

# ENV SERIES

## MOTORIZED NEEDLE VALVES

The ENV series of motorized needle valves for proportional flow rate adjustment combine the accuracy and repeatability benefits of a stepper motor with the linearity and resolution of a needle valve.

The result is adjustable flow control with less than 2% hysteresis, 0.1% repeatability and 0.2% resolution - making these valves ideal for consistent, high-performance delivery of gases and liquids in medical, life science and advanced-automation applications.



## KEY ADVANTAGES

### \* MULTIPLE ORIFICE SIZES

Available orifice sizes ranging from the low flow  $\varnothing 0.9$  mm (0 to 50 SLPM gas) to high flow  $\varnothing 8.25$  mm (0 to 4900 SLPM gas) make selecting the right size easy.

### \* HIGHLY LINEAR

The linearity of the ENV, as low as 1%, simplifies the creating of lookup tables or outer control loops with an simplified relationship between command input and flow output.

### \* REPEATABLE

By going to the same flow rate each time, with 0.1%, the ENV series provides consistent performance day in and day out

### \* WIDE PRESSURE RANGE

Vacuum through 7 to 10 bar, depending on orifice size, the ENV covers a wide range of inlet pressures. The stiffness and power of the motor ensures that the valve opens at the same command input, independent of pressure.

### \* LOW HYSTERESIS

Less than 2% hysteresis makes integration and programming easy, by providing consistent flow when both increasing and decreasing to get to a setpoint.

### \* HIGH RESOLUTION

0.2% resolution allows the ENV series to make minute flow adjustments in response to very small changes in command input, providing excellent controllability.

## MECHANICAL SPECIFICATIONS

**Valve Type:**

2-Way Proportional

**Gating Element:**

Needle Seat Valve

**Actuation Method:**

Stepper Motor

**Wetted Materials:**

(based on order code)

6061 Al & FKM (suffix left blank)

316 Series SS and FKM (suffix SSF)

316 Series SS and FFKM (suffix SSK)

**Mounting:**

Through-hole

**Mounting Orientation:**

Any

**Environmental Protection Class:**

IP52

**Operating Temperature:**

0...50C (32...122F)

**Filtration:**

40 um Particulate

**Media:**

Neutral Gases, Oxygen, Water, and other Liquids

Other Compatibilities Available

**Burst Pressure:**

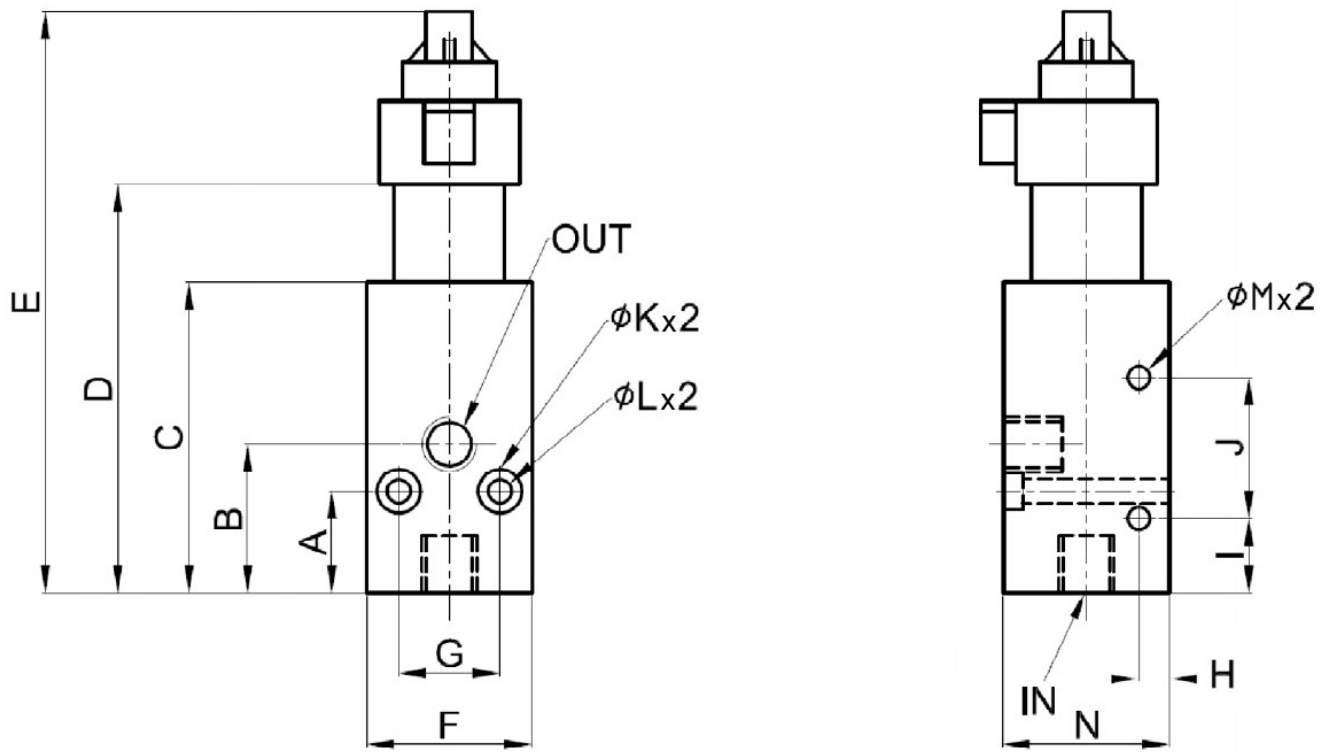
30 bar (435 psi)

