



QUICK SET UP GUIDE

LX-5080-QS



Q-SUN Xe-3 Xenon Test Chambers



For Models:

X3H	X3HDSE
X3HCE	X3HBSCE
X3HSE	X3HDSCE
X3HSCE	X3HDSBSE
X3HBSE	X3HDSBSCE

Revision Date

11 Apr 2022

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1. Specifications, Classifications, Symbols (Feb 2015)

Specifications, Classifications

- The recommended ambient operating temperature and relative humidity (RH) for the Q-SUN tester is $23 \pm 5^{\circ}\text{C}$ and $50 \pm 25\%$ RH.
- The maximum ambient operating temperature and humidity is 40°C and 80% relative humidity.
- Temperatures outside the recommended range may cause chamber temperature and/or humidity faults.
- Transportation and Storage Temperature: -40°C to 80°C .
- Installation Category: Category II for transient over-voltages.
- Pollution Control: Pollution Degree 2.
- Sound Pressure Level: Sound Pressure Level does not exceed 75 dBA.
- Altitude: 2000 meters or less.
- Operation: Continuous Rating.
- Supply Connection: Permanently connected or plug/socket connection (industrial type per IEC 6309 or twist lock type in North America).
- External Disconnect: Required for all connections.
- External Over-Current Protection: Must be rated for not more than 40 A (USA, Canada) or 64 A (Europe).

Symbols



Electrical Shock Hazard



Hot Surfaces Hazard



Attention



Finger/Hand Crushing hazard



**Local Waste & recycling regulations
per the WEEE Directive 2002/96/EC
on Waste Electrical and Electronic
Equipment**

2. Safety Information

Q-Lab accepts no responsibility for the consequences if the user fails to comply with the instructions in this operating manual. Q-Lab will accept responsibility for defective parts or components only if the machinery was defective at the time that the tester was shipped.

- This manual does not claim to address potential safety issues, if any, associated with the use of this product.
- It is the responsibility of the user of this manual to establish appropriate safety and health practices, and to determine the applicability of regulatory limitations prior to use.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment safety devices may be impaired.
- The Q-SUN meets the European Low Voltage Directive 2014/35/EU and complies with the requirements of EN 61010-1: 2010 (Third Edition), "Safety of Electrical Equipment for Measurement, Control and Laboratory Use".
- The Q-SUN meets the European Electromagnetic Directive 2014/30/EC and complies with the requirements of EN 55011:2007 Radiated and Conducted Emissions – class A.
- Use only parts that have been supplied or recommended by Q-Lab.

2.1 Heat and Electrical Shock Hazards (Dec 2020)

Warning Labels

- **Warning:** If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Warning labels indicate heat and electric shock hazards inside the Q-SUN tester.



Figure 2.1a: Hot Surface Warning Label



Figure 2.1b: Shock Hazard Warning Label



Figure 2.1c: Tester door and access panel locations.

All Q-SUN models are equipped with an interlock switch (Figure 2.1d) that turns off the xenon lamps when the lamp access door is opened.



Figure 2.1d: Lamp Door Interlock Switch Location



CAUTION: The vapor hose and the humidifier are hot.

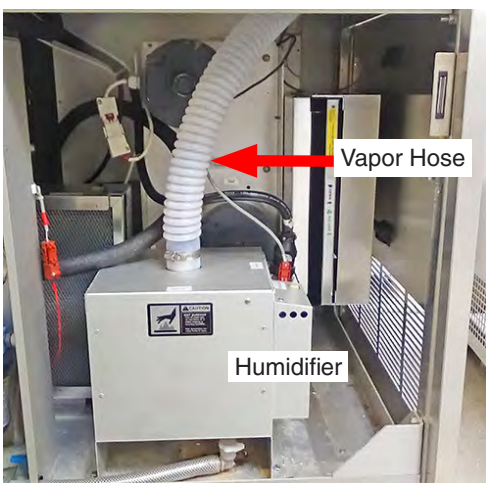


Figure 2.1e: Humidifier Inside Lower Front Door

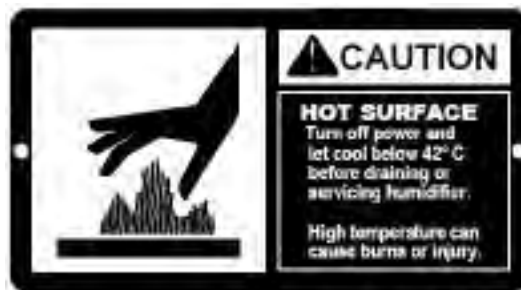


Figure 2.1f: Humidifier Hot Surface Label

2.2 Ultraviolet and Infrared Hazards (Mar 2019)

The Q-SUN lamps produce UV light that can cause severe sunburn, eye inflammation, and damage to your vision. Do not defeat the switch that turns off lamps when the chamber door is open.

Figure 2.2 below shows the location of the chamber door interlock switch inside the right side top access panel.

NOTE: The right side top access panel is connected to the tester by a ground wire tether. When removing the access panel it is not necessary to disconnect the wire. The ground wire is long enough to set the access panel on the ground in front of the tester.

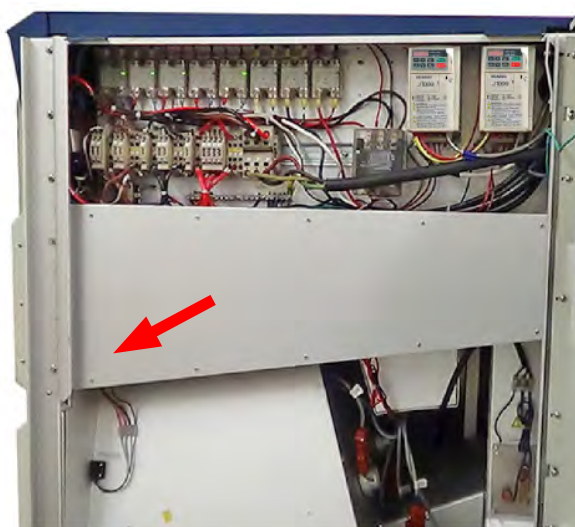


Figure 2.2: Chamber door interlock location (right side top access panel removed).

2.3 Dual Spray System (Oct 2020)

Overview

- Q-SUN Xe-3 models equipped with dual spray (DS) have a separate assembly, which includes the fluid reservoir and an enclosure housing an electrically operated pump system ([Figure 2.3](#)).

Electrical Shock Hazards

- Because the Dual Spray system is electrically operated, care should always be exercised when working on or around the equipment, particularly if the floor is wet.
- The enclosure below the reservoir houses the system pump and other components, and should only be opened by trained service technicians.

Fluid Hazards

- The fluid being introduced into the Q-SUN by the Dual Spray system is determined by the customer's application and fluid specifications are beyond the scope of this manual.
- Fluids that may be corrosive, acidic and/or toxic may be introduced into the Dual Spray system.
- Follow all local, OSHA, EHS, and other applicable material handling safety requirements, recommendations, and practices when mixing, refilling, and disposing of these fluids.
- The Dual Spray reservoir and all containers used in conjunction with fluid storage should be properly labeled.
- Some fluids which may be used in the reservoir of the Dual Spray system can become contaminated with fungus, bacteria, or other organisms.
- Depending on the fluid used, frequent checks and cleaning of Dual Spray components may be required (see [Section 15.5](#)).
- Consideration should be given to mixing small batches of liquid frequently rather than large amounts that could become contaminated before use.



Figure 2.3: Dual Spray reservoir and pump system enclosure.

3. General Description (Oct 2020)

Overview

- The LX-5080-QS Q-SUN Xe-3 Quick Setup Guide is not a technical manual.
- This guide provides basic information on uncrating and setting up Q-SUN Xe-3 Xenon Test Chambers.
- A Q-SUN Xe-3 Technical Manual is necessary for a complete understanding of how to operate Q-SUN Xe-3 Xenon Test Chambers.
 - o See *LX-5080-TM Q-SUN Xe-3 Technical Manual* for information on Q-SUN Xe-3 "E" models that feature enhanced performance, including dual touchscreen control and longer lamp life or higher irradiance capability.
 - o See *LX-5080B-TM Q-SUN Xe-3-H Technical Manual* for the basic non-"E" Q-SUN Xe-3-H tester.

Q-SUN Xe-3 Models Covered in This Guide

Model	Configuration	Control Interface
Xe-3-H	H: Controlled Humidity	Keypad/LCD
Xe-3-HSE	S: Water Spray	Dual Touch Screen
Xe-3-HCE	C: Chiller	Dual Touch Screen
Xe-3-HSCE	Chiller + Spray	Dual Touch Screen
Xe-3-HBSE	BS: Back Spray	Dual Touch Screen
Xe-3-HDSE	DS: Dual Spray	Dual Touch Screen
Xe-3-HBSCE	Back Spray + Chiller	Dual Touch Screen
Xe-3-HDSCE	Dual Spray + Chiller	Dual Touch Screen
Xe-3-HDSBSE	Dual Spray + Back Spray	Dual Touch Screen
Xe-3-HDSBSCE	Dual Spray + Back Spray + Chiller	Dual Touch Screen

Partial List of Standard Test Methods Met by Q-SUN Xe-3 Xenon Test Chambers

- Listed below are several widely used standards that can be performed with Q-SUN Xe-3 testers.
- For an extensive list of standards Q-SUN testers can perform see [LX-5054 Standards Met by Q-SUN Testers](#).

ASTM C1442 – Conducting Tests on Sealants Using Artificial Weathering Apparatus

ASTM D1248 – Polyethylene Plastic Extrusion Materials for Wire and Cable

ASTM D2565 – Xenon Arc – Plastics for Outdoor Applications

ASTM D3424 – Lightfastness of Printed Material

ASTM D3451 – Testing Coating Powders

ASTM D3794 – Testing Coil Coatings

ASTM D4101 – Polypropylene Plastic Injection and Extrusion Materials

ASTM D4303 – Lightfastness of Artists' Pigments

ASTM D4459 – Xenon Arc – Plastics for Indoor Applications

ASTM D4798 – Xenon Arc – Bituminous Materials

ASTM D5010 – Testing Printing Inks & Related Materials

ASTM D5071 – Xenon Arc – Exposure of Photodegradable Plastics

ASTM D7869 – Xenon Arc – Transportation Coatings

ASTM G151 – General Guidelines for Exposure of Nonmetallic Materials

ASTM G155 – Xenon Arc – Test Apparatus for Exposure of Nonmetallic Materials

ISO 11341 – Paints – Xenon Arc

ISO 4892-2 – Plastics – Methods of Exposure to Laboratory Light Sources – Part 2: Xenon-Arc Sources

DIN 53 387 – Artificial weathering and aging of plastics and elastomers by exposure to filtered xenon arc radiation
(Cycles A & E)

4. Operating Environment



The Tester Must Be Located in a Suitable Environment

- All Q-Lab test chambers are sophisticated scientific instruments.
- All tester models must be operated in a suitable controlled environment ([Section 4.1](#)).
- Operating the tester in an unsuitable environment ([Section 4.2](#)) will void the warranty.

NOTE: Some images in this section show "E" models Xe-3 testers. Except where noted, all information is exactly the same for non-"E" (Xe-3-H) testers.

4.1 Suitable Environments (May 2020)

Ambient Laboratory Temperature and Humidity

- The recommended ambient operating temperature and relative humidity (RH) for Q-SUN testers is 23 ± 5 °C and $50 \pm 25\%$ RH.
- Operating outside the recommended range (or in rare cases, even within it), certain standards or test cycle conditions may not be achievable.
- Operating outside the recommended range can result in the tester producing chamber temperature and/or humidity faults.
- Never operate your tester in lab temperatures >40 °C or $>80\%$ RH.
- Consult with Q-Lab for more specific information about achievable chamber temperature/humidity values based upon various ambient lab conditions.

Physical Environment

- A room that is dry, clean, and free of dust, particles, gases, or salt fog.
- A room with an HVAC (heating/ventilation/air-conditioning) system.
- A location away from windows or HVAC vents.
- A location that provides the necessary minimum clearances as specified in [Section 5.7](#).

4.2 Unsuitable Environments (May 2020)

Salt Fog or Other Airborne Contamination

- Operating a Q-SUN tester in an unsuitable environment will void the warranty.
- DO NOT install Q-SUN testers in a room with corrosion chambers (Figure 4.2a).
- DO NOT locate a Q-SUN tester in a room with machines or processes that generate dust, particles, vapors, gases, etc (Figure 4.2b).



Figure 4.2a: Do not install testers in a room with corrosion chambers.



Figure 4.2b: Do not locate testers in a room with airborne dust, particles, or gases.

Uncontrolled Temperature and Humidity

- Do not operate the tester in a room with uncontrolled temperature and humidity (Figure 4.2c).
- Do not locate tester near sources of cold or hot air (Figure 4.2d).

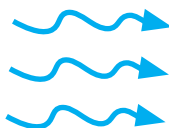


Figure 4.2c: Do not locate testers near open windows.



Figure 4.2d: Keep tester away from sources of hot or cold air.

Other Unsuitable Environments

- **Outdoors:** Rain and dust will corrode or short out electrical components.
- **Metal Dust / Metal Chips:** Do not locate the tester near metal cutting machines or metal grinding machines. Conductive metal dust or metal chips in the air will damage electronic components.
- **Carbon Fibers:** Do not operate the tester where carbon fibers or carbon reinforced plastic are being cut. The conductive carbon fibers will damage electronic components.
- **Conductive Pigments:** Do not operate the tester where carbon black or other conductive pigment dust is in the air. The conductive dust will damage electronic components.
- **Other Corrosive Gases:** Do not expose the tester to acid fog, SO_2 gas, or other corrosive gases.
- **Excessive Voltage:** The electrical supply to the tester must be no more than 10% higher than the voltage listed on the nameplate.
- **Low Voltage:** Recurring “brown-outs” or voltages less than 90% of the rated voltage will damage electrical components.
- **Water Leaks from Ceiling:** Water leaking onto the tester will damage electrical components.

For further detail on laboratory environment requirements, please contact Q-Lab Repair and Tester Support. See [Section 7](#) for contact information.

5. Setup

5.1 Xe-3 Uncrating (Dec 2020)



Carefully read these instructions before uncrating the tester. Follow all local, OSHA, EHS, and other applicable equipment operation and material handling safety requirements, recommendations, and practices.

