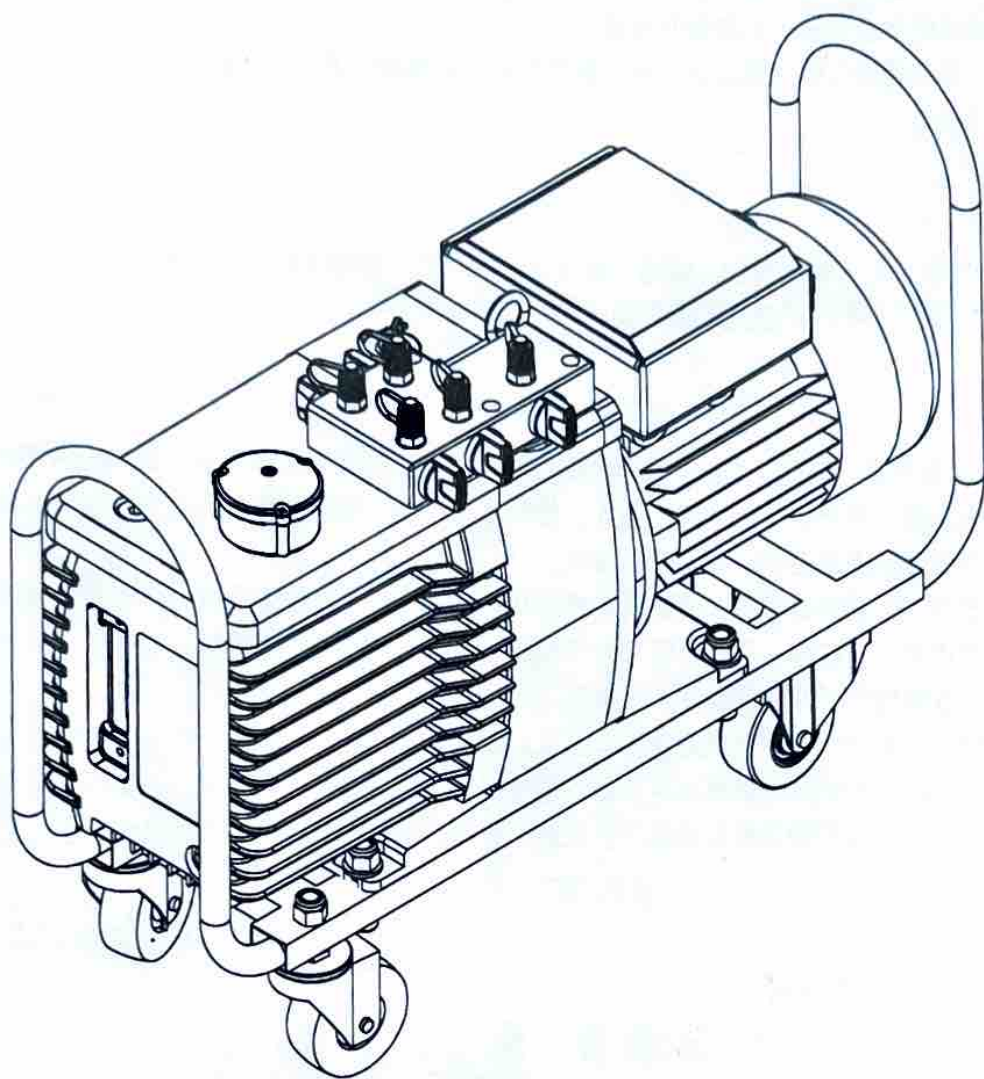


**WIPCOOL®**  
IDEAL PRODUCTS FOR HVAC



**2F10**

# 工业真空泵

INDUSTRIAL VACUUM PUMP

使用说明书

OPERATION MANUAL



## 1. Instruction before use

Thank you for buying WIPCOOL industrial vacuum pump. This manual gives instructions on the correct installation. It is important that you follow these instructions carefully.

