PMV

Create Reliability

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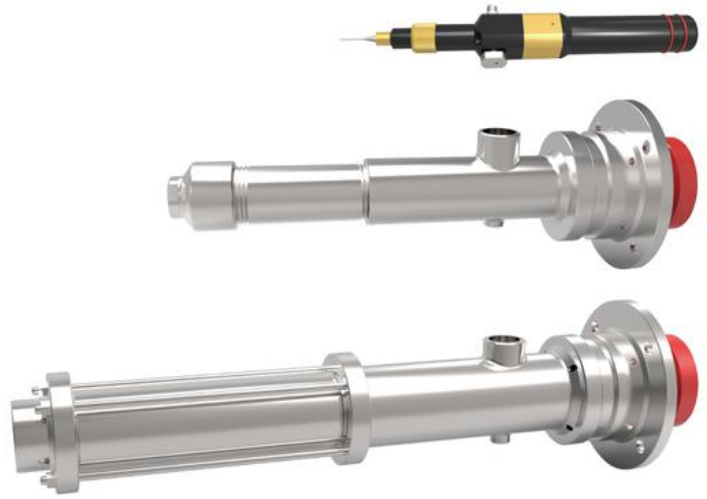
Small Scale Progressive Cavity Pump

01

PMV

Create Reliability



Selection Method

There are many solutions for liquid quantitative extrusion system, and there are many choices of products and systems.
It is necessary to consider the different characteristics of the medium and the different process to select the appropriate scheme.

VISCOSITY

When selecting products according to the properties of media, the viscosity of media is an important parameter for selection.
There are many kinds of media, from low viscosity media such as water to high viscosity media such as thermal conductive adhesive.
If not clear, can refer to daily life in contact with the liquid medium viscosity control table, conversion of approximate viscosity.

Viscosity comparison table (The temperature is 20 ℃)

CPS(mPas)	1	60-80	1000	1500	3000	5000	10000	15000
Medium	Water, Acetone, Alcohol	Salad oil	Angine oil	Detergent	Shower Gel	Paint	Face cream	Yogurt
CPS(mPas)	20000	30000	50000	70000	100K	150K	200K	1000K
Medium	Toothpaste	Ketchup	Honey	Strawberry Jam	Mayonnaise	Solder Paste	Thermal conductive adhesive	

TYPE

Glue: epoxy resin, anaerobic glue, silica gel, UV glue, polyurethane glue, solder paste, thermal conductive glue, etc;

Food: beverage, jam, cream, chocolate, syrup, etc

Chemical industry: petroleum, dyes, chemicals, organic solvents, polymers, cosmetics, shampoo, toothpaste, etc;

Others: liquid flowable medium

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Flow rate

The glue output of medium is the most important parameter for selection, and the ways to determine the glue output can be roughly divided into:

1. Weight calculation method: when the output weight and density of medium are known:

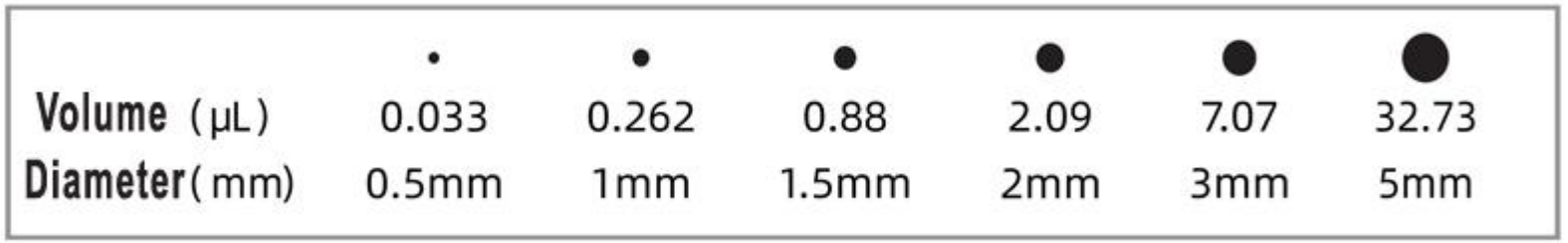
$$\rho=\frac{m}{V}\left(\text{密度}=\frac{\text{质量}}{\text{体积}}\right)\rightarrow m=\rho v、\ v=\frac{m}{\rho}$$

