D35 Vacuum Pump Series

# User Guide

**Issue** **16**

**Date** **2020-06**

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# About This Document

## Purpose

This document is related to the D35 flow control vacuum pump products,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

LCD touchscreen speed control, frequency speed control, anti-loosening connector, knob speed control, related parameters, wiring instructions

# Change History

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

| Issue | Date | Product Version | Issuer | Modification |
|---|---|---|---|---|
| 10 | 2019-11 | 1.0 | LWL | Correct the drawing of dimensions |
| 11 | 2019-11 | 1.0 | XYL | Add the D35H high pressure product |
| 12 | 2019-12 | 1.0 | XYL | Update current parameter |
| 13 | 2020-1 | 1.0 | LWL | Correct wiring instructions of the top configuration type |
| 14 | 2020-5 | 1.0 | LWL | Add the flow curve, starting current curve and types of connectors |
| 15 | 2020-5 | 1.0 | LYZ | Correct the description of frequency speed control signal |
| 16 | 2020-6 | 1.0 | LWL | Update description of medium |

# Contents

# 1 Characteristics


## 1.1 Working Status Indicator

Only the knob speed control type and frequency speed control type are equipped with working status indicator lights, which can visually feed back the working status of the pump. The top configuration type is equipped with an LCD touch screen that can display working status and fault codes.

## 1.2 Brush-less DC Motors

This model is driven by brush-less motors which have the advantages of long service life, low interference and high reliability.

## 1.3 Protections

Equipped with overheating protection, overload protection, power supply under-voltage and over-voltage protection and reverse connection protection function, which to the greatest extent prevents accidental damage to the pump.

## 1.4 Modular Pneumatic Connectors

This series of pumps has Rc1/8 internal thread interface, which can be installed with stainless steel push-in connectors (6mm and 8mm inner diameter), reinforced nylon hose connector, stainless steel hos connectors and PP hose connectors. This product is equipped with reinforced nylon hose connectors as standard. The standard reinforced nylon hose connector is recommended to match 4*8 silicone tube and the optional plastic and stainless steel hose connectors are recommended to match with 7*13 silicone hose. The size of the tube can be appropriately changed according to the softness and hardness of the hose.There are two options of stainless steel push-in connectors for matching with 6*8 or 4*6mm hard tubes. The user can select the corresponding pneumatic connectors when ordering according to the pipeline situation. For ordering options, see section 3.4.

# 2 Special Functions

## 2.1 Speed Control Function

The flow rate of the pump can be changed by adjusting the motor speed. The Top configuration type is equipped with an LCD touch screen and speed control signal interface, which can be used to start and stop and control the motor speed through the LCD touch screen, and also through frequency signals. Knob speed control type models have an external speed control knob, which can control the speed, start and stop of the pump. Frequency speed control type models can be controlled by user inputting frequency signal. Please refer to Chapter 5 Electrical Connection for specific usage of different speed adjustment methods.

## 2.2 Working Status Indication and Warning

1.The knob speed control type and frequency speed control type are equipped with working status indicator lights. Users can understand the working status of the equipment through the color change of the indicator lights:

When the green light is constantly on, it means the power supply is normal and the pump is not working;

When the green light flashes, it means the pump is working normally;

c.When the indicator light remains red, it means that the power supply voltage is too high or too low. If the voltage is correct and the red light is constantly on, it means the pump is working abnormally;

d.When the positive and negative poles are reversed, the indicator light is off, the pump does not work, but it will not damage the pump.

2. The Top configuration type is equipped with a LCD touch screen, and alarm codes will be displayed when different faults occur, and fault handling is more convenient. (The figure below is

for illustration only, please refer to Chapter 5 Alarms and Troubleshooting for details.)


## 2.3 State Memory Function

When the pump is stopped due to abnormal power failure, the pump will continue to run according to the state and speed of the last power-off when the power supply is recovered. When using the knob or touch switch to start the pump, the pump will continue to run at the speed before the last shutdown. (**Note:** This function is only valid on the frequency speed control type, knob speed control type and top configuration type.)

# 3 Technical Specifications

## 3.1 Key Specifications

| Model | Rated Voltage (V DC) | Load Current (mA) | Flow (L/min) | | Relative Vacuum (-kPa) | Output Pressure (kPa) |
|---|---|---|---|---|---|---|
| | | | Peak Flow | Average Flow | | |
| D35L | 24 | ≤280mA | ≥4.0 | ≥2.4 | ≥35 | ≥58 |
| D35S | 24 | ≤250mA | ≥3.0 | ≥1.8 | ≥30 | ≥40 |
| D35L | 12 | ≤380mA | ≥4.0 | ≥2.2 | ≥35 | ≥58 |
| D35S | 12 | ≤350mA | ≥2.0 | ≥1.6 | ≥30 | ≥40 |
| D35H | 24 | ≤450mA | ≥8.0 | ≥5.0 | ≥55 | ≥130 |

**Note:** 1. The input voltage requires 24V±10%.

2. Unless otherwise specified, the technical parameters are measured under the conditions of temperature 25℃ and standard atmospheric pressure of 101kPa. For products with other parameters and specifications, you can contact us to customize.

3. The parameters in the table are measured at the maximum speed of the motor. When the motor speed changes, the pressure/vacuum level is basically unchanged.

4. The above parameters are measured under the configuration of standard stainless steel hose connectors. If other types of connectors are configured, the parameters may change slightly.

5. 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 Description of Types

| Types | Function and Configurations |
|---|---|
| Basic Type | Equipped with brushless DC motor, long service life, low electromagnetic interference, and non-adjustable motor speed. |
| Knob Speed Control Type | Equipped with working condition indicator and speed control knob switch, through the knob to adjust the speed, start and stop of the pump. |
| Frequency Speed Control Type | Equipped with working status indicator, equipped with a signal connector to adjust the speed,start and stop through the input frequency signal. |
| Top configuration Type | Not only equipped with an LCD touch screen to control motor speed and display fault code, but also equipped with speed regulation and feedback signal port. |

## 3.3 List of Models Combination for Sale

| Version / Type | Simplified Version | Standard Version | Premium Version |
|---|---|---|---|
| Basic Type | D35L、D35S、D35H | All models customizable | All models customizable |
| Knob Speed Control Type | | D35L、D35S、D35H | D35L、D35S |
| Frequency Speed Control Type | | D35L、D35S、D35H | D35L、D35S |
| Top Configuration Type | | | D35L、D35S |

**Note**: √ in the above table means that there is a corresponding product for sale, unchecked means that there is no corresponding product. (The above table does not include customized products.

## 3.4 Options of Modular Pneumatic Connectors

| Connector Option | Material | Recommended Hose/Tube |
|---|---|---|
| Default hose connector | reinforced nylon | Silicone hose with inner diameter 4mm |
| plastic hose connector | PP | Silicone hose with inner diameter 6~7mm |
| Stainless steel hose connector | Stainless steel | Silicone hose with inner diameter 7~8mm |
| PC6 push-in connector | Stainless steel | 6mm outer diameter hard tube |
| PC8 push-in connector | Stainless steel | 8mmouter diameter hard tube |
| Nylon Rc1/8 internal thread | reinforced nylon | Install connectors above or other kind of connectors |

**Note:** The products are shipped with reinforced nylon hose connectors by default. If you need to configure other types of connectors, please specify when ordering.

## 3.5 Description of Versions

| Version / Performance | Simplified Version | Standard Version | Premium Version |
|---|---|---|---|
| Life-time | ⩾2500h | ⩾6000h | ⩾10000h |
| Reliability | ★ | ★★★ | ★★★★★ |
| Parameter consistency | ★ | ★★ | ★★★ |
| EMC | ★ | ★★ | ★★★ |

| | | | |
|---|---|---|---|
| Ambient temperature | 0~40℃ | 0~50℃ | 0~50℃ |

**Note**: 1. The more ★, the better performance of this item.

2. The lifetime above does not refer to the lifetime of D35H. The lifetime of D35H is currently> 500h and related tests are still in progress.

## 3.6 Life-time Test Conditions

In a clean, non-corrosive laboratory, the pump carries a full load (With the outlet of D35L, D35S is blocked, the inlet directly open to the atmosphere, D35H is tested under three conditions: 1. The outlet is blocked and the inlet is directly open to the atmosphere 2. The inlet is blocked and the outlet is directly open to the atmosphere 3.The inlet and outlet are directly open to the atmosphere), and runs continuously around the clock; the ambient temperature 5℃～33℃, fluctuates with the climate; the relative humidity 30% ～ 85%, fluctuates with the climate.

## 3.7 Working Conditions

1.Environment: Permissible ambient temperature range of the simplified version products is 0 ℃ ～ 40 ℃ , and the permissible ambient temperature of the standard and premium versions is 0℃～50℃. The permissible relative humidity of all pumps in this series is ≤90%, no condensation. The pump should not be exposed to the sun, and should work in a clean and ventilated environment.

