

# VACUUM PUMP

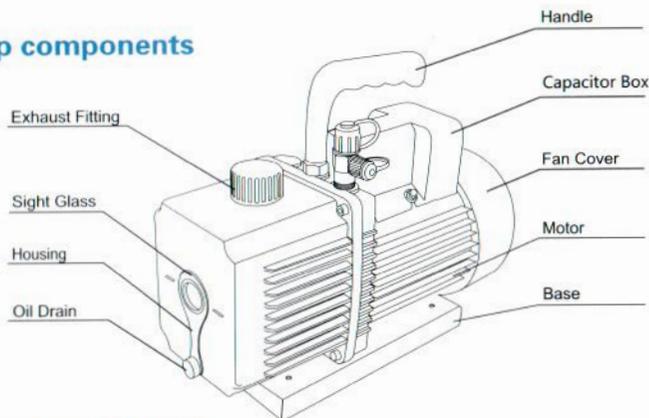
## Operating Manual

Please read the operating manual  
carefully before using.



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### I. Pump components



### II. Operating Manual

#### 1. Before operating

All 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.

(a) Check the voltage and frequency at the outlet and ensure it matches the specifications on the pump motor metal plate. Ensure that the ON-OFF switch is in the OFF position before connecting the pump to a power source. Remove and discard the exhaust plug from the exhaust fitting.

(b) Fill the oil reservoir with oil before activate the pump. Remove the Oil Fill cap and add oil until oil show at the bottom of the sight glass. Refer to technical data in manual for the correct oil capacity of pump.

(c) Place back the Oil Fill cap and remove the cap from the inlet fitting. Turn the motor switch to ON position. Place back the cap on the inlet fitting when the pump runs smoothly. This may takes 2 to 30 seconds depends on the ambient temperature. After the pump operates for approximately one minute, check the sight glass for proper oil level, which should be aligned with the sight glass Oil Level line. Refill oil if necessary.

Note: The oil level should be aligned with the indicating line on the sight glass when the pump is running. Insufficient oil filled will result in poor vacuum performance. Excessive of oil can result in overflowing of oil from the exhaust fitting. **To reduce the risk of injury, when applying to the R32 and HFO-1234yf, please be sure to operate the pump at cool and ventilated place.**

#### 2. To shut off pump after use

To prolong pump lifespan and smooth start-up, these procedures to shut off pump should be followed.

- (a) Turn off the manifold valve between the pump and the system.
- (b) Remove the hose from the pump inlet.
- (c) Cover the inlet port openings to prevent any contamination or foreign particles from entering the port.

### III. Maintenance

#### 1. Vacuum pump oil:

The condition and type of oil used in any high performance vacuum pump are extremely important in determining the ultimate attainable vacuum. It is recommended to use the High Performance Vacuum Pump Oil, which is specifically blended to maintain maximum viscosity at normal running temperatures and to improve cold weather start up.

#### 2. Oil Change Procedure

- (a) Ensure the pump is warmed up.
- (b) Remove the Oil Drain cap. Drain off contaminated oil into a container and dispose it properly. Oil can be removed 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.

(c) When the drainage of oil completed, tilt the pump forward to remove the residual oil.

(d) Place back the Oil Drain cap. Remove the Oil Fill cap and fill the oil reservoir with new vacuum pump oil until the oil level is seen at the bottom of the sight glass.

(e) Ensure that the inlet ports are covered before turn on the pump. Allow it to run for one minute to check the oil level. If the oil level is below the sight glass Oil Level line, fill oil slowly (with the pump running) until the oil reaches the Oil Level line. Place back the Oil Fill cap, ensure the inlet is covered and the oil drain cap is closed tightly.

(f) i) If the oil is badly contaminated with sludge that forms during operation, you may need to remove the oil reservoir cover and wipe it.

ii) The alternative method to deal with heavily contaminated oil is to force the oil from the pump reservoir. Leave the pump to run until it is warmed up. While the pump is still running, remove the oil drain cap and restrict the exhaust slightly. This will back-pressure the oil reservoir and purge the oil with contaminants. Turn off the pump when oil stop flowing.

iii) Repeat this procedure as required until the contaminants is removed completely.

iv) Replace the Oil Drain cap and refill the oil reservoir to the proper oil level with clean vacuum pump oil.

### IV. Troubleshooting Guide

Following guide will help you to recover the functionality should there be any malfunction occurs:

### 1. Failure To Start

Check the operating voltage. The pumps are designed to start at  $\pm 10\%$  operating voltage (loaded) at 5°C. However, if exceeded the maximum voltage, switch malfunction may occur.

