Organomation

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Preventative Maintenance Guide for N-EVAP Model 11634-RT

Regular preventive maintenance will help extend the life of your N-EVAP and ensure consistent, trouble-free performance. This guide outlines the recommended maintenance procedure for a 34 position N-EVAP model 11634-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. The estimated time to complete is 1-3 hours, depending on the condition of the unit and your familiarity with maintenance activities. 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.

Kit contents:

- Air filter
- Teflon coated steel needles, qty 34
- Silicone gas tubing (9-inch cut pieces), qty 34
- Silicone gas tubing (18" cut piece)
- 3"x4.5" abrasive pad
- 5/32 hex key
- Maintenance guide

Additional tools needed:

- Calibrated digital thermometer
- Phillips head screwdriver

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

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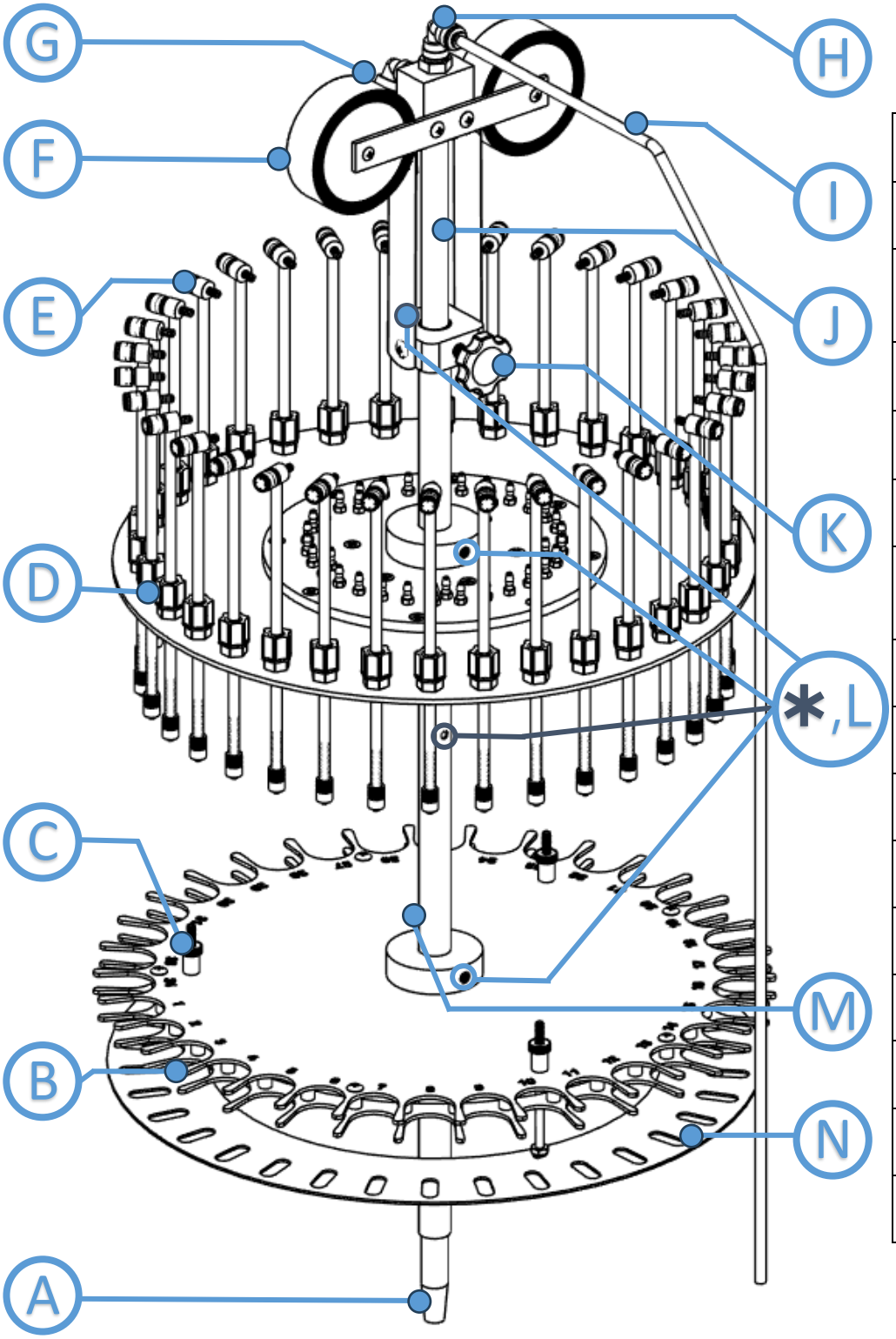
Instrument Diagram