2.Medium: Permissible gaseous media temperature range is 0 ℃～50℃. The medium is allowed to be rich in water vapor, but cannot contain particles or oil mist.

3.Load: Both the inlet and outlet can operate at full load (i.e. completely blocked the inlet), but the applied load at the inlet cannot exceed the maximum vacuum of the pump; the load applied at the outlet cannot exceed the maximum pumping pressure. D35H can work intermittently under the maximum pumping pressure, and working under the maximum pumping pressure for a long time will shorten the service life of the pump.

**Note 1:** Customers who have special requirements for the medium temperature can customize a high-temperature medium model. The

customized high-temperature models are only available in premium versions, such as D35L-43D-GJ (the premium version equipped with a high-temperature medium feature, which allows gaseous medium temperature range of 0℃～100℃)

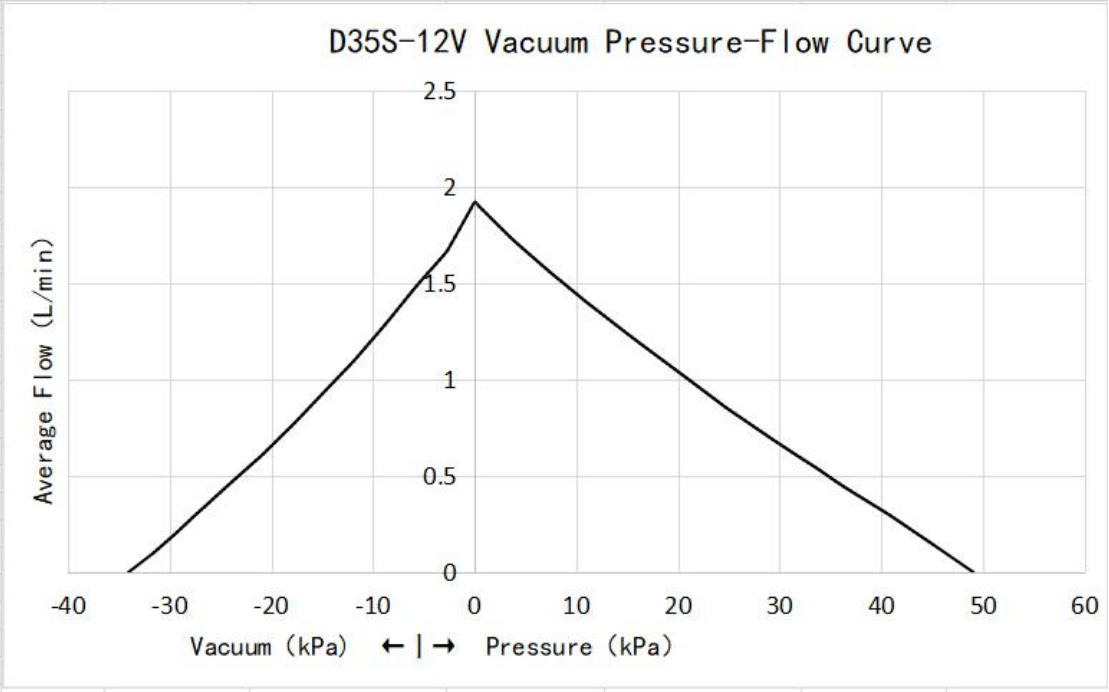
## 3.8 Pump Materials

1. The materials of the wetted parts: reinforced nylon and EPDM rubber, stainless steel. Please check the tolerance of the medium according to the wetted material.If you adopt push-in connector and stainless hose connector, the material of the wetted parts is stainless steel. For special needs, you can customize or change the material of pneumatic connectors.

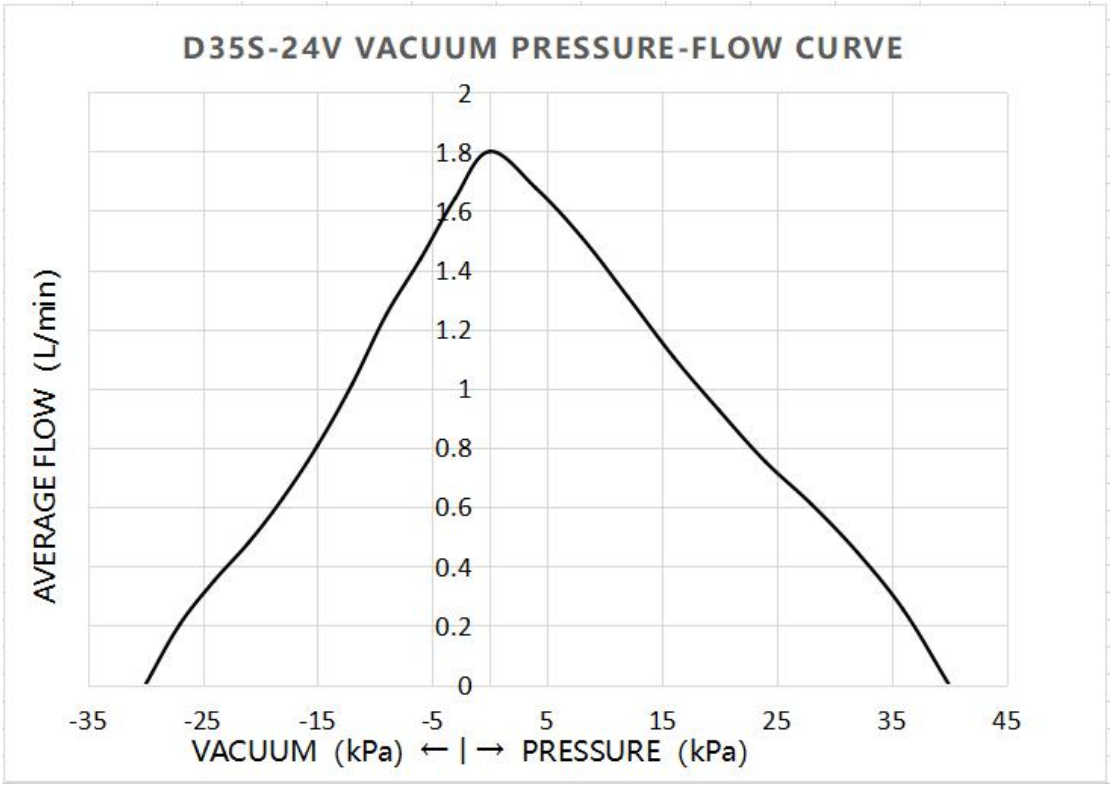
2. The material of the pump body is reinforced nylon, and the material of the shock absorb foot is PVC.

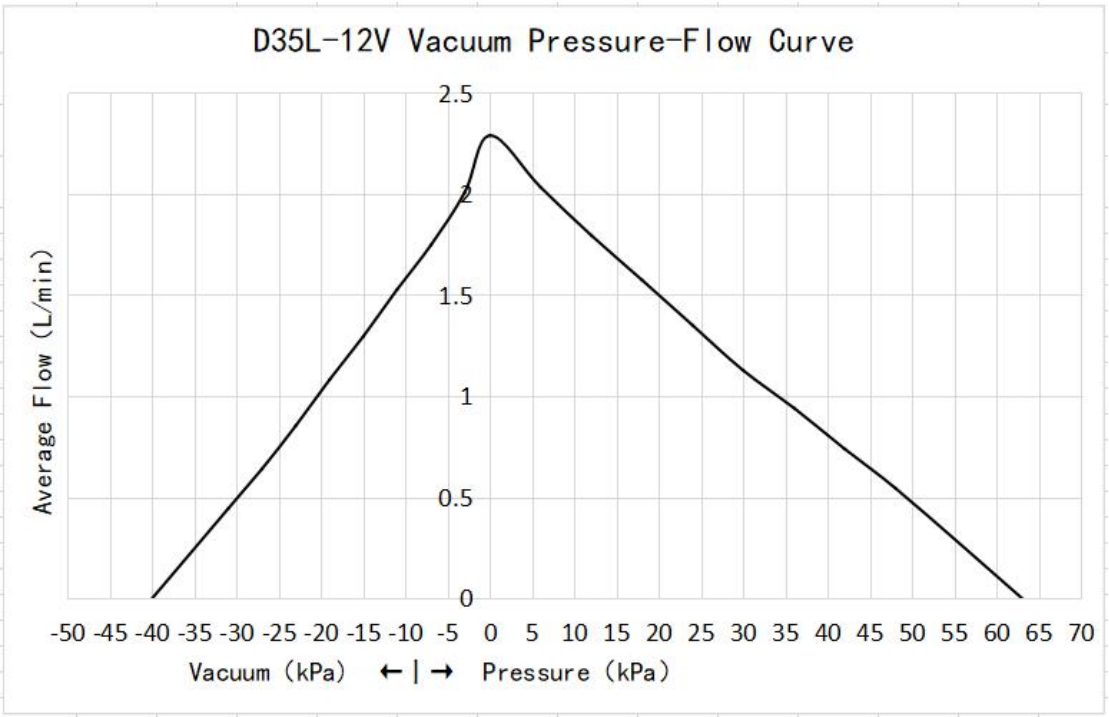
## 3.9 Vacuum Degree Pressure-Flow Curve

