Agilent G3215A Mass Spec Bench

User Guide

Revision A, May 2011

Agilent Technologies

Notices

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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.

Contents

1 Introduction

This manual describes how to install, operate, and troubleshoot the Agilent G3215A Mass Spec Bench.

The Mass Spec Bench is designed to accommodate the rough pump or pumps used with your LC/MS or GC/MS System. It significantly reduces noise, while two internal fans ensure that your pump does not overheat. The platform that supports the rough pump is designed to be separated from the main frame of the bench. This setup minimizes the vibration from the rough pump, which can affect instrument performance of the LC/MS or GC/MS instrument. It is also designed to capture any oil that leaks from the rough pump.

The Mass Spec Bench is compatible with BOC Edwards E1M18, E2M28 pumps, and XDSi35 Dry Pumps. It is also compatible with Agilent MS40, TS600, and TS800 pumps. These pumps are used with:

- Agilent 1100/1200 LC/MS Series instruments
- Agilent 6000 Series LC/MS Systems
- Agilent Single and Triple Quad GC/MS Systems
- Agilent 7500 Series ICP/MS

NOTE The Mass Spec Bench is designed to be rolled on smooth hard surfaces found in the lab environment. Moving the Mass Spec Bench on carpeted surfaces, rough surfaces, or uneven surfaces can be difficult. Additionally, crossing thresholds can present problems as the clearance on the pump tray feet is less than 3/4 of an inch.

General Information

The Mass Spec Bench is designed to comply with the International Electrotechnical Commission (IEC) 61010–1 safety standard.

The Mass Spec Bench Power Supply (part number 5188-1164) complies with applicable safety and Electromagnetic Compatibility (EMC) requirements, including:

- CISPR 11/EN 55011: Group 1, Class A
- IEC/EN 61326
- AUS/NZ
- Canada ICES-001/NMB-001

The Mass Spec Bench is designed and manufactured under a quality system registered to ISO 9001.

Information

The Agilent Technologies Mass Spec Bench meets the following IEC classifications: Installation Category II, Pollution Degree 2, and Equipment Class III (except for the power supply provided, which is Equipment Class I).

The Mass Spec Bench is designed to be used with complete equipment. It is not an electrical enclosure and does not have a protective conductor (ground) terminal intended to be connected to an external protective earthing (grounding) system.

The Mass Spec Bench is designed and tested in accordance with recognized safety standards and is designed for use indoors. If it is used in a manner not specified by the manufacturer, the protection provided by the instrument can be impaired. Whenever the safety protection of the Mass Spec Bench has been compromised, disconnect it from all power sources and secure it against unintended operation.

Refer servicing to qualified service personnel. Substituting parts or performing any unauthorized modification to the instrument can result in a safety hazard.

Symbols

You must observe warnings in the manual or on the instrument during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions violates safety standards of design and the intended use of the instrument. Agilent Technologies assumes no liability for the failure of the customer to comply with these requirements. Table 1 lists the safety symbols that can appear on Mass Spec Bench.

Table 1 Safety symbols

Description	Symbol
See accompanying instructions for more information.	
Indicates a hot surface.	
Pinch hazard.	
Indicates that you must not discard this electrical/ electronic product in domestic household waste.	

Important Safety Warnings

You must observe safety cautions and warnings during all phases of operation, service, and repair of Mass Spec Bench. Failure to comply with these precautions violates safety standards of design and Mass Spec Bench's intended use. Agilent Technologies assumes no liability for the failure of the customer to comply with these requirements.

WARNING

To avoid creating a fire hazard:

- **Do not store oil or solvents inside the sound enclosure.**
- **Do not leave any absorbent materials inside the enclosure to soak up oil.**

WARNING

If a temperature alarm malfunctions or if the alarm has been on for an extended period, Mass Spec Bench and the pump can be dangerously hot. Check that the Mass Spec Bench and pump are cool before you touch them.

CAUTION

To avoid overheating and possible equipment damage:

- Do not block air flow to the fans while running Mass Spec Bench. Install Mass Spec Bench with enough space behind it to allow good air intake.
- Mass Spec Bench must not recirculate hot air. Always position the back end of the Mass Spec Bench where it can draw cool air.

CAUTION

Never run the rough pump(s) without also running Mass Spec Bench fans. Doing so can significantly damage the LC/MS or GC/MS system when one or both of the rough pumps turns off.

