

Bio-Botanical Extraction System

Site Preparation Guide

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General information

This guide helps you prepare your laboratory facility for installation of the Waters Bio-Botanical Extraction System (BBES). Proper site preparation is critical to successful operation of the system.

Related information

Bio-Botanical Extraction System Guide (Waters.com)

Customer support

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

Safety advisories

- ! **Warning:** To prevent personal injury as well as damage and other property, it is essential to follow the site preparation guide.
- ! **Important:** Observe Good Laboratory Practice (GLP) at all times, particularly when working with hazardous materials. Consult the Safety Data Sheets regarding the solvents you use. Additionally, consult the safety representative for your organization regarding its protocols for handling such materials.
- ! **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, site preparation, and 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 have to reschedule the installation. In addition, you may be charged for all travel costs incurred.

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 this guide.
3. Verify that each requirement has been met by marking the check box in each section.
4. Complete the [Customer confirmation, page 26](#), and return it to the sales support representative at your local Waters office.
5. 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, notify Waters so 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.
4. Train the customer on basic operation of the system hardware and software.

Relocating shipping containers

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

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 with the Waters engineer at the time of installation
- Adhere to appropriate country and company regulations

! **Warning:** To avoid injury, get help when lifting the instrument into place if the unit exceeds 23 kg (50 lb). 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 (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 wide enough to accommodate the largest component. For system dimensions, see [Component dimensions, page 8](#) and [System clearances, page 10](#).

Elevators, corridors, and staircases

Elevators and corridors must be wide enough to accommodate the largest component.

! **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 0 °C to 40 °C (32 °F to 104 °F)
- Humidity <80%, non-condensing

Verify relocating shipping containers requirements

Check the box 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 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

Figure 1 and Figure 2 show an example layout for the system.

! **Important:** For questions about layout, contact your Waters representative.

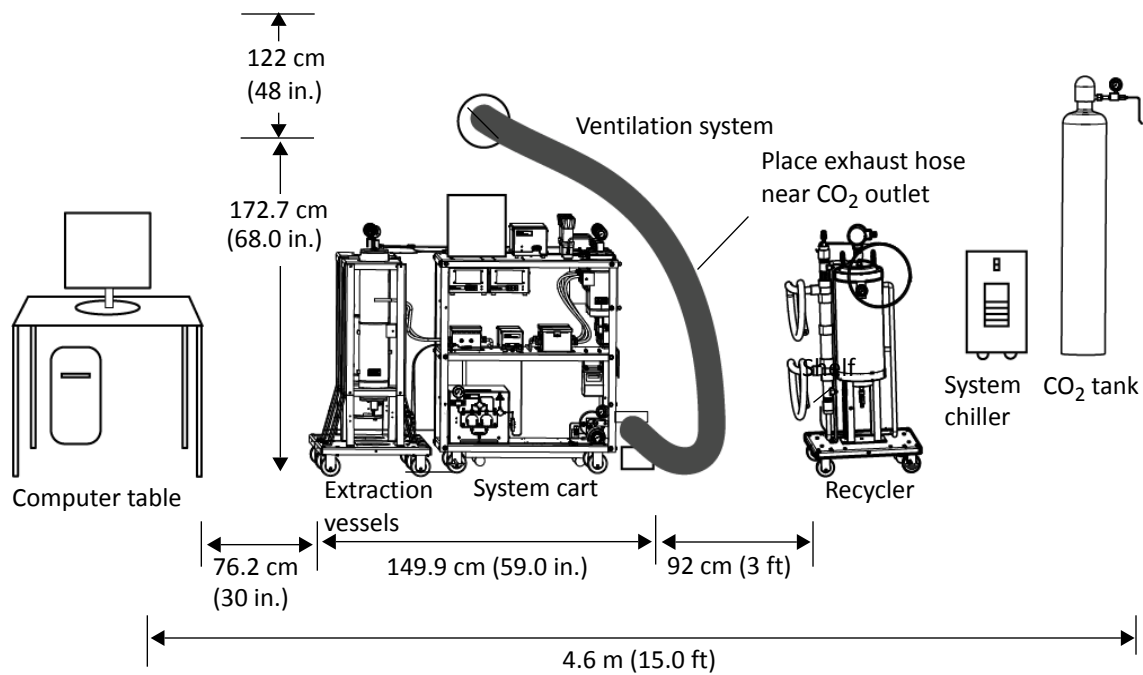


Figure 1 - BBE system layout example (front view)

