Organomation

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Preventive Maintenance Guide for MULTIVAP Model 11848-RT

Regular preventive maintenance will help extend the life of your MULTIVAP and ensure consistent, trouble-free performance. This guide outlines the recommended maintenance procedure for a 48 position MULTIVAP model 11848-RT.

Organomation recommends a full preventive maintenance (PM) check every 1–2 years. Recommended maintenance includes temperature calibration, realignment of moving parts, replacement of routine wear parts, inspection of longer-life serviceable parts, and a final gas flow check. PM can be performed in-house by lab personnel or scheduled with a certified Organomation service provider.

If you've purchased a preventive maintenance kit, all routine replacement parts are included. Additional parts are available from Organomation upon request if wear is noticed on any longer-life serviceable parts during inspection.

Maintenance kit contents:

- Air filter
- Teflon-coated stainless steel needles, qty 48
- Silicone gas tubing (3-inch cut pieces), qty 6
- Thermometer adapter
- 3"x4.5" abrasive pad
- Maintenance guide

Additional tools needed:

- Calibrated digital thermometer
- Phillips head screwdriver

Scan here for day-to-day cleaning and maintenance to keep your MULTIVAP running smoothly between scheduled PM checks

Table of Contents

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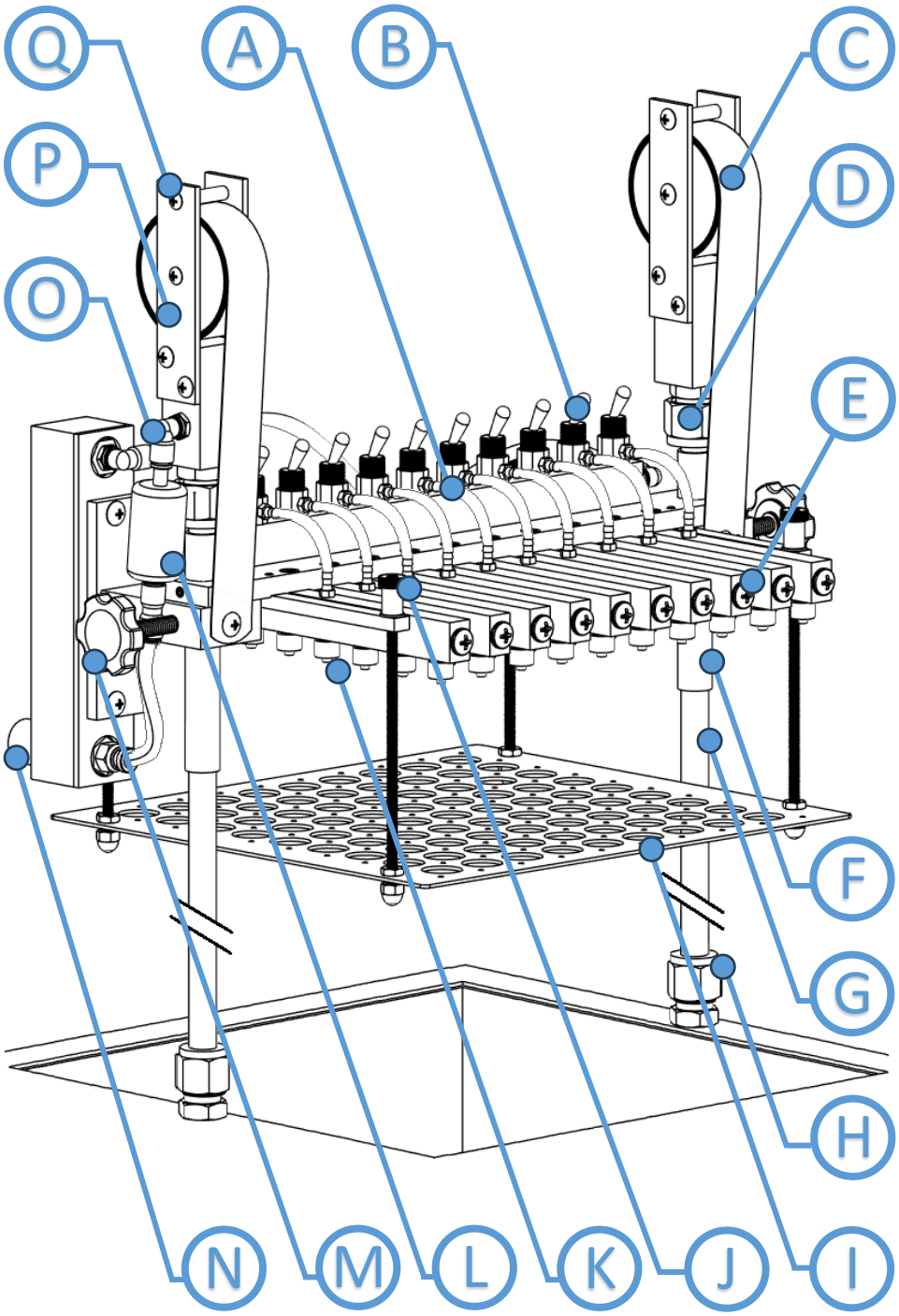
Instrument Diagram



Instrument Component	
A	Silicone tubing
B	Toggle switch
C	Hoist pulley and band spring
D	Hoist nut
E	Manifold screw
F	Guide tube
G	Support rod
H	Bath nut
I	Needle guide plate
J	Knurled thumb nut
K	Luer fitting
L	Filter
M	Hoist knob
N	Flowmeter
O	Swivel fitting
P	Hoist clevis
Q	Hoist screws

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Heat Block Calibration

Check the calibration on the heat block using an external NIST-calibrated thermometer. A traceable calibrated thermometer can be purchased from Organomation if needed.

The heat block can be calibrated using either one-point or two-point calibration. Two-point calibration provides the best performance across a broader temperature range. In most cases, one-point calibration is sufficient.

Bath Calibration Video

Proceed with the following steps to determine the best method and calibrate the heat block:

1. Place the provided thermometer adapter into the center of the heat block.
2. Determine low end discrepancy
    a. Heat the block to 45 °C and wait for the temperature on the controller display to stabilize. This may take 30-60 minutes.
    b. Place a calibrated thermometer in the thermometer adapter and record the measured temperature below.
    c. Calculate the temperature discrepancy between the external thermometer and the bath temperature display. If the external thermometer reading is lower than the bath temperature display, the discrepancy will be negative.

        External thermometer readout (T_1): _____
        Bath temperature display readout (B_1): 45
        Temperature discrepancy ($E_1 = T_1 - B_1$): _____

3. Determine high end discrepancy
    a. Increase the bath temperature to 100 °C and wait for the temperature on the controller display to stabilize. This may take an additional 30-60 minutes.
    b. Place a calibrated thermometer in the thermometer adapter and record the measured temperature below.
    c. Calculate the temperature discrepancy between the external thermometer and the bath temperature display.