- Q-SUN Xe-3 Testers are shipped in one of two types of crates (Figure 5.1a and Figure 5.1b).
- Labels on the crate indicate the location of the instructions to be opened first (Figure 5.1c).
- Instructions for uncrating and setting up the tester are located in the envelope shown in Figure 5.1d.

NOTE: Some images in this section show "E" models Xe-3 testers. Except where noted, all information is exactly the same for non-"E" (Xe-3-H) testers.



Figure 5.1a: This Crate has a Carton Banded to a Wooden Skid.



Figure 5.1b: This Crate has a Wooden Frame Surrounding the Carton.



Figure 5.1c: Labels on the crate indicate the envelope to be opened first.



Figure 5.1d: Open this envelope for important uncrating instructions.

Weights

Shipping Weight (Approximate)	Main Unit
On Skid With Wooden Crate	363 kg (800 lbs)
On Skid With Carton Only	318 kg (700 lbs)
Tester Weight*	190-233 kg (420-512 lbs)

* Weight varies based on installed options.

Tools Required

Phillips Screwdriver (Wooden Crate Only)	Flat Blade Screwdriver	Fork Lift*
Pry Bar (Wooden Crate Only)	Ratchet and 15 mm (9/16") Socket	Small Ladder or Step Stool
Band Cutter	Utility Knife	

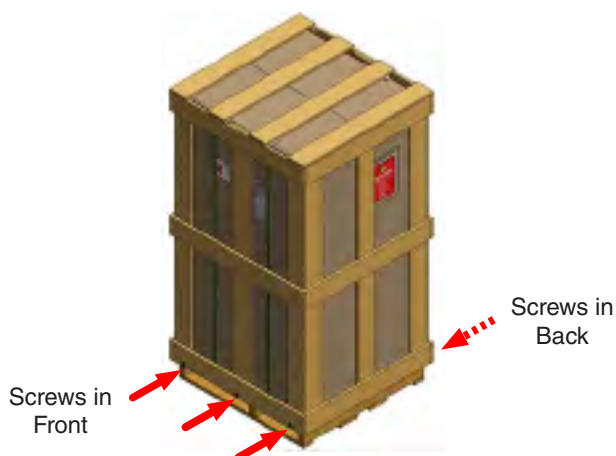
*A fork lift or other mechanical lifting device is recommended for use in moving the crated tester to the installation location, and to lift the frame in one piece from the crate with wooden frame.



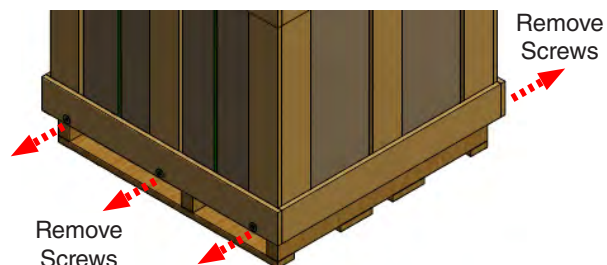
1. Uncrating instructions are located in this envelope. Remove and read the instructions.



2. For crate with wooden frame continue with Step 3. For crate with carton only, go to Step 7.



3. Locate the Phillips screws in the bottom front and back horizontal boards.



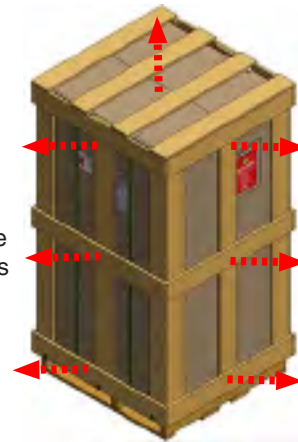
4. Remove all screws.

Use Fork Lift to
Remove Crate
in One Piece



5. If a fork lift is available, use it to carefully lift the wooden frame up and off of the tester.

Or Use Pry
Bar to Remove
Crate in Pieces



6. If a fork lift is not available, use a pry bar to carefully remove the horizontal and vertical wooden pieces off of the tester.

Cut

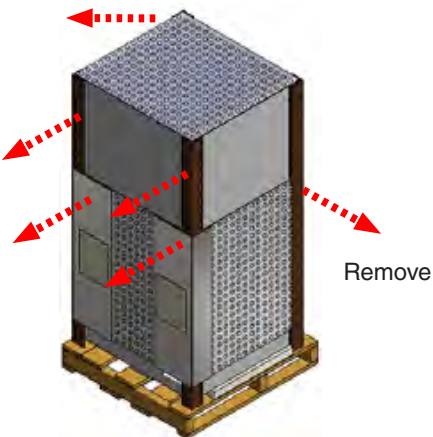


7. Cut the bands holding the carton to the skid. Remove the bands.



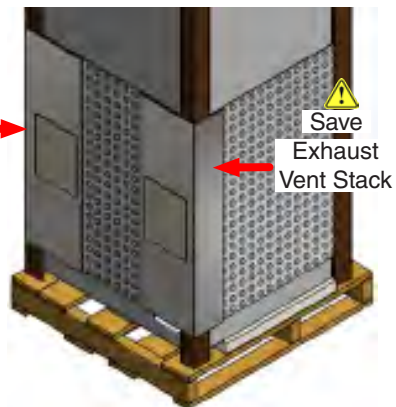
8. Carefully lift the carton up and off of the tester.

Remove

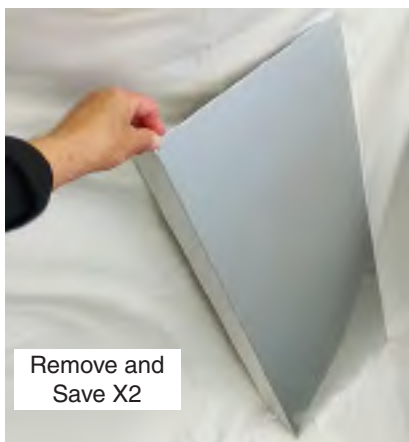


9. Remove all plastic wrap from around the tester.

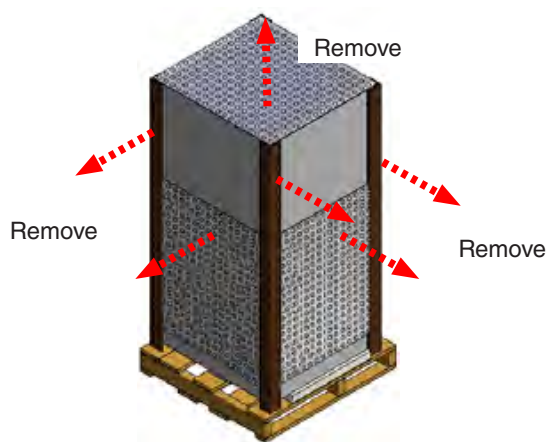
⚠
Save
Exhaust
Vent Stack



10. Locate the two (2) exhaust vent stack pieces taped to the rear corners of the tester marked "Do Not Throw Away". These pieces must be saved.



11. Remove the exhaust vent stack pieces (X-6971) and set aside.



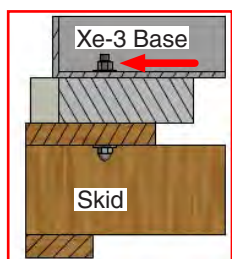
12. Remove the four (4) corner protectors and all bubble wrap and tape from around the tester.



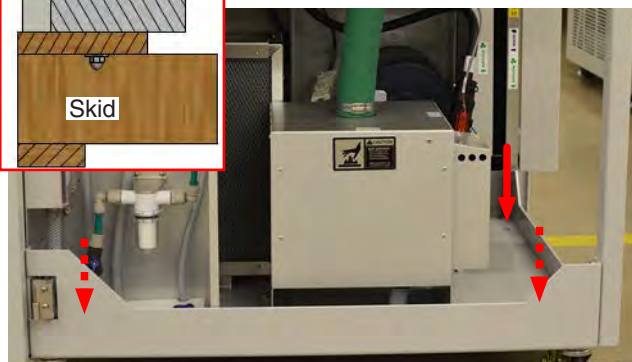
13. Locate the two (2) latches in the right side lower access panel.



14. Open the latches and remove the access panel. Open the lower front door.



Bolt Cross Section Detail



15. Locate three (3) bolts in the base of the tester that secure the tester to the skid. Remove the bolts.



At least two people are needed to remove the Q-SUN from the skid.

16. Remove the tester from the skid.



- a. Begin by tilting the Q-SUN and removing the three foam strips under the bottom of the unit.
- b. “Walk” the Q-SUN off the skid in the direction parallel to the boards of the skid.
- c. Slide the Q-SUN into place and adjust the leveling feet so the unit is level.
- d. Remove adhesive tape from various parts on the inside and outside of the unit.

17. Remove the tester from the skid.



18. Open and remove all parts from separate cartons shipped with tester.

5.2 Chiller Uncrating (Apr 2021)

- For Q-SUN Xe-3 models with chiller (C), follow the instructions in this section to uncrate the chiller unit.
- Carefully read these instructions before uncrating the chiller.
- The tables below list chiller weights and tools needed for uncrating.
- Chillers are shipped in two types of crates ([Figure 5.2.a](#) and [Figure 5.2.b](#)).

Weights

Shipping Weight (Approximate)	
On Skid With Wooden Crate	182 kg (400 lbs)
On Skid With Carton Only	136 kg (300 lbs)
Chiller Weight	123 kg (270 lbs)

Tools Required

Phillips Screwdriver (Wooden Crate Only)	Flat Blade Screwdriver
Pry Bar (Wooden Crate Only)	Ratchet and 15 mm (9/16") Socket
Band Cutter	Utility Knife
Fork Lift*	
*A fork lift or other mechanical lifting device is recommended for use in moving the crated chiller to the installation location, and to lift the wooden frame in one piece from the crate with wooden frame.	



Figure 5.2.a: This Crate has a Carton Banded to a Wooden Skid.

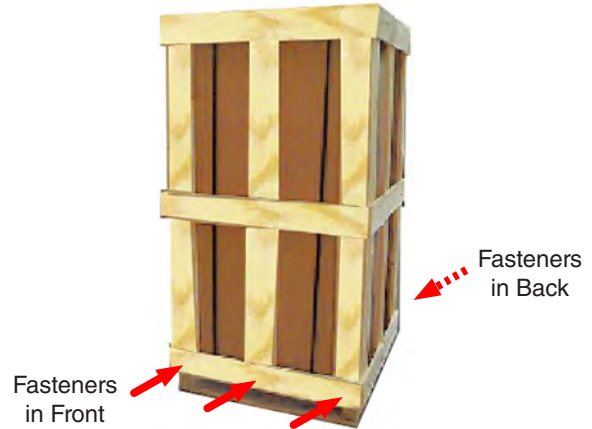


Figure 5.2.b: This Crate has a Wooden Frame Surrounding the Carton.

Section 5. Setup



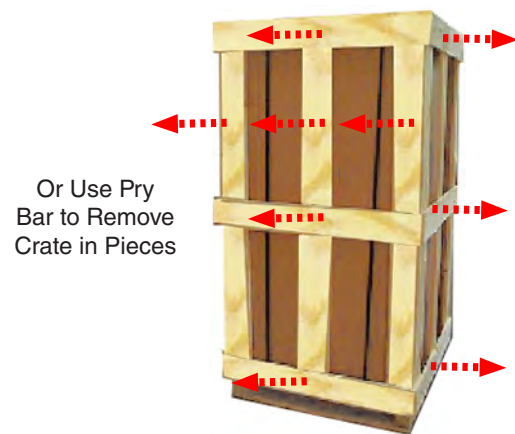
1. For crate with wooden frame continue with Step 2. For crate with carton only, go to Step 5.



2. Remove the fasteners in the bottom front and back horizontal boards.



3. If a fork lift is available, use it to carefully lift the wooden frame up and off the carton in one piece.



4. If a fork lift is not available, use a pry bar to carefully remove the horizontal and vertical wooden pieces off the carton..



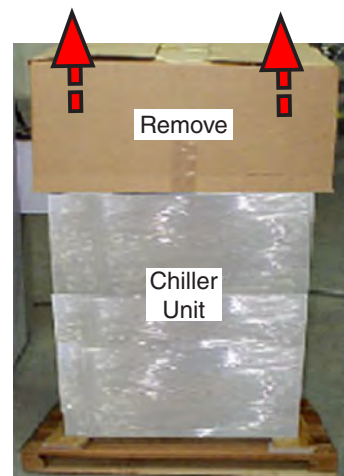
5. Cut the bands holding the carton to the skid. Remove the bands.



6. Carefully lift the carton up and off of the tester.



7. Remove the hose and bag of fittings from the top of the inner carton. Set aside.



8. Remove the inner carton from on top of the main chiller unit. Set aside.



9. Open the carton. Remove the duct assembly pieces and the bag of screws.

Contents of Carton:

X-6916-X CHILLER Q-SUN DUCT ASSEMBLY
 X-6951-X CHILLER TRANSITION DUCT ASSEMBLY
 X-6964-X CHILLER DUCT ASSEMBLY
 U-5150 1/4" PHILLIPS SCREWS (14)

10. Contents of the carton are listed above. Unwrap all and set aside.



11. Remove the plastic wrap from the chiller unit.



12. Remove the air filter at the side of the carton. Set aside.



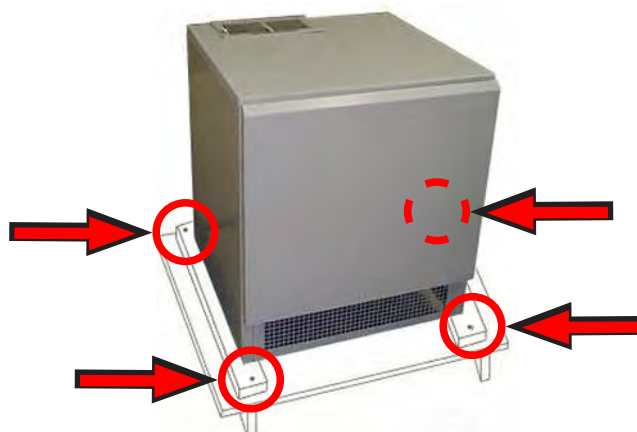
13. Remove any remaining plastic wrap from the chiller unit.



