

EAS Piston Pump Specification Sheet



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1 Introduction

1.1 Overview

The HaloFlx-EAS series is a compact, high-performance, long-lifespan, maintenance-free, easy-deaeration piston pump, specifically designed for precision liquid handling such as automated pipetting, dilution, and dispensing operations.

The unique chamber structure design cleverly combines fluid characteristics to reduce flow loss and maximize priming and deaeration efficiency, eliminating stubborn bubbles. Based on positive displacement piston technology, extensive testing shows that the HaloFlx-EAS series has an expected life of five million cycles and repeatability within 1.5% at 2% stroke. Compared to traditional syringes, the HaloFlx-EAS series saves downtime and maintenance because it does not require routine preventive maintenance such as cleaning and nut tightening. By selecting the seal flushing option, the life of the HaloFlx-EAS series can be extended even longer, especially when used with highly corrosive or crystallization-prone liquids.

1.2 Features

- Compact design, small form factor, easy integration.
- Long lifespan, 5 million cycles(Note 1), over 15 times that of traditional glass/PTFE syringes, silicone-free seals.
- Maintenance-free(Note 2).
- Piston: Ceramic; Seal: UHMWPE, optional light-shielding configuration.
- 42 linear stepper motor, 1.8°, bipolar, high-speed, low-noise, full stroke time at maximum speed $\leq 1s$.
- Standard 1/4-28UNF threaded connection, other threaded connections such as M6 optional.
- Three initial position optocoupler optional.
- Unique chamber structure design, maximizes priming and deaeration efficiency.
- Integrated driver ISC1000 optional, control interfaces RS-232/RS-485/CAN.

Notes:

1: Medium is pure water, room temperature, back pressure 50KPa

2: For salt-containing solutions, necessary protection and maintenance procedures should be designed considering crystallization factors.

Foreach Warranty

Please refer to our General Terms of Sale (GTS)

2 Appearance and Dimensions

The 2D drawings show dimensions with the default motor configuration. Total height may vary slightly with different motor configurations.

