2424 ELS Detector

Site Preparation Guide

Waters

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Table of Contents

General information

This guide helps you prepare your laboratory facility for installation of your Waters system. Proper site preparation is critical to successful operation of the system.

Related information

2424 ELSD User Guides (Waters Web site)

Customer support

If you have questions about this document or preparing your site, contact your local Waters sales representative.

Safety advisories

Warning: Failure to completely read and explicitly follow the site preparation guide may result in damage to the products, injury to persons, and damage to other property.

Important: Observe Good Laboratory Practice (GLP) at all times. When working with hazardous materials, consult the safety representative for your organization.

Warning: To avoid contact with solvents, wear suitable gloves and safety glasses.

Responsibilities

The customer must prepare the site as required before the Waters-certified engineer can install the system.

Customer responsibilities (storage and site preparation)

Important: It is essential to prepare the site correctly and complete the checklist accurately. If a Waters service engineer arrives on site to begin your installation and cannot proceed because of inadequate site preparation or lack of necessary supplies, you may be charged for all travel costs incurred.

Please contact Waters if you have questions about preparing your site.

1. Provide appropriate storage for Waters equipment before it is installed.
2. Prepare your laboratory to meet the requirements specified in the site preparation guide.
3. Verify that each requirement has been met by ticking the check box in each section.
4. Ensure that the person designated to operate and maintain the system is present at the installation for training in basic system operation.

Note: If the designated person cannot be present at the installation, please notify Waters so that we can reschedule the installation for a more convenient time.

Waters responsibilities (installation)

1. Unpack the system.
2. Install the system.
3. Test system performance to ensure that it is properly installed and operational.

Relocating shipping containers

Follow the guidelines in this section to lift, relocate, and store shipping containers.

Important: Do not unpack the equipment before lifting or moving it.

Lifting

As a general guide before lifting, lowering, or moving the shipping containers:

- Assess the risk of injury
- Take action to eliminate risk
- Plan the operation ahead of the installation, and in conjunction with the Waters engineer at the time of installation
- Adhere to appropriate country and company regulations

Important: If your system includes a mass spectrometer, refer to the appropriate site preparation guide for additional lifting requirements.

Warning: To avoid injury, use appropriate lifting equipment to lift the mass spectrometer. Do not lift it manually.

Warning: To avoid injury, get more than one person to lift the instrument into place if the unit exceeds 23 kg (50 lbs). If necessary, use lifting equipment that can raise the instrument to the height of the laboratory bench.

Moving

If you move the shipping containers, transport them to the laboratory designated for system use. Follow these guidelines:

- Ensure that all passageways accommodate the largest component.
- Keep shipping containers on the pallet. If you find it necessary to transport shipping containers individually (i.e., without the pallet), be sure to move all containers, and retain all packing slips.

Caution: To avoid damaging the system, do not bump or jolt it during transport. If you must transport the instrument across an uneven surface, carry it on a forklift truck or trolley.

Doorways

Doorways must be a minimum width to accommodate the largest component. For system dimensions, see Table 1 and Table 2.

Elevators, corridors, and staircases

Elevators and corridors must be wide enough to allow corners to be negotiated. If you plan to move the system via staircase, you are responsible for moving the system.

Important: For safety reasons, Waters is not responsible for moving products via staircases.

Storage

Ensure the following storage conditions before Waters installs your system:

- Unopened shipping crates
- Storage area temperature -30 to 60 °C (-22 to 140 ° F)
- Humidity <95%, non-condensing)

Verify relocating shipping containers requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑ **All relocation requirements met**

Space and load requirements

Ensure that the laboratory bench has sufficient space for system configuration and installation, and can support the weight of all components.

Install the Waters 2424 ELS Detector in an area that meets the requirements listed in Table 2. The Waters 2424 ELS Detectors are stackable units and do not require extra bench space. The unit's dimensions are shown in Figure 1 and Table 1.

The Waters ELS Detector should be placed close to the outlet of the column to minimize band broadening, which will reduce the resolution of the chromatogram.

Important: If you are using more than one detector in your system, the Waters 2424 ELS Detector must be connected as the last detector in line because the column effluent is nebulized and exhausted as a gas vapor.

Caution: To avoid damage to the Waters 2424 ELS Detector, the amount of weight stacked on top of it should not exceed 40 pounds.