        External thermometer readout (T_2): _____
        Bath temperature display readout (B_2): 100
        Temperature discrepancy ($E_2 = T_2 - B_2$): _____

4. If the difference between E_1 and E_2 is less than (<) 2, then a one-point calibration is sufficient (see step 5). If the difference is greater than 2, a two-point calibration should be used (see step 6).

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5. One-point calibration

   Recommended when the difference between E_1 and E_2 is less than 2. Example: $ABS(E_1 - E_2) \leq 2$

   a. Press and hold both ▲ and ▼ simultaneously until the screen reads **TUNE**.
   b. Release the buttons and push ▼ until the screen reads **LEVL**.
   c. Hold ✱ and press ▼ until the screen reads 3, then release ✱.
   d. Press ▲ until the screen reads **ZERO**.
   e. Calculate the average discrepancy range using the following formula:

      $$Average\ Discrepancy\ Range = \frac{E_2 - E_1}{2}$$

      Average Discrepancy Range: _____

   f. Hold ✱ and press ▲ or ▼ to adjust **ZERO** to the discrepancy calculated in step 5e. Make sure to pay attention to the calculated sign.
      i. Use ▼ for negative (-) values
      ii. Use ▲ for positive (+) values
   g. Once the correction has been entered, release ✱.
   h. Press and hold both ▲ and ▼ simultaneously to save the new settings and exit the calibration menu.

6. Two-point calibration

   Recommended when the difference between E_1 and E_2 is 2 or greater. Example: $E_1 = 1$ and $E_2 = 4$

   a. Press and hold both ▲ and ▼ simultaneously until the screen reads **TUNE**.
   b. Release the buttons and push ▼ until the screen reads **LEVL**.
   c. Hold ✱ and press ▼ until the screen reads 3, then release ✱.
   d. Press ▲ until the screen reads **SPAN**.
   e. Calculate discrepancy range

      $$Discrepancy\ Range = \frac{E_2 - E_1}{T_2 - T_1} \times 130$$

      Discrepancy range: _____

   f. Hold ✱ and press ▲ or ▼ to adjust **SPAN** to the discrepancy range calculated in step 6e. Make sure to pay attention to the calculated sign.
      i. Use ▼ for negative (-) values
      ii. Use ▲ for positive (+) values
   g. Once the correction has been entered, release ✱.

Press and hold both ▲ and ▼ simultaneously to save the new settings and exit the calibration menu.

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Manifold Alignment

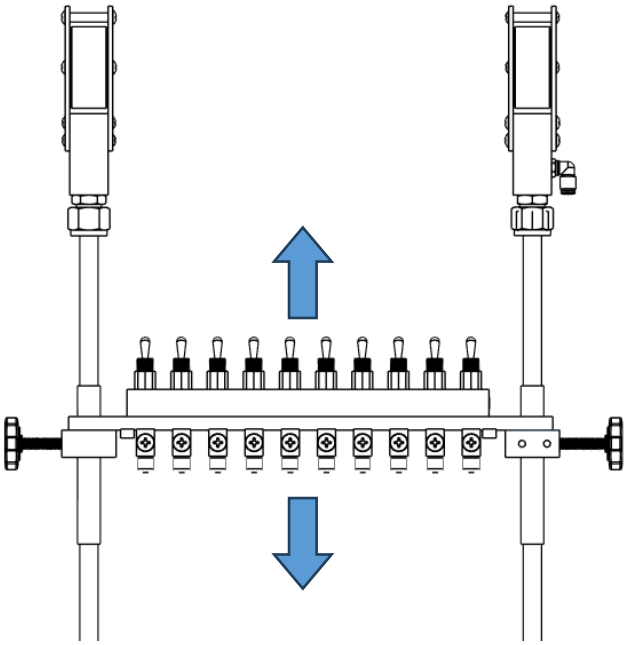
Misalignment between the two rods supporting the manifold can cause it to bind and stick during use. To check the alignment:

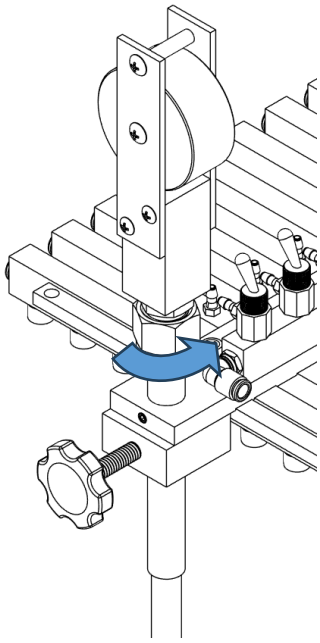
Manifold Alignment Video

1. Check that the manifold slides up and down smoothly.

   The manifold should slide down without jumps and should slide back up on its own if allowed to.

   If the manifold slides smoothly, proceed to needle guide alignment. If maintenance is required, see below for instructions.





