



D11 Precision Micro Pressure Gas Pump

User Guide

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Hilintec

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About This Document

Purpose

This document is a description of the D11 precision micro pressure gas pump products in testing period, which is used to guide relevant technical personnel to initially understand the characteristics of the product.

Intended Audience

This document is intended for technical personnel. You should have a good understanding of your product and have a clear concept of the relevant parameters, specifications, and other information of the applications of the micro pump.

Keyword

Related parameters, wiring instructions, small size, large flow rate

Change History

The change history accumulates each update of this document. The latest version of the document contains all the previous updates.

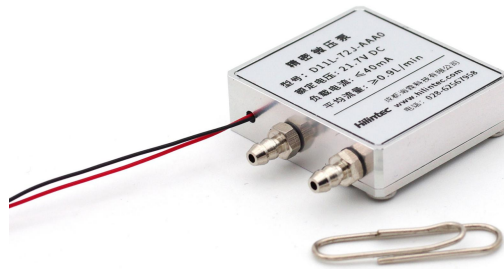
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01	2022.09.26	1.0	GJW	First official release.

Contents

About This Document	I
Change History	III
Contents	IV
1 Characteristics	6
1.1 Compact Size.....	6
1.2 Structure Advantage.....	6
1.3 Flow Pulsation.....	6
1.4 Compact Size, Large flow Rate, Low Pressure.....	7
2 Special Functions	8
2.1 Flow Adjustable Function.....	8
2.2 Convenient Hose Connection.....	8
3 Technical Specifications	9
3.1 Performance Specifications.....	9
3.2 Configuration List.....	9
3.3 Reliability Parameters.....	10
3.4 Modular hose connector options.....	10
4 Product Description	11
4.1 Medium Requirement.....	11
4.2 Load Requirement.....	11
4.3 Corrosion Requirement.....	11
4.4 Operating Requirement.....	11
5 Product Model Description	12
4.1 Brief Description of Model Naming.....	12
6 Filtering diaphragm replacement instructions	13
6.1 Filtering Diaphragm Replacement Instructions.....	13

7 Electrical Connection	14
7.1 Definition of Signals	14
7.2 Logic Wiring Diagram	6
8 Cautions	7
9 Dimensions	8
10 Appearance	10

1 Characteristics



1.1 Compact Size

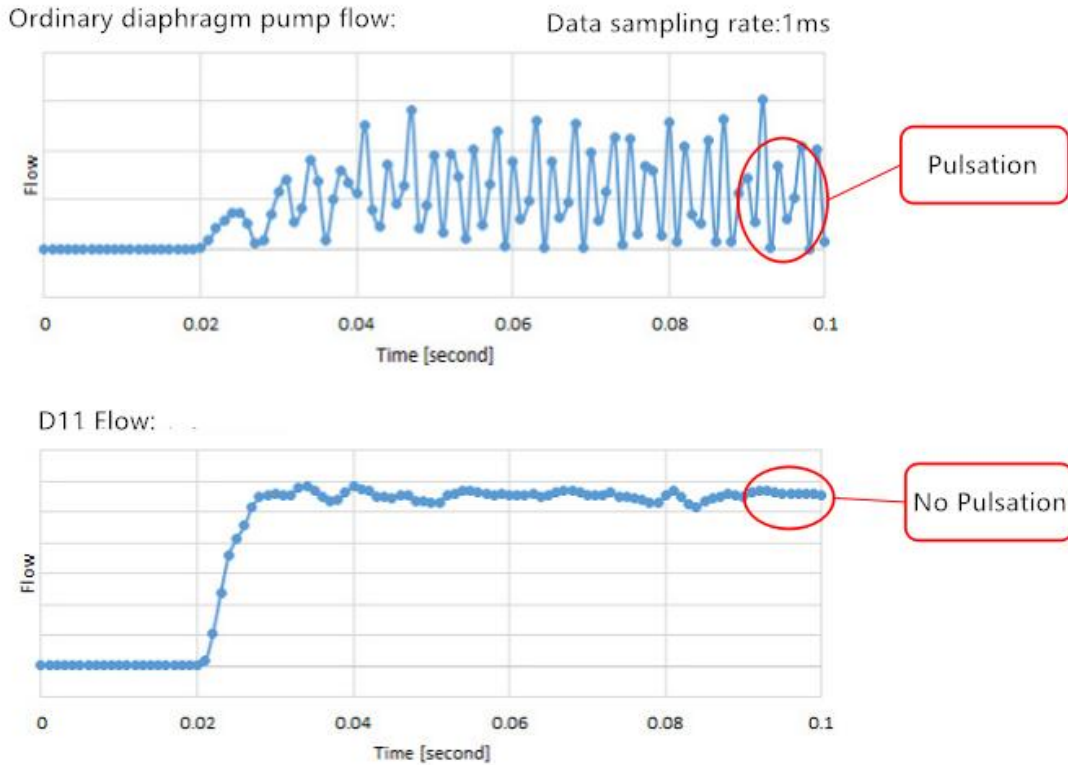
The product weighs about 30g with an overall size of about 40*35*10mm. It is suitable for applications that require thin thickness, small volume.

