

# Vacuum Pump with Manifold Gauge Set User Manual



Read Carefully Before Use  
Keep for Future Reference

# Safety Information

## Warning!

- Turn your air-conditioning system off before evacuation.
- Read these instructions carefully before use and keep them for future reference. Provide them to anyone who will use this product and provide them with this product if it is ever given or sold to a third party. Failure to follow these instructions may lead to serious property damage and severe personal injury.
- **ONLY** use with R134a, R22, or R410a refrigerant and their matching A/C systems.
- **DO NOT** allow use by children or by any person whose mental or physical condition precludes safe use. Keep children, bystanders, and pets away during use, restricting access to the work area if necessary. Stay alert, watch what you are doing, and use common sense when using this product. Do not use it while you are tired or under the influence of drugs, alcohol, or strong medication.
- **ALWAYS** use with proper personal protective equipment (PPE) including breathing, eye, and hand protection in a well-ventilated place, as these refrigerants can irritate your eyes, nose, throat, and skin or cause frostbite, heart arrhythmia, unconsciousness, and even death. Further, operating your vehicle in a closed environment may result in carbon monoxide poisoning and other problems. If you begin to develop symptoms such as headaches, dizziness, or nausea during use of this product, turn off your vehicle and get fresh air **IMMEDIATELY**. Do not continue work until the vehicle has been moved to an area with better ventilation.
- **ONLY** use the vacuum pump with stable, compatible, and well grounded power sources. Do not use 3-to-2 prong adapters, ungrounded extension cords, or extension cords of insufficient gauge for this device's expected electrical load. Never pull on the power cord or modify the power plug.
- **DO NOT** get the vacuum pump wet or operate it with wet hands or in highly humid environments. If any electrical component accidentally becomes wet, disconnect the pump from power **IMMEDIATELY** and wait for it to completely dry before resuming use.
- **DO NOT** leave this product unattended during use.
- Use **EXTREME** caution when disconnecting the hoses after use as they may still contain some refrigerant under pressure.
- **DO NOT** operate this product if any part is damaged or shows any sign of malfunction. Repair or replace problematic components before further use. Never replace any components with nonidentical ones.
- **ALWAYS** avoid all direct contact with the vacuum pump oil. Remove contaminated clothing and flush with copious amounts of water if contact accidentally occurs with the skin. If contact accidentally occurs with the eyes, **IMMEDIATELY** flush them with copious amounts of water for at least 15 minutes while seeking medical attention. **NEVER** swallow the oil, which may cause fatal problems.

# Specifications

## Vacuum Pump

<b>Input Voltage &amp; Freq.</b>	110–120 V~ 60 Hz	
<b>Rated Power</b>	1/3 HP	245 W
<b>Evacuation Speed</b>	4 cfm	0.11 m <sup>3</sup> /m
<b>Oil Capacity</b>	7.6 fl. oz.	225 mL
<b>Dimensions</b>	14.6×6.1×11.2 in.	37×15.5×28.5 cm
<b>Net Weight</b>	15 lb.	6.8 kg