2. Loosen the white nuts holding the hoists onto the manifold.

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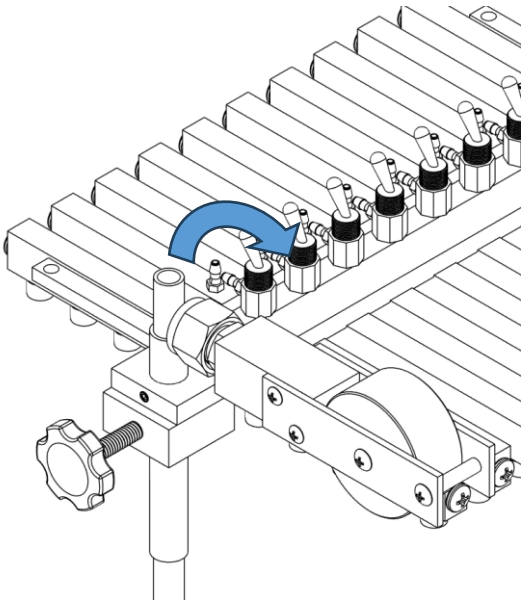
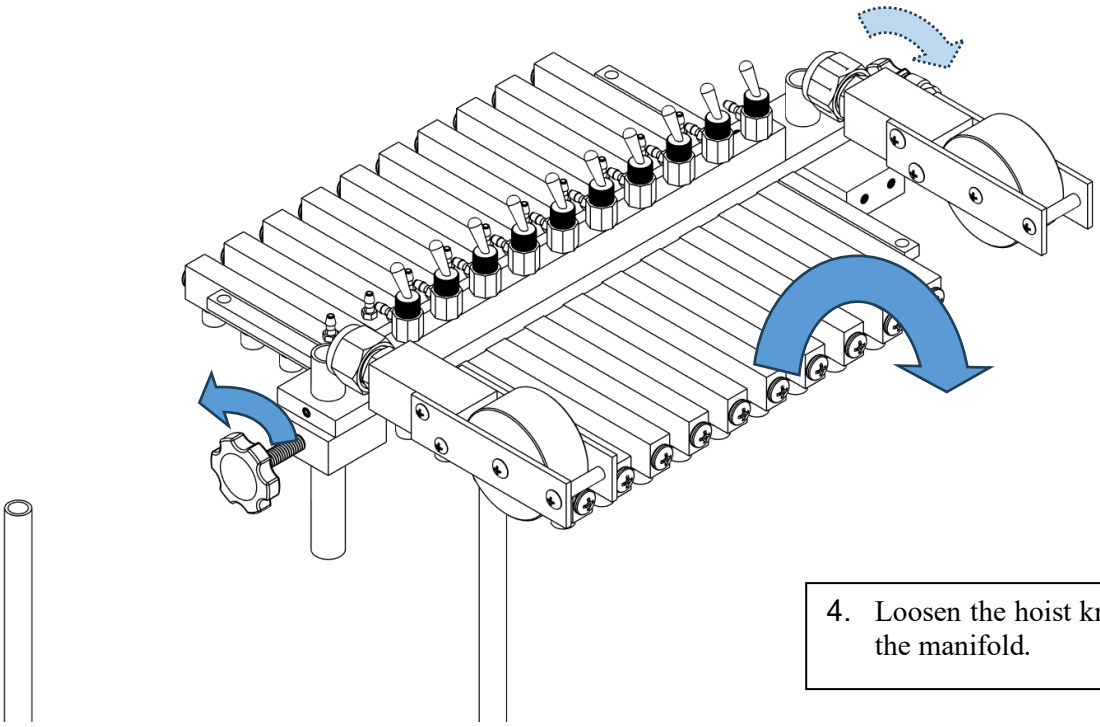
3. Remove each hoist pulley and lay it horizontally next to the manifold.





4. Loosen the hoist knobs and remove the manifold.

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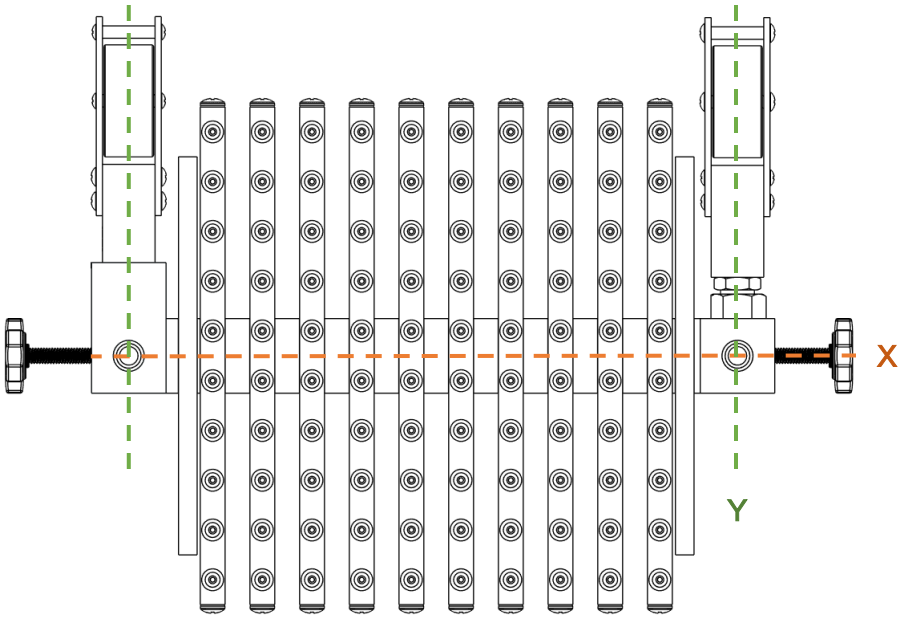
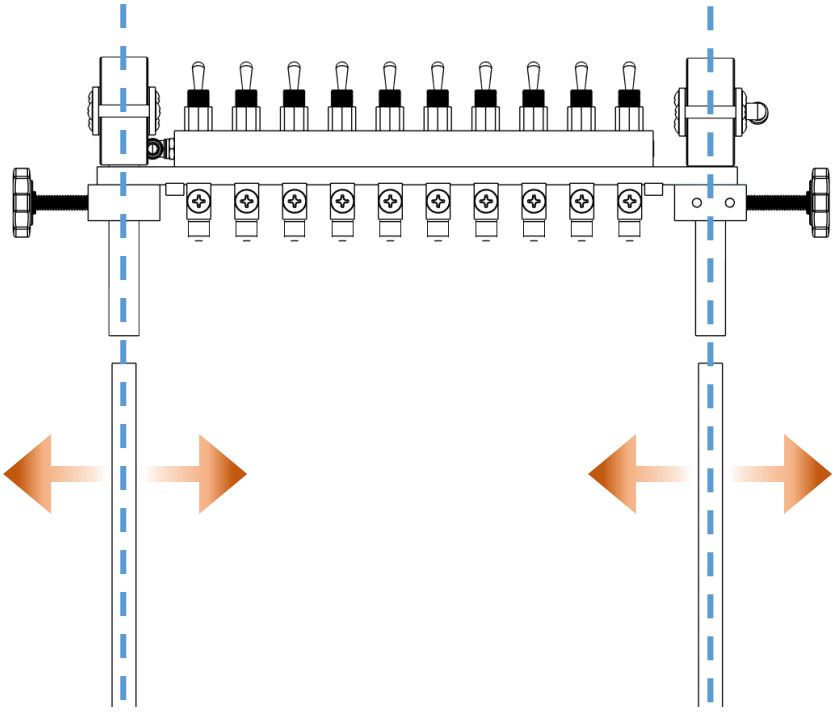
5. Line the manifold up with the top of the two support rods by hovering the manifold over the rods without touching.

   If the rods are misaligned, only one rod will line up with the manifold at a time.





