# Features - 12L / 12D Series Limit Switch mightyZAP Actuator

- Simple linear motion control between two points by limit switch
- Compactly integrated into small case (Limit switch, DC motor, gearbox, lead screw, rod, etc.)
- 12V Coreless Motor Lineup & 12V/7.4V Cored Motor Lineup
  : Coreless motor is superior to the Cored motor in its lifespan and output power.
- Rated Load of 12N ~ 100N according to gear ratio
  : Speed is inversely proportional to force, the stronger the force, the slower the speed.
- Max 22mm Stroke, Travel can be adjusted within 22mm when external switch is applied.
- Relatively reasonable cost comparing to servo actuator lineup
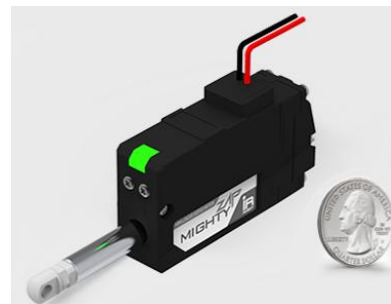
[Specification - Coreless Motor Lineup]

Motor Voltage	22mm Stroke		
	Rated Load 35N	Rated Load 55N	Rated Load 100N
12V	**12L-35S-22**	**12L-55S-22**	**12L-100S-22**
Rated Load / Max. Speed(No Load)	**35N** / 28mm/s	**55N** / 15mm/s	**100N** / 7.7mm/s
Applicable Max Load / Max. Speed(No Load)	70N / 28mm/s	110N / 15mm/s	200N / 7.7mm/s
Gear Ratio	10:1	20:1	50:1
Gear Type	4 Metal & 2 Engineering Plastic Gears		
Mechanical Self-Lock	Yes		
Wire	300mm / 0.08x60 (22AWG)		

[Specification - Cored Motor Lineup]

Motor Voltage	22mm Stroke
	Rated Load 12N
7.4V	**12D7-12S-22**
12V	**12D-12S-22**
Rated Load/ Max. Speed(No Load)	**12N** / 10mm/s
Applicable Max Load / Max. Speed(No Load)	24N / 10mm/s
Gear Ratio	10:1
Gear Type	Engineering Plastic Gears
Mechanical Self-Lock	Yes
Wire	300mm / 0.08x60 (22AWG)

Wiring Diagram for 12L / 12D Series Limit Switch mightyZAP Actuator

[Basic Connection]

< Normal Rotation Connection >
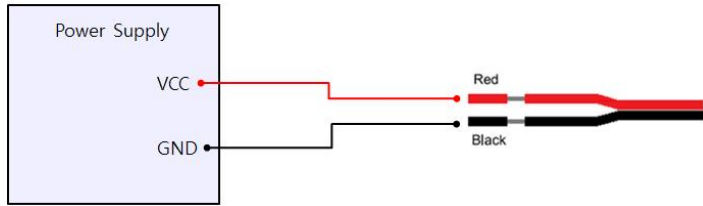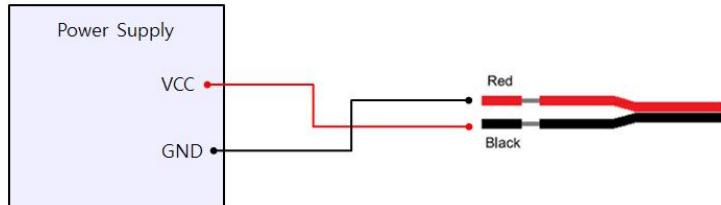
< Counter Rotation Connection >

· For actuator control, direction control is performed by applying forward and reverse voltage to the exposed wire. The DPDT switch makes it easy to change the direction of motion.
· The voltage application range is 7V~13VDC, but the rating is 12V, so the power is weakened and the speed is slowed down at the voltage below 12V.
· **If voltage over 13V is applied, the circuit and motor may be damaged**. Be sure to apply voltage below the rated voltage of 12V.

