



Empowering you to work smarter

Smart Vacuum Pump  
**NRP6Di NRP8Di**  
User Manual



Failure to follow warnings could  
result in death or serious injury.

**SAVE THIS MANUAL  
FOR FUTURE REFERENCE**

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**MASTER** SERIES

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**Warning**  
Do not leave pump running unattended in a closed environment without adequate ventilation

## The Industry's First Smart Vacuum Pump

NRP6Di and NRP8Di, the HVACR industry's first smart vacuum pumps, use inverter drive, vacuum measurement, and smart control technologies to begin the era of smart pumps.

NRP6DV and NRP8DV also use DC inverter drive motors, but use a mechanical vacuum gauge to insure the proper vacuum has been achieved.

The inverter-driven twin-cylinder vacuum pump is powerful, weighs up to 16 lbs less than a conventional pump and provides deep evacuation, insuring that all non-condensables and moisture have been removed from the sealed system prior to charging with refrigerant.

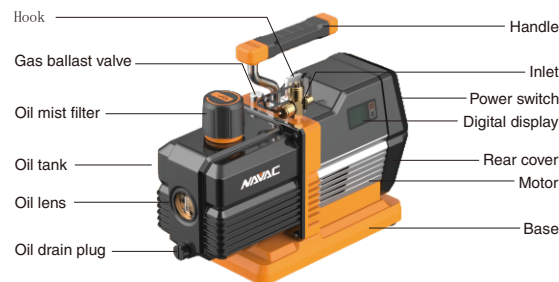
Vacuum measurement technology precisely measures the system evacuation during the entire process and provides real time vacuum level display, so you have a comprehensive view of the systems internal evacuation condition.

The pre-programmed computer chip, smart control technology, and the standard solenoid valve ensure the system's moisture removal by automatically extending the evacuation time to achieve the set vacuum.

Upon reaching the set evacuation level, the NRP6Di and NRP8Di models will beep to announce the evacuation is completed and the technician can move on to charging the system.

## INTRODUCTION AND TECHNICAL INFORMATION

In order to make it easier to understand the components of the vacuum pump, please see the picture below.



## DC INVERTER DRIVE VACUUM PUMPS

Model	NRP6Di	NRP8Di
Power Supply	110V / 60Hz	110V / 60Hz
Flow Rate ( CFM )	6 CFM	8 CFM
Ultimate Vacuum	15 micron	15 micron
Motor Power ( HP )	3/4	3/4
Oil Capacity ( oz )	17.6	17.6
Dimensions ( in )	14x5.3x11.9	14x5.3x11.9
Weight ( lbs )	25.35	25.35
Inlet Port	1/4", 3/8", 1/2" Flare	1/4", 3/8", 1/2" Flare

## APPLICATION

NAVAC inverter drive dual-stage rotary vane vacuum pumps are used to remove air, moisture, and other non-condensables from sealed HVACR systems. The products can be used for evacuation of HVACR repair and new installations, with refrigerants including CFC, HFC, HCFC, and HCEF, such as R-12, R-22, R-410A, R-404A, R-32, R-134A, 1234yf, etc.

## SPECIAL FEATURES

- Lighter and smaller, and premium quality vacuum pump, weighing under 26 lbs.
- Built-in solenoid isolation valve which closes automatically on shutdown or loss of power.
- Integrated vacuum gauge/pump structure, high precision, for deep ultimate vacuum level.
- Forced oil lubrication ensures vane sealing, cooling and high reliability.
- Large and easy to see oil-level window design help prevent oil supply shortage.
- Non-sparking design, suitable for R-32, 1234yf refrigerants.

## PREPARATION PRIOR TO USING VACUUM PUMP

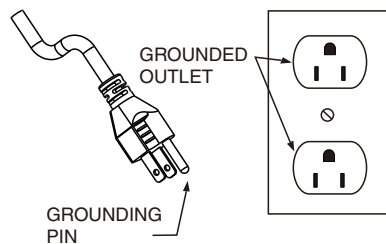
## GROUNDING INSTRUCTIONS

This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

## WARNING:

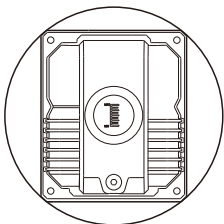
Improper installation of the grounding plug is able to result in a risk of electric shock. When repair or replacement of the cord or plug is required, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.

Check with a qualified electrician or serviceman when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.



1. Verify the power supply being used, to match the voltage on the nameplate.
2. Ensure that the pump is switched off prior to connecting to the power source.
3. Check for proper oil level, or change if needed.
4. Remove the oil fill cap, filling oil to the level in between the two oil sight glass lines, as shown in the drawing below. For specific pump oil volume, please see the technical specification table.