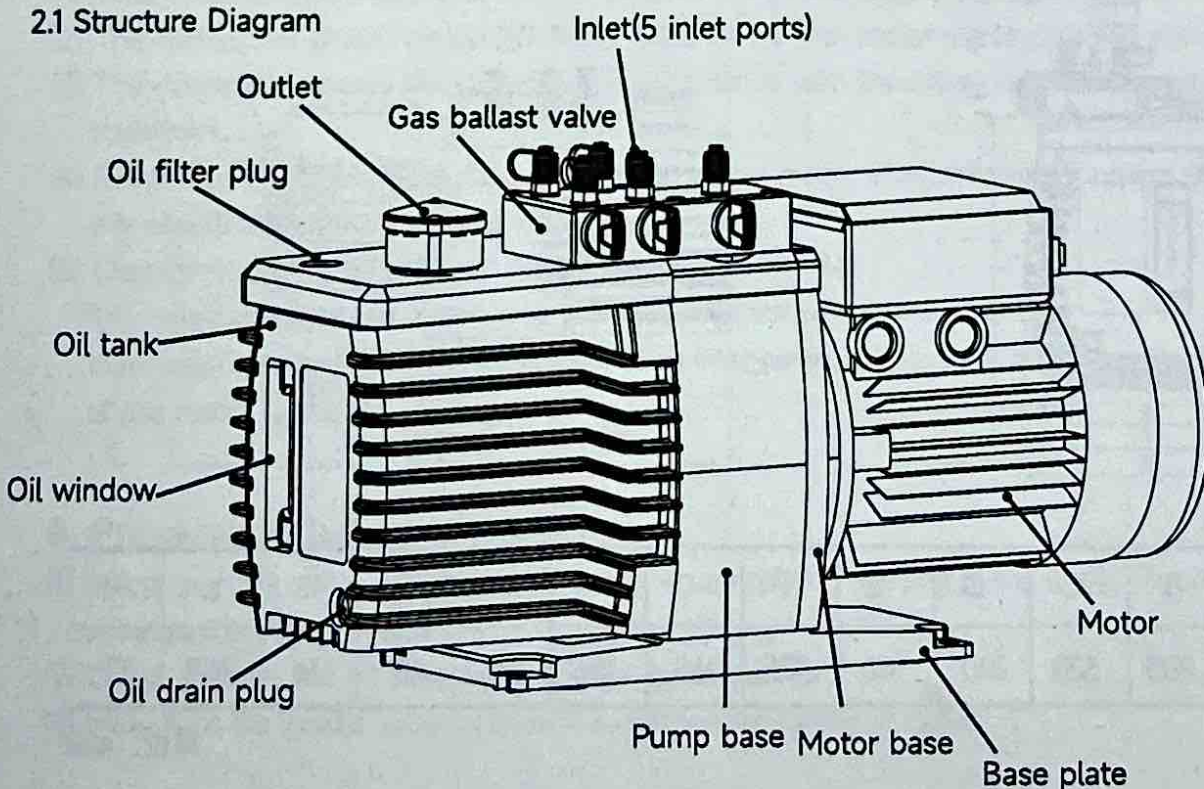
### ⚠ Matters needing attention in transportation

- (1) Any small negligence might cause damage to pump, thus please handle with care;
- (2) The pump can be removed only when the pump is shut down and power is disconnected;
- (3) Check to ensure no oil leakage in pump, due to the oil drained out of the pump might put people at the risk of slip;
- (4) When hoisting the pump, make sure the hoisting assembly device is safe, in order to avoid staff injuries or pump damage caused by falling down the pump.