# How to apply DPDT Switch or External Micro Limit Switch
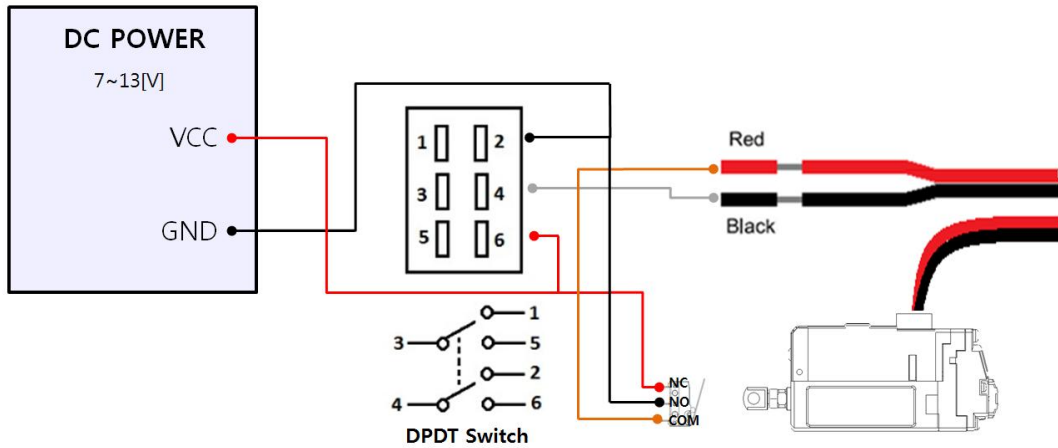
1) DPDT Switch Connection
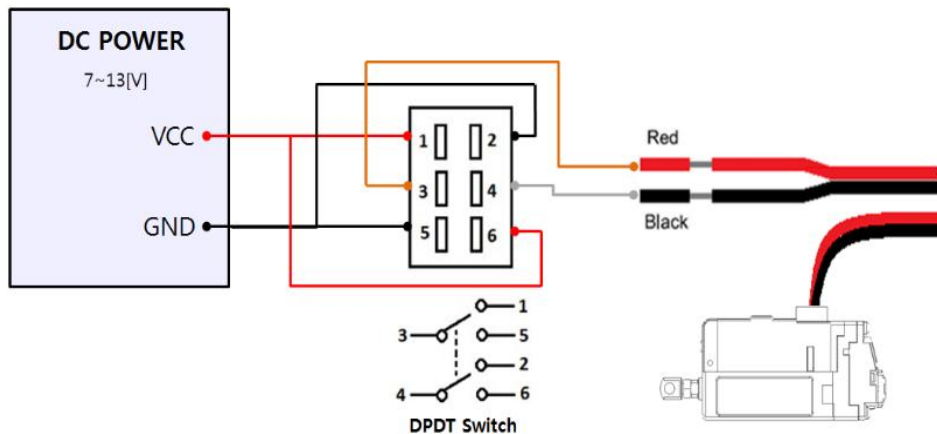
[Description]

· The DPDT switch has two built-in SPDT switches to perform the same operation.
· The operation of the switch according to the above wiring diagram is as follows.
· Pay attention to wiring to avoid short circuit due to incorrect wiring. (The pins of the DPDT switch must not be in contact with each other)

Switch Status	RED(3)	BLACK(4)	Motion
▲	VCC(1)	GND(2)	CW
O	OPEN	OPEN	STOP
▼	GND(5)	VCC(6)	CCW
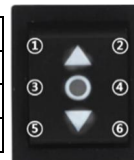
2) External Limit Switch Connection

[Description]
In order to implement a shorter stroke other than the standard 21.8mm stroke, after installing an additional micro limit switch on the outside, connect the limit switch additionally as shown in the DPDT switch wiring diagram above.

