

# Installation Procedure

## Cryostation® s-series

s50 | s100 | s200

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MONTANA INSTRUMENTS®



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Specifications and product information listed in this document are accurate at the time of publishing for a standard system. Options, custom designs, and other modifications may cause slight differences. Future design changes to the system, including software updates, may change.

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# Section 1 - Preface

## **WARNING**

### **Read all instructions before using this product**

All users must read and understand this manual and all other safety instructions before using the equipment. Retain these instructions for future reference.

This manual is intended for users of the Montana Instruments products and systems described herein. Users include anyone who may physically interact with the system or peripheral equipment, including installing, setting up, or configuring the system or anyone who may operate system components via operating panels, the supplied user interface, or remote interfaces.

This manual may be used by facilities personnel for determining infrastructure requirements in the room or building where the equipment will be installed.

This manual should be referenced by authorized service personnel for important safety and hazard information and other product restrictions.

## 1.1 Conventions Used in this Manual

The following style conventions are used in this document:

- A vertical bar (|)
  - Indicates alternative selections. The bar may be used in place of “and” or “or.”
- Alphanumeric List (1., 2., 3...| a., b., c...)
  - Indicates instructions or actions which should be completed in a specific ordered sequence.
- Bulleted List (• | ◦ | -)
  - Indicates instructions, commands, or additional information about an action.
  - May alternatively be used for unordered lists of materials or additional reference notes.
- `Courier Font`
  - Indicates a label or indicator on a physical product or part.
  - Indicates a system output, such as a display reading.
  - May also be used for URLs, file paths, file names, scripting language, prompts, or syntax.

### 1.1.1 Abbreviations

The following abbreviations may be used:

- ACM: Ancillary Control Module
- CAN: Controller Area Network
- DMM: Digital Multimeter

- HDMI: High Definition Multimedia Interface
- MI: Montana Instruments
- PCB: Printed Circuit Board
- TCM: Temperature Control Module
- UI: User Interface
- UPS: Uninterruptible Power Supply
- USB: Universal Serial Bus
- VNC: Virtual Network Computing

### 1.1.2 International System of Units (SI) Symbols

- C: Celsius
- cm: Centimeter
- K: Kelvin
- kg: Kilogram
- m: Meter
- mK: Millikelvin
- MPa: Megapascal
- mTorr: Millitorr
- mW: Milliwatt
- s: Second

### 1.1.3 System of Imperial Units Symbols

- ft, ' : Foot
- in, " : Inch

### 1.1.4 Explanation of Safety Warnings

Safety and hazard information includes terms, symbols, warnings, and instructions used in this manual or on the equipment to alert users to precautions in the care, use, and handling of the system. The following hazard levels and information are considered:

 **DANGER**

**Serious personal injury**

Imminent hazards which, if not avoided, will result in serious injury or death.

 **WARNING**

**Serious personal injury**

Potential hazards which, if not avoided, could result in serious injury or death.

 **CAUTION**

**Possible personal injury**

Potential hazards which, if not avoided, could result in minor or moderate injury.

**NOTICE**

**Command or Product Safety Notice**

Potential hazards which, if not avoided, could result in product damage.

**» NOTE**

Points of particular interest for more efficient or convenient equipment operation; additional information or explanation.

### 1.1.5 Graphical Symbols

The following symbols may be used in diagrams, supporting text, and on physical parts:

	Hazard Alert: General Warning		Hazard Alert: High Voltage
	Hazard Alert: Laser Radiation		HDMI port
	CAN bus module		USB port

## 1.2 General Hazard & Safety Information

The following descriptions are of general hazards and unsafe practices that may result in product damage, severe injury, or death.

- The products, parts, and components in this manual are to be serviced by authorized Montana Instruments service representatives only. Failure to do so will void the warranty and may damage the product and/or create a safety hazard.
- Only use all components provided for the intended purpose described herein.
- If the equipment or any component is used or modified in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The following hazards may be typical for this product:

 **WARNING**

**Risk of injury when lifting or moving system components**

System components, including standalone equipment and installed assemblies, may be heavy.

- Use caution when lifting or moving equipment or assemblies. Ensure proper lifting principles are used to avoid injury.
- Equipment or assemblies >20 kg should always be lifted by two or more people or with a suitable lifting device.

**Risk of injury due to sharp edges**

- The interior of the enclosure contains sheet metal parts that may have sharp edges.
- When working inside the enclosure (authorized service personnel only), exercise caution to avoid getting cut by these edges.