6. Push or pull the two rods in or out as needed so that they line up exactly with the manifold.

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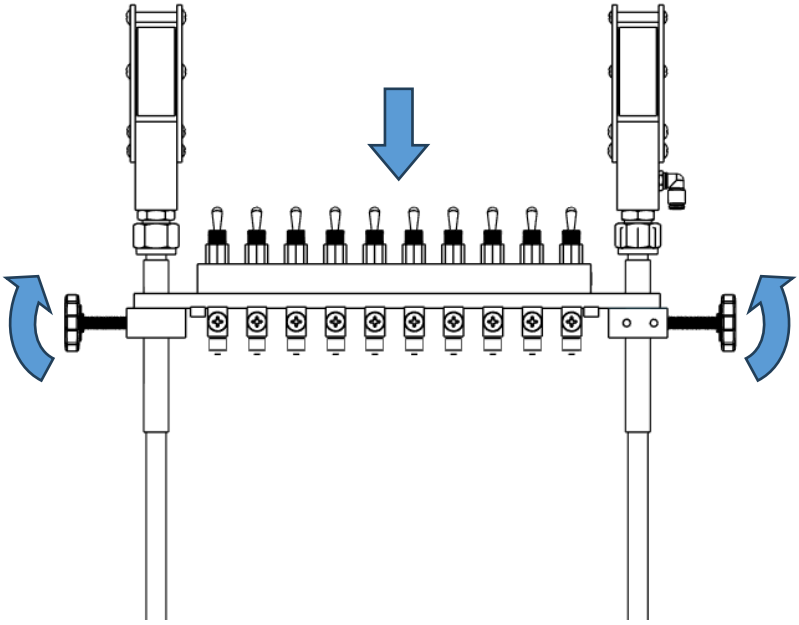
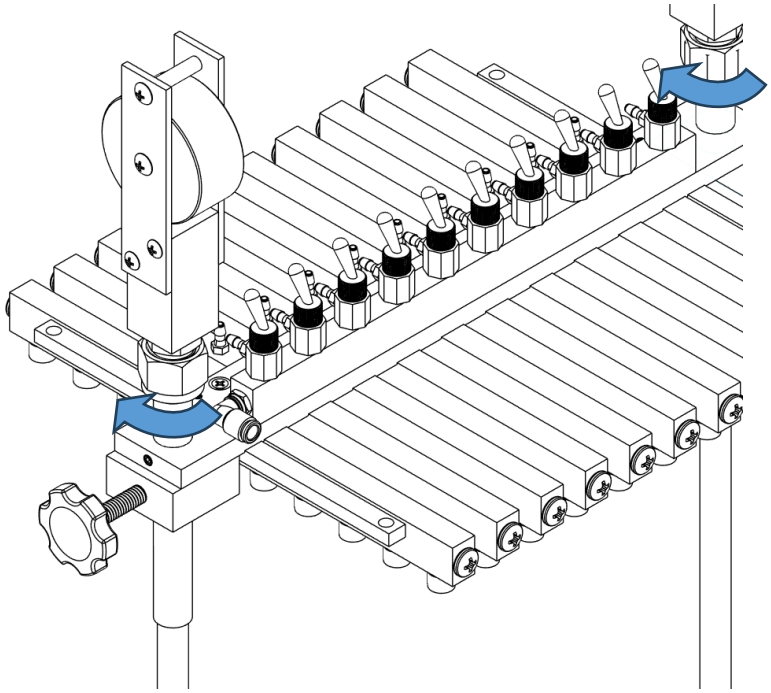
7. Slide the manifold back onto the posts and secure it in place.





8. Reseat the two hoist assemblies firmly on the rods, tightening them (finger-tight only) to prevent leaks.

   The hoists should be oriented in parallel with each other.

If that does not resolve the issue, check both rods to make sure they are clean of residue or corrosion that may be causing friction. Corrosion can be cleaned off with the abrasive scouring pad included.

If the hoist still does not move smoothly, pull the manifold down all the way and inspect the band springs on either side for damage or kinks that may be causing resistance. New hoist pulleys can be ordered by contacting sales@organomation.com.

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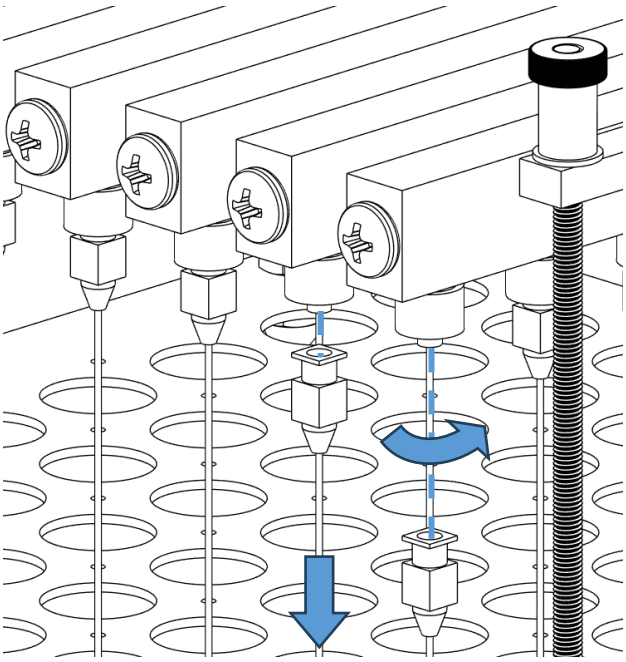
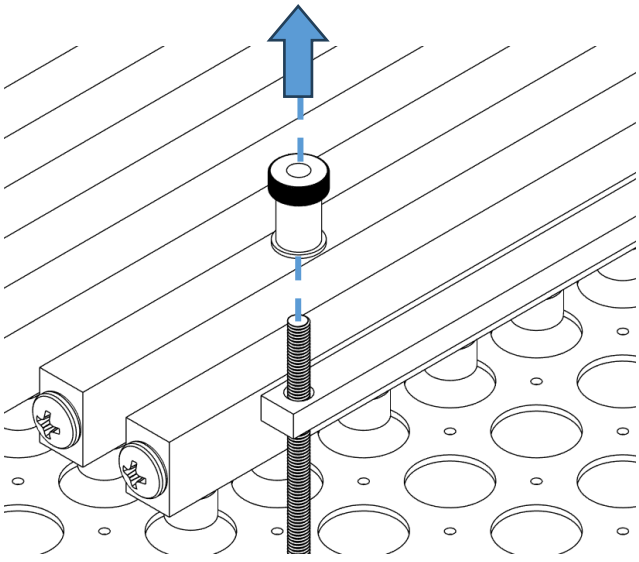
Needle Guide Alignment

Check that the needle guide can be raised and lowered. The needle guide plate should be parallel to the surface of the heating unit and not stuck in place. If the needle guide cannot be raised and lowered, check and adjust the alignment of the four threaded posts:

1. Remove all needles if you have not already.





2. Remove the four alignment nuts holding the needle guide to the manifold and slide the needle guide out from the two mounting bars.

   It is easiest to loosen all four nuts evenly to avoid the manifold becoming more stuck than it already is.

   If needed, use both hands to straighten out the needle guide before removing it, pushing up on the lowest side to straighten it out.