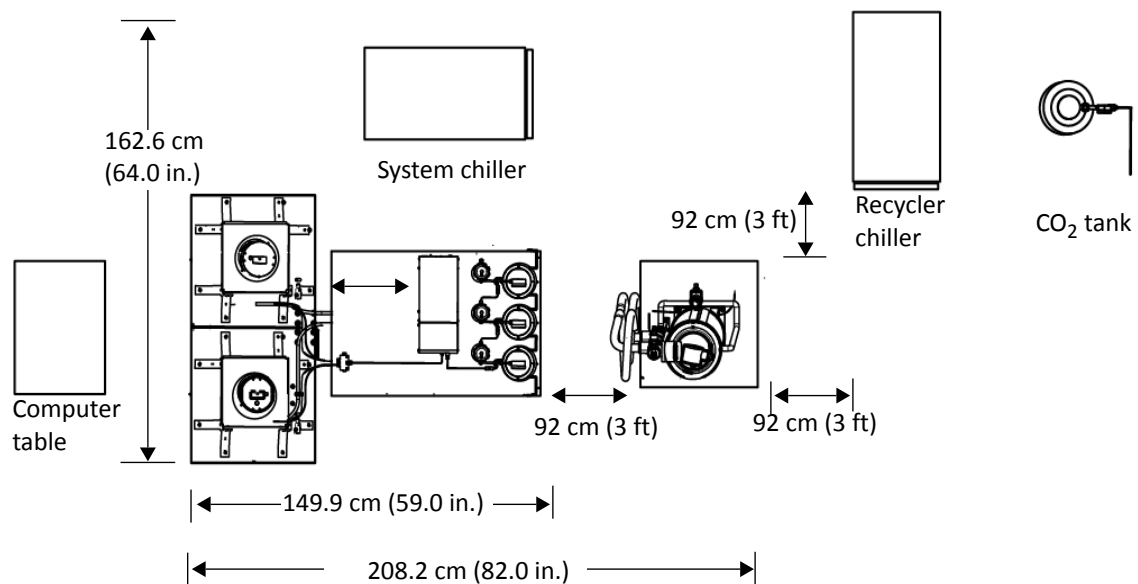


Figure 2 - BBE system layout example (top view)

Component dimensions

Ensure that your laboratory has sufficient space for all system components (see [Table 1](#)).

- ! **Important:** Provide at least 152 cm (5 ft) of vertical clearance.
- ! **Important:** For specific height and weight restrictions, contact your Waters service representative.

Table 1: Component dimensions

System component	Width	Depth	Height
Circulating bath	23.1 cm (9.1 in.)	63.0 cm (24.8 in.)	48.8 cm (19.2 in.)
Extraction vessel (5-L)	58.4 cm (23.0 in.)	61.0 cm (24.0 in.)	127.0 cm (50.0 in.)
Extraction vessel (10-L)	58.4 cm (23.0 in.)	61.0 cm (24.0 in.)	172.7 cm (68.0 in.)
LCD monitor	45.0 cm (18.0 in.)	25.0 cm (10.0 in.)	42.0 cm (17.0 in.)
PC	18.0 cm (7.0 in.)	45.0 cm (18.0 in.)	45.0 cm (18.0 in.)
Recycler (optional)	58.4 cm (24.0 in.)	61.0 cm (24.0 in.)	147.3 cm (58.0 in.)
Recycler chiller (optional)	36.8 cm (14.5 in.)	70.2 cm (27.6 in.)	57.5 cm (22.6 in.)
System chiller	32.0 cm (12.6 in.)	50 cm (19.7 in.)	60.0 cm (23.6 in.)

