

# Specifications

The SAM Module is a double high module that interfaces with a patient monitor via a Rac 2A housing or a Tram-Rac 4A housing (using either the lower two slots or the upper two slots).

## Performance Specifications

Information Displayed:	Inspired and expired CO <sub>2</sub> , N <sub>2</sub> O, O <sub>2</sub> <sup>*</sup> , and Agent concentrations in %, mmHg or kPa; respiratory rate, continuous CO <sub>2</sub> and O <sub>2</sub> <sup>*</sup> waveforms.
Measurement Range:	
CO <sub>2</sub> :	0 to 10%
N <sub>2</sub> O, O <sub>2</sub> <sup>*</sup> :	0 to 100%
Isoflurane, Halothane, Enflurane, Sevoflurane:	0 to 7%
Desflurane:	0 to 20%
Rise Time (10-90%, at 250 ml/min SAM, 150 ml/min SAM-80):	
CO <sub>2</sub> :	< 400ms
O <sub>2</sub> <sup>*</sup> , N <sub>2</sub> O, Agents:	< 600ms
Accuracy:	
O <sub>2</sub> <sup>*</sup> :	± 2% Abs.
N <sub>2</sub> O:	± 5% Abs.
CO <sub>2</sub> , Hal, Enf, Iso, Des, Sevo:	± 0.2% Abs. or ± 5% of reading, whichever is greatest
Detection threshold of second anesthetic agent in mixture:	0.3% of agent gas.
Trends:	All gas values and respiratory rate for up to 24 hours
Sampling:	Sidestream
Technology:	Infrared for CO <sub>2</sub> , N <sub>2</sub> O, agents Paramagnetic for O <sub>2</sub> <sup>*</sup>
Flow rate:	
SAM:	250 ml/mn ±40 ml/mn
SAM-80:	150 ml/mn ±40 ml/mn
Calibration:	Automatic zero to room air for all gasses
Gas compensation on CO <sub>2</sub> :	N <sub>2</sub> O (automatic) O <sub>2</sub> <sup>*</sup> (automatic) Temperature (automatic) Atmospheric pressure (automatic)
Alarms:	
Type:	Automatic (with defaults) and manual as set in the patient monitor
High/low expired:	CO <sub>2</sub> , N <sub>2</sub> O, O <sub>2</sub> <sup>*</sup> and agent
High/low inspired:	CO <sub>2</sub> , N <sub>2</sub> O, O <sub>2</sub> <sup>*</sup> and agent
Respiratory rate:	Adjustable high and low
On-screen occlusion alarm	
No breath detection system	
System diagnostic alarms	
Temporary silence:	2 minutes with automatic reset
Input:	
System interface:	May be used with Tramscope, Solar, and Eagle 3000

# 4 CALIBRATION

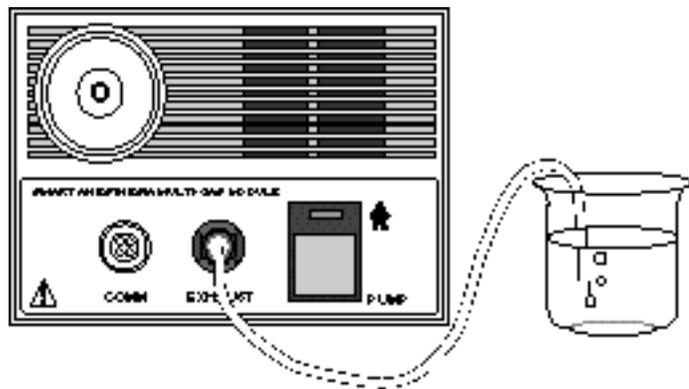
# Leak Test

On an annual basis, or whenever there is a suspected leak in the pneumatic circuit, you should perform a leak test.

Before you perform the leak test, turn the gas analyzer on for at least 30 minutes to allow the temperature of the unit to stabilize.

With the unit stabilized and in its normal operating mode, complete the following steps:

1. Connect a length of tubing from the exhaust (EXH) port on the front of the SAM module and place it in a beaker of water as shown below.