### 2. Oil leakage

(a) Ensure the oil is not a spillage from vacuum pump, etc.

(b) If leakage exists, the housing gasket or the shaft seal may need to be replaced. If leakage exists in the area of the oil drain plug, you may need to reseal the plug using a commercial pipe thread sealer.

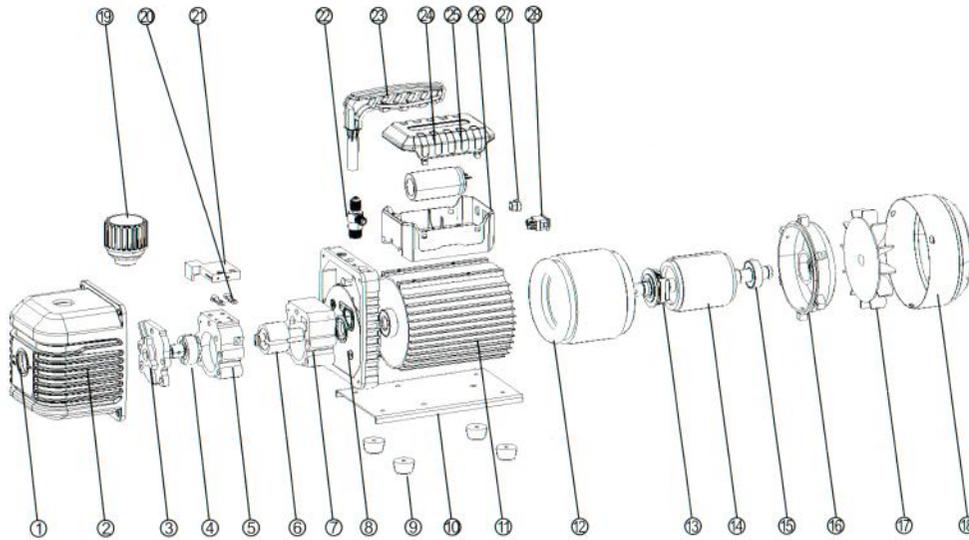
### 3. Failure To Attain A Good Vacuum

(a) Ensure the vacuum gauge and all connections are in good condition and leakfree. 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.

(b) Ensure the pump oil is clean. A badly contaminated pump may require several oil flushes.

(c) Ensure the oil is at the proper level. For optimum pump operation, the oil must be even with the Oil Level line on the sight glass when the pump is running. Do not overfill as operating temperatures will cause the oil to expand, which will appear at a higher level than when the pump is not running. To check the oil level, start the pump with the inlet covered. Check the oil level in the sight glass. Add oil if necessary.

V. Technical Drawing



1.SIGHT GLASS	12.MOTOR STATOR	23.HANDLE
2.HOUSING	13.CENTRIFIGAL SWITCH	24.CAPACITOR
3.PUMP BACK COVER	14.MOTOR ROTOR	25.CAPACITOR BOX COVER
4.PUMP BACK ROTOR	15.BEARING	26.CAPACITOR BOX HOLDER
5.PUMP BACK STATOR	16.MOTOR COVER	27.SOCKET
6.PUMP FRONT ROTOR	17.FAN	28.POWER SWITCH
7.PUMP FRONT STATOR	18.FAN COVER	
8.TRESTLE	19.EXHAUST FITTING	
9.RUBBER FOOT	20.VALVE PLATE	
10.BASE	21.ANTI-FOG COVERY	
11.MOTOR HULL	22.INLET FITTING	

VI. Technical Parameter

VP N SERIES

Single stage vacuum pump

Models	VP115N		VP130N		VP140N		VP150N	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	1.8CFM 50L/min	2.0CFM 57L/min	2.5CFM 71L/min	3.0CFM 85L/min	3.5CFM 100L/min	4.0CFM 115L/min	4.5CFM 128L/min	5.0CFM 142L/min
Ultimate Vacuum	2Pa 150 microns		2Pa 150 microns		2Pa 150 microns		2Pa 150 microns	
Stage	1		1		1		1	
Power	1/4HP		1/4HP		1/3HP		1/3HP	
Inlet Port	1/4"SAE		1/4" SAE		1/4"&3/8"SAE		1/4"&3/8"SAE	
Oil Capacity	240ml		230ml		330ml		320ml	
Dimensions(mm)	240x93x200		240x93x200		280x115x230		280x115x230	
Weight	4.0kg		4.3kg		7.0kg		7.5kg	