Table 1: Component dimensions

System component	Width	Depth	Height
System cart: Accommodates ABPR, automation module, collection vessels, heat exchangers, MBPR, mass flow meter, P-50 co-solvent pump (optional), P-200 CO ₂ pump, relay, and temperature control module	91.0 cm (36.0 in.)	61.0 cm (24.0 in.)	122.0 cm (48.0 in.)

Weights

Table 2 shows the nominal weights for the system cart and components.

Table 2: System and component weights

System component	Weight
Base system minimum configuration	100 kg (220 lb) Note: Weight does not include optional P-50 co-solvent pump, optional recycle system, the chiller, and the data system.
Base system with P-50 co-solvent pump and flow meter	122 kg (270 lb) Note: Weight does not include the optional recycle system, the chiller, and the data system.
Extraction vessel (5-L)	91 kg (200 lb) Two per system with no 10-liter vessel.
Extraction vessel (10-L)	143 kg (315 lb)
System chiller	48 kg (106 lb)
Optional recycler	102 kg (225 lb)
Recycler chiller	66 kg (145 lb)
Data system (Actual weights may differ, depending on the model.)	
PC	14 kg (30 lb)
LCD monitor	5 kg (11 lb)

Additional space requirements

Also allow space for:

- preparation and sample loading of the sample material before extraction
- weighing before and after loading
- collection containers and solvent storage
- CO₂ tank cart
- drying and grinding the sample material (Waters recommends a separate room)

Clearances

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

Table 3: System clearances

System/component	Clearance
Cart	<ul style="list-style-type: none"> • Front: 30.5 cm (12 in.) • Rear: 30.5 cm (12 in.)
5-liter stand	
10-liter stand	<ul style="list-style-type: none"> • Front: 30.5 cm (12 in.) • Rear: 30.5 cm (12 in.) • Top: 25.0 cm (20 in.)
Recycler (optional)	<ul style="list-style-type: none"> • Front: 30.5 cm (12 in.) • Rear: 30.5 cm (12 in.) • Distance from recycler chiller heat exhaust: ≥92 cm (3 ft)
Recycler chiller	<ul style="list-style-type: none"> • Front: 30.5 cm (12 in.) • Rear: 30.5 cm (12 in.)
Recycler chiller heat exhaust	<ul style="list-style-type: none"> • Distance from recycler ≥92 cm (3 ft)

Verify space and load requirements

Check the box 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 space and load requirements met

Solvent requirements

- ! **Caution:** To ensure proper performance of the SFE system, use clean, high-purity solvents. Failure to provide clean solvents and glassware can cause significant delays to the installation. For details on clean solvents, see [Controlling Contamination in LC/MS Systems \(715001307\)](#).
- ! **Important:** For details on solvent brands, glassware requirements, and procedures to control contamination, see the [safety data sheets \(SDSs\)](#) for your product.

Have the following solvents available for the installation:

- Ultra-pure water
- Isopropanol
- 90% ethanol (for cleaning)
- Acetone (for cleaning)
- 99% ethanol, 200 proof (for extraction)

Verify solvent requirements

Check the box 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

Carbon dioxide (CO₂)

The system requires a liquid CO₂ supply with an industrial grade or better without a regulator, depending on the application.

CO₂ source

- ! **Important:** You must use a liquid CO₂ supply. Gas delivery cylinders do not work with the BBE system.
- ! **Caution:** To ensure a minimum inlet pressure of 55 bar, do not use low-pressure tanks such as Dewars.
- ! **Caution:** Ensure that tanks are acclimated to room conditions for a minimum of 12 hours before use. Cold areas require up to 24 hours of acclimatization.

Use one of the following distribution systems:

- Glass-coated cylinder with dip tube, capable of delivering ≥ 725 psi
- In-house distribution system

Cylinder. If you use a cylinder, the CO₂ source must be within 152 cm (5 ft) of the rear of the system. The cylinder must be properly secured in a fixed position.

In-house distribution system. The in-house distribution system must provide:

- a shutoff valve that is clean and particle-free, non-lubricated, free from silicone and EPDM rubber, and compatible with CO₂
- CO₂ that is regulated ≥ 725 psi

Verify gas requirements

Check the box 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.

