Agilent

Agilent CrossLab CS
Electronic Leak Detector

Operation Manual

Notices

Manual Part Number

G6693-90000

Edition

Third edition, May 2024
Printed in USA

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Warranty

Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Leak Detector

Introduction

Figure 1. The Agilent CrossLab CS leak detector front screen buttons.

The Agilent leak detector is controlled with two buttons on the front of the instrument directly below the screen, as shown in **Figure 1**. The functions of these buttons are described in this section.

Power/Mode button

The Power/Mode button is used to switch the leak detector on and off, as well as to scroll through and select different operational modes.

- To turn on the instrument, briefly press and release the Power/Mode button.
- To turn off the instrument, press and hold the Power/Mode button for three seconds.
- To scroll through the available modes, when the instrument is on, briefly press and release the Power/Mode button.

Enter/Clear/Toggle button

The Enter/Clear/Toggle button is used to access additional functionality within the operating modes.

- To reset the baseline of detection in **Detection** mode, briefly press and release Enter/Clear/Toggle button.
- To change the settings in **Info** mode, press and hold the Enter/Clear/Toggle button for two seconds.

Switching the leak detector On and Off

With the Leak Detector powered off, briefly press and release Power/Mode button to turn the unit on. The screen will flash the words **Leak Detector** for approximately three seconds, then begin operating.

Figure 2. The initial screen display for the Agilent leak detector.

With the unit powered on, press and hold the Power/Mode button for three seconds to power down the unit.
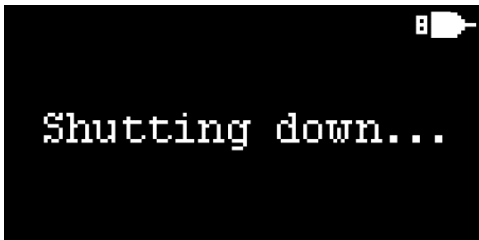
Figure 3. The shutdown screen for the Agilent leak detector.

Notes, Cautions, and Warnings

| NOTE |

- The tubing is not replaceable. Do not attempt to remove the tubing.
- The filter is the only serviceable part in the leak detector cartridge.
- Annual calibration for the leak detector cartridge is not necessary.
- Update to the latest firmware if the leak detector cartridge is being used with ADM Flow Meter mainframe with firmware version 1.2.1911.1501 and below.

| CAUTION |

- **Do not use the leak detector to detect corrosive gases.**
- **Do not expose the probe tip to extreme sources of heat.**
- **Do not use the leak detector to probe in areas where there are solvents or liquids (such as snoop).**
- **Do not use the leak detector in temperatures outside of its specified operating range.**
- **Do not use the leak detector in high humidity environments outside of its specified humidity range.**
- **The probe should not be misused for other purposes except to conduct sniffing in suspected leak areas.**

| WARNING |

- **Use only a 5 V DC, 0.5 A USB power source and the supplied USB cable to run this device.**
- **Do not use the leak detector in hazardous environments where there are large leaks of flammable gases.**
- **Do not use the leak detector as safety equipment.**

WARNUNG

- Verwenden Sie zum Aufladen dieses Geräts ausschließlich eine 5v DC, 0,5A USB-Stromquelle und das mitgelieferte USB-Kabel.
- Verwenden Sie den Lecksucher nicht in gefährlichen Umgebungen, in denen große Mengen an brennbaren Gasen austreten.
- Verwenden Sie den Lecksucher nicht als Sicherheitsausrüstung.

ATTENTION

- Utilisez uniquement une source d'alimentation USB 5 V CC, 0,5 A et le câble USB fourni pour charger cet appareil.
- N'utilisez pas le détecteur de fuites dans des environnements dangereux où de grandes fuites de gaz inflammables existent.
- N'utilisez-pas le détecteur de fuites comme équipement de sécurité.

