

# VACUUM PUMP

## Operating Manual



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# VACUUM PUMP

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Thank you for using our products!

It's helpful for you to read the specification carefully before using. In order to make users know the specification, please give it with products to users, if you want to resell or sell as a whole set.

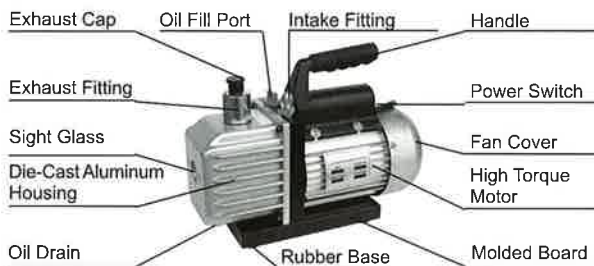
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# VACUUM PUMP

## I、 Pump components



## II、 Operating manual

### (1) Before using your vacuum pump

In all cases, motors are designed for operating voltages plus or minus 10% of the normal rating. Single voltage motors are supplied fully connected and ready to operate.

1. Check to be sure the voltage and frequency at the outlet match the specifications on the pump motor decal. Check the ON-OFF switch to be sure it is in the OFF position before you plug the pump into an outlet. Check to be sure the gas ballast valve is closed. Remove and discard the exhaust plug from the end of the pump's handle.

2. The pump is shipped without oil in the reservoir. Before starting the pump, fill it with oil. Remove the OIL FILL cap and add oil until oil just shows in the bottom of the sight glass. The approximate oil capacity of the pump is 220~250ml.

3. Replace the OIL FILL cap and remove the cap from one of the inlet ports. Turn the motor switch to ON. When the pump runs smoothly, replace the cap on the inlet port. This may take from two to 30 seconds depending on the ambient temperature. After the pump runs for approximately one minute, check the sight glass for proper oil level. The oil level should be even with the sight glass OIL LEVEL line. Add oil if necessary.

Note: When the pump is running, the oil level should be even with the line on the

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sight glass. Underfilling will result in poor vacuum performance. Over filling can result in oil blowing from the exhaust.

## (2) To use the gas ballast feature:

Moisture from the A/C-R system that is carried into the pump as a vapor tends to condense into a liquid and combine with the vacuum pump oil. When moisture contaminates the pump oil, it reduces the pump's ability to reach its ultimate deep vacuum level.

The gas ballast valve purges a small amount of atmospheric air through the exhaust chamber. This extra volume of air mixes with the vapor from the refrigerant system to prevent condensation and to help exhaust moisture in the form of vapor from the pump.

To use the gas ballast, start the pump and open the gas ballast valve until the system has reached approximately 1000-3000 microns. Close the valve to allow the pump to pull down to its ultimate vacuum level. The gas ballast valve is located beside the handle, opposite the inlet fitting.

The gas ballast valve may be opened or closed at any time during pump operation. It is fully open at two turns counterclockwise.

## (3) To shut down your pump after use

To help prolong pump life and promote easy starting, follow these procedures for shutdown.

1. Chose the manifold valve between the pump and the system.
2. Remove the hose from the pump inlet.
3. Cap the inlet port to prevent any contamination or loose particles from entering the port.

## III. To maintain your high vacuum pump

### 1. Vacuum Pump oil:

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The condition and type of oil used in any high vacuum pump are extremely important in determining the ultimate attainable vacuum. We recommend the use of High Vacuum Pump Oil. This oil has been specifically blended to maintain maximum viscosity at normal running temperatures and to improve cold weather starts.

## 2. Oil Change Procedure

(1) Be sure the pump is warmed up.

(2) Remove the OIL DRAIN cap. Drain contaminated oil into a suitable container and dispose of properly. Oil can be forced from the pump by opening the inlet and partially blocking the exhaust with a cloth while the pump is running. Do not operate the pump for more than 20 seconds using this method.

(3) When the flow of oil has stopped, tilt the pump forward to drain residual oil.

(4) Replace the OIL DRAIN cap. Remove the OIL FILL cap and fill the reservoir with new vacuum pump oil until the oil just shows at the bottom of the sight glass. The approximate oil capacity of the pump is 220~250ml.

(5) Be sure the inlet ports are capped, then turn on the pump. Allow it to run for one minute, then check the oil level. If the oil is below the sight glass OIL LEVEL line, add oil slowly (with the pump running) until the oil reaches the OIL LEVEL line. Replace the OIL FILL cap, making sure the inlet is capped and the drain cap is tight.

(6) a) If the oil is badly contaminated with sludge that forms when water is allowed to collect in the oil, you may need to remove the oil reservoir cover and wipe it out.

b) Another method of dealing with heavily contaminated oil is to force the oil from the pump reservoir. To do this, allow the pump to run until it is warmed up. While the pump is still running, remove the oil drain cap. Slightly restrict the exhaust. This will back-pressure the oil reservoir and force the oil from it, carrying more contaminants. When the oil ceases to flow, turn off the pump.

Repeat this procedure as required until the contamination is removed.

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Replace the OIL DRAIN cap and refill the reservoir to the proper level with fresh pump oil.

## IV. Troubleshooting Guide

Your pump has been designed for dependable use and long life. If something should go wrong, however, the following guide will help you get pump back into service as quickly as possible.

If disassembly of the pump is required, please check your warranty. The warranty may be voided by misuse or customer tampering which results in the pump being inoperable.

### 1. Failure To Start

Check the line voltage. The pumps are designed to start at  $\pm 10\%$  line voltage (loaded) at 32°F. At extremes, however, switching between the start and run windings may occur.