Caution: The 2424 ELS detector requires at least four inches of open space at the front upper left corner to allow air circulation for the Peltier device. If the detector is adjacent to other equipment on its left side, the overall width requirement is 15.2 inches.

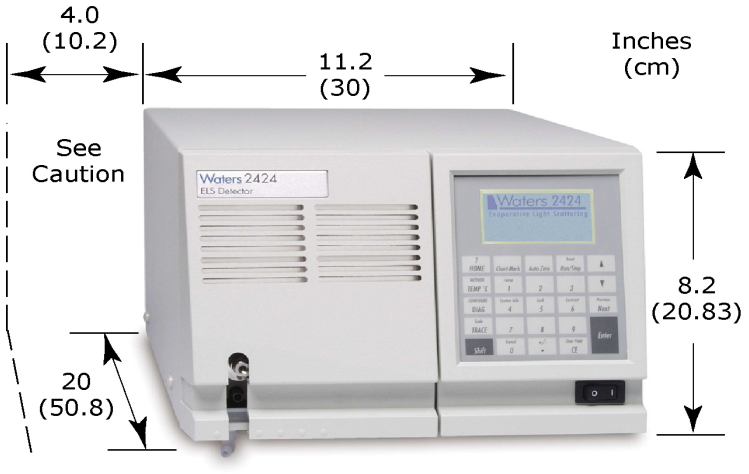


Figure 1 - Space requirements

Component dimensions

Make sure your laboratory bench has sufficient space for and can support the weight of all system components (Table 1).

Important: For specific height and weight restrictions, contact your Waters service representative.

Table 1: Component dimensions and weight

System component	Width	Depth	Height	Weight
2424	30.2 cm (11.2 in.)	50.8cm (20 in.)	20.83 cm (8.2 in.)	18.6 kg (41.0 lbs)

Clearances

Ensure the laboratory space provides sufficient clearance (working space) for all necessary components (Table 2).

Table 2: System clearances

Component	Clearance
System component	• Rear: 15.2 cm (6 in.) • Right: 5 cm (2 in.) **Note:** If placed adjacent to other equipment on the left, the left side minimum clearance increases to 10.2 cm (4 in.)

Verify space and load requirements

Check the box below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑ **All space and load requirements met**

Solvent requirements

Caution: To ensure proper performance of the LC/MS system, use clean, high-purity (LC/MS-grade) solvents. Failure to provide clean solvents and glassware can cause significant delays to the installation.

Have the following solvents available for the installation:

- Water
- Methanol

Important: For details on solvent brands, glassware requirements, and procedures to control contamination, see:

- *Controlling Contamination in UltraPerformance LC®/MS and HPLC/MS Systems* (715001307), located in the Waters Support Center
- The safety data sheets (SDSs) for your products

Verify solvent requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the completed site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑ **All solvent requirements met**

Gas requirements

Gas for the 2424 ELS

Use air or nitrogen

The 2424 ELS detector requires:

- a suitable supply of nitrogen gas or zero-grade air
- a gas flow of approximately 3 to 4 L/min
- a constant gas supply (65 to 100 psi at the regulator)

Important: Gas cylinders are not recommended because of their limited capacity. For example, a standard-size tank of nitrogen running a standard flow nebulizer at 25 psi would last approximately 40 hours. The gas consumption is approximately 2 liters per minute.

Important: A pressure relief valve vents gas if the input gas pressure is too high. If you hear gas leaking from the pressure relief valve, lower the input pressure to avoid wasting gas.

Warning: To avoid injury, do not use gases that support combustion with combustible solvents. For this reason, nitrogen is often a better choice than air, as air can cause oxidation of samples.

Air/gas quality

Air/gas quality should meet the highest possible standards for particle diameter, moisture, and oil density.

Note the following air quality recommendations:

- Use house air. Do not use compressed air that contains chemicals, synthetic oils with organic solvents, salts, corrosive gases, or similar contaminants.
- If necessary, install air filters on the upstream side of in-house compressor valves. Filters should provide filtration of 5 microns or less.
- To remove excessive moisture from the air source, install an air dryer after a cooler, drain catch, or water separator.
- If carbon dust is generated by the in-house compressor, install mist separators on the upstream side of compressor valves.

Verify gas requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All gas requirements met**

Power requirements

Refer to the following power requirements when preparing your laboratory.

