

Main Features

Precision

- 50~90 μm positional accuracy (Varied by each stroke version. See spec chart.)
- Absolute position sensing via Potentiometer (No Calibration needed)
- Position feedback
- 32Bit Micro controller, High resolution (4096) A/D converter

Durability

- Heavy Duty Reliable coreless or cored motor
- Smart Overload protection detects jam or over 50% duty-rate (Overridable)
- Life-cycle Reference Data in our homepage (Under 50% duty cycle recommended)
- Vertical (Z axis) use is possible due to mechanical Self-lock (Certain models are not applicable, see the model specification chart)

Easiness

- Compact size for space constraints
- Hassle-free, Built-in drive circuit
- Daisy chain serial connection between servos
- Various mounting solutions
- Detachable and 90° rotatable hinge design (Patented)
- Various APIs / Libraries / Examples of programming languages (C# / C++ / Python / Java / Raspberry Pi / Arduino etc.)
- Dedicated PC Software (Parameter setting & simple motion testing) and PC USB Interface (IR-USB01) available (Optional)
- LED Error indicator & LED self-diagnosis function
- Paired with various controller types (PC / PLC / Arduino / Raspberry-Pi / RC Controller / Dedicated embedded board etc.)

Variety

- Two types of motor choices (Coreless & Cored motor)
- Various Stroke options (26 to 96mm)
- Various Force options (6 to 100N at 12V and 6N/12N at 7.4V)
- Various Speed options (7.7 to 110mm/s at No load condition)
- Two types of data communication options (TTL or RS-485)
- IR Robot open protocol (Download from homepage)
- TTL(Data comm.) or PWM(Pulse signal) is automatically recognized in TTL/PWM version
- Active on custom design orders upon customer's request

Applications

- Medical device and Lab equipment
- Vending and game machine
- Robotics
- Automation (Factory / Home / Agriculture etc)
- Production and inspection jigs
- UAV (Fixed wing / Helicopter / Multicopter etc)
- DIY, Education, Hobby, etc

Model Name System

Feature	Options
M : Motor Type	D : Cored L : Coreless
V : Voltage	7 : 7.4V 12 : 12V
F : Force (Rated)	XXX N (Newton)
C : Communication type	PT : PWM & TTL F : RS-485
S : Stroke	3 : 27mm* 4 : 41mm 6 : 56mm 10 : 96mm

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

* Basic stroke for cored motor version is 26mm and to be extended to max. 29mm using IR-USB01

Coreless Motor Line-up

- High force, highly durable coreless motor applied
- Stroke option : 27mm*, 41mm , 56mm, 96mm
- Force option : 12 to 100N
- 12V Motor with 7 ~ 13V input voltage range
- RS-485 or TTL/PWM communication type options
- Metal alloy rod
- Engineering plastic case (27mm stroke version)
- Aluminum stroke case & engineering plastic motor case (41mm / 56mm / 96mm)

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

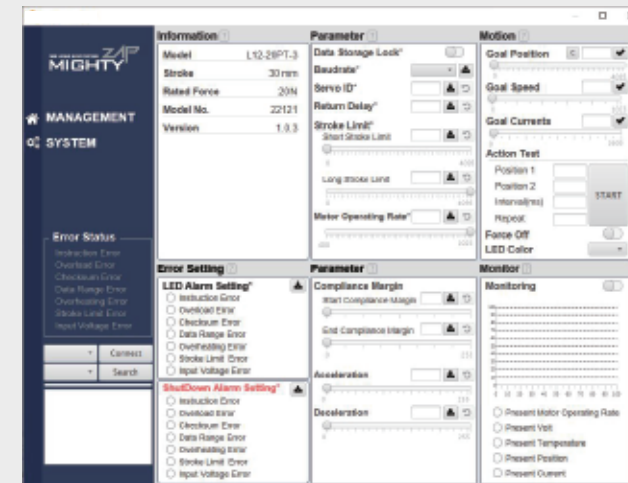


Cored Motor Line-up

- Heavy duty cored motor applied
- 26mm stroke (26mm stroke can be extended to 29mm using IR-USB01)
- RS-485 or TTL/PWM communication type options
- Force option : 6N and 12N
- Engineering plastic rod
- Motor Voltage options
 - 7.4V Motor with 6.5 ~ 8.9V input voltage range
 - 12V Motor with 7 ~ 13V input voltage range



