

ACQUITY UPLC

Sample Organizer Operator's Overview and Maintenance Information

Revision A

Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

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Overview

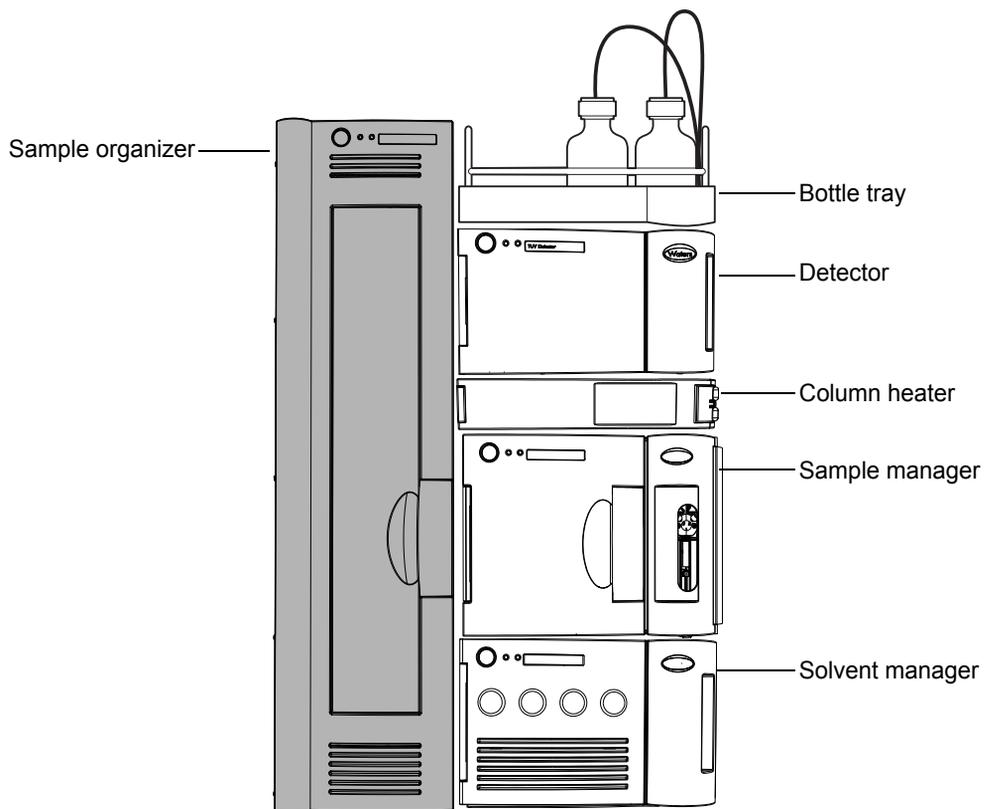
Note: The sample organizer described in this document is compatible only with sample managers fitted with a rotary tray (the sample manager-flow thorough needle, for example).

The sample organizer stores multiple microtiter or vial plates and transfers them to and from the sample manager, automating processing and increasing throughput.

The sample organizer's storage shelf compartment can hold a selection of ANSI/SBS plates, which you load into the organizer through a large, swing-open front door. Heaters and coolers thermally condition the shelf compartment and, together with the sample manager's heater/cooler, maintain the temperature at a set point that you determine.

Location of sample organizer in the ACQUITY UPLC system

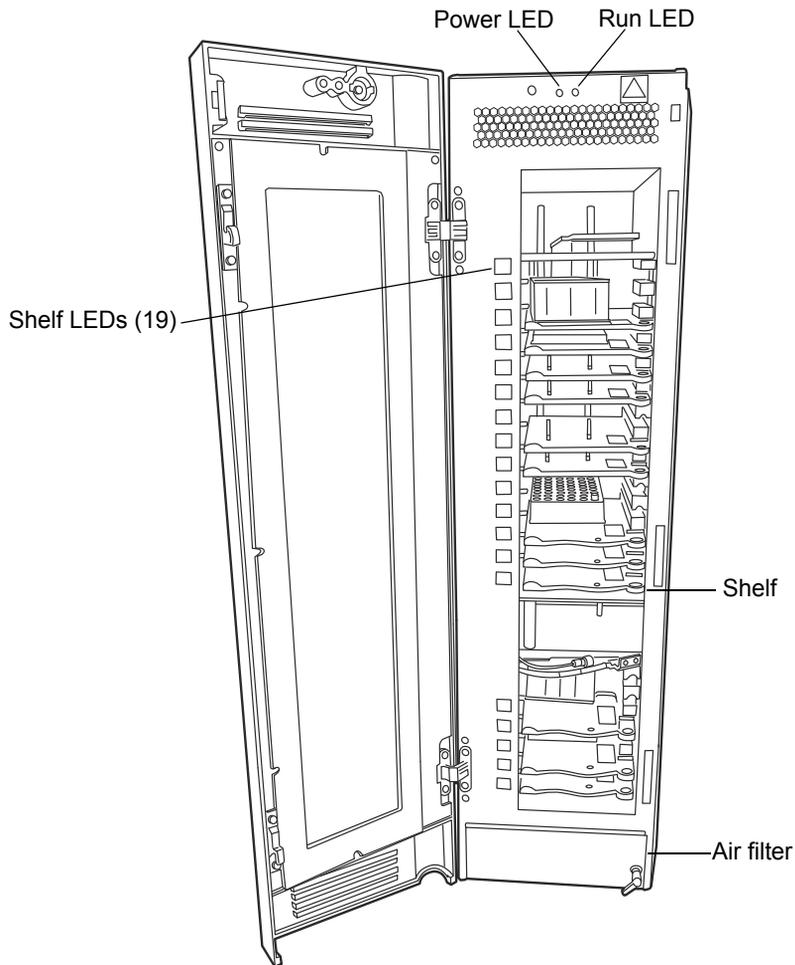
The following diagram shows the location of the sample organizer in the ACQUITY UPLC system.