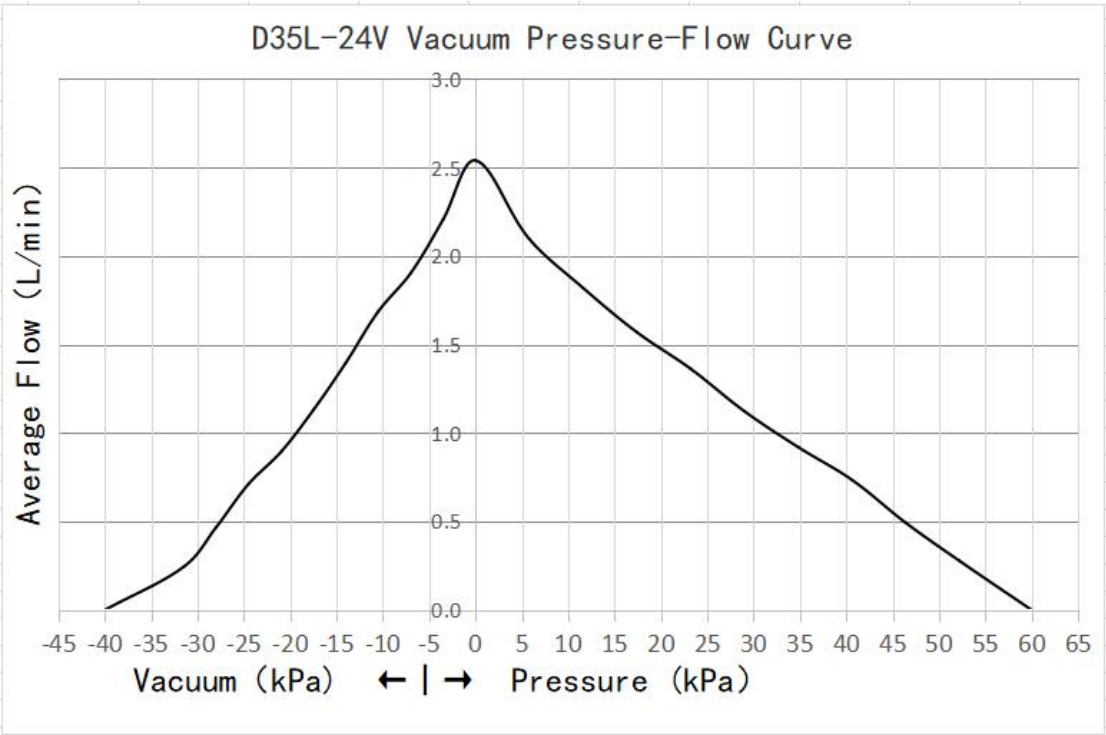
There are individual differences between different micro pumps, so this curve is a statistical value, only as a technical reference for users to confirm the working point. The "flow" mentioned in this section refers to the "average flow".

