

ACQUITY Arc / Arc Bio System

Site Preparation Guide

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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

[ACQUITY Arc system 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.

Glossary of abbreviations

See [Table 1](#) for a glossary of product name abbreviations.

Table 1: Glossary of abbreviations

Abbreviation	Component name
2414	2414 Refractive Index (RI) Detector
2424	2424 Evaporative Light Scattering (ELS) Detector
2432	2432 Conductivity Detector
2475	2475 Multi-wavelength Fluorescence Detector
2489	2489 UV/Visible Detector
2998	2998 Photodiode Array (PDA) Detector
30-cm CH	30-cm Column Heater
30-cm CHC	30-cm Column Heater/Cooler
CH-30A	30-cm Column Heater-Active
ISM	Isocratic Solvent Manager
QDa	ACQUITY QDa Detector
QSM-R	Quaternary Solvent Manager-Routine
SM FTN-R	Sample Manager FTN-Routine
WFMA	Waters Fraction Manager - Analytical
CPSO	Common Platform Sample Organizer

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 mass spectrometer site preparation guide for additional lifting requirements.



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.

! **Notice:** 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 wide enough to accommodate the largest component. For system dimensions, see [Table 2](#) and [Table 3](#).

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:

- Shipping crates are unopened
- Storage area temperature is -30 to 60 °C (22 to 140 ° F)
- Humidity is 20 to 85%, 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.

Recommended configurations

The figures below show recommended layouts for your system as configured in a single, double, or triple stack.

! **Important:** If you do not know which layout to prepare for, contact your Waters representative.