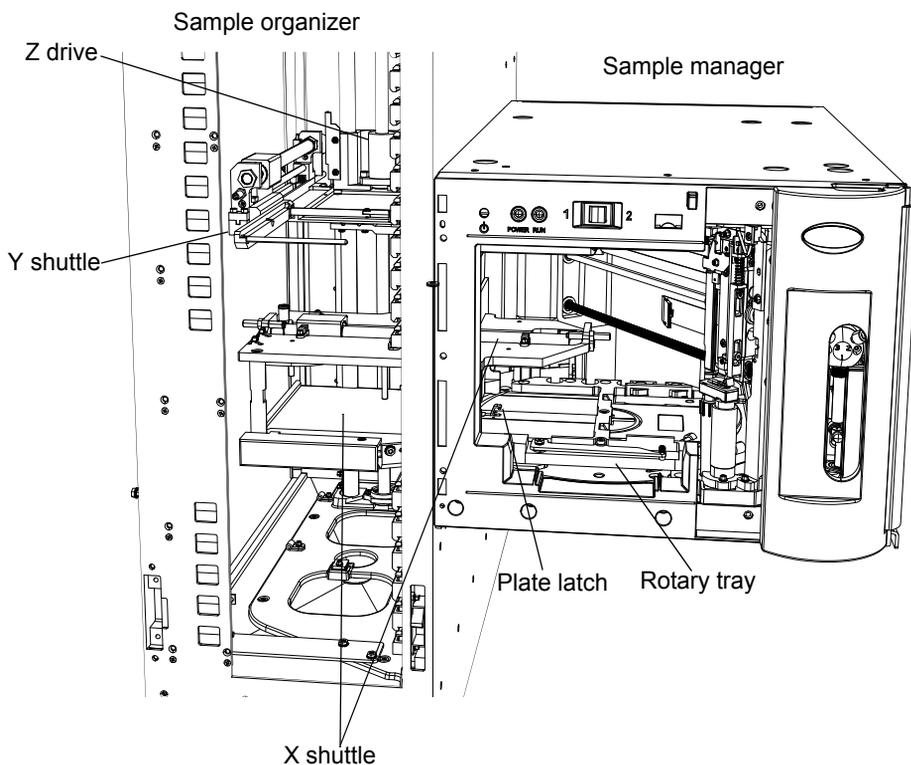
Sample organizer major components

The following diagrams show the sample organizer's major components.

Front view, with door open:



Cross-sectional view of sample organizer connected to sample manager:



Sample organizer components:

Component	Description
Air filter	Filters the air that is circulated through the unit.
Plate latch	Mechanism in sample manager that facilitates the securing and releasing of plates transferred from the sample organizer.
Power LED	Indicates the power-on or power-off status of the sample organizer. This LED is green when power is on and unlit when power is off.
Rotary tray (for sample organizer)	Component in the sample manager that accepts sample plates from the sample organizer and users.
Run LED	Indicates the run status. A steady green run LED indicates that injections are being run.

Sample organizer components: (Continued)

Component	Description
Shelf LEDs	Numerically identifies configured shelf locations.
X shuttle (X-axis)	Transfer shuttle that moves the plate between the sample organizer and sample manager.
Y shuttle (Y-axis)	Transfer shuttle that moves the plate between the shelves and the X shuttle.
Z drive	Moves the Y shuttle transfer mechanism up and down within the sample organizer.

Preparing for operation



Caution: If you must relocate the ACQUITY UPLC system instruments, remove the modules that rest atop the shelf support brackets. Do not lift the instruments by the shelf support brackets. Doing so can damage the instruments.

Ventilation

Allow at least 7.6 cm clearance at the rear of the sample organizer for ventilation.

Pneumatic source kit (optional)



Caution: To avoid damaging the sample organizer, do not use compressed air that contains chemicals, synthetic oils with organic solvents, salts, corrosive gases, or similar contaminants. The use of other compressed gasses is not recommended.

The sample organizer includes an internal compressor and does not require an external pneumatic air source. However, an optional external pneumatic source kit is also available that can be installed in the sample organizer to replace the internal compressor and allow operation from an external compressed air source (517 to 689 kPa [5 to 7 bar, 75 to 100 psi]). Use only dry, filtered, oil-free, compressed air to operate the sample organizer.

Initiating communications

To initiate communications between the sample manager and sample organizer:

1. Power-on the sample organizer by pressing the power switch on the top, left-hand side of the door.

Requirement: The sample organizer must be powered-on before the sample manager.

2. Power-on the sample manager by pressing the power switch on the top, left-hand side of the door.

Requirement: If the sample manager is powered off for any reason, you must reboot the sample organizer, and then power on the sample manager.

