6. Preventive Maintenance

6.1.   Introduction

Contact your local Service Center or refer to the Service Manual for service instructions and performance tests and checks. Maintenance should be performed by qualified service technicians only. Contact Capnographytechnicalsupport@medtronic.com for additional information.

When the monitor is in Service Mode, no alarms, whether patient or equipment, will sound.

6.2.   Monitor Service Hours

The number of hours the monitor may continue working before service is required and before calibration is required appears in the main Service Mode screen; an example is seen in *Figure 48. Service Mode Screen* on page 177.
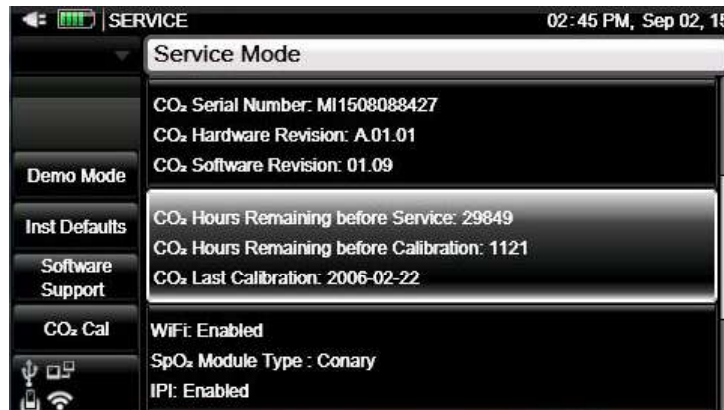
In addition to required service as described above, regular maintenance and safety checks should be scheduled with a qualified service technician every 24 months. Contact Capnographytechnicalsupport@medtronic.com for additional information.

Battery back-up time of the Li-ion battery may degrade over a period of time. To avoid degradation of battery capacity, it is recommended that the battery pack be replaced every two years. This should be part of the regular maintenance and safety checks scheduled every 24 months.

This information can be viewed on the service screen by clicking the **Menu** button on the front panel of the monitor and then **Setup>Service**. Enter the service password (reference *13.1 Monitor Service Password* on page 247) and click **Done** to open the Service Mode screen. Use the right arrow to move to the center of the screen and use the down arrow to scroll down to the relevant section, in which the following information is provided:

- **CO_2 Hours Remaining Before Service**

- **CO_2 Hours Remaining Before Calibration**

- **CO_2 Last Calibration**

Figure 48. Service Mode Screen

6.3. CO_2 Calibration

The unit is calibrated when it leaves the factory.

It is recommended that you calibrate the monitor within two weeks of the **Calibration Required** message appearing on the monitor.

CO_2 monitoring on the monitor will enter standby mode automatically in cases when the monitor is left on for 30 minutes or longer without a FilterLine attached. This automatic standby mode reduces the need for frequent calibration in use cases in which the monitor is left on for long periods of time without a FilterLine attached. In these cases, time periods in which a monitor is turned on but a FilterLine is not attached will not count towards time to calibration, thus preventing the need for unnecessary calibrations.

Caution:
The calibration must be performed with a manufacturer authorized Calibration Kit containing a gas mixture of 5% CO_2 21% O_2 and Bal N_2 and the authorized connecting means ("T" piece).

A manufacturer-approved Calibration Kit can be purchased from Scott Medical (part numberT4653ORF-2BD). It includes:

- **Calibration Gas containing 5% CO_2, 21% O_2 Bal N_2**

- **Tubing Adapter ("T" Piece)**

- **Calibration Line (Calibration FilterLine)**

If this process is performed while a battery powers the monitor, make sure that the battery is fully charged.

Prior to checking the calibration, verify that the Calibration Line supplied with the Calibration Kit is firmly attached.

Calibration shall be performed as follows:

1. Click the **Menu** button on the front panel of the monitor.

2. Navigate to and select **Setup** on the Menu screen.

3. Navigate to and select **Service** on the Setup Menu screen.

4. Input Service password and click **Done.**

5.   Select **CO₂ Cal.**

6.   Select **Start** and follow the instructions on the screen.

7.   The instructions on the screen will guide you regarding the rest of the process, including results, until you reach the screen which will provide you with calibration results.

6.4.   CO$_2$ Calibration Check

Caution:
The calibration check must be performed with a manufacturer authorized Calibration Kit containing a gas mixture of 5% CO_2 21% O_2 and Bal N_2 and the authorized connecting means ("T" piece).