ATTENZIONE

- Per caricare questo dispositivo, utilizzare solo una fonte di alimentazione USB da 5 V CC, 0,5 A e il cavo USB in dotazione.
- Non utilizzare il rilevatore di fughe in ambienti pericolosi in cui vi siano importanti fughe di gas infiammabili.
- Non utilizzare il rilevatore di fughe come apparecchiatura di sicurezza.

ADVERTENCIA

- Para cargar este dispositivo, use solamente una fuente de alimentación USB de 0,5A, DC 5V y el cable de alimentación suministrado.
- No utilice el detector de fugas en entornos peligrosos en los que existen grandes fugas de gases inflamables.
- No use el detector de fugas como equipo de seguridad.

Leak Detector
Notes, Cautions, and Warnings

警告	• 仅使用 5v DC、0.5A USB 电源和随附的 USB 电缆为本设备充电。
	• 请勿在有大量易燃气体泄漏的危险环境中使用检漏仪。
	• 请勿将检漏仪用作安全设备。

Product Specifications

Table 1   Agilent leak detector specifications

Parameter	Value
Sensitivity[*]	Helium 0.003 mL/min in atmosphere
Operating Temperature Range	0 to 45 °C (non-condensing)
Storage Temperature Range	−15 to 50 °C
Power	(three) AA batteries (alkaline), or USB power
Display	128 × 64 pixels monochrome with 16 gray scales

* When verified with calibrated leak source at ambient temperature of 20 to 26 °C at standard atmospheric pressure.

Detection Sensitivity to Gases

The sensitivity of detection to other gases depends on the relative thermal conductivity of the target gas with respect to ambient air. Below is a table of the calculated minimum detectable leak.

Table 2   Calculated minimum detectable leak

Gas	Minimum Detectable Leak Rate (mL/min)	Level Indicator
Hydrogen	0.0025	Filled bar
Helium	0.003	Filled bar
Methane	0.014	Filled bar
Nitrogen	1.0	Empty bar
Argon	0.03	Empty bar
Carbon dioxide	0.03	Empty bar

Operating Modes

With the leak detector switched on, briefly press the Power/Mode button to scroll through different operational modes.
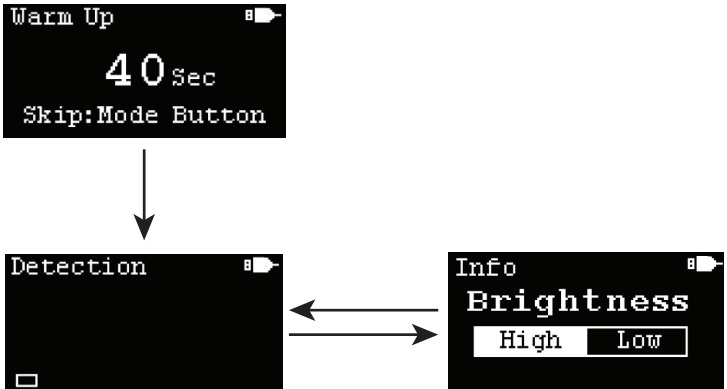
Figure 4. Example of warm up screen and scroll to operational modes.

The available operational modes are as follows:

Warm Up mode

This is the default mode on power up. The leak detector warms up for 50 seconds when turned on. The warm up process can be skipped by briefly pressing and releasing the Power/Mode button. However, to guarantee accuracy in **Detection** mode, allow for the completion of the warm up process. After the warm up is complete, the leak detector will switch to **Detection** mode automatically and is ready for use.

Detection mode

In this mode, the leak detector is ready to detect a gas leak. When the probe is measuring ambient air, the first bar alternating between a filled bar and an empty bar indicates that the leak detector is stable. Press the Enter/Clear/Toggle button to clear the bars if it is not alternating between a filled and an empty first bar.
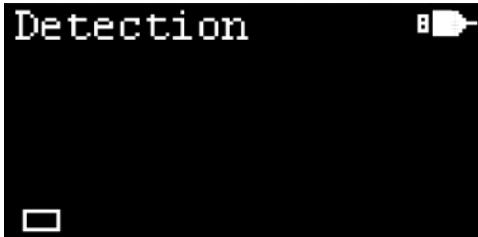
When a gas leak is detected, bar levels are displayed on the screen. The number of bar levels is proportional to the extent of the leak, and a maximum of eight bar levels can be displayed, indicating a large leak is detected. There are two types of bar levels to indicate the type of gas entering the detector:

Filled bar – Gas leak for gases with higher thermal conductivity than air.

