V20240711

Vacuum Pump with Manifold Gauge Set

User Manual

Read Carefully Before Use
Keep for Future Reference

Safety Information

Danger

- Read **ALL** these instructions carefully before use and keep them for future reference.

  Provide these instructions to anyone who will use this product.

  Provide these instructions with this product if it is ever given or sold to a third party.

  Failure to do so may lead to serious property damage and severe personal injury.

- **ONLY** use this product for its intended purpose, evacuating and charging air conditioning (A/C) systems using **R134a**, **R12**, **R22**, or **R502** refrigerant.

  DO NOT use with **ANY** other refrigerants, which can damage this product and your property.

  Any other use **NOT** specified herein could potentially pose risks and void **ALL** warranties stated or implied.

- These instructions are **ONLY** an introduction to this product.

  For specifics on particular tasks, consult the service manual provided by your A/C system's manufacturer as well.

- **DO NOT** use this product while you are tired or under the influence of drugs, alcohol, or strong medication.

- **DO NOT** allow use by children under the age of **18**, anyone **WITHOUT** specialized **HVAC** training, persons unfamiliar with this product and its compatible A/C systems, or people whose physical or mental impairment precludes safe use.

- **ALWAYS** keep children, bystanders, and pets away during use.

  Restrict access to your work area as needed.

- **ALWAYS** ensure that your work area is clean, bright, well-ventilated, and free of explosives or heat sources.

  Cluttered or dark areas invite accidents.

  Working on refrigerant in closed environments may result in carbon monoxide poisoning and other problems.

  Firecrackers, open flames, and other similar things may cause fires or explosions.

Safety Information

- **ALWAYS** wear appropriate personal protective equipment (PPE) including breathing, eye, and hand protection.

  Refrigerants can irritate your eyes, nose, throat, and skin or cause frostbite, heart arrhythmia, unconsciousness, and **EVEN** death.

- **DO NOT** operate this product if any component is damaged or shows any sign of malfunction.

  Repair or replace problematic components before further use.

  NEVER replace any components with nonidentical or unauthorized ones.

- **ALWAYS** turn off your A/C system **BEFORE** performing evacuation with this product.

- **ALWAYS** check that the vacuum pump's power cord is undamaged **BEFORE** evacuation.

  NEVER use electrical devices with **ANY** problematic power cords.

  NEVER attempt to remove **ANY** permanently preconnected power cords.

- **DO NOT** move the vacuum pump by pulling on its power cord or modify its power plug.

- **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 the pump's expected electrical load.

- In case of power loss during operation, unplug the vacuum pump **IMMEDIATELY** until power is restored.

- **DO NOT** get the vacuum pump wet or operate it with wet hands or in highly humid environments.

  DO NOT rinse the entire pump with tap water, immerse it completely in water, or expose it to rain.

  In the event of any signs indicating that any electrical component accidentally becomes wet, disconnect the pump from power **IMMEDIATELY** and wait for it to completely dry **BEFORE** resuming use.

- **ALWAYS** avoid **ALL** direct contact with the vacuum pump oil.

  If contact accidentally occurs with the skin, remove contaminated clothing and flush with copious amounts of water.

Safety Information

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.

- **DO NOT** run the vacuum pump **WITHOUT** the provided oil or with its oil inlet left open.

  ALWAYS maintain the oil level between the **MIN** and **MAX** height marks on the reservoir window during use.

- **ALWAYS** be sure to apply the correct attachments and connections.

  Failure to follow this may result in severe equipment damage and personal injury.

Connected To		Product Parts/Attachments
Low-Pressure service port of A/C system		Blue hose, blue coupler, blue valve
High-Pressure service port of A/C system		Red hose, red coupler, red valve
Vacuum pump		Yellow hose, middle port between the valves
Refrigerant can	Puncture style	Yellow hose, taper-pin tap, middle port between the valves
	Self-Sealing style	Yellow hose, round-pin tap, middle port between the valves

- **ALWAYS** perform leak tests for this product and your A/C system **BEFORE** charging.

  Address the issue(s) in time and ensure that everything is leak-free before continuing on your way.

- Stay alert, watch what you are doing, and use common sense when using this product.

- If you begin to develop symptoms such as headaches, dizziness, or nausea during use, stop work and get fresh air **IMMEDIATELY**.

  DO NOT continue work until better ventilation is provided for your work area.

- **DO NOT** leave this product unattended during use.

- Use **EXTREME** caution when disconnecting the quick couplers and hoses after use.

  They may still contain some refrigerant under pressure.

- **DO NOT** maintain this product with harsh abrasives or caustic chemicals.

- **NEVER** disassemble the vacuum pump or manifold gauge.

  NEVER modify their internal components **WITHOUT** professional guidance.

