressor tube (2) onto the check valve inlet (3) and pull the tube off the valve.
2. Disconnect the black thermal fuse lead wire (4) from controller board connector terminal J1-3 and the white wire (6) from the steam generator.
3. Trace the path of the black wire back to the base of the steam generator (5). Cut all the cable ties holding the black wire.
4. Using a wrench, disconnect the compression nut (7) holding the Teflon™ tube (8) from the top of the steam generator.
5. Using a wrench, disconnect the compression nut (9) holding the steam generator outlet tube (10) to the probe bracket inlet fitting (11) and the compression (12) nut holding the steam generator outlet tube to the steam generator outlet fitting (13).

6. Remove the two screws (14) from the steam generator bracket (15). Note: The steam generator will still be attached to the PCB by the thermocouple lead (16).
7. Carefully cut the two cable ties closest to the steam generator that hold the thermocouple leads together.
8. Gently lift and turn the steam generator assembly onto one side to expose the bottom of the assembly. Be careful not to stress the thermocouple leads. (Min. bend radius - 3/16 inch / 5 mm).
9. Remove the small screw (17) that attaches the steam generator bracket to the steam generator.
10. Disconnect the thermal fuse (18) from the lower power terminal on the steam generator. Note the routing of the thermal fuse assembly between the bracket and spacing lugs (20) on the bottom of the steam generator.
11. Remove the thermal fuse.

1. high temperature rated cable tie
2. compressor tube
3. check valve inlet
4. black thermal fuse wire
5. aluminum steam generator
6. white wire (attaches here)
7. compression nut
8. Teflon™ tube
9. compression nut
10. steam generator outlet tube
11. probe bracket inlet fitting
12. compression nut
13. steam generator outlet fitting
14. two screws (obscured)
15. steam generator bracket
16. thermocouple lead
17. screw
18. thermal fuse
19. steam generator electrical terminal
20. spacing stand-offs
21. double thermal fuse
22. modified steam generator bracket
23. modified steam generator



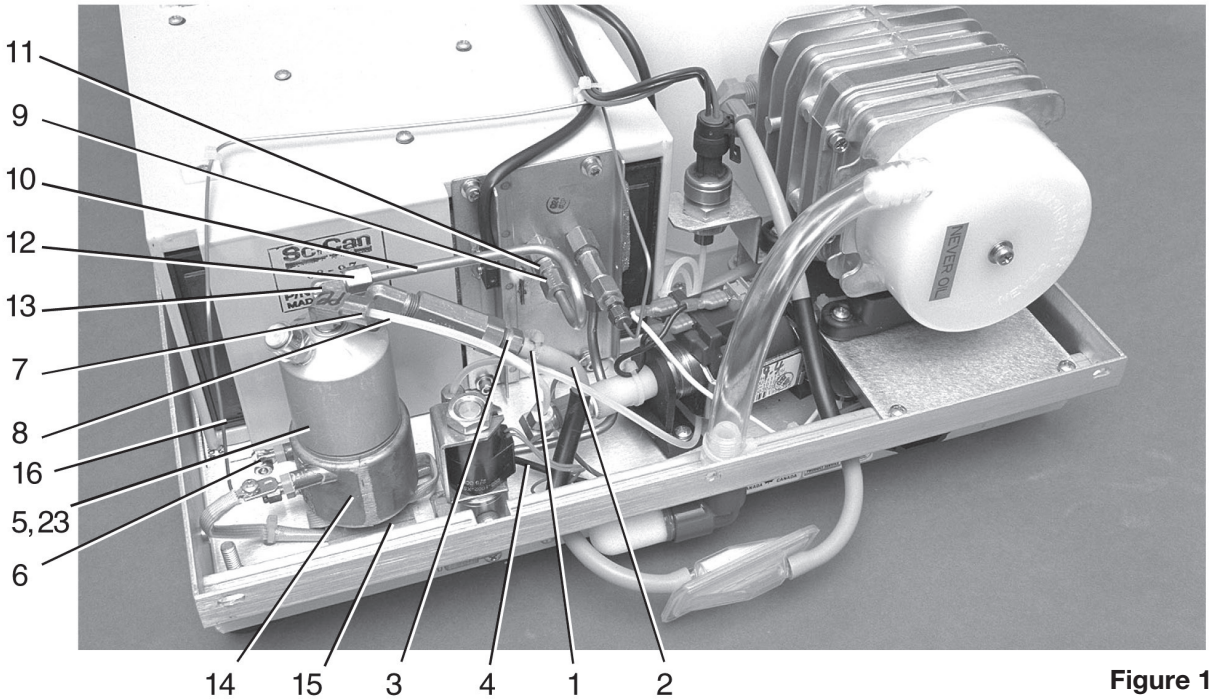


Figure 11

Replacing the Thermal Fuse on the Aluminium Steam Generator (for all models)

Determine which configuration is being serviced and use the appropriate parts to service the unit.

To replace the thermal fuse proceed as follows (refer to Figure 9):

1. Connect the terminal of the appropriate thermal fuse (5 for type A - single) or (8 for type B/C - double) to the lower power terminal on the steam generator (1 for type A/B) or (10 for type C).
2.
    a. For Type A configuration, replace the steam generator bracket (2) with a modified steam generator bracket (9). Route the wire from the fuse assembly (5) between the standoffs (7) and the standoffs on the modified steam generator bracket. The fuse must be placed exactly between the standoffs. Attach the steam generator bracket to the steam generator (1) using the small screw (4). Do not pinch or crush the wire between components. Ensure that the screw is tightened securely.
    b. For Type B configuration, route the wire from the fuse assembly (8) between the standoffs (7) on the bottom of the steam generator (1) and the standoffs on the modified steam generator bracket (9). The fuse must be placed exactly between the standoffs. Attach the steam generator bracket to the steam generator (1) using the small screw (4). Do not pinch or crush the wire between components. Ensure that the screw is tightened securely.
    c. For Type C configuration, route the wire from the fuse assembly (8) between the two sets of standoffs (7) on the bottom of the modified steam generator (10).

    The fuse must be placed exactly between the standoffs. Attach the steam generator bracket (2) to the steam generator using the small screw (4). Do not pinch or crush the wire between components. Ensure that the screw is tightened securely.

    NOTE: For the remainder of the procedure, refer to Figure 11 and proceed as follows.
3. Carefully return and attach the steam generator assembly to the chassis using two screws (14). Start the screws into the tapped hole but do not tighten the screws. Be careful not to stress the thermocouple leads. (Min. bend radius - 3/16 inch / 5 mm).
4. Connect the compression nut (12) holding the steam generator outlet tube (10) to the steam generator outlet fitting (13) and the compression nut (9) holding the steam generator outlet tube (10) to the probe bracket inlet fitting (11). Tighten finger tight.
5. Connect the compression nut (7) holding the Teflon™ pump tube (8) to the top of the steam generator. Tighten finger tight, then continue to tighten the nut using a 3/8-inch wrench. Do not overtighten.
6. Tighten the two screws (14) that attach the steam generator assembly to the chassis.
7. Using a wrench, tighten the compression nut holding the steam generator outlet tube to the steam generator outlet fitting and also the compression nut holding the steam generator outlet tube to the probe bracket fitting.
8. Route the black wire (4) from the fuse assembly and connect the wire to Controller Board connector J1-3. Connect the white wire (12) to the steam generator electrical terminal (19).
9. Bundle the loose wires together in the wiring harness and secure using nylon cable ties every 2-3 inches.
10. Reinstall the compressor tube (6) onto the check valve inlet (3) and secure the tube to the valve with a high temperature rated cable tie (1).

11. A dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* to confirm that the wire has not been pinched or crushed between the steam generator and the bracket. The tests must be performed again once the work is completed and the cover has been returned to the unit.
12. Refill the reservoir using steam process distilled water.
13. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.
14. Reinstall the cover.

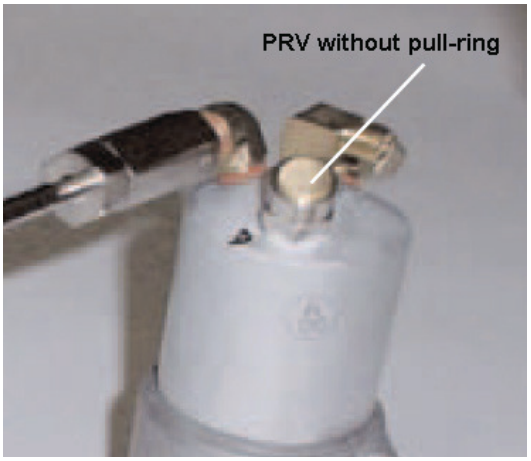
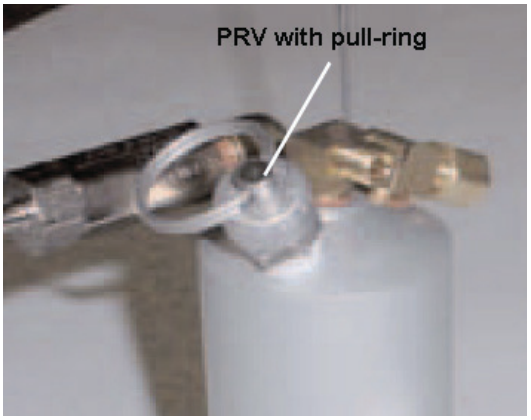
Removing and Replacing the thermal fuse on the Stainless Steel Steam Generator

Instructions for changing the thermal fuses on the stainless steel steam generator are NOT included in this manual. If the thermal fuses have failed on a stainless steel steam generator, it is strongly recommended that the steam generator be replaced by a modern "Alex" type unit.