Instrument Component	
A	Tapered Rod
B	Sample Holder and Sample Spring
C	Thumb Nut
D	Tube Fitting
E	Valve Tube Assembly
F	Hoist Pulley and Band Spring
G	Filter
H	Swivel Fitting
I	Gas Tube
J	14.25 Inch Rod
K	Hoist Knob
*	Set Screw Dimple
L	Set Screw
M	Center Tube
N	Support Tray

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Bath Calibration

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

The bath 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 bath:

1. Ensure the bath is filled with water to ½ inch below the rim before starting.
2. Determine low end discrepancy
    a. Heat the bath 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 bath 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 80 °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 bath 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): 80
        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

   $$Discrepancy\ Range = \frac{E_2 - E_1}{T_2 - T_1} \times 101$$

   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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Hoist Alignment

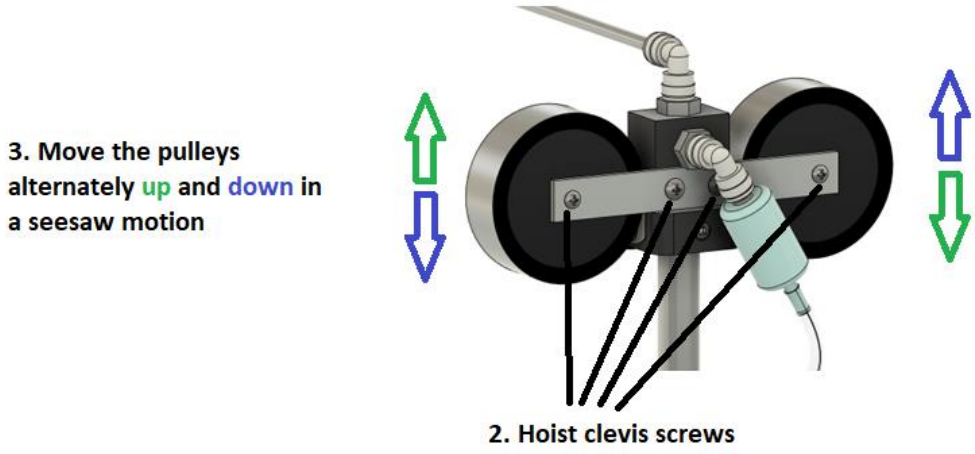
Check that the manifold slides up and down smoothly. The manifold should slide down without "jumping" and should slide back up on its own if allowed to. If it does, this section can be skipped. If not, maintenance is required.

Most hoist issues in N-EVAPs are caused by misalignment of the center tube supporting the manifold or misalignment of the clevis and pulley blocks.

To realign the hoist clevis:

1. Raise the manifold to its uppermost position and secure it in place by tightening the black thumbscrew.
2. Slightly loosen the 8 screws on the hoist assembly using a Phillips head screwdriver.
3. Using both hands, gently grasp both hoist pulleys and jiggle them a few times in a seesaw motion. Caution: band springs can be sharp. Take care not to cut your hands.
4. Lower and raise the manifold a few times using the black thumbscrew to realign the hoist.
5. Retighten the screws while the manifold is in its uppermost position.