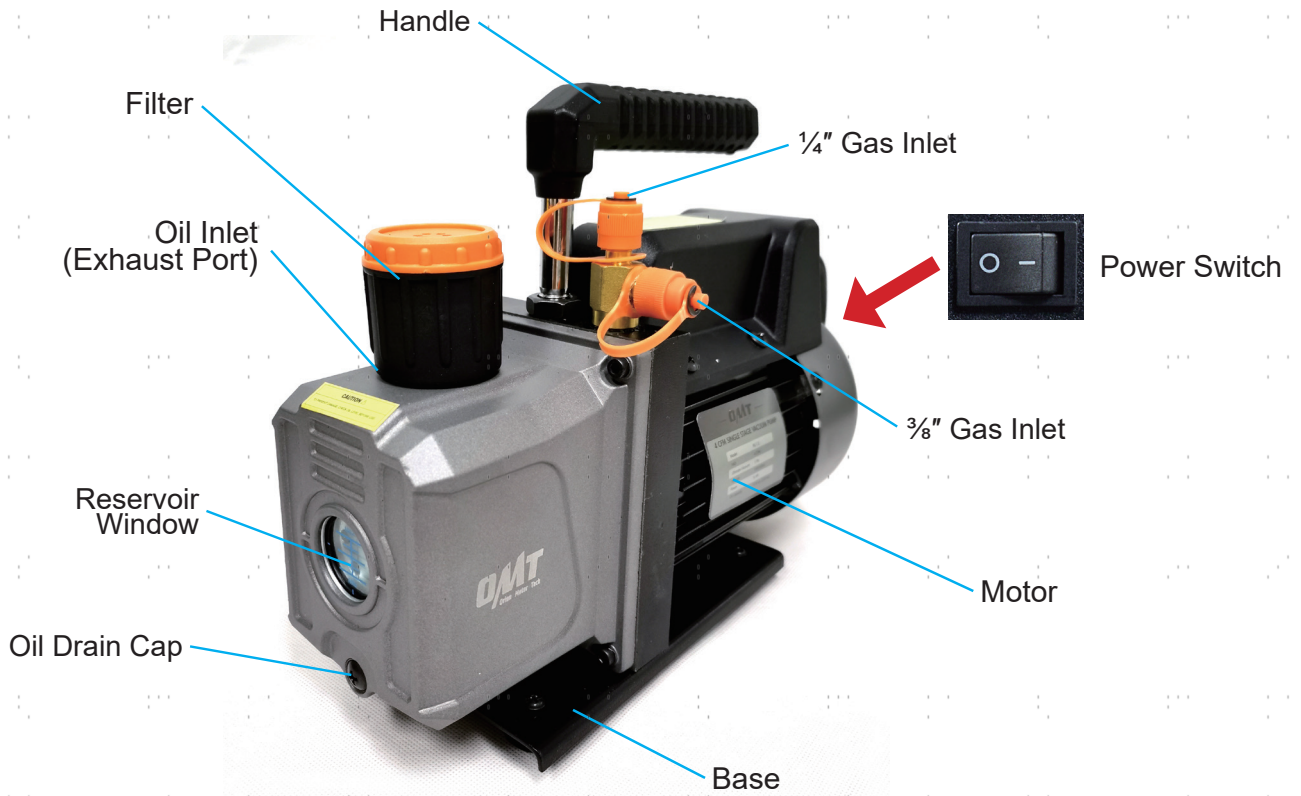
## Gauge Set

<b>Compatible Refrigerants</b>		R134a, R22, and R410a	
<b>Low Pressure Gauge</b>	<b>Pressure Range</b>	-15* to 550 psi	-1 to 38 Bars
	<b>R134a Temp. Range</b>	-20 to 170°F	-29 to 77°C
	<b>R22 Temp. Range</b>	-20 to 140°F	-29 to 60°C
	<b>R410a Temp. Range</b>	-60 to 110°F	-51 to 43°C
<b>High Pressure Gauge</b>	<b>Pressure Range</b>	-15* to 750 psi	-1 to 52 Bars
	<b>R134a Temp. Range</b>	0 to 190°F	-18 to 88°C
	<b>R22 Temp. Range</b>	-20 to 160°F	-29 to 71°C
	<b>R410a Temp. Range</b>	-50 to 160°F	-45 to 71°C
<b>Hoses</b>	<b>Length</b>	4.9 ft.	1.5 m
	<b>Max. Pressure</b>	4000 psi	276 Bars
<b>Net Weight</b>		6.4 lb.	2.9 kg