3. In the ACQUITY UPLC Console, select Sample Manager from the system tree.

4. In the sample manager information window, click Configure > Sample Organizer.

5. In the Sample Organizer Configuration dialog box, select the appropriate sample organizer from the list of serial numbers, and then click OK.

Result: The sample organizer automatically detects which shelves are present and illuminates their corresponding LEDs. During this operation, the sample organizer also detects which shelves contain plates.

Sample compartment considerations



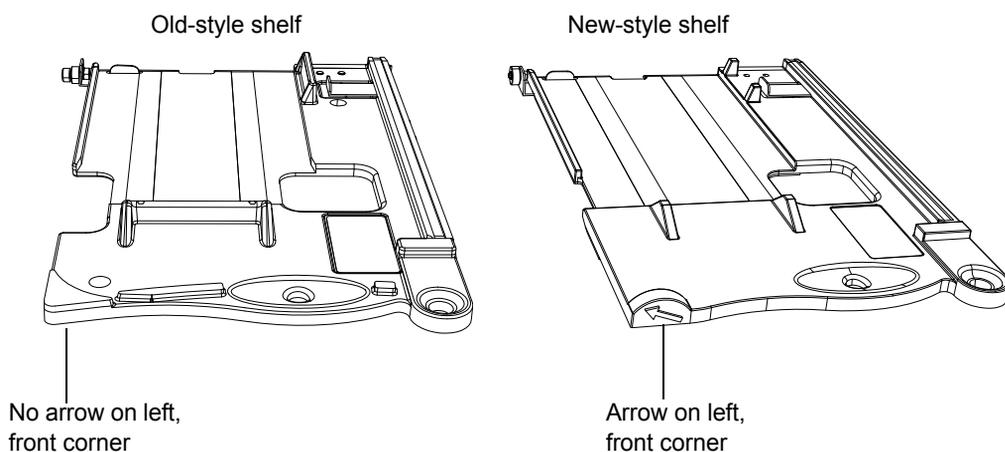
Warning: To avoid injury, keep hands and loose clothing clear of moving parts in the sample compartment. Opening the sample organizer door while parts are moving causes all parts to stop moving upon completion of the current movement, which can take up to four seconds.



Caution: To prevent spillage or damage from solvent vapors, use Waters-approved cap mats, sealing caps, or heat-seal film on the samples. Consult the document *Using Plates and Vials with ACQUITY UPLC and ACQUITY UPLC H-Class Systems* (part number 715002434) for a list of approved plates, vials, caps, and sample covers.

Loading/rearranging shelves

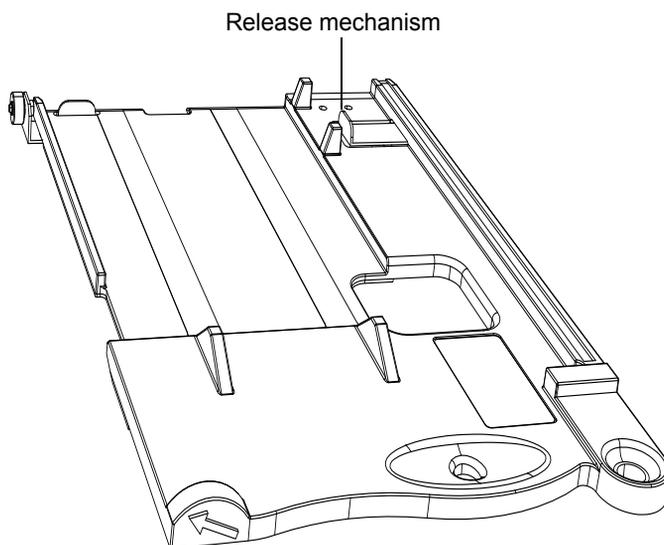
Tip: Old-style shelves are not compatible with the new ACQUITY UPLC sample organizer. An arrow on the left, front corner of the shelf differentiates new-style shelves from old-style shelves.



To rearrange the shelves:

1. Open the sample organizer door.
2. Add, move, or remove shelves from the sample organizer, so that the shelf configuration suits the plates you intend to run.

To remove a shelf from the sample organizer, pull the shelf out until it hits the hard stop, and then push the release mechanism to the left to release it.

