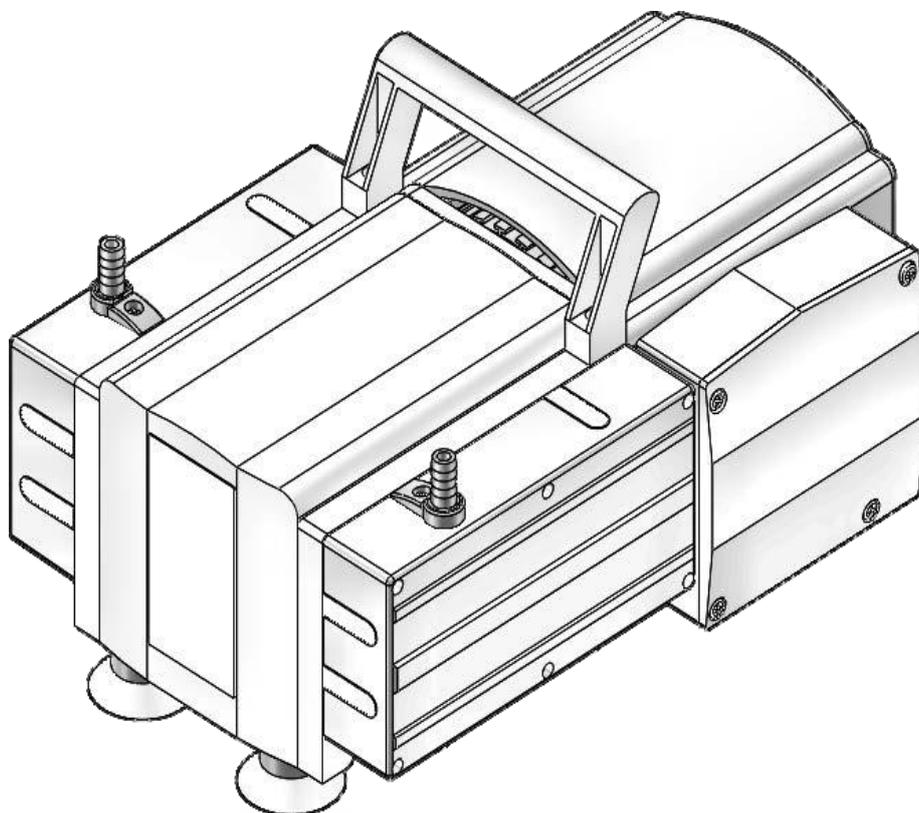




# Diaphragm Vacuum Pump

# Instruction manual of diaphragm vacuum pump



**USA LAB INC**

(Please read the instruction manual carefully before operation and keep it properly)

## **Preface**

### **1. Safety**

This chapter elaborates on the safety rules/regulations involved in the installation and use of the DVP series diaphragm vacuum pump. Users should follow the operating procedures strictly to ensure product and personal safety and avoid accidents while mastering the relevant warning signs.

### **2. User qualification**

The operator of the DVP series diaphragm vacuum pump should have practical operating experience and be able to master the requirements in this manual. Otherwise, it should be used under the guidance of personnel with corresponding technical abilities.

### **3. Usage**

The DVP series diaphragm vacuum pump is required to install indoors, which can be used in conjunction with other products to provide the pressure conditions required for experimentation or production.

### **4. Application scope:**

- a) Evaporation and distillation testing equipment;
- b) Concentrator;
- c) Vacuum drying oven
- d) Reactor;
- e) Negative pressure filtration test, solid phase extraction test

### **5. Improper use**

Any operation which is failed to follow the instruction manual constitutes improper use.