<input type="checkbox"/>	All gas requirements met
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Power requirements

Refer to the following power requirements when preparing your laboratory:

- All BBES components require a grounded power source. The receptacles from this power source must be accessible to all components, and must share a common ground.
- The recycler and system chillers each require a dedicated circuit.
- The inline collection heater (HE4) must be plugged into the same outlet as the recycler chiller.
- The individual modules—except for the chillers, relays, optional heat exchanger (HE3), PC, HE4, and LCD monitor—are connected to the attached power strip.

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

See [System power requirements, page 15](#) for a summary of component power requirements.



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

Table 4 shows the current draw and power cords for the BBES system.

Table 4: BBES current draw and power cords

Component	Typical (A)		VA		Total current		Total VA		Calories/hr		Total current	US cord end	Power circuit
	120 V	240 V	110 V	220 V	110 V	220 V	110 V	220 V	110 V	220 V			
											N/A	N/A	N/A
2-L collection vessel	N/A	2.54	N/A	558	N/A	2.54	N/A	1000	164	479800	2.54	N/A	N/A
5-L extraction vessel	N/A	8.6	0	1892	0	8.6	0	2000	0	1626827	8.6	6-20	220-4
10-L extraction vessel	N/A	17.2	0	3784	0	17.2	0	4000	0	3253654	17.2	6-20	220-4A/5
ABPR	N/A	0.4	0	88	0	0.4	0	88	0	75666	N/A	N/A	N/A
Automation module	1.83	N/A	220	N/A	1.83	N/A	220	N/A	189165	N/A	1.83	N/A	220-2
Computer PC (typical)	1.1	N/A	121	0	1.1	0	121	0	104041	0	1.1	5-15	110-1
Computer monitor (typical)	0.9	N/A	99	0	0.9	0	99	0	85125	0	0.9	5-15	110-1
Recycler heat exchanger (HE3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inline heater (HE2)	N/A	8.6	0	2000	0	17.2	0	3784	0	3253654	8.3	N/A	N/A
Inline collection heater (HE4)	N/A	4.16		1000	N/A	4.16		1000	N/A	859845	4.16	6-20	220-25
Mass flow meter	N/A	0.2	0	44	0	0.2	0	44	0	37833	0.4	N/A	N/A
P-200 CO ₂ pump	N/A	4.0	0	880	0	4	0	880	0	756664	4	N/A	N/A
P-50 co-solvent pump	N/A	1.6	0	352	0	0	0	0	0	0	0	N/A	N/A
Relay module (12 A)	N/A	4.3	0	946	0	4.3	0	946	0	813414	4.3	6-20	220-3
Relay module (20 A)	N/A	4.3	0	946	0	8.6	0	1892	0	1626827	8.6	6-20	220-3
Recycler chiller	N/A	12	0	2640	0	12	0	2640	0	2269991	12	6-20	220-1
System chiller (Julabo)	10	N/A	1100	N/A	10	N/A	1100	N/A	945800	N/A	10	5-20	220-1
System strip	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	6-20	220-2
Temperature controller (CN6)	N/A	0.1	0	22	0	0.2	0	44	0	37833	0.2	N/A	N/A

POWER REQUIREMENTS

Table 5: System power requirements

Component ¹	Nominal rated voltage	Fuse rating	Maximum power consumption
ABPR	110/220 VAC 50/60 Hz	3 A/250 VA	220 VA
Automation module	110/220 VAC 50/60 Hz	3 A/250 VA	220 VA
Temperature controller	110/220 VAC 50/60 Hz	1 A/250 VA	220 VA
Inline heater (HE2)	100 VAC to 240 VAC 50/60 Hz	10 A/250 V	2000 VA
Inline collection heater (HE4)	100 VAC to 240 VAC 50/60 Hz	10 A/250 V	1000 VA
P-200 CO ₂ pump	100 VAC to 240 VAC 50/60 Hz	10 A/250 V	880 VA
P-50 co-solvent pump	100 VAC to 240 VAC 50/60 Hz	10 A/250 V	352 VA
Relay module (12 A)	200 VAC to 240 VAC 50/60 Hz	12 A/250 V (two per vessel)	12 A-2640 VA
Relay module (20 A)	200 VAC to 240 VAC 50/60 Hz	12 A/250 V (one per vessel)	N/A
Mass flow meter	115 VAC to 230 VAC 50/60 Hz	0.4 A/250 V	20 VA
2-L vessel cyclone	200 VAC to 240 VAC 50/60 Hz	N/A	1000 VA
5-L vessel heater	200 VAC to 240 VAC 50/60 Hz	N/A	2000 VA
10-L vessel heater	200 VAC to 240 VAC 50/60 Hz	N/A	4000 VA (2000 W per heater)