Electrical safety

Follow all local electrical safety requirements in preparing your laboratory.

Over-voltage rating

The laboratory environment must comply with installation (over-voltage) category II.

Power source/receptacles

All system components require a dedicated, earthed (grounded) power source. The receptacles from this power source must be accessible to the system components, and must share a common ground. Use Table 4 as a guide for determining the receptacles required for the components in your system.

Optional valves

If your system includes optional valves, be aware that each valve includes a power supply that requires a power receptacle that uses a common, earthed (grounded) power source.

Power summary

See Table 3 for a summary of component power requirements. For more information on power terminology, see Plug/receptacle types., page 13.

Caution: Never use an extension cord to connect the instrument to an AC power source.

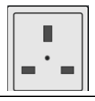
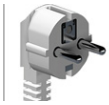
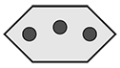
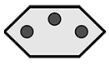
Table 3: System power requirements

Component	Nominal rated voltage	Maximum power consumption	Typical power consumption
2424	100 to 240 VAC 50/60 Hz	240 VA	200 VA (nominal)

Plug/receptacle types.

Requirement: Ensure that one receptacle is available for each system component (including the data system).

Table 4: Power cords supplied by Waters

Region	Plug	Receptacle	Receptacle type
US/ Canada/ Japan/ Taiwan			NEMA 5-15R
UK			BS 1363
Europe			CEE 7
Australia			AS/NZS 3112
Brazil			NBR 14136
China			CPCS-CCC
Denmark			107-2-D1
Switzerland			SEV 1011
India			UK2-15R
Korea			SK1-16R

Verify power requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All power requirements met**

Environmental requirements

Air quality

Ensure that the laboratory is not exposed to excessive dust.

Important: The laboratory environment must comply with pollution degree 2.

Humidity

Ensure relative humidity of the laboratory is between 20 to 95%, non-condensing.

Air flow

Ensure that air flow from heating or air-conditioning diffusers is not directed on the system.

Temperature

The operating temperature range of the laboratory is from 4 to 30° C (39.2 to 86° F).

Vibration

Ensure the laboratory is located away from heavy machines such as compressors and generators, which can create excessive floor vibration.

Magnetic fields

If using the system with a mass spectrometer, ensure the laboratory is located away from strong magnetic fields such as those generated by NMR systems or magnetic sector mass spectrometers.

Radio emissions

Minimize radio frequency (RF) emission from surrounding sources. Possible sources of RF emission include RF-linked alarm systems, mobile telephones, and hand-held transmitters.

Caution: If use of any of these devices causes interference, discontinue using the interfering device.

Verify environmental requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All environmental requirements met**

Waste collection requirements

The drip management system is a gravity-driven drainage system that effectively collects and removes any solvent leaks and process waste

Important: To maintain proper drainage and leak control, ensure the system is level.

A siphon waste drain located just beneath the front-mounted nebulizer, drains larger droplets of liquid waste that do not enter the drift tube.

Important: Suspend waste tubing above the liquid level in the waste container. Failure to do so may allow atmospheric pressure to force mobile phase to back up the waste tube and into the drift tube assembly.

Waste container

Position a suitable waste container (Figure 2) below the bench top.