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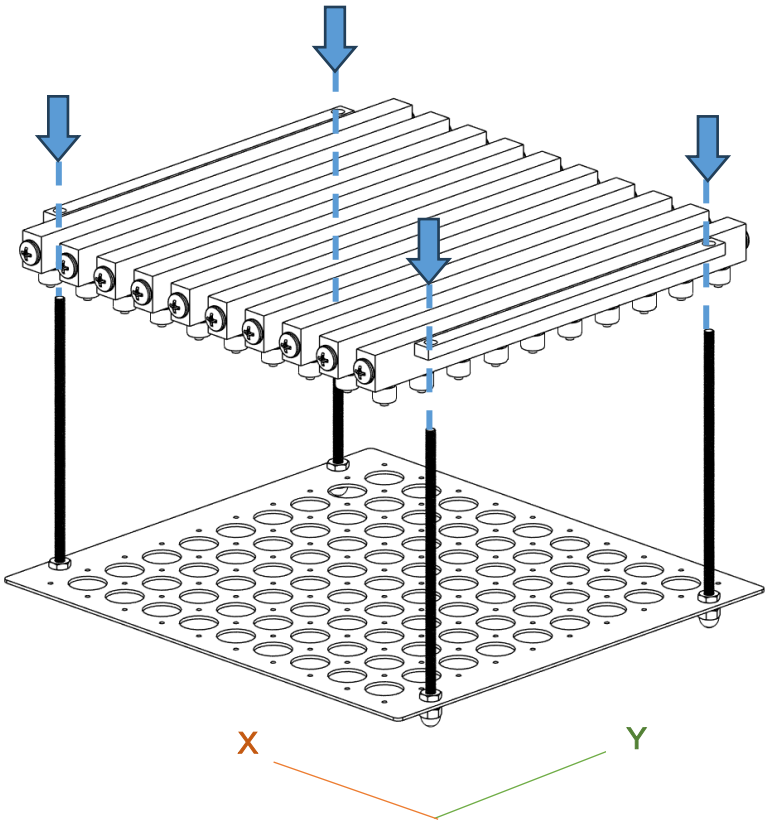
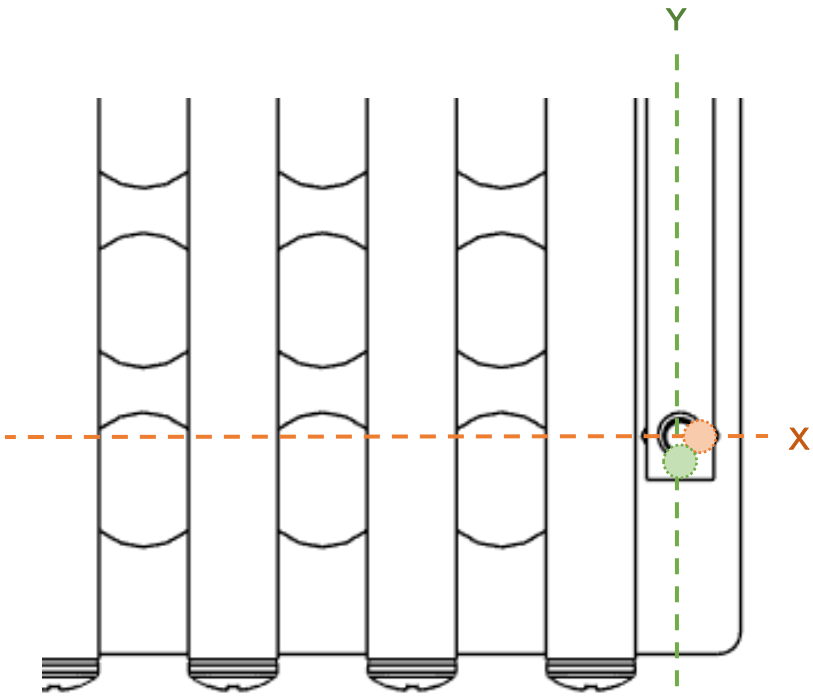
3. Hover the guide slightly below the manifold to gauge the misalignment of the posts





4. Starting with the front right, align the post in the appropriate direction center with the hole in the needle guide bar.

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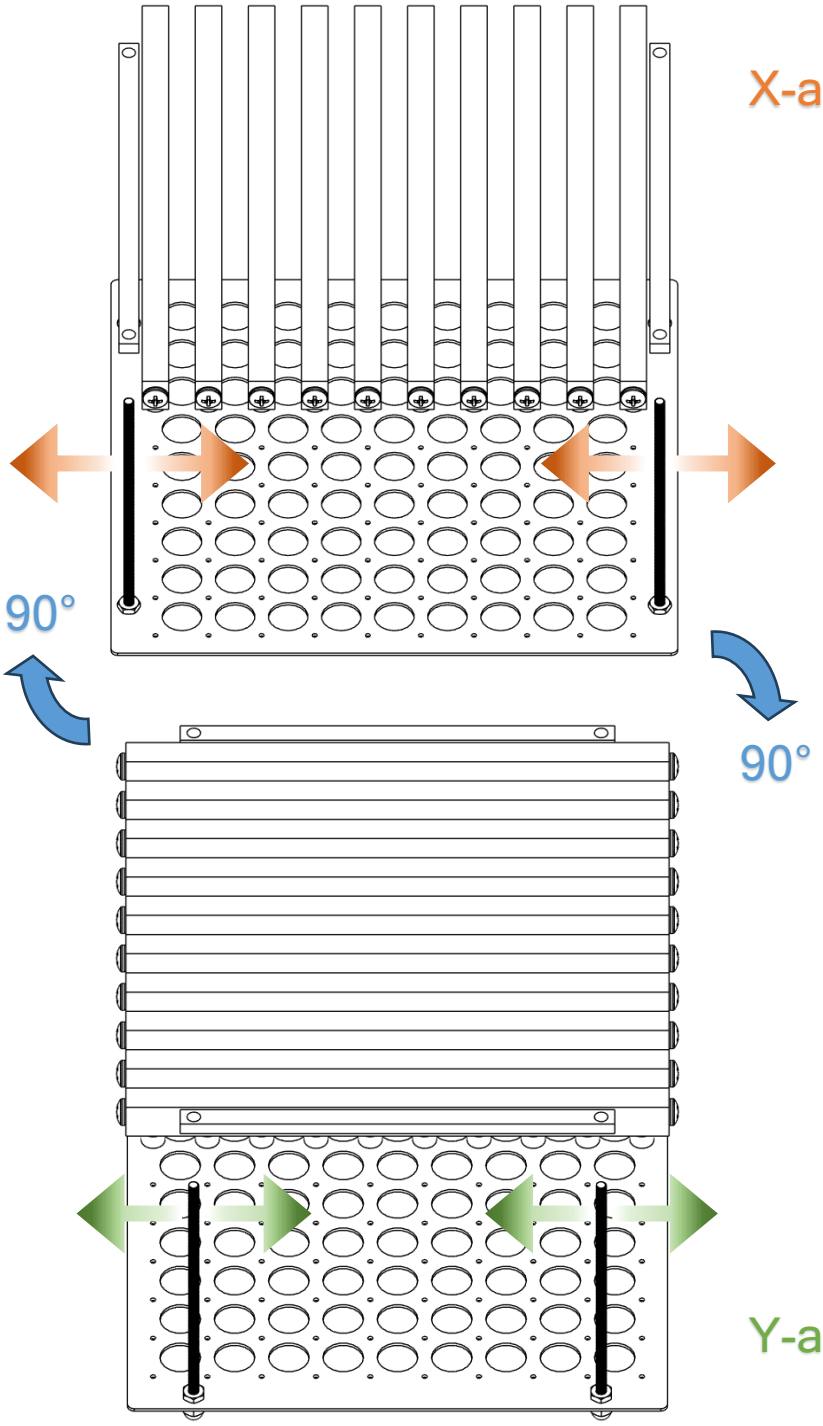