Pressure Relief Valve (PRV)

There are two types of Pressure Relief Valves (PRV) fitted to STAT*IM* units. Note that they are unit specific and the two types SHOULD NOT be interchanged.

The two types are as follows:

Type 1: 70 p.s.i. PRV without pull ring This type of PRV are factory fitted on steam generators on the following units: • ALL STAT*IM* 5000 non S (North American specification) units irrespective of steam generator type. • STAT*IM* S units (European specification) with 1st generation steam generator from 1996 to 2003.	
Type 2: 43.5 p.s.i. PRV with pull ring This type of PRV are factory fitted on steam generators on the following units: • STAT*IM* S units (European specification) with stainless steel or "Alex" type steam generators (2004 to date).	

The function of the PRV is to protect the STAT/*M* unit by allowing steam to vent to atmosphere in the event of an overpressure situation NOT detected by the software.

Important: **this device is a safety critical item. The checking and replacing of the device may be subject to various pressure regulations in some countries.**

It is recommended that you familiarize yourself with the local regulations with regard to pressure systems before attempting to check/replace the PRV.

In the event of a requirement to change the PRV, always replace like with like as the unit will have been designed and validated for that specific PRV.

Checking the Pressure Relief Valve

Caution: Checking of the PRV under running conditions should only be undertaken by visual means. Manually activating the PRV should not be undertaken under any circumstances other than by authorized pressure vessel testing engineers.

To perform this test, the STAT/*M* unit must be running with the cover off and the control box attached as if running as test cycle during servicing. For revision 7.x units the unit can be run with the cover removed but still connected to the controller.

To check the PRV, proceed as follows:

1. Start a normal cycle on the unit and wait for the unit to reach sterilisation temperature and pressure.
2. Using a reflective, cold surface (e.g. a dental mirror), place it close to the PRV and observe for condensation.
3. If condensation is apparent when the unit is at optimum operating pressure then the PRV has failed and should be replaced.

Important: Checking of the upper limit of the PRV can only be done with the PRV removed from the steam generator and should only be undertaken in accordance with local regulations and by an authorised pressure vessel testing engineer.

Removing and Replacing the Pressure Relief Valve

To remove the PRV, proceed as follows:

The unit should be OFF, with the mains cable removed from the socket and the cassette removed from the armature. No pressure or power should be present while performing this operation.

The cover should also be removed.

It is also recommended that the steam generator and associated components are cool to the touch before proceeding.

1. Using a ½" wrench, CAREFULLY unscrew the PRV from the steam generator and remove.

   Caution: On aluminum steam generators that have not had the PRV removed or changed for some time, removing the prv may damage the internal thread on the steam generator.

   In certain circumstances the thread may be recovered using a 1/8" NPT taper tap, but the steam genrator will need to be removed and inverted to perform this function so that any debris caused by the re-threading can fall away from the inside of the unit. Under no circumstances should debris be allowed to enter/remain in the steam generator.

   If the thread can not be recovered and correct fitting of the PRV can not be safely assured, then the complete steam generator should be replaced.
2. If the internal thread is OK, remove any P.T.F.E. tape CAREFULLY with tweezers so that when the new PRV is inserted the tape debris will not enter the steam generator.

To replace the PRV, proceed as follows:

1. Prepare the new PRV by wrapping the threads with Teflon™ pipe tape in the rotational direction of the thread. (minimum 4 complete turns).
2. Thread the new PRV into the steam generator by hand.
3. Using the ½" wrench, tighten the PRV until medium resistance is felt. **Ideally a MINIMUM of 4 turns should be achieved. Do not over tighten the new valve.**
4. Run a sterilization cycle and observe all fittings and tubes for leaks. Check LCD read-outs for messages indicating cycle status.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Printer and Data Logger

STAT*IM* 5000/5000S units are capable of operating several printing or data recording devices depending on the model.

The following is an overview of unit variants and what can and cannot be used with them:

1995 – 2007: STAT*IM* 5000/5000S units with revision 2.x/5.x or 6.x controller board

- These were available both with and without a built-in STATPRINTER mechanism located on the left side of the front fascia.
- The internal printer mechanism is the same as the STATPRINTER mechanism usually associated with the external 2000/2000S STATPRINTER unit.
- Units purchased WITHOUT a printer can be retro-fitted with a printer module using part number 01-210000 “Thermal Internal Printer Kit for STAT*IM* 5000/5000S”.
- **Note that a SciCan Data Logger cannot be fitted to these units as the chassis cannot accommodate the installation of the appropriate cable port.**

2007 onwards: STAT*IM* 5000/5000S units with revision 7.x controller board

- These units are also available both with and without a built in STATPRINTER mechanism located on the left side of the front fascia.
- Units purchased WITHOUT a printer will have a 9-pin RS232 port located on the rear of the chassis for connecting an external (generic) printer OR a SciCan Data Logger.
- These units can also be retro-fitted with a printer module using part number 01-210000 Thermal Internal Printer Kit for STAT*IM* 5000/5000S.
- Units WITH an internal printer DO NOT have a 9-pin RS232 port on the rear of the chassis but DO have a cutout in the chassis to retro-fit a port using part number 01-110222S “RS232 Port Kit, STAT*IM* 5000/5000S” should you wish to convert a printer unit to a Data Logger unit.

General notes:

For revision 2.x/5.x/6.x controller boards

- The printer cable connector on 5000 non S units is attached to the **P2 connector on the main PCB.**
- The printer cable connector on 5000 S units is attached to the **P2 connector on the pressure interface PCB.**

For revision 7.x controller boards

- The printer cable connector or RS232 internal port connector on ALL 5000/5000S units is attached to the **SERIAL connector on the main PCB.**

For all units

- Some internal printer module assemblies were manufactured with a ferrite core assembled to the cable. If so, ensure the ferrite core is in place when the assembly is reinstalled. See; “Positioning the Ferrite Core”.

Printer

Internal Printer

Removing and Replacing the Printer Module (where fitted).

To remove the printer module assembly (1), proceed as follows (see Figure 1):

1. Remove the cover of the STAT*IM* unit. See chapter 6.

2. Place the cover (2) on a clean work surface to avoid scratching the cabinetry surface.

3. Remove the four screws (3) securing the printer module assembly to the fascia assembly (4). Retain the screws.

4. Remove and place the printer face down on the work bench.

To replace the printer module (1), proceed as follows (see Figure 1):

1. Install the printer module assembly in the fascia assembly (4) using the four screws (3) retained during disassembly.

2. If the module contains a new Printer Interface Board, or a new printer module, the print quality may require adjustment. See; “Adjusting Print Quality” and “Printer Interface Board: Important Notes.”

3. Replace the cover of the STAT*IM* unit. See chapter 6.

4. Plug-in the unit power cord and turn the power switch ON.

5. Test printer.

Positioning the Ferrite Core

If the printer module assembly you are servicing was manufactured with a ferrite core attached to the cable, the core must be present during reassembly. Position the core three to four inches from the printer module. Apply double sided adhesive tape to the core and carefully attach it to the fiche paper shield on the back of the printer module so the cable is not unduly strained, but will still reach either the P2 connector on the Controller Board, or the P2 connector on the Transducer Interface Board.

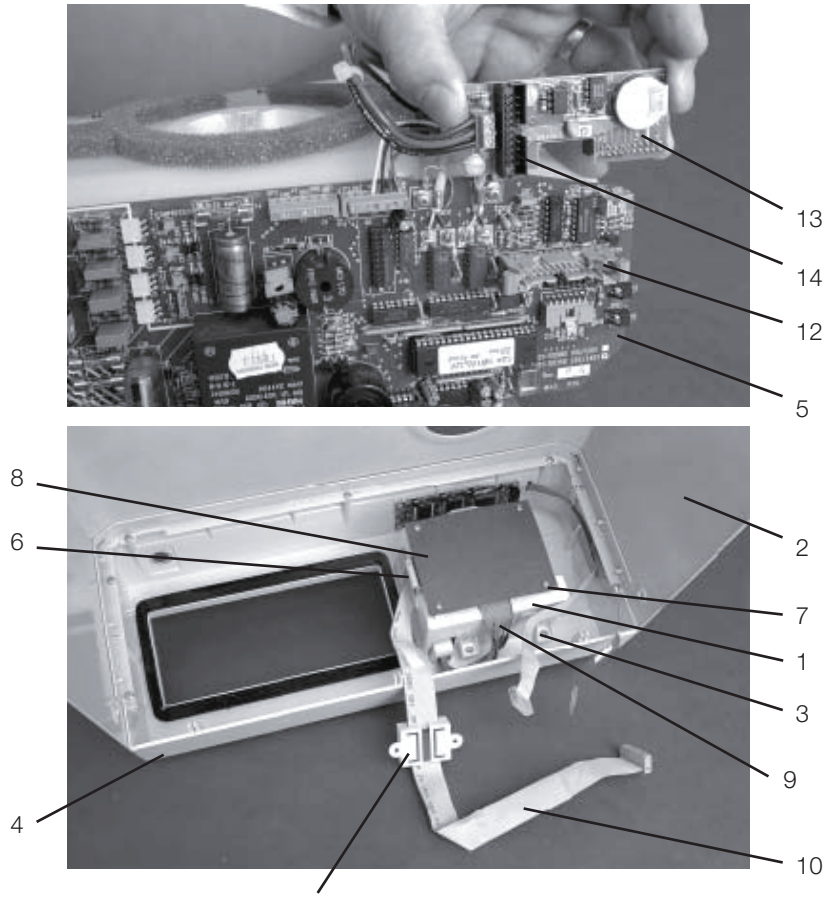
Removing and Replacing the Printer Interface Board (module removed from fascia).