1. The cooling heat exchanger (HE1) has no electrical parts.

Power receptacles

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

Use [Figure 3](#), [Figure 4](#), [Table 6](#), and [Table 7](#) (page 16) as guides for determining the receptacle layout required for your system components.

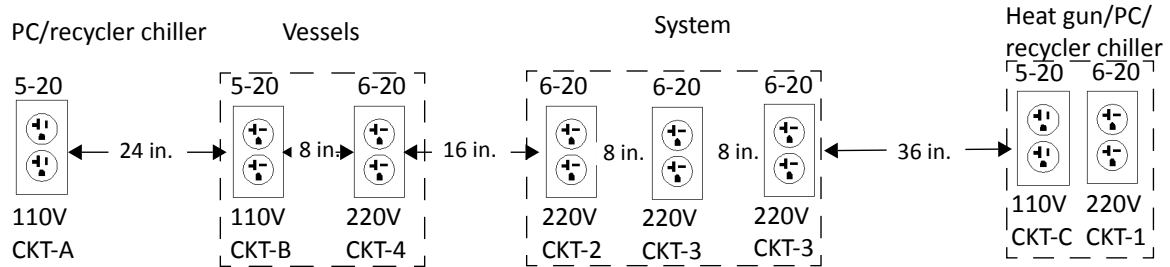


Figure 3 - Recommended receptacle layout (5-L system)

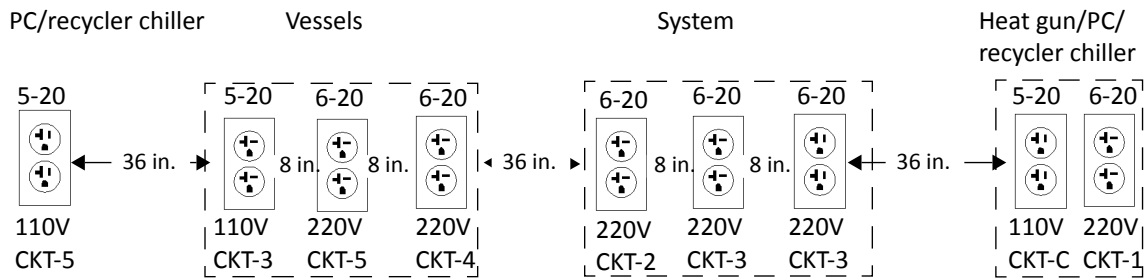


Figure 4 - Recommended receptacle layout (10-L system)

Table 6: 5-L system power receptacles

220 circuits		110 circuits		Parameter	Specification
CKT-1	Recycler chiller, HE4	CKT-A	Computer and monitor	Maximum output = 56522 W	
CKT-2	System power strip	CKT-B	System chiller, recycler display	110-V receptacles	Duplex 5-20 NEMA
CKT-3	Cyclone heaters (2 cords)			220-V receptacles	Duplex 6-20 NEMA
CKT-4	Vessels (2 cords)			All receptacles	Approximately (~) 13 inches from floor
				All circuits (110 and 220)	20A
				PC and recycle positions can be reversed	

Table 7: 10-L system power receptacles

220 circuits		110 circuits		Parameter	Specification
CKT-1	Recycler chiller, HE4	CKT-A	Computer and monitor	Maximum output = 56522 W	
CKT-2	System power strip	CKT-B	System chiller, recycler display	110-V receptacles	Duplex 5-20 NEMA
CKT-3	Cyclone heaters (2 cords)	CKT-C	Heat gun	220-V receptacles	Duplex 6-20 NEMA

Table 7: 10-L system power receptacles

220 circuits		110 circuits		Parameter	Specification
CKT-4	Vessels (2 cords)			All receptacles	Approximately (~) 13 inches from floor
CKT-5	Vessels (2 cords)			All circuits (110 and 220)	20A

Table 8 shows the power cords supplied by Waters. For part numbers, see the [part locator](#).