 **WARNING**

**High voltage: danger of electric shock**

Electric shocks and burns from capacitor discharge or power circuits could lead to serious injury or death.

- Before turning on any power supply, the ground prong of the power cord plug must be properly connected to the ground connector of the wall outlet. The wall outlet must have a third prong or must be properly connected to an adapter that complies with these safety requirements.
- Only use replacement power cords or power plugs with the same polarity and power rating as that of the original ones. Do NOT use inadequately rated cables.
- If the equipment or the wall outlet is damaged, the protective grounding could be disconnected.
- Do NOT use damaged equipment until its safety has been verified by authorized personnel.
- Do NOT disconnect or tamper with the operation of the protective earth terminal inside or outside the apparatus.
- Before accessing the enclosure or when otherwise servicing the unit (authorized service personnel only), completely power down the system and unplug the power cable.
- If power must be applied to diagnose issues or otherwise, a grounding strap must be applied to the arm interfacing internal components.

**NOTICE**

**Only clean exterior surfaces with acceptable fluids**

- Only use deionized water, glass cleaner, or isopropyl alcohol to clean the exterior surfaces of any enclosure. Do NOT use any volatile chemicals other than isopropyl alcohol.
- Apply fluid to a clean, lint-free cloth and wipe the surface with a cloth. Do NOT apply fluid directly to any surfaces or enclosures.

 **WARNING****Risk of serious injury due to hazards associated with cryocooling**

All personnel working with the system must be aware of the potential hazards associated with cryocooling.

- Personnel working with the system should be trained in emergency measures that may be required in the event of an accident.

**Risk of suffocation due to potential asphyxiates.**

Nitrogen (N<sub>2</sub>) and Helium (He) are potential asphyxiates if released into an enclosed area with poor ventilation. A decrease in air oxygen content can be caused by leaks.

- Ensure that proper tubing is used and good connections are made at each connection point to prevent the release of these gases.

**Risk of explosion due to high pressure if the system is not allowed to vent properly.**

- Never bolt or otherwise fasten the lid of the sample chamber closed. The lid acts as a safety pressure release in the event of high-pressure accumulation in the Cryostation.

**Risk of cold contact burns.**

- Parts of this system are very cold and may cause severe burns to the skin.
- Allow components to warm up to room temperature before touching. If contact occurs, consult a physician immediately.

**NOTICE****Take care when moving the Cryostation**

- Do NOT tilt the Cryostation more than 45 degrees. Inverting the Cryostation will cause damage.
- The Cryostation and sample chamber are a single unit. The attached sample chamber must be supported at all times. Do NOT lift the Cryostation by the sample chamber.
- Do NOT lift the Cryostation by the cryocooler tube or the top of the main body enclosure.
- The Cryostation ships with red locking plugs and a shipping support to prevent damage to sensitive components. Do NOT remove these until after the unit has been attached to the table.

**Take care when moving the compressor**

- Do NOT tilt the compressor. Doing so may damage the unit.
- The compressor is on casters for moving. Ensure casters are locked before operating.

**Risk of product damage due to improper use**

- Never disconnect the vacuum hose while the temperature of any stage of the Cryostation is below 285 K.
  - Never open the case or vent valves when the temperature of any stage is below 285 K.
  - Only use dry nitrogen gas with the Cryostation. Do NOT substitute other gases for system venting.
  - Avoid using any material in the sample chamber that may outgas or otherwise contaminate the optical windows and Cryostation surfaces.
  - When manually operating heaters, monitor the Stage 1 and Stage 2 temperatures to ensure these temperatures do NOT rise above 350 K. Temperatures above 350 K may damage critical components within the system.
- Peripheral cards must not exceed 600 W to avoid product damage**
- The system control unit can supply a maximum power of 600 W across all installed peripheral cards. Ensure the cumulative power of all installed peripheral cards (maximum power rating of all cards added together) does not exceed 600 W.
- Transportation and installation**
- When not in a rack unit, the enclosure should not be stacked on any other equipment nor should other equipment be placed on it.
  - Allow 8 cm minimum clearance from any ventilated face (sides, front) and 20 cm clearance in the rear for cables and hoses.
  - Do NOT move the unit while operational. Remove all cables prior to moving. Lift the enclosure by using both handles on the front face.

## 1.3 Technical Support Information

Any technical questions or issues with the system that cannot be resolved with the information in this manual should be referred to an authorized Montana Instruments service representative.

### 1.3.1 Warranty & Repairs

If the system or parts need to be returned to the Montana Instruments factory or an authorized service center for repair or service, contact an authorized service representative for a return merchandise authorization (RMA) number and instructions on returning the unit.

