CurieJet™ Low-Power MicroPump

PS22L / GS22L

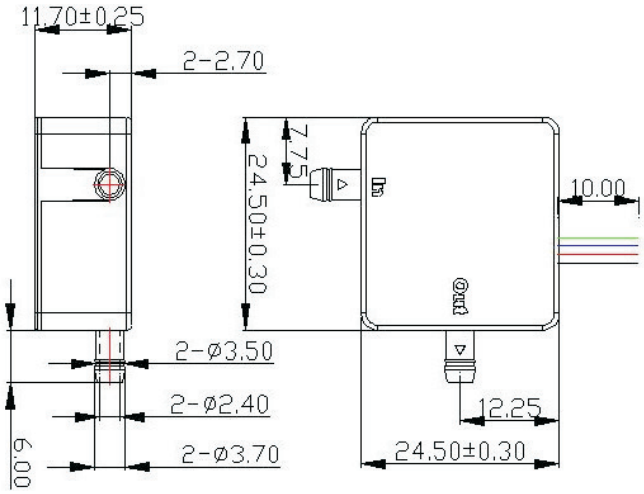
Piezoelectric Diaphragm MicroPump

DataSheet

Specifications

Dimensions (L x W x T)	24.5 x 24.5 x 12 mm (refer to the drawing also)		
Inlet/Outlet (ID / OD / H)	2.4 / 3.5 / 4.75 mm (refer to the drawing also)		
Mass	10g		
Storage Temperature	-20℃ to 70℃(refer to Figure 1 also)		
Operating Temperature	-20℃ to 70℃(refer to Figure 1 also)		
Wetted part material		Default	Options
	Body:	POM	PP, COC (COC need extra fee).
	Rubber:	EPDM	Teflon (FKM), NBR, IIR, Silicone.
	Membrane:	Polyimide.	(No other options)
	Diaphragm:	304 Stainless Steel	(No other options)
Power Consumption	Normal version : 0.2 ~ 0.5 W (depending on FlowRate/ driving frequency)		
	LessPower version: 0.05 ~ 0.25 W (depending on FlowRate/ driving frequency)		
Flow rate	PS22L:3 ~ 50 ml/min by 25℃ water (Depending on driving frequency)		
	GS22L:2 ~ 20 ml/min by air (Depending on driving frequency)		
Pumping Pressure	PS22L:30 ~ 45kPa by 25℃ water (Depending on driving frequency)		
	GS22L:2 ~ 4.5kPa by air (Depending on driving frequency)		
Suction Pressure	2 ~ 4.5kPa (Dry running)		
Repeat accuracy	±15%		
Life time	>10,000 hours		
Particle Tolerance	<100um		
Liquid viscosity	<500 cP(refer to Figure 3 also)		

Note:
1.* EPDM as default. Optional Teflon version is available upon request.
2.* Flow rate depends on the tube length and the data tested with 10cm length inlet/oulet tube.
3.Specifications are subject to change without notice.



Dimension in mm

Performance

The customer should realize that the flow rate is affected by the temperature and the blocking pressure, as Figure 1 shown. The maximum flow rate appears at the resonant frequency of the whole fluidic system, as referring to Figure 2.

The maximum flow rate and the corresponding resonant frequency are influenced by the tubing material and size, the fluid properties and the system volume. Besides, any un-solvable particles or fibers in the fluid may more or less influence the pumping performance. Especially, the fibers are likely to be trapped at the valve and thus the function of the valve is diminished.

According to our tests, the particles with diameter below 100μm in the fluid can be pumped smoothly. But, a large quantity of particles will decrease the pumping performance to some extent.

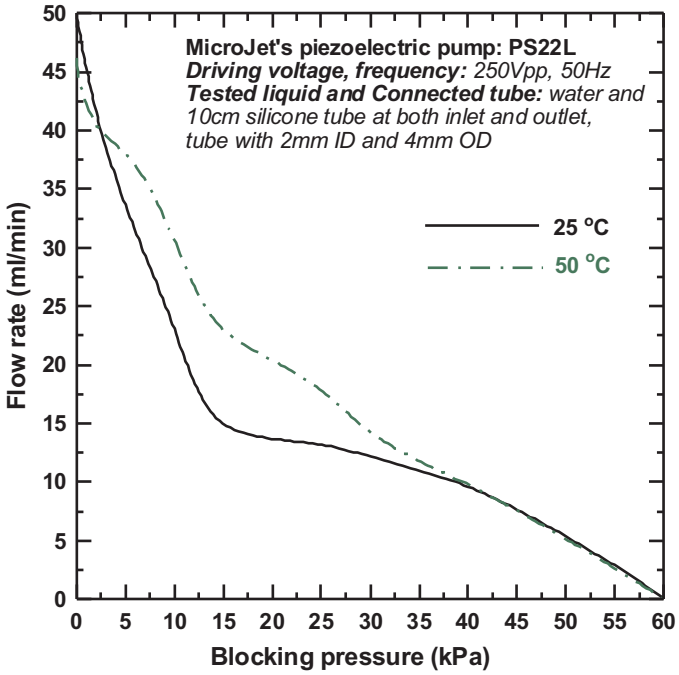


Figure 1. Relation of flow rate and outlet blocking pressure at various temperatures.