Table 8: Power cords supplied by Waters










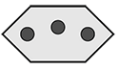



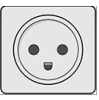

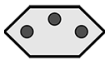




Region	Plug	Receptacle	Receptacle type
US/ Canada/ Japan/ Taiwan			NEMA 5-15R
UK			BS 1363
Europe			CEE 7
Australia			AS/NZS 3112
Brazil			NBR 14136
China			CPCS-CCC
Denmark			107-2-D1
Switzerland			SEV 1011
India			UK2-15R

Table 8: Power cords supplied by Waters (continued)

Region	Plug	Receptacle	Receptacle type
Korea			SK1-16R

Verify power requirements

Check the box 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.

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

CO₂ detectors

- !** **Warning:** To prevent injury or death from CO₂ vapors, install multiple CO₂ ambient-air sensors and alarm units to comply with the permissible exposure limit (PEL) for CO₂ prescribed by the US Occupational Safety and Health Administration (OSHA). Install the CO₂ air sensors and alarm units instead of, or in addition to, an oxygen monitor. The units must detect CO₂ levels to 10,000 ppm and issue an alarm at 5,000 ppm CO₂.

Waters recommends the following external sensors and alarms for SFE systems:

- CO₂ sensor and alarm, to warn of large leaks or cylinder malfunctions
- Oxygen sensor and alarm, to detect CO₂ leaks that cause the oxygen level to fall below safe levels
- Lower-explosive-limit (LEL) sensor and alarm, to detect and warn of accidental spills of co-solvent or leaks that can contain solvent in an aerosol-like state

Air quality

Ensure that the laboratory is not exposed to excessive dust.

- !** **Caution:** Do not place the system in the same room used to grind the product. Grinding dust can enter the instrument and harm the electronics.
- !** **Important:** The ventilation system must provide an air exchange rate of four rooms per hour.

Humidity

Ensure that 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

! **Warning:** To prevent injury, use care in operating the system at the higher temperatures listed. CO₂ can boil or overpressure its supply cylinders at higher temperatures.

! **Caution:** Failure to operate in the listed temperature ranges compromises system performance and can cause instrument failure.

- The optimum temperature range of the laboratory is 19 °C to 23 °C (66 °F to 74 °F).
- Short-term temperature variations must not exceed ±3.5 °C (±5 °F) over 24 hours.

Vibration

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

Radio emissions

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

! **Caution:** If one of these devices causes interference, discontinue its use.

Verify environmental requirements

Check the box 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.

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

Venting of the system is the sole responsibility of the customer. Venting requirements must be met before the system can be installed.

Exhaust safety requirements vary depending on laboratory size, system configuration, application, and type and quantity of extraction material.

- ! **Warning:** To avoid serious injury or death from CO₂ vapors, ensure that the CO₂ system is properly vented (see [CO2 hazards to humans, page 20](#)).
- ! **Warning:** The active exhaust vent must provide a minimum vacuum of 2 mbar (0.03 psi) below atmospheric pressure (negative pressure).
- ! **Warning:** Exhaust venting must comply with all local safety and environmental regulations. The ANSI/AIHA Z9.2-2001 standard for “Fundamentals governing the design and operation of local exhaust ventilation systems” provides guidance on compliant exhaust systems.

CO₂ hazards to humans

Carbon dioxide exhibits three primary hazards for humans:

- Toxicity, at levels that exceed 10,000 ppm (PEL 5,000 ppm)
- Frostbite, from uncontrolled release of pressurized CO₂ to atmosphere or contact with accumulated dry ice at a leak site
- Asphyxiation, caused by displacement of oxygen

Before proceeding with any safety-monitoring configuration, consult your environmental health and safety manager regarding applicable local, federal, and international safety regulations and requirements.