## 2. Main features and scope of application

2F10 vacuum pump is one of the most basic vacuum equipment in the field of vacuum application, and it has been widely used in application fields that need vacuum environment, including scientific research, teaching, vacuum application complete sets of equipment, electronic industry, semiconductor industry, monitor production line, vacuum package, vacuum freeze drying, refrigerator and air-conditioner production line, lamp manufacture and analytical instrument, etc. The pump can be used alone, also can be used as forepump and backing pump of high vacuum and ultrahigh vacuum system including molecular pump, diffusion pump, roots pump, etc. The pump cannot be used for pumping neither gas containing dust, corrosive and explosive, or gas that can chemically react with black metal and vacuum pump oil; nor can it used as a compression pump or transmission pump. It must not exceed 3 minutes for pump air inlet open continuously to atmosphere. Under the condition that air inlet pressure is less than 1333 pa, continuous operation is allowed. This series of high-speed straight oil seal sliding-vane rotary vacuum pump is characterized by excellent ultimate vacuum, low noise, no oil injection, no oil leakage, etc. The structure of non-return check valve system, pump pressure control system and convenient and reliable gas ballast valve ensure the product of stable performance, long service life, low malfunction, convenient maintenance.

### 2.1 Structure Diagram

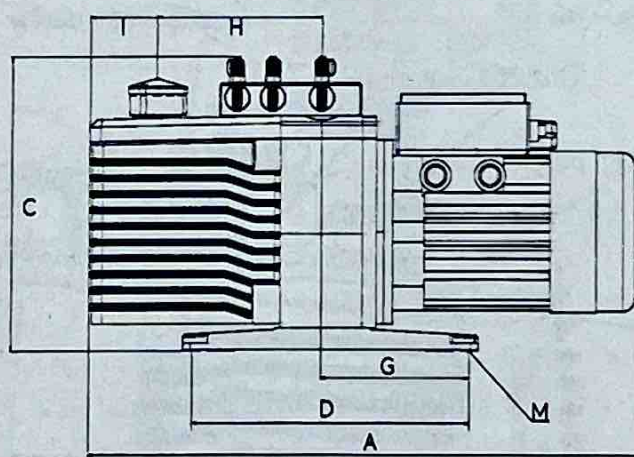
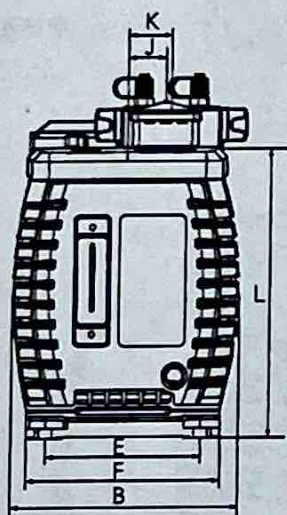
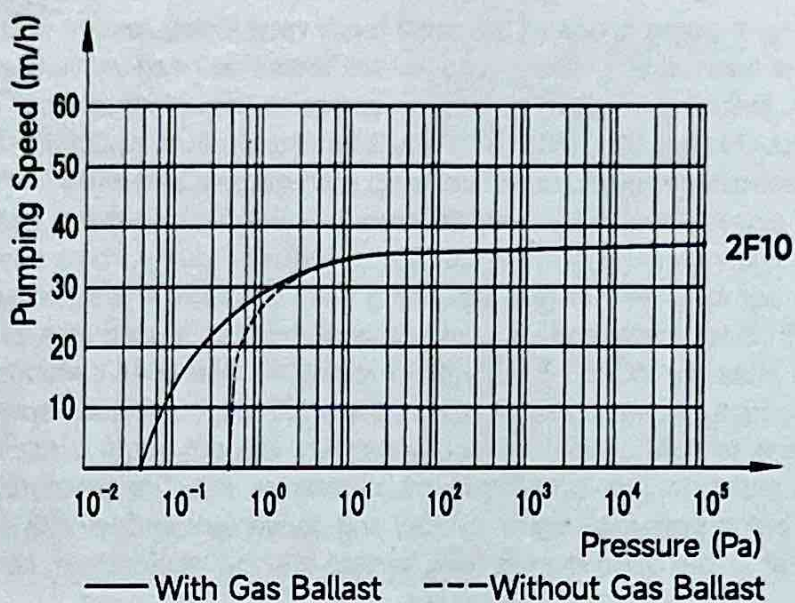