To remove the Printer Interface Board (6) from the module, proceed as follows (see Figure 1):

1. If detachable, disconnect the Printer Driver ribbon cable (9) and Printer Interface ribbon cable (10). See Printer Interface Board: Important Notes.

2. Remove the four screws (7) from the Printer Interface Board. Retain the screws.

3. Remove and retain the Printer Interface Board and the Printer Interface Board shield (8). There may be four nylon spacers (not shown) between the board and the stand-offs. See; “Printer Interface Board: Important Notes.”



1. Printer module assembly
2. Cover
3. Screws
4. Fascia assembly
5. Controller Board
6. Printer Interface Board
7. #1 Phillips screws
8. Printer Interface Board shield
9. Printer ribbon cable
10. Printer Controller ribbon cable
11. Ferrite core
12. Controller Board P2 connector
13. Pressure Interface Board
14. Pressure Interface Board P2 connector

Figure 1

To replace the Printer Interface Board, proceed as follows (see Figure 1):

1. Connect the Printer Interface ribbon cable (10) to Printer Interface Board header P1. Cable (assemblies may differ). If the connector is not polarized, note the orientation of Pin 1 of the connector and Pin 1 of the board.

2. Connect the Printer ribbon cable (9) connector to Printer Interface Board header P2.

3. Place the Printer Interface Board, component side down, on the module. Replace the Printer Interface Board shield (8) and insert the four screws (7) retained during disassembly.

4. If the Printer Interface Board has been repaired, or is a new Printer Interface Board, the print quality may require adjustment. See; “Adjusting Print Quality” and “Printer Interface Board: Important Notes.”

Printer Interface Board – Important Notes

1. In order to operate with version 1.1 STAT*IM* Controller Boards, Printer Interface Boards version 2.0 and higher require the removal of jumper J2.

2. Nylon spacers are required for mounting version 1.1 Printer Interface Boards ONLY.

3. To adjust the print contrast potentiometer R21 on Printer Interface Board versions prior to 2.0, the Printer Interface Board must be removed from the printer module assembly. To adjust the print contrast potentiometer, R21, on Printer Interface Board version 2.0, the printer module assembly must be removed from the fascia. To adjust the print contrast potentiometer, R21, on Printer Interface Board versions 2.1 and later, R21 is accessible with the printer module assembly installed in the fascia.

4. Setting the printer contrast too dark on version 1.1 Printer Interface Boards may cause the STAT*IM* L / 5000/ 5000S to reset while printing under low line-voltage conditions. If this problem occurs, adjust R21 to lighten the print contrast, or upgrade to a later revision of Printer Interface Board.

5. The cable connecting the Printer Interface Board to the STAT*IM* Controller Board is permanently soldered to the Printer Interface Board on all boards prior to version 2.2.

6. Some version 1.1 Printer Interface Boards were fabricated with a strain-relief on the connector attaching to STAT*IM* Controller Board position P2. The strain-relief must be removed before connecting to STAT*IM* Controller Board versions 2.0 and later.

Removing and Replacing the Battery

You may encounter printers that were manufactured with replaceable batteries or printers manufactured with soldered batteries. Replaceable batteries must be properly stored and handled to avoid discharge. The time and date functions of the printer are battery supported when the unit is not running. If the time or date printout is incorrect, try resetting the time and date as described in the Operator's Manual. Power the printer and STAT*IM* OFF and wait several minutes before powering them back ON. If the time and date are still incorrect, replace the battery on the printer interface board.

To replace the battery, proceed as follows:

1. Remove the Printer Interface Board as described in Removing the Printer Interface Board.

2. a. If there is a replaceable battery, remove and discard the old battery. Install a new battery. Always replace the battery with a fresh battery of equal rating and size.

   b. If the battery is soldered, carefully de-solder BAT1 from the component side of the board. Note the orientation of the anode and cathode. Solder the replacement battery in position BAT1.

Adjusting Print Quality

To alter print quality, the contrast adjustment pot (R21) located on the printer Interface Board must be adjusted.

To adjust the print quality, proceed as follows:

1. Current versions of the Printer Interface Board have the printer contrast adjustment pot (R21) located at the edge of the board, and adjustments may be made using a small adjustment tool while the printer module is still in the fascia assembly.

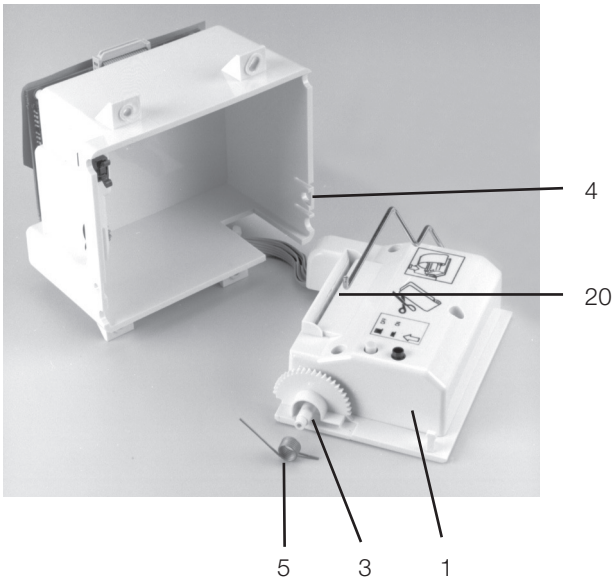
Earlier versions require that the Printer Interface board be removed from the back of the module before the pot is accessible. See, "Removing the Printer Controller Board" and "Printer Interface Board - Important Notes."

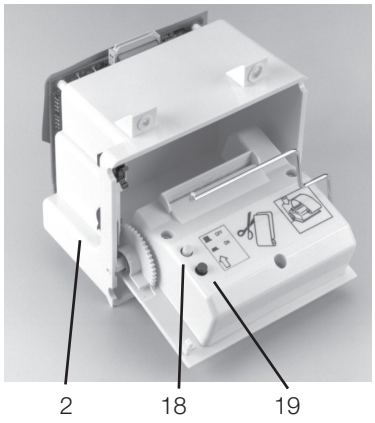
2. To adjust and test print quality, turn the unit power switch ON. Open the printer module and enable the printer by pressing the printer power button (item 18, Figure 2). Start and then quickly stop a cycle. Doing so causes an error message to be printed. While the error message is printing, adjust the pot (R21).

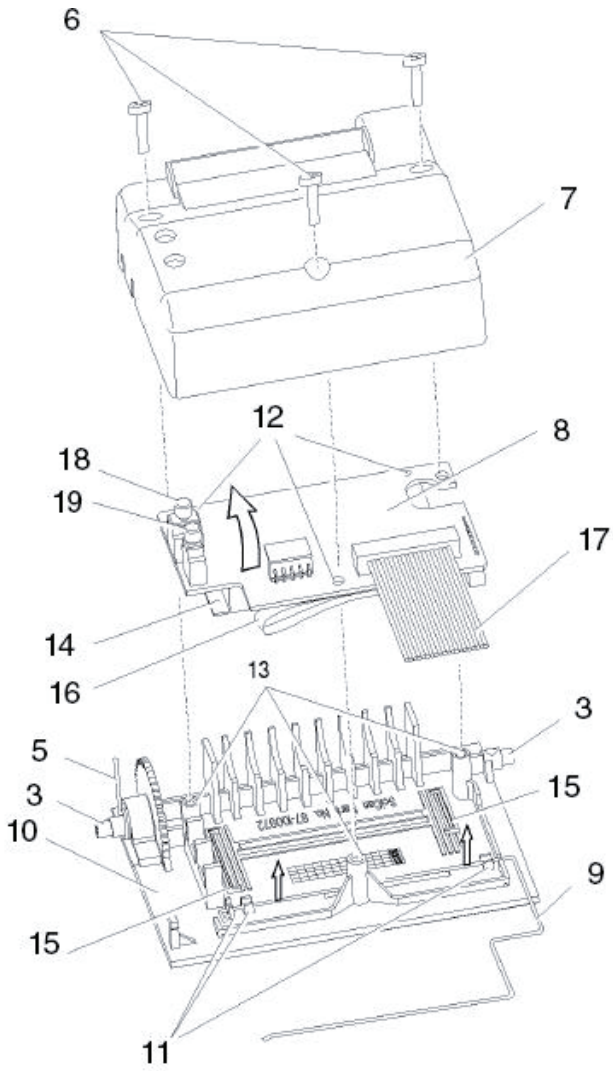
3. If further adjustment is required, repeat steps 1 and 2. Reinstall the cover. See section 6