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## WARNING

**Do not** “experiment” with any commands found in the SERVICE MODE menu.

The Service Mode menu is intended for use only by qualified personnel. It is possible to lose patient data, damage the operating software for the patient monitor, and even affect the GE Unity Network.

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2. At the patient monitor, execute the following menu sequence starting from the MAIN menu:

MONITOR SETUP

SERVICE MODE

Password

Enter day and month from the monitor screen with leading zeros (i.e.: July 4 = 0407).

CALIBRATE

CALIBRATE SAM

SERVICE BENCH

3. Completely block the sample inlet on the front of the module by connecting a short piece of tubing and pinching the tube off. Wait about 10 seconds until the plumbing circuit pumps down to a blocked line vacuum.

4. For 15 seconds count the number of bubbles that may appear in the beaker. Less than 6 bubbles in 15 seconds is acceptable.
5. Return to the MAIN MENU and observe that (after 5–7 seconds) a BLOCKED LINE message appears on the screen.
6. Remove the block from the Sample Inlet. Next use the Trim Knob control to select either parameter window then press it to display the next message. Finally select CLEAR MESSAGE to clear the BLOCKED LINE message.

The pump stops for about 5 seconds then restarts. Air bubbles should once again be visible exiting the tube.

7. Proceed to “Calibration” on the following pages.

# Quick Calibration

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## NOTES

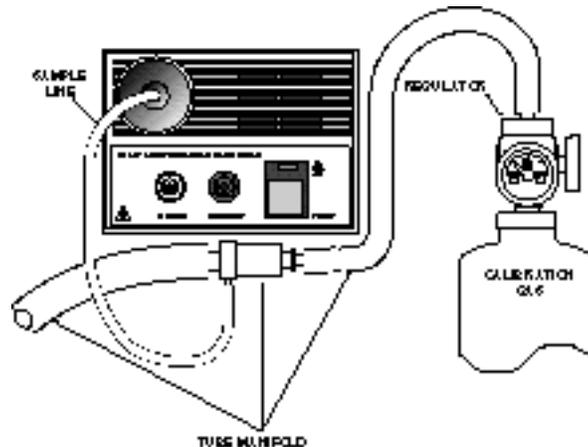
Quick calibration is not a feature of Tramscope software version 17C.

Module temperature must be stable. Allow the module to run for at least 30 minutes before doing a quick calibration.

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A quick calibration should be performed every six months and any time a question arises concerning the module's operation. A quick calibration uses a one-cylinder, multiple gas mixture. The set-up of the calibration kit (pn 415531-002) is shown below.



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## CAUTION

**Do not** pressurize the module.

**Do not** cover the end of the calibration airway adapter tubing.

Introduction of gas into the module must be passive.

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Complete all of the following steps to calibrate the module.

1. Set up for monitoring but remove the Aqua-Knot water trap and have no patient connected.
2. Use the Trim Knob control to display the CO<sub>2</sub> menu.
3. Select CALIBRATE MODULE option from the CO<sub>2</sub> Menu. (You should see a popup menu with APPLIED and ABORT choices.)
4. Attach the regulator to the gas cylinder.
5. Connect the sample line to the regulator.

6. Open the regulator.
7. Wait until the CO<sub>2</sub> has reached peak value, then select APPLIED from the popup menu.

Calibration is completed in a matter of seconds.

*If successful*, the unit displays no message and the unit returns to the normal operating condition.

*If unsuccessful*, the message “CALIBRATE MODULE” appears in the CO<sub>2</sub> values window.

- If insufficient calibration gas was the cause, the message can be cleared with the CLEAR MESSAGE option in the CO<sub>2</sub> Menu and the procedure repeated.
  - If the values were too far out of range for this automatic calibration, do not use the module. Call GE Service and ask for Technical Support to help with troubleshooting. (See “How to Reach Us” in Chapter 1, “Introduction.”)
8. When calibration is complete, close the regulator and remove it from the gas cylinder to prevent gas loss during storage.