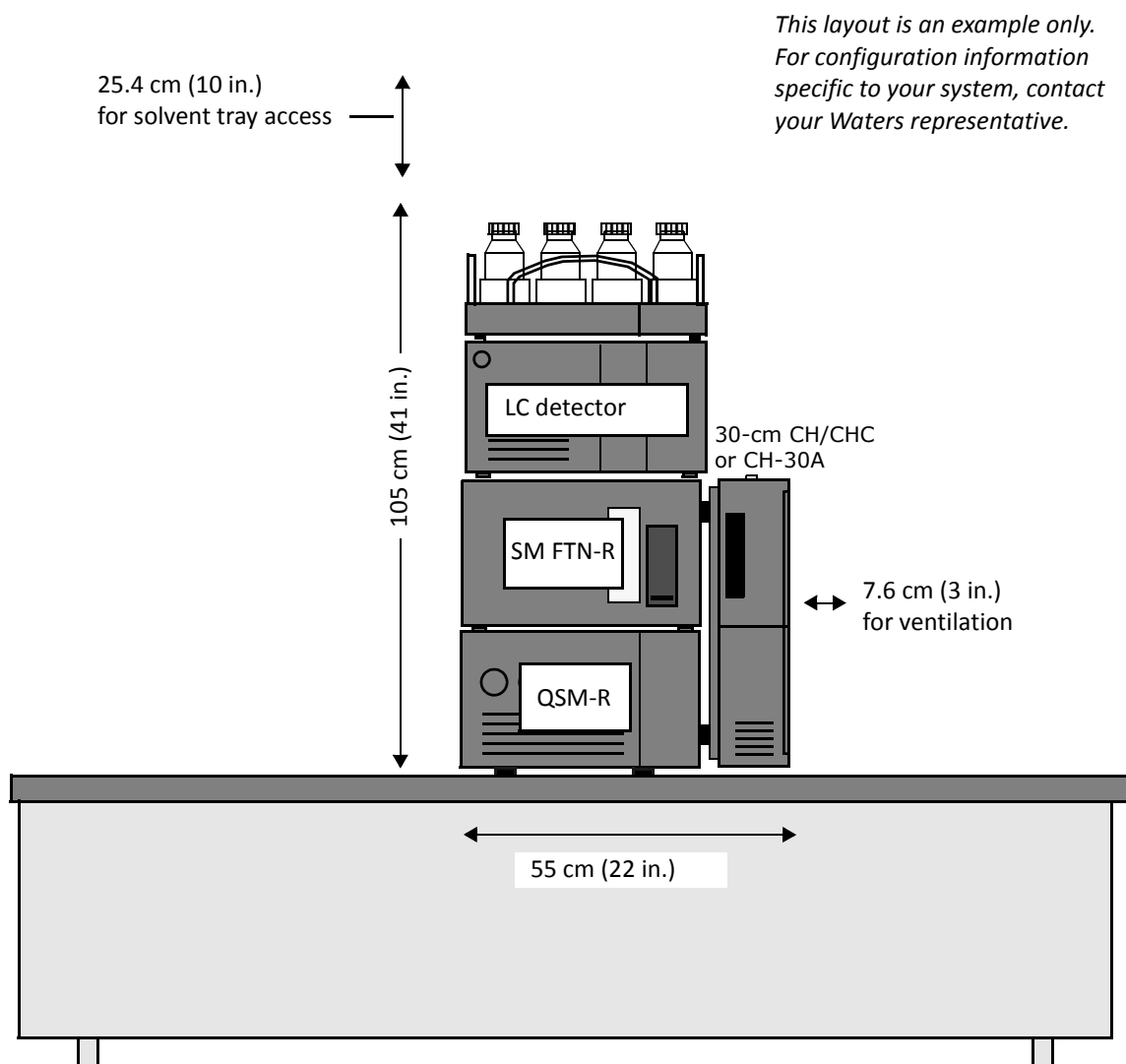


Figure 1 – Example configuration for single detection (front view)