Specifications

Vacuum Pump

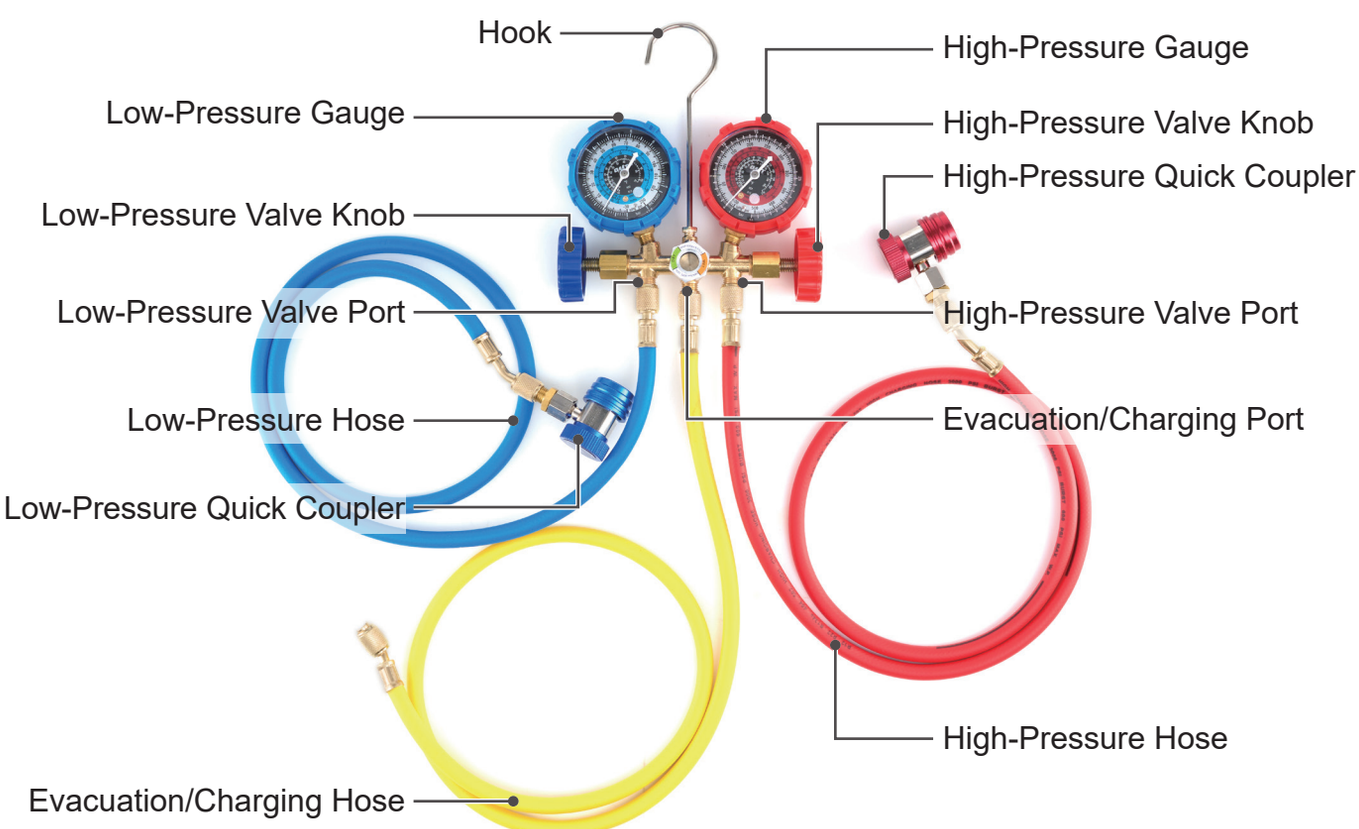
Region	North America	EU & UK
Input Power	110–120 (V) AC / 60 Hz	220 V AC / 50 Hz
Rated Power	1/4 HP	186 W
Evacuation Speed	3.5 cfm	0.1 m^3/min.
Oil Capacity	7.6 fl. oz.	225 mL
Dimensions	10.6×4.3×8.5 (in.)	27×11×21.5 (cm)
Net Weight	11 lb.	5 kg

Gauge Set

Compatible Refrigerants		R134a, R12, R22, and R502	
Low Pressure Gauge	Pressure Range	−15* psi to 250 psi	−1 Bars to 17.5 Bars
	R134a Temp. Range	−40°F to 100°F	−40°C to 38°C
	R12 Temp. Range	−40°F to 100°F	−40°C to 38°C
	R22 Temp. Range	−50°F to 70°F	−45°C to 21°C
	R502 Temp. Range	−80°F to 60°F	−62°C to 16°C
High Pressure Gauge	Pressure Range	−15* psi to 500 psi	−1 Bars to 35 Bars
	R134a Temp. Range	0°F to 190°F	−18°C to 88°C
	R12 Temp. Range	0°F to 210°F	−18°C to 99°C
	R22 Temp. Range	0°F to 160°F	−18°C to 71°C
	R502 Temp. Range	−50°F to 160°F	−45°C to 71°C
Hoses	Length	3 ft. / 11 in.	1.2 m
	Max. Pressure	3000 psi	206 Bars
Net Weight		4.9 lb.	2.2 kg