1.2 Structure Advantage

There are no mechanical rotation and transmission parts inside, and the Bernoulli principle is used to transmit gas, so that it has the advantages of no vibration and low noise; the outer shell is made of aluminum alloy, which has a certain protection ability against external impact and has good air tightness

1.3 Flow Pulsation

Due to the completely different working mode from traditional air pumps, it has more advantages than traditional air pumps in terms of flow pulsation. It has a flow output stability far exceeding that of diaphragm pumps, and the flow pulsation is extremely small.



1.4 Compact Size, Large flow Rate, Low Pressure

In the case of a sufficiently small volume, a large flow parameter far exceeding the volume limit is generated, and the flow output is stable and reliable; different from traditional pumps, this product controls the pressure and vacuum at an extremely low level while meeting the large flow rate, Suitable for some small volume, large flow, low pressure scenarios.

2 Functions

2.1 Flow Adjustable Function

The flow rate can be controlled by adjusting the input voltage, and the flow rate has no obvious saltatory fluctuations during adjustment; the adjustable range is large, and a wide range of adjustments from 0L/min to 0.9L/min can be realized

2.2 Convenient Hose Connection

Under the premise of small volume, interchangeable connectors are realized, and copper air nozzles or M3 internal thread connectors can be selected according to application needs; and because the pressure of the air circuit of this product is extremely low, the requirements for the strength of the pipeline connection are corresponding reduced, there is no need to consider the strength of the pipeline connection when connecting the pipeline; but the pipeline connection should not be too long, otherwise the flow rate may drop

3 Technical Specifications

3.1 Performance Specifications

Model	Rated Voltage (V DC)	Rated Voltage (mA)	Peak Flow (L/min)	Average Flow (L/min)
D11M	21.7	≤40	≥0.9	≥0.9

- Note:**
1. The operating voltage requires 11V~21.7V. The input voltage changes will affect the load current and flow.
 2. Unless otherwise specified, the technical parameters are measured under the conditions of temperature 20°C and standard atmospheric pressure of 101kPa.
 3. The parameters in the table are measured at rated voltage.
 4. The peak flow rate in the table refers to the flow value measured with a rotameter, and the average flow rate is measured with a soap film flow-meter.

3.2 Configuration List

Material List		
Pump Chamber	Aluminium Alloy	
Air Nozzle	Copper Hose Connector	
Pump interior	Ceramic Nitrile Polypropylene	
Connector options		
Connector Type	Default Hose Connector A type	M3 internal thread

3.3 Reliability Parameters

Models	D11
Version	Premium Version
No Load Lifetime (hrs)	5000hours(Estimated)
Test conditions	life test conditions:the inlet and outlet are directly connected to the atmosphere, let the pump work continuously under normal pressure for 24 hours without stopping
	Environmental conditions for life test: In a clean, non-corrosive laboratory, the ambient temperature is 5~33℃ fluctuates with the climate, and the relative humidity of the environment is 50%~85%, fluctuates with the climate;
	The source of the experimental data is from Hilin Technology Aging and life laboratory and supplier laboratory
Working Conditions	
Environment	Permissible ambient temperature range is 0℃~40℃, The permissible relative humidity is ≤90%, no condensation. The pump should not be exposed to the sun, and should work in a clean and ventilated environment. Life test data comes from pumping clean air. When pumping ordinary indoor and outdoor air, the flow rate of the pump may drop and attenuate due to the accumulation of dust inside the air. The filter membrane should be replaced at least every 300 hours of accumulated work.