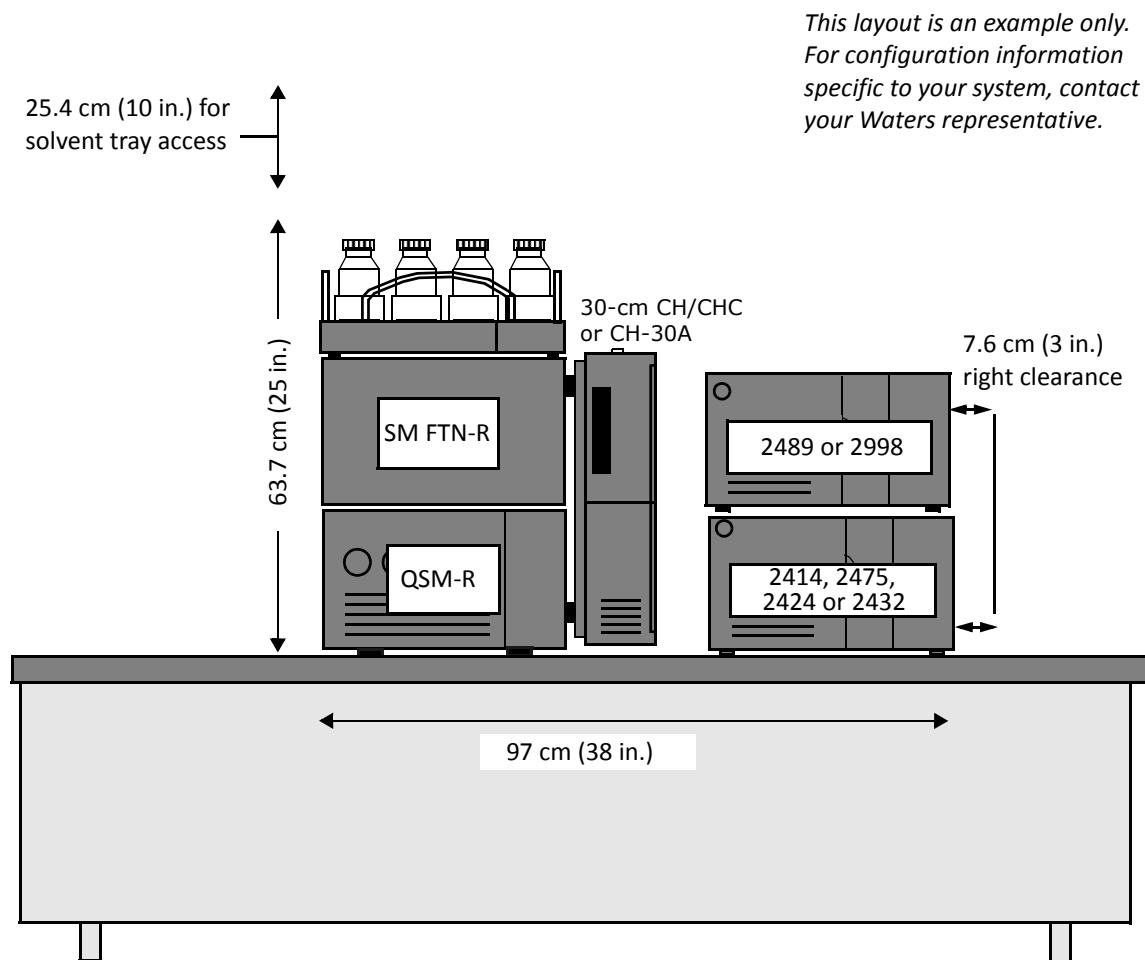


Figure 2 – Example configuration for dual detection (front view)

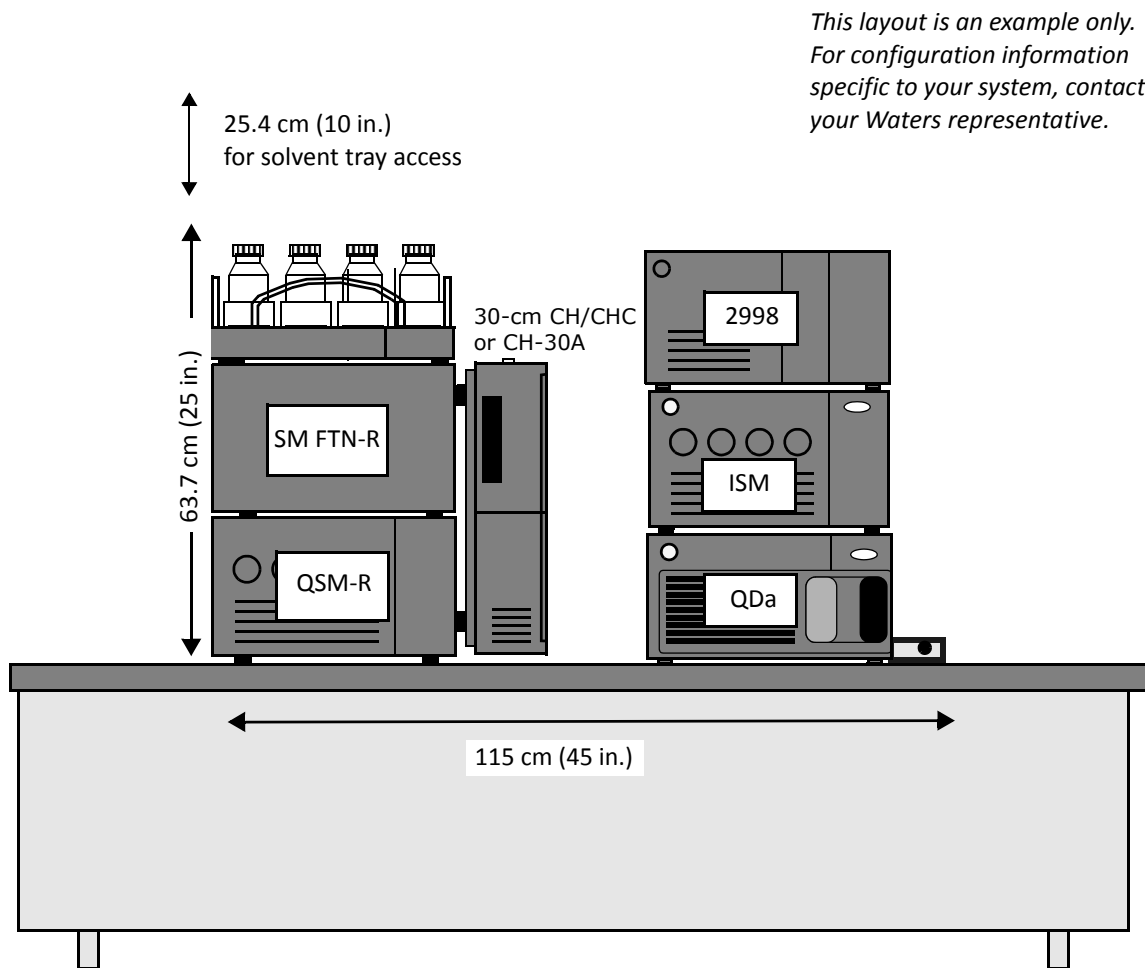


Figure 3 – Example configuration with QDa and 2998 (front view)