Electromagnetic compatibility

This device complies with the requirements of CISPR 11. Operation is subject to the following two conditions:

- This device must not cause harmful interference.
- This device must accept any interference received, including interference that can cause undesired operation.

If you notice harmful interference to radio or television reception, and the interference stops when you turn off the Mass Spec Bench, do these steps:

- Relocate the radio or antenna.
- Move the device away from the radio or television.
- Plug the device into a different electrical outlet, so that the device and the radio or television are on separate electrical circuits.
- Make sure that all peripheral devices are also certified.
- Make sure that appropriate cables are used to connect the device to peripheral equipment.
- Consult your equipment dealer, Agilent Technologies, or an experienced technician for assistance.
- Changes or modifications not expressly approved by Agilent Technologies could void the authority of the user to operate the equipment.

Sound emission certification for Federal Republic of Germany

- Sound pressure – Lp < 70 dB according to EN 27779:1991
- Schalldruckpegel – LP < 70 dB am nach EN 27779:1991

Cleaning

To clean the Mass Spec Bench:

1. Clean the air intake grates with a damp cloth.
2. Wipe out excess oil in the pump enclosure with a cloth. Dispose of dirty cloths in accordance with local laws or regulations.
3. Wipe the outer surfaces with a mild soap solution to remove any oil or dirt.

Recycling the Product

For recycling, contact your local Agilent sales office.

Parts Identification

Table 2 lists the contents of the Mass Spec Bench kit. Figure 1 and Figure 2 depict the parts of the Mass Spec Bench.

Table 2 Contents list

Part	Quantity	Part number
Mass Spec Bench	1	G2581-80100
Power supply	1	5188-1164
User Guide	1	G3215-90001

Figure 1 Mass Spec Bench (front view).

NOTE See Figure 25 on page 34 for a view of the front panel controls.

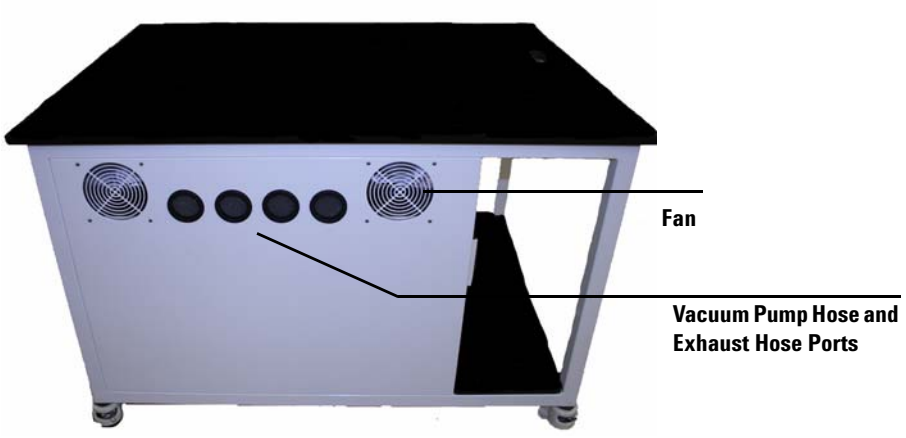

Figure 2 Mass Spec Bench (rear view).

NOTE Power supply not shown.

Site Preparation

Prepare the installation site to meet the criteria in Table 3.

Table 3 Site prep information

Criteria	Description
Physical dimensions	
Weight	20.5 kg (145 lbs)
Dimensions	129 × 91.4 × 81.2 cm (48 × 36 × 32 inches) (L × W × H)
Power supply	
AC input voltage	100 to 240 VAC ±10%
DC output voltage	+24 V
Output load (max.)	1.25 A
Input frequency	47 to 63 Hz
Power consumption	11 W
Rated current	450 mA
Temperature and humidity ranges	
Ambient temperature	5 to 35 °C (41 to 95 °F)
Humidity	15 to 95%
Altitude	≤ 3353 m (11,000 ft)

2 Installation

This chapter describes how to unpack, assemble, and install the rough pumps inside the Mass Spec Bench.

If possible, position the Mass Spec Bench so that there is room to access the rear of the instrument for repairs. See Table 3 on page 12 for table dimensions.

Before you begin, make sure that you have:

- Pump oil pan (p/n G1946-00034)
- Tygon 1/2-inch I.D. exhaust tubing (p/n G1946-80077)
- Utility knife
- Wire cutter
- 3/4-inch wrench (Spanner)

Step 1. Unpack the Mass Spec Bench

The Mass Spec Bench is packaged in a protective cardboard container that is strapped to a wooden pallet. You must cut the metal shipping straps before you can remove the unit from the pallet.