密度: Density　质量: mass　体积: volume

Flow rate

2. The extrusion method is dot:

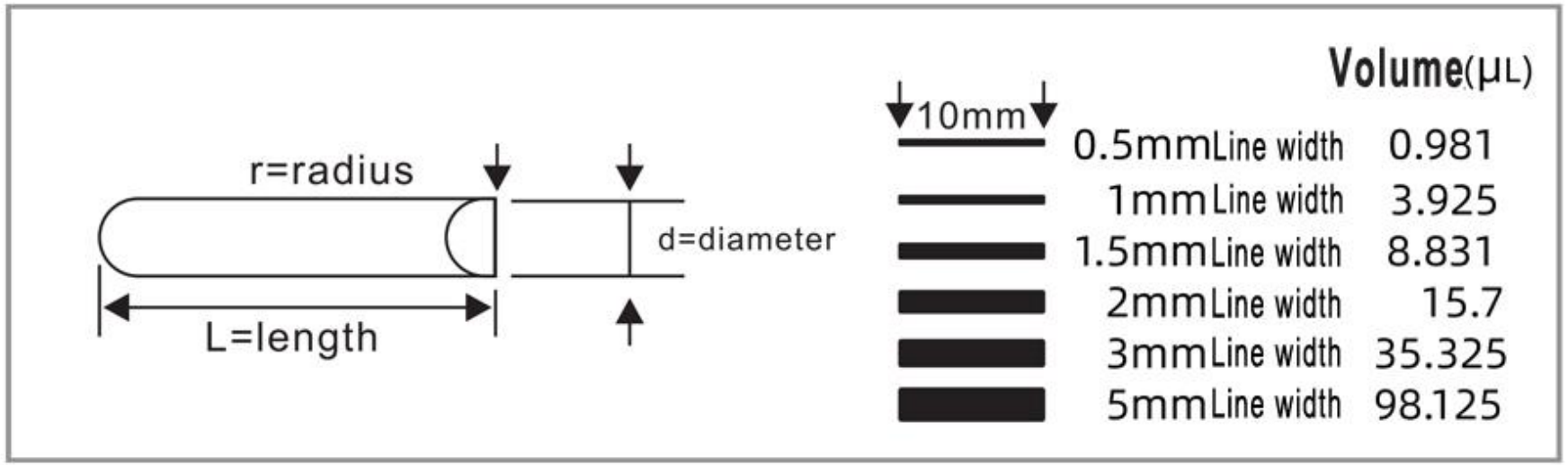
The volume of a point = the volume of a sphere = $v = 0.2618d^3$ (d: the diameter of a dot)



Volume (μL)	0.033	0.262	0.88	2.09	7.07	32.73
Diameter (mm)	0.5mm	1mm	1.5mm	2mm	3mm	5mm

3. The extrusion method is scribing:

The volume of a straight line = the volume of a cylinder = $v = \frac{1}{2}\pi r^2 L$ ($\pi = 3.1416$)



Technological Considerations

1. dispensing method of screw valve:

Glue enters the inlet of the screw valve through the glue supply device, and the outlet of the screw pump valve is directly connected with the needle head, and various shapes are pointed out in cooperation with the triaxial platform or mechanical arm. Generally, it is applied to the dispensing process with small amount of glue.)

2. Glue filling method of glue filling screw pump:

Glue enters the inlet of the glue filling pump through the glue supply device, and the outlet of the glue filling pump is connected with a pipeline, and the outlet of the pipeline is connected with a platform or a mechanical arm for glue filling or dispensing, or is directly discharged as a conveying mode. Generally, it is applied to the glue filling process with larger glue quantity and better fluidity.

Technological Considerations

3. Extraction mode of platen pump system:

Glue is packaged in barrels, and the glue is directly pumped out of the barrel by using the platen pump system, and the outlet pipeline is connected to the platform or mechanical arm for glue pouring or dispensing.

Generally, it is applied to the glue filling process with a large amount of glue and poor fluidity.

02

Single-component screw pump

The stator at the discharge end of PMV screw valve is self–locked by threads, which is easy to disassemble and can be replaced in a short time without interruption of the production line.

Single-component screw pump

★ No residual glue drawing phenomenon at the front end of the needle:

Spiral structure design, freely adjust the forward and reverse rotation to realize the suck back function, and completely solve the phenomenon of medium drawing and residual glue.

★ No pulsation, no shearing to materials:

Constant-displacement screw pump will not produce pulsation and shear effect on medium during transportation, so it will not have any influence on medium properties.

★ It is not affected by liquid level and viscosity change:

The change of medium liquid level and viscosity will not affect the conveying accuracy of screw valve, thus avoiding frequent adjustment of dispensing parameters.

Single-component screw pump

★ Medium containing particulate matter can also be transported quantitatively:

The screw valve will not damage the particulate matter when conveying high content medium.

★ Easy to clean and replace:

Screw valve has simple structure, and can clean and replace fittings conveniently without affecting production.