Empty bar – Gas leak for gases with lower thermal conductivity than air.
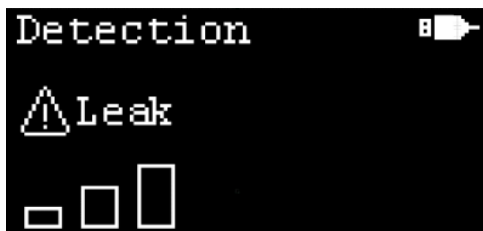
When the number of bar levels is greater than two, the leak alert sign will blink on the screen to give a visual alert, and the buzzer will sound to give an audible alert.

When probing ambient air, false readings of bars may be displayed on the screen. This may be due to tip drift. To perform a reset and baseline correction, hold the probe in ambient air for 2 seconds, then press and release the Enter/ Clear/Toggle button. After the correction, the number of bar levels is reset to zero and **Recalibrated** is displayed on the screen to indicate that the leak detector is recalibrated.
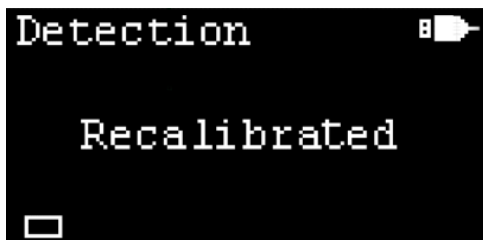
Info mode

Info mode provides details on the leak detector and the currently installed cartridge, including the filter expiration date. In addition, **Info** mode controls settings such as the display brightness level and turning the buzzer on and off.

To access Info mode:

1   Briefly press and release Power/Mode button until **Info** mode is observed on the screen.

2   Once in **Info** mode, briefly press and release the Enter/Clear/Toggle button to scroll through the available pages.

Display brightness

Display brightness can be set to high or low.

To change the display brightness setting:

1   With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the **Brightness** screen is displayed.

2   Press and hold the Enter/Clear/Toggle button for two seconds to toggle between **High** and **Low** options. The screen brightness changes based on the selected option.

Buzzer

When the leak detector is on, the buzzer setting defaults to **On**. This means that the leak detector is able to give an audible alert when the number of bar levels displayed are greater than two.

To change the buzzer setting:

1   With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the **Buzzer** screen is displayed.

2   Press and hold the Enter/Clear/Toggle button for two seconds to toggle between **On** and **Off** options. The buzzer function changes based on the selected option.

Auto off

In battery power mode, the unit defaults to "auto off" when the power is on. This means that every time the unit is activated, a "power-off" cycle begins, lasting for 10 minutes. The leak detector will operate continuously until it is manually turned off.

In USB power mode, the Auto off function is always off and the option to change the **Auto off** setting is disabled.

To change the Auto off setting:

1   With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the **Auto off** screen is displayed.

2   Press and hold the Enter/Clear/Toggle button for two seconds to toggle between **On** and **Off** options. The **Auto off** function changes based on the selected option.

Errors/Warnings

With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the **Error/Warning** screen is displayed.