WARNING **The metal straps have sharp edges. Be careful not to cut yourself.**

1 Cut the metal shipping straps using wire cutters or sheet metal snips.

2 Remove the outer straps and cardboard box. See Figure 3.

Figure 3 Mass Spec Bench container

3 Cut the metal shipping straps that secure the Mass Spec Bench to the wooden pallet. See Figure 4.

WARNING **The metal straps have sharp edges. Be careful not to cut yourself.**

Figure 4 Mass Spec Bench on wooden pallet

4 Remove the upper box that contains the pump tray.

WARNING **This box is heavy and must be lifted by two people.**

Figure 5 Pump tray box

5 Remove the protective plastic film and cardboard edge protectors.

6 Pull the ratchet handle contained within the castor and turn the ratchet in a clockwise direction to move up the pad. See Figure 6.

Make sure to retract the pad completely into the castor body. If the ratchet spins freely, use your finger to hold the gear inside the castor.

The castors contain rubber vibration absorbing pads that are extended to help secure the Mass Spec Bench to the pallet. Each castor contains a pad. These pads must be retracted so that the castors touch the floor.

Figure 6 Ratchet handle pulled out

WARNING **To avoid personal injury, do not try to lift the Mass Spec Bench without assistance. The bench weighs over 70 kg (155 pounds). Always use good lifting practices appropriate for the installation.**

7 When all four wheels are touching the pallet, lift the Mass Spec Bench off the pallet.

Use at least four people (one on each corner of the bench) to lift to the floor.

Step 2. Prepare the pump tray

The Mass Spec Bench is designed to accommodate up to two pumps in the enclosure. The pumps must be oriented correctly to ensure proper air flow. Improper air flow can damage the pumps due to overheating.

Depending upon the configuration, an LC/MS instrument can have a curved fitting on the end of the vacuum hose. If the hose reaches the pump, the vacuum hose is properly attached.

Note that these instructions assume a new instrument installation. If this installation is for an installed instrument, the instrument must be vented PRIOR to installing the vacuum pumps inside the enclosure.

1 Open the cardboard box which contains the pump tray.

2 Remove the pump tray surface.

WARNING

To avoid personal injury when you lift the pump tray:

- **Use two people to lift the tray**
- **Be careful not to pinch your fingers.**

Figure 7 Pump tray surface on top of the pump tray, inside of the pump tray box

3 Lift the pump tray out of the cardboard box.

4 Open the door completely to allow the most working space.

5 Make sure you can identify the front of the pump tray.

The front of the pump tray is marked with an **F**. The front of the pump tray also has a short lip design. The pump tray must be installed correctly or it will not fit and will be very difficult to remove once installed.

Figure 8 Front of pump tray

6 Tilt the pump tray sideways to fit the tray through the opening of the enclosure. Then insert the pump tray with the rear tilted back. The two rails will catch the pump tray. Let the pump tray drop into the front.

Figure 9 Installed pump tray

7 When the pump tray has been installed inside the enclosure, install the pump tray surface in the pump tray.

   Center the pump tray surface as best as possible in the pump tray.

8 Peel off the protective film and any stickers from the pump tray surface.

Figure 10 Peeling off the protective film

Figure 11 Peeling off a sticker from the pump tray surface

The Mass Spec Bench is now prepared for the installation of the rough pumps.

Step 3. Install the Rough Pumps inside Mass Spec Bench

The rough pump(s) must be oriented correctly when installed. The rough pumps have either multiple cooling fans or a single fan. If the pump contains oil, the sight glass (used to check the oil level in the pump) must face the door. Otherwise, oil level in the pump will be difficult to determine. If the pump is an oil-free design (dry pump), the main cooling fan must face the rear of the Mass Spec Bench

NOTE For this step, the castors must extend to keep the Mass Spec Bench in place. Otherwise, the Mass Spec Bench can move around while the pumps are being installed.