**Electrical Connector:**

JST SMR-04V-B

	Units	ENV-0090	ENV-0375	ENV-0670	ENV-0825
Orifice Size	mm	0.9	3.75	6.7	8.25
Minimum Pressure	vacuum	vacuum	vacuum	vacuum	vacuum
Maximum Pressure	bar (psi)	7 (101.5)	7 (101.5)	10 (145)	10 (145)
Maximum Flow Rate (Air)	slpm	50	410	3200	4900
Maximum Flow Rate (Water)	lpm	0.94	8.6	62	95
Leakage	slpm	<0.1	<0.1	<0.1	<0.1
Ports		1/8" BSPP	1/8" BSPP	3/8" BSPP	PT 1/2"
Compatible Driver		D5-01-U01	D5-03-U01	D5-05-U01	D5-06-U01

## DIMENSIONS



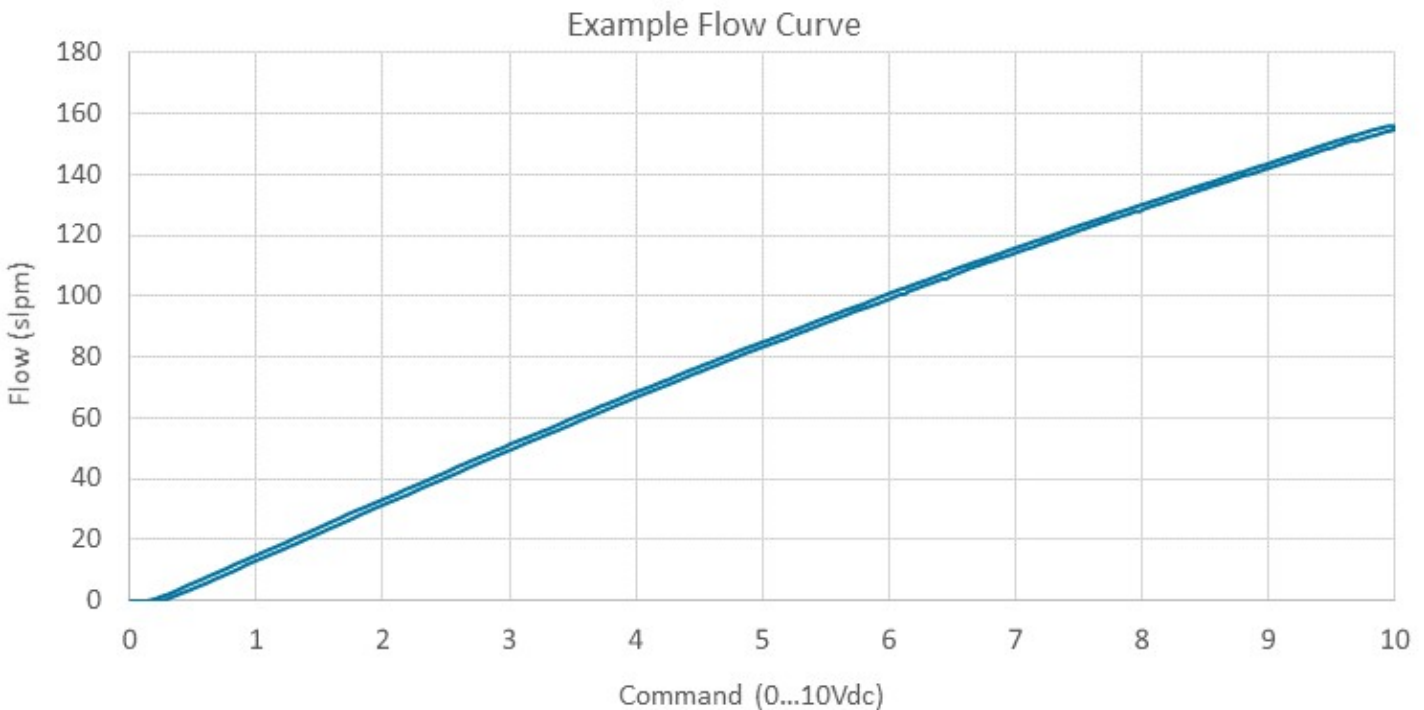
	A	B	D	E	F	G	H	I	J	$\phi K$	$\phi L$	$\phi M$	N	IN	OUT
ENV-0090	5.3	14.3	43.8	81.1	25.0	15.0	-	-	-	6.0	3.3	-	25.0	G 1/8	G 1/8
ENV-0375	15.4	26.2	57.8	94.2	29.7	18.3	4.95	13.6	25.6	7.0	4.3	4.3	29.7	G 1/8	G 1/8
ENV-0670	19.8	32.4	72.1	110.1	40.0	28.0	-	-	-	7.0	4.3	-	40.0	G 3/8	G 3/8
ENV-0825	10.0	32.4	81.8	147.5	50.0	30.0	-	-	-	8.0	4.8	-	40.0	PT 1/2	PT 1/2

## PERFORMANCE SPECIFICATIONS

	Units	ENV-0090	ENV-0375	ENV-0670	ENV-0825
Hysteresis	% FS	±2	±2	±2	±2
Linearity	% FS	±2	±1	±10	±10
Repeatability	% FS	± 0.1	± 0.1	± 0.1	± 0.1
Resolution <sup>1</sup>	slpm	0.1	0.3	2.0	2.0
Response Time <sup>2</sup>	seconds	0.8	1.0	1.25	2.5