Hoist Alignment Video



If the hoist still does not move smoothly, check the center tube and hoist pulleys for damage:

1. Lower the manifold and secure it in place by tightening the black thumbscrew.
2. Inspect the band springs for kinks, bowing, or any other damage that may be causing resistance. New hoist pulleys can be ordered by contacting sales@organomation.com.
3. Check both rods to make sure they are clean of residue or corrosion that may be causing friction. Residue can be cleaned off with an abrasive scouring pad. Be careful not to use abrasive materials on any Teflon-coated (black) parts.
4. Check the center tube for deformation and dents. Any significant warpage can cause friction and impair motion.

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Manifold Alignment

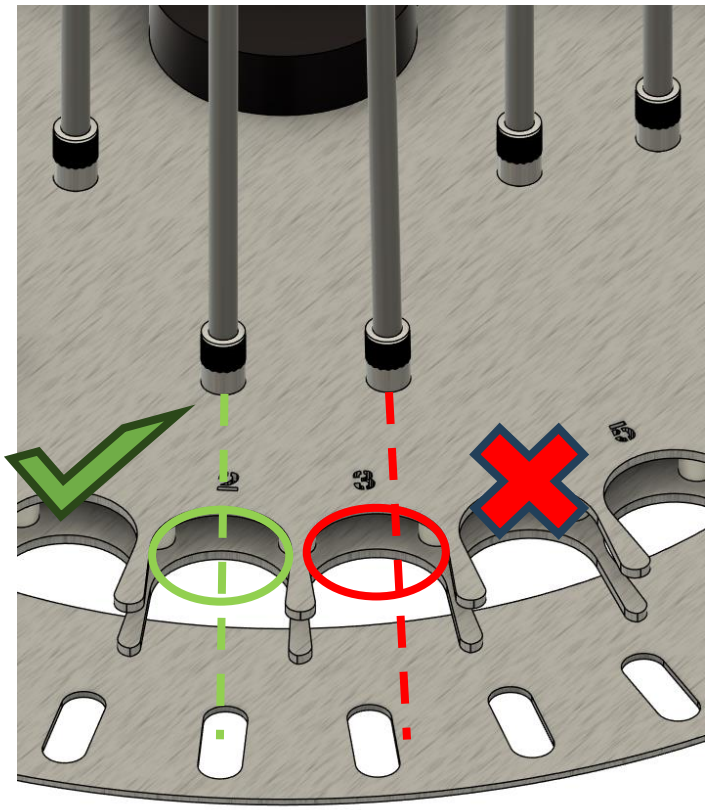
Check that the valve tube slides up and down smoothly. The luer should be centered within the respective slot of the sample holder directly below. If not, maintenance is required.

Most manifold issues in N-EVAPs are caused by misalignment of the sample holder. To realign the manifold:

1. Remove the needle from one sample position.
2. Loosen the 3-part fitting for that sample position and lower the valve tube to just above the sample tray.
3. Use the provided hex key to loosen the two set screws on the sample holder plate collar.
4. Rotate the sample holder so that the valve tube is centered over a test tube position.
5. Tighten the set screws to hold the sample holder plate securely.
6. Raise the valve tube to its initial position and tighten the 3-part fitting to secure it in place.

Check the 3-part fitting for cracks and that each piece thread smoothly when paired together. The valve tube should not move laterally, or tilt, when the fitting is fully fastened.

Valve tubes should be straight and free of corrosion or residue. Any bends may restrict motion and/or gas flow. Clean off any residue with the non-abrasive pad provided.