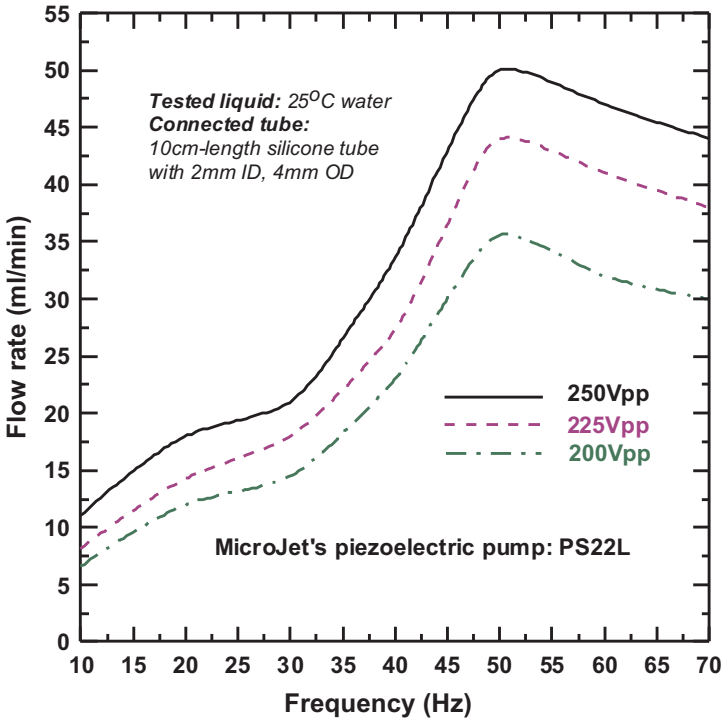
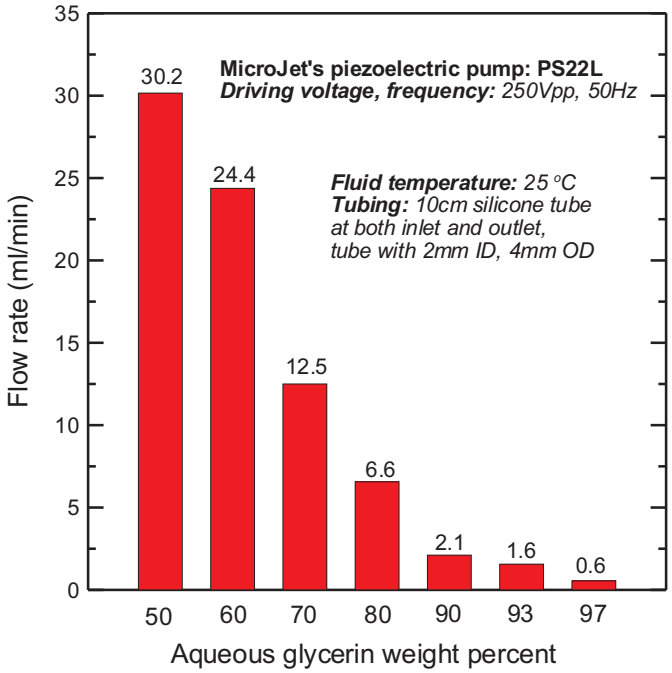


Figure 2. Frequency responses of flow rate at three driving voltages of actuator.



Weight percent	50	60	70	80	90	93	97
20 C viscosity (cP)	6.00	10.8	22.5	60.1	219	367	765
30 C viscosity (cP)	4.21	7.19	14.1	33.9	109	172	340

Figure 3. Effect of liquid viscosity on flow rate

Ordering Information (Please refer Curiejet MicroPump Catalog for version definition)

Liquid Pumps

- PS22L (Non-Driver)
- PS22L (5Vdc,50ml/min,L)
- PS22L (5Vdc,50ml/min,Q)
- PS22L (5Vdc,50ml/min)
- PS22L (5Vdc, DCT, L)
- PS22L (5Vdc, DCT)
- PS22L (12Vdc,50ml/min)
- PS22L (12Vdc, DCT)