## 2.2 Technical specification

Model	2F10
Pumping Speed	20CFM@50Hz, 24CFM@60Hz
Ultimate Pressure Without Gas Ballast	4 Microns
Ultimate Pressure With Gas Ballast	8 Microns
Rotate Speed	1420 rpm@50Hz, 1700 rpm@60Hz
Motor Power	1.5HP
Fuel-Injection Quantity	2.0 L
Operating Ambient Temperature	8-40°C
Noise	<53 dB
Weight	-40 kg

Pumping rate curve chart



Model	A	B	C	D	E	F	G	H	I	J	K	L	M
2F10	616	205	320	310	140	175	165	186	75	40	34	262	12

单位: mm



### 3. Installation

- (1) The pump must be set at the horizontal position, since unsteadiness and slanting installation might cause pump vibration; the noise might be heightened and even damage might occur.
- (2) When connecting pump with vacuum system, it is suggested to connect with under-chassis screw.
- (3) When choosing pump installation site, the following factors should be taken into consideration: Easy to assemble, maintain and unassembled; Favorable ventilation condition; Easy connection.
- (4) Pump operating ambient temperature: 8-40°C, humidity should be not more than 85%.

### 4. Vacuum system connection

- (1) This pump has 5 inlets and can be connected to the vacuum system as needed.
- (2) The pipeline for connecting the pump with vacuum system should be as short and thick as possible, and curve should be minimized as far as possible.
- (3) The size connecting to the pipe should be at least consistent with the air inlet size. If the pipe diameter is less than the pump inlet diameter, the pumping speed will decline.
- (4) The size of pump exhaust pipe should be at least consistent with the size air outlet. If the pipe diameter is less than the pump air outlet diameter, the pressure of pump fuel tank will increase, and pump vacuum degree will be unstable.
- (5) When install the exhaust air duct, agglomeration should be prevented from refluxing to pump.
- (6) The leakage detecting should be carried out in the joint of pipeline and flange. Good leakproofness is very important for pump to reach ultimate pressure.

### 5. Wiring connection

- (1) Before connection, check and confirm whether the power supply has been cut off.
- (2) The connection should be carried out in accordance with motor sign by trained electricians.
- (3) The connection should be carried out in accordance with the rating value on the motor trademark.
- (4) Please make sure the right rotation direction of the motor after connecting power supply; this should be paid special attention.
- (5) Check the rotation direction of motor through the air inlet:  
first, open the inlet and outlet, and then put the inlet cover on the air inlet;  
then instantaneously power on while observe inlet cover, if it sucked, the right rotation direction of the motor is shown.

### 6. Preparation before operation

- (1) Before starting pump, make sure air outlet is unblocked; starting pump under blocked air outlet is strictly prohibited.
- (2) Check oil level and oil capacity in oil tank before usage.
- (3) Make sure the power supply conform to nameplate rating of motor.



- (4) Ensure the motor rotation is in right direction.
- (5) Changing oil and restarting pump when the pump is stopped for a long time, pump intake port should be covered to start the pump, so as to discharge the gas contained in oil pump.