Unit:mm

2.1 EAS-1000 μ L

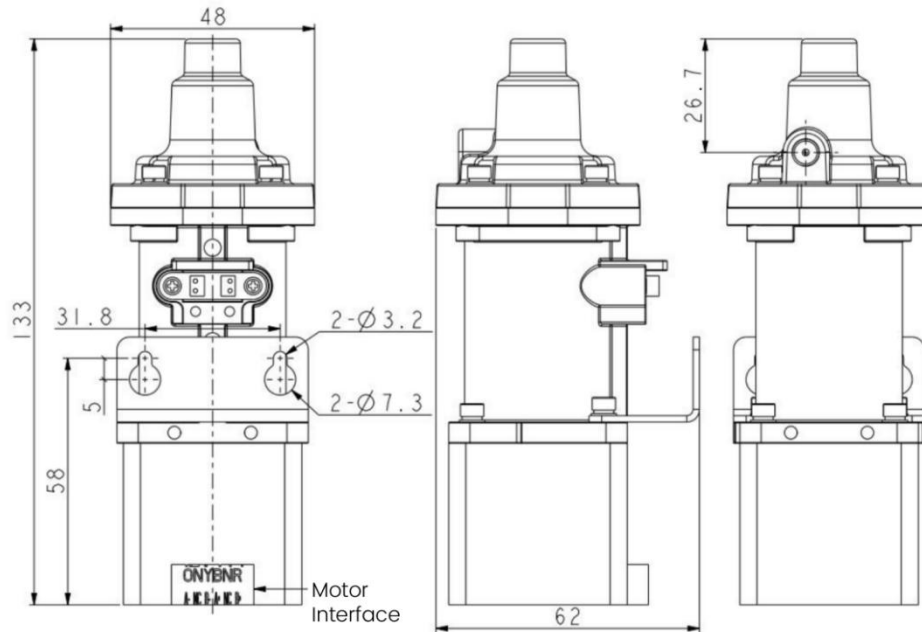


Figure 1 EAS-1000 μ L Outline Dimensions

2.2 EAS-0500 μ L

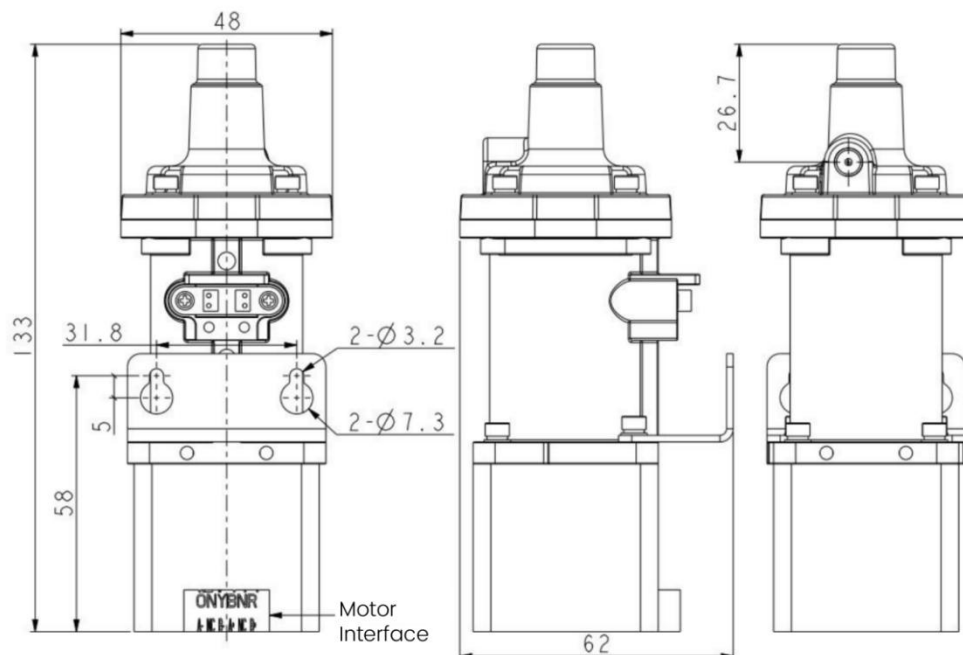


Figure 2 EAS-0500 μ L Outline Dimensions

2.3 EAS-0100 μ L

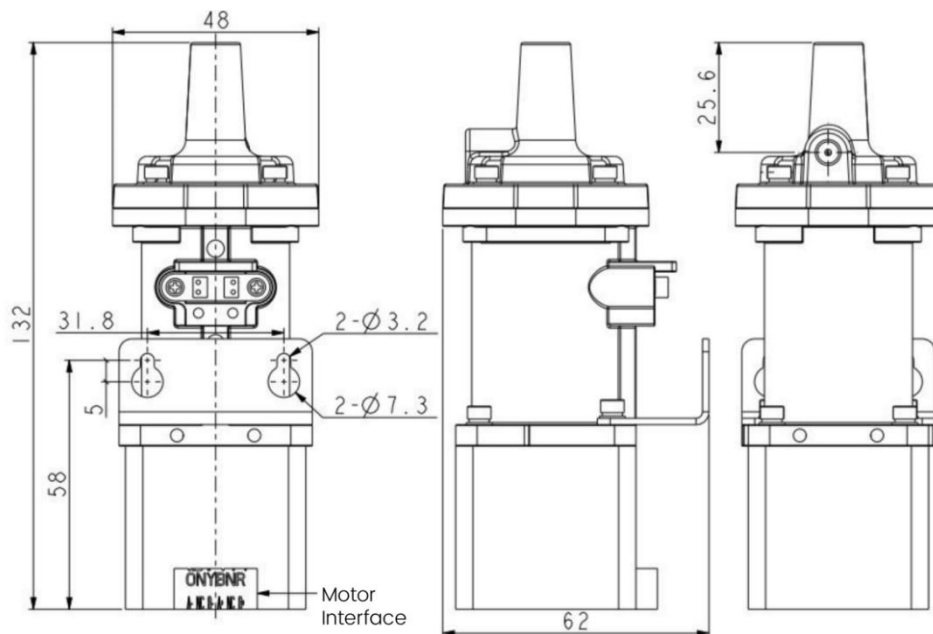


Figure 3 EAS-0100 μ L Outline Dimensions

3 Stroke Information

The schematic diagram of the pump's stroke distribution is as follows:

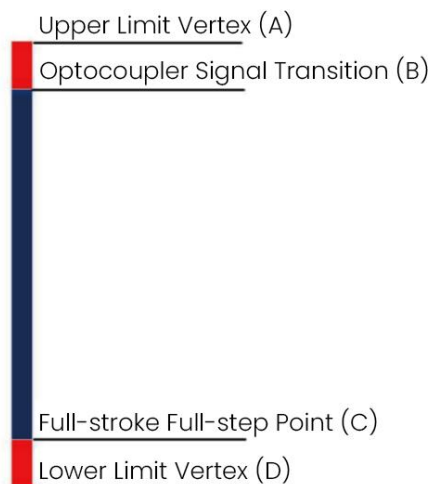


Figure 4 Pump Stroke Distribution

Description:

When the piston moves upward to point B, the optocoupler is in the blocked state; the AB distance $\geq 0.6\text{mm}$.