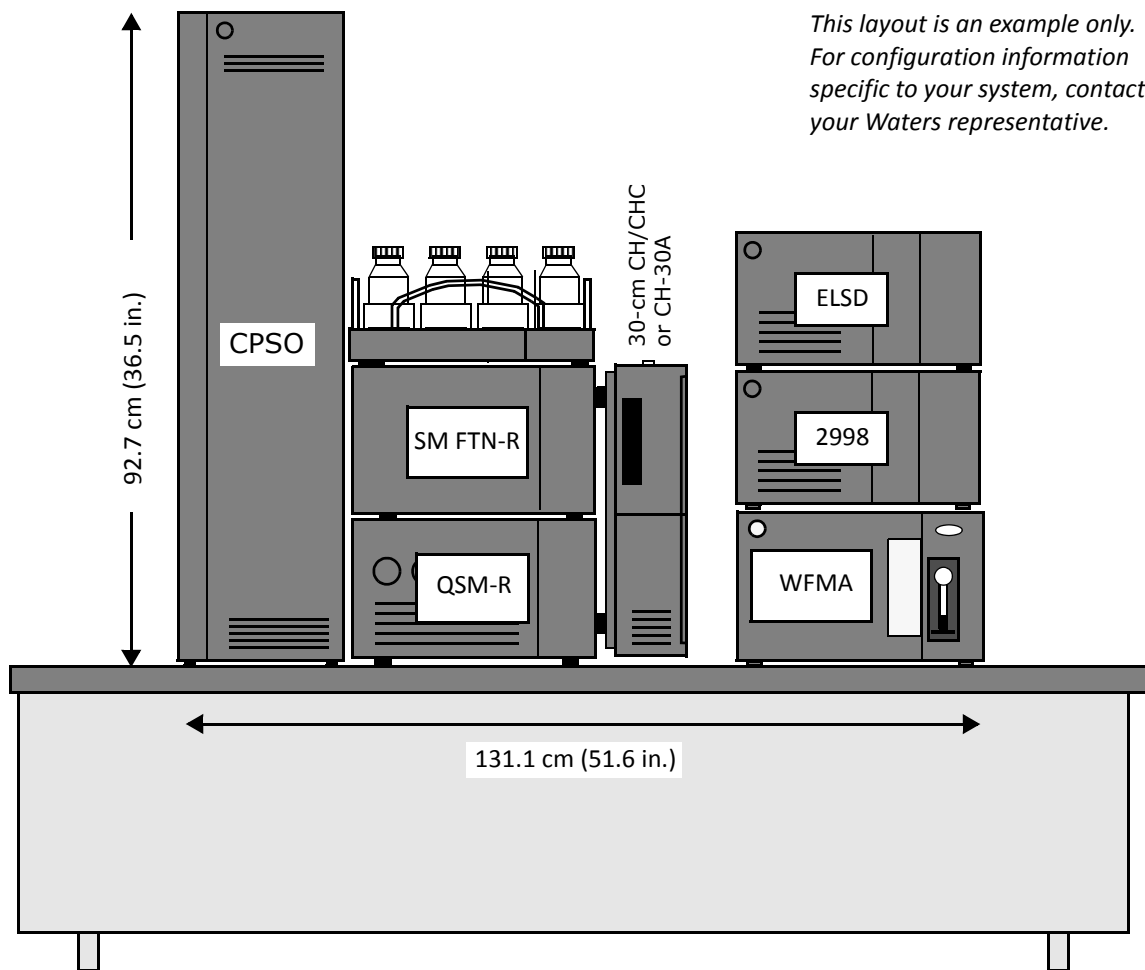


Figure 4 – Example configuration with WFMA and CPSO (front view)