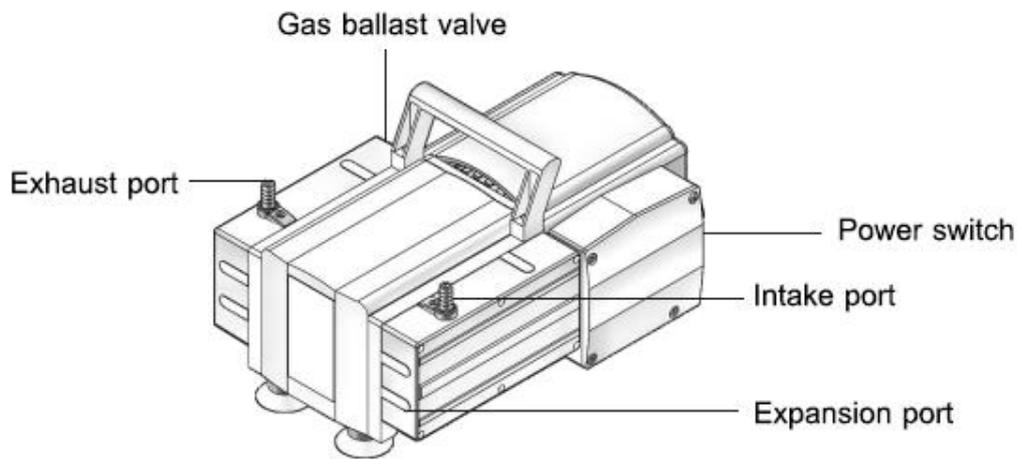
Any damage caused by improper use shall be the sole responsibility of the user. It is prohibited to use under the following conditions:

- a) Explosive gas environment or explosive dust environment;
- b) Places where the power supply does not meet the requirements;
- c) Strong magnetic field environment or corrosive environment.
- d) This product is not suitable for pumping flammable and explosive substances, liquids, solid particles, or media with extremely high dust content.

## Overview

The diaphragm vacuum pump is a laboratory instrument independently developed by our company with high vacuum, corrosion resistance, and low noise. It can be used with products, such as rotary evaporators, reactors, and vacuum filters to meet the vacuum requirements of different application scenarios. When used in conjunction with our vacuum controller, the diaphragm vacuum pump can achieve precise adjustment of vacuum degree, resulting in more accurate and effective experimental research data.

## Structure



## Product Features

1. Superior corrosion resistance: All parts in contact with air such as diaphragms, valve plates, chambers, gas pipelines, and exhaust joints are made of corrosion-resistant materials such as PTFE/FFKM, which are suitable for various complex environments.
2. High vacuum degree: The maximum pressure can reach 800pa.
3. Fast pumping: The pumping rate can reach 60L/min.
4. Strong power: 200 W motor provides strong power, large output torque, and stable speed.
5. Low temperature rise: Reasonable air duct design combined with larger fan blades enables better heat dissipation of the motor, lower pump body temperature, and surface temperature not exceeding 55 °C.
6. Stable operation: The transmission mechanism has undergone special dynamic balancing treatment, resulting in small body amplitude and smooth operation.
7. New appearance design: With a completely new appearance design, the diaphragm pump is smaller in size and lighter in weight.
8. The parts in contact with gas are coated with PTFE or PTFE material, and the diaphragm and valve plate are made of PTFE or Teflon material.

## Technical parameters

Model	USA-DVP-2.4
Ambient temperature (°C)	5-35
Environmental relative humidity (%)	≤70
Motor power (W)	200
Maximum vacuum degree/ultimate pressure (Pa/mbar)	600/6
Power supply	220-240v~,50HZ
Ultimate pumping rate (L/min)	60
Air intake size	Ø6*Ø8
Exhaust size	Ø6*Ø8
Recommended hose sizes for intake and exhaust	Ø14*Ø8
Gas ballast valve	PTFE+FKM
Valve plate material	FFKM
Diaphragm material	PTFE+FKM
Material of the gas line connection pipe	FEP
Material of air intake and exhaust	PTFE+C
Gas chamber	ETFE
Case protection grade	Ip20
Overall dimension W*D*H(mm)	354*250*210
Net weight (Kg)	9.5
Package dimension W*D*H(mm)	400*305*250
Gross weight (Kg)	10

## Test data

### 1. Testing conditions:

1. Environmental temperature 20 °C
2. Test site: Our R&D center

### 2. Testing result:

Ambient temperature	RH	Testing equipment		Target vacuum value	Time
		Diaphragm vacuum pump	Rotary evaporator		
20°C	≤70 %	DVP-2.4	ATR-001 2L	10mbar	20s
20°C	≤70 %	DVP-2.4	RE-1005 5L	10mbar	1min
20°C	≤70 %	DVP-2.4	RE-1010 10L	10mbar	2min
20°C	≤70 %	DVP-2.4	RE-1020 20L	10mbar	6min
20°C	≤70 %	DVP-2.4	RE-1050 50L	10mbar	14min