Removing the Printer Assembly

To remove the printer assembly (1) from the printer module assembly (2), proceed as follows (see Figure 2):







1. Cover
2. Printer module assembly
3. Hinge pin
4. Snap mechanism
5. Spring
6. Screws
7. Printer housing
8. Printer board
9. Paper roll arm
10. Printer door
11. Paper roll arm retaining clips
12. Printer board mounting holes
13. Mounting bosses
14. Printer body
15. Locating ribs
16. Print head flexible cable
17. Printer ribbon cable
18. Power button
19. Paper advance button
20. Paper feed slot

Figure 2

1. Remove the printer module. See ‘Removing the Printer Module’ above.

2. Unlatch the printer assembly from the printer module assembly. The printer assembly is held into the module by two hinge pins (3). The pin on the bottom left of the assembly sits in a recessed slot / retaining hole. The pin on the bottom right hand of the assembly is captured by a snap mechanism. Deflect the snap (4) away from the printer to free the hinge pin, and swing the assembly out of the module housing.

3. Remove the printer spring (5) from the left hand hinge pin and retain for re-assembly.

4. Using a #1 Phillips screwdriver, remove three screws (6) from the printer housing (7) and set them aside for use in re-assembling the printer.

5. Remove the housing. Note the orientation of the printer board (8) and the paper roll arm (9) assembled on the printer door (10).

6. Carefully lift the Printer Board upwards and away from the printer door. Be careful when handling the board. The printer is integral to the wiring board. Do not place strain on the connections of the ribbon cable soldered to the board.

7. Remove the paper roll arm from the clips (11).

8. Carefully rest the printer board beside the assembly.

Replacing the Printer

To replace the printer, proceed as follows (see Figure 2):

1. Carefully snap the paper roll arm (9), in the position shown, back into the clips (11) on the printer door.

2. Place the printer board (8) back into position on the printer door (10). Note the alignment of the printer board mounting holes (12) and the mounting bosses (13) on the printer door. The black plastic printer body (14) rests between the locating ribs (15) on the inside of the printer door.

3. Check that the print head flex cable (16) and printer ribbon cable (17) are not pinched between the printer door and the wiring board.

4. Place the printer housing (7) on the printer door (10). Check again to be sure that the flexible cables are not pinched between the cover and the door. The power button (18) and the paper advance button (19) must protrude through the openings in the cover and operate freely.

5. Secure the printer housing to the printer door with the three screws (6) retained during the disassembly procedure. Do not over tighten these screws.

6. Place the printer spring (5) on the left hand hinge pin of the printer assembly, with the long arm positioned to align with the long slot on the module housing.

7. Place the left hand hinge pin in the recesses slot / retaining hole and align the long spring arm. Swing the right hand hinge pin towards the module housing and push firmly onto the snap mechanism (4).

8. Replace the printer into the snap mechanism.

Installing Thermal Paper into the Printer

NOTE: Use only paper approved for use with the Statprinter. The use of any other paper may damage the printer and will void the warranty. Thermal paper is available from SciCan (SciCan order no. 01-101657S).

Do not operate the printer without paper. If you run out of thermal paper, or if you do not wish to use the printer, turn it OFF.

Never pull the paper backwards through the printer. This will damage the printer mechanism.

To install the paper into the printer, proceed as follows (see Figure 3.1):

1. Power the STAT*IM* unit ON.

2. Open the printer door (1) by pushing on the top half of the door.

3. Power the printer ON.

4. Unroll a small amount of paper roll (4) and trim the corners using the paper cutting template included with each box.

5. Move the paper roll arm(4) into the loading position. Place the paper roll (3) on the arm so the paper strip feeds from the top of the roll and then carefully insert it into the paper feed slot(5) until it stops. If the paper does not feed from the top, the heat sensitive side of the paper will not be in contact with the print head and the printer will not print.

6. With one hand, continue to gently feed the paper strip into the paper feed slot while at the same time pressing the paper advance button with the other hand until the paper feeds by itself. Keep the paper straight when feeding it into the printer or it may jam. Do not force the paper into the slot! If the paper will not feed into the slot, pre-cut the end of the roll again and reload the paper.

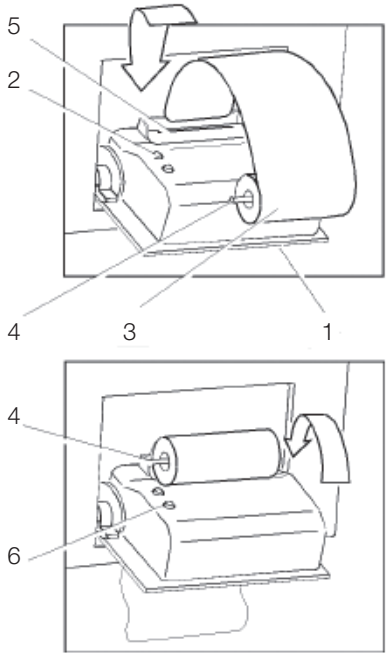


Figure 3.1

7. Continue to press the paper advance button (6) until the paper feeds through the paper exit slot on the front of the printer. Then, move the paper roll (3) and arm into the operating position and close the printer door (1). The printer is now ready to operate.

When you see a red line on one side of the paper, it is time to replace the roll.

If a paper jam occurs, and the paper cannot be removed by pressing the paper advance button (6) do not pull the paper backwards through the printer.

Never put a utensil or tool into the paper exit slot.

For full instructions on how to remove paper jams, see “Removing Paper Jams” below.

To replace the paper roll (3), proceed as follows (see Figure 3.2):

1. With scissors, cut the paper between the roll (3) and the paper feed slot (5)

2. Remove the roll from the arm and discard the unused portion.

3. Press the paper advance button (6) to feed the paper that remains in the printer out of the slot at the front of the printer.

4. Install the new thermal paper roll by following the instructions described above.

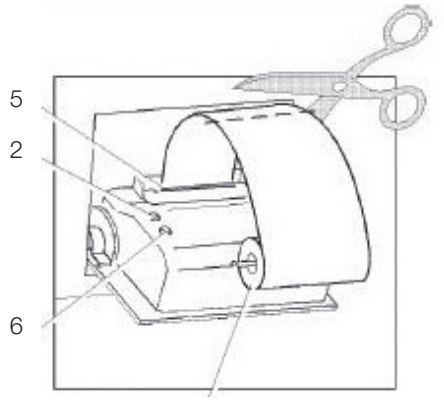


Figure 3.2

Removing Paper Jams

NOTE: If paper jams in the printer and cannot be removed by pressing the paper advance button, the printer must be disassembled. Do not pull the paper backwards through the printer. Never put utensils or tools into the paper exit slot.

When paper is jammed in the printer, proceed as follows:

1. Turn the host unit power OFF.

2. Make sure the printer power button (18) is in the OFF position and disconnect the printer cable (2) (Figure 1) from the STAT*IM* printer connector port and the printer.

3. Using scissors cut the paper between the roll and the paper feed slot (20).

4. Remove the three screws (6) from the printer housing (7) and set them aside for use in reassembling the printer. Remove the housing.

5. Note the orientation of the exposed printed wiring board and the paper roll arm assembled on the printer door (10). Remove the paper roll arm (9) from the clips (11).

6. Gently lift the printed wiring board (8) upwards and away from the printer door (10).

Be careful when handling the board. The printer is integral to the wiring board. Do not place strain on the connections of the ribbon cable soldered to the board. Do not remove the connector of the flexible cable (16) from the connector header on the board.

The paper drive mechanism on the underside of the wiring board is now exposed.

7. Using a pair of tweezers or fine needle-nosed pliers, carefully remove the paper from the mechanism.

8. When the paper is removed, proceed as described in “Replacing the Printer.”

External Serial Printers (for use on Rev. 7.x controller boards ONLY)

When fitting an external printer to a STAT*IM* unit it is recommended that a 'till roll', 'point of sale' or 'receipt' style printer is used similar to the example shown:

Note that these printers are NOT sold by Scican and should be purchased in the relevant territory by the user or the dealer for fitting. They are readily available (typically over the internet).

These printers do not normally come with a cable as standard and a Serial **Null Modem Cable DB9F – DB25M** will be required.

Star SP212FD42-230 'Point of Sale' Printer

Recommended Printers for STAT*IM*s with Revision 7 Controller Boards

The following printers have been tested by SciCan and are recommended for use as an external printer for STAT*IM* 5000 units with Rev. 7 boards. They may be purchased from your local computer store or from an online supplier.