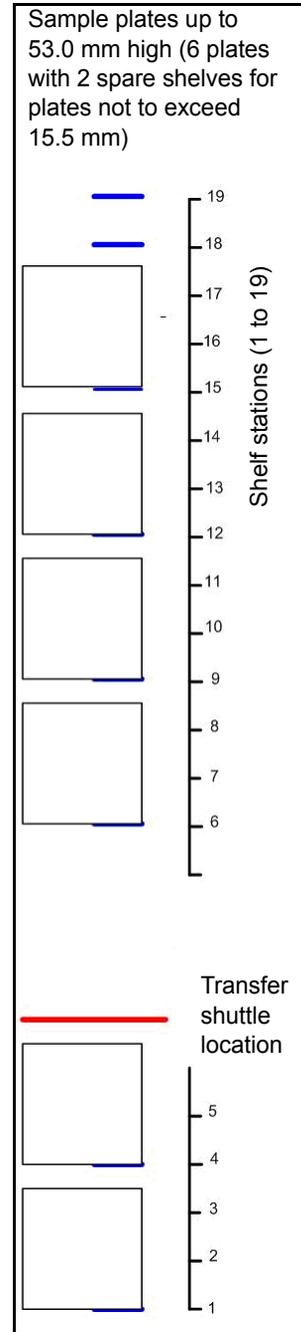
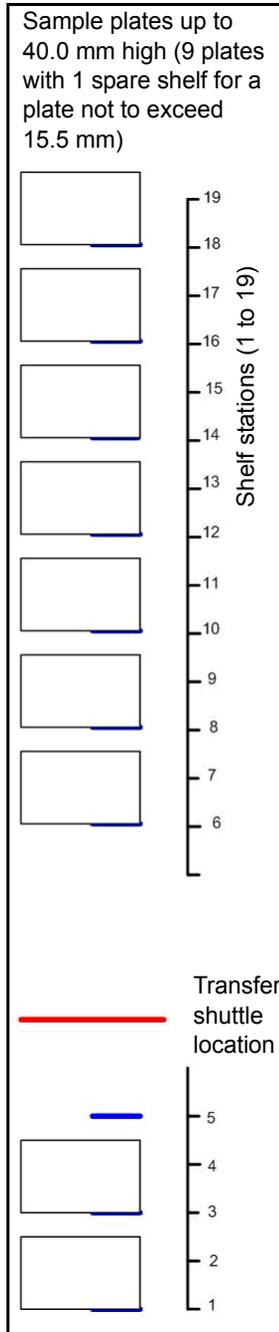
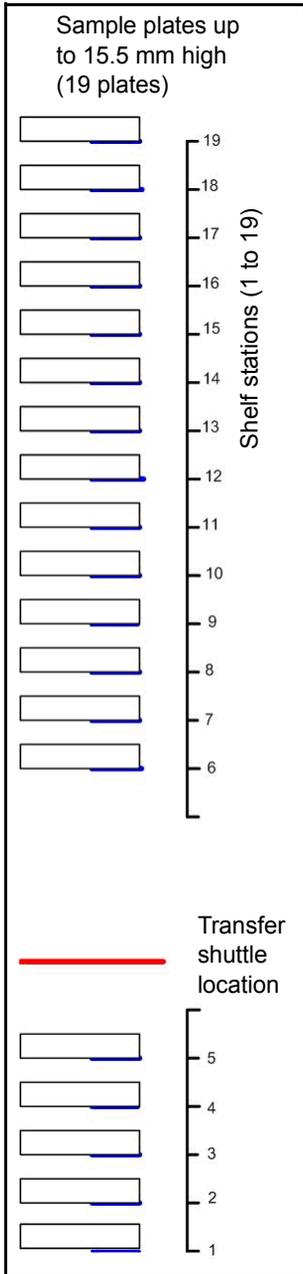


Refer to the following table and figure for the number of shelf slots required for various plates.

Number of shelf slots required for various plates:

Plate type	Number of shelf slots required
Standard microtiter plate (15.5 mm or less)	1
Intermediate plate (40.0 mm or less)	2
Deep well plate/vial holder (53.0 mm or less)	3

Shelf diagram:





Caution:

- To prevent spillage or damage from solvent vapors, use Waters-approved cap mats, sealing caps, or heat-seal film on the samples. Consult the document *Using Plates and Vials with ACQUITY UPLC and ACQUITY UPLC H-Class Systems* (part number 715002434) for a list of approved plates, vials, caps, and sample covers.
 - To ensure the transfer shuttle moves freely and without damaging the sample organizer, you must be able to slide a shelf-plate-vial combination in or out without interfering with the shelves or plates directly above and below it.
3. Slide the shelf into the sample organizer until it stops.
 4. Repeat [step 2](#) and [step 3](#) until all shelves are placed correctly.



Caution: To avoid jarring the plates from their shelves, do not slam the sample organizer door closed.

5. Close the sample organizer door.
Tip: Closing the door ensures the shelves are positioned correctly.
6. In the ACQUITY UPLC Console, select Sample Organizer from the system tree.
7. In the sample organizer information window, click Configure > “Scan and store shelf layout”.

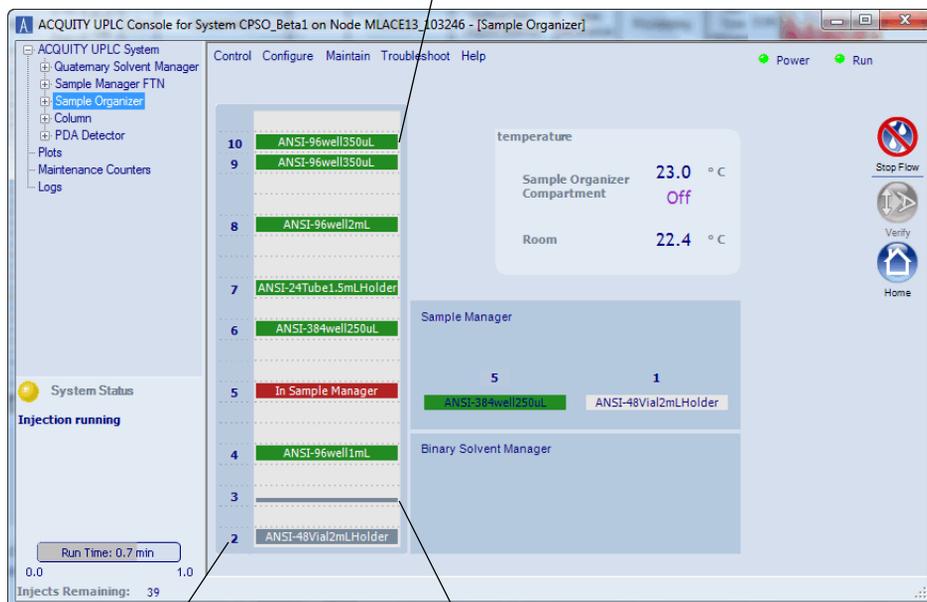
Result: The sample organizer initializes and scans the shelves for their positions and also for which shelves contain plates. When it detects a new shelf, the sample organizer illuminates the LED inside the sample organizer’s door, to the left-hand side of the shelf.