Table 3   Error and warning code descriptions

Code	Type	Description	Troubleshooting
01 No Cal Info	Error	No calibration information	Contact Agilent Technical Support
02 No Verif	Error	Leak detector is not verified	Contact Agilent Technical Support
03 No Setting	Error	Leak detector settings missing	Contact Agilent Technical Support
04 No Cart	Error	No cartridge detected	Install a valid cartridge
05 No MF Info	Warning	No mainframe information	Contact Agilent Technical Support
06 I2C Fail	Error	Hardware communication failure	Reboot the leak detector
07 No Fltr Date	Warning	No filter date information	Contact Agilent Technical Support
08 Filter Exp	Warning	Filter expired	Renew the filter and reset the filter new date
09 Low RTC Bat	Warning	RTC (real time clock) backup battery low	Contact Agilent Technical Support
10 Zero Fail	Error	Baseline correction error	Reboot the leak detector
11 Need Zero	Error	Large voltage drift because voltage out of range	Press the Clear button in **Detection** mode
12 Ver Mismatch	Error	Firmware version mismatch with cartridge version	Upgrade the firmware to latest version
13 Invalid Cart	Error	Unable to identify cartridge types	Contact Agilent Technical Support

Filter date information

With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the **Filter** screen is displayed.

The **Filter** screen displays date information about the currently installed cartridge. This includes the filter new date and filter expiry date which is one year from filter new date. In addition, there is a rectangular bar as a graphic representation of the remaining usage period of the filter.


When the filter is expired, the rectangular bar is fully filled and **Expired!** is blinking in the rectangular bar to alert the user.

Filter exchange

The **Filter Exchanged** screen confirms that the leak detector is prepared for a filter exchange. By default, the **Filter Exchanged** screen is hidden. It can be shown under two scenarios:

1 The **Filter Exchanged** screen will automatically be added into the **Info** mode pages when the filter has expired.

2 The **Filter Exchanged** screen can manually be triggered by pressing and holding the Enter/Clear/Toggle button for two seconds while in the **Filter** page.
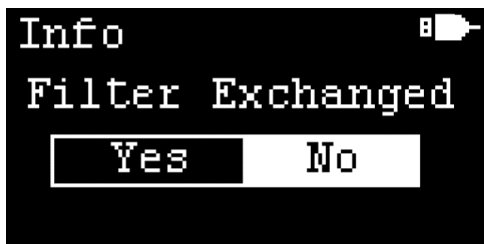
To change the **Filter Exchanged** option:

1 In the **Filter Exchanged** screen, press and hold the Enter/Clear/Toggle button for two seconds to toggle between **Yes** and **No** options.

2 With the desired option highlighted, briefly press and release the Enter/Clear/Toggle button to select the highlighted option.

Filter date reset

The **Reset Filter Date** screen allows the filter date to be updated when a new filter has been installed. The **Reset Filter Date** screen is hidden and can only be prompted when the **Yes** option in the **Filter Exchanged** screen is selected.

To change the **Reset Filter Date** option:

1   In the **Reset Filter Date** screen, press and hold the Enter/Clear/Toggle button for two seconds to toggle between **Yes** and **No** option.

2   With the desired option highlighted, briefly press and release the Enter/Clear/Toggle button to select the highlighted option.

After the **Yes** option is selected, the **Filter New** date is reset to the current Pacific time, and the **Filter Due** date is set to one year after the **Filter New** date.
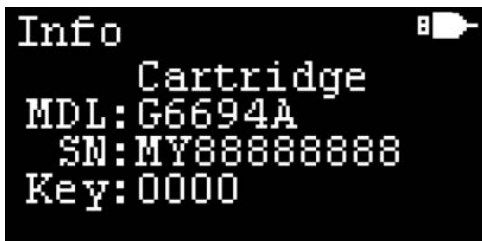
Cartridge information

With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the Cartridge screen is displayed.

The Cartridge screen displays information about the currently installed cartridge. This includes the cartridge model number (**MDL**), serial number (**SN**) and key number (**Key**).

```
Info              ▯▮▭
        Cartridge
MDL:G6694A
  SN:MY88888888
Key:0000
```

Mainframe information

With **Info** mode displayed, briefly press and release the Enter/Clear/Toggle button to cycle through available screens until the Mainframe screen is displayed.

