

Main Features

Precision

- 50µm positional accuracy
- Absolute position sensing via Potentiometer (No need Calibration)
- Position feedback
- 32Bit Micro controller, High resolution (4096) A/D converter

Durability

- High force/highly durable coreless motor applied (For Premium lineup)
- Overload protection (Overridable)
- MTBF Data – Refer to the website (50% Duty cycle recommended)

Easiness

- Compact size for space constraint
- Hassle-free Built-in drive circuitry
- Daisy chain serial connection between servos
- Self-Lock feature thanks to mechanical design
- Various mounting solutions
- Applicable to the Gravity direction (Z axis) (Refer to user manual)
- Various API/Examples of programming languages (C# / C++ / Python / Java / Raspberry Pi / Arduino etc.)
- Dedicated PC Software (Parameter setting & Control test) and PC USB Interface (IR-USB01) available (Optional)

Variety

- Wide product range from economical lineup(w/cored motor) to premium lineup (w/coreless motor)
- Various force/speed combination from 6N to 100N
- 3 different stroke options (27mm, 41mm and 56mm)
- PWM/TTL(3pins) or RS-485 (4pins) protocol (PWM/TTL signal automatically recognized, PLC and PC control using RS-485 comm.)
- 7.4V or 12V input voltage

Applications

- Factory Automation (Good substitute for pneumatic cylinder)
- Various production & inspection jigs
- Medical equipments
- Robotics
- UAVs / Drones
- DIY, Education and Hobby (w/ Arduino, Raspberry Pi and Lego)

Model Name System

Feature	Options
M : Motor Type	D : Cored L : Coreless B : Brushless (B to be released later)
V : Voltage	7 : 7.4V 12 : 12V
F : Force (Rated)	XXX N (Newton)
P : Protocol	PT : PWM & TTL F : RS-485
S : Stroke	3 : 27mm* 4 : 41mm 6 : 56mm

* 27mm can be extended to 30mm using IR-USB01

Premium Lineup

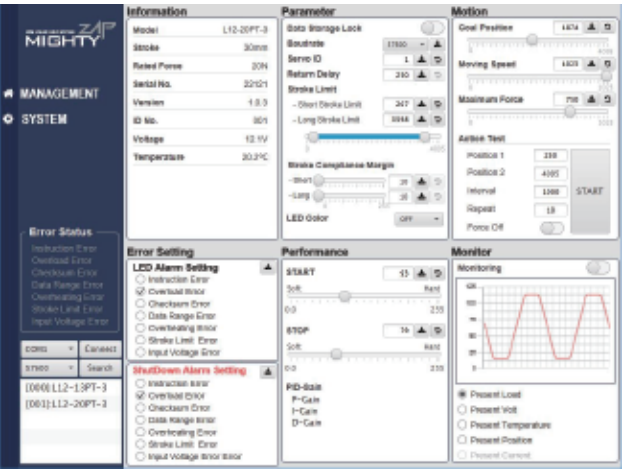
- High force, highly durable coreless motor applied
 - Stroke option – 27mm*, 41mm and 56mm
 - Force option - 17~100N
 - 7.4V or 12V input voltage option
 - RS-485 or TTL/PWM protocol option
 - Metal alloy rod
- * 27mm stroke can be extended to 30mm using IR-USB01



Economical Lineup

- Heavy duty cored motor applied
- 27mm stroke (27mm stroke can be extended to 30mm using IR-USB01)
- Force option - 6N and 12N
- 7.4V or 12V input voltage option
- RS-485 or TTL/PWM protocol option
- Engineering plastic rod

PC Software - MightyZAP Manager



- Setting for various operation parameters & memory parameters
 - Baud rate, ID, Delay, Stroke limit, Compliance margin setting
 - LED Alarm, Shutdown condition setting
 - Acceleration/Deceleration setting via PID control
 - Goal Position, Speed, Force setting
- Motion Test
- System initialization and Firmware update
- Voltage, Load, Temperature, Present position monitoring
- Need optional “PC USB Interface IR-USB01”

Standard Accessories



- | | |
|----------------------|--|
| 1 Hinge Base 1pc | 7 Wire(F Version) : 4Pin Molex to Molex (RS-485) |
| 2 Hinge 1pc | 8 Wire(PT Version) : 3Pin Molex to Molex (TTL) & S-02 to Molex (PWM) (S-02 to Molex wire for PWM to be packed in Economical version only.) |
| 3 M3 NUT 2pcs | 9 Socket head M3.0x8 mounting bolt 3pcs (41mm/56mm Stroke version only) |
| 4 Hinge Shaft 1pc | |
| 5 Rod End Tip 1pc | |
| 6 M2.5x6 Screws 3pcs | |

Optional Accessories

PC USB Interface IR-USB01

Along with our dedicated software- mightyZAP manager, user may control below via IR-USB01.