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

Product Diagram



Package List

No.	Name	Qty.
1	Vacuum Pump	1
2	Gauge Set	1
3	Evacuation/Charging Hose (Yellow)	1
4	Low-Pressure Hose (Blue)	1
5	High-Pressure Hose (Red)	1
6	Low-Pressure Quick Coupler (Blue)	1
7	High-Pressure Quick Coupler (Red)	1
8	½″ Male to ¼″ Female Adapter	1
9	¼″ Male to ⅜″ Female Adapter	1
10	Vacuum Pump Oil	1
11	Work Gloves	2
12	Tape	1
13	Bag	1
14	R134a Tap with Taper Pin (Puncture Style)	1
15	R134a Tap with Round Pin (Self-Sealing Style)	1

Necessary but Not Included:

- Micron Gauge
- M4 Hex Wrench
- Valve Core Wrench
- Dust Masks
- Goggles

Installation

⚠ Warning

- *Make sure your surroundings **ARE** safe for using this product.*

  Avoid operating in crowded, dark, or cluttered areas.

  *Ensure **NO** explosives or ignition sources nearby.*

- ***DO NOT** mix up **ALL** hoses, couplers, and ports mentioned herein, as they are **NOT** interchangeable.*

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 an M4 hex wrench (not included).

3. Unscrew the pump's filter by hand, exposing its oil inlet. Add the provided oil until the reservoir window is covered between its "MIN" and "MAX" height marks. Replace this filter, screwing it into place.

4. Unscrew the vacuum pump's ¼″ gas inlet cap by hand, wrap the inlet's threading with the provided tape, connect one end of the yellow evacuation/charging hose to the inlet, and screw it into place by hand. In the event that the inlet malfunctions, connect the hose to the ½″ gas inlet using a ¼″ male to ⅜″ female adapter and repair or replace the problematic inlet as needed.

5. To evacuate a system, remove the evacuation/charging port cap by hand and apply some tape to its threading as described above. Connect a micron gauge (not included) with this port and the other end of the yellow hose. (The port's diameter is ¼″. Use the provided ½″ male to ¼″ female adapter or any other necessary adapter if needed.) Make sure they are tightly joined and turn the micron gauge on.

   To charge your system, connect the yellow hose directly to the port.

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 port 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.

Installation

7. 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 ¼″ male to ⅜″ female adapter or other necessary adapters if needed.

Operation

> **⚠ Warning**
>
> - *Be sure that **ALL** connections **ARE** tightly secured.*
> - *Put on necessary PPE **BEFORE** starting work.*
> - *For optimal safety and performance, we recommend you take training **BEFORE** operating this product.*
>
>   *Injury and failure could happen due to a lack of training.*

Evacuation

> **⚠ Warning**
>
> *Again, check that your A/C system has been **COMPLETELY** turned off.*

1. Open the low-pressure valve by turning its knob completely counterclockwise.
2. 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.
3. When the micron gauge reads less than 500 microns, your A/C system is fully cleared. Close the valve by turning its knob completely clockwise and turn off the pump by flipping its power switch to **O**.
4. Disconnect the evacuation hose from the pump and micron gauge.

Operation

Charging

1. Ensure that everything is correctly set up for charging as explained in Installation.

2. Connect the outlet of either R134a tap to the charging hose and its inlet to your refrigerant can.

> **⚠ Warning**
>
> - ***ALWAYS*** *keep your refrigerant cans away from heat sources and direct sunlight.*
> - *Be sure* ***NOT*** *to open your refrigerant cans by accident in* ***ANY*** *way.*
> - *Ensure that* ***BOTH*** *valves on the gauge* ***ARE*** *completely closed* ***BEFORE*** *starting work.*
> - ***NEVER*** *leave your refrigerant cans or the gauge unattended when charging A/C systems.*
> - ***ALWAYS*** *wear proper PPE when disconnecting the couplers and hoses after charging is complete, as they may contain some refrigerant under pressure.*

   Turn its handle clockwise to open the can and then counterclockwise to allow the refrigerant to flow into the hose.

3. Start your A/C system and set it to the maximum cooling and fan speed.

4. Check for any leakage before you recharge. Open the high-pressure valve by turning its knob completely counterclockwise. If the high-pressure gauge's pointer keeps swinging, close the valve by turning its knob completely clockwise immediately. 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.

5. 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 between 25–80 psi (1.7–5.5 bars). To stop charging the system, close the low-pressure valve by turning its knob completely clockwise.

6. Close the tap by turning its knob 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 below the "MIN" height mark 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 M4 hex wrench. 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 a valve core wrench (not included). 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** 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.

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