5. Adjust the front right post (B) by pulling or pushing the two posts apart as needed until both front posts line up with the provided holes.

   Rotate the needle guide 180° so that the two rear posts are in front. Repeat the process of aligning the right front post (D) with the left front post (C).

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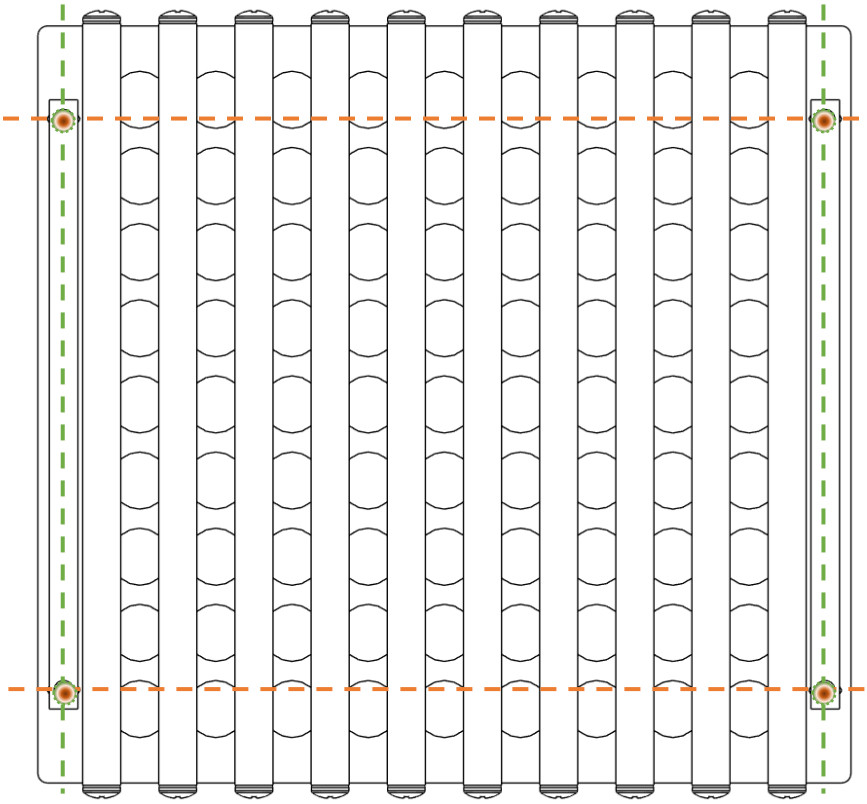
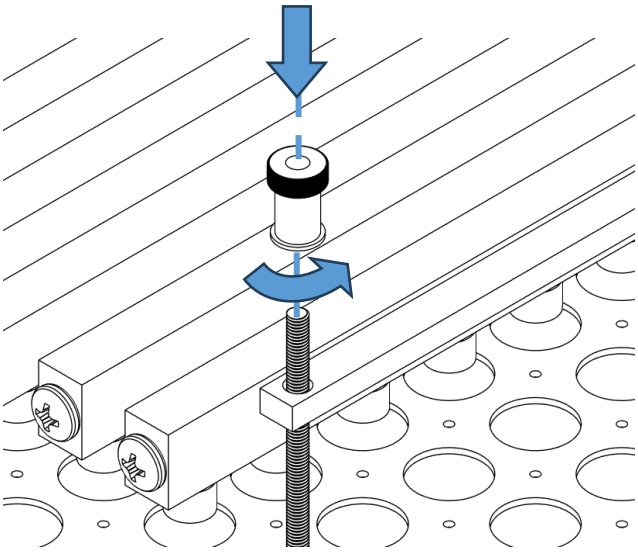


6. Check to see if all four posts align with the four provided holes. Repeat steps 3-6 if necessary.



7. Replace the needle guide on the manifold and lift to the desired height.

   Spin the four alignment nuts down to secure the needle guide in place.

   Take care to keep the needle guide plate parallel to the floor during installation.

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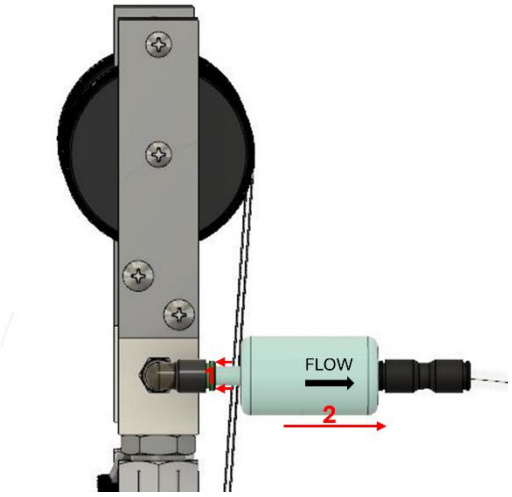
Routine Wear Parts

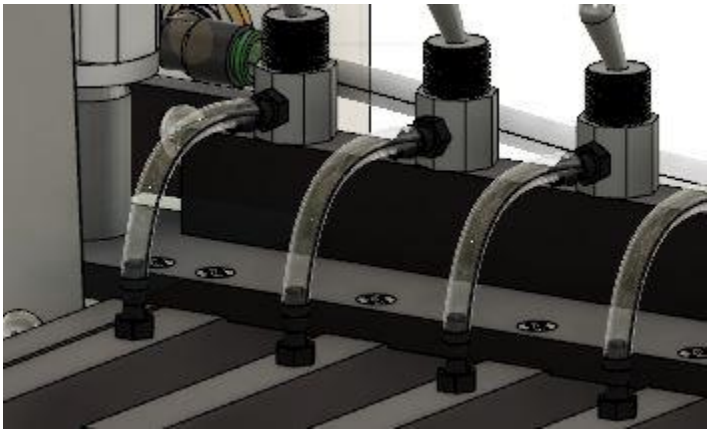
The following wear parts are included in this maintenance kit and should be preemptively replaced for optimal performance.