The BC interval is the selected full stroke integer steps (2000/2400/4000 Steps); the CD distance $\geq 1.3\text{mm}$.

The optocoupler is in the blocked state in the AB interval; the optocoupler is in the unblocked state in the BD interval.

For more options, please consult local agents and suppliers.

4 Motor Configuration

4.1 4-wire Bipolar Motor

4.1.1 Electrical Characteristics

Table 1 4-wire Bipolar Motor Electrical Parameters

4-wire Bipolar Motor Electrical Parameters		
Item	Specification	Remarks
Rated Current	1.2 A/Phase	--
Number of Phases	2 Phase, Bipolar	4-wire
Winding Resistance	$1.9\Omega \pm 10\%$	25°C
Winding Inductance	$4.0\text{mH} \pm 20\%$	1kHz
Static Angle Error	$\pm 0.09^\circ/\text{MAX}$	1 (Excluding hysteresis error)

4.1.2 Pin Connection

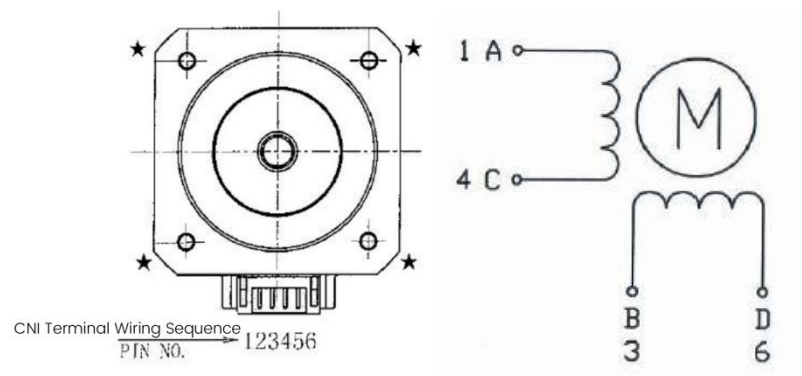


Figure 5 4-wire Bipolar Motor Pin Connection

5 Optocoupler Configuration

5.1 3-wire Optocoupler

5.1.1 Electrical Characteristics

Table 2 3-wire Optocoupler Electrical Parameters

3-wire Optocoupler Electrical Parameters		
Item		Specification
Input Side	Forward Voltage	5~24V DC
	Supply Voltage	30V
	Collector Current	50mA

Table 3 3-wire Optocoupler Typical Application

3-wire Optocoupler Typical Application	
Item	Recommended Value
Current Limiting Resistor R_f	No Current Limiting Resistor Required
Pull-up Resistor R_L	10k Ω
Note: R_L is the recommended value for $V_{CC}=5V$ DC.	

5.1.2 Pin Connection

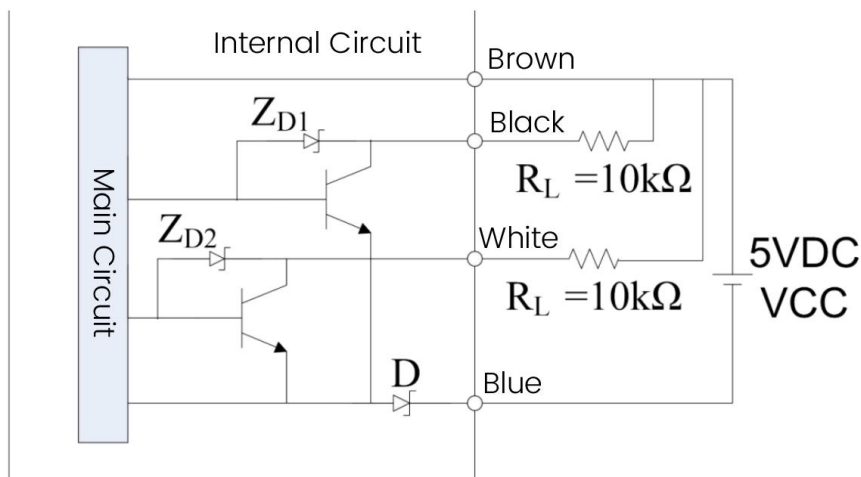


Figure 6 3-wire Optocoupler Pin Connection

Wiring Instructions:

- Brown wire: Select power supply voltage within DC 5~24V range, no current limiting resistor required.
- Blue wire: Connect to the negative terminal of the power supply.
- Black wire/White wire: Signal output lead. Connect to the positive terminal of the power supply via a pull-up resistor. If the white wire is selected for output, it is light-on high-level mode; if the black wire is selected for output, it is dark-on high-level mode.