Tips:

- In the ACQUITY UPLC Console, a bar displays for each empty shelf. A bar also displays for each shelf that contains a plate. See the following figure for an example of an empty shelf and shelves that contain plates.
- After you configure the plate type or shelf, using Empower or MassLynx software, the plate identification appears in the wider bar.

Sample organizer information window:

Bar indicates the shelf contains a plate.
Plate information appears after plates
and shelves are configured in Empower
or MassLynx.



Shelf number

Blank bar indicates
the shelf is empty.

8. Configure the plates and shelves in the Empower or MassLynx data software.

Requirement: You can load plates and shelves before or after configuring them, but you must configure them before creating the sample set method.

Note: If Empower software controls the system,

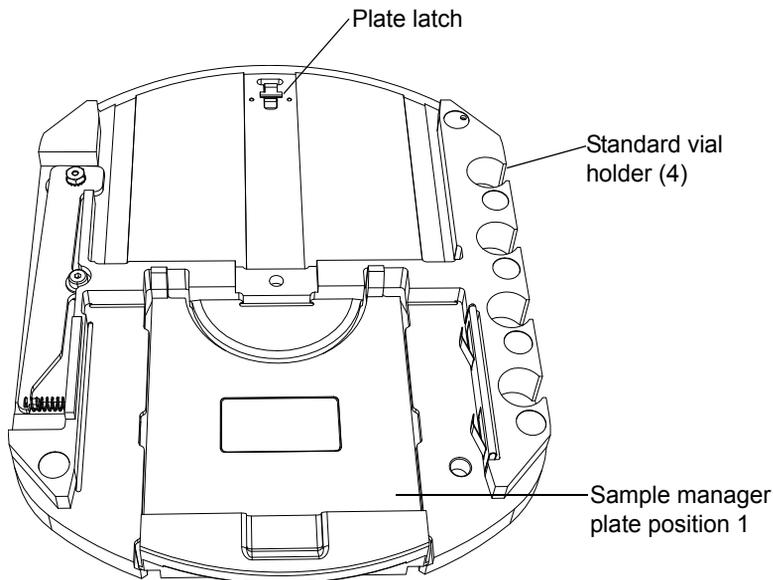
- the corresponding LED blinks when a shelf contains a plate that is part of a sample set.
- the corresponding LED displays a bracket symbol ([]) when a plate shuttles from a shelf to the sample manager, to indicate a plate is assigned to that shelf.

If MassLynx software controls the system, the corresponding LED does not blink when a shelf contains a plate that is part of a sample set.

Loading sample plates

The sample organizer holds as many as 19 standard ANSI/SBS footprint plates that you load through the front door. Note, however, that the actual number of plates you can load depends on their height. The sample manager contains a rotary tray in which position 1 is user-accessible, and position 2 is reserved for plates transferred from the sample organizer.

Sample manager rotary tray:



Refer to the table on [page 8](#) for the number of shelf slots required for various plates.

How plates are transferred

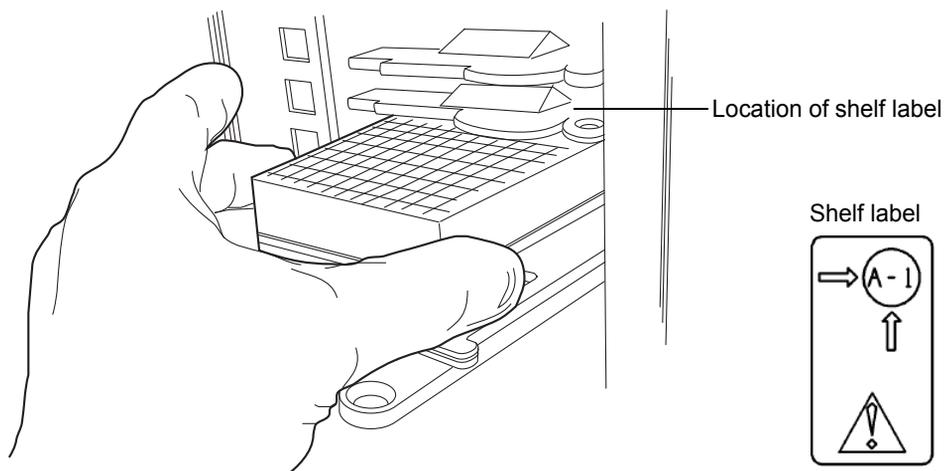
Three subassemblies move plates within the sample organizer: the Z drive, Y shuttle, and X shuttle. The Z drive moves the Y shuttle to the target shelf, where the Y shuttle withdraws the plate. Then, the Z drive moves the Y shuttle to the same elevation as the X shuttle. The Y shuttle moves the plate into the X shuttle, which transfers the plate into the sample manager for processing. When the sample manager finishes with the plate, the X shuttle

transfers it back into the sample organizer. The process is reversed to return the plate to the shelf it came from.

