

HMD3 Syringe Pump with Solenoid Valve Specification Sheet



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1 Introduction

In today's competitive market environment, how to shorten product development cycles and accelerate time-to-market is a critical issue for every instrument developer. However, the extended periods required for the development, testing, and validation of core microfluidic components often impact final product delivery. From now on, use the HMD3 series syringe pump to comprehensively accelerate your product release cycle.

1.1 Features

- Designed and manufactured to the highest quality standards, compliant with ISO9001, EU RoHS Directive, and CE safety certification, eliminating regulatory.
- Provides fluid applications within the range of 5 μ L~5mL, and offers different valve configuration options, making it highly suitable for parallel liquid handling tasks with multiple probes, and delivering excellent precision.
- Features excellent characteristics for multi-channel parallel processing applications, including compact size, easy maintenance, long lifespan, and extremely stable driver software.
- Offers a rich range of syringe capacity options: 50 μ L, 100 μ L, 250 μ L, 500 μ L, 1.0mL, 2.5mL, 5.0mL.
- Integrated valve design, capable of independently completing various complex liquid operations such as pipetting, dispensing, and dilution through a built-in programmable command system.
- Integrated drive control, paired with a powerful command system and automatic operation mode, can even fulfill all your fluid operations without requiring an additional main control board.

Foreach Warranty

Please refer to our General Terms of Sale (GTS)