Suggested External Printers by SciCan	End Of Line CR/LF	Serial Port Bitrate	Printer user ° char
Epson TM-U220D (C31C515603)	CR/LF	9600	248 [0xF8]
Citizen IDP-3110-40 RF 120B	CR	9600	N/A
Star Micro SP212FD42-120	CR	9600	210 [0xd2]
Star Micro SP216FD41-120	CR/LF	9600	210 [0xd2]
Star Micro SP512MD42-R	CR/LF	9600	210 [0xd2]

Important notes:

- **The printers referenced above MAY be superseded from time to time. The updated equivalent MAY be able to be used with your STAT*IM* unit but it is important to ensure that the 'End of Line CR/LF', 'Serial Port Bitrate' and 'Printer uses º char' are appropriate to the new printer.**

- **Some of the reference numbers above may contain voltage references (e.g. SP212FD42-120). If the voltage in your region is different, then you should ensure that you obtain a printer with the correct voltage (e.g., for a 230V territory, the printer reference should be SP212FD42-230).**

Installing the external printer on your STAT*IM* unit.

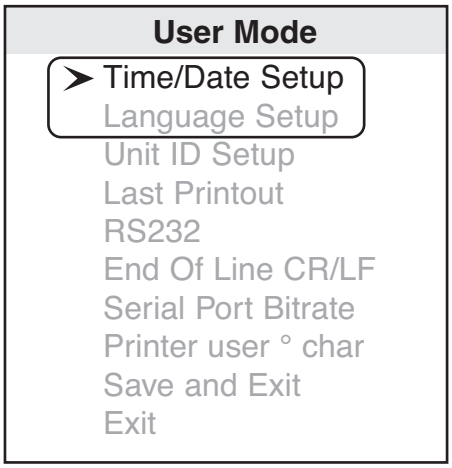
Setting the STAT*IM* unit

Locate the printer port on the rear of the unit and proceed as follows:

1. Ensure the STAT*IM* is powered OFF

2. Press and hold the STOP button and power ON the STAT*IM* unit to access the USER menu.

The following menu is now available and the display on the LCD screen should be as highlighted.



3. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to "RS232" and select it by pressing the RUBBER & PLASTICS button.

4. You should now have the option of "N/A", "USB/Flash MSD" or "Serial Printer" which can be scrolled through by using the UNWRAPPED and WRAPPED buttons.

5. Scroll to "Serial Printer" and press the RUBBER & PLASTICS button to select and return to the user menu.

6.Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to "End of Line CR/LF" and press the RUBBER & PLASTICS button to access the options.

7. Using the UNWRAPPED and WRAPPED buttons, scroll until reaching the desired CR/LF value in the table above (or from the printer's user manual) and press the RUBBER & PLASTICS button to select and return to the user menu.

8. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to "Serial Port Bitrate" and press the RUBBER & PLASTICS button to access the options.

9. Using the UNWRAPPED and WRAPPED buttons, scroll until reaching the desired Bitrate value in the table above (or from the printer's user manual) and press the RUBBER & PLASTICS button to select and return to the user menu.

10. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to "Printer uses º char" and press the RUBBER & PLASTICS button to access the options.

11. Using the UNWRAPPED and WRAPPED buttons, scroll until reaching the desired Hex value in the table above (or from the printer's user manual) and press the RUBBER & PLASTICS button to select and return to the user menu. **Important note: the UNWRAPPED button will increase the displayed value by 1, and the WRAPPED button will increase that displayed value by ten.**

12. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to "Save and Exit" and press the RUBBER & PLASTICS button, which will now save the data, and take you out of the user menu and back to the operating menu.

Note: When printed or electronic records are being kept for future reference, it is important to ensure the correct data is printed, and a check should be undertaken at this stage to ensure that the date, time and unit number (where appropriate) are set before using a data recording device. This may have been undertaken during installation, if not, refer to the user manual or to this service manual's Chapter 13, "Using the service menu" for information on resetting the time, date and unit number.

13. Power OFF the STAT*IM* unit.

Connecting the Printer

1. Connect the printer to the STAT*IM* unit using a Serial Null Modem Cable DB9F – DB25M and secure the cable.
2. Connect the printer power supply to the mains power socket as appropriate to the printer being used.
3. Power ON the printer.
4. Power ON the STAT*IM* unit.
5. The unit is now ready for use.

Data Logger

(for use on Rev. 7.x controller boards ONLY)

Installing the SciCan Data Logger

Setting the STAT*IM* unit

SciCan's Data Logger can record and store cycle information onto a mass storage device (MSD) such as a USB Flash Drive or SD memory card.

The Data Logger is supplied with two cables for connection to 25 pin (early STAT*IM* 2000 units only) and 9 pin (all revision 7 2000 and 5000 units) data ports. The 9 pin cable is the only one required for 5000 units.

NOTE: Statim 5000 units manufactured with internal printers will NOT have a communication port fitted. However,

- **Units that were manufactured with Revision 7.x controller boards should have a cut-out in the chassis with a blanking plate and can be upgraded for data logger use by installing RS232 Port Kit Statim 5000/5000S part number 01-110222S.**

- **Units that were manufactured with Revision 2.x/5.x/6.x controller boards DO NOT have a cut-out in the chassis and CANNOT be upgraded for data logger use.**

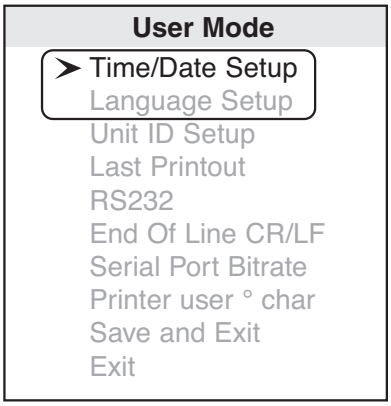
For this operation the **Null Modem Serial Cable DB9F – DB25M** is required

Locate the printer port on the rear of the unit and proceed as follows:

1. Ensure the STAT/*M* is powered OFF

2. Press and hold the STOP button and power ON the STAT/*M* unit to access the USER menu.

3. The following menu is now available and the display on the LCD screen should be as highlighted.



4. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to “RS232” and select it by pressing the RUBBER & PLASTICS button.

5. You should now have the option of “N/A”, “USB/Flash MSD” or “Serial Printer” which can be scrolled through by using the UNWRAPPED and WRAPPED buttons.

6. Scroll to “USB/Flash MSD” and press the RUBBER & PLASTICS button to select and return to the user menu.

7. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to “Serial Port Bitrate” and press the RUBBER & PLASTICS button to access the options.

8. Using the UNWRAPPED and WRAPPED buttons, scroll (if required) to the Bitrate value of **9600** appears in the display and then press the RUBBER & PLASTICS button to select and return to the user menu.

9. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to “Printer uses ° char” and press the RUBBER & PLASTICS button to access the options.

10. Using the UNWRAPPED and WRAPPED buttons, scroll (if required) to the Hex value of **32 [0x20]** appears in the display and then press the RUBBER & PLASTICS button to select and return to the user menu. **Important note: the UNWRAPPED button will increase the displayed value by 1, and the WRAPPED button will increase that displayed value by ten.**

11. Using the UNWRAPPED and WRAPPED buttons, scroll until the cursor is next to “Save and Exit” and press the RUBBER & PLASTICS button, which will now take you out of the user menu and back to the operating menu and will save your changes.

12. The LCD display should now show the following:

HH:MM DD/MM/YYYY

“MSD NOT DETECTED”/”INSERT MSD/FLASH”/”SELECT A CYCLE”

Messages “MSD NOT DETECTED”, “INSERT MSD/FLASH” and “SELECT A CYCLE” will rotate in sequence and not all appear at the same time.

Note: When printed or electronic records are being kept for future reference, it is important to ensure the correct data is printed, and a check should be undertaken at this stage to ensure that the date, time and unit number (where appropriate) are set before using a data recording device. This may have been undertaken during installation, if not, refer to the user manual or to this service manual's Chapter 13, "Using the service menu" for information on resetting the time, date and unit number.

13. Power OFF the STAT*IM* unit

Connecting the Data Logger

1. Connect the Data Logger to the power cable attached to the transformer supplied. **Important note: ensure that the plug is fully inserted in the socket on the Data Logger.**

2. Attach the adaptor suitable for your regional power supply on to the main body of the transformer. Plug in to the mains supply BUT DO NOT SWITCH ON AT THIS TIME.

3. Ensure that the STAT*IM* unit is powered OFF.

4. Using the **Null Modem Serial Cable DB9F – DB25M** supplied, connect the Data Logger to the STAT*IM* unit and secure the cable.

5. Power the Data Logger ON.

6. Power the STAT*IM* unit ON.

The LCD display should now show the following:

HH:MM DD/MM/YYYY

"MSD NOT DETECTED"/"INSERT MSD/FLASH"/"SELECT A CYCLE"

Messages "MSD NOT DETECTED", "INSERT MSD/FLASH" and "SELECT A CYCLE" will rotate in sequence and not all appear at the same time.