## Packing list

Item	Name	Quantity
1	Diaphragm vacuum pump	1 unit
2	2-meter silicone hose (used at the exhaust)	1 pc
3	Power cord	1 pc
4	Instruction manual	1 copy

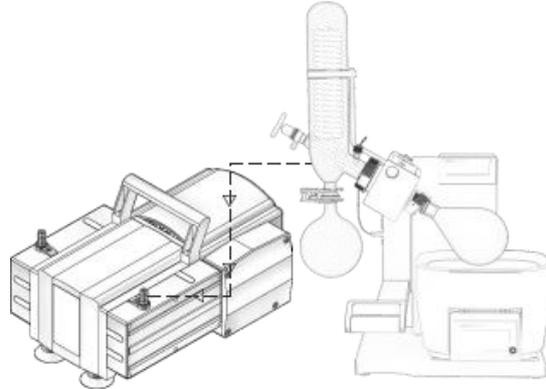
## Installation

### 1. Precautions:

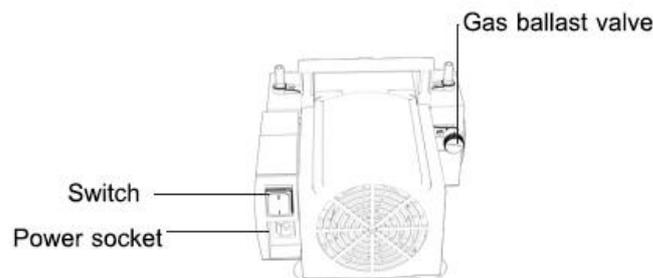
- 1) The workplace should be kept clean and dry;
- 2) During the installation process, the product cannot be inverted;
- 3) The ventilation opening of the product must not be obstructed! The surrounding environment should be well ventilated;
- 4) If liquid splashes or spills onto the product casing, it should be wiped clean first to ensure that all components are intact before being put into use;
- 5) Open the outer packaging box, take out and read the product manual carefully, and check whether the equipped components are complete according to the packing list;
- 6) Place it on a stable workbench with a tilt angle of no more than 10 degrees;
- 7) Keep the instrument away from objects or equipment that are magnetic or capable of generating magnetic fields;
- 8) Do not use instruments in areas with explosive hazards;
- 9) Do not use the instrument in a high humidity or high dust environment for a long time.

### 2.Connection&operation:

- 1) Connect the silicone tube to the exhaust port of the rotary evaporator or other equipment
- 2) Make sure the connecting pipe is firmly fixed without sharp corners or folds
- 3) Connect the power cord to the power socket shown in Figure 2



- 4) Turn on the switch and start the diaphragm vacuum pump
- 5) By adjusting the gas ballast valve to change the pressure in the gas chamber, the effect of sewage discharge or drainage can be achieved, and the vacuum can be stabilized.



## Daily maintenance

- 1) If the vacuum degree is unstable during daily use, the gas ballast valve can be opened to use the pressure difference to blow the internal pipeline;
- 2) When pumping organic solvents for a long time, the pipeline can be appropriately cleaned with clean water;
- 3) If the vacuum degree cannot be reached, and it is necessary to check whether the gas ballast valve is open. If it is open, please close it; Check if there is any damage to the gas pipeline. If there is any damage, please replace it with a new pipeline; Check if there is any dirt in the transparent pipeline at the lower end of the pump body. If there is any dirt, please open the gas ballast valve to blow or disassemble the pipeline for cleaning.
- 4) Motor malfunction: If you encounter a motor malfunction, please contact our professional after-sales engineer to resolve it.

## Warranty Statement

The warranty period of our company's product is one year (calculated from the date of product sale). During the warranty period, users can replace or have free repairs for products with quality issues by presenting the warranty card and commercial invoice. Except for one of the following situations:

1. The warranty period has expired;
2. Instrument damage caused by the user's own fault;
3. The user did not follow the instructions and caused damage to the instrument;
4. The damage to the instrument caused by exposure to radioactive or corrosive substances;
5. The damage to the instrument caused by the user's unauthorized disassembly or repair and debugging by maintenance personnel not approved by our company.

## Warranty Card

Customer name			
Product name		Product model	
Contact person		Contact method	
S/N:			
Customer's feedback:			