★ A simpler way of feeding materials:

Different feeding modes can be applied, and it is only necessary to ensure a certain pressure to make the medium enter the inlet of the screw valve, without frequently adjusting the feeding parameters.

Single-component screw pump

★ Selection parameters of one-component screw valve：

Model	Flow/per revolution	Glue discharging speed	Feeding port	Discharge hole	Net weight of valve
MJ003	0.003ml	0.03mll/min~0.36ml/min	1/8"	Luer Lock	350g
MJ010	0.01ml	0.1ml/min~1.2ml/min	1/8"	Luer Lock	350g
MJ060	0.06ml	0.6ml/min~7.2ml/min	1/8"	Luer Lock	400g
MJ200	0.2ml	2ml/min~24ml/min	1/8"	Luer Lock	500g
MJ400	0.4ml	4ml/min~48ml/min	1/4"	1/4"	2.3kg
MJ1000	1ml	10ml/min~120ml/min	1/4"	1/4"	2.8kg
MJ1600	1.6ml	16ml/min~190ml/min	3/8"	1/4"	3.kg

Single-component screw pump

★ Parameters:

Accuracy: 2%
Repetition accuracy: 1%
Transportable medium:

a. medium viscosity: ≤ 1000000cps
b. medium pressure: ≤ 0.6Mpa
c. medium temperature: ≤ 80℃

Screw valve configuration:

1) optional motor type: DC brushless servo motor/stepping motor
2) Rotor material: 17-4PH hardened stainless steel /3-4 stainless steel /316 stainless steel, etc.
Material of stator: FKM/NBR/EPDM/FFKM
4) Material of valve body: anodized aluminum /304 stainless steel

Single-component screw pump

★ Parameters:

Composition of screw valve controller:

1) control box: motor drive board: 30035
Touch screen: 4.3 "
Enclosure: custom control box

2) External ports:

Control screw valve port: 8-chip aviation plug
Equipment online port: two-core aerial plug (receiving switch signal)

3. Two-component screw valve

Two-component screw pump

★ High precision glue amount and correct proportion:

Constant volume pump with eccentric spiral structure can realize high efficiency, high precision and high stability of two-liquid extrusion.

★ Concise adjustment of mixing ratio and dispensing amount:

The glue output can be adjusted simply and quickly by changing the speed parameter of the motor.

★ It is not affected by liquid level and viscosity change:

The change of medium liquid level and viscosity will not affect the conveying accuracy of screw valve, thus avoiding frequent adjustment of dispensing parameters.

Two-component screw pump

★ Medium containing particulate matter can also be transported quantitatively:

The screw valve will not damage the particulate matter when transporting the medium with high solid content.

★ Easy to use and high cost performance:

Use disposable static mixing pipe to discharge glue, which is simple, convenient, environment-friendly and economical.

★ Avoid glue waste and save economy:

Two-component screw valves are not in contact with each other before glue enters the static mixing pipe, thus avoiding the waste caused by premature mixing and curing of glue.

Single-component screw pump

★ Selection parameters of two-component screw valve：

Model	Flow/per revolution	Glue discharging speed	Recommended mixing ratio	Net weight of valve
MJ200-200	0.4ml	4ml/min~48ml/min	1:1~1:3	1.5kg
MJ200-060	0.26ml	2.6ml/min~30ml/min	1:2~1:5	1.4kg
MJ200-010	0.21ml	2.1ml/min~25ml/min	1:10~1:30	1.3kg
MJ200-003	0.203ml	2ml/min~24ml/min	1:40~1:60	1.3kg
MJ060-060	0.12ml	1.2ml/min~14ml/min	1:1~1:3	1.3kg
MJ060-010	0.07ml	0.7ml/min~8.4ml/min	1:3~1:10	1.25kg
MJ060-003	0.063ml	0.63ml/min~7.5ml/min	1:10~1:20	1.25kg
MJ010-010	0.02ml	0.2ml/min~2.4ml/min	1:1~1:3	1.15kg
MJ010-003	0.013ml	0.13ml/min~1.5ml/min	1:2~1:5	1.15kg
MJ003-003	0.006ml	0.06ml/min~0.72ml/min	1:1~1:3	1.15kg
MJ1600-1000	2.6ml	26ml/min~310ml/min	1:1~1:5	6.3kg
MJ1600-400	2ml	20ml/min~240ml/min	1:3~1:10	5.8kg
MJ1000-1000	2ml	20ml/min~240ml/min	1:1~1:3	6.1kg
MJ1000-400	1.4ml	14ml/min~168ml/min	1:1~1:5	5.6kg