Air filter
The air filter is located above the flow meter on the right hoist pulley. Remove the old air filter by depressing the black or green ring (1) to release the first fitting while pulling the filter (2) away from the fitting. Repeat for the second fitting.

Connect the new filter in the same position. The flow arrow on the filter should point out, from the hoist pully to the tube running to the flow meter.



Silicone tubing
Remove the six 3” lengths of silicone tubing connecting to the toggle switches in the manifold. Grasping the tubing in the center, first pull up on the lower portion to disconnect it from the luer bar and then pull horizontally to disconnect it from the toggle switch. Do not attempt to disconnect both sides of the tubing at once—the torque may cause the barbs to snap. Replace with the tubing provided.



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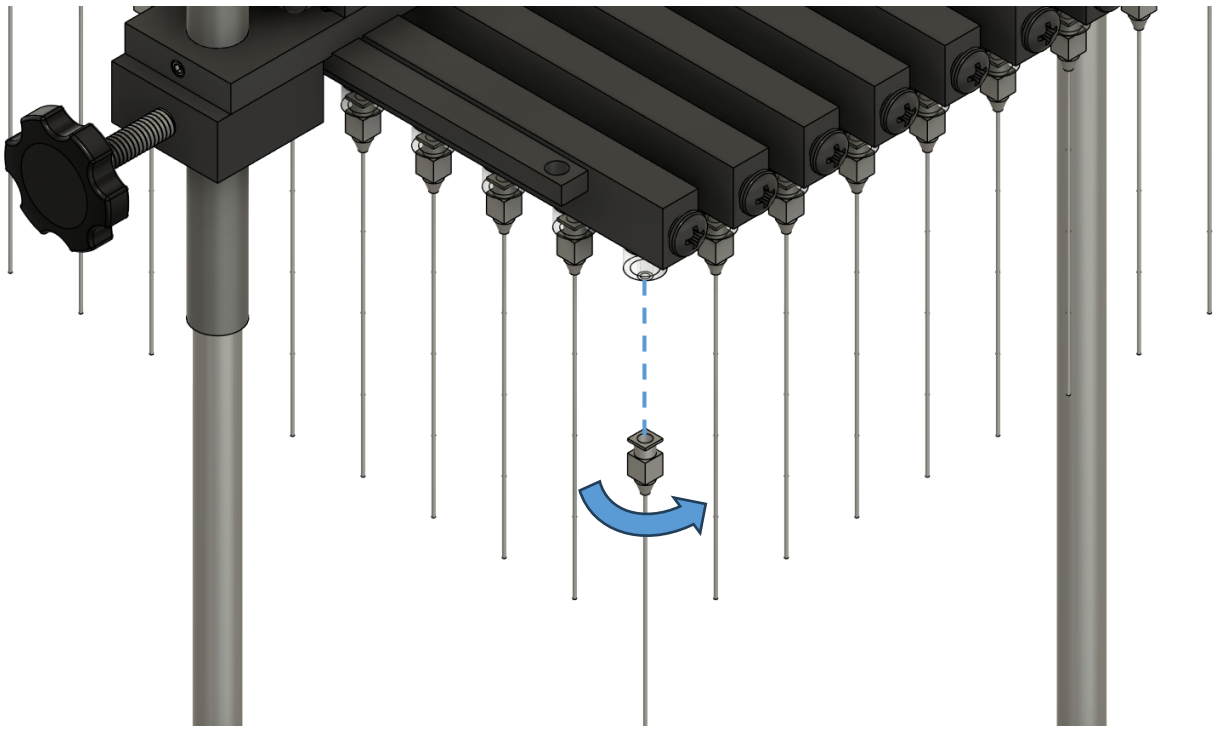
Needles

Remove old needles by rotating counterclockwise a quarter turn. Needles that are bent, corroded, soiled, or blocked should be discarded. Needles that are straight, clean, and unblocked can be retained as spares. Install new needles by rotating clockwise a quarter turn.

If using a needle guide, you will need to lower the needle guide slightly in order to reach the center-most needles.



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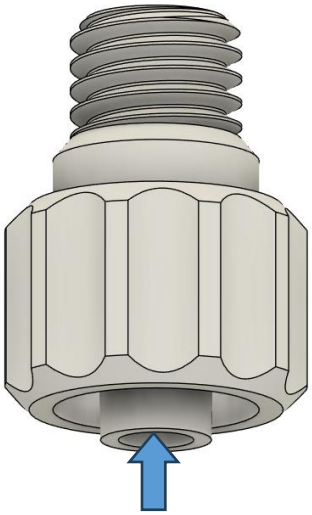
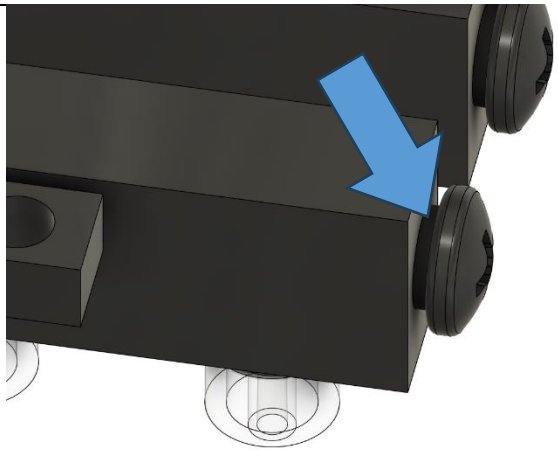
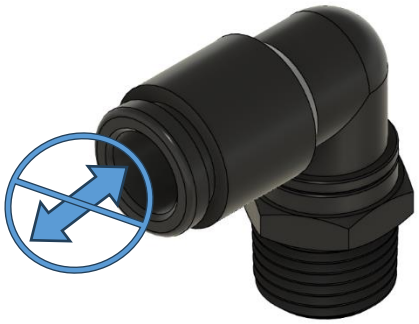
Serviceable Components

The following parts should be inspected for wear and replaced if necessary. The expected lifetime for these parts is longer than two years, but lifespan can be altered based on operating conditions. Replacements can be ordered by contacting sales@organomation.com.

Catalog #	Description	Inspection	Picture
P1306	(48x) Luer fittings	Check for blockage or cracks. Blockages can sometimes be cleared, but any cracked luers should be replaced.	
	(12x) Washers	Check the washers at the end of each luer bar for cracks. Replace cracked washers to prevent leaks.	
	(3x) Swivel fittings	Check for cracks and make sure that the tubing is secure in each fitting.	