· When the limit switch is pressed by the actuator rod, the operation stops.
· Pay attention to wiring to avoid short circuit due to incorrect wiring. (The pins of the DPDT switch must not be in contact with each other)
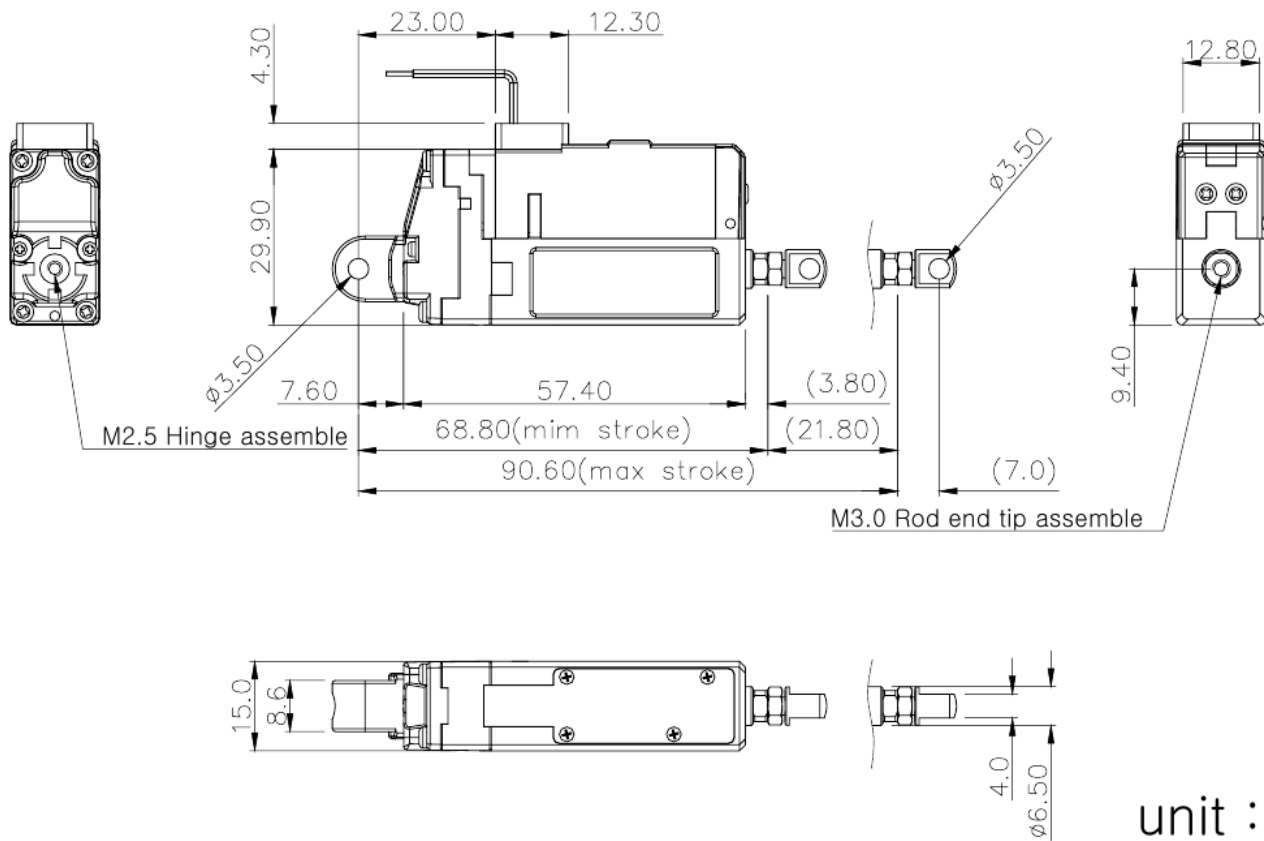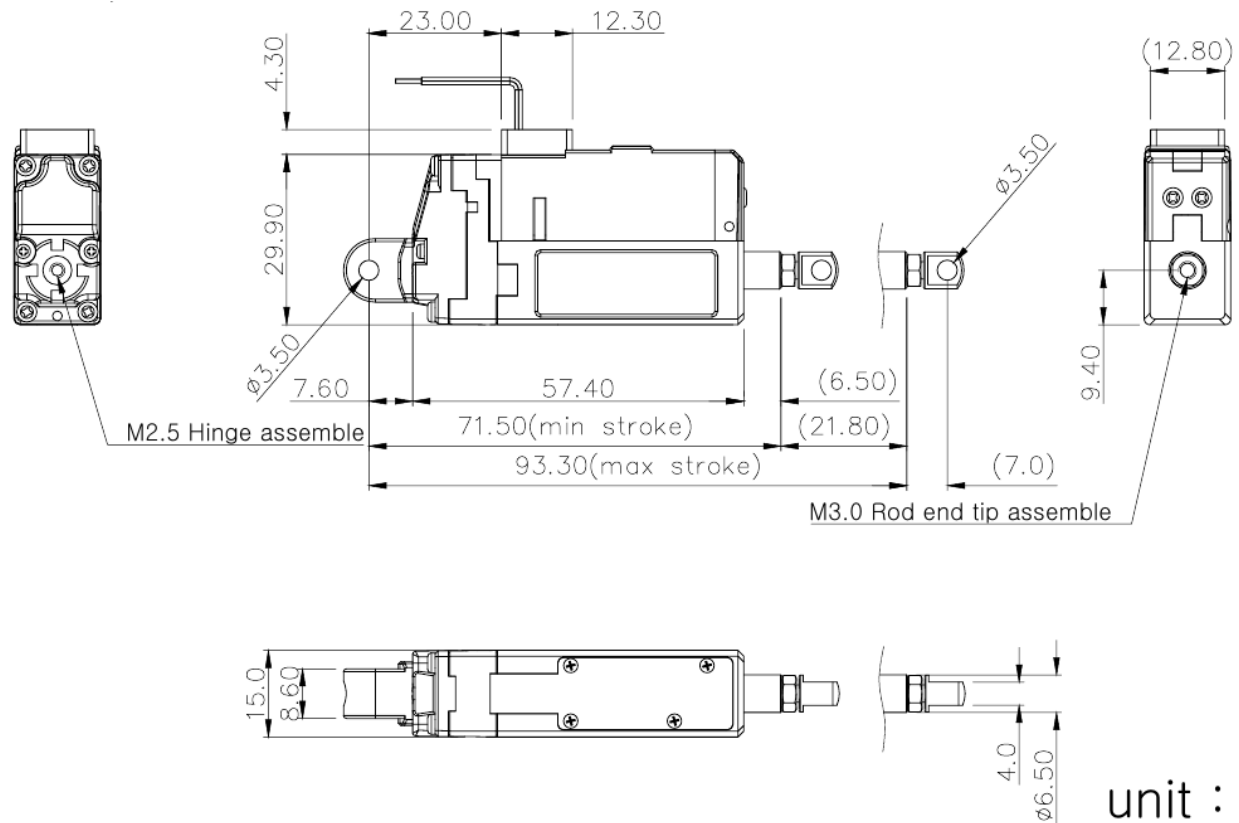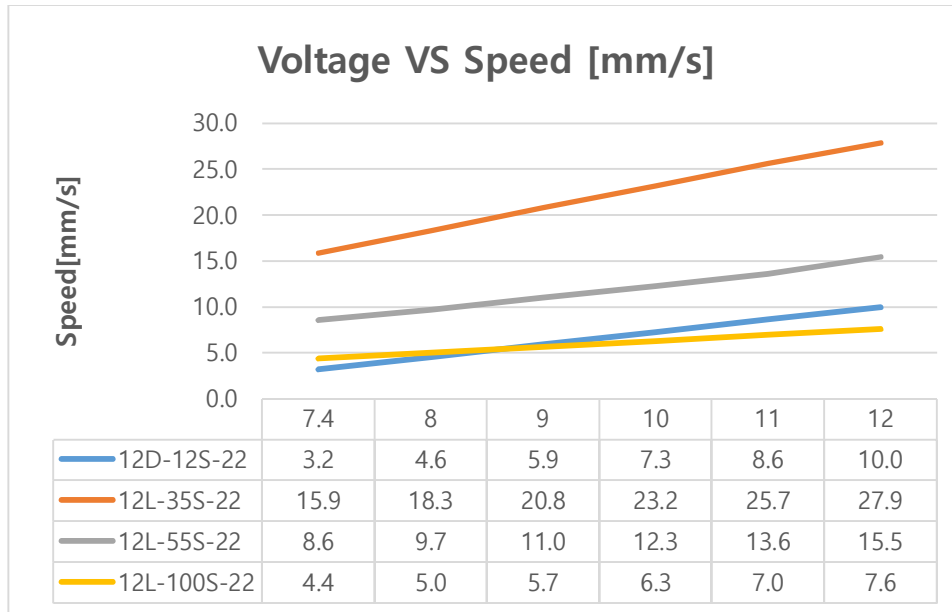
[See next pages]