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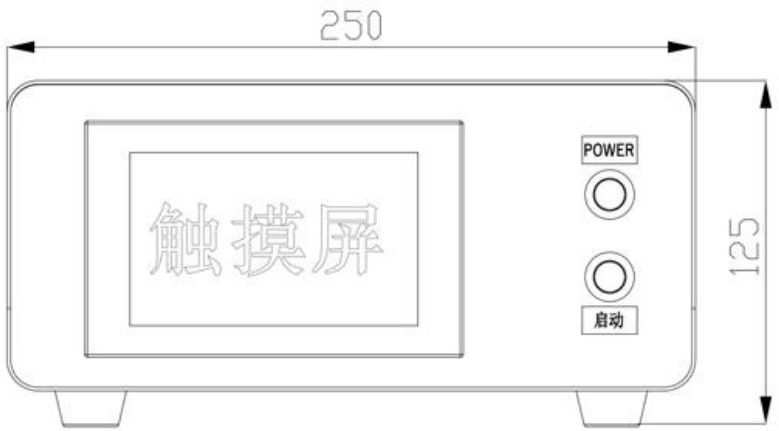
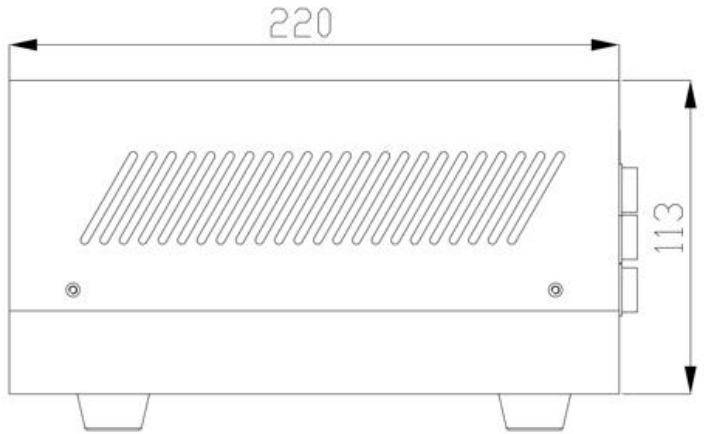
Screw valve controller





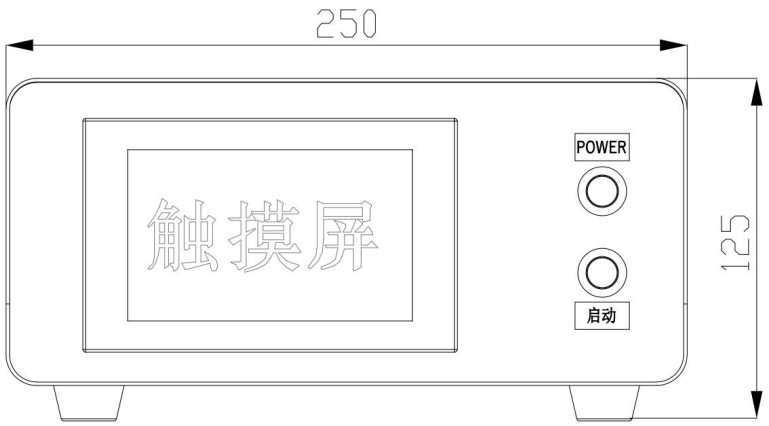
Screw valve controller

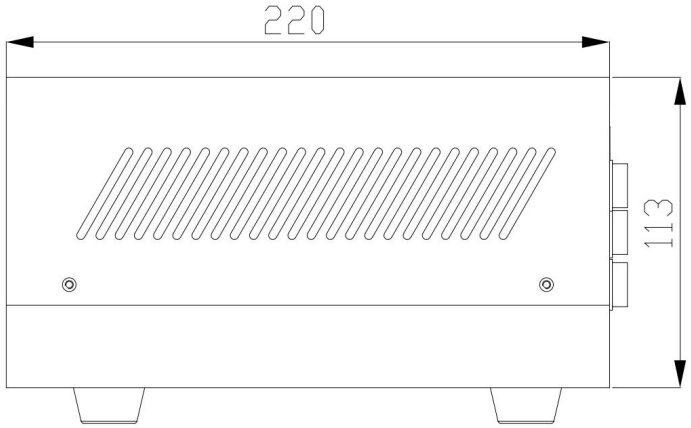
★ Screw valve controller parameters：

Project	SK1-1	SK1-2	Non-standard customization
Measure	250(W)*220(D)*125(H)	250(W)*220(D)*125(H)	In order to adapt to customers' screw valve applications under different working conditions, our controller can accept non-standard customization. For example, one control four, one control eight, one control sixteen and other different controllers
Weight	3.4kg	3.6kg	
Power Supply	AC110~250V, 50/60HZ	AC110~250V, 50/60HZ	
Monitor	4.3″ touch screen	4.3″ touch screen	
Control Quantity	1	2	
Pilot Signal	Switching value signal	Switching value signal	
Ambient Temperature	10~40℃	10~40℃	