For a copy of the Limited Warranty Agreement, visit:

<https://www.montanainstruments.com/support/warranty-information>

### 1.3.2 Accessories & Replacement Parts

Only use cables, hoses, accessories, and parts provided or approved by the manufacturer. Follow all instructions for proper installation or replacement.

- To order spare or replacement parts, please contact your local service representative.
- To order new accessories or options, or for more information on other Montana Instruments products and technologies, please contact your local sales representative.

### 1.3.3 Contact Details

For a complete list of sales and service centers visit: [www.montanainstruments.com/Contact](http://www.montanainstruments.com/Contact)

### **North American Authorized Service**

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- M-F 8:30am-5pm MST | Call: +1.406.551.2796
- Email: [support@montanainstruments.com](mailto:support@montanainstruments.com)

### **North American Sales**

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- M-F 8:30am-5pm MST | Call: +1.406.551.2796
- Email: [sales@montanainstruments.com](mailto:sales@montanainstruments.com)

### **International Sales & Authorized Service**

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- Visit <https://www.montanainstruments.com/contact> for contact information for your local representative.

## Section 2 - System Installation & Handling

### 2.1 Packaging Contents

The system will arrive on 2-4 pallets, depending on the options purchased. Depending on the configuration, the items below may differ. Additional purchased options may be pre-integrated in the sample chamber or packaged separately. Refer to the shipment packing list for more details.

#### Compressor Box

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- Helium Compressor

#### Cryostat Box

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- Cryostat and Sample Chamber (single unit) with pre-installed options (depending on the configuration ordered)

#### System Control Box

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- System Control Unit with pre-installed peripheral cards (depending on the configuration ordered)

#### Vacuum Control Box

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- Vacuum Control Unit

#### Accessory Box

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- User Interface Touchscreen Display

#### Cables & Hoses

- Main Power Cords (2), *System Control and Vacuum Control Units (C13)*
- 6-socket to 6-pin circular M-F connector cable: *Compressor to Cryocooler Head*
- DSUB9 M-M serial cable: *System COMM to Compressor*
- DSUB25 M-M cable: *ACM to Vacuum Control*
- DSUB37 F – split to DSUB25 M, DSUB25 F, MDR26: *TCM to cryostat control*
- USB & HDMI cables: *for the User Interface Touchscreen Display*

#### Accessory Kit

- Tweezers
- Pick Tool
- Allen keys (3): *M1.5, 2.0 & 4.0*
- Apiezon® N-grease: *for cryogenic thermal connections only*
- Apiezon® L-grease: *for lubricating O-rings only*
- GE Varnish Adhesive (VGE): *for wires or samples within 4 K space*
- Kapton® Tape: *for wire insulation*
- Unwaxed Dental Floss: *for wire management*
- KF-25 to VCO adapter: *for vacuum leak testing*
- Spare VCO O-rings
- Fischer Connector Strip: *for custom connections*
- Assortment of spare screws

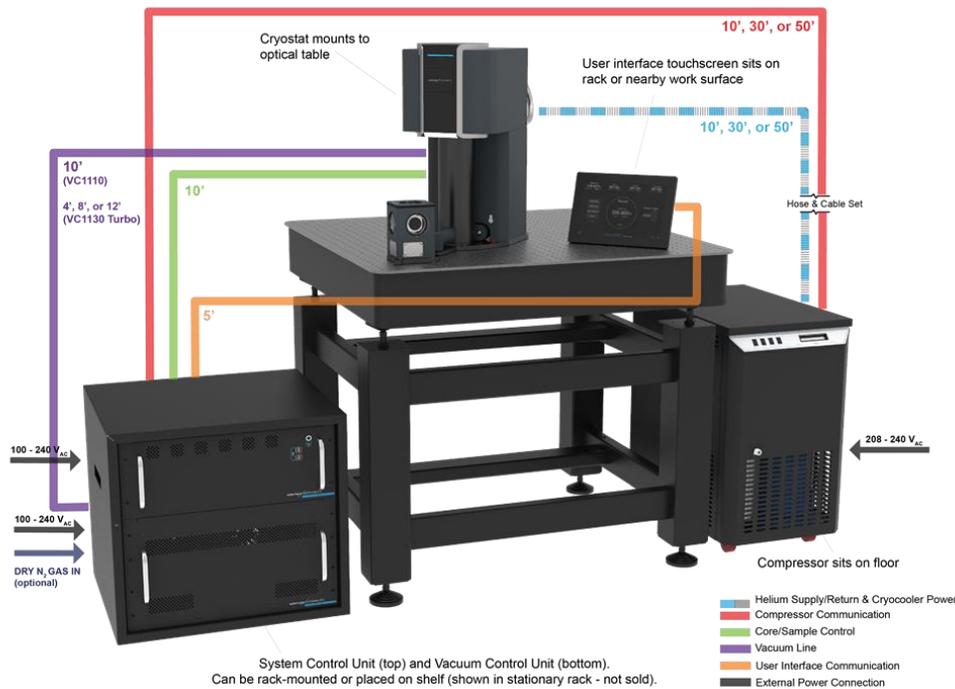
- Window tool: *for removing the window retaining rings on the vacuum housing*
- Purge adaptor and recharge adaptor: *for recharging the system in the event of a helium loss*
- Additional custom components such as sample mounts, window, or thermometers (if purchased)