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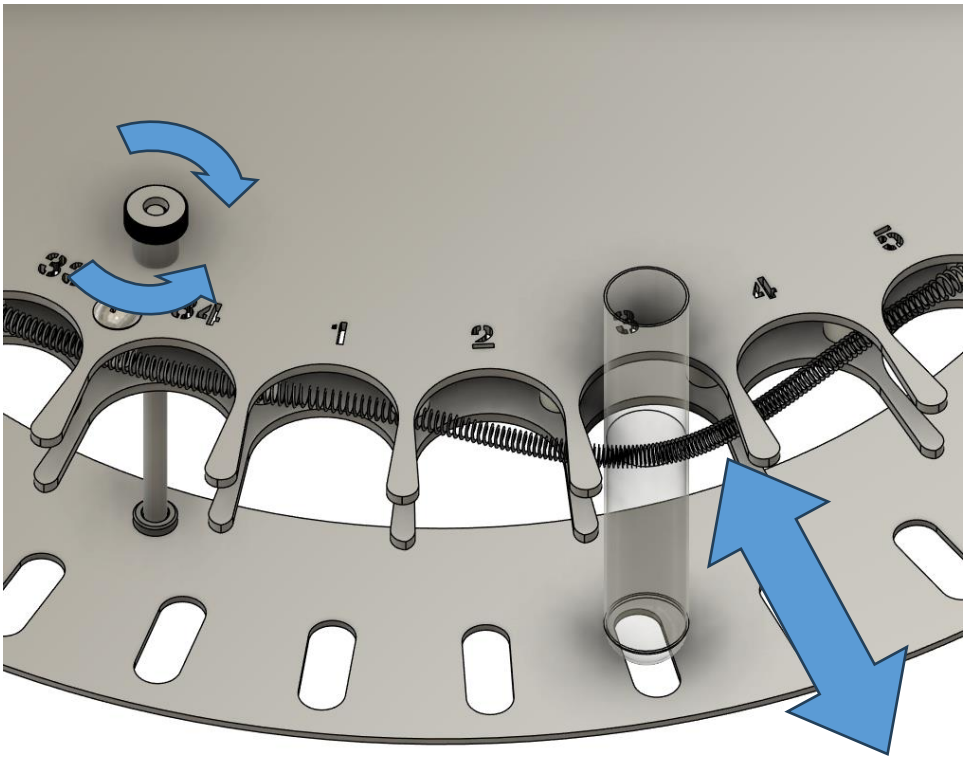
Sample Holder Maintenance

Check that the support tray can be readily adjusted. The thumb nuts should thread along the support posts without binding. The extension spring should stretch and retract to its original shape. If not, maintenance is required.

Most sample holder issues in N-EVAPs are caused by worn parts. Confirm the parts function:

1. Confirm the support tray height can be freely adjusted. Alternate between rotating each of the 3 thumb nuts clockwise and counterclockwise.
2. Confirm the retention spring that holds samples in place can stretch/contract while returning to its original state.
3. Inspect the center collar for cracks.
4. Tighten the set screws to hold the sample holder plate securely to the center tube. It is possible for these set screws to loosen over time.



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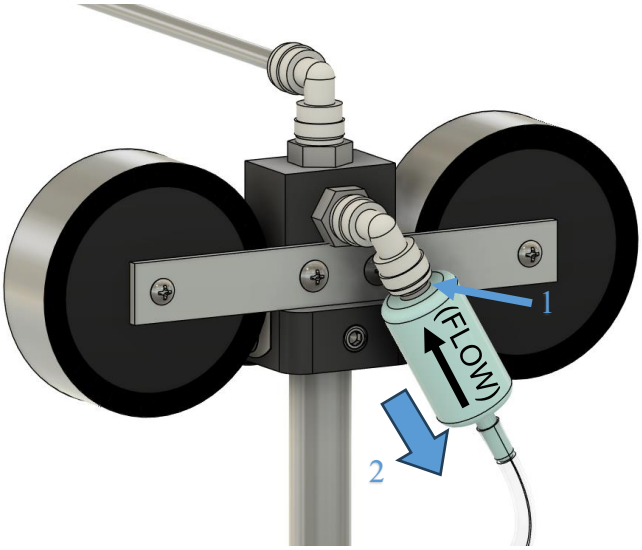
Routine Wear Parts