The **Mainframe** screen displays information about the mainframe. This includes mainframe model number (**MDL**), serial number (**SN**) and firmware version number (**Ver**).

```
Info              ▯▮▭
        Mainframe
MDL:G6691-60500
  SN:MY18080023
Ver:1.0.1909.1201
```
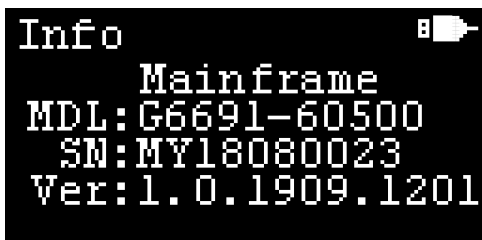
Detecting Leaks

1   Press and release the Power/Mode button to turn on the leak detector.

2   As the leak detector warms up, the pump can be heard. Wait until the warm up process is complete. The unit will switch to **Detection** mode automatically.

3   In **Detection** mode, check the stability of the unit by observing the bar levels on the screen. When stable, there is one bar, which alternates between a filled and an empty bar. The probe should be held up to ambient air for the unit to stabilize.

   • If there is more than one bar observed on the screen, briefly press and release the Enter/Clear/Toggle button to perform baseline correction.

   • Tip drift, temperature, and humidity fluctuations can impact the stability.

4   Place the probe near the gas connection to check for a leak. Avoid touching the probe tip against the fittings, tubing, and so forth as heat conduction may affect the leak detection results.

   • An audible alarm sounds when three or more bar levels are displayed (when the **Buzzer** is set to **On**).

5   Always press and release the Enter/Clear/Toggle button while the probe is held in ambient air. This should be done before probing in suspected leak areas to ensure accuracy.

Replacing and Servicing the Probe Filter

In the leak detector, there is filter installed in the probe to protect against particulate contamination. A clogged filter may cause a decrease in the detection sensitivity.

1   Hold the probe facing upwards and start to unscrew the probe tip.

2   Gently tap the male portion of the probe downwards to remove the mesh filter.

3   The mesh filter can be back flushed with compressed air or replaced entirely. (Order part number G6694-60005).

4   Back flush the probe tip if necessary.

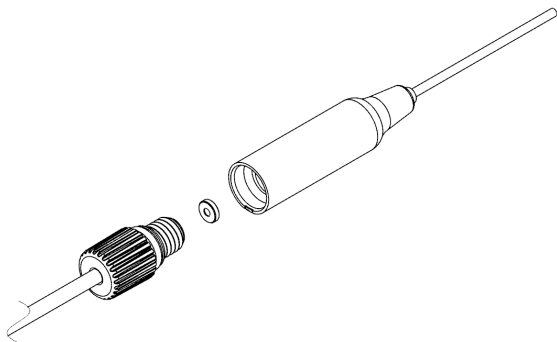5   Insert the mesh filter in position and screw the probe tip back on.

Figure 5. The probe filter, dissembled.

USB interface

Power can be supplied via the micro USB port located on the side of the unit.

NOTE	**Using the USB port to supply power does not recharge the installed batteries.**

USB port

The leak detector can communicate with a connected PC via the USB port. Data from the leak detector can be collected by connecting the USB port to your computer with the included USB cable. The leak detector USB driver will be needed for the instrument to communicate with your PC.

For details, please visit:
www.agilent.com/en/product/gas-purification-gas-managem ent/gas-management/gas-leak-detector to download the driver and view the Connecting your leak detector to your PC instrument sheet.

NOTE

When using the data acquisition capability of the leak detector, you should disable the auto-off feature. See Auto off on page 17.

When the leak detector is being powered via the USB port, the battery icon on the screen is replaced by a USB connector icon.