Dimension　(12L Series – w/ Coreless Motor)
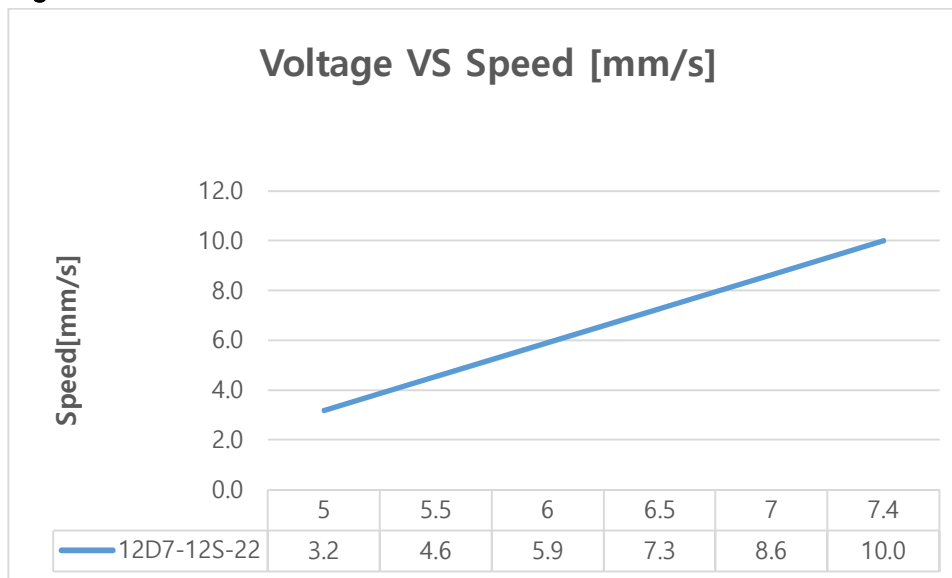

