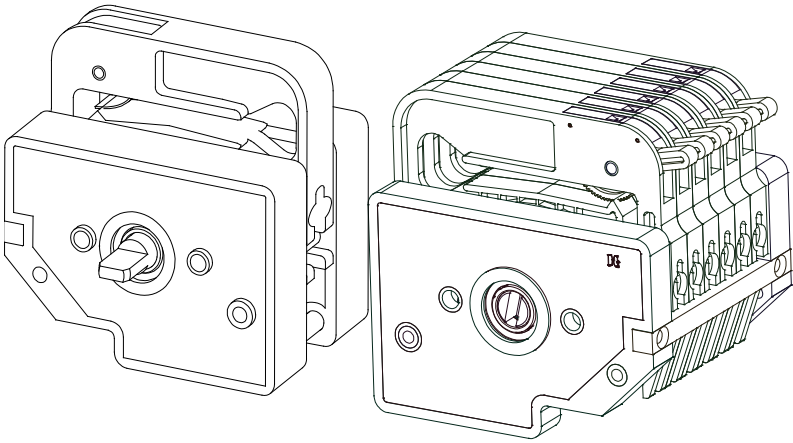




GOLANDER PUMP

DG Pump Head User's Guide



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1 Safety Cautions



Warning: Please read through this user's guide carefully before operating the pump head.



Danger: Remove the power from the pump before mounting or unmounting pump head to the drive.

Danger: Remove the power from pump before attempting any maintenance or any cleaning operation is started.

Danger: Turn drive off before removing or installing tubing. Fingers or loose clothing could get caught in drive mechanism.



Warning: Tubing breakage may result in fluid being sprayed from pump. Please check the tubing frequently and change the tubing in time.

Warning: Please power the pump off before installing external control devices.

Warning: This product is not designed for, nor intended for use in patient connected applications; including, but not limited to, medical and dental use.

Note:

- Only use matched tubing with the pump head to ensure optimum performance. Use of other tubing may void applicable warranties.
- Release the cartridge if the drive stopped for a long time to prevent the rollers from squeezing the tubing all the time.
- Change the squeeze section of the tubing in time to extend its lifetime.
- When tubing breakage occurs, please use a mild detergent solution to clean the pump head. Do not immerse nor use excessive fluid. Please check if the rollers can still rotate smoothly. If not, please stop the drive to prevent it from damaging the pump head.
- Fine adjustment can be made to the gap between the roller and the housing for the tubing. If the pump head can not deliver fluid successfully or the output pressure is too weak, please try to

reduce the gap by rotating the arm of the ratchet wheel until the pump head delivers fluid as expected.

2 Introduction

DG series pump heads are designed for micro flow and multi-channel fluid delivery. The head is stackable and it is easy to change or load tubing. The occlusion gap can be fine tuned. There are 1, 2, 3, 4, 6, 8, 10, 12 channels pump heads with 6 rollers or 10 rollers available. More roller means higher flow accuracy and less pulsation, but smaller flow rate. Stainless steel rollers are easy to clean and resistant to the corrosion. User can rotate the ratchet wheel to the appropriate position for optimum performance. Reduce the gap to get higher output pressure, but it will shorten the lifetime of the tubing. The occlusion will not affect the flow rate.

Some DG pump heads have **color code** (see [Table 1](#) for details) for the ratchet wheel positions. Please rotate the ratchet wheel according to the material and size of the tubing. The pump head accepts the tubing with wall thickness 0.8-1mm, ID 0.13-3.17mm.

Table 1. Tubing and Recommended Ratchet Wheel Position

Tubing Size (ID)	Material	Position		Cartridge Position Color Code
		DG6	DG10	
0.5	Silicone	Red	White	Yellow: Position 1 White: Position 2 Black: Position 3 Red: Position 4 Blue: Position 5 Green: Position 6 Purple: Position 7
1			Yellow	
2		Black	White	
2.4			Yellow	
3				
0.13~3.17	PVC pharmed	Green	Blue	
0.13~3.17	FPM	Blue	Blue	

3 Specifications

Suitable Drive	BT10XX, BT50S
Suitable Tubing Size	Wall Thickness: 0.8mm-1mm ID: 0.13mm~3.17mm
Suitable Tubing type	Silicone, pharmed etc.
Speed Range	0-100 rpm
Flow Range	0-49 mL/min
Channels	1, 2, 3, 4, 6, 8, 10, 12
No. of Rollers	6 Rollers, 10 Rollers 304 SS, (316 SS optional)
Case Material	ABS
Cartridge Material	POM, PVD optional
Occlusion	Adjustable
Operating condition	Temperature 0~40 °C, Relative humidity<80%
Dimensions (WxH)	86x87.3 mm
Weight (DG-2)	0.32 kg (0.7 lbs)

4 Setup and Operation

4.1 Pump Head Installation

- 1) Remove the cartridge from pump head by pressing down the trigger (for DG with 1-3 channels) or using the provided tool to push in the arrow direction on the cartridge (for DG with ≥ 4 channels).