## 2.2 Component Placement and Layout Plan

Prior to unpacking the system, pre-plan the placement of components in the lab space. Detailed dimensions are available online.

- The cryostat (including the sample chamber) must be mounted to an optical table. The main housing can typically be oriented at either 45° or 90° to the hole pattern in the optical table. Allow 60 cm clearance in the back of the unit for the helium and vacuum hoses.
- The compressor must remain upright and sit on the floor. Allow 24 in. clearance in the back, front, sides, and top of the unit for helium hoses and air cooling.
- The system control unit (4U) and vacuum control unit (6U) can be rack-mounted in a standard 19" rack unit (sold separately) or placed on a nearby shelf. Allow 8 cm clearance on the front, sides, and rear.
- The user interface touchscreen can be placed on any nearby work surface.

Please consider the allowable distance between components, as outlined in the cable diagram below. The helium hoses between the cryostat and compressor require a minimum bend radius of 6 in (15cm) for 10 ft (3 m) hoses or 9 in (23 cm) for 30-50 ft (9-15 m) hoses, with a 4 in. (10 cm) straight section at each end. If long hoses were not purchased with the system, the standard length is 10 ft (3 m).



### » NOTE

System pictured may differ from actual system, i.e., compressor model may differ. Routing of the connections are the same.

## 2.3 Unpacking the Components

If an installation was ordered, we recommend leaving the system packed until a service representative arrives.

### NOTICE

#### Inspect shipment upon receipt

Before unpacking the system, please note the condition of the boxes, shock watch sensors, and tilt watch sensors. The boxes should be intact and strapped to the pallets. If there is any visible damage or if the sensors have been tripped, contact an authorized service representative immediately and do NOT proceed with unpacking.

#### Retain equipment packaging for future use

We recommend saving the original equipment packaging (foam, box, and pallets). The packaging is specially designed to support and stabilize the equipment and will be required if the unit needs to be transported in the future. Some components must be packed upright on a pallet to avoid damage.



Shock watch



Tilt watch

### 2.3.1 Unpacking the Compressor

Locate the compressor pallet.

1. Cut the bands securing the box to the pallet.
2. Carefully remove the box surrounding the unit. Lift directly up and over the surrounding foam.
3. Using two people, lift the compressor off the pallet and gently set it on the floor. Take care not to tilt the compressor.
4. The compressor has casters for moving it. Remove the plastic wrap and roll the unit to its desired location.
5. Raise the left corner of the compressor to locate the hex head shipping bolt. Support the compressor base with blocks high enough to gain access to the bolt. Do not raise the corner more than 50 mm (2").
6. Use a 17-mm wrench to remove the bolt. Retain the bolt for future use. The shipping bolt must be reinstalled prior to shipment (See section on Compressor Shipping Preparation).
7. Remove the blocks and lower the compressor onto its wheels.



Compressor on pallet



Step 2: Removing compressor box



Step 3: Locating vacuum and helium hoses



Step 4: Compressor on floor

### 2.3.2 Unpacking the Cryostat

Locate the cryostat box.

1. Remove the box wrap and cut the bands securing the box to the pallet. Carefully lift the box off the pallet and set it on a nearby surface.
2. Open the side of the box and slide out the cryostat and foam onto an adjacent surface.
3. Lift off the top piece of foam.
4. Reach under the unit and grasp the main structure below the baseplate and sample chamber. Supporting the system at the front and back, carefully lift the system out of the foam and onto the table, taking care not to tilt more than 45°. A second person can assist with this step.
5. Carefully remove the plastic wrap around the main body and sample chamber. Leave the window covers in place.
6. Gently slide the unit to the desired location on the optical table.