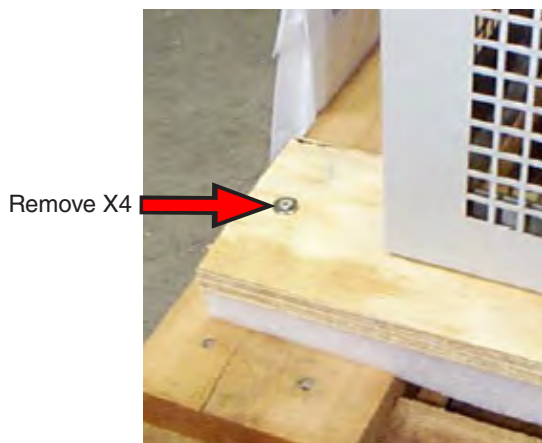
14. Open the chiller front access door.



15. Remove the air bag from the chiller. Close the access door.



16. Locate the four (4) screws that secure the wooden runners under the chiller to the skid

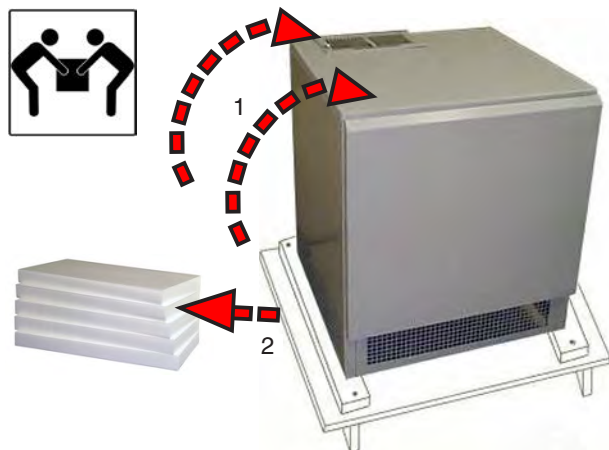


17. Remove the four (4) screws.



At least two people are needed to remove the chiller from the skid.

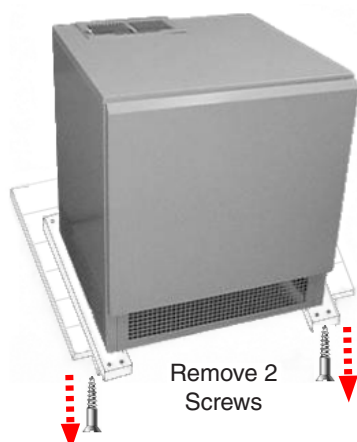
18. Follow Steps 19 through 26 to remove the chiller from the skid.



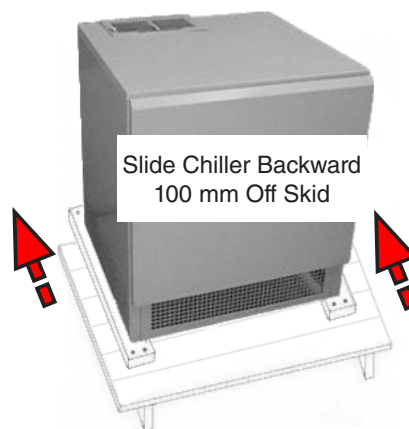
19. Two persons tilt the chiller. Pull the foam pieces out from under the bottom of the unit. Discard foam.



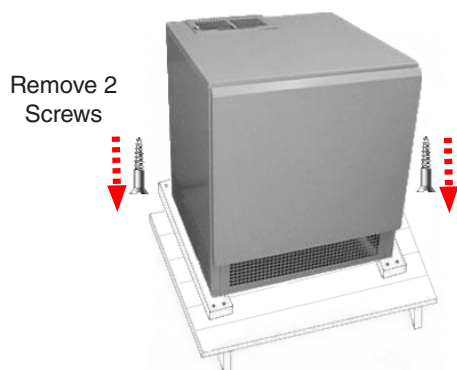
20. Partially slide the unit off the skid in the direction parallel to the boards of the skid, so that the unit overhangs the skid by about 100 mm (4").



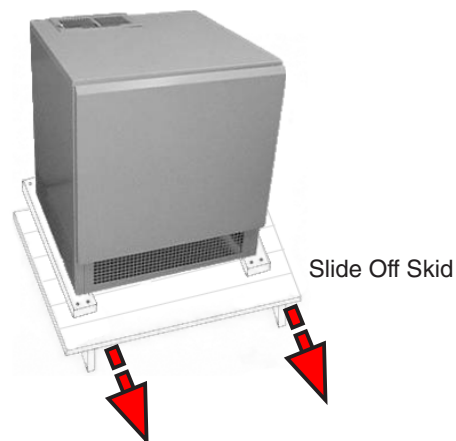
21. With a short screwdriver, remove the two (2) screws from the bottom of each wooden runner that secures the runner to the chiller.



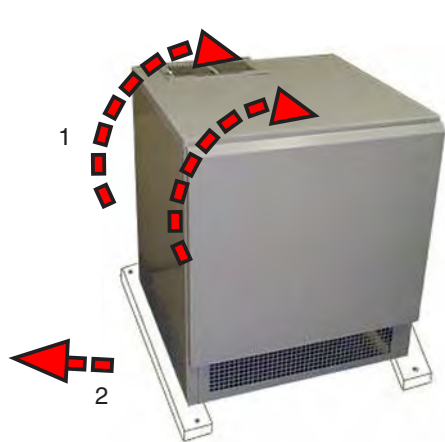
22. Slide the unit the opposite way, until it overhangs the skid about 100 mm (4").



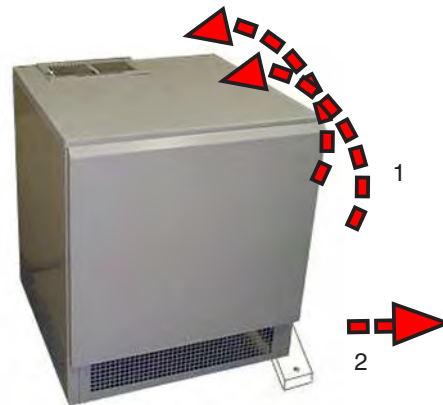
23. With a short screwdriver, remove the two (2) screws from the bottom of each wooden runner that secures the runner to the chiller.



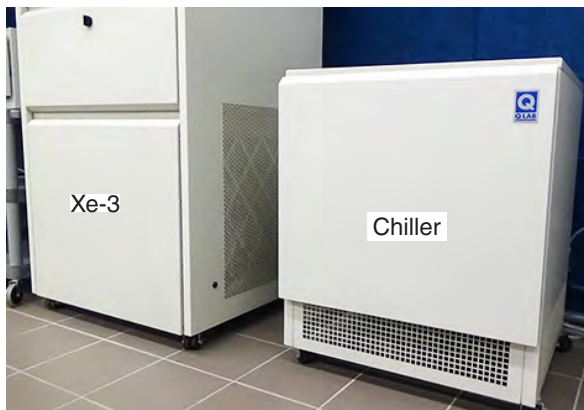
24. Slowly slide the unit (and runners) off the skid onto the floor.



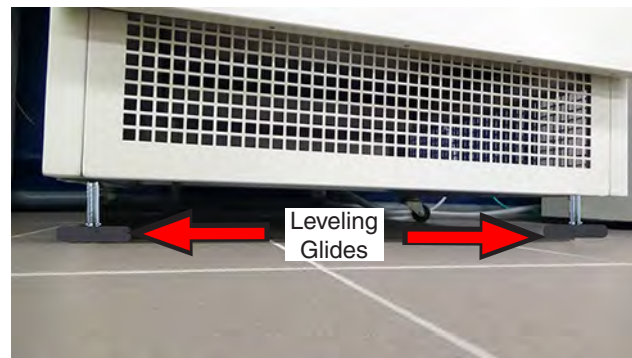
25. Tilt up one side of the chiller and remove the runner. Discard runner.



26. Tilt up the other side of the chiller and remove the other runner. Discard runner.



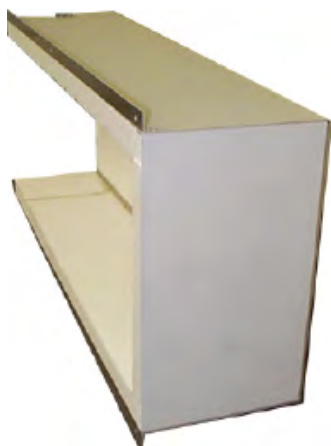
27. Slide the unit into position, at the right side of the installed Xe-3. Space must be available to access the front and rear of the chiller. See Section 3.2.



28. If the chiller is moved, do not hit floor drain, cracks, etc, as the adjustable leveling glides may be damaged.

5.3 Chiller Assembly (Apr 2021)

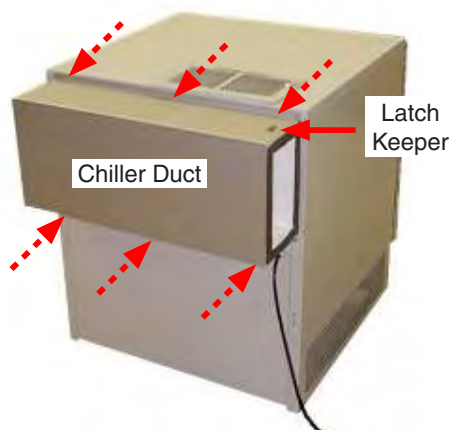
- If the Q-SUN tester does not have the chiller option go to Section 5.4.
- Using six of the enclosed #6 screws, attach the Chiller Duct to the rear of the chiller ([Step 3](#) through [Step 4](#)) with the latch keeper in position as shown.
- Using two #6 screws, loosely attach the Q-SUN duct to the rear panel of the Q-SUN ([Step 5](#) through [Step 7](#)).
- Remove the tester right side lower access panel.
- Remove the chiller shroud in front of the air filter (two screws at top and two screws at bottom of shroud, [Step 8](#)).
- From inside the tester, using two #6 screws, attach the duct to the machine's right rear upright ([Step 9](#)). Tighten the four screws in the Q-SUN duct.
- Reinstall the chiller shroud ([Step 10](#)).
- Using four #6 screws, attach the transition duct to the Q-SUN duct as shown in [Step 11](#) and [Step 12](#).
- Follow [Step 13](#) through [Step 21](#) to complete chiller assembly.



1. Locate the chiller duct assembly (X-6964-X).



2. Notice the latch keeper located on the top of the duct.



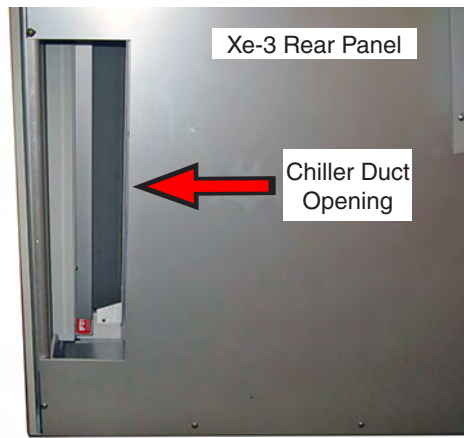
3. Six (6) screw locations to attach the chiller duct to the rear of the chiller.



4. Attach the chiller duct assembly to the rear of the chiller using six (6) Phillips screws (U-5150).



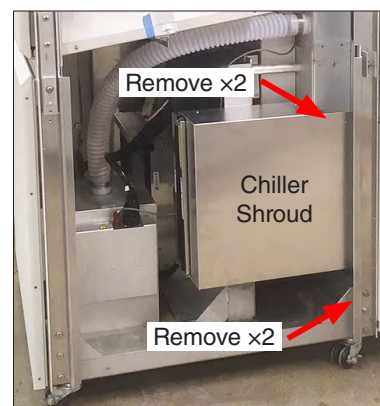
5. Locate the chiller Q-SUN duct assembly (6916-X).



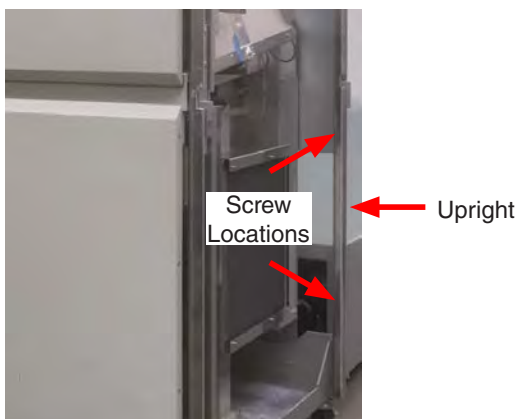
6. Locate the chiller duct opening at the lower left rear of the Xe-3 rear panel.



7. Using two (2) Phillips screws, loosely attach the Q-SUN duct over the Xe-3 chiller duct opening.



8. Remove the tester right side lower access panel. Remove the chiller shroud in front of the air filter (two screws at top and two screws at bottom of shroud). Save the screws and shroud.



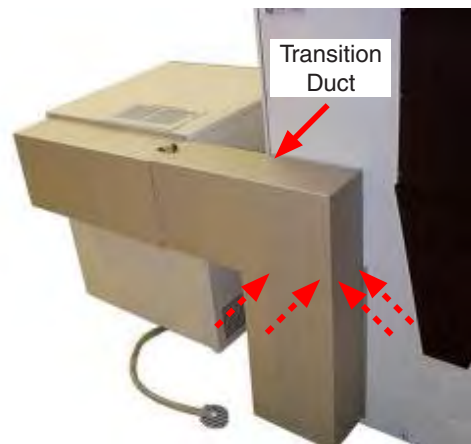
9. From inside the tester, use two #6 screws to attach the Q-SUN duct to the machine's right rear upright. Tighten the four screws in the Q-SUN duct.



10. Reinstall the chiller shroud.



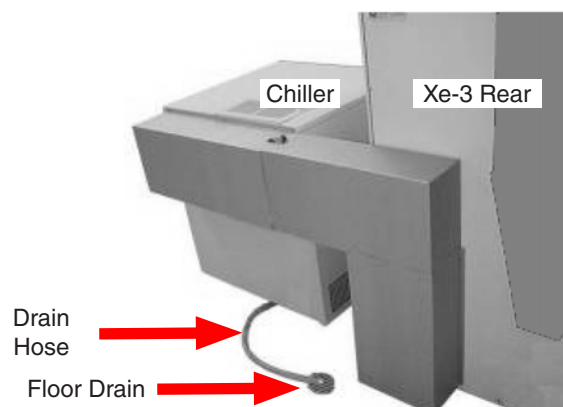
11. Locate the transition duct (X-6951-X).