## 7. Matters needing attention in operation

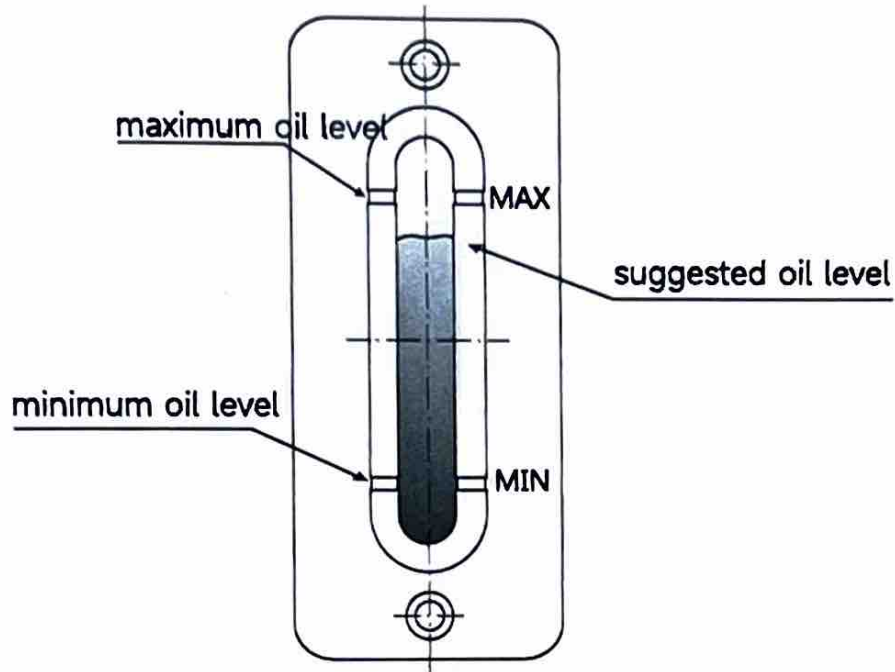
- (1) With condensable gas: pumping perpetual gas, rotary knob of gas ballast valve should be in inactive state.
- (2) Without condensable gas:
  - When vacuum system contains a small amount of condensable gas, turn on gas ballast valve to extract the condensable gas contained in system; when the pumped system declines to a certain value, turn off gas ballast valve to extract air.
  - If the pump work at relatively low temperature, gas may be dissolved in the oil pump, oil might be spoiled, thus affecting the performance of the pump and corrode the pump body. So at the end of the air exhaust, don't stop the pump immediately. Operation should be continued when the gas ballast valve is open and the air inlet is closed, until the condensable gas in oil pump is separated out.
- (3) When the pump is at work or during a short period after termination of pumping, the surface temperature of pump might increase, touching the high temperature part of pump and motor with bare hands is strictly prohibited to avoid scalding.
- (4) Turn off and store the pump:
  - When the work is finished under normal circumstances, you can turn off the pump directly.
  - When the pump was not in use for a long time, block the air inlet and outlet of the pump, to prevent the pump body from being polluted by dust and dirt.
  - When the pump was not in use for a long time, gas will be absorbed on pump and assembly unit; when using the pump again, appropriately extend the time of extraction, after the absorbed gas is out, the pump can come back to normal use.
  - The maximum operating temperature of the pump should not be more than 80 °C.

## 8. Maintenance

- (1) Before discharge the pump from the vacuum system, power supply must be cut off.
- (2) When the pump just stop, the temperature of pump might be high, thus care should be taken to contact the pump to avoid scalding.
- (3) Check the oil capacity:

When the pump is at work, the oil level of pump should be within the corresponding interval of oil mark. If the oil level is too low, you should stop pump and add oil; when the oil level is too high, you should be let out surplus pump oil.





(4) Check the oil quality: Observe the color of pump oil; normal oil pump should be clean and transparent. If oil color turns to dark or turbid, please change oil.

(5) Oil change:

- In order to ensure the pump performance of stability and service life, make sure pump oil is clean and oil capacity is appropriate. Oil change time depends on different usage. If the oil is contaminated, please change oil timely.
- When the pump used for the first time, the time for changing oil should be appropriately shorten.
- It is suggested that oil be changed whenever the pump running for about 100 hours.
- The vacuum degree of pump will constantly decline as working time extends, oil change is needed.

(6) Method for changing oil:

- When changing oil, the pump should be closed; open oil drain plug to put the contaminated oil contained in tank to proper container.
- To discharge the remaining oil in the pump cavity, open air inlet to run the pump for about 10 seconds temporarily. Empty remaining oil, at the same time, check whether the sealing gasket of oil drain plug is in good condition, and screw down the oil drain plug.
- Open the oil fill plug, inject new oil, and screw down the oil fill plug.
- In order to ensure the pump of good performance, the use of dedicated high-speed vacuum pump oil is recommended.