7. Insert USB flash drive or SD memory card.

8. **After a few seconds** the LCD display should now show the following:

HH:MM DD/MM/YYYY

USB/FLASH DETECTED/SAFELY REMOVE MSD/SELECT A CYCLE

Messages "USB/FLASH DETECTED", "SAFELY REMOVE MSD" and "SELECT A CYCLE" will rotate in sequence and not all appear at the same time.

9. The unit is now ready for use.

Data Logger Troubleshooting

If the display reads: "MSD NOT CONNECTED <> INSERT MSD/FLASH", proceed as follows to ensure everything is setup correctly.

1. Check the serial cable connection.
2. Check the power connection.
3. Ensure the lower red LED is lit. It is located between the Data Logger's serial port and power input.
4. Check that the Mass Storage Device (MSD) is properly inserted in the appropriate slot of the Data Logger.
5. Repeat the instructions for Installing the Data Logger on your STAT*IM*.

If the display reads: "SAFELY REMOVE MSD <> MSD/FLASH DETECTED", the MSD/Flash can be safely removed without affecting the data.

If the display reads: "MSD/FLASH FULL <> REPLACE MSD", the MSD is full and the data should be downloaded from the MSD.

If the MSD: has missing lines of Data, refer to the STAT*IM* screen to confirm successful sterilization.

The Data Logger may be reset by unplugging its power supply, disconnecting the MSD and waiting 10 seconds. Then re-connect the power adapter and insert the MSD into the Data Logger.

If the problem persists, contact the SciCan Service Center.

If MSD has: Corrupt or unreadable files and/or directories, refer to the STAT*IM* screen to confirm successful sterilization.

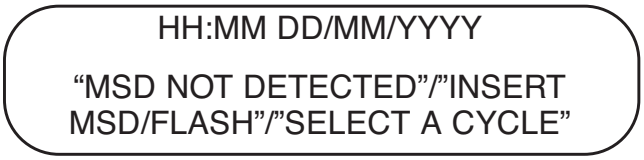
The MSD may have been unplugged while data was being written to it. The MSD should NOT be unplugged until after "SAFELY REMOVE MSD <> MSD/FLASH DETECTED" is displayed.

The corrupted files or directories may be lost. Reformat the MSD on your computer.

Transferring data from the USB drive or SD card

Files are stored on the MSD in txt and pdf format. These can be transferred for storage on a computer hard drive as follows:

1. Ensure the LCD screen of the STAT*IM* reads "SAFELY REMOVE MSD <> MSD/FLASH DETECTED" and the STAT*IM* is in standby. THE UNIT MUST NOT BE RUN WHEN REMOVING THE MSD.
2. Remove MSD from the Data Logger. The STAT*IM* LCD screen should now show the following:



3. Insert the MSD in the relevant port on the computer and wait until the computer has recognised the new device (if transferring for the first time).

4. The contents of the MSD should now be available for viewing in the appropriate application (e.g. Windows Explorer).

5. Locate, or create the preferred folder for storing the data.

6. Data can now be transferred by either:
   a. Drag and Drop
   b. Cut and Paste
   c. Copy and Paste (if you wish to retain the data on the MSD)

7. Safely 'eject' the MSD as appropriate to your computer and remove the MSD.

8. Re-insert the MSD back in to the Data Logger.

9. **After a few seconds** the STAT*IM* LCD display should now show the following:

HH:MM DD/MM/YYYY

USB/FLASH DETECTED/SAFELY
REMOVE MSD/SELECT A CYCLE

10. The STAT*IM* and Data Logger are now ready for use.

Data Logger Specifications

Connection: Serial Cable DB9F-DB25M

Baud Rate: 9600

Electrical Rating: 100V-240V, 0.6A, 50/60 Hz, multiplug

ACKNOWLEDGED MSD

USB Flash Drives:

Cruzer mini 1 GB
Memorex Travel drive 1 GB
Kingston Travel drive 512 MB
PNY Attache 1 GB
Lexar Jump Drive 1 GB

SD Memory Cards:

Kingston 512 MB
Lexar 512 MB
PNY 512 MB
Ultra 512 MB
Kingston ultimate 512 MB

Other USB Flash Drives and SD Cards may also be compatible with this Data Logger.

WARNINGS AND PRECAUTIONS

If you have questions about the unit you are repairing, please do not hesitate to contact your local SciCan representative for information. Also, the STAT*IM* is heavy. Exercise caution and seek assistance when lifting or carrying units.

EXERCISE CAUTION

- Hazardous voltages are accessible when the cover is removed.
- Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.

PERFORM TESTS

- If the cover is removed, a dielectric strength test (Hi-Pot) AND a protective bonding impedance test (ground continuity) must be performed on the STAT*IM* when the work is completed and after the cover has been returned to the unit.

PROTECT THE UNIT

- Use only steam-process distilled water in the STAT*IM*.
- The STAT*IM* contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.
- Ensure there is sufficient steam-process distilled water in the STAT*IM* before activating the pump.
- In order to ensure adherence to the applicable safety agency approvals, state, provincial, regional and national laws, replace components with SciCan approved parts only.

Installation

Environmental Considerations

There are several factors that may affect the performance of your STAT*IM*.
Please review these factors, and select a suitable location in which to install the unit.

Temperature and Humidity

Avoid installing your STAT*IM* in direct sunlight or close to a heat source (e.g. vents or radiators). The recommended operating temperatures are 15-25˚C (59˚F to 77˚F) with humidity of 25-70%.

Spacing

The vents and openings on the STAT*IM* should remain uncovered and unobstructed. Leave a minimum of 50 mm/2˝ between the top, sides and back of the unit and any wall or partition.

Venting

The STAT*IM* should be operated in a clean, dust free environment.

Work Surface

The STAT*IM* should be placed on a flat, level, water-resistant surface.
Never install and operate the unit on a sloped surface.

Electromagnetic Environment

The STAT*IM* has been tested and meets applicable standards for electromagnetic emissions. While the unit does not emit any radiation, it may itself be affected by other equipment which does. We recommend that the unit be kept away from potential sources of interference.

Electrical Requirements

Use properly grounded and fused power sources with the same voltage rating as indicated on the label at the back of your STAT*IM*. Avoid multiple outlet receptacles. If using a surge suppressor power bar, plug in one STAT*IM* only.

Unit Placement

When placing the unit on a counter top, ensure the following:

The level indicator bubble (1) on the front panel should be balanced in the front right quadrant of the target. This will ensure that the unit drains properly. Adjusting the three leveler feet will help you move the bubble if necessary.

The unit should be stable and all four feet should be securely in contact with the counter surface. This will prevent the unit from moving freely.

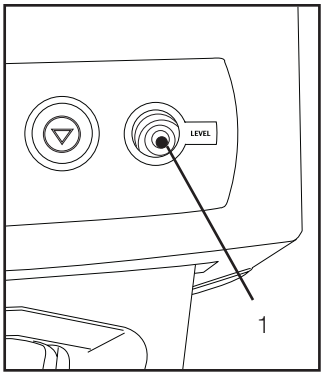


Figure 1

Connecting the Waste Bottle

The waste bottle (2) is used to collect the wastewater after it has been converted to steam and then drained from the cassette. To connect the waste bottle to the STAT*IM*, follow these steps (see Figure 2):

1. Insert the exhaust (3) tube into the fitting (4) on the back of the unit and connect tightly.
2. Cut the tube to length and slide the waste bottle fitting (5) into place.
3. Place the free end of the tube into the hole in the lid of the waste bottle and hand-tighten the fitting. Do not coil the exhaust tube.
4. Unscrew the lid and copper condenser coil (6) assembly from the waste bottle. The lid and coil should come out together.
5. Fill the waste bottle with water to the MIN line and replace the lid and copper condenser assembly. Empty the waste bottle often to avoid unpleasant odors and discoloration of the contents. (A low-level disinfectant, prepared according to the manufacturer's instructions, may be added to the waste bottle to remedy this situation). As a minimum, empty the waste bottle each time you refill the reservoir.
6. Place the waste bottle near the unit. Store the bottle below the unit. The tube can be routed through a hole, (8 mm/0.3″ in diameter) in the counter-top and secured with the provided nylon clamps.