12. Four (4) screw locations to attach the transition duct to the Q-SUN duct.



13. Move the chiller to the installation location beside the tester.



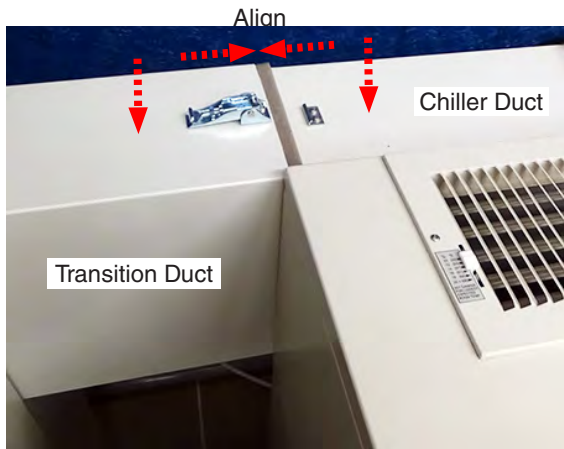
14. Locate the 1/2" drain hose at the bottom rear of the chiller cabinet. Make sure the end of the hose is over or in the drain.



15. Locate the chiller power connector.



16. Connect the chiller power cord to the chiller power outlet at the rear of the tester.



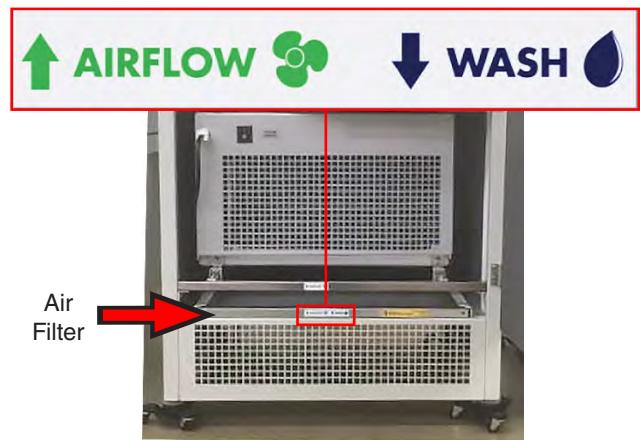
17. Position the chiller so that the chiller duct aligns vertically and horizontally with the transition duct. If needed adjust the chiller leveling glides.



18. Push the ducts together. Make sure the foam seal is in place. Latch the ducts together.



19. Open the chiller front access door. Locate the air filter.



20. Make sure the air flow arrow on the edge of the air filter frame points up.



21. Close the chiller access door.



To Complete Chiller Installation see:

[Section 5.7](#) through [Section 5.10](#)

22. Go to the Sections listed above to complete installation of the chiller.

5.4 Xe-3 Exhaust Vent Assembly (Dec 2020)

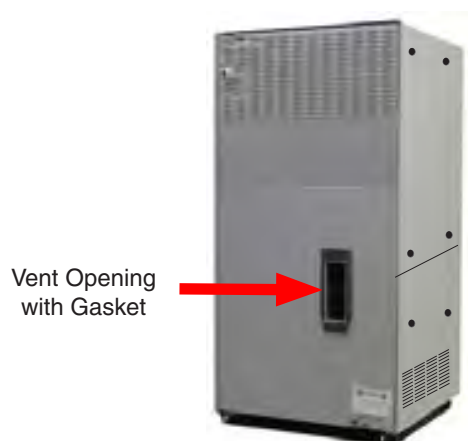


An exhaust vent must be installed on all Xe-3 testers. Parts of the vent assembly are shipped in a separate carton. The vent extension stack pieces are taped to the corners of the tester as shown in Section 5.1, [Step 10](#).

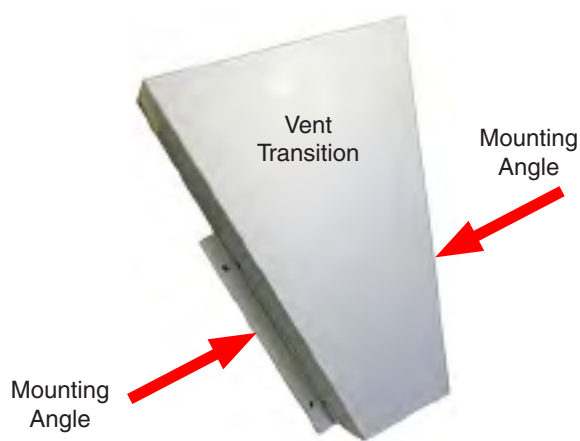


Exhaust Vent Parts

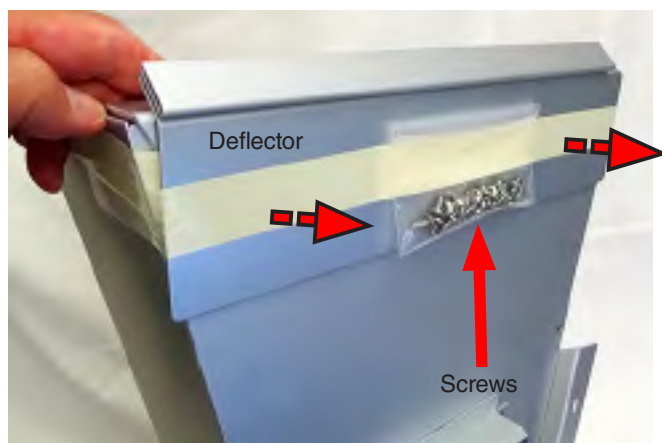
Part No.	Description	Quantity
X-6970-X	Exhaust Vent Transition	1
X-6971	Exhaust Vent Extension Stack	2
X-6974	Exhaust Deflector	1
X-6973	Exhaust Mounting Angle	2
U-5120	8-18 × 3/8" Phillips Pan Head Sheet Metal Screw	18



1. Locate the vent opening in the rear panel of the tester.



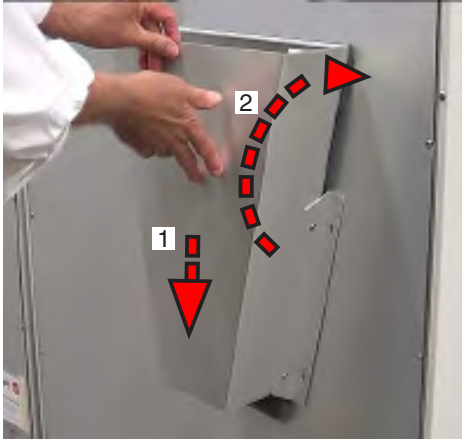
2. Locate the exhaust vent transition (X-6970-X) with two (2) mounting angles attached.



3. Remove the deflector and bag of screws from the rear side of the vent transition.



4. Insert the bottom of the exhaust vent transition into the vent opening.



7. While pushing downward, rotate the top of the vent transition into the vent opening

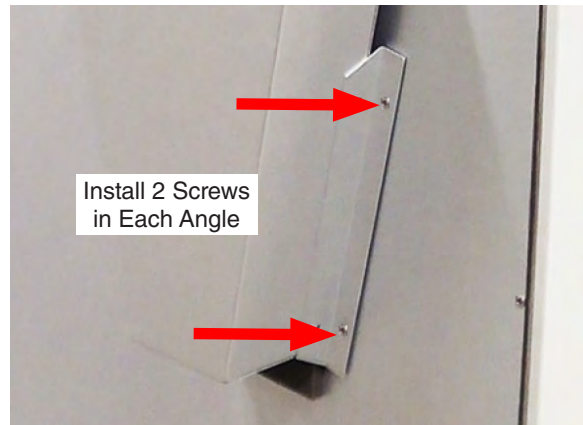


- a. Use downward pressure on the vent transition to clear the vent opening gasket and avoid tearing it.
- b. The mounting angles will fit against the back panel when the vent transition is fully in place.
- c. With the vent transition in place reach down inside and run your fingers along the edges to make sure that the vent gasket was not moved from its original position.
- d. If the gasket moved out of position, remove the vent transition, the reposition the gasket and reinstall the vent transition.

5. Make sure the vent opening gasket did not move.



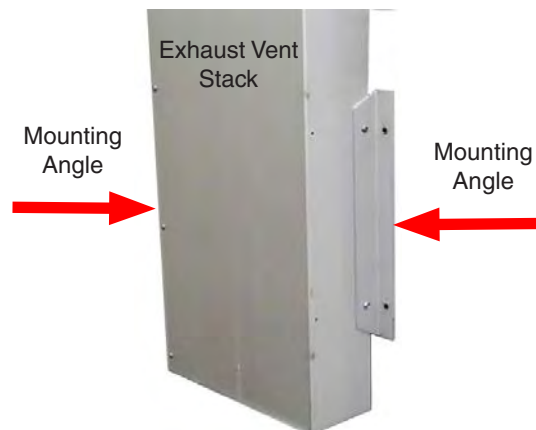
6. Align the holes in the mounting angles on both sides of the transition with the holes in the rear panel.



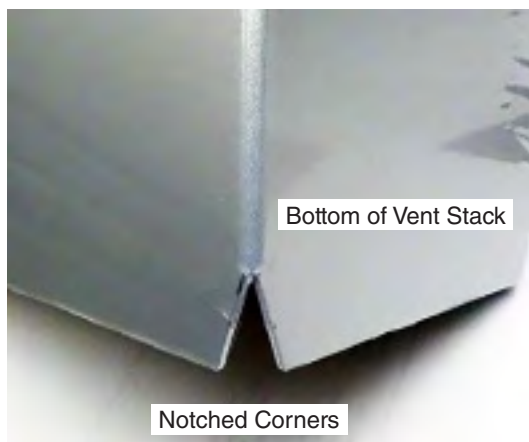
8. Fasten the mounting angles to the rear panel using four (4) screws from the bag removed in Step 3.



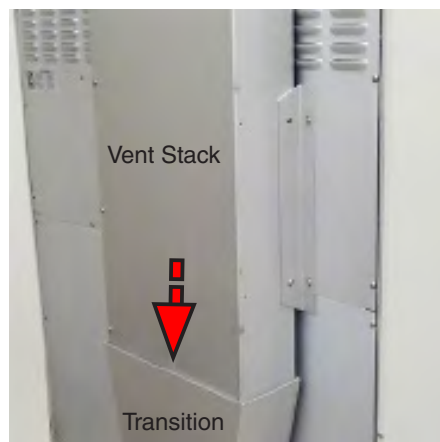
9. Assemble the two (2) exhaust vent stack pieces (X-6971) as shown using screws from the bag.



10. Attach a mounting angle (X-6973) to each side of the exhaust vent stack using screws from the bag.



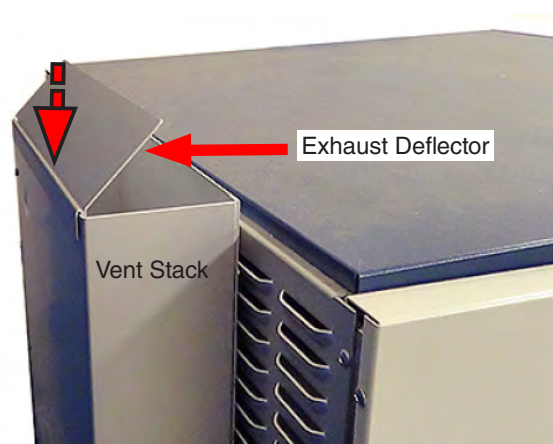
11. Orient the vent stack with the notched corners at the bottom.



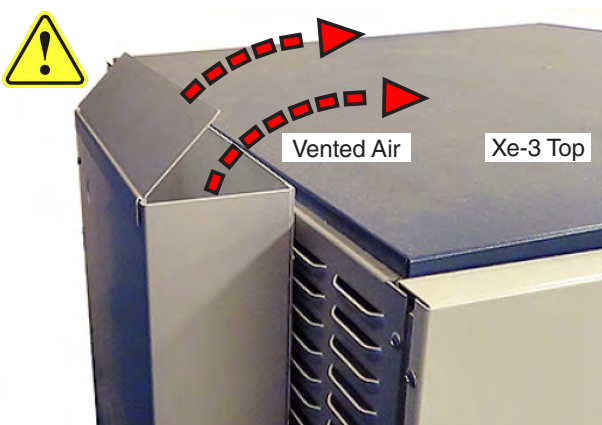
12. Insert the end of the vent stack with the notched corners down into the opening of the vent transition.



13. Attach the mounting angles on both sides of the vent stack to the Xe-3 rear panel using screws from the bag.



14. Attach the exhaust deflector (X-6974) to the top of the vent stack.



15. The exhaust deflector should point so that the vented air is blown over the top of the Xe-3 and away from a wall behind the tester.



16. Completed exhaust vent assembly.

5.5 Back Spray Set Up (Oct 2020)

For Q-SUN Xe-3 models with back spray (BS), follow the instructions in [Section 5.1](#) and [Section 5.4](#) to uncrate the Xe-3 and assemble the Xe-3 exhaust vent. Follow the instructions below to place the Back Spray manifold in the operational position.

- Open the Xe-3 test chamber door and remove the adhesive tape from the specimen tray.
- Slide the open back specimen tray forward, resting it on the chamber door ([Figure 5.5a](#)).
- Remove the adhesive tape that secured the Back-Spray manifold in position during shipping.
- Slide the manifold forward until it contacts the front of the chamber below the chamber door ([Figure 5.5b \[1\]](#)).
- Then slide the manifold left until it contacts the left side of the chamber ([Figure 5.5b \[2\]](#)).
- The manifold is now in the correct operational position.
- See [Section 9](#) for more information on spray systems.

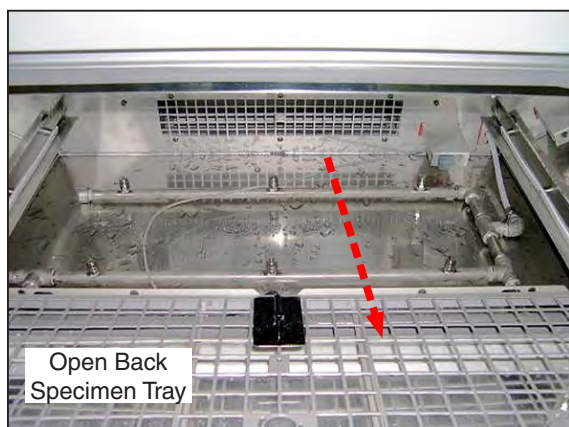


Figure 5.5a: Remove Tape. Slide the open back specimen tray all the way forward.



Figure 5.5b: Remove tape. Slide the manifold forward, then to the left.