3.4 Options of Modular Pneumatic Connectors

Connector Option	Material	Recommended Hose/Tube
Default hose connector A type	copper	Silicone hose with inner diameter 2.5~3mm
M3 internal thread	aluminium alloy	M3 external thread connectors(Recommended effective thread length 3mm)

4 Product Instructions

4.1 Medium Requirement

The temperature of the medium is 0° C~40° C, and liquids are not allowed; it is not allowed to inhale moist gas and oily mist gas, especially smoke such as cigarettes and mosquito coils will seriously affect the lifetime of the product; it is recommended to use it with an external filter

4.2 Load Requirement

This product is a device for sucking/discharging air with a small pressure. It is only suitable for transporting gas medium, and is not suitable for occasions that need to generate a large vacuum degree and pumping pressure.

4.3 Corrosion Requirement

When the pump is working, it should avoid pumping corrosive gas, and the material of the pump casing has certain corrosion resistance

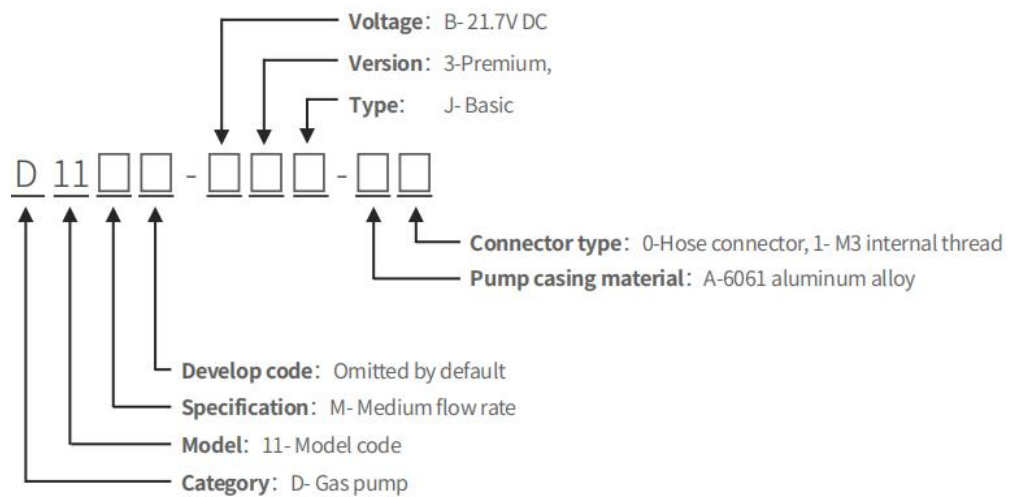
4.4 Operating Requirement

This product can suck/exhale air. dust in the air may accumulate in the pump chamber, which will be affected by dust during work. Please choose to use it in a dust-free environment, or replace the matching filter membrane or external filter regularly; If the filter membrane is not replaced regularly, it may lead to a decrease in product parameters or even irreversible damage

5 Product Model Description

5.1 Brief Description of Model Naming

This series of products are basic type-premium version



Example: D11M-B3J-A1 (D11M air pump, 21.7V voltage, basic type-premium version, Aluminum alloy body, M3 internal thread connector)

6 Filtering Diaphragm

6.1 Dust Filtering Diaphragm Replacement Instructions

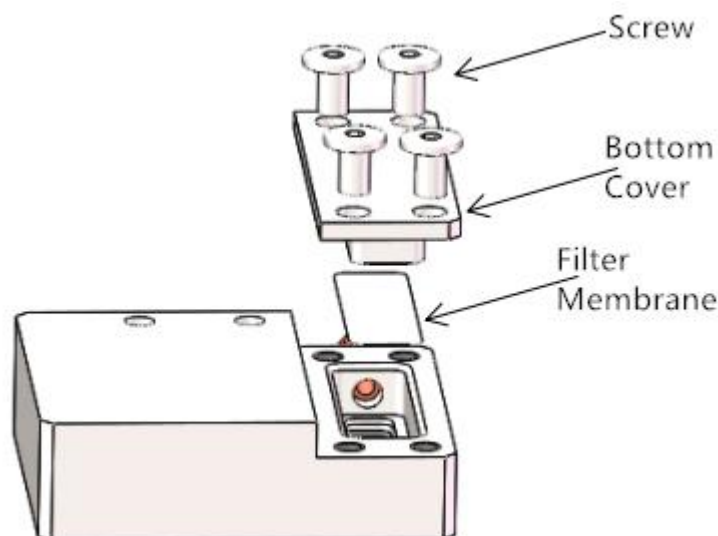
When the pump works in an environment with dust, it is necessary to replace the dust filtering membrane every 300 hours during the accumulated working time, so as to avoid the decrease of parameters and the premature damage of the pump body.