*Step 2: Sliding out the cryostat*



*Step 4: Support and lift the unit out of the foam*



*Step 4: Alternate back support location*

### 2.3.3 Unpacking the Control Units

Locate the control unit boxes.

1. Remove the box wrap and cut the bands securing the box to the pallet. Carefully lift the box off the pallet and set it on the floor or a nearby surface.
2. Open the top of the box and remove the top piece of foam.
3. Reach inside and grasp the underside of the unit. Lift the unit up and out of the box. Keeping the unit in the same orientation, set onto an adjacent surface.
4. Carefully remove the plastic wrap around the enclosure.
5. Move the unit to the desired location.

## 2.4 Installing the Cryostat

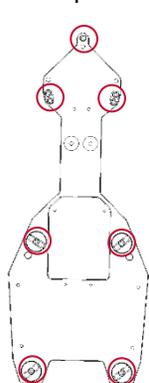
### 2.4.1 Mounting the Cryostat to the Optical Table

The cryostat can be mounted at either 45° or 90° to the hole pattern in an imperial or metric optical table. When aligning the system, make sure you can still reach and access the sample chamber.

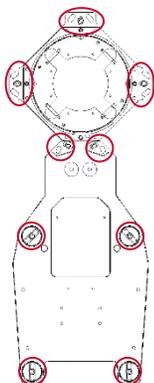
1. Adjust the cryostat so the mounting holes around the sample chamber are directly aligned with holes in the optical table.

The baseplate contains four additional mounting locations, two on either side of the black vertical cryocooler cylinder, and two at the back of the unit. These locations each have a slotted disk for fine adjustment.

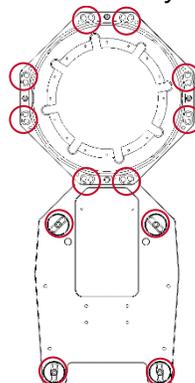
2. Turn the slotted disks at each remaining baseplate location until a table hole is aligned with the slot.
3. Starting at the front of the sample chamber, insert a short hex screw in each mounting location. Start by loosely starting each screw, turning just enough to hold the screw in place. Minor positioning adjustments may still be required.
4. After placing a screw at each location, tighten all screws securely, moving front to back.



s50: seven mounting locations



s100: nine mounting locations



s200: 12 mounting locations



Tightening screws

On some models, the operational cable may be shipped disconnected:

5. Locate the MDR26 cable coming out of the front of the cryostat tower (next to the black vertical cryocooler cylinder).
6. Connect the cable to the lower MDR26 connector on the base side panel of the sample chamber at the location labeled: OPERATIONAL

### 2.4.2 Removing the Shipping Supports

Once the cryostat is secured to the table, the shipping supports can be removed. These should be removed for optimal performance.

1. Locate the red C-spacers on either side of the connection point between the sample chamber and cryocooler (two total). Unscrew the M3 screws.
2. Remove the red caps then pull out the red tab.



*C-spacer locations*



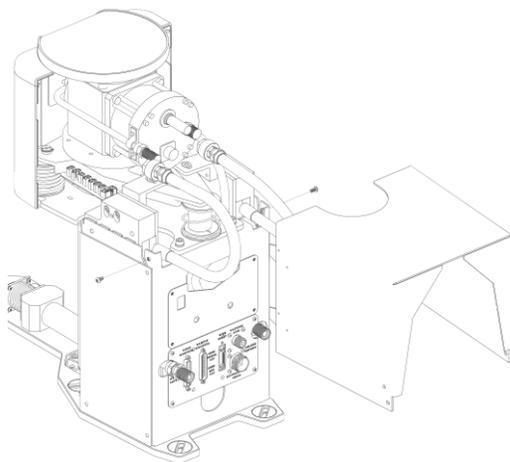
*C-Spacer cap and tab*

**» NOTE**

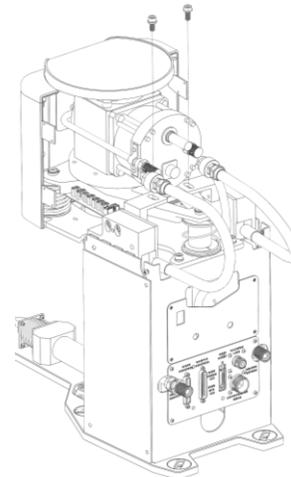
If it is difficult to remove the C-spacer, remove both caps first. Then, follow the steps below to remove the cryocooler shipping support. Finally, gently lift up on the black cylinder surrounding the cryocooler and pull on the red tabs to remove.