5.6 Dual Spray Uncrating and Assembly (Dec 2020)

For Q-SUN Xe-3 models with Dual Spray (DS), follow the instructions in [Section 5.1](#) and [Section 5.4](#) to uncrate the Xe-3 and assemble the Xe-3 exhaust vent. Follow the instructions below to uncrate and assemble the Dual Spray system.

Uncrating


- The Dual Spray system is shipped in one of two types of crates ([Figure 5.6a](#) and [Figure 5.6b](#)).
- If the crate has a wooden frame, carefully remove the fasteners and frame boards.
- Cut the straps that hold the fiberboard carton to the skid. Lift off the carton.
- Cut the straps that hold the Dual Spray cart to the skid ([Figure 5.6c](#)).
- Remove the four side panels and hardware from inside the reservoir.
-  At least two people are needed to remove the Dual Spray system from the skid.
- DO NOT attempt to lift the Dual Spray assembly alone.
- Lift the entire cart and reservoir assembly straight up so that the cart wheels clear the skid.
- Move the entire Dual Spray assembly off the skid onto the floor ([Figure 5.6d](#)).
- See [Section 9](#) for more information on spray systems.



Figure 5.6a: This Crate has a Carton Banded to a Wooden Skid.



Figure 5.6b: This Crate has a Wooden Frame Surrounding the Carton.

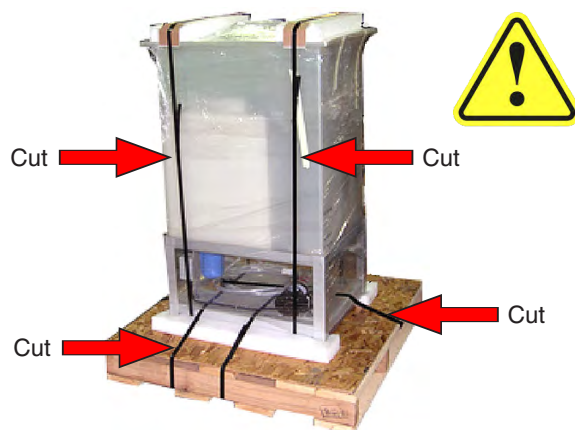


Figure 5.6c: Cut straps. Remove packing material. Remove hardware.

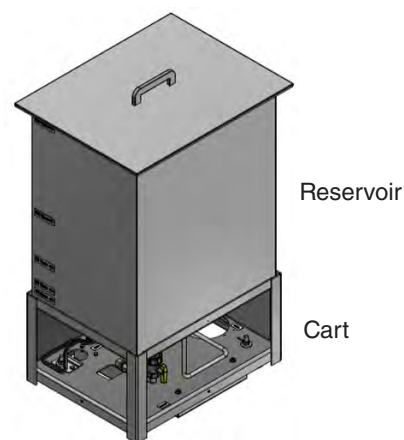


Figure 5.6d: Remove Dual Spray assembly from the skid.

Assembly

1. Carefully unwrap the two (2) cart side panels (X-10081), the cart front panel (X-10082), and the cart rear panel (X-10083).
2. The two (2) cart side panels mount on the sides of the cart (Figure 5.6e).
 - Install the panels by hooking the long flange under the bottom edge of the lower shelf on the cart
 - Then pull the panel up until the short flange hooks over the top edge of the upper shelf
3. Install the rear panel with the electrical and fluid connection openings on the rear of the cart (Figure 5.6f).
4. Install the front panel (Figure 5.6g).
5. Connect the Dual Spray power cord (X-10088-X) to the connector at the rear of the cart (Figure 5.6i).
6. Connect the other end of the power cord to the outlet labeled “Dual Spray” on the Xe-3 rear panel (Figure 5.6j).
7. Connect the tubing (X-10063) into the quick-disconnect fitting at the rear of the cart.
8. Connect the other end of the tubing to the similar fitting on the lower left rear of the Xe-3, labeled “Dual Spray System Fluid Inlet”.
9. If this is being fitted to an existing Q-SUN tester, see Installation Instructions X-10050-L, *Q-SUN Dual Spray Retrofit*.

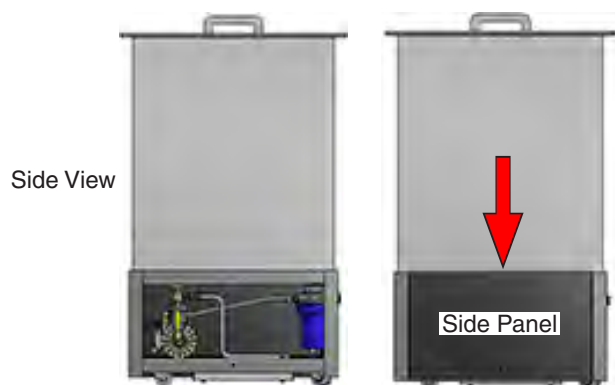


Figure 5.6e: Install one (1) side panel on each side of cart.

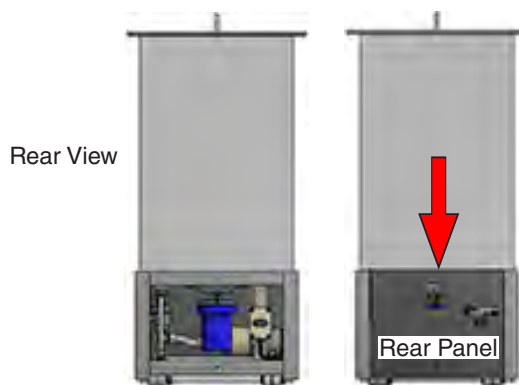


Figure 5.6f: Install rear panel. Openings in panel fit over fluid and electrical connections.

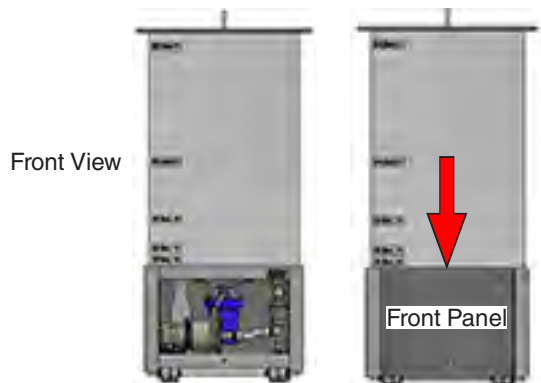


Figure 5.6g: Install front panel.



Figure 5.6h: Position the Dual Spray assembly next to Xe-3 as shown.



Figure 5.6i: Connect power cord at rear of cart.

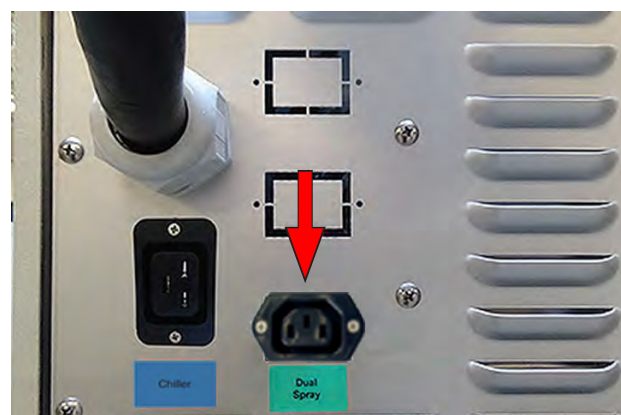


Figure 5.6j: Dual Spray power connector location on Xe-3 rear panel.

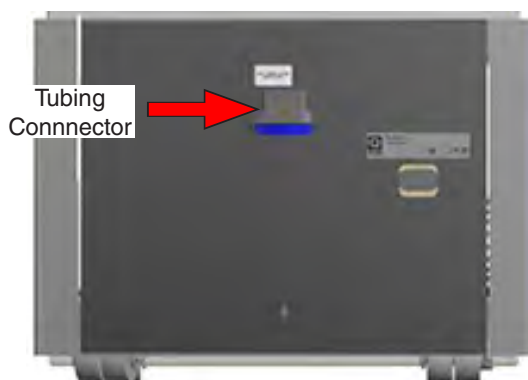


Figure 5.6k: Connect tubing at rear of cart.

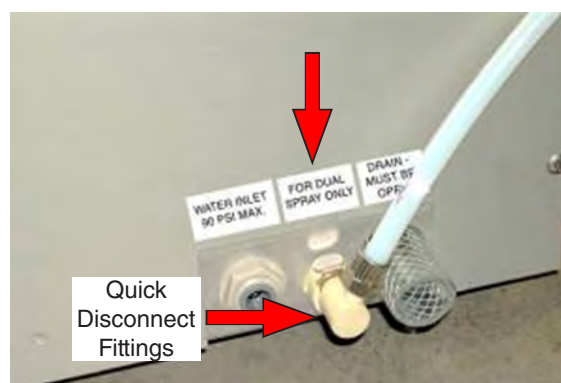


Figure 5.6l: Dual Spray fluid inlet location on lower left of the Xe-3 rear panel with quick disconnect fittings.

5.7 Dimensions and Space Requirements (Mar 2020)

All Xe-3 Models

- The Xe-3 should be positioned as shown in [Figure 5.7a](#) below.
- This position will allow sufficient room to operate the unit, gain access to service areas, and allow proper ventilation through the air intake and exhaust vents.

Q-SUN Xe-3 Dimensions

External Dimensions with Leveling Glides (W × H × D)	91 cm × 178 cm × 99 cm (36" × 70" × 39")
External Dimensions with Casters (W × H × D)	91 cm × 183 cm × 99 cm (36" × 72" × 39")

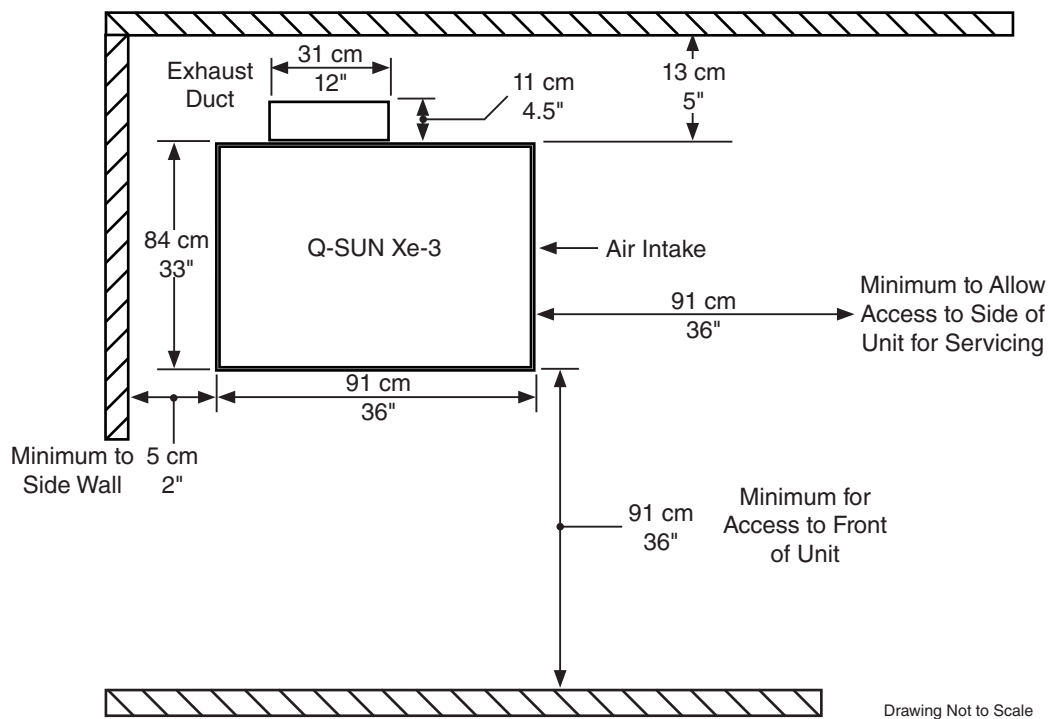


Figure 5.7a: Xe-3 placement without chiller.

Xe-3 with Chiller

- An Xe-3 with Chiller should be positioned as shown in [Figure 5.7b](#) below.
- This position will allow sufficient room to operate the unit, gain access to service areas, and allow proper ventilation through the air intake and exhaust vents.

NOTE: To remove the Xe-3 right side access panels the chiller duct may need to be unlatched and the chiller moved away from the Xe-3.

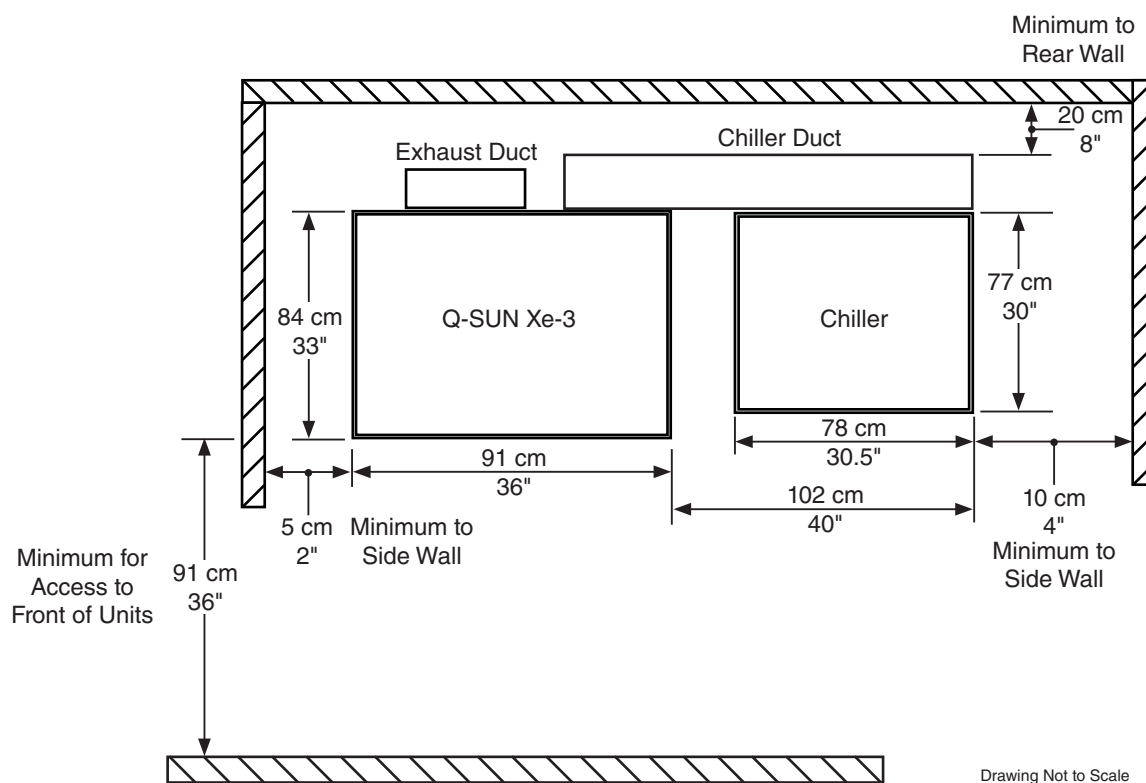


Figure 5.7b: Q-SUN Xe-3 placement with chiller.