To load sample plates:

! **Caution:** When operating the sample organizer in humid environments, open the door only when necessary, because doing so admits humid air into the sample compartment, which causes condensation and decreases thermal performance.

1. Open the sample organizer's door.
2. Withdraw the shelf until it hits the hard stop.
3. Load the plate onto the shelf so that position A,1 is at the rear, right-hand corner, and the forward edge of the plate is behind the stop at the front, left-hand corner.



! **Caution:** To prevent spillage or damage from solvent vapors, use Waters-approved cap mats, sealing caps, or heat seal film on the samples. Consult the *Using Plates and Vials with ACQUITY UPLC and ACQUITY UPLC H-Class Systems* document (part number 715002434) for a list of approved plates, vials, caps, and sample covers.

4. Ensure that the plate does not extend beyond the plate stop at the rear of the shelf.

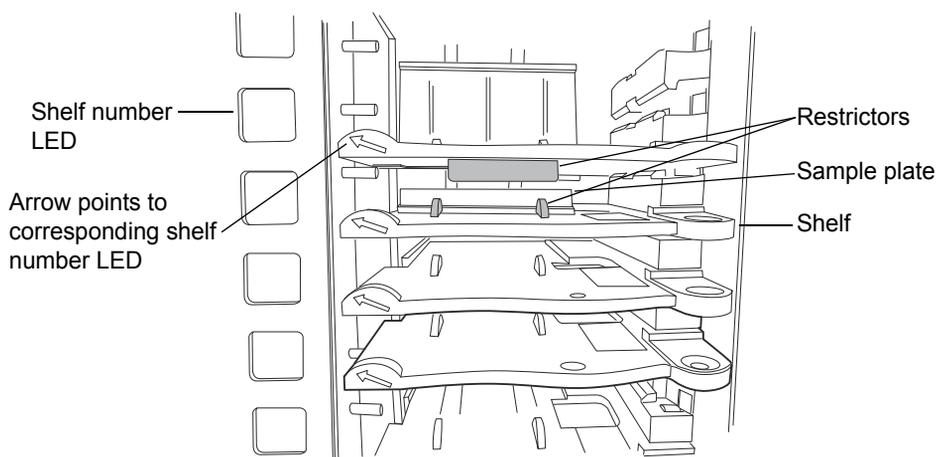
Tips:

- If the sample organizer detects a plate that extends beyond the plate stop at the rear of the shelf, the unit beeps, and the sample compartment light flashes. If you ignore this warning and attempt to run a sample set, an error message will appear in the ACQUITY UPLC Console.
- To ensure the transfer shuttle moves freely and without damaging the sample organizer, you must be able to slide a shelf-plate-vial combination in or out without interfering with restrictors on the shelves directly above and below it. Refer to the table on [page 8](#) for the number of shelf slots required for various plates.

! **Caution:** To ensure the transfer shuttle moves freely and without damaging the sample organizer, you must be able to slide a shelf-plate-vial combination in or out without interfering with restrictors on the shelves directly above and below it. See the following figure.

5. Slide the shelf into the sample organizer until it stops.

Shelf/plate combination and restrictors:



6. Repeat [step 2](#) through [step 5](#) for the remaining plates.



Caution: To avoid jarring the plates from their shelves, do not slam the sample organizer door closed.

7. Close the sample organizer door.
8. In the ACQUITY UPLC Console, select Sample Organizer from the system tree.
9. Click Verify

Result: The sample organizer scans the plates and shelves, senses which shelves contain plates, compares the shelves to the saved layout, and verifies that they match.

Tips:

- When a plate shuttles from a shelf to the sample manager, the corresponding LED displays a blinking bracket symbol ([]), to indicate the plate is assigned to that shelf.
 - If a shelf was added or moved since the last “Scan and store shelf layout” operation, the unit beeps, and displays an error message. Click Configure > “Scan and store shelf layout” to scan the new shelf layout, then click Verify .
10. Assign the plate types to the shelf numbers in the Empower or MassLynx data application.

Tip: You can load plates and shelves before or after configuring them in the data application, but you must configure them before creating the sample set method.

Displaying sample plate information

To display sample plate information:

1. In the ACQUITY UPLC Console, select Sample Organizer from the system tree.
2. In the sample organizer information window, click Configure > “Scan and store shelf layout”, to update and save the configuration of plates on shelves.

The number designations of shelves that contain sample plates appear beside information about the plates.

Tips:

- The plate type information appears only after method setup.
- Move the pointer over a shelf to display the number of samples remaining to be run from that shelf.

Maintaining the sample organizer



Caution: The sample organizer does not require lubrication. Never lubricate sample organizer components. Doing so can damage the device.

Maintaining the sample organizer consists of replacing its air filter and cleaning the device's outer surfaces.

Contacting Waters technical service

If you are located in the USA or Canada, report malfunctions or other problems to Waters Technical Service (800 252-4752). Otherwise, phone the Waters corporate headquarters in Milford, Massachusetts (USA), or contact your local Waters subsidiary. Waters' Web site includes phone numbers and e-mail addresses for Waters locations worldwide. Visit www.waters.com.