/* For PS22L, specified flow rate can be any value between 3ml/min and 50ml/min and the MOQ should be over 1Kpcs Orders /*

Gas Pumps

- GS22L (Non-Driver)
- GS22L (5Vdc,20ml/min,L)
- GS22L (5Vdc,20ml/min,Q)
- GS22L (5Vdc,20ml/min)
- GS22L (5Vdc, DCT, L)
- GS22L (5Vdc, DCT)
- GS22L (12Vdc,20ml/min)
- GS22L (12Vdc, DCT)

/* For GS22L, specified flow rate can be any value between 2ml/min and 20ml/min and the MOQ should be over 1Kpcs Orders /*

Evaluation Purpose (Liquid Pumps)

- EVDC22-5VL:PS22L (5Vdc, DCT, L)+ N22(5Vdc, FC)
- EVDC22-5V:PS22L (5Vdc, DCT)+ N22(5Vdc, FC)
- EVDC22-12V:PS22L (12Vdc, DCT)+ N22(12Vdc, FC)

- EVSF22-5VFTL:PS22L(5Vdc, FT,L)
- EVSF22-5VFTQ:PS22L (5Vdc, FT,Q)
- EVSF22-5VFT:PS22L (5Vdc, FT)
- EVSF22-12VFT:PS22L (12Vdc, FT)

Evaluation Purpose (Gas Pumps)

- EVGDC22-5VL:GS22L (5Vdc, DCT,L)+ N22(5Vdc, FC)
- EVGDC22-5V:GS22L (5Vdc, DCT)+ N22(5Vdc, FC)
- EVGDC22-12V:GS22L (12Vdc, DCT)+ N22(12Vdc, FC)

- EVGSF22-5VFTL:GS22L (5Vdc, FT, L)
- EVGSF22-5VFTQ:GS22L (5Vdc, FT,Q)
- EVGSF22-5VFT:GS22L (5Vdc, FT)
- EVGSF22-12VFT:GS22L (12Vdc, FT)

Notes:
"DCT" means "Dual Control" version.
" L" means "Less Power" version.
"FT" means "F-tunable" version.
"Q" means "Quiet" version.
*Submersible(S) version optional.
*Other materials, like PP or COC to replace POM plastic, and NBR, IIR, FKM to replace EPDM sealing rubber are available and can be specified upon customer's request.

Wiring Information

	Normal	LessPower(L)
Notice Before Wiring	**For Dual Control products to avoid actuator decay in a short time, please connect green wire with frequency input before inputting DC power.**	**Black: Don't touch red wire(DC voltage), to avoid IC break down.** **Red: Don't input voltage larger than 5.5Vdc.**
Specified Flow rate	Black: Gnd Red: Voltage(5Vdc) input, power supply Orange: Voltage(12Vdc) input, power supply Yellow: Disable by inputting digital "High" ("High"=2-5V), Enable by inputting digital "Low". Without any inputting, the pump runs continuously.	Black: Gnd Red: 5Vdc input only, power supply White: On/Off control by inputting logic High/Low signal,(High: >+1.2V; Low: <0.2V) Default to "On" without inputting.
Dual Control (DCT)	Black: Gnd Red: 5Vdc input, power supply Orange: 12Vdc input, power supply Yellow: Control for the AC driving voltage (DC analog 0-0.5V), driving voltage decreases with the DC analog, and thus the flowrate decreases with the DC analog. This input is not necessary in case the user doesn't want to control the driving voltage. As keeping the lead open, the pump is driven at the default driving voltage. Green: Control for the AC driving frequency (by 5Vdc or 12Vdc PWM frequency, 50% duty), input frequency will be the driving frequency. This input is always required in order to run the pump, and the frequency below 60Hz is recommended. Operations over the recommended range may induce the performance permanent decay.	Black: Gnd Red: 5Vdc input, power supply White: On/Off control by inputting logic High/Low signal, (High: >+1.2V; Low: <0.2V) Yellow: Control for the AC driving voltage (DC analog 0-1.3V). The driving voltage increases with the DC analog, and thus the flow rate increases with the DC analog.This input is not necessary in case the user doesn't want to control the driving voltage. As keeping the lead open, the pump is driven at the default maximum driving voltage. Green: Control for the AC driving frequency (by 5Vdc or 12Vdc PWM frequency, 50% duty). Without any inputting, the pump will run at the default driving frequency that almost generates maximum flow rate. The inputting frequency divided by 4 will be the driving frequency(i.e. Fdrv=fin/4). The inputting frequency below 240Hz is recommended as the driving frequency over the recommended may induce permanent decay of the performance.