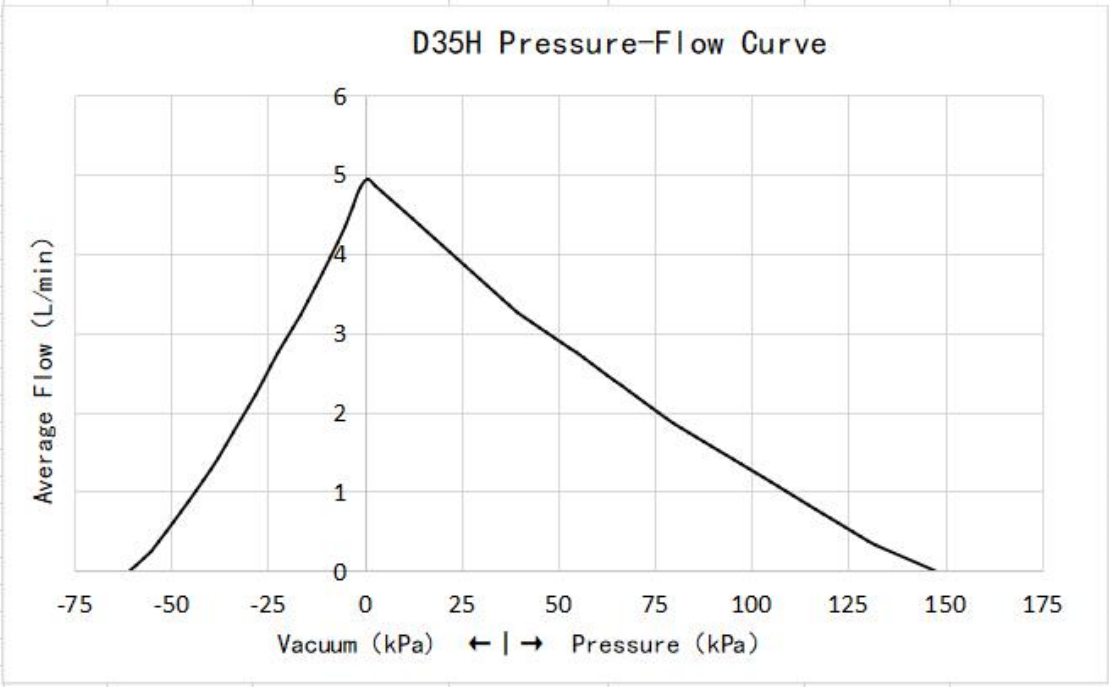






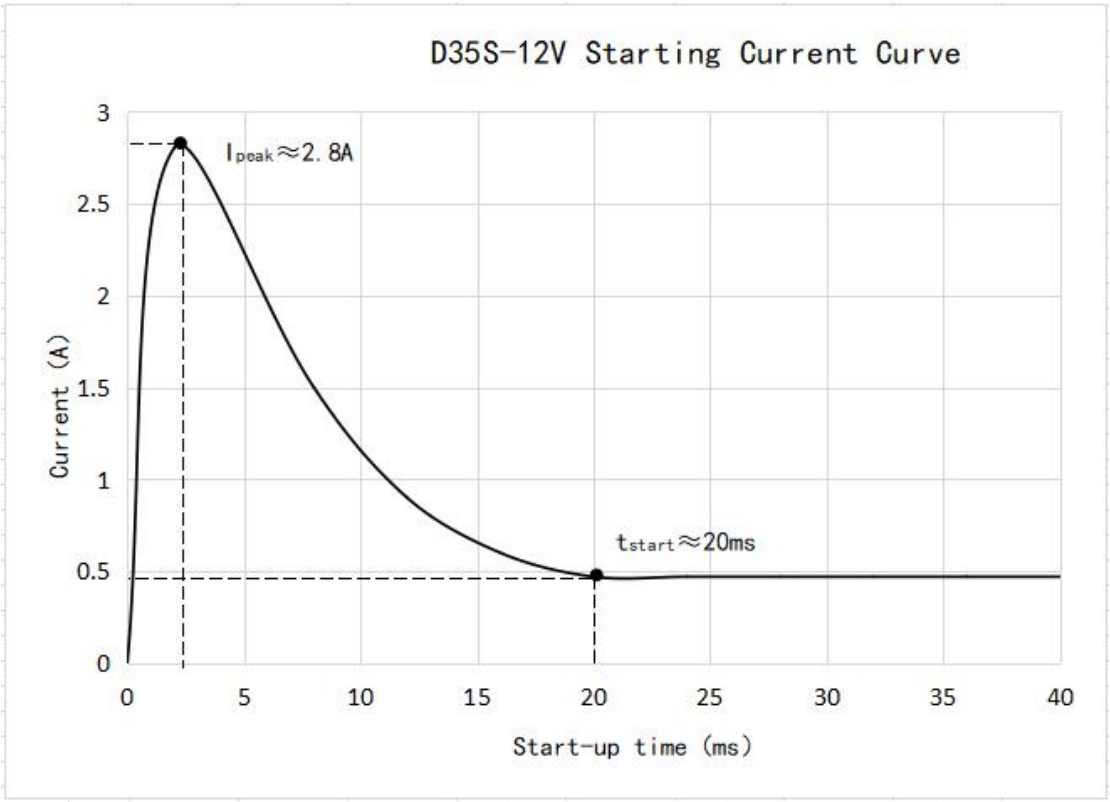



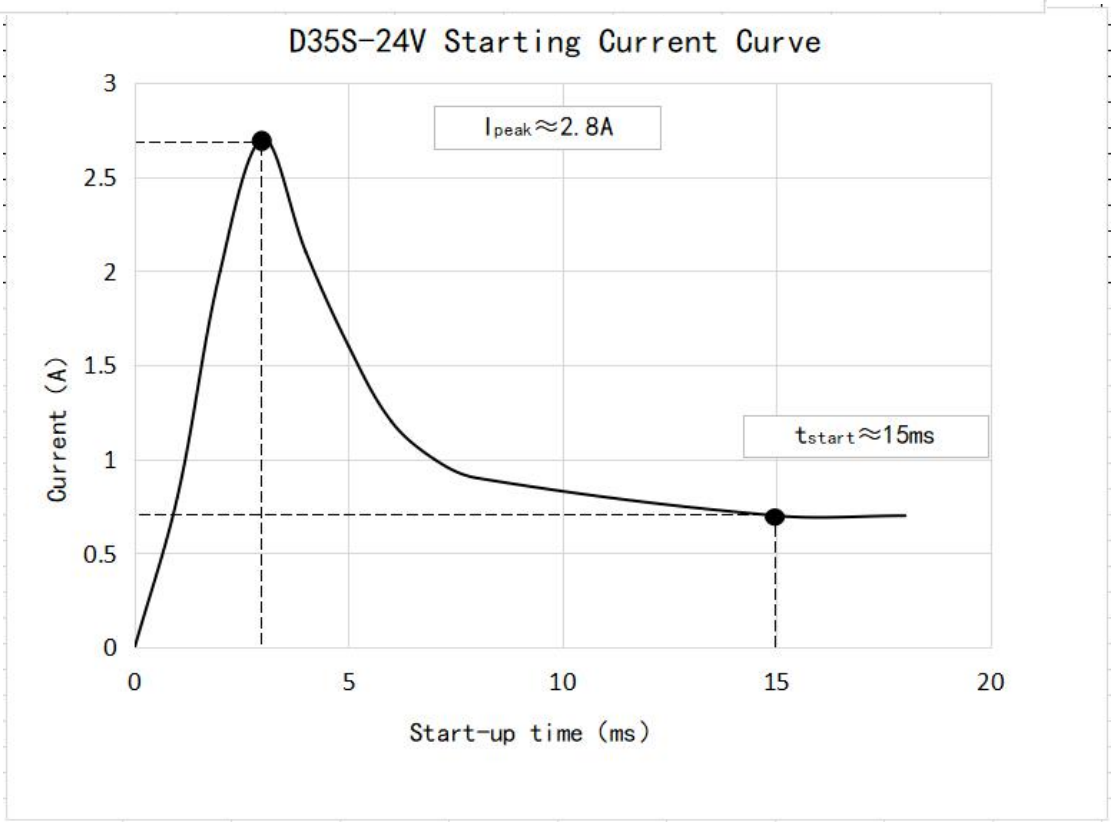

## 3.10 Starting Current Curve

The starting current curve is measured under the working condition that the inlet and outlet are directly connected to the atmosphere, and there are certain individual differences between different micro pumps. This curve is a statistical value, which is only used as a

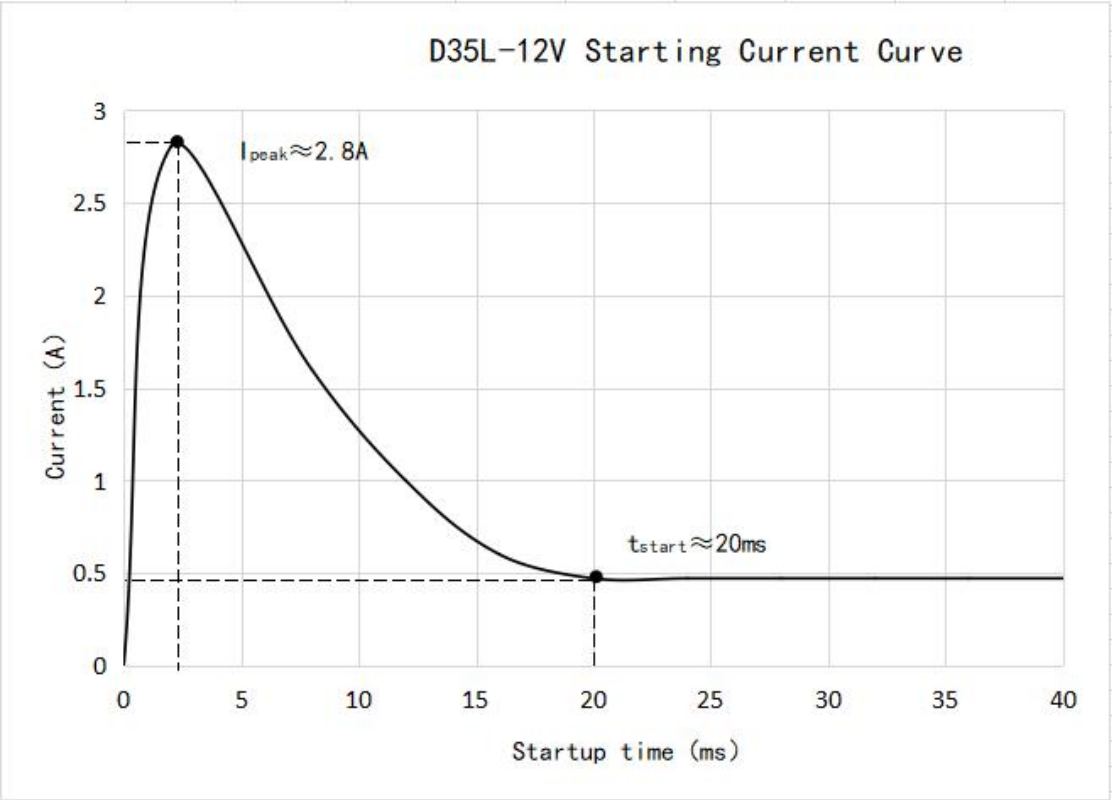
 

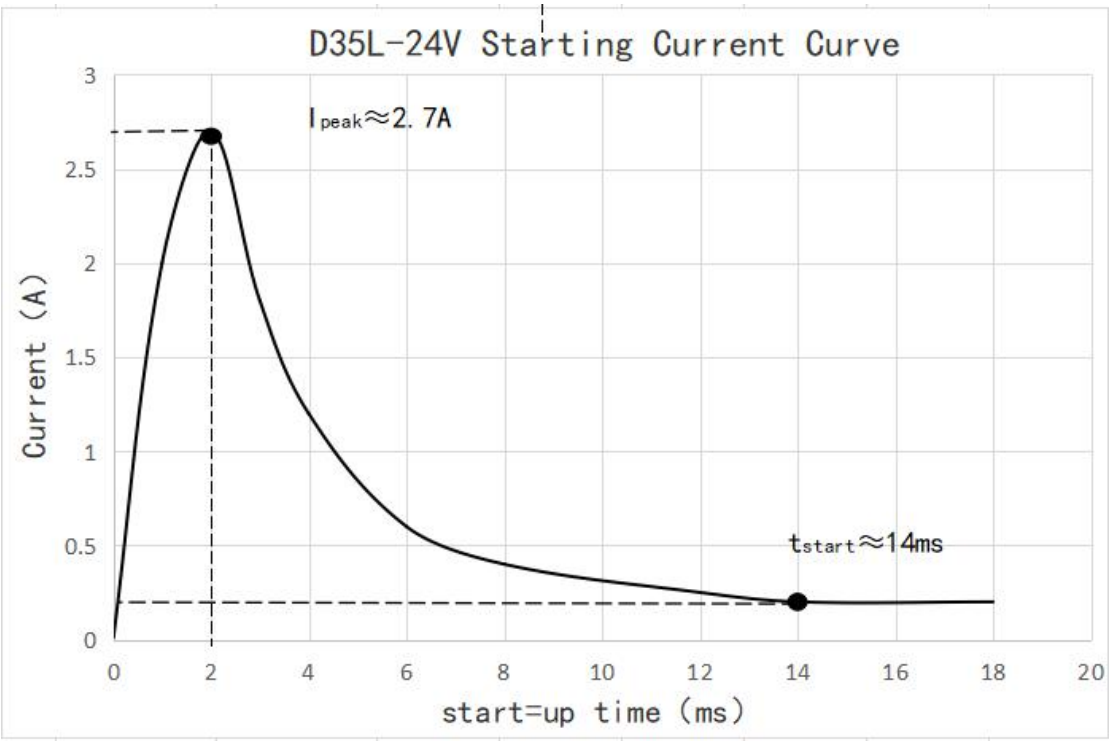
technical reference when users determine the power supply system, and is not for acceptance data.