Screw valve controller

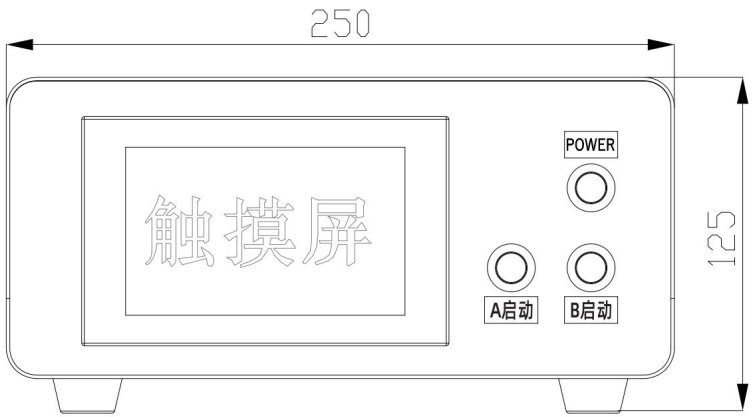
SK1-1

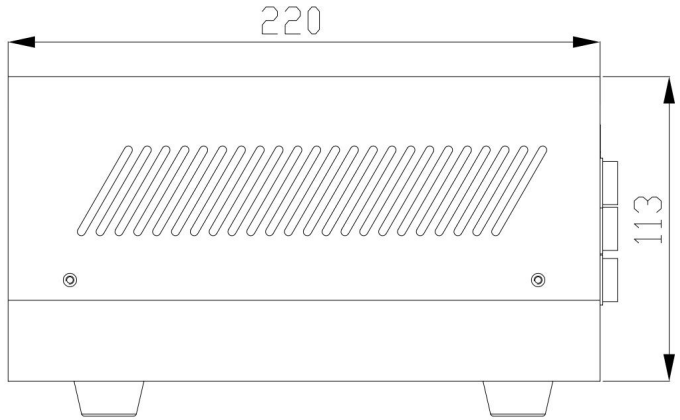




Screw valve controller

SK1-2





Application

Application of Screw Pump in Glue Filling Equipment Industry

PMV screw pump is widely used in glue filling equipment industry, which can transport almost all media, whether it is high viscosity or contains a lot of solid particles.

The media used for metering transportation mainly include harsh media such as epoxy resin, organic silica gel, polyurethane, etc., which are also suitable for transporting media containing a large number of solid particles or media with viscosity value exceeding 1,000,000mPas, thus ensuring accurate and reliable continuous or intermittent transportation of media.

Application

Application of Screw Pump in Glue Filling Equipment Industry

Because these materials contain granular solid fillers, fiber materials, etc., the common gear pump with mechanical structure cannot meet its requirements.

PMV screw pump is characterized by constant pressure continuous operation, no pulsation, no shear and long-term stable operation of medium transportation.

The flow rate of the pump depends only on the number of revolutions. Even under different viscosities or pressures, the pump can deliver accurately.

Technical Parameter

Model	Permissible speed	Optimum speed	Recommended glue output	Glue discharge pressure	Starting torque
0.5CC	12~300rpm	15~60rpm	0.13~0.5ml/s	24bar	≥10 Nm
1.5CC	12~300rpm	15~60rpm	0.38~1.5ml/s	18bar	≥10 Nm
3CC	12~300rpm	15~60rpm	0.75~3ml/s	18bar	≥16 Nm
6CC	12~300rpm	15~60rpm	1.5~6ml/s	18bar	≥20 Nm
12CC	12~300rpm	15~60rpm	3~12ml/s	18bar	≥30 Nm
24CC	12~300rpm	15~60rpm	6~24ml/s	18bar	≥50 Nm
48CC	12~300rpm	15~60rpm	12~48ml/s	18bar	≥100 Nm
96CC	12~300rpm	15~60rpm	24~96ml/s	18bar	≥200 Nm
200CC	12~300rpm	15~60rpm	50~200ml/s	18bar	≥400 Nm

* The rotating speed varies according to the characteristics of the medium. When faced with the medium with high viscosity, high solid content, high abrasiveness and poor fluidity, the rotating speed should be as low as possible. Please contact our engineers for detailed selection.

THANK YOU