Single stage vacuum pump

Models	VP160N		VP170N		VP190N		VP1200N	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	5.0CFM 142L/min	6.0CFM 170L/min	6.0CFM 170L/min	7.0CFM 198L/min	8.0CFM 227L/min	9.0CFM 255L/min	10CFM 283L/min	12CFM 340L/min
Ultimate Vacuum	2Pa 150 microns		2Pa 150 microns		2Pa 150 microns		2Pa 150 microns	
Stage	1		1		1		1	
Power	1/2HP		3/4HP		3/4HP		1HP	
Inlet Port	1/4"&3/8"SAE		1/4"&3/8"SAE		1/4"&3/8"SAE		1/4"&3/8"SAE	
Oil Capacity	300ml		280ml		320ml		600ml	
Dimensions(mm)	320x125x232		320x125x232		340x132x245		340x132x245	
Weight	8.0kg		8.5kg		12.0kg		12.0kg	

Two stage vacuum pump

Models	VP215N		VP230N		VP240N		VP250N	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	1.8CFM 50L/min	2.0CFM 57L/min	2.5CFM 71L/min	3.0CFM 85L/min	3.5CFM 100L/min	4.0CFM 115L/min	4.5CFM 128L/min	5.0CFM 142L/min
Ultimate Vacuum	2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns	
Stage	2		2		2		2	
Power	1/4HP		1/3HP		1/2HP		1/2HP	
Inlet Port	1/4"SAE		1/4"&3/8"SAE		1/4"&3/8"SAE		1/4"&3/8"SAE	
Oil Capacity	230ml		300ml		350ml		350ml	
Dimensions(mm)	240x93x200		280x115x230		320x125x232		320x125x232	
Weight	4.3kg		7.8kg		8.3kg		8.6kg	

## Vacuum Pump

### Two stage vacuum pump

Models	VP260N		VP270N		VP290N		VP2200N	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	5.0CFM 142L/min	6.0CFM 170L/min	6.0CFM 170L/min	7.0CFM 198L/min	8.0CFM 227L/min	9.0CFM 255L/min	10CFM 283L/min	12CFM 340L/min
Ultimate Vacuum	2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns		2x10 <sup>-1</sup> Pa 15 microns	
Stage	2		2		2		2	
Power	1/2HP		3/4HP		1HP		1HP	
Inlet Port	1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	330ml		450ml		630ml		630ml	
Dimensions(mm)	320x125x230		340x132x245		390x145x252		390x145x252	
Weight	9.0kg		12.5kg		15.5kg		16kg	

### A-i SERIES Single stage vacuum pump

Models	A- i120		A- i130		A- i140		A- i150	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	1.8CFM 51L/min	2.0CFM 57L/min	2.5CFM 71L/min	3.0CFM 84L/min	3.5CFM 100L/min	4.0CFM 113L/min	4.5CFM 128L/min	5.0CFM 142L/min
Ultimate Vacuum	1Pa 75 microns		1Pa 75 microns		1Pa 75 microns		1Pa 75 microns	
Stage	1		1		1		1	
Power	1/3HP		1/2HP		1/2HP		1/2HP	
Inlet Port	1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	230ml		330ml		320ml		450ml	
Dimensions(mm)	240 x93 x200mm		280x115x230mm		320 x125 x232mm		340 x132 x245mm	
Weight	5.0kg		7.8kg		8kg		10.0kg	

### Single stage vacuum pump

Models	A- i160		A- i180		A- i190		A- i200	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	5.0FM 142L/min	6.0CFM 170L/min	7.0CFM 198L/min	8.0CFM 227L/min	8.0CFM 227L/min	9.0CFM 255L/min	10CFM 283L/min	12CFM 340L/min
Ultimate Vacuum	1Pa 75 microns		1Pa 75 microns		1Pa 75 microns		1Pa 75 microns	
Stage	1		1		1		1	
Power	1/2HP		3/4HP		3/4HP		1HP	
Inlet Port	1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	350ml		320ml		600ml		600ml	
Dimensions(mm)	340 x132 x245mm		360x132x245mm		390 x140 x252mm		390 x140 x252mm	
Weight	11.0kg		13.5kg		14.0kg		14.5kg	