Air exchange rate

- ! **Important:** The ventilation system must provide an air exchange rate of four rooms per hour.

Exhaust outlets

The system vents through a fume hood to the outside through a ¼-inch compression fitting. If the tubing length is greater than 5 feet or contains multiple bends, use larger tubing to prevent restriction of the escaping gases.

Figure 5 shows the approximate locations of the exhausts. Table 9 lists the fitting details.

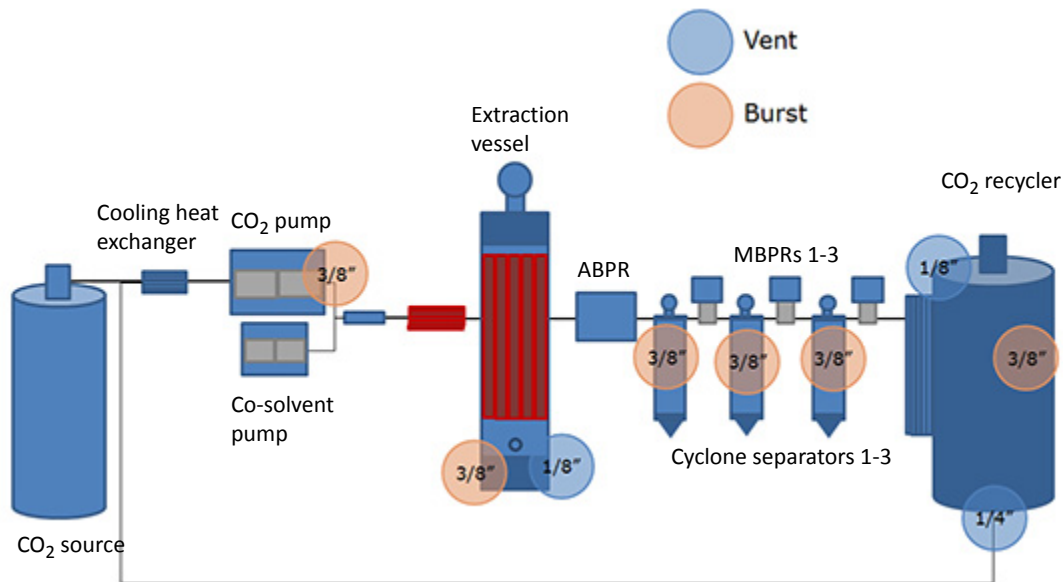


Figure 5 - Exhaust locations

Table 9: Exhaust fittings

System component	Exhaust vent	Fittings on system
Extraction vessel	Exhaust vent	1/8-inch fitting (1)
	Rupture disc	3/8-inch fitting (1)
CO ₂ pump	Rupture disc	3/8-inch fitting (1)
Cyclone separators	Rupture discs	3/8-inch fitting (3)
CO ₂ recycler	Vent	¼-inch fitting (1)
	Vent	1/8-inch fitting (1)
	Rupture disc	3/8-inch fitting (1)

Positioning of the venting system

Consult your local environmental health and safety manager regarding safety requirements for the venting system.

- ! **Warning:** To protect against oxygen deficiency or other health effects, ensure that a venting siphon or hose is positioned near the CO₂ outlet. See [BBE system layout example \(front view\)](#), page 7 for an example of recommended positioning of the venting system.

Rupture disc tubing

The system vents the rupture discs to a hood or to the outside using 6.0-cm (¼-inch) compression fittings attached to each rupture disc outlet. Rupture discs typically burst at pressures of 2,000 to 10,500 psi (see labels on each outlet), but can burst at lower pressures if fatigued.

- ! **Important:** Tubing connected to each fitting must be of sufficient strength to withstand the pressures.
- ! **Warning:** If your application uses toxic substances, be aware that the material can end up in the exhaust system if a rupture disc bursts.