### 2. Oil Leakage

- ① Be sure the oil is not a residual accumulation from spillage, etc.
- ② If leakage exists, the module cover gasket or the shaft seal may need replacing. If leakage exists in the area of the oil drain plug, you may need to reseal the plug using a commercial pipe thread sealer.

### 3. Failure To Pull A Good Vacuum

- ① Be sure the vacuum gauge and all connections are in good condition and leak-free. You can confirm leakage by monitoring the vacuum with a thermistor gauge while applying vacuum pump oil at connections or suspected leak points. The vacuum will improve briefly while the oil is sealing the leak.
- ② Be sure the pump oil is clean. A badly contaminated pump may require several oil flushes.
- ③ Check to be sure the gas ballast knob is tightly closed.

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④ Be sure the oil is at the proper level. For maximum pump operation, the oil must be even with the OIL LEVEL line on the sight glass when the pump is running. Do not overfill—operating temperatures will cause the oil to expand so it will appear at a higher level than when the pump is not running. To check the oil level, start the pump with the inlet capped. Check the oil level in the sight glass. Add oil if necessary.

## V. Technical Parameter

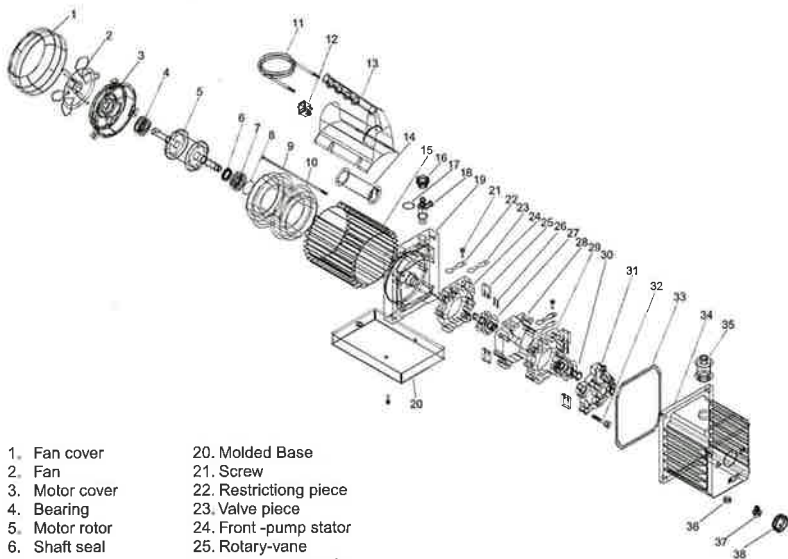
		FY-1C		FY-1.5A		FY-2B		FY-3B	
Voltage		220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz
Free Air Displacement	m <sup>3</sup> /h	3.0	3.6	4.5	5.0	6.0	7.2		
	CFM	1.3	1.5	2	2.5	3.5	4.5	6.5	8
Ultimate Vacuum	Pa	10		10		10		10	
	Microns	150		150		100		100	
Motor		1/4HP		1/4HP		1/3HP		3/4HP	
Intake Ports		1/4"Flare		1/4"Flare		1/4"Flare, 3/8"Flare		1/4"Flare, 3/8"Flare	
Oil capacity		220ml		220ml		250ml		600ml	
Dimensions		290x110x240(mm)		315x120x240(mm)		336x123x255(mm)		385x140x280(mm)	
Net Weight		7Kg		8.1Kg		10.5Kg		20.5Kg	

		2FY-0.5B		2FY-1B		2FY-2B		2FY-3B	
Voltage		220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz
Free Air Displacement		1.3CFM	1.5CFM	2.5CFM	3CFM	4CFM	5CFM	6.5CFM	8CFM
Ultimate Vacuum	Pa	5X10 <sup>-1</sup>		5X10 <sup>-1</sup>		5X10 <sup>-1</sup>		5X10 <sup>-1</sup>	
	Microns	50		50		50		50	
Stages		2		2		2		2	
Motor		1/4HP		1/3HP		1/3HP		3/4HP	
Intake Ports		1/4"Flare, 3/8"Flare		1/4"Flare, 3/8"Flare		1/4"Flare, 3/8"Flare		1/4"Flare, 3/8"Flare 1/2"Acme	
Oil capacity		220ml		220ml		220ml		250ml	
Dimensions		315x120x240(mm)		336x123x255(mm)		336x123x255(mm)		385x140x280(mm)	
Net Weight		9.6Kg		12.5Kg		12.5Kg		20.5Kg	

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## VI. Exploded Drawing



- |                        |                               |
|------------------------|-------------------------------|
| 1. Fan cover           | 20. Molded Base               |
| 2. Fan                 | 21. Screw                     |
| 3. Motor cover         | 22. Restricting piece         |
| 4. Bearing             | 23. Valve piece               |
| 5. Motor rotor         | 24. Front -pump stator        |
| 6. Shaft seal          | 25. Rotary-vane               |
| 7. Bearing             | 26. Rotary-vane spring        |
| 8. Waveform gasket     | 27. Front-pump rotor          |
| 9. Long screw          | 28. Middle fense              |
| 10. Motor stator       | 29. Back-pump stator          |
| 11. Outlet             | 30. Back-pump rotor           |
| 12. Switch             | 31. Back-pump cover           |
| 13. Handle             | 32. Screw                     |
| 14. Capacitor          | 33. Housing gasket            |
| 15. Motor hull         | 34. Die-cast Aluminum housing |
| 16. Oil fill port      | 35. Exhaust fitting           |
| 17. Oil fill port seal | 36. Oil drain gasket          |
| 18. Inlet port         | 37. Oil drain cap             |
| 19. Trestle            | 38. Sight glass               |

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