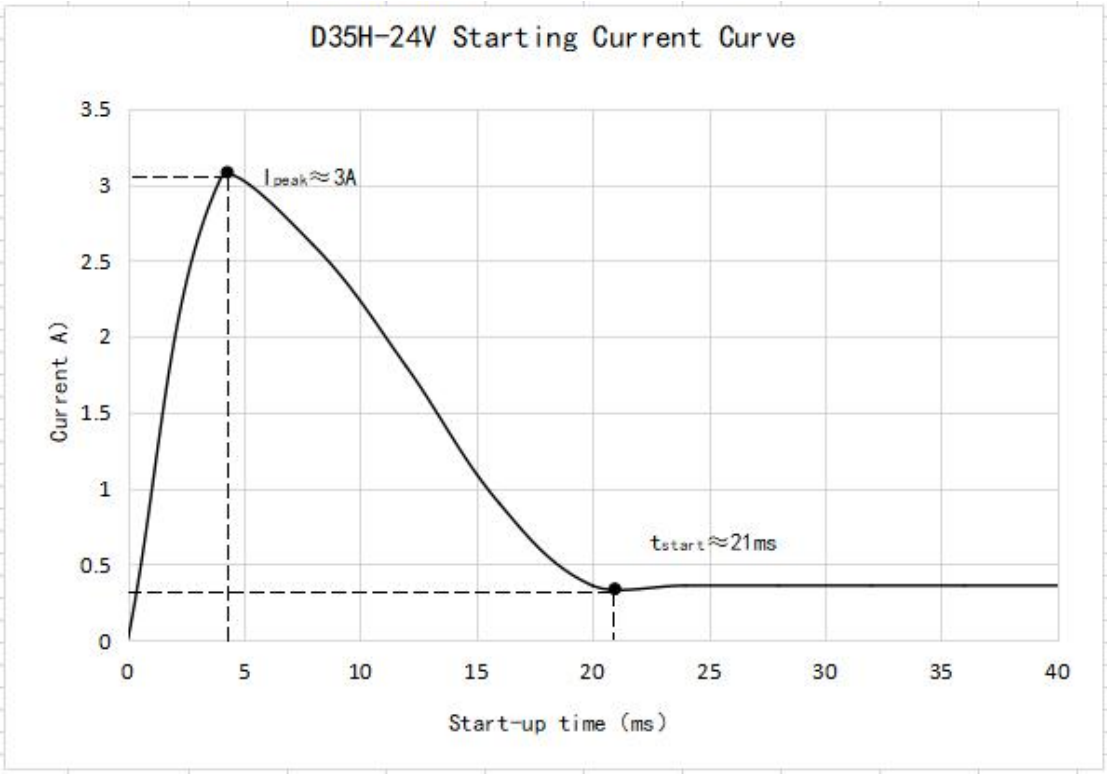




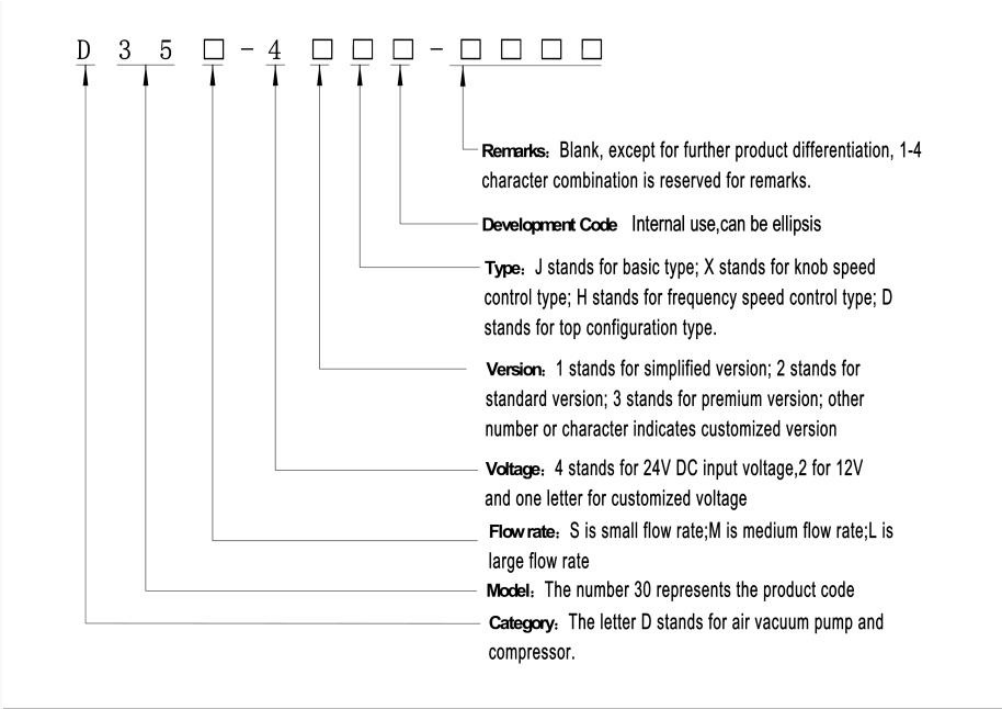





# 4 Product Model Description

## 4.1 Brief Description of Model Naming

This series of pumps are divided into three types according to the selected speed control mode:basic type, knob speed control type, frequency speed control type and top configuration type.




**Note:** If the remarks starts with a letter, it means a special custom function. For example, letter"GJ" means customized high-temperature medium function, and "GH", means customized high-temperature environment function. If it starts with a number, it means other information.

Example 1: D35-21X (D35 pump, 12V voltage knob speed control simplified version)

Example 2: D35-23D-GJ (D35 pump, 12V voltage top configuration type premium version, customized high temperature medium function)

# 5 Electrical Connection

## 5.1 Basic Type

| Wire | Input | Definition | Explanation |
|---|---|---|---|
| 1Red | VCC | 24V or 12V power input | Rated voltage 24V±10% or 12V±10% |
| 2Black | GND | Power Ground | Connect to the negative pole of the DC power |

Table 5-1 Wiring Instruction for Basic Type

**Note:** 1. This type does not have a speed control function. Please connect the wiring strictly according to the instructions in the table above, otherwise it will damage the motor.

2.The user must ensure the input voltage is 24V before wiring. The wrong input voltage will cause damage to the product and is not covered by the warranty.

## 5.2 Knob Speed Control Type

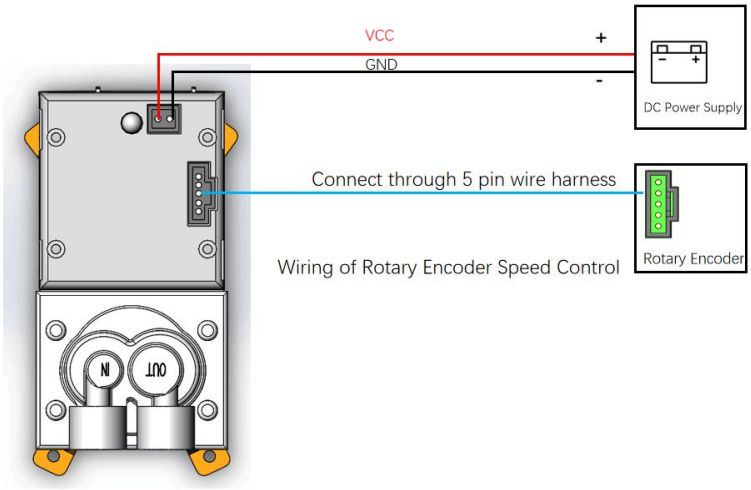



Figure 5-1 Wiring Diagram for Knob Speed Control Type

**Note:** The wire color in the figure above may be different from the actual wire color,please connect according to the figure above .

The red wire of the power connector is connected to the positive pole of the DC power supply, the black wire is connected to the negative pole of the power supply, and the speed regulation connector is connected to the knob circuit board through the wiring harness. The pump will be equipped with a speed control knob switch (rotary encoder). Rotate the knob on the encoder clockwise to increase the speed. When it reaches the maximum speed, continue to rotate the knob clockwise, the speed will remain the maximum value. Rotate the knob counterclockwise to decrease the speed. When it reaches the minimum speed, continue to rotate the speed counterclockwise, it will maintain the minimum flow. Press the knob to control the start and stop of the pump. The pump also has a state memory function. When the pump is started, it will run at the speed before the last stop.

| Connector | Wire | Input | Definition | Explanation |
|---|---|---|---|---|
| 5Pin Connector | 1-5 | Knob signal | Knob speed control switch connector | Connect to the knob speed control switch through the 5Pin harness |
| 2Pin Connector | 1 | VCC | 24V or 12V power input | The rated voltage depends on the voltage: 24V±10% or 12V±10% |
| | 2 | GND | Power Ground | Connect to the negative pole of DC power supply |

Table5-2 I/O Interface Definition of Knob Speed Control Type

**Attachment: Installation instructions for speed control knob switch**

(1) Nut installation: first make a hole with a diameter of about 7mm on the mounting plate, then unscrew the nut on the encoder and remove the gasket, insert the knob of the encoder into the opened hole on the mounting plate, and finally install the gasket and screw back the nut.