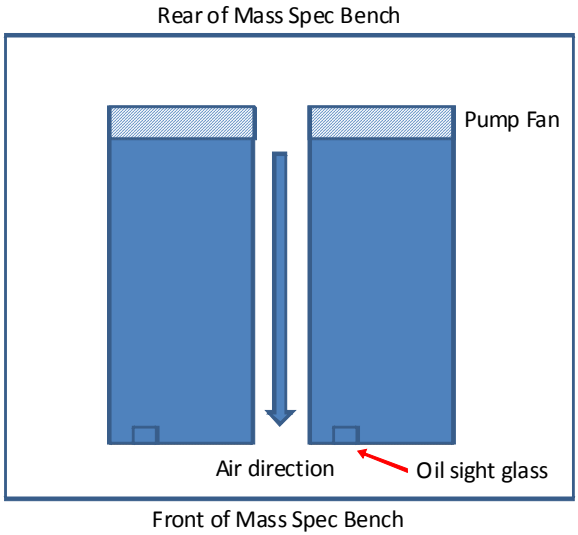

Figure 12 Mass Spec Bench pump orientation

1 Unpack and prepare the rough pumps as described in the LC/MS or GC/MS System installation manual.

   Preparation includes the installation of the oil mist filters (Edwards pumps) and exhaust adaptors (Edwards and Agilent pumps).

2 Put the rough pumps on the metal oil drip tray (part number G1946-00064) while the pumps are on the floor.

The metal oil drip tray is designed to:

- Capture any oil that leaks from the pumps.
- Allow for easier installation. (The pumps have rubber feet to prevent them from moving while operating, but the feet make it difficult to slide the pumps into place.)

3 Slide the pumps to the Mass Spec Bench access door.

Figure 13 Installing the Dry Pump

Figure 14 Tilting the Edwards Rough Pump

NOTE Temporarily extend the castors to keep the Mass Spec Bench from moving while you install the pumps into the enclosure.

4 Lift the rear of the metal oil drip tray with the pump on it and rest it on the frame of the Mass Spec Bench.

5 Lift the front of the metal oil drip tray with the pump on it and slide the pump into the enclosure.

CAUTION To avoid possible equipment damage, make sure that the pumps are installed exactly as shown in the next figures. Improper installation can cause the pumps to overheat and turn off.

Figure 15 Single pump orientation

Figure 16 Dual pump orientation

Figure 17 Dual MS40 Pump orientation

WARNING **To avoid possible injury if you are setting up an existing LC/MS or GC/MS system on the Mass Spec Bench:**

- **The pump can be hot. Use gloves when moving it or wait until it is cool.**
- **The pump is heavy. For your safety, use two people to move it together.**

6 Make sure that the sight glass faces the opening of the door so that the oil level can be monitored. Make sure that the power cords for the pumps are not crimped or under the metal oil drip tray.

7 Attach the exhaust hoses and foreline hoses to the pumps.

   a Remove the pre-cut foam pieces from the hose ports in the Mass Spec Bench. Save these pieces for a later step.

   b Route the fore line hoses through one of the ports.

   c If a second pump is being used, repeat the process.

Figure 18 Dual foreline hose installation

8 Route the Tygon exhaust hose and power cord for each pump through one of the remaining ports. Repeat if there is a second pump.

   The exhaust hose and power cords use the same ports, so use the foam knock outs to fill the remaining area of the hose port on the Mass Spec Bench. This action prevents excessive amounts of cooling air from blowing out these ports.

9 If the pumps are new and require oil before being turned on, fill the pumps at this time with the correct amount of oil.

CAUTION Wipe up any oil spilled during the filling process.

WARNING **Storage of oily rags, paper towels, excess or used oil, or solvents inside the pump enclosure is strictly prohibited as these materials present a fire hazard.**

10 Install the round foam plugs (from step 7on page 26) around the exhaust hoses to plug the holes as much a possible. Use a knife to cut the foam to wrap around the hose.

11 After the pumps are installed, close the door on the pump closure.

12 Remove the protective film and any other stickers on the top black phenolic surface where the instrument is going to be installed.

13 Follow the instructions in the system installation guide to set up the LC/MS or GC/MS instrument on the Mass Spec Bench.

Step 4. Attach the spray chamber exhaust hose

Do this step for LC/MS systems only.

1 Route the spray chamber exhaust hose through the hole in the Mass Spec Bench surface.

2 Attach the spray chamber exhaust hose to the desolvation assembly. Use the hose clamp to secure the chamber exhaust hose in place.

Step 5. Connect the power supply

Connect the power supply to the back of Mass Spec Bench by twisting the ring on the circular connector of the power cord (see Figure 19). Plug the pronged end of the power cord into the wall outlet.