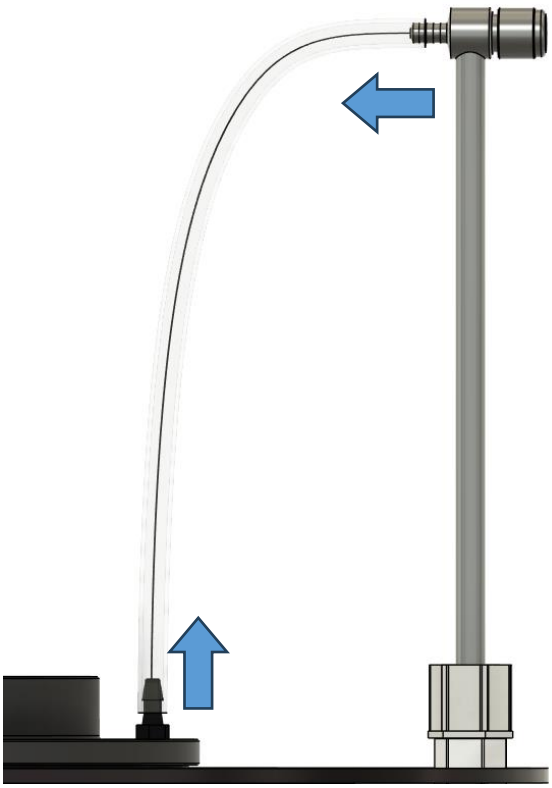
The following wear parts are included in this maintenance kit and should be preemptively replaced for optimal performance.

Air filter

The air filter is located above the flow meter on the right hoist pulley. Remove the old air filter by depressing the grey ring (1) to release the first fitting while pulling the filter (2) away from the fitting. Detach the flexible silicone tubing from the other side of the filter as well.

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





Silicone tubing

Remove the (34) 9” lengths of silicone tubing connecting the valve tube assemblies to the manifold. Pull up on the lower portion of the tubing first to disconnect it from the manifold and then pull horizontally to disconnect it from the valve tube. 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.

Remove the 18” length of silicone tubing running from the air filter to the manifold and replace with the 18” length of new tubing provided.

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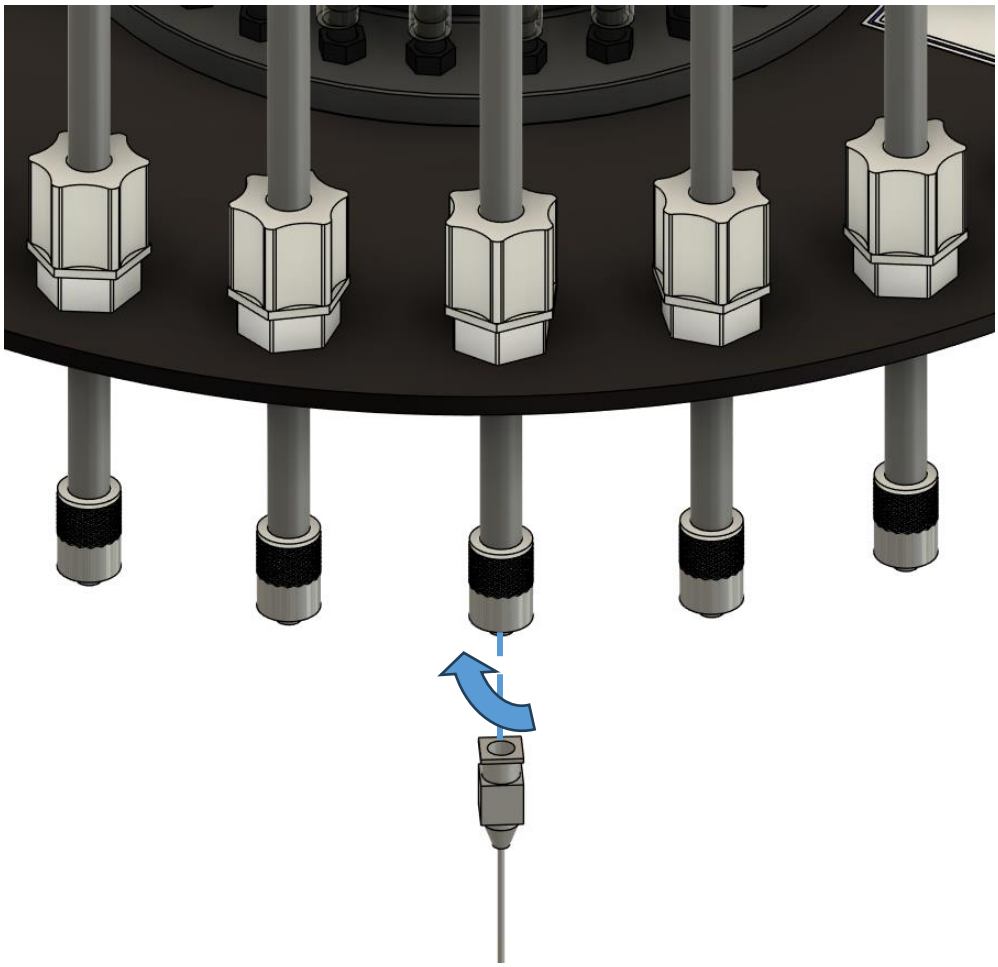
Needles