- Operation parameters and memory parameter setting
- Motion Test
- System initialization and Firmware update
- Voltage, Load, Temperature, Present position monitoring



Metal Bracket IR-MB02 / IR-MB03

Mounting bracket IR-MB02 is dedicated for 27mm stroke lineup and IR-MB03 is for 41 & 56mm stroke lineup.

Referring to the published drawings, user is also able to make this bracket at their end if necessary.

41 mm, 56 mm stroke lineup can be installed through the tapped hole of the body without bracket according to application.



Servo Tester Shield IR-STS01

Control servo motions without PC software. Built with Arduino Leonardo and our own servo shield, user controls servo motor using Arduino API & libraries.



End Bearing IR-EB01

Mount mightyZAP on applications using this end-bearing for most optimal installation. Put it on the Rod-end(M3) and on the end of servo case (M2.5). Two end bearings (M3 and M2.5) to be packed in a set.



Raspberry Pi HAT(Hardware Attached on Top) IR-STS02

IR-STS02 is a Raspberry Pi add-On board which is compatible with Raspberry Pi B3 or Raspberry Pi Zero. With TTL/RS-485/PWM communication interface, power connector and GPIO pins, user is able to control mightyZAP on Raspberry Pie. API and Library can be downloaded from our web.



Premium Lineup

Input Voltage	Communication	Force 20N / Stroke			Force 30~40N / Stroke		
		27mm	41mm	56mm	27mm	41mm	56mm
12V	RS-485	L12-20F-3	L12-20F-4	L12-20F-6	L12-40F-3	L12-30F-4	L12-30F-6
	TTL/PWM	L12-20PT-3	L12-20PT-4	L12-20PT-6	L12-40PT-3	L12-30PT-4	L12-30PT-6
7.4V		L7-20PT-3	-	-	L7-40PT-3	-	-
Rated Force / Max. Speed(No Load)		20N / 80.0mm/s	17N / 80.0mm/s		40N / 28.0mm/s	31N / 28.0mm/s	
Self Lock Force / Z Axis Force		7N / 7N			40N / 30N	31N / 23N	
Gear Ratio		10:1					
Gear Type / Rod Type		Engineering Plastic Gears / Metal Alloy Rod					
Motor Type / Watt / Duty Cycle		Coreless Motor /26W / 50%					
Input Voltage	Communication	Force 50N~60N / Stroke			Force 80~100N / Stroke		
		27mm	41mm	56mm	27mm	41mm	56mm
12V	RS-485	L12-64F-3	L12-50F-4	L12-50F-6	L12-100F-3	L12-80F-4	L12-80F-6
	TTL/PWM	L12-64PT-3	L12-50PT-4	L12-50PT-6	L12-100PT-3	L12-80PT-4	L12-80PT-6
7.4V		L7-64PT-3	-	-	L7-100PT-3	-	-
Rated Force / Max. Speed(No Load)		64N / 10.5mm/s	50N / 10.5mm/s		100N / 7.7mm/s	78N / 7.7mm/s	
Self Lock Force / Z Axis Force		64N / 48N	50N / 37.5N		100N / 75N	78N / 58.5N	
Gear Ratio		30:1			50:1		
Gear Type / Rod Type		4 Metal & 2 Engineering Plastic Gears / Metal Alloy Rod					
Motor Type / Watt / Duty Cycle		Coreless Motor /26W / 50%					

Economical Lineup

Input Voltage	Communication	Force 6~12N / Stroke			
		27mm			
12V	RS-485	12V, RS-485		D12-6F-3	12V, RS-485
	TTL/PWM	12V, TTL/PWM		D12-6PT-3	12V, TTL/PWM
7.4V		7.4V, TTL/PWM		D7-6PT-3	7.4V, TTL/PWM
Rated Force / Max. Speed(No Load)		6N / 36mm/s			12N / 12mm/s
Self Lock Force / Z Axis Force		3N / 3N			12N / 9N
Gear Ratio / Gear Type / Rod Type		10:1 / Engineering Plastic Gears / Engineering Plastic Rod			
Motor Type / Watt / Duty Cycle		Cored Motor / 4.2W / 50%			