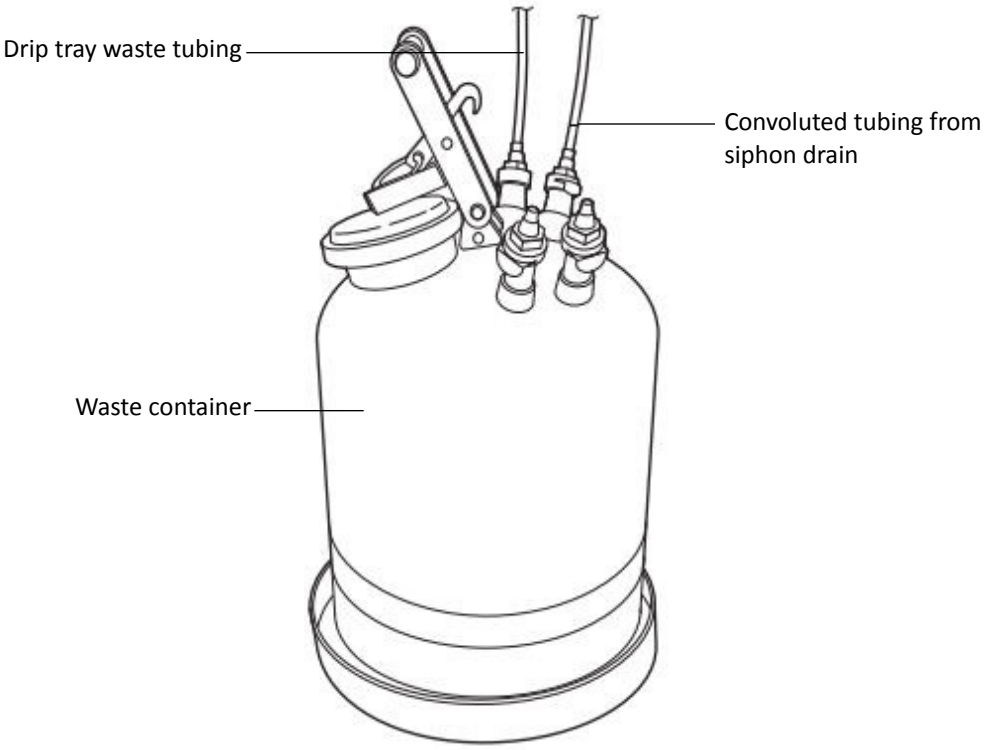


Figure 2 - Example waste container

Verify waste collection requirements

Check the box below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All waste collection requirements met**

Exhaust venting requirements

Exhaust outlets

Important: Venting of the system is the sole responsibility of the customer.

The exhaust from the Waters 2424 ELS Detector should be directed into a fume hood or exhaust vent as shown in Figure 3. The exhaust tube must exit the detector in a downward direction to the vapor trap and the drain line for the desolvation drip tube must also drain down and not be submerged in the waste.

Caution: To avoid injury, exhaust from the Waters 2424 ELS Detector should not be allowed to enter the laboratory atmosphere.

Caution: Do not subject the exhaust vent to direct vacuum as this will affect the instrument's performance.

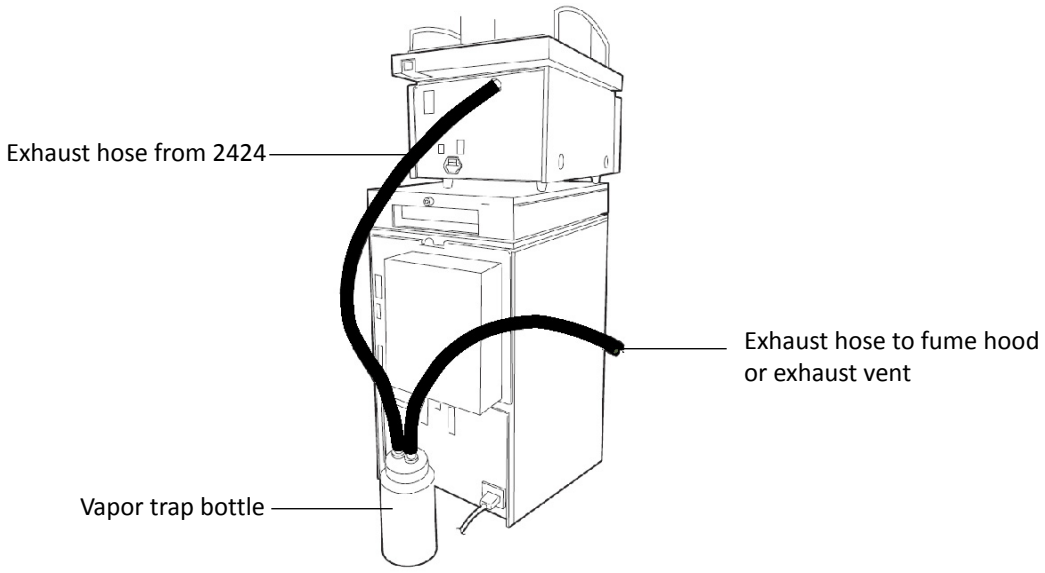


Figure 3 - Proper exhaust hose configuration

Verify exhaust venting requirements

Check the box below to verify that all requirements have been met. After completing all check boxes, return the site preparation guide to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All exhaust venting requirements met**

Test sample requirements

The Waters service engineer uses the samples supplied with the system. If the test samples were received in a separate shipment, you must make the samples available to the Waters engineer at the time of installation. If a Waters service engineer arrives on site to begin your installation and cannot proceed because test samples are unavailable, the installation may be delayed. Waters may ask for reimbursement of costs incurred by the extra time required to complete the installation.