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.



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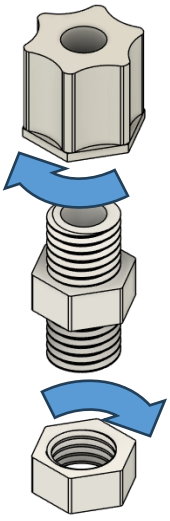
Serviceable Components

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
P0607-P	Luer	Check for cracks or blockage	
P0627-R	Valve Tube Assembly	Check for significant corrosion. Caps should turn smoothly	
P0639	Three-part valve fittings	Should turn easily and hold valve tubes securely	

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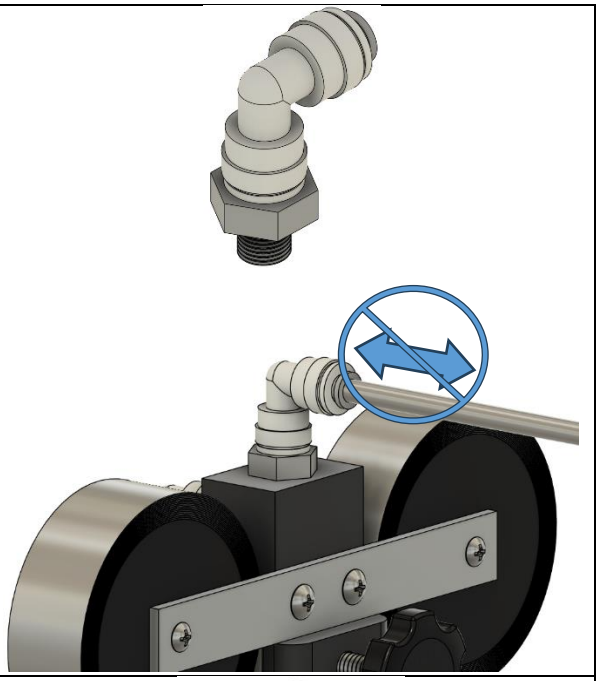
P1204	Upper swivel fitting	Should hold the stainless steel gas supply tube firmly in place.	
P0612-N-R	Hoist thumb screw	Check for cracks	
P1524	Hoist pulleys	Check for cracks or significant corrosion.	