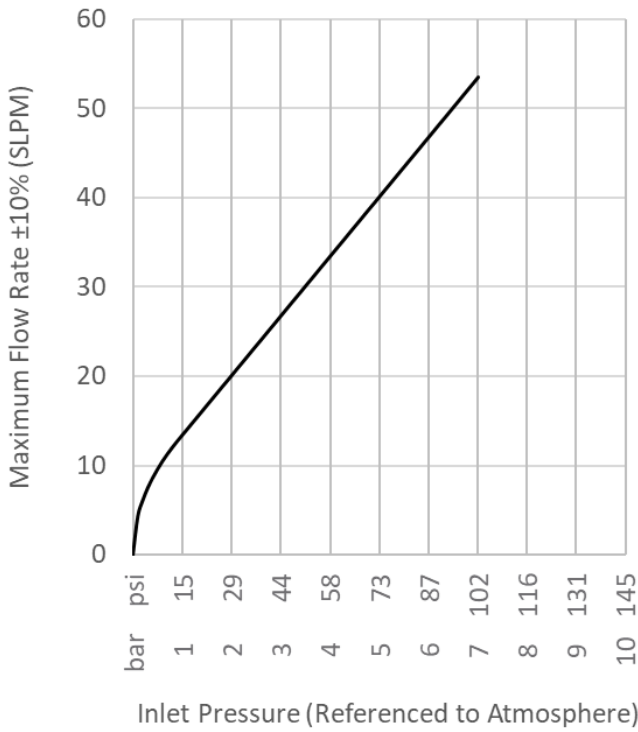
1. Resolution measurements takes at 3 bar inlet pressure to atmosphere
2. Response Time is based on shift from fully-open to fully-closed

## FLOW VS. COMMAND

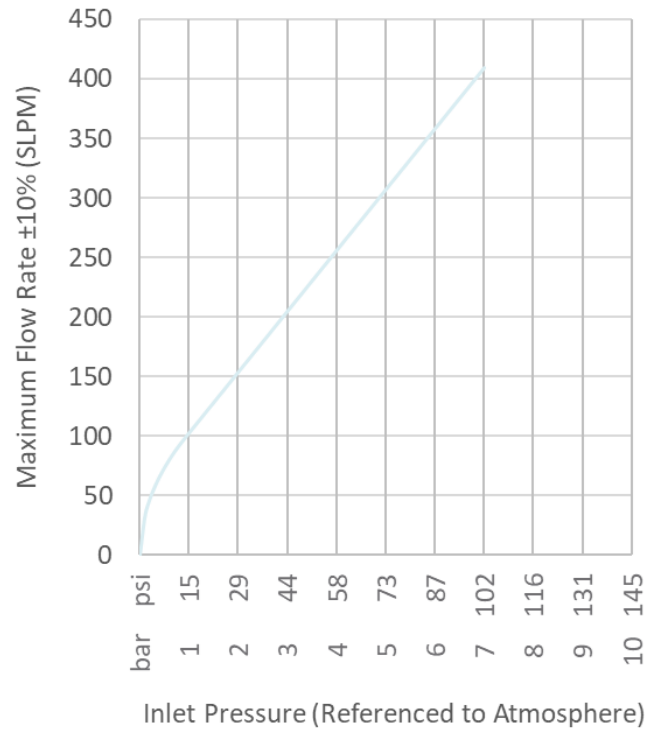


## MAX FLOW VS. INLET PRESSURE (AIR)

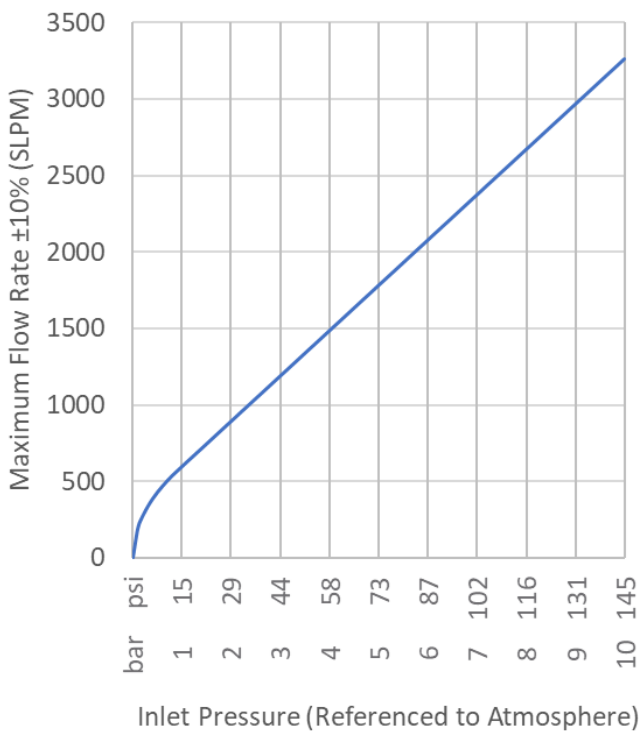
ENV-0090 Maximum Flow Rate (Air)