2 Appearance and Dimensions

Unit:mm

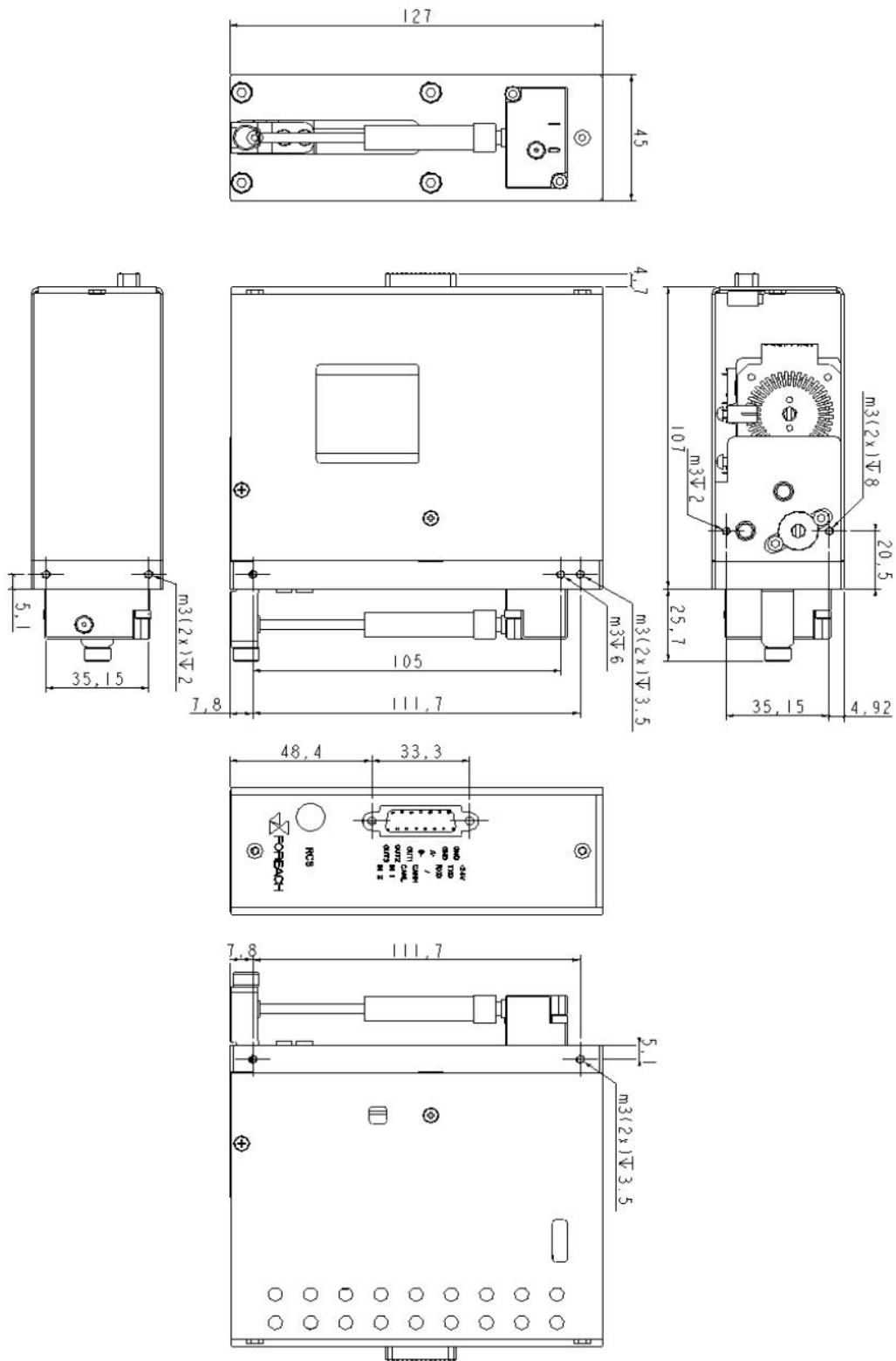


Figure 1 Outline Dimensions

3 Technical Features

3.1 Syringe Piston Drive Assembly

The HMD3 series uses a ground-grade ball screw transmission structure, providing extremely stable linear motion performance. The total stroke length is 30mm, driven by a stepper motor equipped with a precision loss-of-step detection device, enabling backlash-free syringe reset and piston motion loss-of-step detection.

3.2 Motion Curve

Capable of full-stroke operation from a fastest time of 1.25 seconds to a slowest time of 20 minutes. Parameters including start speed, acceleration, maximum speed, deceleration, and stop speed can all be custom-set to meet different application requirements.

3.3 Control Interface

Users can freely choose RS-232/RS-485 or CAN to control the HLD3. Via RS-485 networking, users can control up to 15 HLD3 units with a single communication interface. It is equipped with 2 input and 3 output pins to achieve timing synchronization between the HLD3 and other HLD3 units or other devices. Combined with automatic operation mode, fully automated operation without any main controller is achievable.

3.4 Upgrade

Client firmware is upgradeable.

3.5 Maintenance

The software includes built-in run counters for the syringe and valve, providing reliable data for instrument maintenance scheduling.