Note: In order to prevent pump oil from spilling out, please add oil slowly.



Switch on the power and the pump will begin to operate. After running for approximately one minute, check the oil level. If the oil level is too low, switch off the machine and add the required extra oil. Reinstall the oil fill cap.

Note: While the pump is operating, the oil level should be in between the two oil position lines. If the oil level is too low, it will reduce the performance and could damage the pump vanes. If the oil level is too high, it could cause oil to discharge through the pump exhaust.

## SAFETY WARNINGS

## WARNING:

This machine should only be used for evacuation of refrigerant systems after refrigerant has been removed from the system and the system has been opened to atmosphere. This machine is not to be used as a transfer pump for liquids or any other media; doing so can damage the product.

Note: In order to avoid personal injury, please carefully read and follow the instructions in this user manual and the user guide of the pump.

## NAVAC VACUUM PUMPS ARE NOT ALLOWED TO BE USED FOR A3 OR FLAMMABLE REFRIGERANTS.

1. NEVER CONNECT A VACUUM PUMP TO A PRESSURIZED SYSTEM. Always check to make sure that system and piping pressure is NOT ABOVE ATMOSPHERIC PRESSURE.
2. When handling refrigerants, please wear an eye-protection such as safety glasses or goggles.
3. Avoid direct physical contact with refrigerants, you will get burned.
4. When connecting the power source, all equipments must be grounded in order to prevent electrical hazards.
5. When the pump is in operation, the enclosure surfaces will be hot. Do not touch the oil box or the motor case. Allow adequate ventilation space for heat dissipation.
6. When using R-32, 1234yf or other flammable refrigerants, use an explosion proof electrical outlet.
7. Keep pump dry and away from water, mud, and dirt at all times.
8. Operating pump with intake fittings open to the atmosphere must not exceed 3 minutes.
9. Ambient temperature range for pump use is 30°F to 104°F (-1°C~40°C). The pump can be used in lower ambient conditions, if warmed up inside first and run for more than 1 minute to warm the oil prior to system evacuation.
10. The pump requires 110V±10% power, and the power outlet must be grounded.
11. Prior to connecting the vacuum pump to an A/C-R system, please use proper methods to remove refrigerant from a pressurized system. Note that pumping refrigerants under high-pressure conditions will damage the pump, and refrigerant must be removed using a recovery machine designed for that purpose.

## USE GUIDE

**CAUTION-To reduce the risk of electric shock, do not expose to rain. Store indoors.**

The product should be placed steadily without any incline when it is working. If it has finished its job , please get the plug off and keep the pump housing dustproof by covering a clean film plastic bag on it.

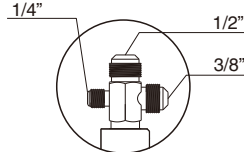
**EXTENSION CORDS**

If an extension cord must be used, be sure it is:

1. A 3-wire extension cord that has a 3-blade grounding plug, and a 3-slot receptacle that will accept the plug on the product
2. In good condition
3. No longer than 50' (15.2m)
4. 16 gauge (AWG) or larger. (Wire size increases as gauge number decreases. 14 AWG and 12AWG may also be used. **DO NOT USE 18 AWG** )

**NOTICE:** Risk of Property Damage. The use of an undersized extension cord will cause voltage to drop resulting in power loss to the motor and overheating.

1. When using the vacuum pump, remove the inlet protection cap from the desired (1/4", 3/8", or 1/2") connecting port, as shown in the diagram above, and connect the pump to the system or piping to be evacuated.



- Use shortest hoses possible for faster and more thorough evacuation.
2. Inspect the hose inlet connection, as well as all connecting hoses for proper seal. There must be no leakage or it will be impossible to draw the required deep vacuum level.
  3. At the beginning of the evacuation process, open the GAS BALLAST screw one full turn counter-clockwise, and once the vacuum gauge reaches 2000 microns, retighten to achieve desired vacuum level.
  4. After evacuation is completed, the smart vacuum pump will beep to indicate the vacuum is complete. If a DV-series pump is being used, shut down the pump and close the system access valve(s).
  5. Turn off the power switch on the pump and disconnect power.
  6. Remove the evacuation hoses.
  7. Close the air entry cap and the air exhaust cap tightly (with the exception of models without air exhaust cap), to prevent dirt or particulates from entering the pump.