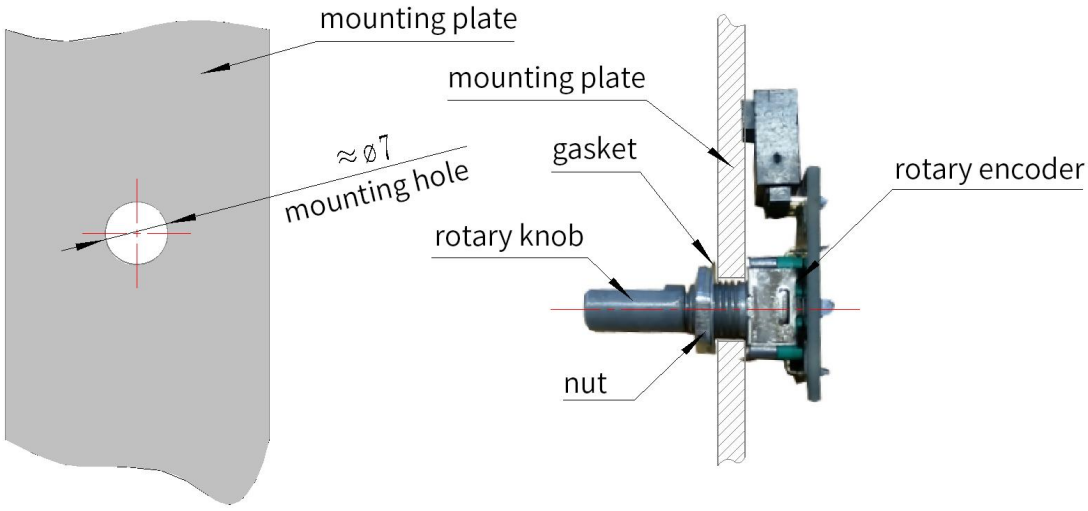



Figure 5-2 Nut Installation

(2)Screw installation: Use two M3 screws to pass through the screw holes and washers of the speed control knob switch, and then fix them to the mounting plate.

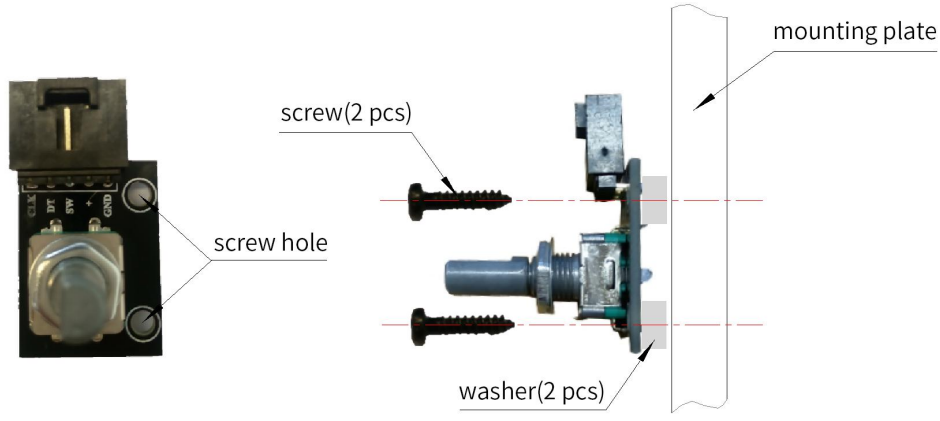



Figure 5-3 Screw Installation

**Note:** In order to avoid welding protrusions on the back of the speed control knob switch to affect the installation, we have attached two Φ3*Φ7*3 insulating washers in the installation accessories. Two M3 screws are usually used for the screws, which need to be prepared by the customer.

## 5.3 Frequency Speed Control Type

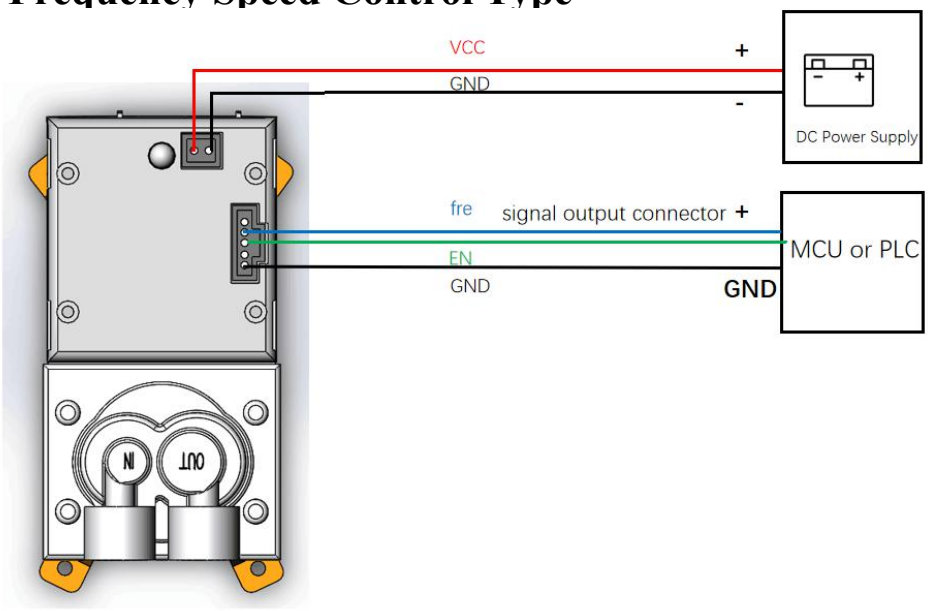



Figure 5-4 Wiring Diagram of Frequency Control Type

| Connector | Wire | Input | Definition | Explanation |
|---|---|---|---|---|
| 5Pin Connector | 1 | NC | Not connected | |
| | 2 | Fre | Frequency speed control signal<br>0V≤low level≤0.8V<br>3.3V≤high level≤5V<br>Note：Input high level＞3.3V, the maximum input voltage should not exceed 5V, otherwise it may cause permanent damage to the micro pump. | Input the square wave, recommended amplitude value 5V, duty cycle 50% and the DC bias voltage 2.5V.<br>The signal frequency range 700hz-3100Hz corresponds to the motor speed of 700-3100rpm,when100<frequency <700Hz, it runs at the minimum speed, when frequency>3100Hz, it runs at the maximum motor speed, and when the frequency≤100Hz,the pump stops running. |

| | | | | |
|---|---|---|---|---|
| | 3 | EN | Enable signal<br>0V≤VIL<0.8V<br>3.3V≤VIH≤5V | Enable signal, low level is effective to enter the speed control mode, high level or floating means running at the last recorded speed. |
| | 4 | NC | Not connected | |
| | 5 | GND | Ground | Power and signal ground |
| 2Pin Connector | 1 | VCC | 24V DC power supply | Rated voltage 24V±10% or 12V±10% |
| | 2 | GND | Power ground | Connect to the negative pole of power supply |

Table 5-3 Interface Definition of Frequency Speed Control Type

**Note:** The wire color in the above figure may be different from the actual wire color,please connect according to the above diagram.

The red wire of the 2pin power connector is connected to the positive pole of the DC power supply, and the black wire is connected to the negative pole of the power supply as shown in the above diagram. The pin sequence from top to bottom of the speed regulation connector is the same as the actual product as shown in the diagram above. The black wire of pin 5 (GND) is connected to the ground of the MCU or PLC. The pin-3 (En) green wire is connected to the low level of the MCU or PLC, and the pin-2 (Fre) blue wire is connected to the frequency signal output port of the MCU or PLC.

## 5.4 Top Configuration Type

The top configuration type is not only equipped with the LCD touch screen speed control and fault display function, but also equipped with a control signal port, as well as frequency speed control function and speed feedback function. The following is a description of the signals corresponding to the wire terminal of the top configuration type.