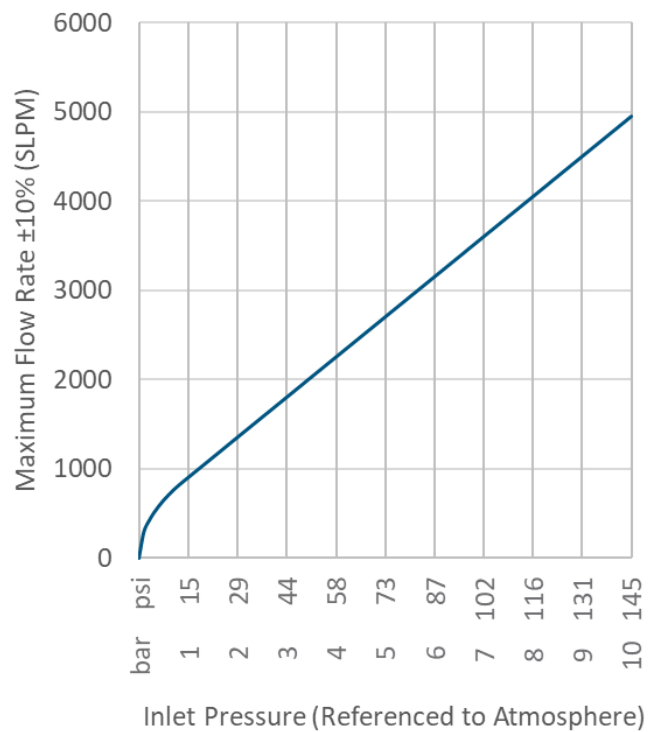
ENV-0375 Maximum Flow Rate (Air)