Xe-3 with Dual Spray

- The Dual Spray system includes a [cart/reservoir assembly](#) with a footprint of approximately 76 × 61 cm (30 × 24").
- The system is powered by connection to the Xe-3 with an 2.5 m (98") power cord.
- The Dual Spray system is equipped with casters and is commonly positioned at the left side of the Xe-3 main cabinet.

5.8 Electrical (Apr 2022)

Specifications

Voltage:	All Models	208 V or 230 V or 400 V \pm 10% - three phase
Current:	Xe-3-HSE/HBSE/HDSE/HDSBSE	39 A @ 208 V, 39 A @ 230 V, 26 A @ 400 V
	Xe-3-HCE/HSCE/HBSCE/HDSCE/HDSBSCE	44 A @ 208 V, 44 A @ 230 V, 26 A @ 400 V
Frequency:	All Models	50 or 60 Hz
Installation:	Rated as Installation (Over voltage) Category II for transient over voltages.	

Figure 5.8a: Electrical specifications.

Voltage

- All Q-SUN Xe-3 models come in 208 V single phase, 230 V single phase, and 400 V three phase versions.
- 208 V, 230 V, or 400 V is specified when the machine is ordered.
- The electrical requirements for Xe-3 testers are shown in [Figure 5.8a](#).
- The input voltage and current rating are shown on the nameplate attached to the rear of the unit ([Figure 5.8b](#)).
- The voltage supplied to the tester must be within $\pm 10\%$ of the voltage rating of the tester and the circuit must be capable of supplying the rated current.

Connections



A power cord IS NOT SUPPLIED with Q-SUN Xe-3 testers. The user must supply and attach a properly-sized power cord and plug to connect the Xe-3 to the Main Power Supply.

- A qualified electrician should make all electrical connections to the tester.
- A hole is provided at the top rear of the machine so that a conduit fitting can be attached and the wires inserted inside the machine to the electrical panel behind the right side top access panel ([Figure 5.8c](#)).

NOTE: The right side top access panel is connected to the tester by a ground wire tether. When removing the access panel it is not necessary to disconnect the wire. The ground wire is long enough to set the access panel on the floor in front of the tester.

- For 208 V or 230 V machines, four wires are required; three current carrying conductors and an earth ground ([Figure 5.8d](#)).
- For 400 V machines, five wires are required; four current carrying conductors and an earth ground ([Figure 5.8e](#)).

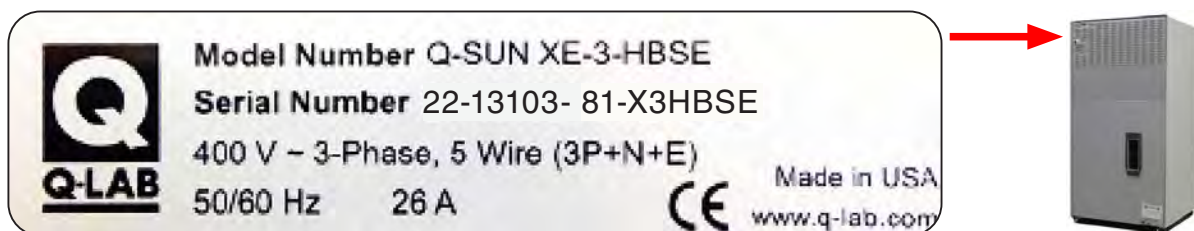


Figure 5.8b: Tester voltage and current shown on nameplate.

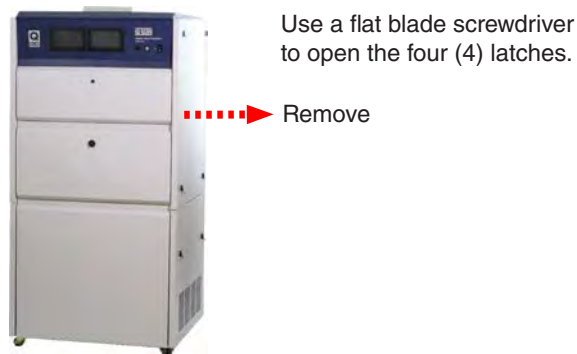


Figure 5.8c: Remove upper right side access panel to see the electrical panel.

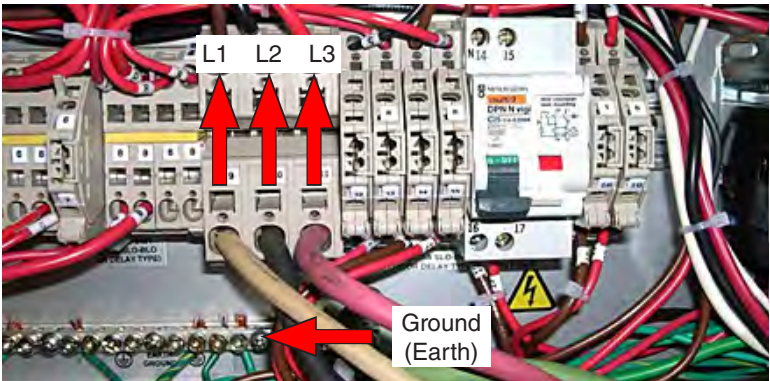


Figure 5.8d: Electrical input connections for 208 V and 230 V testers.



IMPORTANT: The neutral wire must be connected AND it must be connected to the terminal shown.
Be sure the neutral wire and one of the phase wires are not reversed.

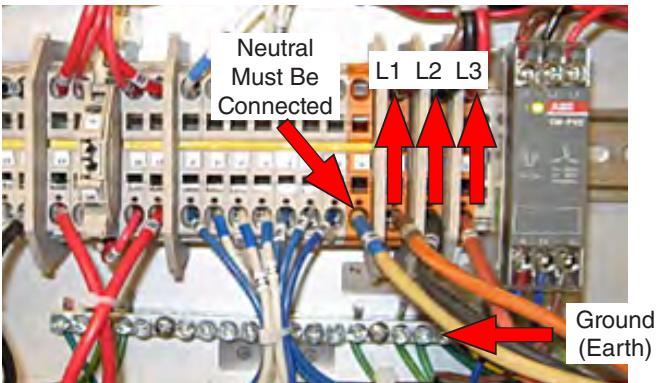


Figure 5.8e: Electrical input connections for 400 V testers.

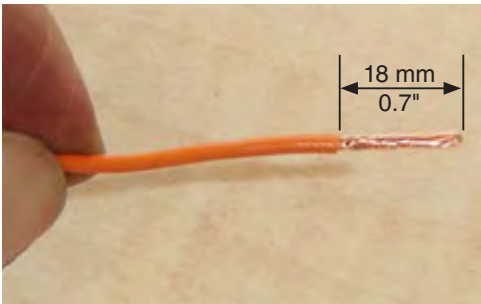
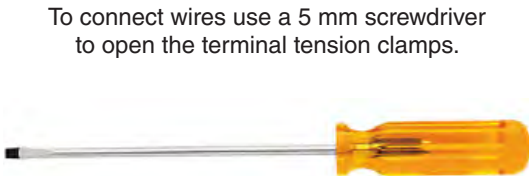


Figure 5.8f: Strip all wires 18 mm (0.7") before connecting.



To connect wires use a 5 mm screwdriver to open the terminal tension clamps.

Figure 5.8g: 5 mm screwdriver.

Chiller

- If the Xe-3 is equipped with a chiller (C models), the chiller gets power from an outlet on the Xe-3 rear panel (Figure 5.8h).



Figure 5.8h: Power outlet for chiller on Xe-3 rear panel.

Back Spray

- Xe-3 models equipped with a Back Spray (BS) system have no additional power requirements.

Dual Spray

- The power cord for the Dual Spray (DS) system connects to an outlet labeled “Dual Spray” on the Xe-3 rear panel (see Figure 5.6j). No additional power connections are required.

NOTE: The number and placement of power outlets on the rear of the Xe-3 varies depending on installed options.

5.9 Water (Sep 2020)

Overview

- Purified water must be supplied to all Q-SUN Xe-3 testers.
- Water is used by the humidifier to produce humidity.
- Water is also used to spray on the test specimens in Xe-3 models with water spray.
- Q-SUN models with water spray require much higher water purity than those with a humidifier and no water spray.
- Reverse osmosis / deionized (RO/DI) water is **required**.
- The Q-SUN tester warranty is voided if water purity conditions are not met.

Specifications

Spray System (Model)	Inlet Pressure	Flow Setting	Average Daily Volume	Resistivity	Conductivity	Silica	Total Dissolved Solids	pH
Front Spray* ("S" models)	30-90 psi (207-620 kPa)	1.4 liter/min	0.16 liter/minute × spray time***	>5M ohm•cm	<0.2 µS/cm	<0.1 ppm	<0.1 ppm	6-8
Front and Back Spray* ("B" models)		15 psi**	0.65 liter/minute × spray time***					
Humidifier (non-"S" models)	10-90 psi (69-620 kPa)	0.1 liter/min	44 liters/day	> 200k ohm•cm	<5.0 µS/cm	Not Important	<2.5 ppm	6-8

* A minimum of 30 psi is needed continuously during spray steps to ensure all specimens are exposed to water spray uniformly. Failure to maintain adequate pressure for the duration of a spray step will cause the tester to produce a fault and interrupt the test.

**15 psi is the flow setting for the Back Spray only.

*** Average daily volume during a spray step is based on a spray on time of 10 seconds and a spray off time of 50 seconds. Adjusting the spray on/off time will change the average daily volume.

Reverse Osmosis / Deionization System

The reverse osmosis / deionized (RO/DI) water system described on the next page produces water pure enough for spray systems. **This type of RO/DI system is required for water spray in Xe-3 testers.**



Important: Use Type I, not Type II anion in the mixed bed tanks of the RO/DI system.

The Strong Base **Type I** Anion resin in the mixed bed tanks is the most important part of these systems to prevent water spotting. This is because strong base Type I anion resin is the only resin that can effectively remove suspended silica.

Suspended silica is the major cause of specimen spotting. Type I anion is much better at removing suspended silica than Type II.

Unfortunately, Type II is the most common anion. So be sure to insist that your water purification supplier installs Type I, not Type II. The cost for Type I anion is about the same as Type II. Note that Type I anion is only necessary in the mixed bed "polishing" stages of the deionization, not in the initial "rough" purification stages.

- Figure 5.9a below shows an effective Reverse Osmosis / Deionized Water System with Anion Type I Resin for spray water silica removal.
- For information on water purification systems, contact the Life Science business of Merck KGaA, Darmstadt, Germany. The Life Science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the USA and Canada.

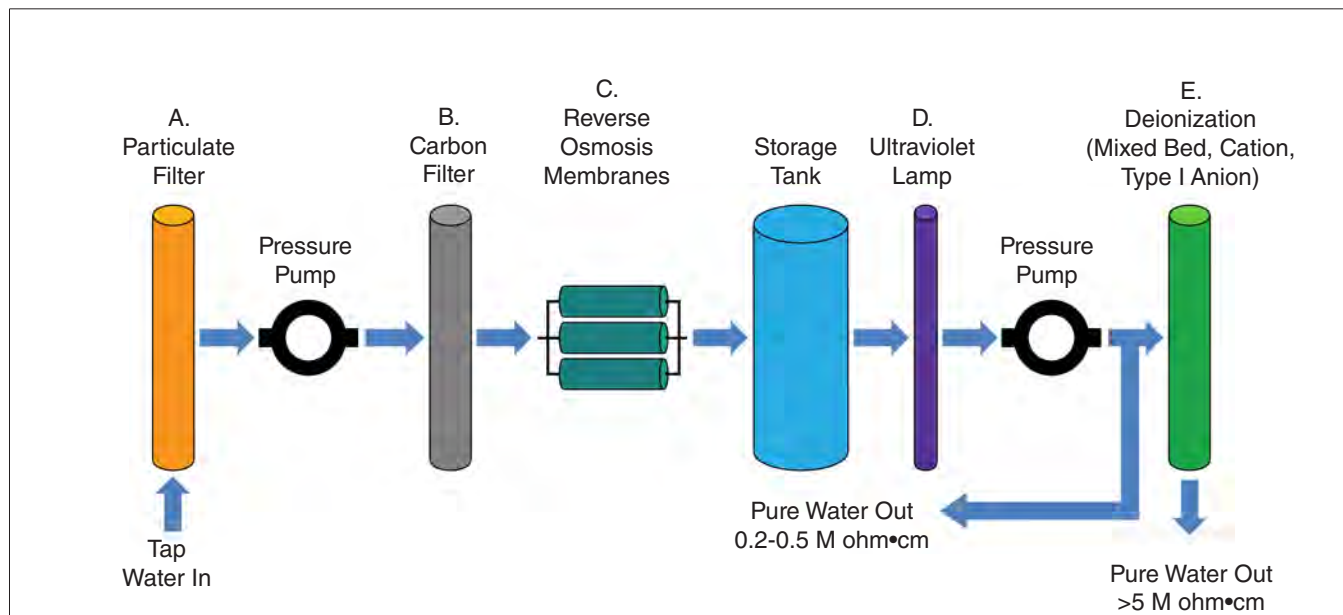


Figure 5.9a: Reverse Osmosis / Deionized Water System.

- Additional RO/DI system information is shown below.

Stage	Purpose	Outgoing Purity	Notes
A. Particulate Filter	Remove small particles		Replace once per year
B. Carbon Filter	Remove chlorine		Replace once or twice per year
C. R/O Membranes	Remove dissolved solids, colloidal silica, organic and biological contaminants	0.2-0.5 M ohm•cm	Rough purification stage
D. Ultraviolet Lamp	Disinfect water		Rough purification stage
E. Mixed Bed Tank	Final polishing to remove positively and negatively charged ions	> 5 M ohm•cm	Final polished water purity

Connections

- The water supply and drain connections are made at the lower rear of the tester (Figure 5.9b).
- The Q-SUN tester is supplied with kit X-7654-K (Figure 5.9b) which includes water inlet and drain fittings to meet various connection configurations (Figure 5.9d through Figure 5.9g).
- A 10 mm water fitting adapter (U-40817-X) for connecting the tester to a 10 mm inlet water supply is also supplied (Figure 5.9c).
- The water inlet hose is not supplied with the tester. Drain hose is supplied with the tester.