*This layout is an example only.
For configuration information
specific to your system, contact
your Waters representative.*

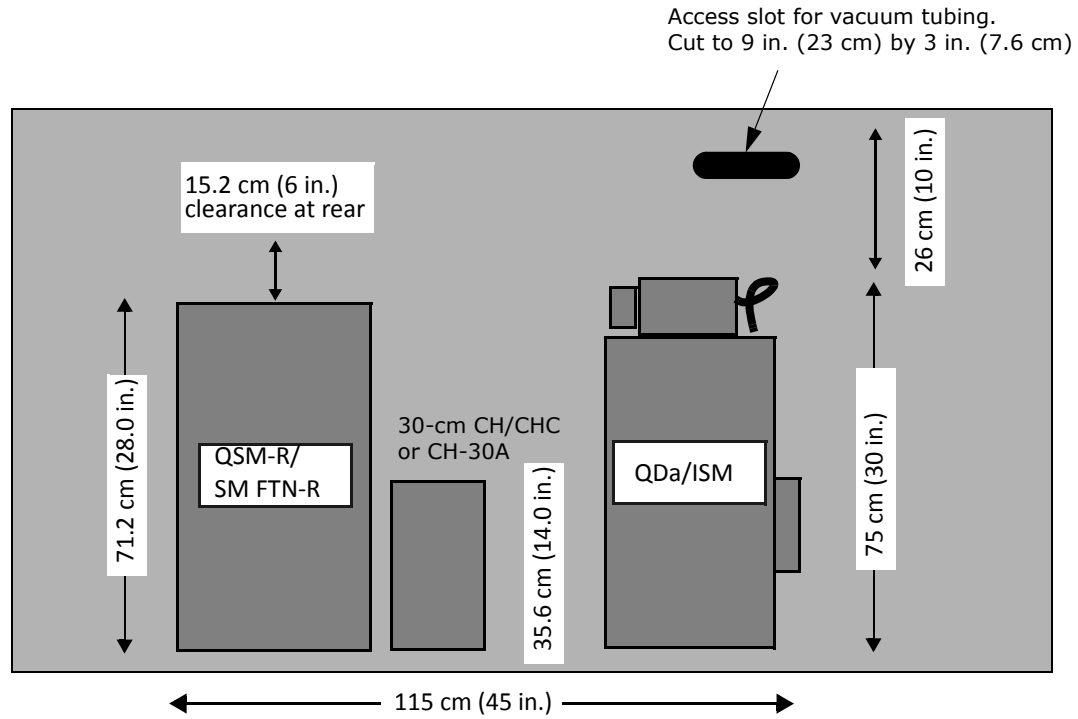


Figure 5 – Example configuration with QDa or ISM (top view)

Component dimensions

Make sure your laboratory bench has sufficient space for and can support the weight of all system components (see [Table 2](#)).

- ! **Important:** Ensure there is at least 152 cm (5 ft) of vertical clearance above the laboratory bench.
- ! **Important:** For specific height and weight restrictions, contact your Waters service representative.
- ! **Important:** For MS requirements, refer to the appropriate mass spectrometer site preparation guide.

Table 2: Component dimensions and weight

System component	Width	Depth	Height	Weight
2414	34.3 cm (13.5 in.)	61.0 cm (24.0 in.)	20.8 cm (8.2 in.)	15.9 kg (35.0 lbs)
2424				18.1 kg (40 lbs)
2432				12.3 kg (27.0 lbs)
2475				17.2 kg (38.0 lbs)
2489				13.6 kg (30 lbs)
2998				14.5 kg (32 lbs)
30-cm CH	20.3 cm (8.0 in.)	35.6 cm (14.0 in.) without cables	55.2 cm (21.8 in.)	9.9 kg (22 lbs)
30-cm CHC				12.7 kg (28 lbs)
CH-30A	12.1 cm (4.75 in.)	17.8 cm (7.0 in.)	50.8 cm (20 in.)	4.5 kg (10 lbs)
ISM	37.7 cm (14.9 in.)	61.5 cm (24.2 in.)	24.5 cm (9.6 in.)	24.9 kg (55 lbs)
Mass spectrometer	Refer to the appropriate mass spectrometer site preparation guide.			
QSM-R	34.3 cm (13.5 in.)	66.1 cm (26.0 in.)	22.9 cm (9.0 in.)	27.7 kg (61 lbs)
SM FTN-R		71.2 cm (28.0 in.)	27.3 cm (10.75 in.)	29.5 kg (65 lbs)
Solvent tray (top-mounted)		52.1 cm (20.5 in.)	12.7 cm (5.0 in.)	2.3 kg (5 lbs)
WFMA		71.1 cm (28 in.)	27.3 cm (10.75 in.)	20.4 kg (45 lbs)
CP50	24.1 cm (9.5 in.)	68.0 cm (26.8 in.)	92.7 cm (36.5 in.)	63.5 kg (140 lbs)