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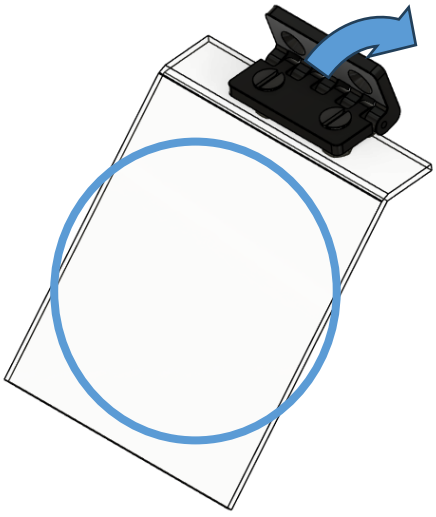
NA1101	Coiled gas connector tube	Check for leaks, kinks, or cracks. Make sure that tubing is still held securely in multi-part fitting.	
BP1255	Splash guard	Should be translucent and not frozen in place.	

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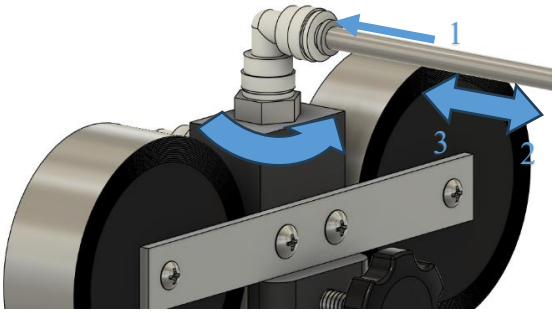
Gas Flow Verification

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 N-EVAP 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 N-EVAP reads 20-30 PSI. If it does not
        i. Adjust the pressure knob on the upper face of the control box as needed.
        ii. Toggle gas flow on and off using the gas flow switch on the N-EVAP 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 needle valves 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 an N-EVAP is the swivel fitting not being fully seated on the upper hoist block. To reseat the fitting, turn off the gas flow, take a ½ open wrench and loosen the gray nut closest to the mounting block, and replace it firmly on the block. On the other end, depress the release ring and, while the ring is depressed, pull firmly on the stainless steel tube to remove, then reseat.



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: 11634-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

Hoist alignment

- ☐ Hoist slides smoothly

  Comments: _____

Manifold alignment

- ☐ Valve tubes slide smoothly
- ☐ Needles are aligned with samples

  Comments: _____

Sample holder maintenance

- ☐ Support tray height can be adjusted
- ☐ Retention spring holds samples securely
- ☐ Set screws are tight

  Comments: _____

Routine wear parts replacement

- ☐ Air filter
- ☐ Silicone tubing
- ☐ Needles

Serviceable components

- ☐ Luer fittings (P0607-P)
  - ☐ All in good condition (no cracks or blockages)
  - ☐ Qty ___ in need of replacement
- ☐ Valve tube assemblies (P0627-R)
  - ☐ All in good condition (valve caps turn smoothly; minimal or no corrosion)
  - ☐ Qty ___ in need of replacement
- ☐ Three-part valve fittings (P0639)
  - ☐ All in good condition (fittings turn easily and hold valve tubes straight and securely)
  - ☐ Qty ___ in need of replacement

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- ☐ Swivel fitting (P1204)
  - ☐ Good condition (tubing is held securely and fitting is not cracked)
  - ☐ Cracked; in need of replacement
  - ☐ Tubing not held securely; in need of replacement
- ☐ Hoist thumb screw (P0612-N-R)
  - ☐ Good condition (no cracks)
  - ☐ Cracked; in need of replacement
- ☐ Hoist pulleys (P1524)
  - ☐ Good condition (manifold slides smoothly up and down after alignment)
  - ☐ In need of replacement
- ☐ Gas connector tube (NA1101)
  - ☐ Good condition (no cracks, leaks, or kinks)
  - ☐ In need of replacement
  - ☐ N/A: Alternative gas tubing used for installation
- ☐ Splash guard (BP1255)
  - ☐ Good condition (translucent; can be raised and lowered)
  - ☐ In need of replacement

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: _____