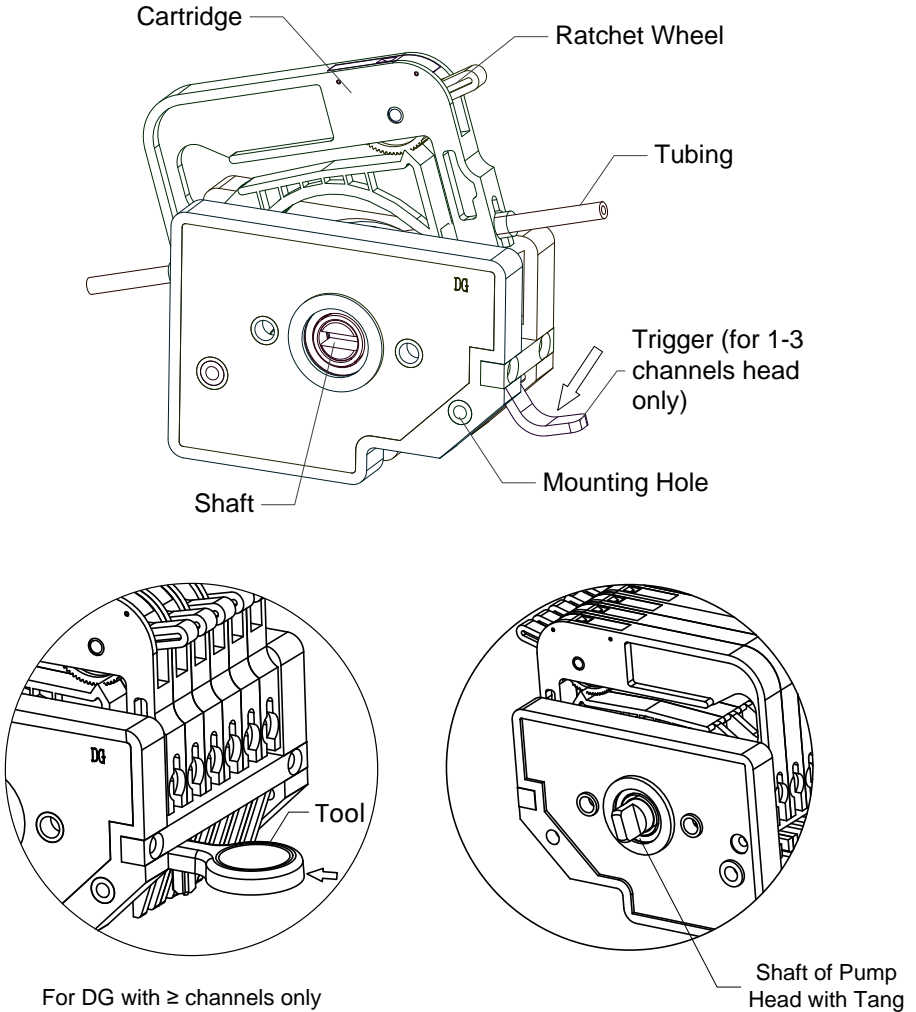


Figure 1. DG Pump Head

- 2) Insert the tang of the pump head shaft into the slot in the shaft on the drive. Then align the pump onto the two alignment pins on the drive.
- 3) Press the pump head against the drive. Insert the provided two Allen screws (M4x12) into the mounting holes from **the back wallboard of the pump head**.
- 4) Tighten the screws using the Allen wrench.