Removing the final shipping support requires removing the top cover of the cooling tower assembly.

3. On the backsides of the top cover, locate the two M4 x 8mm hex screws. Remove with a 2.5mm Allen key.
4. Slide the top cover back. There is a grounding wire attached to this cover, but it is long enough to allow the cover to be set on the adjacent table surface while the remaining steps are completed.
5. Locate the red shipping support brackets (two pieces). Using a 5mm Allen key, remove the M6 x 14mm screws on the top of each bracket. Store these screws and washers in the accessory kit.

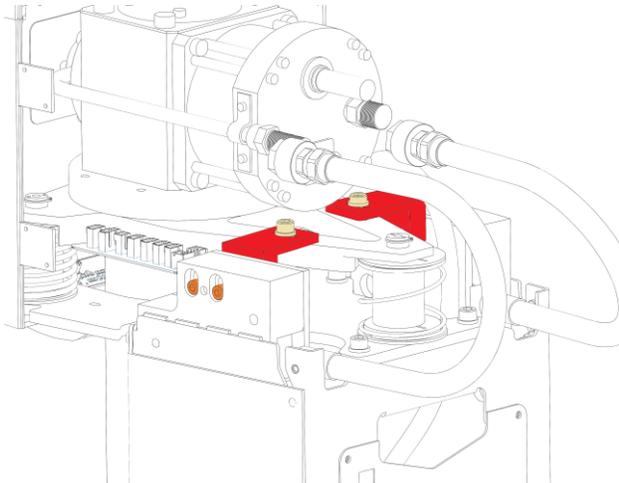


*Step 3-4: Removing the top cover*

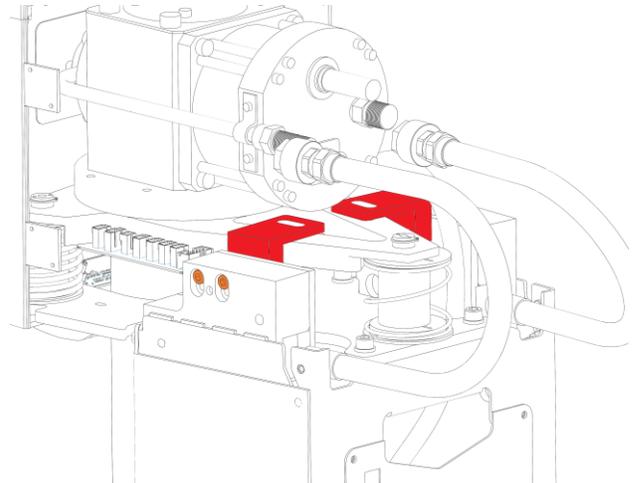


*Step 5: Removing the shipping support screws*

6. On the side of the shipping support, locate the two M5 screws holding the bracket in place (shown orange below). Using a 4mm Allen key, loosen these screws but do not remove them.
7. Slide the shipping bracket (shown red below) up so it is no longer touching the silver tri-flange. Holding it in place, re-tighten the two M5 screws (orange) to secure it in this unlocked position.
8. Repeat steps 6-7 on the other shipping support.

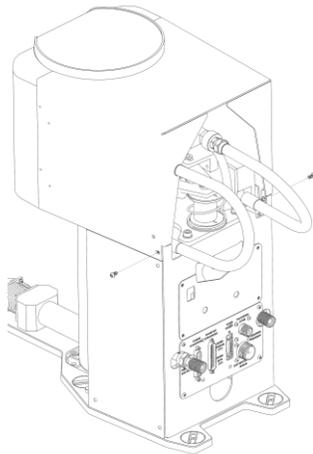


*Bracket bolted in the lower position (for shipping)*



*Bracket locked in the upward position (for operation)*

9. Replace the top cover by sliding it back into place from the rear, aligning the tabs with the inside of the front panel. Replace the two M4 x 8mm screws.