When the flow rate of the pump drops slightly, and the accumulative working time under normal indoor air reaches 300 hours, the back cover should be opened to check and replace the filtering membrane. When working in an environment with a lot of dust, the flow rate should be monitored regularly. And check and replace the filtering membrane in advance.

Product damage caused by working in a severe dust environment and failing to replace the filter membrane as required is not covered by the warranty.

Unscrew the screws and remove the bottom cover, take out the filtering membrane with tweezers and replace it;

The screws are 4*M2.5 hexagon socket screws;



7 Electrical Connection

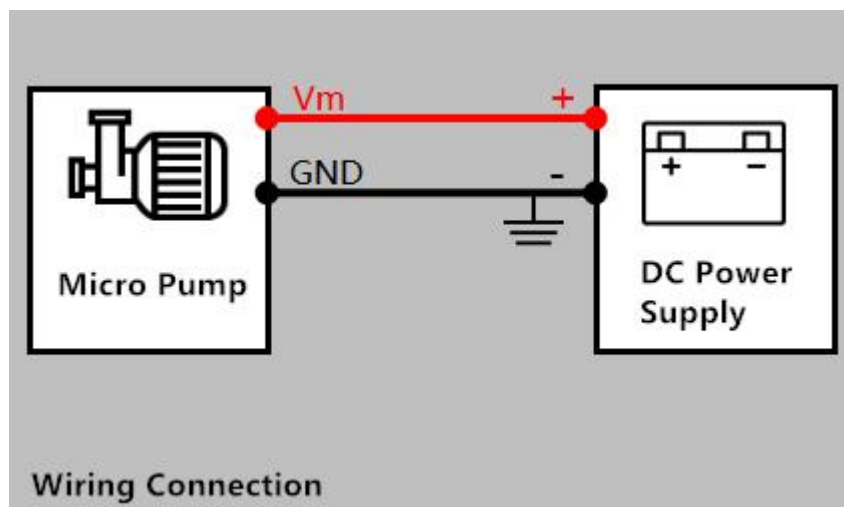
7.1 Definition of Signals

There are 2 wires for this product. The wiring and usage instructions are as follows.

S. N.	Color	signal name	Function	Explanation	Remarks
1	Red	Vm	Positive pole of the power supply	11V~21.7V The flow can be controlled by adjusting the input voltage	The voltage is not allowed to exceed 22V, otherwise the product lifetime will be affected
2	Black	GND	Negative pole of the power supply	/	/

7.2 Logic Wiring Diagram

This product only contains the positive and negative input of the power supply. It only needs to be connected to the appropriate voltage range to operate normally, and the flow rate can be adjusted by adjusting the voltage.