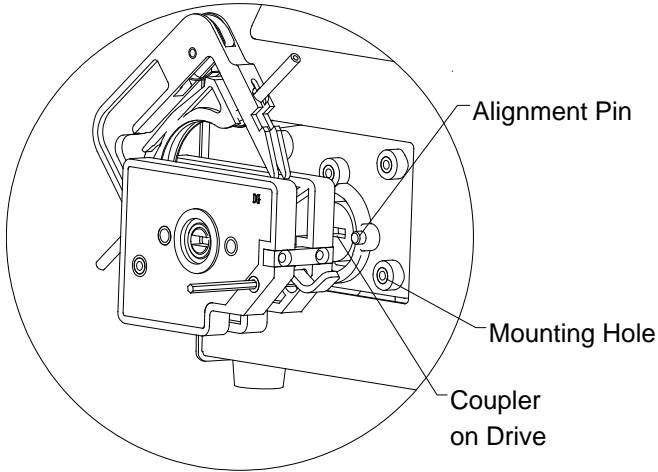


Figure 2. Pump Head Installation

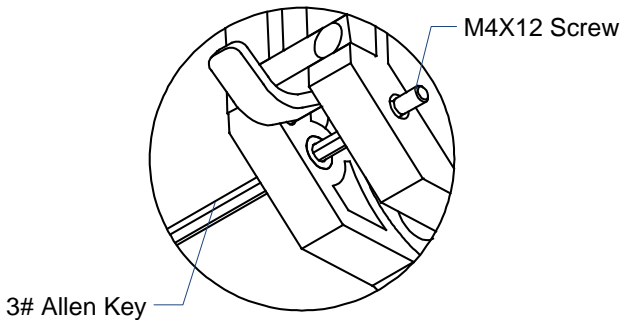


Figure 3. Mounting Screw

Note: When stack another DG pump head to it, please use the same steps above to secure the seconds pump head on the first one.

4.2 Tube Loading

- 1) Be sure the pump drive is turned off.
- 2) Remove the cartridge from pump head.
- 3) Adjust the desired distance between the two stops on the tubing to around 74mm for optimum performance.
- 4) Load the tubing into the slot of the cartridge on each side as shown on the Figure 4.

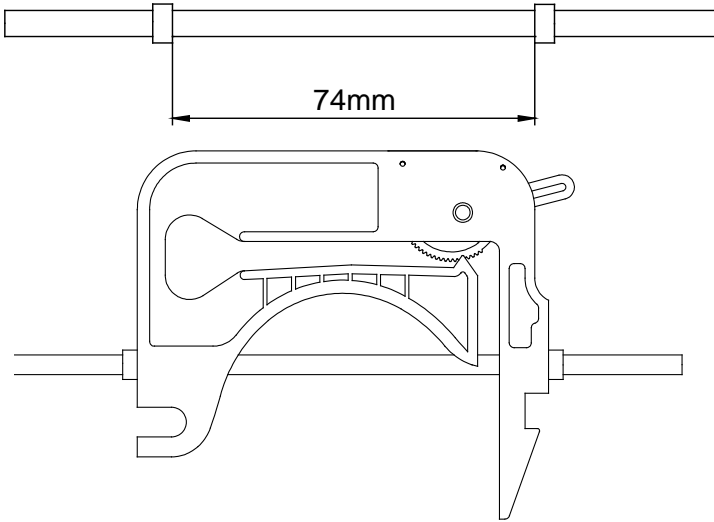


Figure 4. Tubing with Stops

- 5) Rotate the ratchet wheel to the lowest position. Fix the cartridge with the tubing on the pump head.