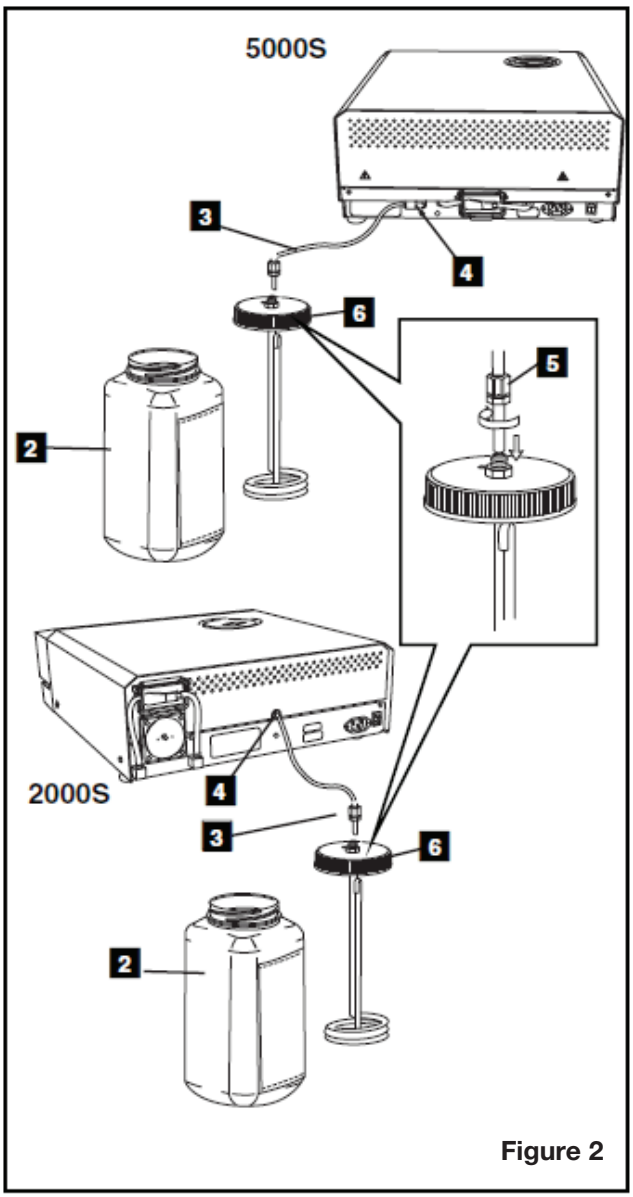


Figure 2

Filling the STAT*IM* Reservoir

When filling the reservoir, ensure you only use steam processed distilled water containing less than 5 ppm total dissolved solids (having conductivity of less than 10 µS / cm). The impurities and additives in other water sources will cause an error reading on the LCD. If you have a water conductivity meter (available from SciCan, order number 01-103139S) check each new water container before filling the reservoir. If your unit is equipped with a Rev. 7.x controller board or higher (software SxxxR6xx), you can read the water conductivity by referring to the 'Water Quality' sub menu in the main user menu.

To fill the reservoir, follow these steps (see Figure 3):

1. Remove the reservoir cap (2)
2. Pour steam-process distilled water into the reservoir until almost full (a maximum of 4L/1 U.S. gal). Use a funnel to avoid spillage.
3. Replace and secure the cap.

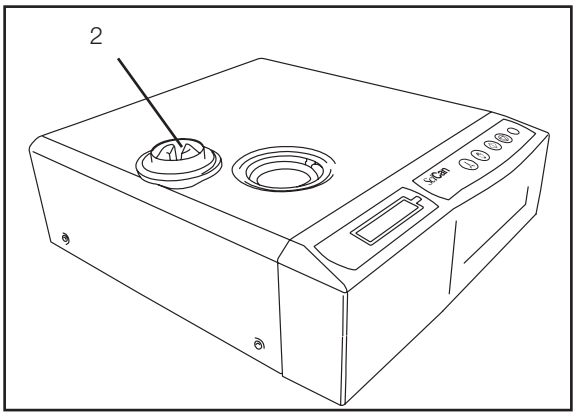


Figure 3

Priming the STAT*IM* Pump

To prime the STAT*IM* pump, follow these steps (see Figure 4):

1. Move the unit to the edge of the work surface. The front leveler feet should be approximately 12 mm/0.5″ from the edge.
2. Lift the front left corner of the unit upward and remove the drain tube (3) from the clip located on the underside of the unit.
3. Pull the drain tube outward so the free end can be positioned over a water container.
4. Fill the reservoir with steam-process distilled water.
5. Remove the plug (4) from the end of the drain tube and allow water to drain from the tube into a container for 30 seconds. When the water flows in a steady stream, replace the stopper.
6. Lift the front left corner of the unit upward and reinsert the tube into the clip on the underside of the unit. Push the excess length of tubing back into the space provided.

Make sure the plug in the drain tube is secured.

After installation, and before sterilizing any instruments, run two cycles.

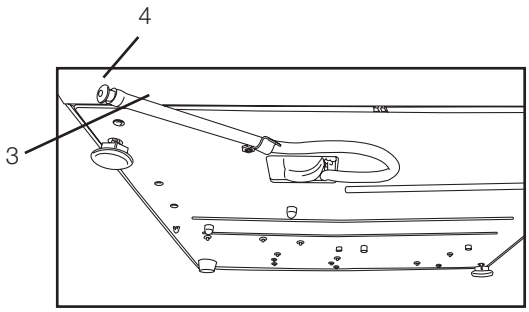


Figure 4

Powering up and setting up the unit

1. Attach the main power cable to the unit and to the outlet socket.
2. Switch on the outlet socket (if appropriate) and then the unit via the power switch on the rear of the unit.
3. Check that the display illuminates.

Setting the Time and Date

For STAT*IM* G4:

See Using the LCD Service Menu on the STATIM G4 in Chapter 3 to access Time and Date.

4. For STAT*IM* Classic, follow these steps and watch the blinking cursor on the LCD:Power the STAT*IM* **OFF**.
5. Press and hold the UNWRAPPED cycle button.
6. While pressing the UNWRAPPED cycle button, power the STAT*IM* **ON**. The LCD display reads:
7. Use the cycle buttons to select and change the selected field's value. To increase a field's value, press the UNWRAPPED cycle button. Hold the button down to increase the value.

Display when setting the Date / Time

8. To select the next field, press the START button.
9. To save changes and return to the regular operating mode, press the **STOP** button.
10. To quit without making changes, power the STAT*IM* **OFF**.

Language Selection

For STAT*IM* G4: See Using the LCD Service Menu on the STAT*IM* G4 in Chapter 3 to access Language Selection.

For STAT*IM* Classic, the messages displayed on the LCD can be changed to a number of different languages.

Display when scrolling through languages

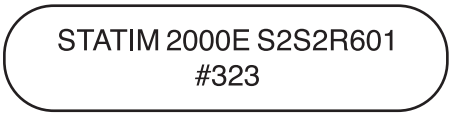
To change the current language selections, follow these steps:

1. Turn the power switch at the back of the unit **OFF**.
2. Press and hold the WRAPPED cycle button.
3. While depressing the WRAPPED cycle button, turn the power switch at the back of the unit to **ON**.
4. Press the UNWRAPPED cycle button to scroll to the next language selection.
5. Press the WRAPPED cycle button to scroll to the previous language.
6. When the desired language is displayed, press the **STOP** button to save the selection and return to the regular operating mode..

Assigning Unit Identifier Number

For STAT*IM* G4: See Using the LCD Service Menu on the STAT*IM* G4 in Chapter 3 to access Assigning Unit number

For STAT*IM* Classic, follow these steps:



Display when assigning unit number

7. Power the STAT*IM* **OFF**.
8. Press and hold the RUBBER / PLASTIC cycle button.
9. While pressing the RUBBER / PLASTIC cycle button, power the STAT*IM* **ON**.
10. Using the cycle buttons, select a maximum of 3 digits to be used as the unit's identifier. The UNWRAPPED button will increase the selected value. Use the RUBBER / PLASTIC to move to the next digit.
11. To save changes and return to the regular operating mode, press the **STOP** button.

Setting/Editing Serial Number

NOTE: This function is available on Rev. 7 controller boards with software revision SXXXR612 on STAT*IM* Classic, and software revision SXXXR700 on STATIM G4.

For STAT*IM* Classic, follow these steps::

1. Power **ON** the STAT*IM* while holding down the UNWRAPPED and WRAPPED keys.
2. Enter the service password to access the service menu.
3. The default password is entered by pressing the UNWRAPPED, WRAPPED, RUBBER & PLASTICS and **STOP** keys in that order (a backdoor password can also be used by pressing the UNWRAPPED, WRAPPED, UNWRAPPED, WRAPPED keys in this order).
4. Enter the Service Menu and select EDIT SERIAL NUMBER from the list.
5. Use the UNWRAPPED button to increase the selected digit and the WRAPPED button to decrease the selected digit.
6. Use the RUBBER & PLASTIC button to select the next adjacent digit.
7. To save changes and return to the regular operating mode, press the **STOP** button.

For STAT*IM* G4, follow these steps:

1. Access the Service Menu as described in Using the LCD Service Menu on the STAT*IM* G4 in Chapter 3 and scroll to SET SERIAL NUMBER.
2. Use the first pair of the arrow buttons to move from one digit to the next. Use the second pair of arrow buttons to change digit values.
3. To save changes and return to the regular operating mode, press the **STOP** button

NOTE: The serial number can be set also by using a Barcode Scanner connected onto the RS232 port (Settings: 96008N1, CR/LF at the end of string).

Setting Air Drying Time

NOTE: This function is available on Rev. 7 controller boards with software revision SXXXR612 on STAT*IM* Classic, and software revision SXXXR700 on STAT*IM* G4. However, this function is not available on U.S. STAT*IM* models.