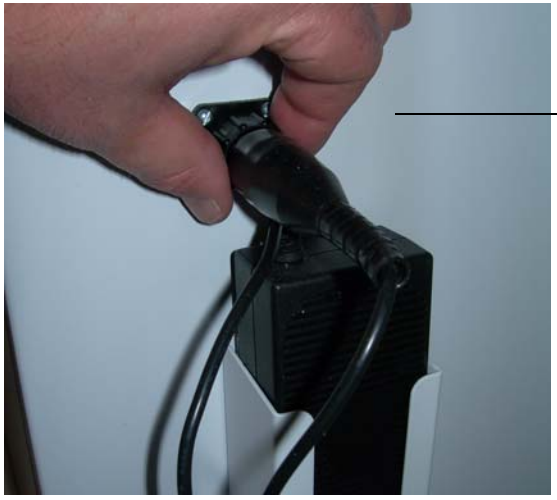

Figure 19 Connecting the power supply.

Step 6. Verify the installation

1. Press the on/off switch on the left side of the enclosure.
2. Check that:
   - The green LED is lit and the fans are on.
   - The temperature alarm is off and the red light is not lit. If either are on, remove the access panels and lid. Refer to Chapter 4, “Troubleshooting”,” for more information.
   - The power cords are positioned so that they do not interfere with the castors or dampening pads inside the castors.

No cables or tubing should be around the castors.

Figure 20 Extendable rubber feet.

Figure 21 Extending the pump tray feet

Step 7. Move the Mass Spec Bench to its final position

1 When the LC/MS or GC/MS instrument has been placed upon the Mass Spec Bench, move the Mass Spec Bench to it final installation position.

2 When the Mass Spec Bench is in the desired position, lower the extendable pads inside the corner castors.

To extend the pads, pull the handle out and turn the ratchet in the clockwise direction. If the ratchet is not turning in the correct direction, flip the switch to change the ratchet direction.

Extend the pads so that the castor wheels no longer touch the floor.

Figure 22 Extendable Rubber Feet

3 When the corner castors have been extended, extend the feet on the pump tray.

This action isolates the rough pump vibration from the Mass Spec Bench. Note that access to the rear castors can be difficult. Use a 3/4 wrench to extend the feet of the pump tray so that the pump tray is no longer in contact with the Mass Spec Bench. The pump tray needs only 1/8-inch of height above the support rails.

Figure 23 Extend the pump tray feet

When the pump tray feet have been lowered, the Mass Spec Bench can no longer be moved until the feet for the pump tray are raised and the pads inside the castors are raised.

3
Operation

To operate Mass Spec Bench, you must:

- Understand the controls and indicators on the front panel
- Know how to handle temperature alarms and signals
- Know how to drain oil from the rough pump and oil tray

Front Panel Controls and Indicators

Figure 24 shows the location of the on/off switch and indicators of the Mass Spec Bench front panel.

Figure 24 Mass Spec Bench

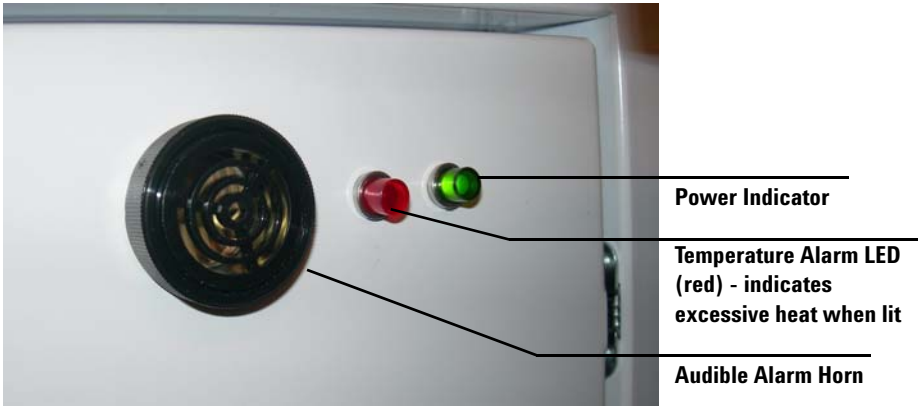

Figure 25 Audible and visual indicators

Figure 26 Fan power switch

To handle temperature alarms

The red LED on the front panel turns on and the alarm sounds when:

- The air flow to the Mass Spec Bench is restricted.
- The room temperature is above 35 °C (95 °F).

- If the red LED is lit:
  - Open the access door to allow air to cool the pump.
  - Check that both fans are turning and that air flow to the Mass Spec Bench is not restricted.