5.2 4-wire Optocoupler

5.2.1 Electrical&Optical Characteristics

Table 4 4-wire Optocoupler Electrical Parameters

4-wire Optocoupler Electrical Parameters			
Item		Symbol	Specification
Input Side	DC Forward Current	I_F	50mA
	DC Reverse Voltage	V_R	5V
Output Side	Collector-Input Voltage	V_{CEO}	30V
	Input-Collector Voltage	V_{ECO}	5V
	Collector Current	I_C	20mA

Table 5 4-wire Optocoupler Electrical Optical Characteristics

4-wire Optocoupler Electrical Optical Characteristics			
Item		Symbol	Specification
Input Side	Forward Voltage	V_F	Standard 1.2V, Max 1.5V
Output Side	Collector-Input Saturation Voltage	$V_{CE(sat)}$	Max 0.5V

Table 6 4-wire Optocoupler Typical Application

4-wire Optocoupler Typical Application		Recommended Value
Item		
Current Limiting Resistor R_f		150~200Ω
Pull-up Resistor R_L		10kΩ
Note: R_f , R_L are recommended values for $V_{CC}=5V$ DC, must be connected by the customer. If the customer uses other power supply voltages, it is recommended to design the value of R_f such that $20mA < I_f < 25mA$.		

5.2.2 Pin Connection

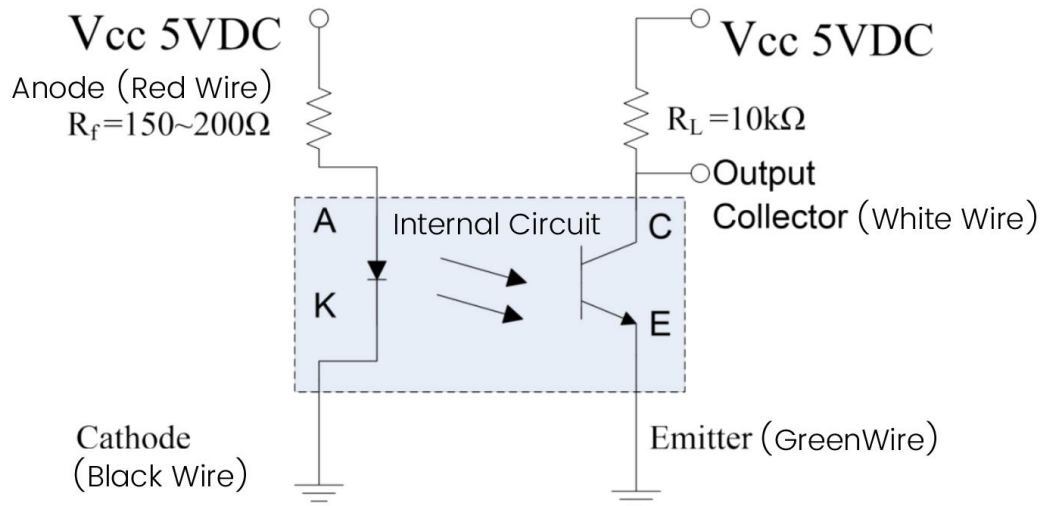


Figure 7 4-wire Optocoupler Pin Connection

Wiring Instructions:

- Red: Connect to the positive terminal of the power supply. A current limiting resistor must be used.
- Black: Connect to the negative terminal of the power supply.
- White: Signal output lead. Open-collector output. After connecting a pull-up resistor, blocked outputs high level, unblocked outputs low level.
- Green: Connect to the negative terminal of the logic power supply.

5.3 5-wire Optocoupler

5.3.1 Electrical&Optical Characteristics

Table 7 5-wire Optocoupler Electrical Parameters

5-wire Optocoupler Electrical Parameters			
Item		Symbol	Specification
Input Side	DC Forward Current	I_F	50mA
	DC Reverse Voltage	V_R	5V
Output Side	Supply Voltage	V_{CC}	17V
	Output Current	I_O	16mA

Table 8 5-wire Optocoupler Electrical Optical Characteristics

5-wire Optocoupler Electrical Optical Characteristics			
Item		Symbol	Specification
Input Side	Forward Voltage	V_F	Standard 1.2V, Max 1.4V
Output Side	Collector-Input Saturation Voltage	$V_{CE(sat)}$	Max 0.4V

Table 9 5-wire Optocoupler Typical Application

5-wire Optocoupler Typical Application		Recommended Value
Item		Recommended Value
Current Limiting Resistor R_f		150~200Ω
Pull-up Resistor R_L		Built-in to Optocoupler
Note: R_f is the recommended value for $V_{CC}=5V$ DC, must be connected by the customer. If the customer uses other power supply voltages, it is recommended to design the value of R_f such that $20mA < I_F < 25mA$. R_L is built-in.		