(7) Clean air inlet filter screen:

During the use of filter screen, since powder and oil dirties might be adsorbed and stacked on the filter screen, the pumping speed may decline, or even be blocked. If dirt gets into the cavity, pump may easily be worn or damaged. Regular checking on screen should be carried out depending on different working condition, when cleaning is needed, remove and clean the filter screen, dry it and reinstall it for use. Please replace the pump in the event of any damages.



## 9. Common fault and disposal measures

Symptom	Possible Cause(s)	Disposal measure(s)
Pump won't start.	1. The power can't be connected.	1. Check the power supply, switch, wire connection.
	2. Abnormal input motor voltage.	2. Ensure that the supply voltage matches the motor rating.
	3. Malfunction occurs in motor.	3. Repair the motor.
	4. Too low environment temperature.	4. Increase the environment temperature.
	5. Inner pieces damage.	5. Repair the pump.
	6. Foreign object in the pump blocks the motor.	6. Repair the pump.
	7. Anti-suckback device has some problems.	7. Repair anti-suckback device.
The pump fails to reach the maximum pressure.	1. The gas ballast valve is open.	1. Turn off gas ballast valve.
	2. Vacuum system leakage.	2. Exclude vacuum system leaking point.
	3. Vacuum gauge is imprecise or improper.	3. Repair or change vacuum gauge.
	4. Oil pollution or insufficient oil quantity.	4. Change or add oil.
	5. Oil blockage.	5. Discharge and repair, clean oil channel.
	6. Vent valve plate damage.	6. Change discharge valve plate.
	7. Anti-suckback device has some problems.	7. Repair anti-suckback device.
Air exhaust speed is slow.	1. The diameter in inlet air pipe and exhaust pipe is too small or the pipeline is too long.	1. Change suitable air inlet pipe and exhaust pipe.
	2. Air inlet filter screen and pipeline is blocked.	2. Clean filter screen and dredge pipeline.
	3. Oil has been contaminated.	3. Change oil.
	4. Vacuum system leakage.	4. Exclude leakage point.
	5. Improper pump selection.	5. Select pump with proper pumping speed.
	6. Anti-suckback valve damage.	6. Repair anti-suckback valve.
When the pump stops, the vacuum system pressure increase excessively fast	1. Vacuum system leakage.	1. Check the vacuum system to exclude the leaking point.
	2. Anti-suckback valve damage.	2. Repair anti-suckback valve.
Pump temperature is too high.	1. The input power voltage is abnormal.	1. Check the power supply, switch, wire connection.
	2. Motor bearing damages.	2. Repair the motor.
	3. Insufficient oil.	3. Inject enough oil quantity.
	4. Coupling damage.	4. Change coupling.
	5. Foreign object exists in pump.	5. Discharge and repair, clean the foreign object.
	6. Rotary vane damage.	6. Discharge and repair the rotary pane.
Pump temperature is too high.	1. Insufficient oil.	1. Inject enough oil.
	2. Continuous work of air inlet under high pressure.	2. Reduce the time of exhaust air as far as possible.
	3. Oil supply system is blocked.	3. Discharge the dump to repair and clean, so as to ensure clear oil channel.
	4. Pump fan damage.	4. Repair fan.
	5. The gas temperature of abstracted gas is too high.	5. Add cooling equipment in air inlet.
	6. Working environment temperature is too high.	6. Lower ambient temperatures.
Oil injection in air outlet	1. Too much oil injection.	1. Let out surplus oil.
	2. Gas ballast valve is open.	2. Close gas ballast valve.
	3. Continuous operation of air inlet under high pressure.	3. Reduce the time of exhaust air.
	4. Pump discharge valve plate damage.	4. Change discharge valve plate.
	5. Vacuum system leakage.	5. Check and exclude vacuum system leakage.
Fuel consumption is too high	1. Leakage occurs between tank and pump bearing oil.	1. Change sealing gasket.
	2. Oil seal damage or corrosion.	2. Change new oil seal.
	3. Oil seal set damage or improper installation.	3. Change new oil seal and install oil seal correctly.
	4. Drain plug sealing gasket damage.	4. Change sealing gasket.