Verify exhaust requirements

Check the box 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.

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

Supply the following items for the installation:

! **Important:** Installation cannot proceed until the customer supplies all items in this section.

CO₂ supplies

- CO₂ supply that is food grade or better
- 6 x 23-kg (50-lb) CO₂ cylinders with dip tube (siphon) for liquid delivery (food or industrial grade); must be capable of delivering 50 bar
- Tank safety rack or tank cart for restraining CO₂ tanks
- Electric blanket or heating pad to wrap around the tank
- CO₂ detector capable of detecting 5,000 to 10,000 ppm CO₂
- Tubing that can vent system waste gas and connect to a 6.0-cm (¼-inch) compression fitting
- Stainless-steel tubing for exhaust vents
- Connection to the CO₂ supply

Note: A CGA 320 tank fitting and 3 m (10 ft) of 3.2-mm (1/8-inch) SS tubing are supplied; you must provide a connection between this tubing and the CO₂ supply.

- Appropriate ducting for ventilation

Laboratory supplies

! **Warning:** To prevent injury from shattering bottles, do not use glass containers.

- Non-glass waste container that can be vented to an exhaust system
- At least two dozen 1.5-L storage containers (for example, stainless steel hot water bath or “bain-marie” vessel)
- Nitrile gloves
- Lint-free tissue
- 2-L supply of ethanol (food grade, 90% or higher) for cleanup
- 8-L supply of 50:50 water/ethylene glycol or water/propylene glycol mix

Note: Do NOT use automotive antifreeze.

- Disposable lab coat
- Safety glasses or face shield
- Movable cart

Tools

- Wrenches: 7/16-inch (2), 3/8-inch, 1/2-inch, 9/16-inch, large adjustable 1 1/8-inch, extra large 2½-inch
- Allen wrench: 3/16-inch T-handle type
- Channel lock pliers: 4-inch minimum opening for servicing extraction vessel frits and seals

Additional supplies

- 9 kg (20 lb) of dried ground material (consistency of sand or coffee grounds)
- Funnel with a 5-cm to 10-cm (2-in. to 4-in.) exit diameter (for adding plant material to the extraction vessel)
- Grinder with the ability to grind the plant material to a sand or coffee ground consistency
- Vessel packing aid (for example, a wooden bat or dowel 5.0 cm x 91.44 cm (2 in. x 3 ft) in length)
- Heat gun (for heating tubing to remove internal clogs)
- Chafing dish (for drying plant material before extraction)
- Shop vacuum with 7.62-cm (3-inch) hose diameter (to clean out extraction vessel after extraction is complete)
- Paper towels or shop rags
- Paint brushes, assorted sizes
- 4 coils (10 ft each) of 1/8-inch stainless steel tubing
- Plexiglas or other floor protection (61 cm x 61 cm, or 2 ft x 2 ft)
- Step stool (for 10-L vessel)
- Squirt bottles
- Cotton swabs
- Dust covers for computer equipment
- Portable temperature monitors, to verify ± 3 °C (± 5 °F) temperature variations

Verify items you must supply requirements

Check the box 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.

<input type="checkbox"/>	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 requalification or revalidation.

Hardware requirements

Ensure that the workstation includes:

- a full-size PCI slot
- two Ethernet ports

Verify workstation requirements

Check the box 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.

<input type="checkbox"/>	All workstation requirements met
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Customer 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 have to reschedule the installation. In addition, you may be charged for all travel costs incurred.

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

<input type="checkbox"/>	<p>I confirm that all supplies are available.</p>
<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.)</p> <ol style="list-style-type: none"> 1. All relocation requirements met, page 6 2. All space and load requirements met, page 10 3. All solvent requirements met, page 11 4. All gas requirements met, page 12 5. All power requirements met, page 17 6. All environmental requirements met, page 19 7. All exhaust requirements met, page 22 8. All items we (the customer) must supply are available, page 24 9. All workstation requirements met, page 25
<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>Indicate availability (check one):</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, notify Waters so we can reschedule the installation for a more convenient time.</p>

Signed: _____

Customer summary

Complete the summary table 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.