4 Component Structure

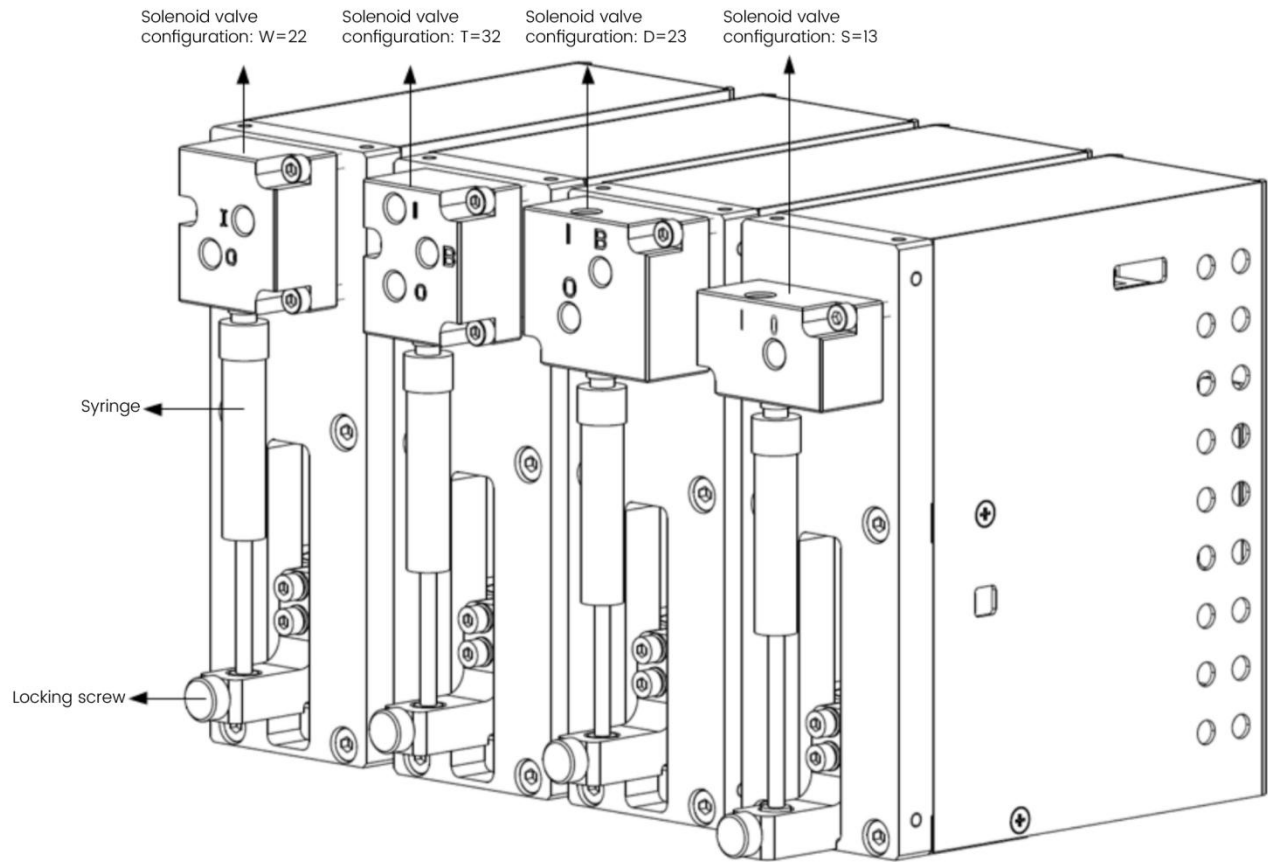


Figure 2 Component Structure

5 Valve Configurations

5.1 2-Port Valve Configuration

Set I command, Port IN connected to Syringe S.

Set O command, Port OUT connected to Syringe S.

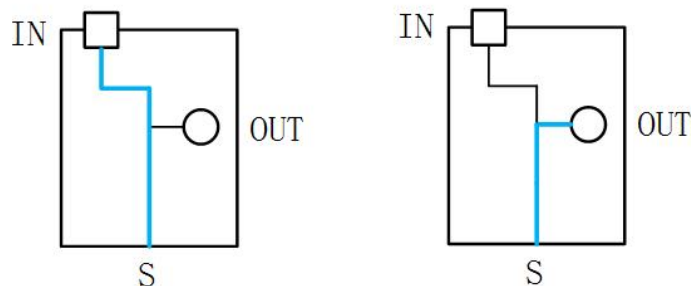


Figure 3 2-Port Valve Configuration

5.2 3-Port Valve Configuration

Set I command, Port IN connected to Syringe S.

Set O command, Port OUT connected to Syringe S.

Set B command, Port Bypass connected to Syringe S.

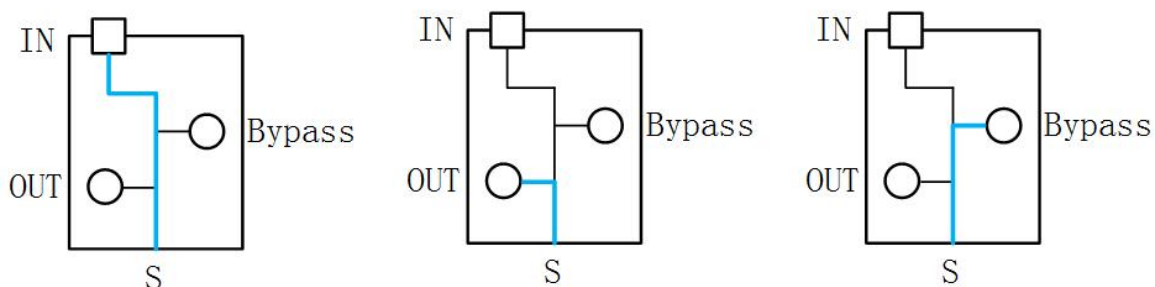


Figure 4 3-Port Valve Configuration

5.3 2-Port Non-Dispensing Solenoid Valve

Valve Command I, Port 1 connected to Syringe S.

Valve Command O, Port 2 connected to Syringe S.

Valve Command B, Port 1 connected to Port 2.

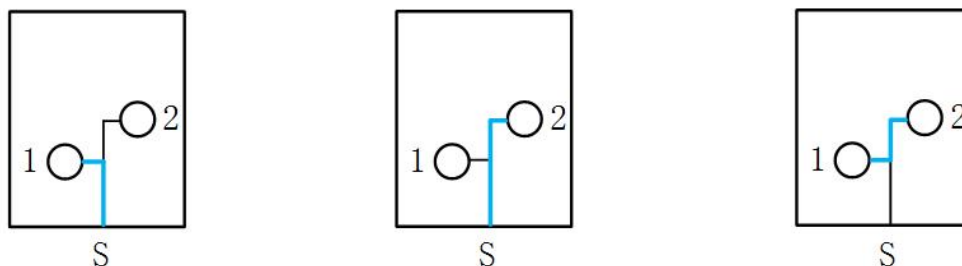


Figure 5 2-Port Non-Dispensing Solenoid Valve

5.4 3-Port Dispensing Solenoid Valve

Valve Command I, Port 1 connected to Syringe S.

Valve Command O, Port 3 connected to Syringe S.

Valve Command B, Port 2 connected to Syringe S.