Note: Connect water supply and allow 20 minutes for the humidifier tank to fill before powering on the tester.

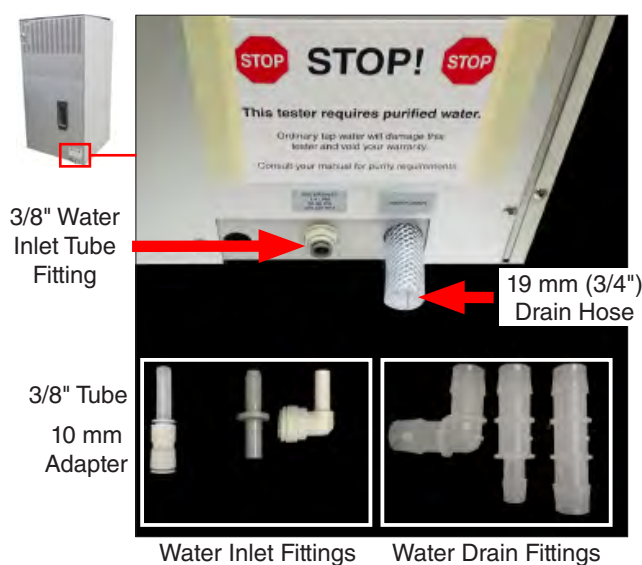


Figure 5.9b: Supplied water inlet and drain fittings.

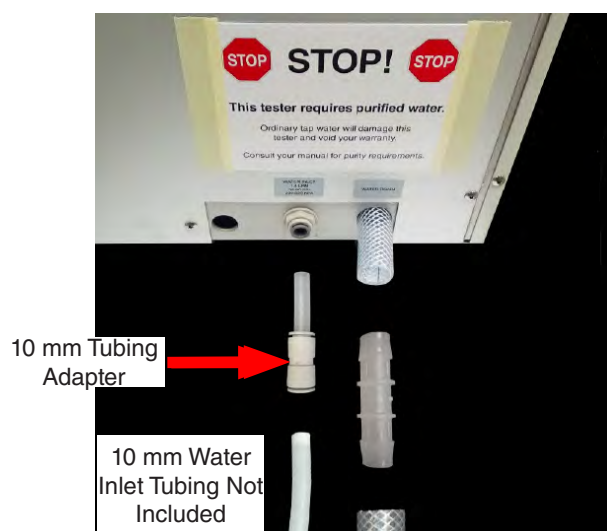


Figure 5.9c: Connect to 10 mm inlet water supply.

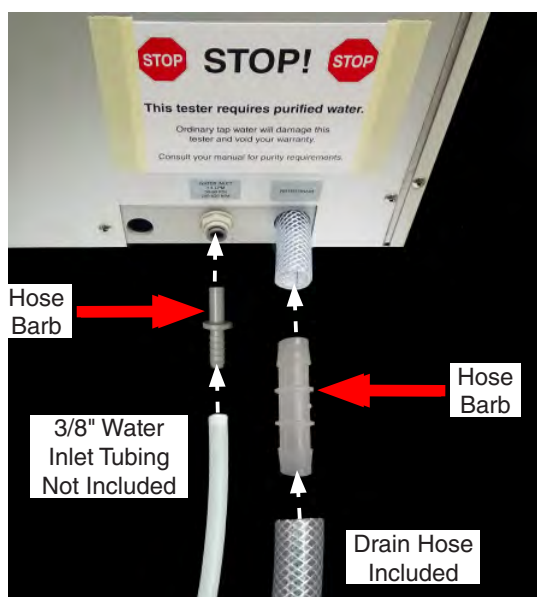


Figure 5.9d: Configuration 1.

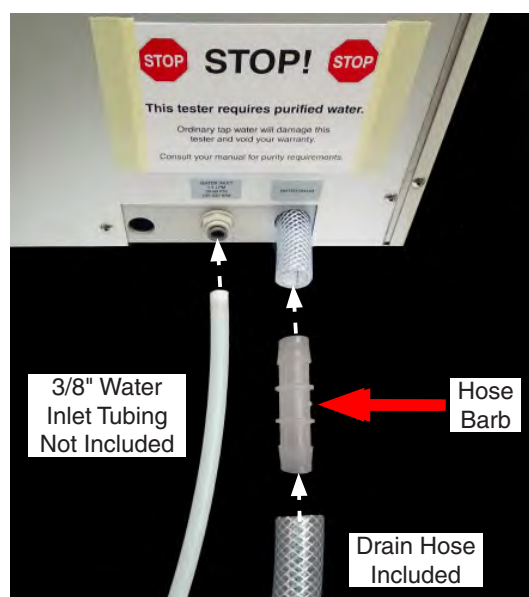


Figure 5.9e: Configuration 2.

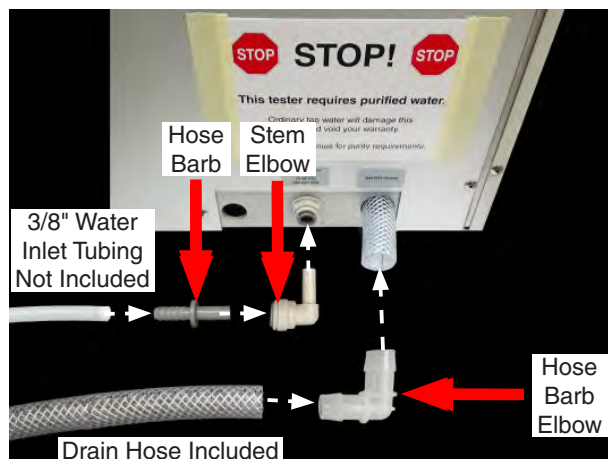


Figure 5.9f: Configuration 3.

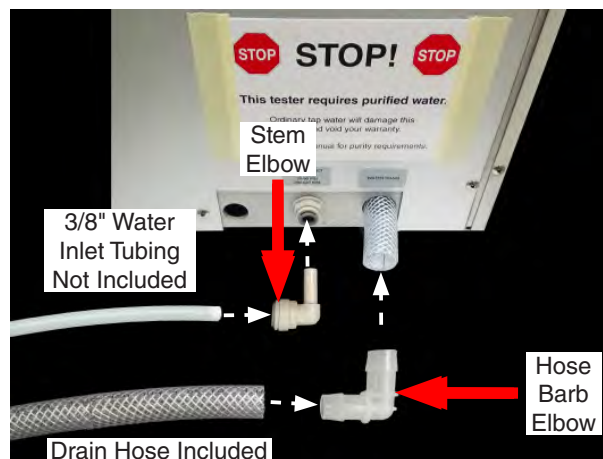


Figure 5.9g: Configuration 4.

To disconnect inlet hose barb or elbow, push in on the dark gray gripper ring on the inlet connector.



Figure 5.9h: Disconnect hose barb or elbow.

Raised Drain

- The drain tube must lie flat on the floor. If the tester drain hose must rise more than 100 mm (4.0") above the floor at any point before reaching a drain, a pump is needed or the tester must be elevated.
- An optional drain pump kit is available (see [Section 14.1](#)) to pump drain water over obstacles or to an elevated drain.
- Alternatively, an optional lift kit can be used to raise the entire tester up off of the floor (see [Section 14.2](#)).
- Do not use concrete blocks, pallets, bricks, or other means to raise the tester to achieve proper drainage.
- Contact Q-Lab Repair and Tester Support with any questions about tester drainage requirements.

Chiller

- The chiller does not require an input water supply.
- A drain connection must be made to drain water that condenses on the chiller evaporator coil.
- The drain connection is made at the lower rear of the chiller ([Figure 5.9i](#)).
- The chiller has a short piece of 1.3 cm (1/2") drain hose exiting below the rear panel.
- A 1.3 cm (1/2") × 2 cm (3/4") reducer is included in the drain kit to allow the chiller drain to be connected to the 2 cm (3/4") drain hose that is supplied in the drain kit.

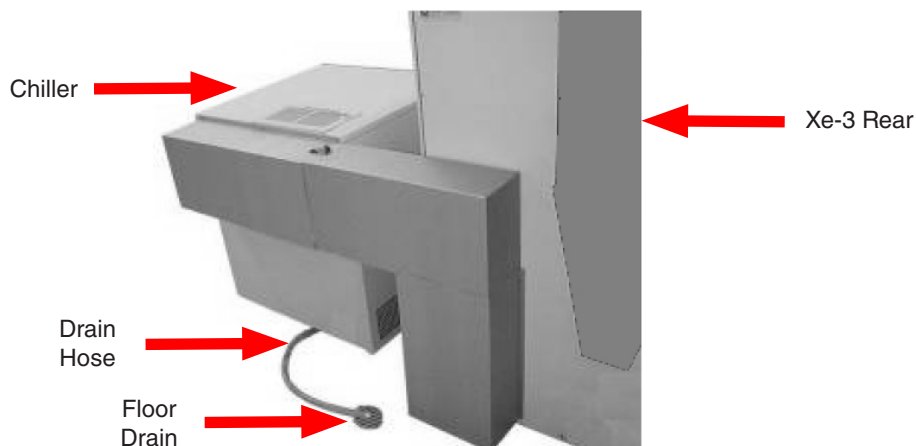


Figure 5.9i: Chiller drain hose routed to floor drain.

Back Spray

- Xe-3 models equipped with a Back Spray (BS) system have no additional water connection requirements

Dual Spray

- The Dual Spray system has a fluid drain hose at the bottom of the reservoir ([Figure 5.9j](#)).
- The reservoir drain valve and hose are accessed by removing one of the Dual Spray cart side panels.
- Make sure the drain hose is extended to an appropriate fluid disposal drain before opening the drain valve.
- Opening the ball valve allows fluid from the reservoir to be pumped to the spray nozzles in the Xe-3 test chamber.
- See [Section 2.3](#) for important information regarding potential fluid hazards.

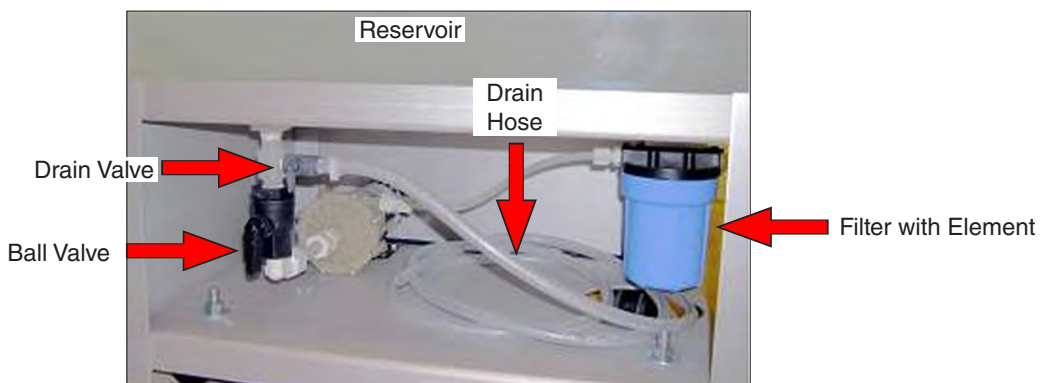


Figure 5.9j: Cart side panel removed to access Dual Spray drain valve and drain hose.

5.10 Venting (Dec 2020)

Xe-3

- The Q-SUN Xe-3 releases warm, moist exhaust air directly into the room.
- Xe-3 testers without chiller produce 5400 watts (18425 BTU/hr) of room heat.
- Xe-3 testers with chiller produce 6600 watts (22520 BTU/hr) of room heat.
- The Xe-3 humidifier exhausts approximately 6.0 liters (13.2 pounds) per hour of water vapor into the room.
- A dehumidifier may be required to prevent condensation from forming in the room.
- The recommended ambient operating temperature and relative humidity (RH) for the Xe-3 tester is $23 \pm 5^{\circ}\text{C}$ and $50 \pm 25\%$ RH. See [Section 4](#) for more important information on recommended tester operating conditions.
- The air conditioning and ventilation required to maintain the recommended ambient operating temperature and humidity should take into account the Q-SUN heat and water vapor exhaust.



The Xe-3 air intake and exhaust vents must not be obstructed. Keep filters clean.

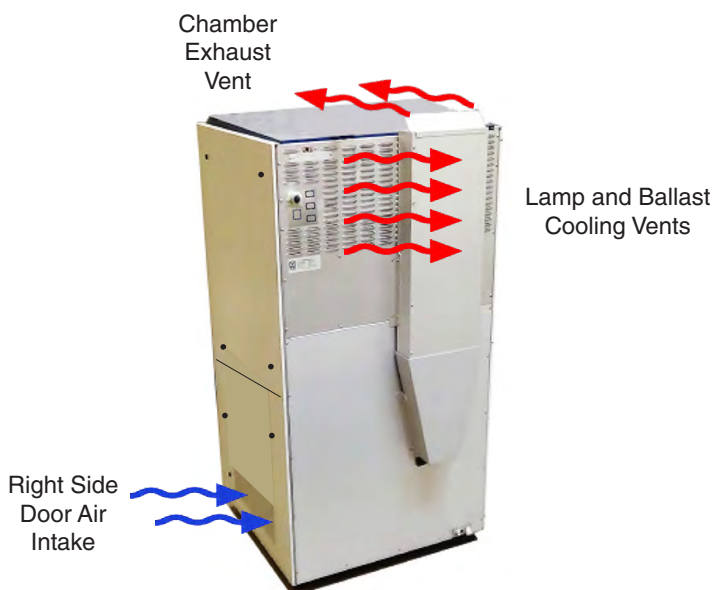


Figure 5.10a: Q-SUN Xe-3 Rear View Showing Air Intake and Exhaust Vent Locations

Contact [Q-Lab Repair and Tester Support](#) for venting options.

Chiller



The chiller air intake and exhaust vents must not be obstructed. Keep filters clean.