**Note:**

1. For the Di-series pumps equipped with a digital vacuum gauge, after turning on the power, press the start button on the display panel to start the pump. When the vacuum reaches 500 microns, the pump will continue running at a reduced speed. Then 30 minutes after this, buzz alarm indicates the evacuation is complete.
2. Always evacuate systems in conjunction with a micron vacuum gauge, such as the NAVAC NMV1, if using the standard inverter drive pump. Micron vacuum gauges precisely measure and display system evacuation during the entire process, giving you a comprehensive view of the sealed system internal evacuation condition.
3. Please pay attention to any changes in the oil level during pump operation. If the oil level falls below the center line, immediately add more vacuum pump oil to avoid damage to the pump.
4. If any residual refrigerant comes in contact with the vacuum gauge sensor, the digital display may go wrong. Once the refrigerant has been evacuated, the sensor and display will automatically start working again.
5. Vacuum pump and oil must be above 30° F.

## MAINTENANCE

1. Vacuum pump oil has three major functions: pump lubricant, pump cooling, and pump sealant. During the evacuation process, the pump oil will absorb moisture being pulled from the system, causing it to be less effective as a lubricant and pump vane seal, extending evacuation time and possibly allowing the pump to overheat. We recommend that the oil be changed just before evacuating each A/C-R system to insure the pump oil is in a clean condition as this is the key factor in determining if the pump can achieve the required vacuum levels. In order to maintain the optimum operation of the pump, we recommend that you use NAVAC vacuum pump oil. This oil is made using a unique process and can maintain proper viscosity during normal operation and temperatures, and it's also helpful for cold starts. Should the NAVAC oil not be available, reputable brands of special-purpose vacuum pump oil may be used.

**Note:** Should the pump oil become opaque, dirty, or full of moisture, promptly change oil. This will greatly speed up evacuation, especially when there is a lot of moisture in system piping from having been left open to the atmosphere for an extended period of time.

**Oil change procedure:**

1. To ensure that the pump and oil are warm, run pump for approximately one minute prior to changing oil. Do not run longer than this, as it may be possible to damage the pump.
2. While the pump is running, open one inlet port and allow oil to drain out of the pump. After turning off pump, open the oil drain plug, and drain used oil into an appropriate vessel and dispose of properly.
3. As oil stops draining, tip the pump to drain any remaining oil in the bottom of the pump.
4. Replace and tighten oil drain plug.
5. Remove oil fill cap, pour in new oil until the oil is at the proper level in the sight glass (the same procedure prior to using the pump above).

**REQUIREMENTS FOR WARRANTY COVERAGE**

Product warranty is provided for product quality problems for two years from date of sale. For warranty to be valid, the following conditions must be met:

1. Products issues due to manufacturing defects confirmed by qualified agents.
2. Products which have not been maintained or dismantled by unauthorized parties.
3. Products that have been used in accordance with the User Manual. All maintenance services shall be performed during the warranty period.

**Statement:** Other than repairing the product defective, the manufacturer of this product will not be liable for any other costs, such as time spent in fixing the issue, refrigerant consumption, refrigerant disposal costs, as well as unauthorized transportation and labor costs.