When the leak detector is connected to PC software, the buttons on the leak detector are disabled. This is indicated by an icon to the left of USB icon on the screen.
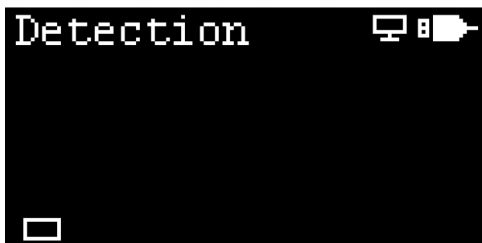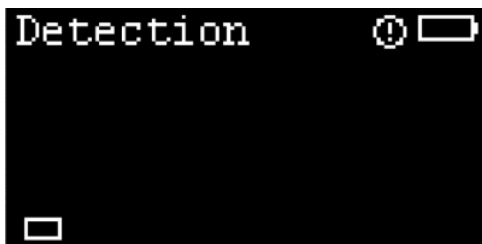
Warning and Error Indications

Various warning and error indications are displayed on the screen as appropriate. Each is described below.

Warning indication

A warning icon appears on the screen when the leak detector is being operated outside of acceptable conditions, when the filter is expired, when the RTC battery is low, and so on.

Error indication

When a hardware fault occurs, an error icon is displayed on the screen. This example shows when a cartridge is not detected in the leak detector.
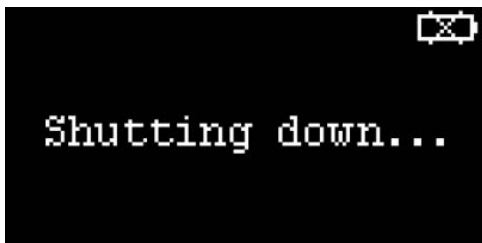
Low battery indication

When the batteries need to be replaced, a low battery indication is displayed on the screen. When power is too low for operation, the leak detector will automatically shut down.
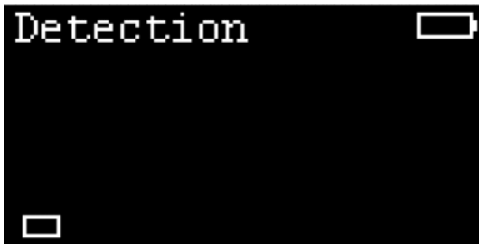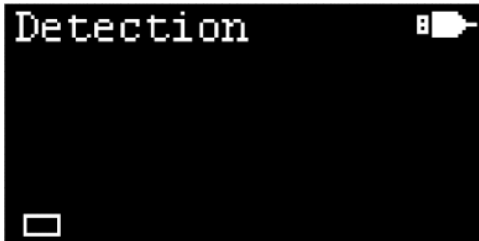
Power Indications

The leak detector can be powered by batteries or through the USB port.

When powered by batteries, a battery icon will appear on the screen.

When powered through the USB port, a USB icon will appear on the screen.

Installing and Replacing the Cartridge

Installing the cartridge

The CrossLab CS Mainframe is a platform that can accept the ADM Flow Meter Cartridge (part number G6692A) and Electronic Leak Detector Cartridge (part number G6694A).

| NOTE | **If you purchased the leak detector cartridge standalone, update your existing mainframe to the latest firmware when using your leak detector for the first time.** |

Remove the packaging on the Leak Detector Cartridge and insert into the CrossLab CS Mainframe slot. Hand tighten the two captive thumbscrews. The Leak Detector Cartridge comes with an attached sniffer probe and tubing which is not removable.
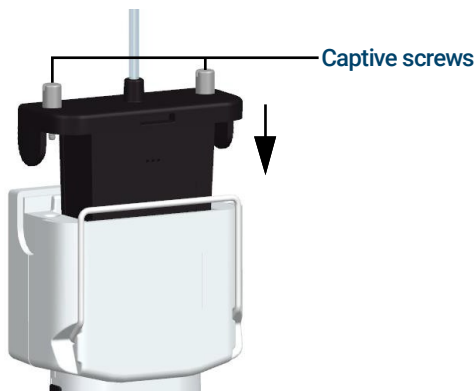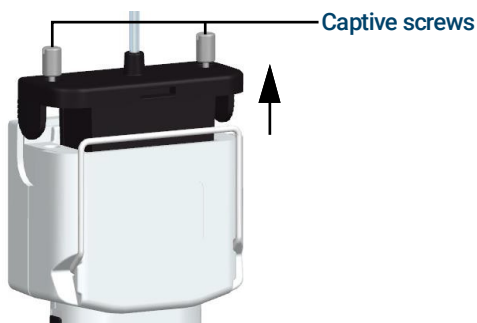

Figure 6. Leak Detector Cartridge being inserted into the CrossLab CS Mainframe slot.