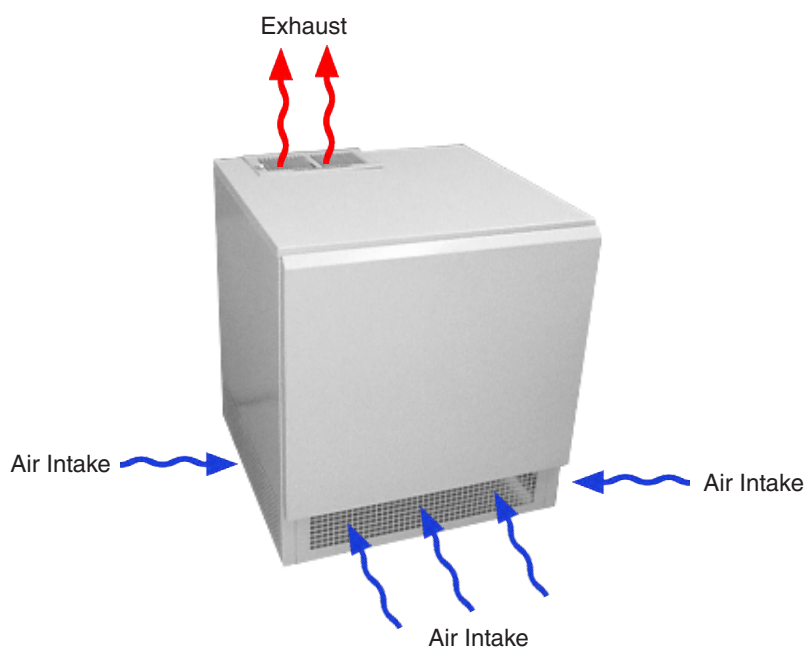


Figure 5.10b: Chiller Air Intake and Exhaust Vent Locations

Back Spray

- Xe-3 models equipped with a Back Spray (BS) system have no additional venting requirements.

Dual Spray

- Xe-3 models equipped with a Dual Spray (DS) system have no additional venting requirements.

6. Start Up

Overview



See *LX-5080-TM Q-SUN Xe-3 Technical Manual* or *LX-5080B-TM Q-SUN Xe-3 Technical Manual* for a complete guide to the programming and operation of the Q-SUN Xe-3 Xenon Test Chamber.

6.1 Specimen Mounting (May 2020)

- Specimens are placed on the tray in the test chamber ([Figure 6.1](#)).
- Other specimen mounting configurations are possible. See [Specification Bulletin LX-5047](#) for specimen mounting guidelines and available holders.



Figure 6.1: Xe-3 Specimen tray pulled out and specimens placed on tray.

6.2 Q-SUN Xe-3, All “E” Models Control Panel (May 2020)

- The power switch is located on the tester control panel ([Figure 6.2a](#)).
- Two touch screen displays provide for control and monitoring of tester operation ([Figure 6.2b](#)).
- The Menu Screen is a control interface that provides functions for setting up and running test cycles, calibration of sensors, viewing diagnostic information, and display of error messages. ([Figure 6.2c](#)).
- The Status Screen displays test setup parameters and provides real-time data on actual test conditions ([Figure 6.2d](#)).



Figure 6.2a: Power switch on control panel of all “E” model Xe-3 testers.

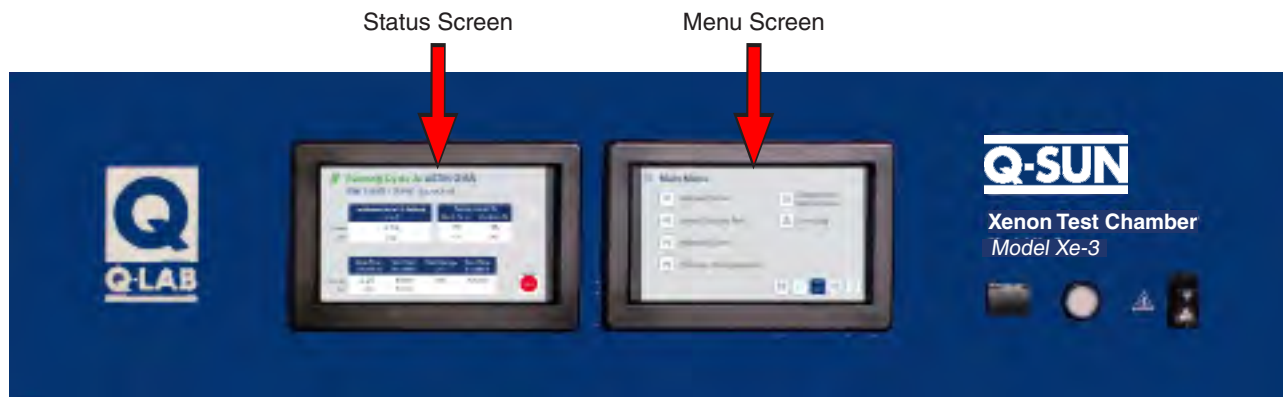


Figure 6.2b: Status screen and menu screen.

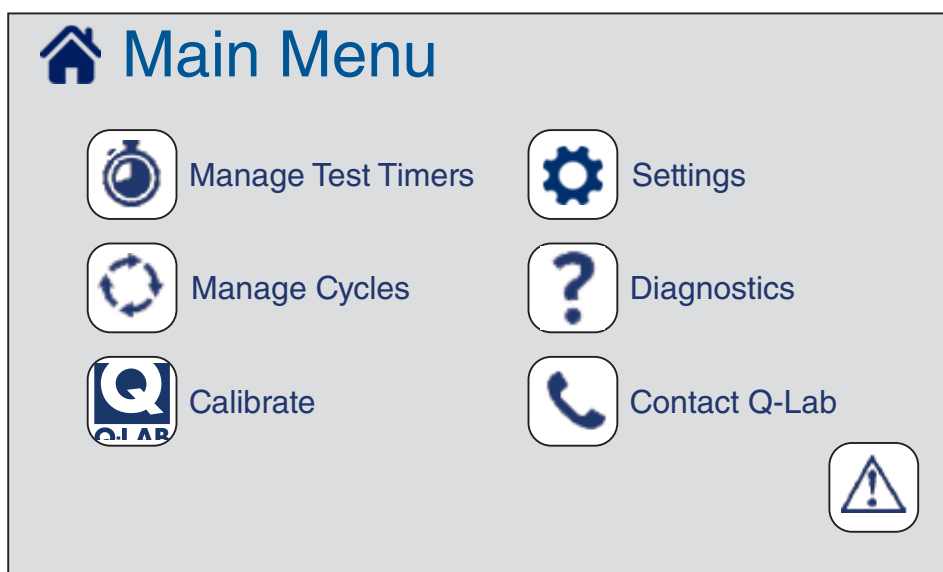


Figure 6.2c: Menu screen.



Figure 6.2d: Status screen.

6.3 Q-SUN Xe-3-H Control Panel (May 2020)

- The power switch is located on the tester control panel (Figure 6.3a).
- The keypad is used to enter all input required for tester operation (Figure 6.3b).
- The status and message display shows keypad input as well as diagnostic information and messages. (Figure 6.3c).
- The test monitor displays show test setup parameters and provides real-time data on actual test conditions (Figure 6.3d and Figure 6.3e).

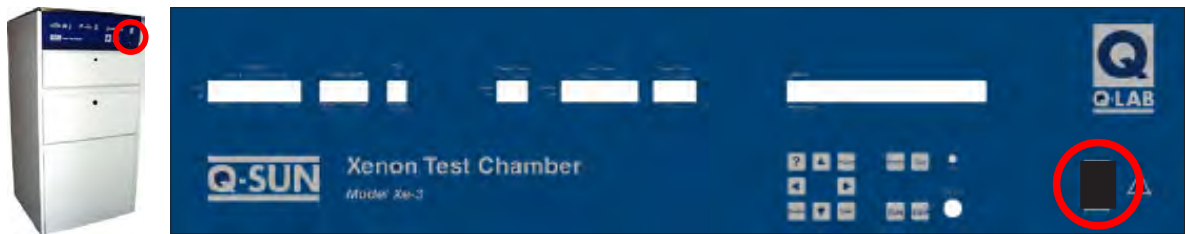


Figure 6.3a: Power switch on Xe-3-H control panel.



Figure 6.3b: Xe-3-H keypad.



Figure 6.3c: Xe-3-H status and message display.



Figure 6.3d: Xe-3-H irradiance, temperature and relative humidity display.

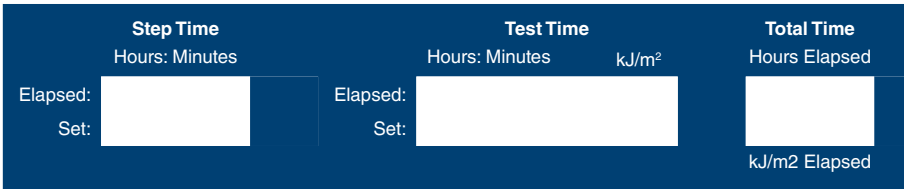


Figure 6.3e: Xe-3-H step time, test time, and total time display.

6.4 Chiller (May 2020)

- The Q-SUN Xe-3 will determine if the chiller is needed during each step of a test program, based on the type of step, the temperature set point, and the lab temperature.
- Make sure the chiller power cable is connected to the power outlet on the rear of the Xe-3 (see [Figure 5.8h](#)).
- **IMPORTANT:** The ON/OFF switch, located inside the chiller front door ([Figure 6.4a](#)), should remain in the **ON** position.
- The chiller may not start running immediately when the switch is turned to **ON**, as the Q-SUN will turn the chiller **ON** and **OFF** as needed for the step being run.
- The damper position must be set to the lowest temperature expected in the room where the Q-SUN is operating ([Figure 6.4a](#)).
- Using the graduations on the damper as a guide, the damper louvers should be adjusted ([Figure 6.4b](#)) to be fully open if the room is 20° C (68° F) or warmer.
- In a room of 10° C (50° F) the damper should be almost closed.

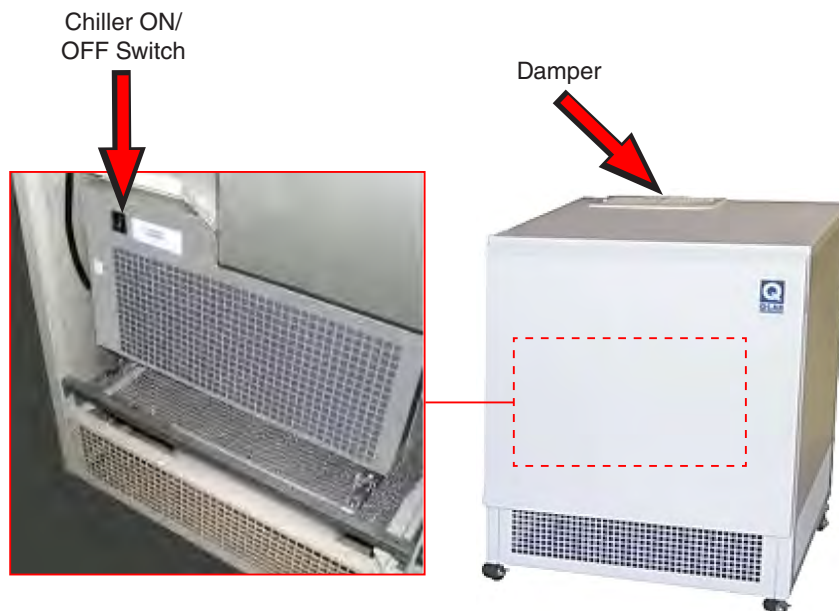


Figure 6.4a: Chiller ON/OFF switch and damper location.



Figure 6.4b: Damper adjustment location at top rear of chiller.

6.5 Dual Spray (May 2020)

- The dual spray system operates only during AUXILIARY and LIGHT+AUXILIARY steps.
- If the spray is desired for a specific test:
 1. Add the desired liquid to the reservoir (the unit may be rolled to another area easily by first disconnecting the power cord and the plumbing via the quick-connect fitting).
 2. Verify the dual spray power cord is plugged into both the base and the Xe-3 outlet marked Dual Spray (Figure 5.6j).
 3. Verify the tubing connecting the dual spray unit to the Q-SUN tester is fully inserted at both ends.
 4. Program an AUXILIARY or LIGHT+AUXILIARY step at the desired sequence, for the desired length of time.
- During the AUXILIARY or LIGHT+AUXILIARY step, the dual spray pump will operate, spraying the liquid onto the top (front) of the specimens.
- All other functions of the machine will cease (there will be no light, no temperature or humidity control, etc.).
- A horizontal specimen tray insert (part number X-10080-X) has been provided so the liquid can pool on the specimens without running off, if desired (Figure 6.5a).
- The open mesh sample tray assembly (part number X-7035-X) must be placed under the horizontal specimen tray insert (Figure 6.5b).



Figure 6.5a: Horizontal specimen tray insert - install on open mesh tray so liquid will not run off the specimens.



Figure 6.5b: Open mesh specimen tray - install under horizontal specimen tray insert.

NOTE: Use a leveling instrument to verify that the specimen tray is actually level. If it is not level, the entire Xe-3 can be raised / lowered to the desired height by adjusting the four leveling pads or casters that support the machine.



Do Not Use a Water Repurification System with Dual Spray Models

- Xe-3 Dual Spray models should not have a Water Repurification System installed.
- Drainage should go directly to waste and cannot be reused.
- Using a repurification system will result in adding the solution to the repurification reservoir, contaminating purified water and compromising tester components.

7. Warranty (Oct 2020)

All Q-SUN Xenon Test Chambers and components are guaranteed against defects in workmanship or materials for one year. Liability is limited to replacing or repairing any part or parts that are defective in materials or workmanship.

Liability in all events is limited to the purchase price paid. Damage due to accident or abuse is not covered. Labor cost is not covered.

Q-Lab Corporation makes no other warranties, including implied warranties of merchantability, or fitness for a particular purpose, except as may be expressly provided by the Q-Lab Corporation in writing.

Q-Lab Corporation shall not be liable for any incidental, consequential, special, or contingent damages arising out of the sale or use of any product.

Q-SUN test chambers are made in the USA.

8. Repair and Tester Support (Sep 2020)

- Q-Lab Repair and Tester Support is available Monday through Friday from 8:30 AM to 5 PM (international office time).
- Please contact Q-Lab support (see contact information below).
- You can also visit our website at www.q-lab.com to register your tester to access additional useful troubleshooting guides, operating manuals, and technical information.



For sales, technical, or repair support, please visit:

Q-Lab.com/support

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