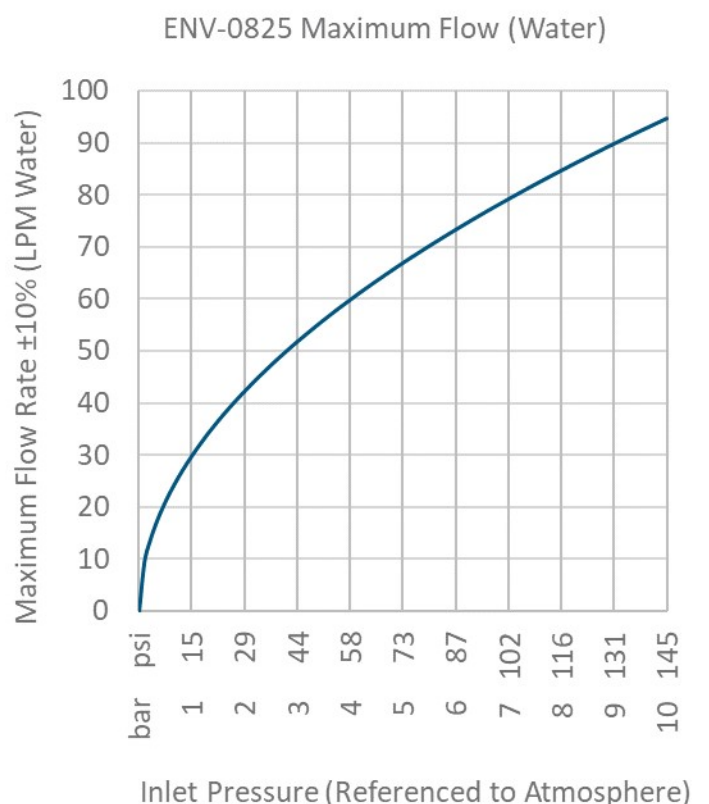
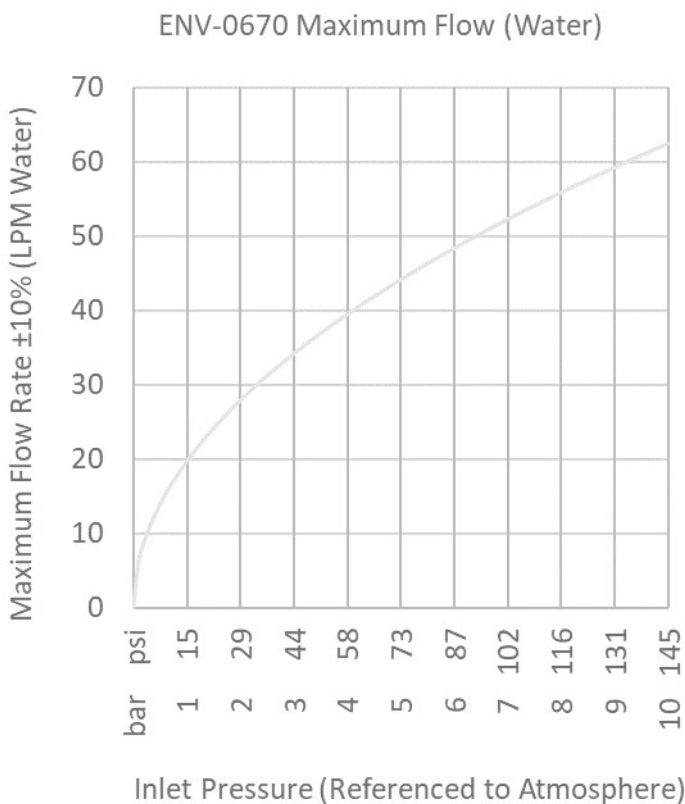