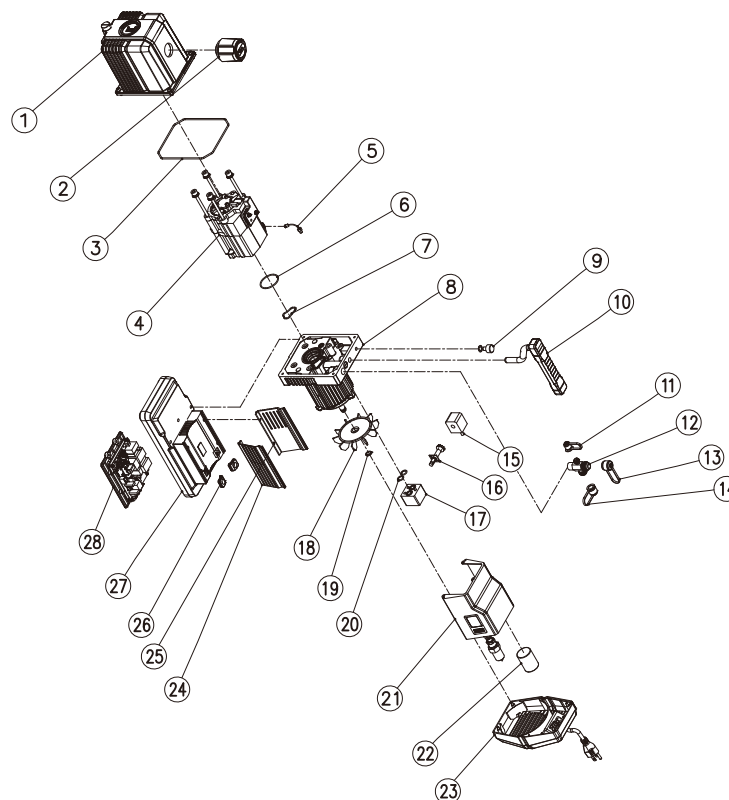
## TROUBLESHOOTING

Malfunction	Possible Cause	Remedy
Low Vacuum	1. Secondary air inlet connection cap loose on the air inlet port.	Tighten the cap.
	2. Damaged rubber ring inside the secondary air inlet connection cap.	Replace the rubber ring.
	3. The volume of oil is insufficient.	Add oil to the center line of the oil display.
	4. Pump oil becomes opaque or absorbed too many impurities.	Replace with new oil.
	5. The pump's oil entry hole is clogged or the oil supply is insufficient.	Clean the oil entry hole, clean the oil filter.
	6. The pump connecting hoses, manifold or system has a leak.	Inspect the connecting hose gaskets and system, repair leaks.
	7. The pump selection is wrong.	Check the size of the container to be evacuated, recalculate and select an appropriate pump model.
	8. The pump has been used for too long, damage and wear to components caused increased gaps between parts.	Inspect and repair, or replace the pump.
Oil leak	1. Damaged oil seal.	Replace the oil seal.
	2. Loose or damaged oil box connections.	Tighten the connecting screws, replace O-rings.
Oil spray	1. Excessive oil volume.	Remove oil until the oil position line is reached.
	2. Inlet port pressure is excessively high for a long period.	Select an appropriate pump, increase the pumping speed.
Start-up problems	1. Oil temperature is too low.	Exposed the air entry hole to the external atmosphere, and remove the oil fume filtration device. Use a screwdriver to turn the engine axle in an anti-clockwise direction.
	2. Motor, power source or circuit board malfunctions.	Inspect and repair.
	3. Foreign objects entered the pump.	Inspect and remove.
	4. Voltage supply is excessively low or high.	Inspect the power source voltage.
	5. Overload trips.	After overload trip occurs, switch kept On. Remove the power plug, wait for approximately 30 seconds before inspecting and repairing.

## Notes:

1. The pump is inverter driven and the motor has over-current / overload protection, please troubleshoot after overload resets.
2. If the above methods cannot resolve your problems, please contact your nearest distributor or take the pump to a repair center. We will do our best to provide you with a quick turnaround to keep you working.

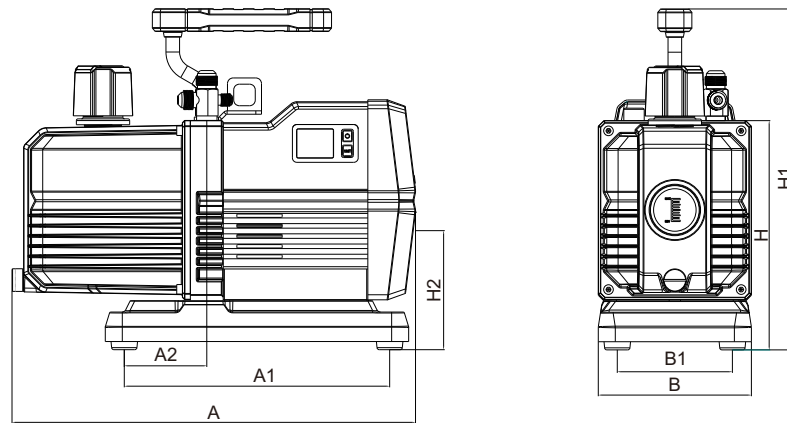
## EXPLODED VIEW



## REPAIR PARTS LIST

Ref No.	PART No.	Description
1	RP18001	Oil Housing Assy
2	RP18002	Exhaust Filter and Noise Reducer
3	RP18003	O-ring
4	RP18004	Pump Body
5	RP18005	Gas Ballast Assy
6	RP18006	O-ring
7	RP18007	O-ring
8	RP18008	Motor Assy
9	RP18009	Gas Ballast Knob
10	RP18010	Handle
11	RP18011	1/4" Inlet Cap
12	RP18012	Four-Way Connection
13	RP18013	3/8" Inlet Cap
14	RP18014	1/2" Inlet Cap
15	RP18015	Solenoid Valve Winding
16	RP18016	Iron Core Assy
17	RP18017	Solenoid Valve Body
18	RP18018	Fan
19	RP18019	Elastic Collar
20	RP18020	O-ring
21	RP18021 RP16021	Digital Display Controller Assy
22	RP18022	Capacitor
23	RP18023	Back Cover Assy
24	RP18024	Guard Board I
25	RP18025	Guard Board II
26	RP18026	Sheath
27	RP18027	Base Plate
28	RP18028	Controller Assy

## DIMENSION



Unit: inch

Model	A	A1	A2	B	B1	H	H1
NRP6Di	14	9.2	2.9	5.3	4	11.9	8
NRP8Di	14	9.2	2.9	5.3	4	11.9	8