8

Cautions

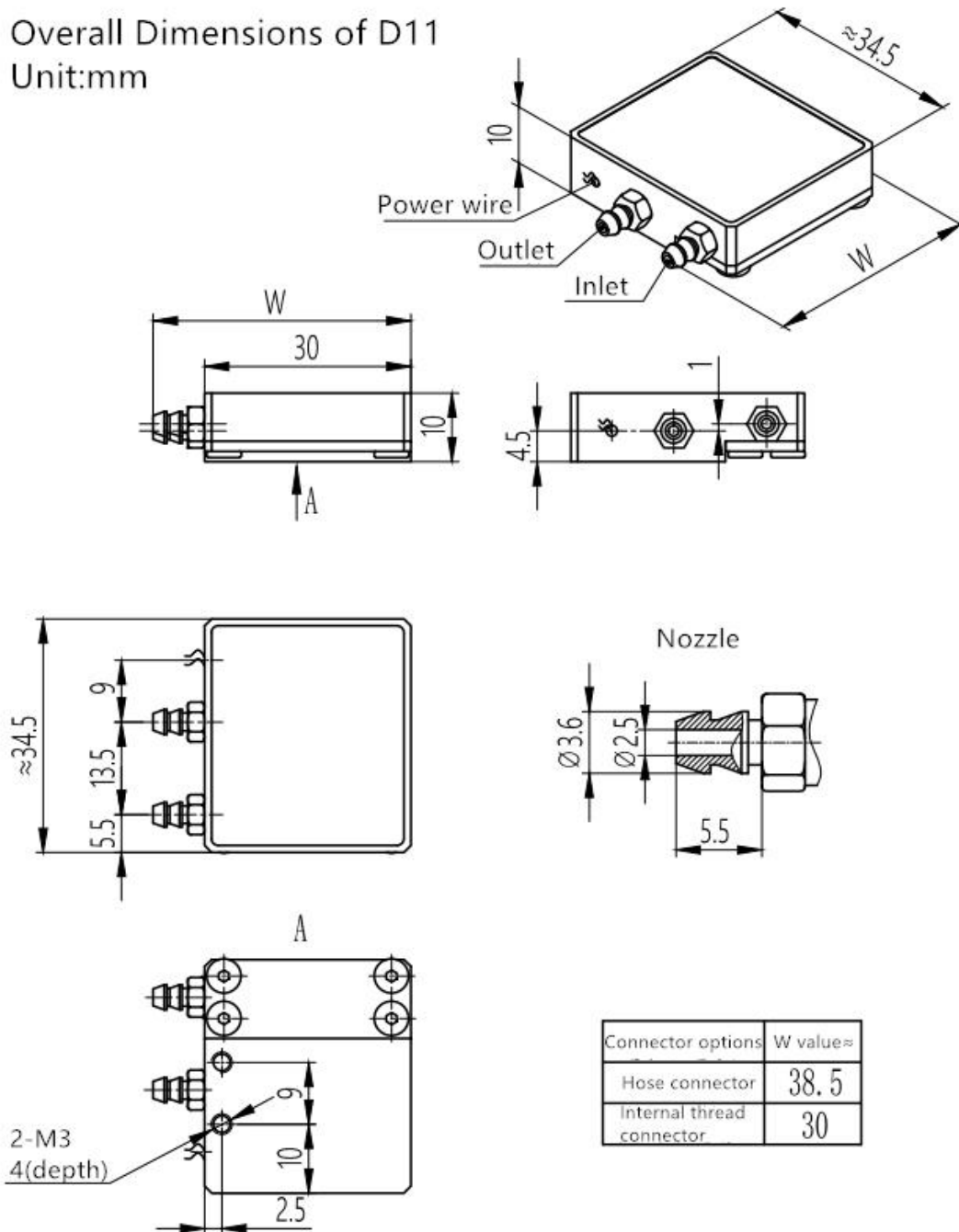


Please read the instructions in this chapter carefully and follow the instructions strictly before use.

- 1. This product has no waterproof, dust-proof, and explosion-proof functions and cannot be used in flammable and explosive environments!**
- 2. Foreign matter must not fall into the connectors, and there should be no solid particles or oil mist in the medium, otherwise the micro pump will be damaged!**
- 3. When this product is used to transfer harmful medium, it must be double-sealed to ensure personal safety!**
- 4. Do not disassemble part of the structure of the sealed pump body, artificial disassembly damage is not covered by the warranty**
- 5. Please follow the user guide instructions strictly!**
- 6. Use in a dust-free environment!**
- 7. Please replace the filter membrane or filter regularly as required. The decrease of flow rate and early damage caused by dust accumulation are not covered by the warranty!**

9 Dimensions

Overall Dimensions of D11
Unit:mm



Connector options	W value≈
Hose connector	38.5
Internal thread connector	30

Installation instructions:

1. The size shown in the picture is the approximate installation size, the actual size may be slightly different, the final size is subject to the actual object;
2. The pump bottom comes with two M3 screw mounting holes, the effective thread length is 4mm
3. If you do not use screws for fixing during installation, you can also use adhesive for fixing

10

Appearance