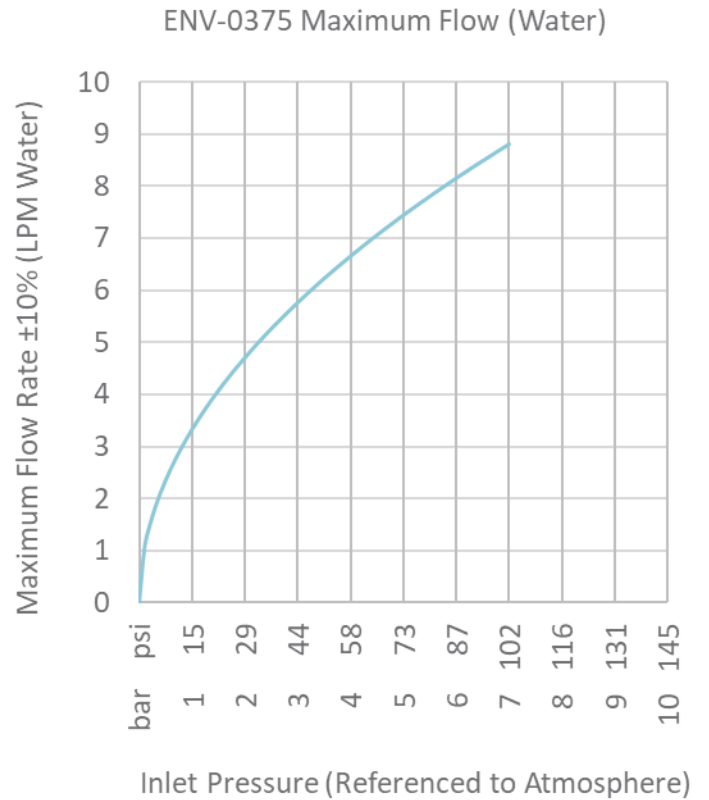
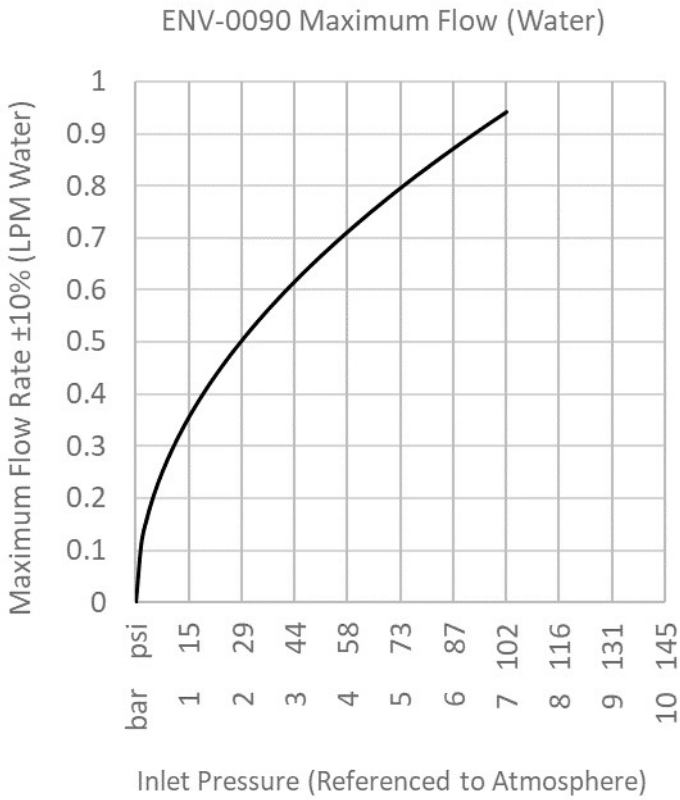
ENV-0670 Maximum Flow Rate (Air)