*Step 9: Replacing the top cover*

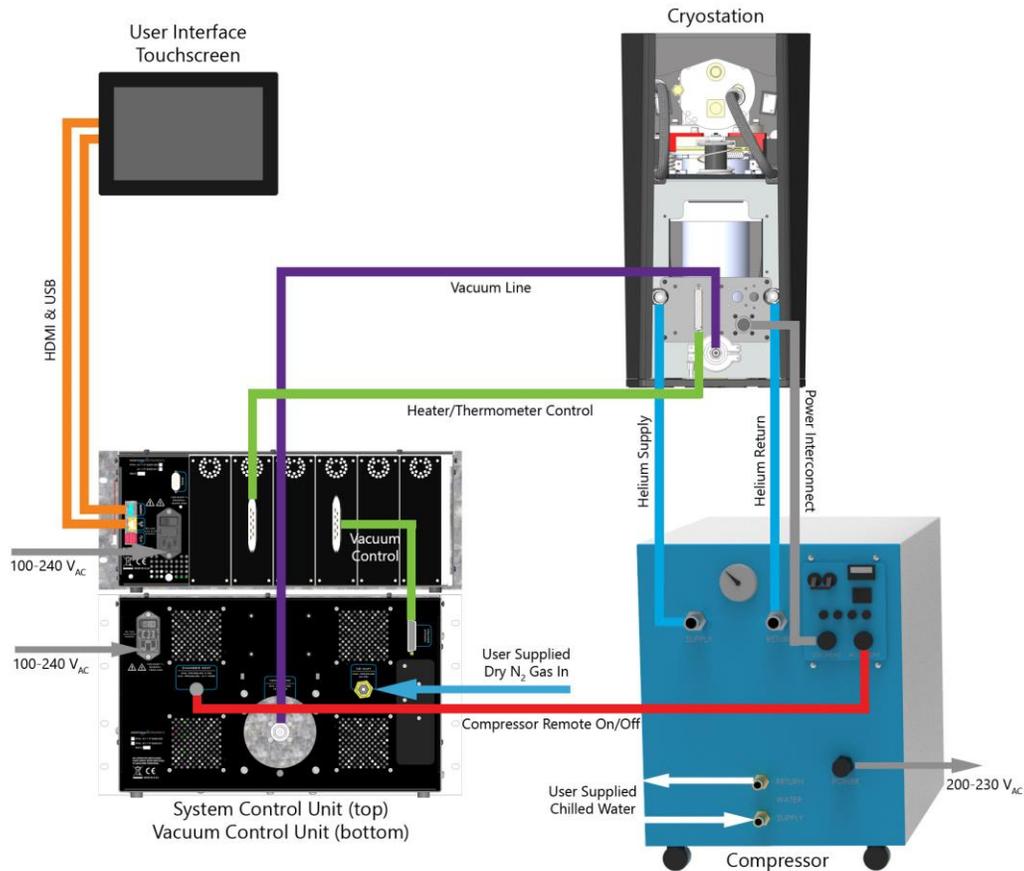
**NOTICE**

Keep the C-spacers, shipping supports, and screws. These should be reattached and locked in place any time the cryostat needs to be moved in the future.

## 2.5 Connecting System Cables and Power

### NOTICE

**Only use cables and hoses provided or approved by the manufacturer**  
 Only use the cables and hoses in the manner described below.



1. Remove any plastic covers from the connector locations on the back of the compressor, the cryostat, the system control unit, and the vacuum control unit.

### Helium Hoses: ————

Helium hoses should first be tightened by hand. Use a crescent wrench to continue to tighten the fitting, stopping as soon as force is required. Do not overtighten.

2. Locate the helium hose labeled `SUPPLY`. Connect one end to the `SUPPLY` location on the front of the compressor. Connect the other end to the `SUPPLY` location on the back panel of the cryostat.
3. Locate the helium hose labeled `RETURN`. Connect one end to the `RETURN` location on the front of the compressor. Connect the other end to the `RETURN` location on the back panel of the cryostat.

### NOTICE

**Check cable connections**

- Be sure to connect supply to supply and return to return. Do NOT switch the supply and return hoses, as the return hose may have internal contamination from extended use.
- Before connecting, ensure there is a single O-ring at each connection point and hose end.
- Keep the fittings straight to avoid any loss of helium as the hose is attached.
- Damage may result if the helium supply and return lines do not have room to expand and contract. Ensure the tubing runs straight from the back of the unit and makes loose gentle bends between connections. The minimum bend radius is 6 in (15cm) for 10 ft (3 m) hoses or 9 in (23 cm) for 30-50 ft (9-15 m) hoses.
- Do not let the helium hoses contact or rest on the optical table, as this can introduce vibrations.

#### Cryocooler Power Interconnect:

4. Locate the 6-socket to 6-pin circular M-F connector cable. Connect the M end to the back of the compressor. Connect the F end to the CRYOCOOLER HEAD location on the back panel of the cryostat.

#### Compressor Communication:

5. Locate the DSUB9 M-M series cable. Connect one end to the DSUB9 location on the back of the compressor. Connect the other end to the COMM PORT location on the back of the system control unit. Tighten both connections with the thumbscrews to secure.