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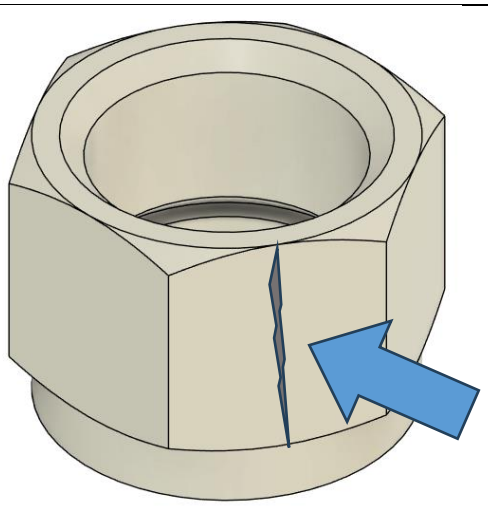
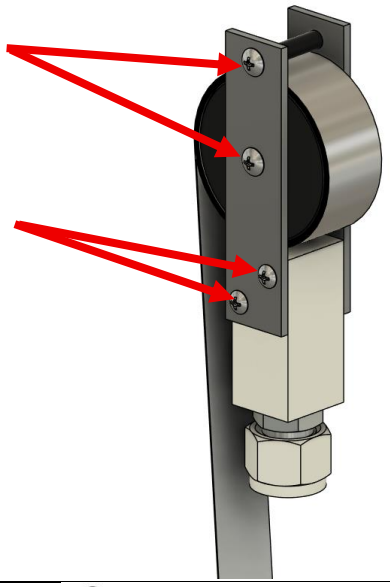
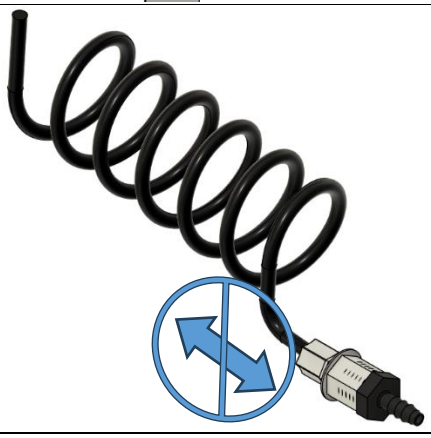
	(2x) Hoist nuts	Check for cracks.	
	(16x) Hoist screws	Check that all screws on the hoist assemblies are tight. Tighten with a Phillips head screwdriver if any are loose.	
NA1101	Gas connector tube	Check the coiled gas connector tube or alternative gas supply tubing for leaks, kinks, or cracks. Make sure that the connector tube is held securely by the gas fittings.	

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Gas Flow Verification

Even if there were no flow issues observed before maintenance, it is a good idea to perform these final checks to make sure the gas path is tight and everything is still functioning as intended.

1. Check functioning of flow meter
    a. Completely close the flow meter by rotating the flow meter dial clockwise until it stops.
    b. Turn on the MULTIVAP and set the gas flow switch to the central "off" position.
    c. Turn on the gas source, leaving the gas flow switch in the "off" position.
    d. Check that the built-in pressure regulator gauge on the MULTIVAP reads 20-30 PSI. If it does not,
        i. Adjust the pressure knob at the rear of the unit as needed.
        ii. Toggle gas flow on and off using the gas flow switch on the MULTIVAP to ensure that the gauge reading is accurate. It is normal for the gauge reading to shift slightly the first time gas flow is toggled on and off. Use the pressure knob to readjust pressure if needed.
    e. Allow the system to sit for 5 minutes and check the gauge reading again to ensure that there is not a steady decrease in pressure while the system is inactive. If the pressure reading does drop while inactive, there may be a nitrogen leak within the control box. Contact Organomation for support.
    f. Turn the gas flow switch on to "Manual" and rotate the flow meter dial counterclockwise. This should open the valve, causing the ball to respond. If there is no response, contact Organomation for further troubleshooting instructions.
2. Listen for leaks throughout the system
    a. Close all toggle switches and open the flowmeter fully. Make sure that the gas source is on and the gas flow switch is set to "Manual".
    b. Listen for leaks. The flowmeter should hold steady at 0 L/min.
        i. *If in doubt, spray a diluted soap mixture over potential leak site. Look for bubbles.

The most common cause of leaks in a MULTIVAP is the right-side hoist assembly not being fully seated on the gas delivery tube. To reseat the hoist assembly, turn off the gas flow, loosen the white nut and thumb screw to remove the hoist assembly, and replace it firmly on the stainless-steel tube. Press down while rotating slightly to ensure the hoist is completely on the stainless-steel tube. Finger-tighten the white nut to prevent further leaks.

If leaks persist, scan for gas flow troubleshooting or contact Organomation for guidance.

Organomation Technical Support

Email: sales@organomation.com
Phone: 1 (978) 838-7300
Web: www.organomation.com/contact

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Preventative Maintenance Checklist

Model: 11848-RT
Serial Number: _____
Date Completed: _____
Next Service Date: _____
Performed By: _____

Heating unit calibration

- ☐ Heating unit calibrated against a traceable thermometer
  Select calibration method used:
  - ☐ One-point calibration
  - ☐ Two-point calibration

Manifold alignment

- ☐ Manifold slides up and down smoothly

  Comments: _____

Needle guide alignment

- ☐ Needle guide is parallel to the bath surface can be raised and lowered
- ☐ N/A: needle guide is not used in this installation

  Comments: _____

Routine wear parts replacement

- ☐ Air filter
- ☐ Silicone tubing
- ☐ Needles

Serviceable components

- ☐ Luer fittings (P1306)
  - ☐ All in good condition (no cracks or blockages)
  - ☐ Qty ___ in need of replacement
- ☐ Luer bar washers)
  - ☐ All in good condition (no cracks)
  - ☐ Qty ___ in need of replacement
- ☐ Swivel fittings
  - ☐ Good condition (tubing is held securely and fitting is not cracked)
  - ☐ Qty ___ in need of replacement
- ☐ Hoist nuts
  - ☐ Good condition (no cracks)
  - ☐ Qty ___ in need of replacement
- ☐ Hoist screws
  - ☐ All screws are tight
- ☐ Hoist pulleys (P1304)
  - ☐ Good condition (manifold slides smoothly up and down after alignment)
  - ☐ In need of replacement

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- ☐ Gas connector tube (NA1101)
  - ☐ Good condition (no cracks, leaks, or kinks)
  - ☐ In need of replacement
  - ☐ N/A: Alternative gas tubing used for installation

Comments: _____

Gas flow verification

- ☐ Pressure gauge reads 20-30 psi with the gas switch set to “off”
- ☐ Flow meter responds to gas flow
- ☐ No leaks observed in system

Comments: _____