ENV-0825 Maximum Flow Rate (Air)



## MAX FLOW VS. INLET PRESSURE (WATER)



## RECOMMENDED DRIVERS

The D5 series of bipolar stepper motor drivers maximizes the performance of the ENV series of stepper valves by taking a 0...10Vdc command input and providing a step and direction output to the valve

Motorized Needle Valve	Recommended Driver
ENV-0090	D5-01-U01
ENV-0375	D5-03-U01
ENV-0670	D5-05-U01
ENV-0825	D5-06-U01



## ELECTRICAL SPECIFICATIONS

**Power Requirement:**  
24Vdc

**Command Input Impedance:**  
4kΩ

**Output:**  
Step and direction to valve

**Power Consumption:**  
1.9 W—Maintaining Position  
3.8 W—Changing Position

**Command Resolution:**  
0.03 Vdc

**Input Mating Connector:**  
EDZ1550/4

**Maximum Power Consumption:**  
12W

**Ambient Temperature:**  
0...50C (32...132F)

**Motor Output Mating Connector:**  
JST PHR-4

**Command Input:**  
0..10Vdc

## LEDS

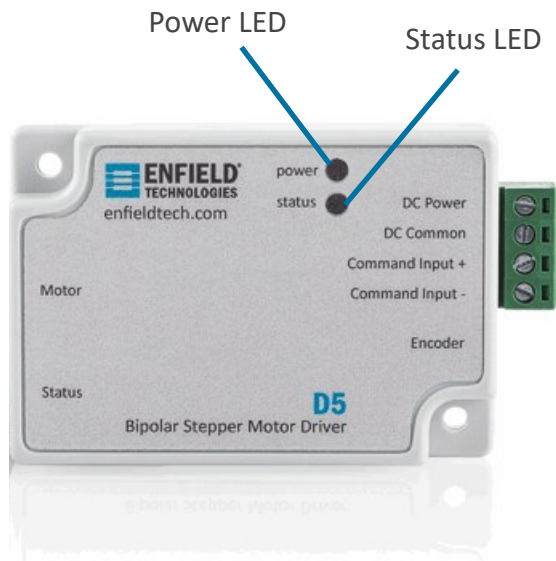
**LEDs:**

Power

- On: Board has power
- Off: Board does not have power

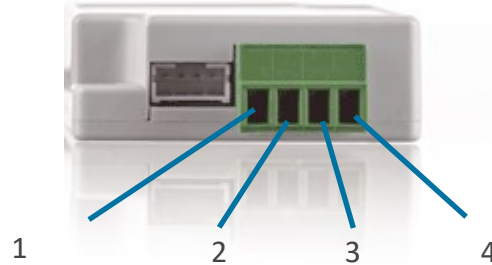
Status

- On: Changing Position
- Off: Maintaining Position
- Flashing: Error



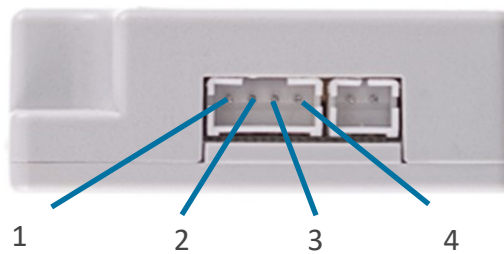