Common Specification

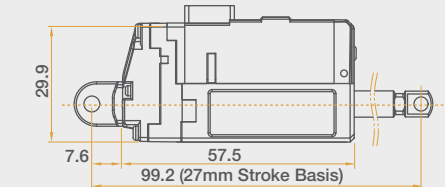
Positional Accuracy		0.05mm (50μm)	Micro Controller		32bit ARM Core, 4096 Resolution (A/D converter)
Mechanical Backlash		0.05mm (50μm)	Pulse Range		900μs(Retracted)-1500 μs(Center)-2100μs (Extended)
Position Sensor		10KΩ linear Potentiometer	Parameter Setting		Programmable via PC Software
Input Voltage		7.4V or 12.1V (Rated)	Ingress Protection		IP-54 (Dust & Water Tight)
Current Consumption	Idle	Premium : 30mA at 12.1V / 25mA at 7.4V	Size / Weight (Excluding rod-end & hinge)	27mm	57.5(L)x29.9(W)x15(H)mm / 45~65g
		Economical : 30mA at 12.1V / 25mA at 7.4V		41mm	86.9(L)x36(W)x18(H)mm / Approx.104g
	Max. (Stall)	Premium : 2.3A at 12.1V / 3.4A at 7.4V		56mm	111.5(L)x36(W)x18(H)mm / Approx.128g
		Economical : 0.33A at 12.1V / 0.46A at 7.4V			
Audible Noise		Approx. 50db at 1m	Operating Temp.		-10℃ ~ 60℃
Communication		Premium : RS-485 or TTL/PWM Economical : RS-485 or TTL/PWM	Standard Accessory		1 Mounting Bracket, 2 types Rod end (Detachable linkage and Metal nut(M2.5) type), Wire Harnesses
LED Indication		7 Error Indications (Overload, Checksum, Data Range, Overheat, Stroke Limit, Input voltage, Instruction Error)	Wire Harness (Molex to S-02 PWM wire to be packed in Economical version only)		PWM/TTL(PT version) : Molex to S-02 and Molex to Molex Type (Molex 50-37-5033, 3pins) / 200mm length, 0.08x60(22AWG) or RS-485(F version) : Molex to Molex Type (Molex 0510650400, 4pins) / 200mm length, 0.08x60(22AWG)

* Design and Specification can be changed without prior notice for further improvement.

V.2.1

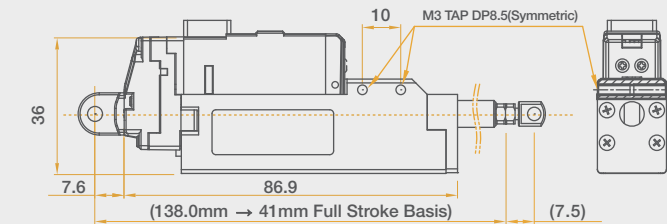
Dimension

27mm Stroke Version

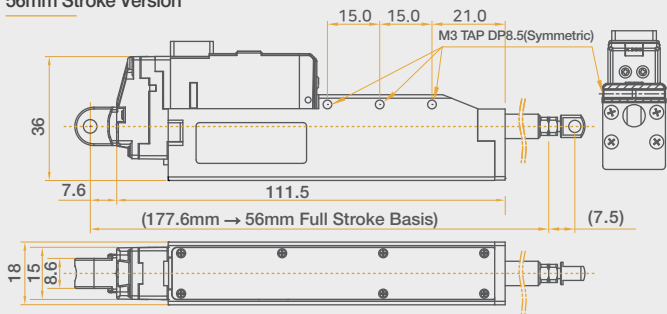


* Stroke can be extended to 30mm using IR-USB01

41mm Stroke Version



56mm Stroke Version



ZAP MIGHTY
MINI LINEAR SERVO MOTOR

- Micro Size
- Position Control
- Robust Force
- Built-in Drive Circuit
- 27/41/56mm Stroke

Size Comparison

www.irrobot.com

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MINI, BUT MIGHTY.

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27/41/56mm Stroke

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