Important: Please contact Waters if you have questions about providing test samples.

Note: If your laboratory practices require full sample certification documentation, Waters Analytical Standards and Reagents provide ready-to-use reference materials and reagents that are fully traceable and certified.

Verify test sample requirements

Check the box below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All test sample requirements met**

Items you must supply

Supply the following items for the installation:

- Constant supply (65 to 100 psi at the regulator) of nitrogen gas or zero-grade air
- Non-glass waste container that can be vented to an exhaust system
- Measuring cylinder, 100 µL
- Solvent reservoir, 1 L
- Nitrile gloves
- LC/MS-grade methanol
- LC/MS-grade water
- Waters-supplied test samples

Caution: Ensure that supplied items have never been washed with detergent, washed with other glassware, or washed in facilities that might have detergent residue. Washing glassware in a common dishwashing facility can contaminate glassware with detergent residues, which may contain polyethylene glycol and other “sticky” substances. Vinyl-coated steel racks can be additional sources of contamination.

Verify items you must supply requirements

Check the box below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All items we (the customer) must supply are available**

Workstation requirements

Software/operating system requirements

If you are providing your own computer for a Waters chromatography data system, contact your Waters sales representative for details on the required computer software and operating system specifications.

Important: Refer to the Release Notes for additional information and restrictions. The Release Notes contain important information about known and fixed issues, installation, and configuration instructions, and recommendations for re-qualification or re-validation.

Hardware requirements

Ensure that the workstation includes:

- a full-size PCI slot
- two Ethernet ports
- serial ports - what type?

Verify computer requirements

Check the box below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All computer requirements met**

Remote services

If you have opted to use Remote Services, ensure that the laboratory has an active Internet connection.

Installation of the Waters Connections INSIGHT® software (Intelligent Services that provide real-time, remote system monitoring and notification) requires an active Internet connection. This Internet connection can either be direct or through a firewall or proxy server.

Notice: The Connections INSIGHT Service Agent uses SSL (Secure Sockets Layer) port 443 to connect to the Waters Connections Enterprise Server (WCES). Information sent includes only instrument usage counters, error message text, and instrument configuration data. The agent does not access or transmit business-sensitive information, and it connects only to the WCES.

Verify Remote Services requirements

Check ONE of the boxes below to verify that all requirements have been met. After completing all check boxes in the site preparation guide, return it to Waters.

Important: Installation cannot proceed unless all site preparation requirements have been met.

❑	**All Remote Services requirements met**
❑	**N/A: We have not opted to use Remote Services**

Confirmation

Important: It is essential to prepare the site correctly and complete the checklist accurately. If a Waters service engineer arrives on site to begin your installation and cannot proceed because of inadequate site preparation or lack of necessary supplies, you may be charged for all travel costs incurred.

Important: Please contact Waters if you have questions about preparing your site.

❑	**I confirm that all supplies are now available.**
❑	**I confirm that all requirements have been met and all Requirement check boxes have been completed. (See list of check box items below.)** 1. All relocation requirements met, page 6 2. All space and load requirements met, page 9 3. All solvent requirements met, page 10 4. All gas requirements met, page 11 5. All power requirements met, page 14 6. All environmental requirements met, page 15 7. All test sample requirements met, page 18 8. All items we (the customer) must supply are available, page 19 9. All computer requirements met, page 20 10. All Remote Services requirements met, page 21 11. N/A: We have not opted to use Remote Services, page 21
❑	**I confirm that an operator will be available for demonstration and training by a Waters engineer during the installation.** *Indicate availability (check one):* • During the entire installation • During part of the installation: approximately _____% of the time **Important:** If the designated person cannot be present at the installation, please notify Waters so that we can reschedule the installation for a more convenient time.

Signed: _____

Summary

Please complete the summary table below in block letters.

Job title	
Name	
Organization	
Street	
City/state	
Zip/postal code	
Country	
Telephone	
Fax	
Email	

! **Important:** The installation of your system cannot begin until the site preparation guide has been fully completed and returned to your local Waters representative.