PC Software - mightyZAP Manager



- Setting for various operation parameters & memory parameters
 - Baud rate, ID, Delay, Stroke limit, Motor Operating rate, Goal Position
 - LED Alarm, Overload setting
- Simple Motion Test
- System reset and Firmware update
- Motor Operating rate, Voltage, Temperature, Present position monitoring
- Need optional "PC USB Interface IR-USB01"
- Windows compatible mightyZAP manager software enables user to set various parameters & test motions. (Able to download from our website for free)
(PC Software will be updated from time to time, so it is recommended for the user to download and update PC software properly.)

Standard Accessories



Optional Accessories

Extension Wire IR-EW01~04

We offer extension wires as below for application in your facilities.

- IR-EW01 : **1,000mm** length with **3pins TTL/PWM** Molex connectors (50-37-5033)
- IR-EW02 : **2,000mm** length with **3pins TTL/PWM** Molex connectors (50-37-5033)



- IR-EW03 : **2,000mm** length with **4pins RS-485** Molex connectors (51065-0400)
- IR-EW04 : **4,000mm** length with **4pins RS-485** Molex connectors (51065-0400)

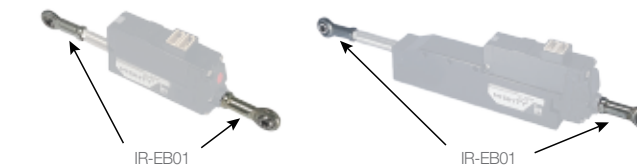


Optional Accessories

End Bearing IR-EB01

Mount mightyZAP servo on applications using this end-bearing for most optimal installation. Put it on the Rod-end(M3) and on the end of mightyZAP servo case (M2.5).

Two end bearings (M3 and M2.5) to be packed in a set.



Metal Bracket IR-MB02

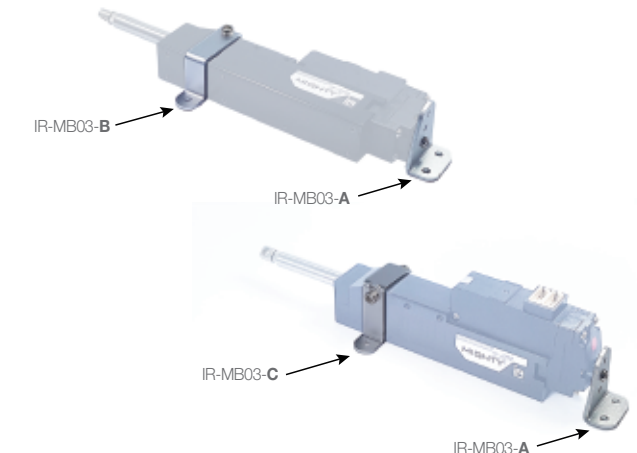
Mounting bracket IR-MB02 is dedicated for 26 / 27mm stroke line-up.

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

Metal Bracket IR-MB03

Mounting bracket IR-MB03 is dedicated for IR-MB03 is for 41mm, 56mm, 96mm stroke line-up. Referring to the published drawings, user is also able to make this bracket at their end if necessary.

41mm, 56 mm, 96mm stroke line-up can be installed through the tapped hole of the body without bracket according to application.



Optional Accessories

PC USB Interface IR-USB01

The IR-USB01 is the interface board which connects mightyZAP servo with user's PC so that user is able to do various tasks shown below.

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



Servo Tester Shield IR-ST01

Control mightyZAP servo motions without PC software.

Built with Arduino Leonardo and our own servo shield, user controls servo motor using Arduino API & libraries.



Raspberry Pi HAT(Hardware Attached on Top) IR-ST02

IR-ST02 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 servo on Raspberry Pi. API and Library can be downloaded from our web.



EZ mightyZAP controller IR-CT01

Stand-alone easy mightyZAP servo controller. Arduino base circuitry (But not Arduino shield compatible).

Able to choose two types of control switches (two position push button or linear slide switch) for simple motion control.

Automatic motion can be programmed on PC with Sketch software (provide various examples).