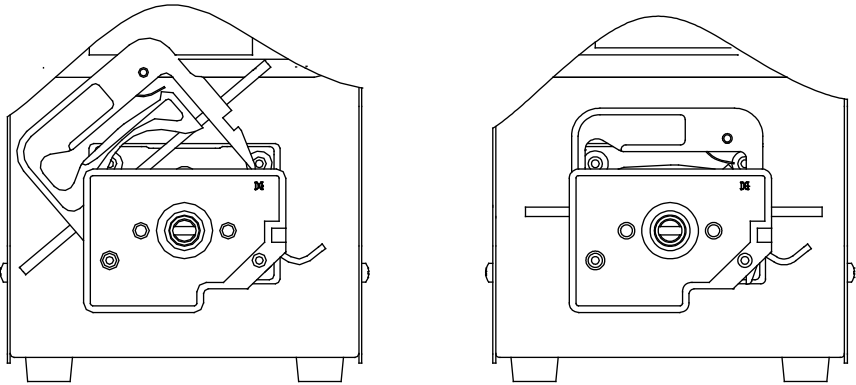


Figure 5. Fix the Cartridge

5 Dimensions

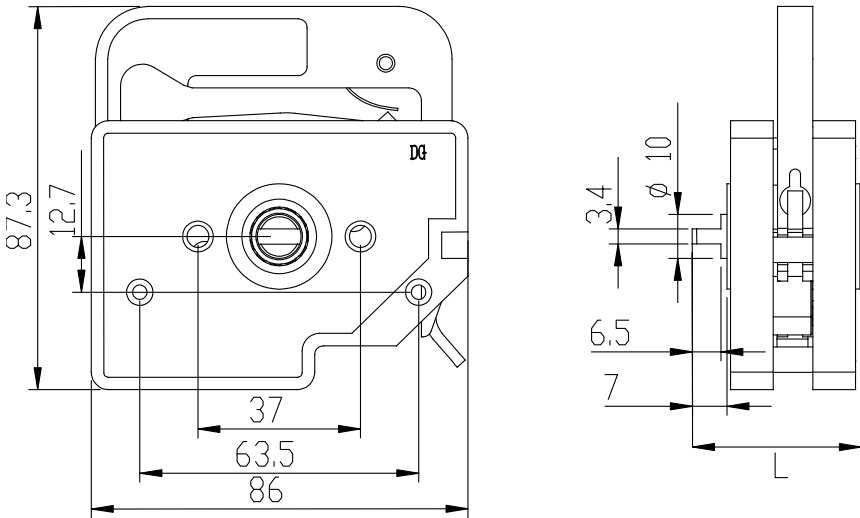


Figure 6. Dimensions (mm)

6 Warranty

The product comes with one-year labor and parts warranty. The limited warranty does not cover any damage that is caused by improper usage and handling.

7 Regular Maintenance

- 1) Always check the tubing and connections to make sure there is no leakage. Keep the pump head dry.
- 2) Do not use chemical solvents to clean the head.
- 3) The ratchet wheel is designed for occlusion adjustment, it will not affect flow rate.
- 4) As time goes on, the flow rate will slightly change. Please adjust the drive speed or calibrate the flow rate when necessary.
- 5) The pump head with 10 rollers has smaller flow rate compared to the one with 6 rollers. However, the flow is smoother.

- 6) There would be 3-5% difference among the channels for multiple-channel pump head. For higher precision application, we recommend only use one channel pump head for each pump.
- 7) If necessary, please apply some grease on the oil-bearing of the pump head after running for a fairly long time.
- 8) After 50 hours use, please check the tubing if it is still in good working condition.
- 9) Applying some grease on the tubing will extend its lifetime.

8 Typical Flow, Pressure Data

The rated flow rate below is for 75 °F water at standard atmospheric pressure. The tubing length is 1 meter, 0.5m for inlet and 0.5m for outlet.

Table 2. DG6 Flow Rate (mL/min)

Speed (rpm)	ID (mm)					
	0.13	0.25	0.5	0.76	1	1.22
0.1	0.00016	0.0005	0.0022	0.0048	0.0058	0.0108
1	0.0016	0.005	0.022	0.048	0.058	0.108
50	0.08	0.25	1.1	2.4	2.9	5.4
100	0.16	0.5	2.2	4.8	5.8	10.8

Table 3. DG6 Flow Rate (mL/min)

Speed (rpm)	ID (mm)					
	1.52	1.65	2.1	2.4	2.79	3.17
0.1	0.017	0.018	0.021	0.026	0.035	0.049
1	0.17	0.18	0.21	0.26	0.35	0.49
50	8.5	9	10.5	13	17.5	24.5
100	17	18	21	26	35	49

Table 4. DG10 Flow Rate (mL/min)

Speed (rpm)	ID (mm)					
	0.13	0.25	0.5	0.76	1	1.22
0.1	0.00011	0.00045	0.00177	0.0039	0.0048	0.008
1	0.0011	0.0045	0.0177	0.039	0.048	0.080
50	0.055	0.225	0.885	1.956	2.42	3.981
100	0.11	0.45	1.77	3.91	4.84	7.96

Table 5. DG10 Flow Rate (mL/min)

Speed (rpm)	ID (mm)					
	1.52	1.65	2.1	2.4	2.79	3.17
0.1	0.013	0.014	0.016	0.02	0.028	0.041
1	0.134	0.140	0.161	0.2	0.28	0.41
50	6.714	7.031	8.05	10	14	20.5
100	13.43	14.06	16.1	20	28	41

Table 6. DG Tubing size

Parameters	Tubing Size				
	0.5x0.8	2.4x0.8	1x1	2x1	3x1
Wall Thickness (mm)	0.8		1		
ID (mm)	0.5	2.4	1	2	3
Max Pressure (Mpa)	0.1				