5.3.2 Pin Connection

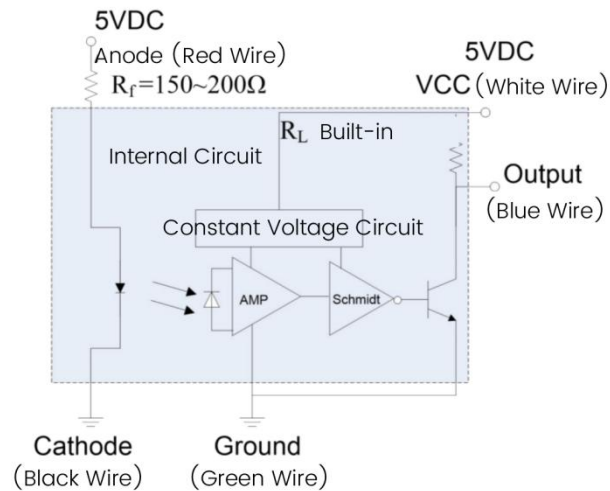


Figure 8 5-wire Optocoupler Pin Connection

Wiring Instructions:

- Red wire: Connect to the positive terminal of the power supply. A current limiting resistor must be used.
- Black wire: Connect to the negative terminal of the power supply.
- White wire: Logic power supply for the photoelectric sensor output.
- Blue wire: Signal output lead. Blocked outputs low level, unblocked outputs high level.
- Green wire: Connect to the negative terminal of the logic power supply.

6 Specifications

6.1 Basic Capacities

Table 10 Basic Capacities

Basic Capacities			
Capacity(μ L)	Resolution(Note3) (μ L/Step)	Full Stroke Steps(Step)	Lead Screw Lead(mm)
0050	0.025	2000	1.27
0100	0.05	2000	1.27
0250	0.125	2000	1.27
0500	0.25	2000	1.27
1000	0.5	2000	1.27
2500	1.12	2236	1.27
5000	2.5	2000	1.27
6000	2.5	2400	1.27
10000	2.5	4000	1.27
20000	5	4000	2.54

Note:

3: Resolution=Capacity/Full Stroke Steps; For example, current range 100 μ L, full stroke steps 2000 steps, resolution = 100/2000=0.05 μ L/Step.

6.2 Basic Specifications

Table 11 Specifications

Specifications		
Specification	Unit	Parameter
Pump Type	--	Piston Type
Piston	--	Ceramic
Installation Dimensions	mm	2xM3x31.8 or 2xM3x42.8
Threaded Connection	N/A	2x1/4-28UNF or 2xM6
Backlash(Note4)(Retraction Error)	%	$\leq 1.0\%$
Accuracy (at full stroke)	%	$\leq 0.5\%$
Repeatability(at full stroke)	%	$\leq 0.5\%$
Accuracy (at 2% stroke)(Note5)	%	$\leq 2.0\%$
Repeatability (at 2% stroke)(Note6)	%	$\leq 1.5\%$
Fluid Pressure(Note7)	MPa	< 0.30

Notes:

4: Backlash compensation required in software for precise dosing.

5: Stepper precision stroke test method; i.e., evaluated by testing the accuracy of piston stroke.

6: Stepper precision stroke test method; i.e., evaluated by testing the accuracy of piston stroke.

7: For more pressure options, consult your local agents and suppliers.

6.3 Options

Initial position photoelectric sensor optional: 3/4/5 wire optocoupler or wireless optocoupler.

Motor optional: 4-wire bipolar motor, 6-wire unipolar motor.

Pump head material optional: G=PCTG, A=PMMA, P=PPS, K=PEEK.

Pump head type optional: Transparent, Light-shielding.

Full stroke steps optional: Standard specification 2000 steps, High resolution 4000 steps.

Mounting bracket optional: 2xM3x31.8, 2xM3x42.8.

Rich selection of tubing kits optional: Tubing assemblies, fittings.

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