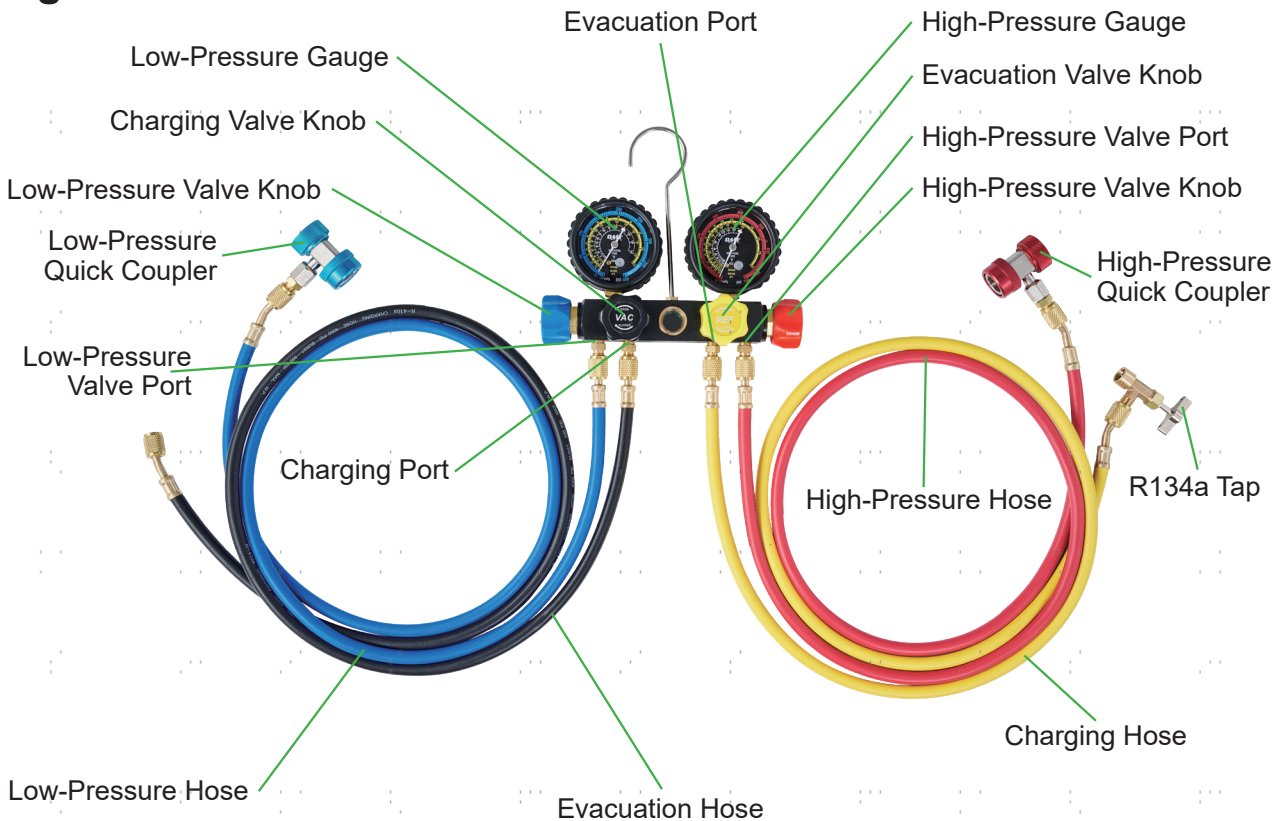
\* Note that the negative readings are given in inches of mercury (inHg) roughly equal to half the equivalent value in psi.

# Product Diagram

## Vacuum Pump



## Gauge Set



# Package List

No.	Name	Qty.
1	Vacuum Pump	1
2	Gauge Set	1
3	Evacuation Hose (Black)	1
4	Charging Hose (Yellow)	1
5	Low-Pressure Hose (Blue)	1
6	High-Pressure Hose (Red)	1
7	Low-Pressure Quick Coupler (Blue)	1
8	High-Pressure Quick Coupler (Red)	1
9	1/2" Male to 1/4" Female Adapter	1
10	1/4" Male to 1/2" Female Adapter	1
11	1/4" Male to 5/16" Female Angled Adapters	2
12	Vacuum Pump Oil	1
13	Work Gloves	2
14	Tape	1
15	Bag	1
16	R134a Tap (Puncture Style)	1
17	R134a Tap (Self-Sealing Style)	1
18	Leak Detector	1
19	Valve Core Wrench	1

## Necessary but Not Included:

- Micron Gauge × 1
- Phillips Screwdriver × 1

# Installation

1. Put on your dust mask, goggles, work gloves, and any other PPE necessary for your work area.
2. Place the vacuum pump on a firm level surface and make sure the oil drain is tightly closed by screwing its cap into place with a Phillips screwdriver (not included).
3. Unscrew the pump's filter by hand, exposing its oil inlet. Add the provided oil until the reservoir window is completely covered. Replace this filter, screwing it into place.
4. Unscrew the vacuum pump's  $\frac{1}{4}$ " gas inlet cap by hand, wrap the inlet's threading with the provided tape, connect one end of the black evacuation hose to the inlet, and screw it into place by hand. In the event that the inlet malfunctions, connect the hose to the  $\frac{3}{8}$ " gas inlet using a  $\frac{1}{4}$ " male to  $\frac{3}{8}$ " female adapter (not included) and repair or replace the problematic inlet as needed.
5. Make sure the black evacuation valve is tightly closed by turning its knob completely clockwise. Remove the evacuation port cap by hand and apply some tape to its threading as described above. Connect a micron gauge (not included) to this port and the other end of the evacuation hose. (This port's diameter is  $\frac{1}{4}$ ". Use the provided  $\frac{1}{2}$ " male to  $\frac{1}{4}$ " female adapter or any other necessary adapter if needed.) Make sure they are tightly joined and turn the micron gauge on.
6. Make sure the blue low-pressure valve and red high-pressure valve are tightly closed by turning their knobs completely clockwise. Remove the valve caps by hand and wrap some tape around their threading as before. Connect the blue low-pressure hose and red high-pressure hose to their matching valve ports and screw them into place by hand.
7. Make sure the yellow charging valve is tightly closed by turning its knob completely clockwise. Remove the charging port cap by hand, connect one end of the yellow charging hose to the port, and screw it into place by hand.
8. If applying R134a or R22 refrigerant, connect the outlet of either R134a tap to the other end of the charging hose and its inlet to your refrigerant can. If applying R410a refrigerant, connect your R410a tap (not included) to the hose using one of the provided  $\frac{1}{4}$ " to  $\frac{5}{16}$ " angled adapters. Turn the handle of the tap clockwise to open the can and then counterclockwise to allow the refrigerant to flow into the hose.
9. Make sure your A/C system is turned off.