#### Vacuum Hose:

6. Locate the vacuum hose. Connect one end to the VACUUM LINE location on the back of the vacuum control unit. Connect the other end to the VACUUM LINE location on the back panel of the cryostat. The O-ring seal only needs to be compressed, so take care not to overtighten.

### **NOTICE**

#### **Check cable connections**

- Do NOT overtighten the vacuum hose, as this can spin the fitting and cause a vacuum leak.
- Make sure the vacuum tube fitting has a single O-ring in it. The O-rings occasionally come loose and fall out.

#### Control Cables:

7. Locate the DSUB37 F – split cable. Connect the DSUB37 F end to the HEATER/THERMOMETER CONTROL location on the TCM peripheral card in the system control unit. Where the cable splits, attach the DSUB25 F end to the SAMPLE CONTROL location, the DSUB25 M end to the CORE CONTROL location, and the MDR26 to the USER INPUT locations on the back panel of the cryostat. Tighten connections with the thumbscrews to secure.
8. Locate the DSUB25 M-M series cable. Connect one end to the VACUUM CONTROL location on the back of the vacuum control unit. Connect the other end to the VACUUM CONTROL location on the ACM peripheral card in the system control unit.

#### User Interface:

9. Locate the USB and HDMI cables. Connect these cables from the back of the system control unit to the user interface touchscreen display.

### Nitrogen (optional):

To keep the sample space clean, a dry clean nitrogen connection is highly recommended, especially in humid climates. Nitrogen will help rid the system of moisture and decrease the initial pump down time.

10. Connect a ¼ in (6mm) tube to your nitrogen source (this tubing is not supplied).
11. Start the nitrogen supply at a low flow rate.
12. Verify that the nitrogen is flowing through the tube and does not contain any water vapor. Allow some nitrogen to flow through the tube to remove impurities.
13. Connect this tube to the N<sub>2</sub> INLET fitting on the back of the vacuum control unit by pressing in.
14. Set the nitrogen pressure to approximately 15 psi.

To disconnect the tubing, push the green circle on the fitting inwards and pull the tubing out.

<b>» NOTE</b>
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The system uses nitrogen during a VENT operation or during a COOLDOWN or PULL VACUUM operation if a "dry nitrogen purge" is enabled.
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### System Power:

Be sure to connect all other cables and hoses prior to connecting system power.

15. Locate one of the C13 main power cords. Ensure the rocker switch on the back of the system control unit is off ( o ).
16. Connect the main power cord to the C14 inlet located on the rear of the enclosure.
17. Connect the power plug to the appropriate 100 – 240 VAC wall outlet power source.
  
18. Locate the other C13 main power cord. Ensure the rocker switch on the back of the vacuum control unit is off ( o ).
19. Connect the main power cord to the C14 inlet located on the rear of the enclosure.
20. Connect the power plug to the appropriate 100 – 240 VAC wall outlet power source.
  
21. Ensure the rocker switch on the front of the compressor is off ( o ).
22. Ensure that the 50/60 Hz toggle switch is in the correct position.
23. Ensure that the circuit breaker on the compressor is open (handle in the down position).
24. Uncoil "output to cryocooler" cable and connect to Accessory port located on the front of the compressor.
25. Connect the compressor power cable to the appropriate 208 – 240 VAC wall outlet power source.

<b>» NOTE</b>
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Once all cables and hoses are connected, use the Velcro straps provided to neatly bundle the cables, but do NOT include the helium hose. The helium hoses should never be strapped down in any location.
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## 2.6 Moving the System

If the system ever needs to be moved to a different lab or location, follow the steps below:

1. Save any important data on the system.
2. Gracefully power down the unit by:
  - a. Tap (press and release) the power button on the front of the system control unit -or-
  - b. On the touchscreen UI, navigate to `MENU > SYSTEM SETTINGS` and select `POWER OFF`
3. Remove the helium and vacuum hoses, paying special attention to ensure the O-rings remain in place.
4. Remove the remaining cables and electrical connections.
5. Replace the red locking rings and c-spacers and lock the red shipping support down on the tri-flange. Then, unbolt the system from the optical table.
6. Re-pack the system in original packaging. Some components **must be** packed upright on a pallet to avoid damage.

### **NOTICE**

- Follow all handling instructions for the individual components as outlined in *General Hazard & Safety Information* section.
- If you are uncomfortable with moving the system on your own, or if you need to order any replacement packaging, please contact an authorized service representative.
- Do NOT attempt to disassemble any components of the system beyond the original state as shipped from the Montana Instruments factory.