CAUTION The Mass Spec Bench must not recirculate hot air. Always position the back end of the Mass Spec Bench where it can draw cool air.

You cannot turn off the alarm. It stops when the temperature returns to an acceptable level.

To change rough pump oil

Change the rough pump oil every six months. Refer to your ICP/MS, GC/MS or LC/MS *Maintenance Guide* for detailed information on how to change your pump oil.

1 If your rough pump has a ballast value, make sure that the valve is closed.

2 Properly vent the system.

3 Turn off the main power for the LC/MS or GC/MS system. If the rough pump is not plugged into the LC/MS or GC/MS system, unplug the rough pump from the wall outlet.

4 Turn off Mass Spec Bench.

5 Open the front access door of Mass Spec Bench by pushing the top of the latch.

Figure 27 View of E1M18 pump through access door.

WARNING **The pump can be hot. To avoid possible injury, use gloves when moving it, or wait until it is cool.**

6 Slide the metal oil drip tray that holds the rough pump to the front of the pump tray and onto the frame of the Mass Spec Bench. This position

provides easier access to the drain port. Be careful not to slide out the pump too far.

7 Remove the oil drain plug from your rough pump. Refer to your pump documentation. See Figure 27.

8 Reinstall the drain plug when the oil has completely drained.

CAUTION Wipe up any spilled or excess oil.

WARNING **To avoid creating a fire hazard:**

- **Never put a paper towel or other absorbent material under the rough pump.**
- **Always remove from the enclosure any oil soaked or contaminated towels used for cleaning.**

9 Dispose of the oil according to local safety and environmental guidelines.

10 Return the rough pump(s) to their usual position and remove the fill port plug.

11 Use a funnel to fill the pump. Refer to the pump documentation for more information.

12 After the rough pump have been filled, replace the port plug.

13 Close the access door.

4 Troubleshooting

Table 4 describes solutions to problems that can occur with Mass Spec Bench. If your problem is not listed or the solution listed does not work, consult your pump documentation or contact your Agilent service representative.

WARNING **To avoid being burned by hot surfaces, wait for the pumps to cool down before servicing or troubleshooting.**

Table 4 Problems and solutions

Problem	Solution
Pump does not fit in Mass Spec Bench.	Check for proper orientation of the pump and configuration of the vibration dampers. See "Step 3. Install the Rough Pumps inside Mass Spec Bench" on page 22. Call your Agilent service representative if the orientation and configuration are correct.
Mass Spec Bench does not turn on.	Check that the power supply is plugged securely into both Mass Spec Bench and the wall outlet. If it is, call your Agilent service representative. Do not continue to use your rough pump in the Mass Spec Bench.

Table 4 Problems and solutions (continued)

Problem	Solution
Temperature alarm does not turn off.	Open the Mass Spec Bench door. Make sure that both of the cooling fans are blowing inside the enclosure. Check the back of the Mass Spec Bench to make sure that the air intakes for the cooling fans are not blocked. Make sure that adequate cool air is available to the Mass Spec Bench. Call your Agilent service representative if the lab temperature is within specifications.
Mass Spec Bench poorly muffles the sound of the pump.	Make sure that the front door is closed tightly and securely in place.
Green LED does not light.	Check that power is supplied to Mass Spec Bench and the power switch is on. If it is, call your Agilent service representative.
Fans do not turn.	Check that power is supplied to Mass Spec Bench and the power switch is on. If it is, call your Agilent service representative. Do not continue to use your rough pump in the Mass Spec Bench.
The temperature alarm does not sound even though the room temperature is above 35 °C (95 °F) and the red over-temperature LED is lit.	Check that power is supplied to Mass Spec Bench and the power switch is on. If it is, call your Agilent service representative. Do not continue to use your rough pump in the Mass Spec Bench— the alarm may have failed.
The red over-temperature LED is not lit even though the room temperature is above 35 °C (95 °F) and the alarm is sounding.	Check that power is supplied to Mass Spec Bench and the power switch is on. If it is, call your Agilent service representative. Do not continue to use your rough pump in the Mass Spec Bench— the LED may have failed.
The temperature alarm is not sounding and the red over-temperature LED is not lit even though the room temperature is above 35 °C (95 °F).	Check that power is supplied to Mass Spec Bench and the power switch is on. If it is, call your Agilent service representative. Do not continue to use your rough pump in the Mass Spec Bench— the thermostat may have failed.

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In This Guide

This guide is used to set up the Mass Spec Bench.

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Agilent Technologies