For vehicular A/C systems, attach the blue low-pressure coupler and red high-pressure coupler to their matching hoses and screw them into place by hand. Pull back the couplers' sleeves, push them onto their matching service ports of your system, and release the sleeves.

For home A/C systems, connect the low and high-pressure hoses to their matching service ports on the outdoor unit, using the provided  $\frac{1}{4}$ " male to  $\frac{1}{2}$ " female adapter or other necessary adapters if needed.

# Operation

## Evacuation

1. Ensure that everything is correctly installed for evacuation as explained in Installation.
2. Open the evacuation and low-pressure valves by turning their knobs completely counterclockwise.
3. Connect the vacuum pump to a stable, compatible, and grounded power source. Turn on the pump by flipping its power switch to **I** and evacuation should begin.
4. When the micron gauge reads less than 500 microns, your A/C system is fully cleared. Close the valves by turning their knobs completely clockwise and turn off the pump by flipping its power switch to **O**.

## Charging

1. Ensure that everything is correctly installed for charging as explained above.
2. Start your A/C system and set it to the maximum cooling and fan speed.
3. Check for any leakage before you recharge. Open the high-pressure and charging valves by turning their knobs completely counterclockwise. If the high-pressure gauge's pointer keeps swinging, activate the provided leak detector by turning its control knob to **2–7** and place its sensing tip close to any joint or hose. (The larger the number is, the higher the operational intensity is.) If its operational ticking sound escalates, there is a leakage. Close the valves by turning their knobs completely clockwise and deactivate this detector by turning its knob to **1**. If any loose joints or worn parts are detected, repair or replace them before further use. Once there is no leakage, close the high-pressure valve while keeping the charging valve open.
4. Open the low-pressure valve by turning its knob completely counterclockwise and recharging should begin. Consult your system's specifications to find its recommended pressure, usually 25–80 psi (1.7–5.5 bars) for R134a or R22 refrigerant and 110–130 psi (7.6–9 bars) for R410a refrigerant. To stop charging the system, close the charging and low-pressure valves by turning their knobs completely clockwise.
5. Close the tap by turning its handle completely clockwise and then remove it from the refrigerant can.

# Maintenance

- Disconnect the pump from power between uses and before undertaking any cleaning, maintenance, or repair.
- The exterior of the pump can be cleaned with a soft damp cloth. Do not use harsh abrasives or caustic chemicals. Do not allow any electrical component to become wet or damp.
- When the oil turns turbid or its level falls near the bottom of the reservoir window, replace it using the following procedure:
  1. Make sure the remaining oil is warm. If you are unsure of your oil's temperature, plug in and turn on your pump, running it for about 10 minutes to heat the oil sufficiently. Turn off the

pump and unplug it before continuing.

2. Remove the oil drain cap using your Phillips screwdriver. Grip the handle of the pump and tilt it down to drain the remaining oil into a suitable container.
  3. Screw the cap into place and start filling it as instructed above. Once the initial oil can has been used up, only use oil of equivalent weight (ISO 100 or SAE 30) as a replacement.
- **NEVER** scrape or abrade the hoses or drop the pump or gauges on hard or rough surfaces.
  - If any copper core preinstalled in any hose is damaged or worn, replace it with a new identical one using the provided valve core wrench. If any part of the pump or gauge set is damaged, worn, or shows signs of malfunction, repair or replace it with a new identical one before further use.
  - If the pump and gauge set will not be used for an extended period of time, store them and their accessories in a cool, dry, and clean place away from direct sunlight and inaccessible to children.

## Troubleshooting

Problems	Possible Solutions
The vacuum pump cannot be turned on.	Check your power supply and the pump's power cord. Correct any problems as needed.
	Move the pump to a warmer location, wait a while, and activate your pump.
The vacuum pump turns off automatically during use.	The thermal protector will deactivate your pump if its motor reaches 160°F (70°C). Wait about 15 minutes to let it cool down and restart your pump.

## Contact Us

Thank you for choosing our products! If you have any questions or comments, contact us at [support@orionmotortech.com](mailto:support@orionmotortech.com) and we'll resolve your issue ASAP!

For a .pdf copy of the latest version of these instructions, use the appropriate app on your smartphone to scan the QR code to the right.