When you contact Waters, be prepared to provide this information:

- Error message (if any)
- Nature of the symptom
- Instrument serial numbers and firmware version
- Flow rate
- Operating pressure
- Solvent(s)
- Detector settings (sensitivity and wavelength)
- Type and serial number of column(s)
- Sample type and diluent
- Data software version and serial number
- ACQUITY UPLC system workstation model and operating system version

For complete information on reporting shipping damages and submitting claims, see the document *Waters Licenses, Warranties, and Support Services*.

Locating system serial numbers

The serial number on the system's instruments and devices facilitates service and support. Serial numbers also provide a way to create single log entries for each module, so that you can review the usage history of only that instrument or device.

Be prepared to provide the serial numbers of the instruments or devices in your system when you contact Waters customer support.

To view the information for an instrument or device:

1. In the ACQUITY UPLC Console, select an instrument or device from the system tree.
2. Click Configure > View module information.

Result: The Module Information dialog box displays this information:

- Serial number
- Firmware version
- Firmware checksum
- Component software version

Alternatives:

- From the main window, place the pointer over the visual representation of the system instrument or device you want information for.
- Obtain the serial number from the printed labels on the rear panels of instruments and devices or inside their front doors.

Maintenance schedule

Perform the following routine maintenance on the sample organizer to ensure reliable operation and accurate results. When using the system throughout the day (and on nights and weekends), or when using aggressive solvents, such as buffers, perform these maintenance tasks more frequently.

Recommended routine maintenance schedule:

Maintenance procedure	Frequency	For information...
Replace the air filter behind the door	As needed	See page 19 .
Clean the device's exterior	As needed	See page 19 .

Maintenance considerations

Safety and handling

Observe these warning and caution advisories when you perform maintenance operations on your system.



Warning: To prevent injury, always observe Good Laboratory Practice when you handle solvents, change tubing, or operate the sample organizer. Consult the Material Safety Data Sheets regarding the solvents you use.



Warning: To avoid electric shock, do not remove the device's protective panels. The components within are not user-serviceable.



Caution: To avoid damaging electrical parts, never disconnect an electrical assembly while power is applied to an instrument or device. To completely interrupt power, set the power switch to Off, and then unplug the power cord from the AC source. Wait 10 seconds thereafter before you disconnect an assembly.

Proper operating procedures

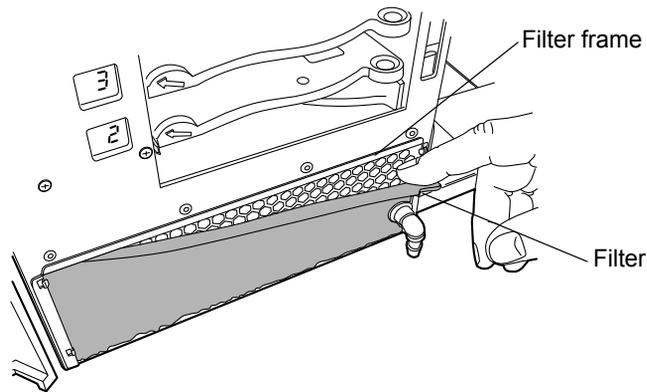
To ensure the system runs efficiently, see [page 5](#).

Replacing the air filter

To replace the air filter:

1. Open the sample organizer door.
2. Remove the air filter from the air filter frame on the bottom of the sample organizer and discard it.

Tip: You need not remove the air filter frame or waste line to remove the air filter.



3. Insert the waste line through the hole in the new air filter, and slide the filter up the waste line toward the air filter frame.
4. Place a few drops of silicone adhesive on the air filter frame, and then tuck the new air filter into the air filter frame.

Cleaning the device's exterior

Clean external surfaces of the sample organizer using only a soft, lint-free paper or cloth dampened with water.

Observe these requirements when cleaning device surfaces:

- Always ensure the electrical power to the device is interrupted.
- Always use eye and hand protection during the cleaning process.
- Apply the water to a clean cloth only, and then wipe the device.
- Never spray or apply the water directly onto any device surface.

Specifications

Physical specifications



Warning: To avoid back injuries, do not attempt to lift the sample organizer without assistance.

The following table lists the physical specifications for the ACQUITY UPLC System sample organizer.

Physical specifications:

Attribute	Specification
Height	96.5 cm (38.0 inches)
Width	25.4 cm (10.0 inches)
Depth	72.2 cm (30.0 inches)
Weight	<ul style="list-style-type: none">• In crate, prior to bench assembly: 56.7 kg (125.0 pounds)• On bench, ready for operation: 63.5 kg (140.0 pounds)

Environmental specifications

The following table lists the environmental specifications for the ACQUITY UPLC System sample organizer.

Environmental specifications:

Attribute	Specification
Operating temperature	4 to 40 °C (39.2 to 104 °F)
Operating humidity	20 to 80%, noncondensing
Shipping and storage temperature	-30 to 60 °C (-40 to 140 °F)
Shipping and storage humidity	20 to 85%, noncondensing

Electrical specifications

The following table lists the electrical specifications for the ACQUITY UPLC System sample organizer.