Clearances

Ensure the laboratory space provides sufficient clearance (working space) for all necessary components (Table 3).

! **Important:** For mass spectrometer requirements, refer to the appropriate mass spectrometer site preparation guide.

Table 3: System clearances

System/component	Clearance
Customer's laboratory bench	<ul style="list-style-type: none"> Vertical: 152 cm (5 ft)
ACQUITY Arc / Arc Bio system components	<ul style="list-style-type: none"> Rear: 15.2 cm (6 in.) Right: 7.6 cm (3 in.)
Mass spectrometer	<ul style="list-style-type: none"> Refer to the appropriate mass spectrometer site preparation guide.
Solvent tray (top-mounted)	<ul style="list-style-type: none"> Vertical: 25.4 cm (10 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.

<input type="checkbox"/> All space and load requirements met
--

Solvent requirements



Notice: 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.



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



Important: For MS requirements, refer to the appropriate mass spectrometer site preparation guide.

Have the following solvents available for the installation:

- Water
- Acetonitrile
- Methanol
- Isopropanol (IPA)

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 mass spectrometer

! **Important:** For MS gas requirements, refer to the appropriate MS site preparation guide.

Gas for the ELS detector

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)

Note: Gas cylinders are not recommended because of their limited capacity. Ensure these conditions:

Air/gas quality

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

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.

<input type="checkbox"/>	All gas requirements met
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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 5](#) 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.

Systems with an MS

If your system includes a mass spectrometer, refer to the appropriate MS site preparation guide.

Power summary

Table 4 shows system power requirements.

! **Notice:** Never use an extension cord to connect the instrument to an AC power source.

Table 4: System power requirements

Component	Nominal rated voltage	Maximum power consumption
2414	100 to 240 VAC 50/60 Hz	145 VA
2424		200 VA
2432		160 VA
2475		280VA
2489		195 VA
2998		195 VA
30-cm CH		200 VA
30-cm CHC		240 VA
CH-30A		N/A
ISM	100 to 240 VAC 50/60 Hz	200 VA
Mass spectrometer	Refer to the appropriate mass spectrometer site preparation guide.	
QSM-R	100 to 240 VAC 50/60 Hz	360 VA
SM FTN-R		420 VA
WFMA		400 VA
CPSO		540 VA

Plug/receptacle types

Provide appropriate wall receptacles for the plug(s) that come with your system (see [Table 5](#)).

- ! **Notice:** If you are uncertain which power cord is supplied for your region, contact your Waters representative.
- ! **Requirement:** Ensure that one receptacle is available for each system component (including the data system).

Table 5: 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

Table 5: Power cords supplied by Waters (continued)

Region	Plug	Receptacle	Receptacle type
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.

<input type="checkbox"/>	All power requirements met
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Environmental requirements

! **Important:** For MS environmental requirements, refer to the appropriate MS site preparation guide.

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 lower than 80%, non-condensing.

Air flow

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

Temperature

The ambient temperature in the laboratory must be from 4 to 40 °C (39 to 104 °F). Short-term thermal variations should be no more than 2 °C (3.6 °F) over 60 minutes.

! **Notice:** Failure to operate in this range will compromise system performance and can result in instrument failure.

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.

! **Notice:** 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.