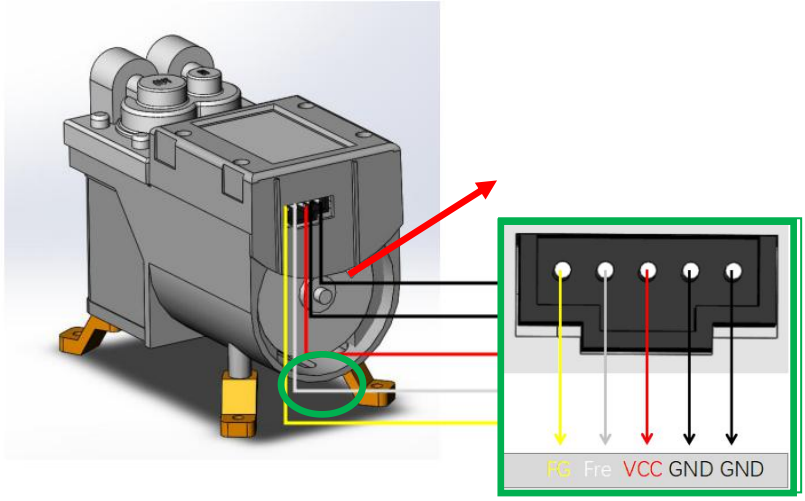


Figure 5-5 Signal and Pin Sequence Description of Top Configuration Type

| Pin | Input | Definition | Explanation |
|---|---|---|---|
| 1Yellow | Fg | Speed feedback signal<br>3.3V≤high level≤5V<br>1≤low level<0.8V | The rotation speed of the motor can be obtained through the feedback signal of Fg, and the 6 square waves fed back means one rotation of the motor. |
| 2White | Fre | Frequency speed control signal<br>3.3V≤high level≤5V<br>0≤low level<0.8V | Input the square wave, recommended amplitude value is 5V, duty cycle 50% and the DC bias voltage 2.5V.<br>The signal frequency range 700hz-3100Hz corresponds to motor speed of 700-3100rpm, when 100<frequency<700Hz, it runs at the minimum speed, when frequency>3100Hz, it runs at the maximum motor speed, and when the frequency≤100Hz, the pump stops running. |
| 3Red | VCC | 24V or 12V power supply | Rated voltage<br>24V±10% or 12V±10% |
| 4Black | GND | Power ground | Connect to the negative pole of power supply |
| 5Black | GND | Power ground | If without our power adapter, this ground wire is recommended to be reliably grounded to make the system more stable. |

Table 5-4 Interface Definition of Top Configuration Type

**Note:** 1. In order to prevent the start-stop button on the touch screen from being accidentally touched, it is necessary to hold a certain area during operation and long press to trigger.

2. If the user who purchases the top configuration type does not use our matching power supply, it may cause interference to the operation of the pump.Reliable grounding helps improve operational reliability!

3. If the accessory wire sequence color does not correspond to the table, please check the wire definition and connect according to the sequence!

There are two speed control modes for the top configuration type: (1) LCD speed control and (2) frequency speed control. The following is the wiring instruction for the two speed control methods.

1. Wiring Description Using LCD Touchscreen

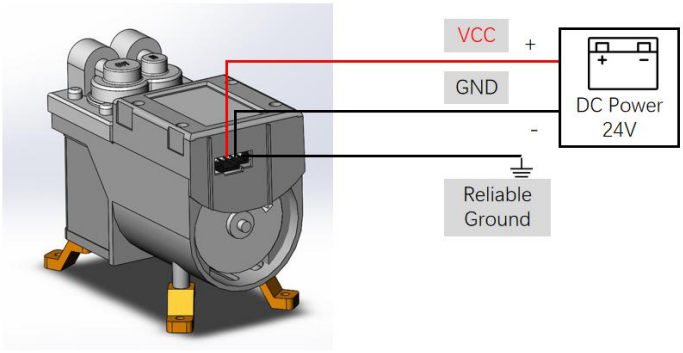



Figure 5-6 Wiring Instruction Using LCD Touchscreen

The red wire at the power connector is connected to the positive pole of the 24V DC power supply, and the black wire is connected to the negative pole of the power supply. Control the pump operation by controlling the LCD screen.

**Note:** 1.In order to prevent the start-stop button on the touch screen from being accidentally touched, it is necessary to hold a certain area during operation and long press to trigger.

2.If the user who purchases the top configuration type does not use our matching power supply, it may cause interference to the operation of the pump.Reliable grounding of Pin-5 wire helps improve operational reliability!

2. Wiring Instruction Using Frequency Speed Control

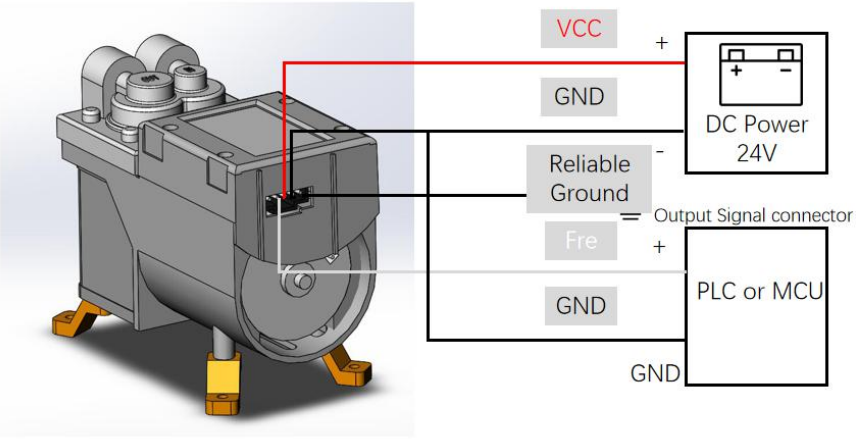



Figure 5-7 Wiring Instruction Using Frequency Speed Control

The red wire at the power connector is connected to the positive pole of the DC power supply, and the black wire is connected to the negative pole of the power supply. If not using our standard adapter, this ground wire is recommended to be reliably grounded to make the system more stable. Fre is connected to the frequency signal output port of the PLC or MCU, and GND is connected to the grounding port of the MCU or PLC. Control the pump running speed by adjusting the frequency of the square wave.

3. Frequency Signal Description

The signal frequency 700hz-3100Hz corresponds to motor speed of 700-3100rpm, when 100<frequency<700Hz, it runs at the minimum speed, when frequency>3100Hz, it runs at the maximum motor speed, and when the frequency≤100Hz, the pump stops running. 3.3V≤ high level amplitude ≤5V

## 5.5 Alarms and Troubleshooting

| Working Condition | Alarm definition | Error code | Possible reason | Troubleshooting |
|---|---|---|---|---|
| Power supply over voltage | "power" flashing | EE01 | The output voltage of the DC power supply is greater than the normal voltage range. | 1. Check whether the output voltage of the power supply is consistent with the product label, and power on again.<br>2. If there are frequent alarms, please contact customer service. |
| Power supply under voltage | "power" flashing | EE02 | The output voltage of the DC power supply is less than the normal voltage range. | 1. Check whether the output voltage of the power supply is consistent with the product label, and power on again.<br>2. If there are frequent alarms, please contact customer service. |
| Insufficient output power | "power" flashing | EE03 | The output power of the DC power supply cannot meet the pump running power requirements or power supply output stability is poor. | Replace the DC power supply with higher output power.<br>If there are frequent alarms, please contact customer service. |
| Abnormal motor stop | "motor" flashing | EE31 | Motor stalls, abnormal speed feedback. | 1. Check whether the pipeline load is normal (reduce the running load of the pump), and power on again.<br>2.If there are frequent alarms, please contact customer service. |
| Large motor speed deviation | "motor" flashing | EE32 | The deviation between the actual motor speed and the set speed is too large. | 1. Check whether the pipeline load is normal (reduce the running load of the pump), and power on again.<br>2.If there are frequent alarms, please contact customer service. |

Table 5-5 Error Code Definition of Top Configuration Type

**Note:** 1. The above fault alarm codes are only applicable to top configuration type.

# 6 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 pneumatic connectors, and there should be no solid particles in the medium, otherwise it will damage the micro pump!**

**3. When this product is used to transfer harmful medium, it must be double-sealed to ensure personal safety!**

**4. The matching piping components and containers must have sufficient strength to ensure personal safety!**

**5. Built-in precision control circuit, need to use high-quality DC power supply to power the pumps!**

**6. If this series of pumps do not use the matching power supply, it may cause interference to the operation of the pump. Please follow the instructions strictly!**

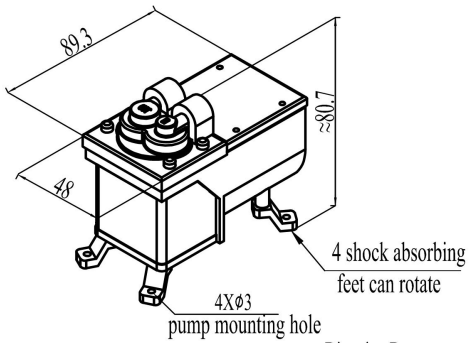
**7. Before wiring, the user should ensure that the input voltage is 24V or 12V according to the nameplate label. The wrong input voltage will cause damage to the product and is not covered by the warranty.**