3 Additional I/O Pins and 3 additional Analog Pins for connecting with of various analog and digital sensors. Additional UART pin for Bluetooth or Zigbee communications. Reliable Input battery connector for servo and controller.



Coreless Motor Line-up

Specification Chart

Motor Voltage	Communication	Force 12N / Stroke	Force 20N / Stroke				Force 30~40N / Stroke			
		27mm	27mm	41mm	56mm	96mm	27mm	41mm	56mm	96mm
12V	RS-485	L12-12F-3	L12-20F-3	L12-20F-4	L12-20F-6	L12-20F-10	L12-40F-3	L12-30F-4	L12-30F-6	L12-30F-10
	TTL/PWM	L12-12PT-3	L12-20PT-3	L12-20PT-4	L12-20PT-6	L12-20PT-10	L12-40PT-3	L12-30PT-4	L12-30PT-6	L12-30PT-10
Rated Force / Max. Speed(No Load)		12N / 110.0mm/s	20N / 80.0mm/s	17N / 80.0mm/s			40N / 28.0mm/s	31N / 28.0mm/s		
Mechanical Self Lock (Z Axis Application)		Not Available	Not Available				Available			
Gear Ratio / Gear Type / Rod Type		10:1 / Engineering Plastic Gears / Metal Alloy Rod								
Motor Type / Watt / Duty Cycle		Coreless Motor / 26W / 50%								
Motor 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		
Rated Force / Max. Speed(No Load)		64N / 10.5mm/s		50N / 10.5mm/s		100N / 7.7mm/s		78N / 7.7mm/s		
Mechanical Self Lock (Z Axis Application)		Available				Available				
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%								

Cored Motor Line-up

Motor Voltage	Communication	Force 6N~12N / Stroke			
		26mm			
12V	RS-485	12V, RS-485	D12-6F-3	12V, RS-485	D12-12F-3
	TTL/PWM	12V, TTL/PWM	D12-6PT-3	12V, TTL/PWM	D12-12PT-3
7.4V	RS-485	7.4V, RS-485	D7-6F-3	7.4V, RS-485	D7-12F-3
	TTL/PWM	7.4V, TTL/PWM	D7-6PT-3	7.4V, TTL/PWM	D7-12PT-3
Rated Force / Max. Speed(No Load)		6N / 36mm/s		12N / 12mm/s	
Mechanical Self Lock (Z Axis Application)		Not Available		Available	
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

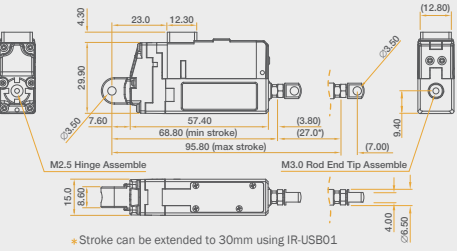
Positional Accuracy		26mm / 27mm / 41mm Stroke : 0.05mm (50μm)						Wire Harness (Molex to S-02 PWM wire to be packed in Cored Motor Version only)	PWM/TTL(PT version) : Molex to S-02 and Molex to Molex Type (Molex 50-37-5033, 3pins) / 200mm length, 0.08x60(22AWG) or RS-485(F version) : Molex to Molex Type (Molex 0510650400, 4pins) / 200mm length, 0.08x60(22AWG)G)		
		56mm Stroke : 0.07mm (70μm)									
		96mm Stroke : 0.09mm (90μm)									
Mechanical Backlash		0.03mm (30μm)						Data Communication / Protocol		RS-485 or TTL(PT version) / IR Robot open protocol	
Position Sensor		10KΩ linear Potentiometer						Pulse Signal / Pulse Range		PWM (PT version, Used in RC model hobby) / 900μs(Retracted)-1500 μs(Center)-2100μs (Extended)	
Input Voltage Range		7 ~ 13V for 12V Motor, 6.5~8.9V for 7.4V Motor						Operating Temperature		-10℃ ~ 60℃	
LED Indication		7 Error Indications (Overload, Checksum, Data Range, Overheat, Stroke Limit, Input voltage, Instruction Error)						Ingress Protection		IP-54 (Dust & Water Tight)	
								Audible Noise		Approx. 50db at 1m	
Current Consumption		7.4V			12V			Size / Weight (Excluding rod-end & hinge)	26/27mm	57.4(L)x29.9(W)x15(H)mm / 49~52g	
		Idle	Rated	Stall	Idle	Rated	Stall		41mm	86.9(L)x36(W)x18(H)mm / 96~99g	
		30mA	250mA	0.48A	30mA	140mA	0.3A		56mm	111.5(L)x36(W)x18(H)mm / 124~127g	
	Cored	30mA	250mA	0.48A	30mA	140mA	0.3A		56mm	111.5(L)x36(W)x18(H)mm / 124~127g	
		Coreless	-	-	-	20mA	380mA		1.5A	96mm	151.5(L)x36(W)x18(H)mm / Approx. 177g