Dimension　(12D Series – w/ Cored Motor)

Figure 1. Voltage /Speed[m/s]

Figure1-1 . 12V Model

Voltage VS Speed [mm/s]

	7.4	8	9	10	11	12
12D-12S-22	3.2	4.6	5.9	7.3	8.6	10.0
12L-35S-22	15.9	18.3	20.8	23.2	25.7	27.9
12L-55S-22	8.6	9.7	11.0	12.3	13.6	15.5
12L-100S-22	4.4	5.0	5.7	6.3	7.0	7.6

※　Data includes tolerance. / 해당 Data는 오차를 포함하고 있습니다.

Figure1-2 .　7.4V Model

Voltage VS Speed [mm/s]

	5	5.5	6	6.5	7	7.4
12D7-12S-22	3.2	4.6	5.9	7.3	8.6	10.0

※　Data includes tolerance. / 해당 Data는 오차를 포함하고 있습니다.

Figure 2. Voltage / Stall Force[N]

Figure2-1 . 12V Model

Voltage VS Stall Force [N]

	7.4	8	9	10	11	12
12D-12S-22	17	22.8	28.6	34.4	40.2	46
12L-35S-22	105	126	147	168	189	210
12L-55S-22	150	180	210	240	270	300
12L-100S-22	300	360	420	480	540	600
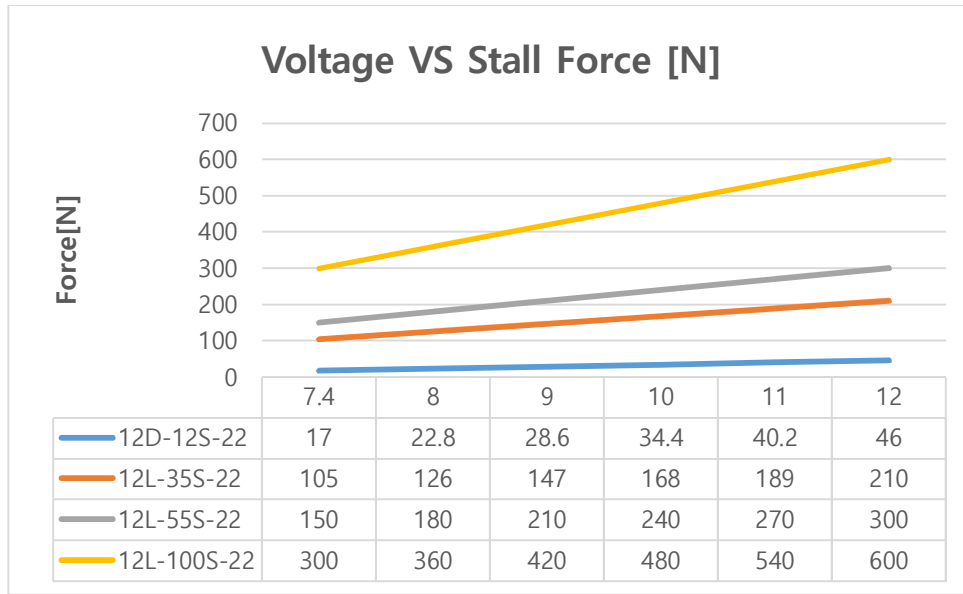
※ Data includes tolerance. / 해당 Data는 오차를 포함하고 있습니다.

Figure2-2 . 7.4V Model

Voltage VS Stall Force [N]

	5	5.5	6	6.5	7	7.4
12D7-12S-22	17	22.8	28.6	34.4	40.2	46

※ Data includes tolerance. / 해당 Data는 오차를 포함하고 있습니다.