Electrical specifications:

Attribute	Specification
Protection class ¹	Class I
Oversvoltage category ²	II
Pollution degree ³	2
Moisture protection ⁴	Normal (IPXO)
 Line voltages, nominal	Grounded AC
Voltage range	100 to 240 Vac
Frequency	50/60 Hz
Maximum power draw	540 VA
Fusing	10 A

- 1. Protection Class I** – The insulating scheme used in the instrument to protect from electrical shock. Class I identifies a single level of insulation between live parts (wires) and exposed conductive parts (metal panels), in which the exposed conductive parts are connected to a grounding system. In turn, this grounding system is connected to the third pin (ground pin) on the electrical power cord plug.
- 2. Oversvoltage Category II** – Pertains to instruments that receive their electrical power from a local level such as an electrical wall outlet.
- 3. Pollution Degree 2** – A measure of pollution on electrical circuits that can produce a reduction of dielectric strength or surface resistivity. Degree 2 refers only to normally nonconductive pollution. Occasionally, however, expect a temporary conductivity caused by condensation.
- 4. Moisture Protection** – Normal (IPXO) – IPXO means that no Ingress Protection against any type of dripping or sprayed water exists. The “X” is a placeholder that identifies protection against dust, if applicable.

Performance specifications

The following table lists the performance specifications for the ACQUITY UPLC System sample organizer.

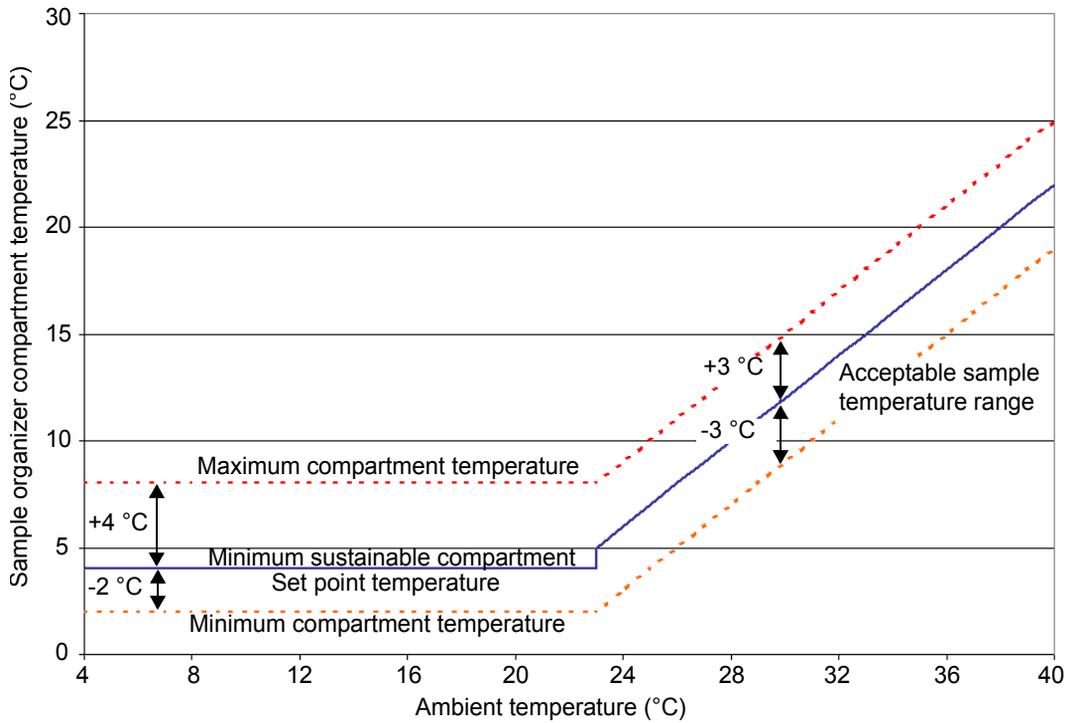
Performance specifications:

Item	Specification
Sample plate compatibility	Compatible with vials and plates listed in the <i>Waters Sample Vials and Accessories</i> brochure.
Sample plate capacity	Maximum of 19 plates, as high as 15.5 mm Maximum of 9 plates, as high as 40.0 mm Maximum of 6 plates, as high as 53.0 mm
Minimum sample plate height	13 mm
Maximum sample plate height (includes vials, caps, and cap mats)	53 mm

Performance specifications: (Continued)

Item	Specification
Sample compartment temperature range	<p>Between 4 and 40 °C, in increments of 0.1 °C, with a tolerance range of between -2 and +4 °C</p> <ul style="list-style-type: none"> • At a setpoint of 4 °C with ambient temperature <23 °C and humidity <80%, maintains a sample temperature of 2 to 8 °C. • At ambient temperatures >23 °C and/or humidity >80%, the sample manager and sample organizer can maintain an average sample temperature of 18 °C below ambient, ± 3.0 °C.
Temperature accuracy	No more than a ± 1.0 °C in temperature between a traceable external temperature measurement device and instrument temperature measurement device.
Temperature stability	± 1.0 °C (at the sensor with sample compartment door closed)
Pneumatic system operating pressure range	414 to 758 kPa (4 to 8 bar, 60 to 110 psi)
Optional external pneumatic source pressure range	517 to 689 kPa (5 to 7 bar, 75 to 100 psi)
Minimum sample compartment temperature specifications	See the graph “Minimum sample compartment temperature specifications”, below.

Sample compartment temperature specifications:



The graph shows achievable sample compartment temperature and expected variation at various ambient temperatures.