A manufacturer-approved Calibration Kit can be purchased from Scott Medical (part numberT4653ORF-2BD). It includes:

- Calibration Gas containing 5% CO_2, 21% O_2 Bal N_2

- Tubing Adapter ("T" Piece)

- Calibration Line (Calibration FilterLine)

If this process is performed while a battery powers the monitor, make sure that the battery is fully charged.

Prior to checking the calibration, verify that the Calibration Line supplied with the Calibration Kit is firmly attached.

6.4.1. Calibration Check Procedure

Note:
At any stage in the Calibration Check procedure, you

> can go back to the first screen by clicking the **Back** button on the front panel.

The Calibration Check process includes the following steps:

1. Click the **Menu** button on the front panel of the monitor.

2. Navigate to and select **Setup** on the Menu screen.

3. Navigate to and select **Service** on the Setup Menu screen.

4. Input Service password and click **Done.**

5. Select **CO_2 Cal.**

6. Select **Cal Check** and follow the instructions on the screen.

7. Connect a FilterLine to the monitor and click **Start**.

8. Follow the instructions on the screen and click **Continue**, or click **Abort** to stop the Calibration Check.

The instructions on the screen will guide you regarding the rest of the process, including results.

6.5. Operations Log

The monitor provides the option of accessing a monitor operations log for troubleshooting, maintenance and other purposes.

The Operations log can be accessed as follows:

1. Click the **Menu** button on the front panel of the monitor.

2. Navigate to and select **Setup** on the Menu screen.

3. Navigate to and select **Service** on the Setup Menu screen.

4. Input Service password and click **Done.**

5.   Navigate to and select **Software Support** and then **Operations Log**.

6.   Navigate to and select drive on which data shall be stored.

7.   Select **Start** to begin downloading the data in txt format.

The following information is stored in the Operations Log (with date and time):

- Institutional defaults settings at turn-on

- Any change of settings

- Patient Admit/Discharge

- Patient IDs

- Alarms occurrences

- Times in pump-off mode

- Error code/messages

- User button presses

- Times in Temporary/Permanent alarm silence

The operations log includes a maximum of 4000 entries per category or 30 days of information.

6.6.   Service Statistics Report

The monitor provides the option of accessing a Service Statistics Report for troubleshooting, maintenance and other purposes. The report can be stored on USB flash drive or micro SD card as a txt file. This is intended for use by service technicians, who may contact Capnographytechnicalsupport@medtronic.com for more information.

The Service Statistics Report can be stored as follows:

1.   Click the **Menu** button on the front panel of the monitor.

2.   Navigate to and select **Setup** on the Menu screen.

3.   Navigate to and select **Service** on the Setup Menu screen.

4.   Input Service password and click **Done**.

5.   Select **Software Support>Advanced Support>Service Data**.

6.   Enter Service Mode password and click **Done**.

7.   Navigate to and select **Output to USB** and select the USB device.

6.7.   Maintenance

Contact your local representative to order spare parts, calibration kits, or to get answers to any questions regarding service and periodic maintenance.

6.8.   Cleaning

Germicidal disposable cloth wipes, or wipes moistened with Isopropyl alcohol or 96% Ethanol may be used to clean the monitor. Cleaning with a wipes moistened with these solutions should be followed by wiping the monitor with distilled water. Caustic or abrasive cleaners should not be used to clean the monitor.

Read the Instructions for Use enclosed with each reusable SpO_2 sensor before attempting to clean the sensor. Follow the sensor cleaning and disinfecting procedures in the particular sensor's Instructions for Use. SpO_2 sensors which are not reusable should not be cleaned. All Microstream CO_2 sampling lines are not reusable and should not be cleaned.

WARNING:
The device is not sterile. Do not autoclave or sterilize this device.

Caution:
Do not spray or pour any liquid directly on the monitor, accessories or consumables.

Caution:
Do not use caustic or abrasive cleaners, or harsh solvents, including petroleum-based or acetone solutions, to clean the device.

Caution:
Microstream™ etCO$_2$ consumables are designed for single patient use and are not to be reprocessed. Do not attempt to clean, disinfect or blow out the FilterLine as the monitor can be damaged.

Caution:
Do not expose SpO$_2$ sensor connector pins to cleaning solution as this may damage sensor.