## ELECTRICAL CONNECTIONS (INPUTS)



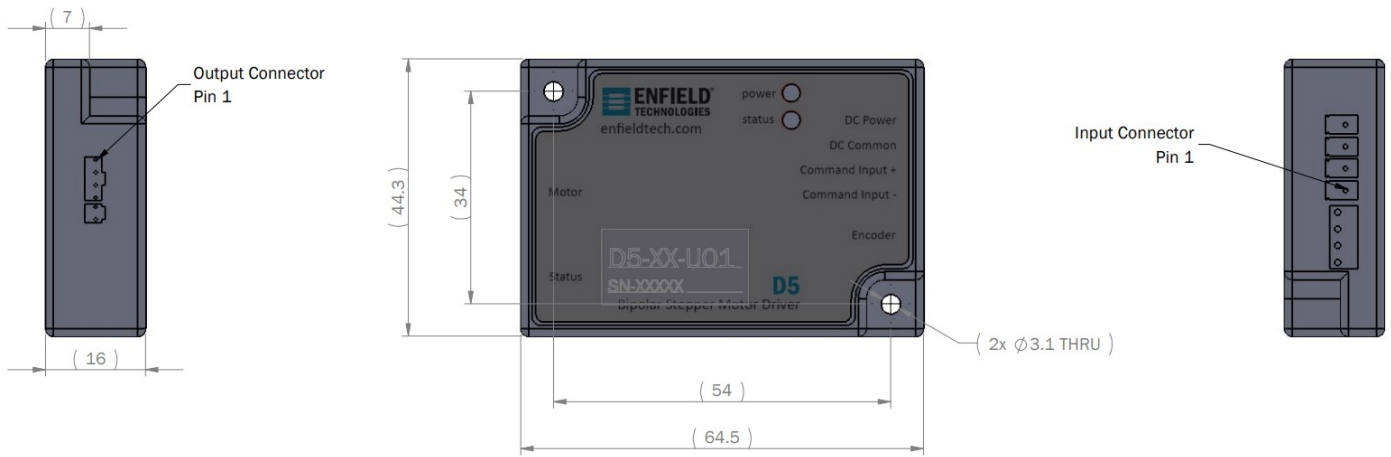
Pin #	1	2	3	4
Function	Command -	Command +	DC Common	DC Power
Input	0Vdc	0...10Vdc	0Vdc	24Vdc

## ELECTRICAL CONNECTIONS (OUTPUTS)



Pin #	1	2	3	4
Cable Wire Color	Brown	Black	White	Blue
Output	B-	B+	A-	A+

## DIMENSIONS



**Enfield Technologies** is an expert in high performance proportional control systems. Our standard product line focuses on pneumatics. With custom products and engineering services, we also apply our expertise in other areas of fluid power, electromechanical systems, and control electronics. New developments in pneumatic technology are opening doors for design engineers to create unique, market leading products and systems.

Enfield Technologies is leading this innovation. Our control valves and electronics solve many of the challenges posed by compressible fluids. The additional functionality and performance from Enfield Technologies helps our customers create breakthrough applications and enhance existing systems. Simply put, we make pneumatics do things that others declare impossible.

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