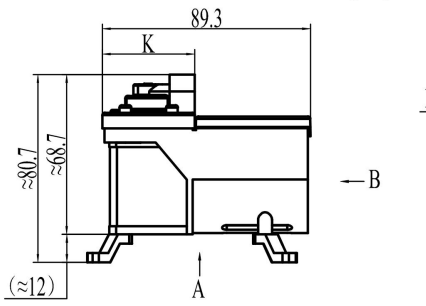
**8. Oil mist, high-viscosity liquids and liquids that are easy to precipitate and crystallize are not permissible!**

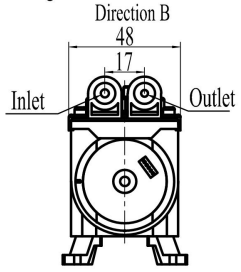
**9. Please operate strictly in accordance with the requirements of this user guide!**

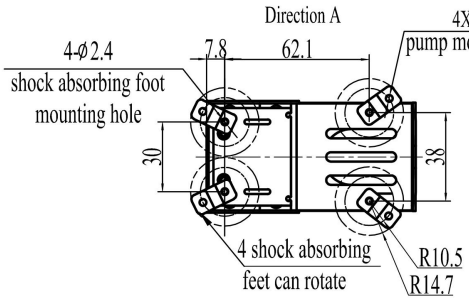
# 7 Dimensions

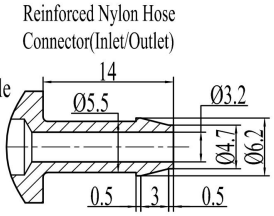
Overall Dimensions of D35 Basic Type (unit:mm) Outline Drawing without Connectors



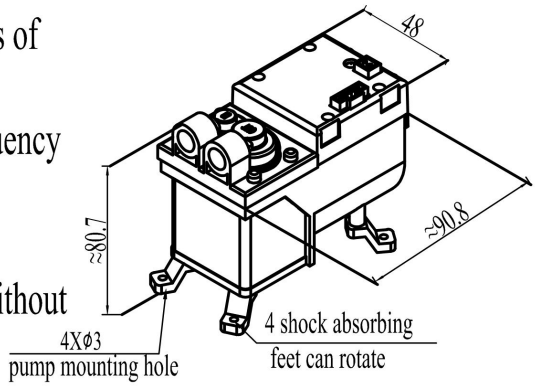



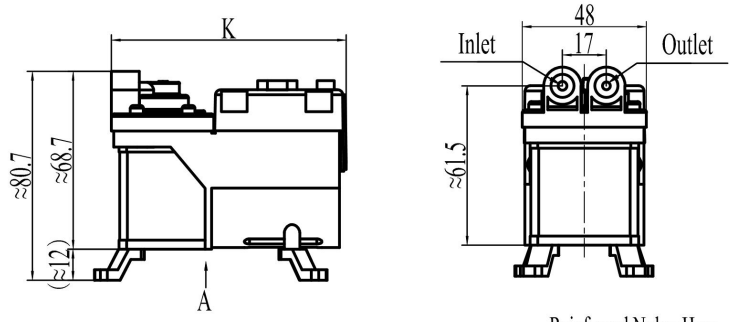



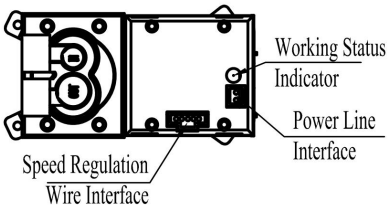

| Type of Connectors | | K value |
|---|---|---|
| no connector | | ≈90.8 |
| Push-in Connector | 6mm | 90.8+X(≈105①) |
| | 8mm | 90.8+X(≈107②) |
| Stainless Steel Hose Connector | | 90.8+Y(≈108③) |
| Reinforced Nylon Hose Connector | | 90.8+Z(≈108④) |

Size of ①②③④ is related to the pneumatic connectors and its installation dimensions, for reference only, the error may be a few millimeters

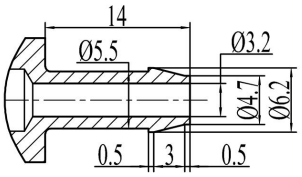
## Overall Dimensions of D35 Knob Speed Control Type/Frequency Speed Control Type（unit:mm）Outline Drawing without Connectors

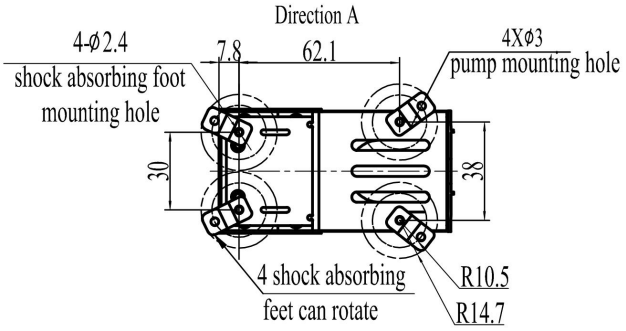



Reinforced Nylon Hose Connector(Inlet/Outlet)

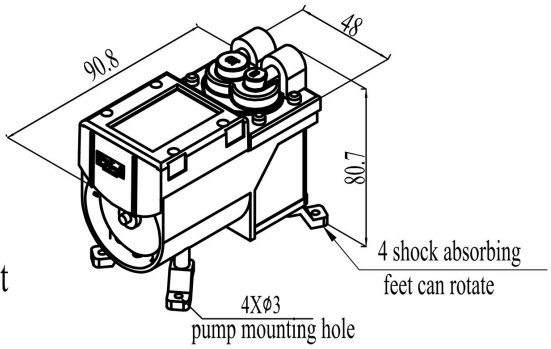


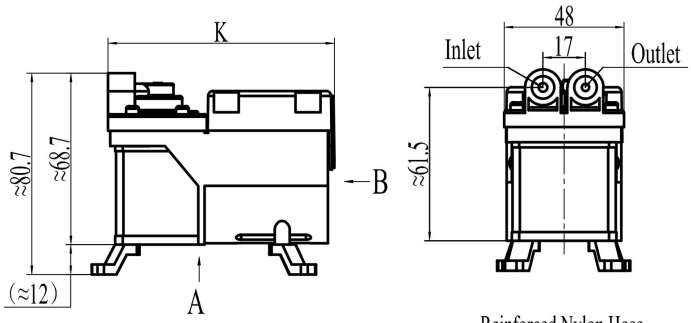




| Type of Connectors | | K value |
|---|---|---|
| no connector | | ≈90.8 |
| Push-in Connector | 6mm | 90.8+X(≈105①) |
| | 8mm | 90.8+X(≈107②) |
| Stainless Steel Hose Connector | | 90.8+Y(≈108③) |
| Reinforced Nylon Hose Connector | | 90.8+Z(≈108④) |

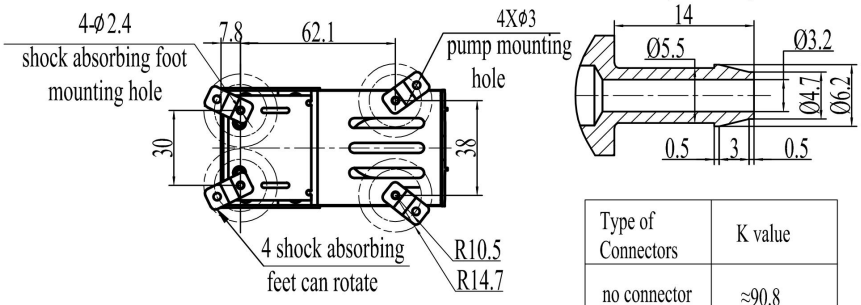
Size of ①②③④ is related to the pneumatic connectors and its installation dimensions, for reference only, the error may be a few millimeters

Overall Dimensions of D35 Top Configuration Type（unit:mm）Outline Drawing Without Connectors



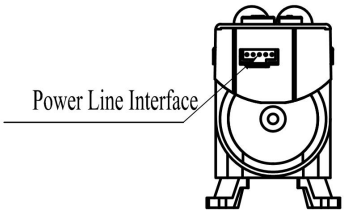




Direction A










| Type of Connectors | | K value |
|---|---|---|
| no connector | | ≈90.8 |
| Push-in Connector | 6mm | 90.8+X(≈105①) |
| | 8mm | 90.8+X(≈107②) |
| Stainless Steel Hose Connector | | 90.8+Y(≈108③) |
| Reinforced Nylon Hose Connector | | 90.8+Z(≈108④) |

Size of ①②③④ is related to the pneumatic connectors and its installation dimensions, for reference only, the error may be a few millimeters

Installation instructions:

1. The screws on the pump cannot be removed, otherwise it will damage the pump;

2. The mounting hole is a self-tapping screw hole, which is not easy to be repeatedly tightened and disassembled, otherwise it will cause loose and unreliable installation.

# 8 Appearance

## D35 Top Configuration Type




# D35 Frequency Speed Control Type

# Knob Speed Control Type




# D35 Basic Type




**Note:** The appearance of the above-mentioned hydraulic connector differs with optional configurations.