## Vacuum Pump

### Two stage vacuum pump

Models	A- i210		A- i220		A- i230		A- i240	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	1.0FM 28L/min	1.5CFM 42L/min	1.8CFM 51L/min	2.0CFM 57L/min	2.5CFM 71L/min	3.0CFM 84L/min	3.5CFM 100L/min	4.0CFM 113L/min
Ultimate Vacuum	1x10 <sup>-1</sup> Pa 7.5 microns							
Stage	2		2		2		2	
Power	1/4HP		1/2HP		1/2HP		1/2HP	
Inlet Port	1/4" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	230ml		230ml		330ml		600ml	
Dimensions(mm)	240 x93 x200mm		280 x115 x230mm		320 x125 x232mm		340 x132 x245mm	
Weight	4.5kg		8.5kg		9.5kg		11kg	

### Two stage vacuum pump

Models	A- i250		A- i260		A- i280		A- i2200	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	4.5CFM 128L/min	5.0CFM 142L/min	5.0FM 142L/min	6.0CFM 170L/min	7.0CFM 198L/min	8.0CFM 227L/min	10CFM 283L/min	12CFM 340L/min
Ultimate Vacuum	1x10 <sup>-1</sup> Pa 7.5 microns		1x10 <sup>-1</sup> Pa 7.5 microns		1x10 <sup>-1</sup> Pa 7.5 microns		1x10 <sup>-1</sup> Pa 7.5 microns	
Stage	2		2		2		2	
Power	1/2HP		3/4HP		1HP		1HP	
Inlet Port	1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	530ml		500ml		600ml		550ml	
Dimensions(mm)	340 x132 x245mm		360 x132 x245mm		390 x145 x252mm		390 x145 x252mm	
Weight	12kg		13.5kg		16kg		17kg	

### NON-SPARK SERIES Two stage vacuum pump

Models	A- i210-NS		A- i220-NS		A- i230-NS		A- i240-NS	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	1.0CFM 28L/min	1.5CFM 42L/min	1.8CFM 51L/min	2.0CFM 57L/min	2.5CFM 71L/min	3.0CFM 84L/min	3.5CFM 100L/min	4.0CFM 113L/min
Ultimate Vacuum	1x10 <sup>-1</sup> Pa 7.5 microns							
Stage	2		2		2		2	
Power	1/4HP		1/2HP		1/2HP		1/2HP	
Inlet Port	1/4" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	230ml		230ml		330ml		600ml	
Dimensions(mm)	240 x93 x200		280 x115 x230		320 x125 x232		340 x132 x245	
Weight	4.5kg		8.5kg		9.5kg		11kg	

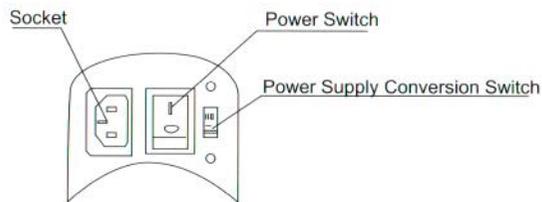
**Two stage vacuum pump**

Models	A- i260-NS		A- i280-NS		A- i2200-NS	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Flow Rate	5.0CFM 142L/min	6.0CFM 170L/min	7.0CFM 198L/min	8.0CFM 227L/min	10CFM 283L/min	12CFM 340L/min
Ultimate Vacuum	1x10 <sup>-1</sup> Pa 7.5 microns		1x10 <sup>-1</sup> Pa 7.5 microns		1x10 <sup>-1</sup> Pa 7.5 microns	
Stage	2		2		2	
Power	1HP		1HP		1HP	
Inlet Port	1/4" & 3/8" SAE		1/4" & 3/8" SAE		1/4" & 3/8" SAE	
Oil Capacity	460ml		600ml		550ml	
Dimensions(mm)	360 x132 x245mm		390 x145 x252mm		390 x145 x252mm	
Weight	13.5kg		16kg		17kg	

**VII. Dual Voltage & Dual Frequency Series**

**Outlook Structure**

Use below outlook drawing for better understanding of Dual Voltage & Dual Frequency Series



Note:

1. This product operates in ambient temperature: 5°C~40°C
2. Power Supply of the products are 110-127V 50/60Hz  
220-240V 50/60Hz

Check power supply parameter before using the vacuum pump and ensure the Power Supply Conversion Switch is set at the right place: 110V or 220V.

3. This product is equipped with Thermal Protection function:

If the ambient temperature is too hot or the voltage is too high, the product may stop functioning. It is recommended not to switch off the power supply immediately.

If the product re-start up automatically after 3 minutes, it is recommended to cool the product by lowering the ambient temperature or power supply voltage to prolong the lifespan of the vacuum pump.