For STAT*IM* Classic, follow these steps:

1. Power up unit while pressing the **STOP** button to access the User Setup menu.
2. Using the UNWRAPPED and WRAPPED buttons, scroll to AIR DRYING and select it by pressing the RUBBER AND PLASTIC button.
3. Use the UNWRAPPED and WRAPPED buttons to change the displayed values and the RUBBER AND PLASTIC button to select and move to the next digit. Press the **STOP** button when completed.

For STAT*IM* G4, follow these steps:

1. Access the Service Menu as described in Using the LCD Service Menu on the STAT*IM* G4 in Chapter 3 and scroll to DRYING TIME.
2. Use the first pair of the arrow buttons to move from one digit to the next. Use the second pair of arrow buttons to change digit values.
3. To save changes and return to the regular operating mode, press the **STOP** button.

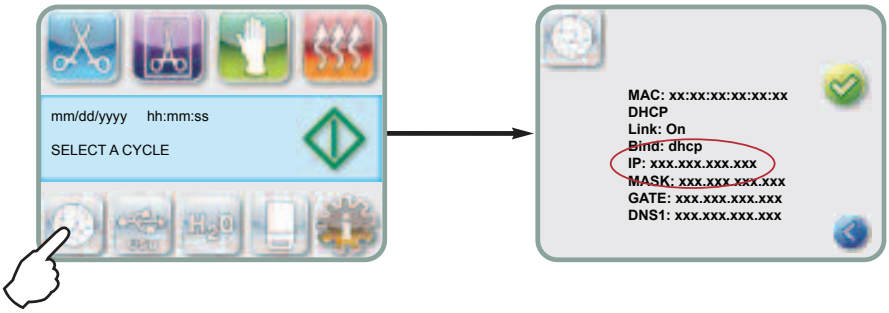
Connecting STAT*IM* 5000 G4 to a Network

The STAT*IM* G4 has a 10/100Base-T Ethernet port located at the back of the unit.
To connect it to a network using a router, follow these steps:

1. Connect the network cable to the Ethernet port at the back of the unit. If the customer's office uses a router, the router should automatically assign the unit an IP address. You will know the IP address has been assigned when the red X over the Network icon disappears.

NOTE: In some circumstances, where there is no router, for example when using Windows Network Sharing, you may have to assign a dedicated or 'static' IP address. To assign a static IP address, contact your local network administrator.

2. From the main screen, press the NETWORKING icon  . The Networking screen displays information about the STAT*IM*'S connectivity, including its IP address.



3. Type the IP address displayed on the touchscreen into the browser of any computer connected to the same network as the STAT*IM* to access your unit's web portal. You will know that an IP address has been assigned when the red X over the Network icon disappears.

NOTE: Connection time will vary depending on the network speed, and making an initial connection may take longer.

Connecting to a wireless network

The STAT*IM* G4 can be configured for wireless use by connecting the Ethernet port to an external wireless bridge / access point. SciCan currently recommends the use of the D-Link® DAP-1522 Xtreme N® Duo Wireless Bridge. Contact the customer's network administrator to learn more about setting up a wireless bridge.

Setting up the web portal

This web portal is a direct connection to the STAT*IM* on the customer's network. It is protected by the customer's firewall and not accessible to outside users. To set up the web portal follow these steps:

Setting up the CONTACTS page

1. Click on the SETUP page and go to the CONTACTS tab.
2. Here you will be prompted to provide a user name and password. For both the user name and password, the default is "scican". Use it to enter and thenyou can customize it using the PASSWORD tab.
3. The information you use to fill the fields on the CONTACTS page, such as office name, address and uploaded logo, is then used to customize the customer's web portal home page and print outs.

Setting up the LAN page

1. From the SETUP page, use the LAN tab to check your network settings.
2. If the office is using a router, keep the Automatic IP box checked. This will populate the fields for correct network settings automatically.
3. If you want to assign different values to these fields, uncheck the box, populate the fields and click Save to preserve the changes.

Setting up email

1. From the SETUP page, use the REMOTE tab to assign the unit an email address.
2. Your STATIM must use an email account set up either with your Internet service provider or with a web-based email service. Populate the email account fields on this page with your provider's information if you are working with an email address from your Internet service provider. To use one of the STATIM web portal's preset email servers (choose from gmail, gmx mail, Yahoo and MSN mail), you must create an account for your STATIM (e.g. drsmithstatim@gmail.com).
3. A test email will be sent to verify your settings. Uncheck the box if the customer does not want to receive downloads and promotions from SciCan.

Setting up email NOTIFICATIONS

1. From the SETUP page, use the NOTIFICATIONS tab to enter the email addresses to which will be sent operating information and/or cycle faults.
2. A configurable message box lets you add details to identify the unit, such as its location.
3. Uncheck the box if the customer does not do not want SciCan Technical Service to automatically receive the unit's cycle fault emails.

NOTE: If you are not receiving emails from the unit, check the spam filter to be certain the STAT*IM* has been identified as an accepted email source.

Setting the TIME zone and Internet synchronization

1. From the SETUP page, use the TIME tab to set the time and according to the customer's time zone and check the box for the unit to synchronize automatically with dedicated Internet time servers. It will then automatically reset its clock whenever it connects to the network.

NOTE: It will override any manual changes made to time settings directly on the unit.

Setting the PASSWORD

1. Set a new user name and password to keep unauthorized users from changing the configurations made on ConnectIM as well as the Contacts information the STAT*IM* uses to generate forms.
2. From the SETUP page, go to the PASSWORD tab. Note that both the default user name and password is 'scican'.

Setting up a BACKUP

1. From the SETUP page, use the BACKUP tab to back up all the configurable changes and Contacts information made on the STAT*IM*'s web portal by storing a file on the office computer.
   NOTE: For security reasons, your email password will not be saved.
2. Click download settings to automatically store all settings in a file on the computer (TIP: Use the Save function on the computer to choose a specific location, otherwise it will load the file in a default location preset by the browser).
3. To restore settings, click Choose file and browse for the file on the computer, select it and click Restore.

Using TESTS

1. From the SETUP page, click on the TOOLS tab.
2. From here you can run a simple pass or fail test to check the network connectivity. The results will confirm whether you are accessing the Internet, accessing a router and whether the unit has a proper IP address.

Preparing Unit for Use

Once the unit is installed and before any instruments are sterilized, run two cycles. Remove the cassette once it has cooled. Clean the top (lid) and bottom (tray) sections using a soft cloth to wipe the inside surfaces and then rinse thoroughly with tap water. Once the cassette is clean and dry, coat the inside surfaces with STAT-DRI. Please note that STAT-DRI drying agent is not be to used with the U.S. models of the G4 models (G4-121101 and G4-201103).

Shipping the Unit

Before you move the unit, you will need to drain the reservoir. To do so, follow these steps:

1. Place a water container below the unit.
2. Using the drain tube (see Priming the STAT*IM* Pump, Figure 4) empty the contents of the reservoir into the water container.
3. Remove any remaining water from the reservoir with a non-linting, absorbant towel.
4. Screw-in the three leveler feet found underneath the unit.
5. Repack the unit in the original packing materials and include all accessories originally included with the unit.
6. Specify heated and insured shipping.

Unit installation checklist

Listed below you will find a generic check list for use when installing a STAT*IM* unit to ensure installation is complete.

1. INVENTORY CHECK

Open box and check contents:

- ☐ STAT*IM* unit
- ☐ Cassette tray and lid
- ☐ Unwrapped instrument rack (inside cassette)
- ☐ Waste bottle
- ☐ Waste bottle lid and condenser fitting
- ☐ Tube mounting hardware (clips and screws)
- ☐ Power cord
- ☐ Operators manual
- ☐ Certificate of testing
- ☐ Exhaust tube
- ☐ STAT-DRI (not available for U.S. G4 models)
- ☐ Drying plates (5000S only)
- ☐ Process Challenge Device (Helix) with test strips (S units only)

2. UNIT INSTALLATION

Set up unit as follows:

- ☐ Locate unit and level
- ☐ Connect Waste bottle
- ☐ Fill Reservoir with steam distilled water
- ☐ Prime pump
- ☐ Connect mains lead and switch on machine
- ☐ Install printer if appropriate
- ☐ Set time and date
- ☐ Check and select language as appropriate
- ☐ Assign unit number if required
- ☐ Assemble and insert cassette.
- ☐ Run unit

3. TESTING THE UNIT

Power up unit and run as follows:

- ☐ Check cycle selection on all cycles.
- ☐ Assemble test helix and integrator as per helix instructions. (S units only).
- ☐ Remove cassette and place assembled helix on instrument rack.
- ☐ Insert cassette and run a Hollow Wrapped Cycle (S units)/ Wrapped cycle (non S units).
- ☐ Check for steam leaks
- ☐ At end of cycle, (no drying) remove cassette and remove helix.
- ☐ Check integrator for pass/fail (✔ = pass ✖ = fail)* (S units only)
- ☐ Run 2nd Hollow Wrapped/Wrapped cycle

If the integrator shows a fail, do not use the unit. Replace unit and call SciCan representative.

14. STAT*IM* Operational Diagram