Swapping or replacing the cartridge with ADM Flow Meter cartridge

1 Press and hold the Power/Mode button for three seconds to power down the unit.

2 Loosen both captive thumbscrews completely and lift the cartridge out of the CrossLab CS Mainframe body.
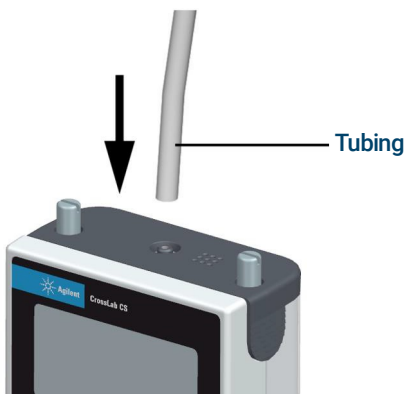

Captive screws

3 Insert cartridge of ADM Flow Meter in to the CrossLab CS Mainframe body. Hand tighten the two captive thumbscrews.

4 Install new flexible tubing.

Tubing

Replacing the Batteries

NOTE	**Recycle used batteries in accordance with all applicable governmental requirements for your location.**

To replace the batteries, do the following:

1 Press and hold the Power/Mode button for three seconds to power off the leak detector.

2 Remove the battery cover by pressing in on the grooved thumb pad on the rear of the leak detector and sliding the battery cover off.

3 Remove and replace the three AA batteries.
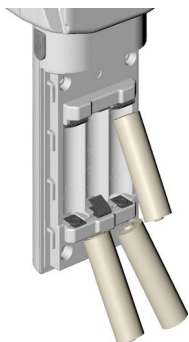
4 Reinstall the battery cover. Position the battery cover over the batteries and slide onto the flow meter until it locks in place.
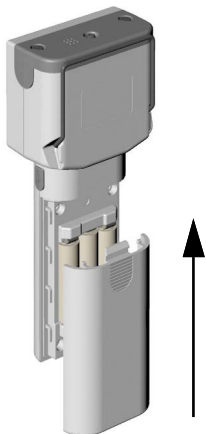
5 Briefly press the Power/Mode button to power on the leak detector.

Upgrading the Firmware

When a newer version of the flow meter firmware is available, you can upgrade to the latest version using your PC via the USB connection of the leak detector.

Please visit **http://www.agilent.com** for instructions.

Using the Leak Detector Stand

The flip down wire stand will give you a better viewing angle when the leak detector is placed above bench level. Pull the stand down until it is in the locked position.

Stand

Safety and Regulatory Certification

Conforms to the International Electrotechnical Commission (IEC) 61010-1 safety standard.

Conforms to the following regulations on Electromagnetic Compatibility (EMC) and Radio Frequency Interference (RFI):

- CISPR 11/EN 55011: Group 1, Class A
- IEC/EN 61326-1

This ISM device complies with Canadian ICES-001(A). Cet appareil ISM est conforme a la norme NMB-001(A) du Canada.

Class A EMC certification

This equipment has been evaluated for its suitability for use in a commercial environment. When used in a domestic environment, there is a risk of radio interference.

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Designed and manufactured under a quality system registered to ISO 9001.

Disposal

Please consider the environment when disposing of the instrument and packaging materials. Please recycle all environmentally friendly waste. Please contact your local government agency or facility operator for the proper disposal of the instrument and batteries.

Agilent