<input type="checkbox"/>	All environmental requirements met
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Waste collection requirements

The ACQUITY Arc / Arc Bio system drip management system is a closed-architecture, gravity-driven drainage system that effectively collects and removes any solvent leaks and process waste from the needle and plunger seal washes. Each instrument uses a drip tray to collect and route the waste from one module tray to the one beneath it.

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

Waste container

Position a suitable waste container ([Figure 6](#)) below the bench top. Use separate waste containers to collect condensate waste from an SM FTN-R and mass spectrometer. If using detectors in a dual configuration, you must use the ACQUITY Arc Dual Optical Detection Kit (205001495).

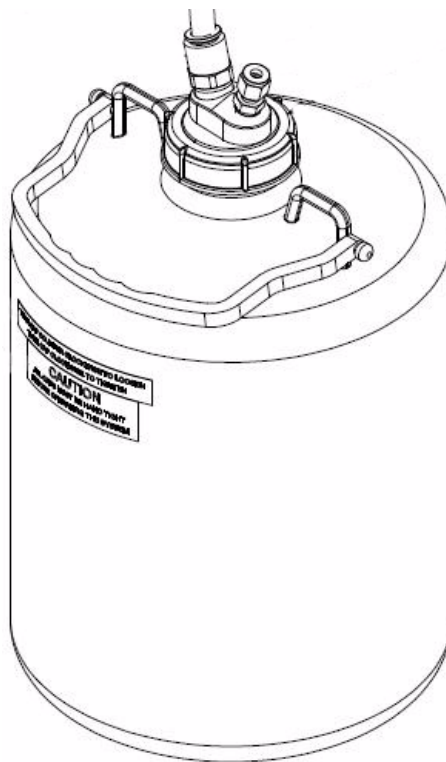


Figure 6 – Example waste container

Exhaust outlets

! **Important:** For mass spectrometers, refer to the appropriate MS site preparation guide.

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.

<input type="checkbox"/>	All waste collection requirements met
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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.

<input type="checkbox"/>	All test sample requirements met
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Items you must supply

Supply the following items for the installation:

- Acetonitrile
- Water
- Methanol (LC/MS-grade recommended for systems with a mass spectrometer)
- Formic acid (analytical-grade for systems with a mass spectrometer)
- Calibrated pipettes: 1 mL
- Measuring cylinders: from 10 mL to 1 L (sizes vary)
- Volumetric flasks: 10-mL, 100 mL, two 1 L, two 2 L
- Appropriate waste containers
- Calibrated analytical balance
- Nitrile gloves
- Lint-free tissue
- Waters-supplied test samples

! **Important:** If your system includes a mass spectrometer, refer to the mass spectrometer site preparation guide for other required items.

! **Notice:** 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.

<input type="checkbox"/>	All items we (the customer) must supply are available
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Computer 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 hardware, software, and operating system specifications.

! **Important:** Refer to the [Software 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.

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.

<input type="checkbox"/>	All computer requirements met
<input type="checkbox"/>	N/A

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.

<input type="checkbox"/>	All Remote Services requirements met
<input type="checkbox"/>	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.

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

<input type="checkbox"/>	I confirm that all supplies are now available.
<input type="checkbox"/>	<p>I confirm that all requirements have been met and all Requirement check boxes have been completed. (See list of check box items below.)</p> <ol style="list-style-type: none"> 1. All relocation requirements met, page 7 2. All space and load requirements met, page 14 3. All solvent requirements met, page 15 4. All gas requirements met, page 16 5. All power requirements met, page 20 6. All environmental requirements met, page 22 7. All test sample requirements met, page 25 8. All items we (the customer) must supply are available, page 26 9. All computer requirements met, page 27 10. All Remote Services requirements met, page 28 11. N/A: We have not opted to use Remote Services, page 28
<input type="checkbox"/>	<p>I confirm that an operator will be available for demonstration and training by a Waters engineer during the installation.</p> <p><i>Indicate availability (check one):</i></p> <ul style="list-style-type: none"> • During the entire installation • During part of the installation: approximately _____% of the time <p>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.</p>

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

Signed: _____

Summary

Please complete the summary table below using block letters.

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