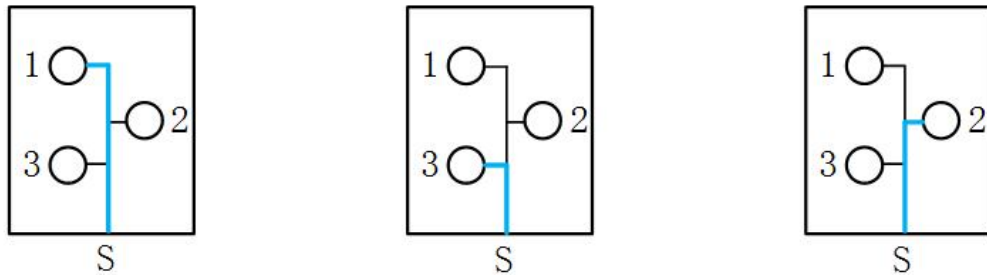


Figure 6 3-Port Dispensing Solenoid Valve

6 Specifications

Table 1 Specifications

Specifications			
Specification		Parameters	
Piston	Principle	Equipped with precision loss-of-step detection device and stepper motor driving a ball screw.	
	Stroke	30mm	
	Full Stroke Operating Time	1.2-1200s	
	Linear Velocity	0.025-25mm/s	
	Resolution	Standard Mode: 3000 increments; Microstepping Mode: 24000 increments	
Syringe	Capacity	50 μ L, 100 μ L, 250 μ L, 500 μ L, 1.0mL, 2.5mL, 5.0mL	
	Threaded Connection	1/4-28UNF	
	Pressure Resistance	0.4MPa	
	Accuracy	Accuracy Error $\leq 1\%$ (rated stroke)	
	Repeatability	Repeatability Error $\leq 0.05\%$ (Rated Stroke, $\geq 250 \mu$ L) Repeatability Error $\leq 0.1\%$ (Rated Stroke, $\leq 100 \mu$ L)	
Rotary Valve	Valve Configuration	2-Port Solenoid Valve, 3-Port Solenoid Valve	2-Port Non-Dispensing Solenoid Valve, 3-Port Dispensing Solenoid Valve
	Threaded Connection	1/4-28UNF	1/4-28UNF
	Response Time	≤ 50 ms	≤ 50 ms
	Operating Pressure Range	-75Kpa~0.2Mpa	-75Kpa~0.2Mpa
Installation Dimensions	Height	127mm	
	Width	45mm	
	Depth	116mm	
Power Supply	Voltage	24V $\pm 10\%$	
	Current	1.5A	
Interface	Type	RS-232, RS-485, CAN	
	Baud Rate	9600/38400 (RS-232 & RS-485) 100k, 125k, 250k, 500k & 1M (CAN)	
	Specification	Data Bits: 8	Parity: None Stop Bit: 1
Communications	Address	Up to 15 Individual Addresses	
	Correspond	Data Terminal	
Firmware		Programmable ramps, cutoff speed, backlash compensation, piston speed, delays and loops, termination moves, diagnostics, absolute and relative positions.	
Input		2x TTL Inputs (4.7k Pull-up)	
Output		3x CMOS (HC-level) Outputs	
Environment	Operating Temperature	15°C to 45°C	
	Operating Humidity	20-80%RH at 40°C, Non-condensing	
	Storage Temperature	-20~65°C	
Weight		800g	

Note:

Parameters subject to change. For details, please consult FOREACH.

7 Ordering Information

Table 2 Order List

Product Model Information List		
Product Code	Model	Description
919037	HMD3-1PKFSU28	Syringe Pump HMD3-1PKFSU28 919037
919038	HMD3-1PKFDU28	Syringe Pump HMD3-1PKFDU28 919038
919042	HMD3-1EFTU28	Syringe Pump HMD3-1EFTU28 919042
919047	HMD3-1EIFWU28	Syringe Pump HMD3-1EIFWU28 919047

HMD3	-	1	PK	F	S	U28	N
Series		Channel Count	Valve Seat Material	Diaphragm	Valve Configuration	Thread	Other
HMD3		1: 1 Channel	PK: PEEK AC: POM E: PEI MA: PMMA	F: FKM K: FFKM E: EPDM	S: 13(2-Port SV*) D: 23(3-Port SV*) T: 32(3-Port Dispensing SV*) W: 22(2-Port Non-Dispensing SV*)	U28: 1/4-28 M6: M6*1	None (With Drive)

Figure 7 HMD3 Selection Table

Note:

Not all cross-combination products listed above are available. For standard products, please see "Chapter 8 Ordering Information".

SV*: Solenoid Valve

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