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

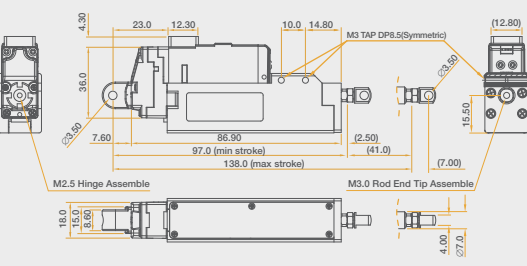
V.3.1

Dimension (Coreless Motor Lineup)

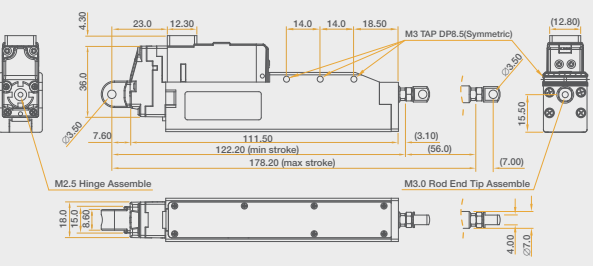
27mm Stroke Version



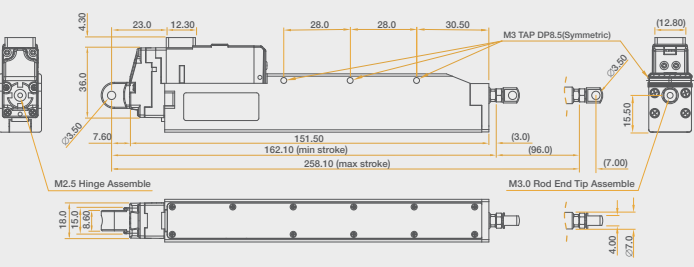
41mm Stroke Version



56mm Stroke Version

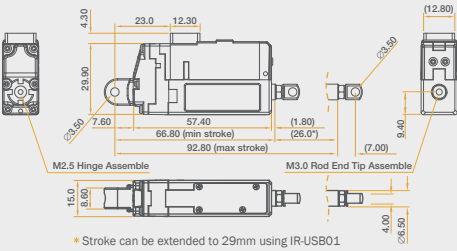


96mm Stroke Version



Dimension (Cored Motor Lineup)

26mm Stroke Version



In case that our standard actuator does not meet your requirement, Please feel free to contact us to inquire customization.

Benefits for corporate customers

- Quantity Discount program
- Customization
- Instant technical support

MIGHTY ZAP
MINI LINEAR SERVO ACTUATOR

- Micro Size with Built in Drive Circuit
- Precision position accuracy (50~90µm)
- Data Communication and Position Feedback
- Stroke Options (26 to 96mm)
- Force Options (6 to 100N)
- Speed Options (7.7 to 110mm/sec)

www.irrobot.com

Head Office : 401-1303, 655, Pyeongcheon-ro, Bucheon-si, Gyeonggi-do, Korea (Zip 14502)

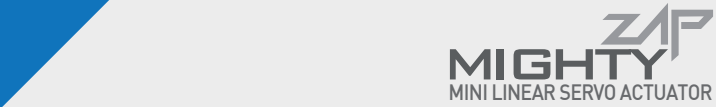
MINI, BUT MIGHTY.

Managing Director
Daniel (Hyun-Bo) Hwang

+82-70-7600-9471
irsales@irrobot.com

IR ROBOT
IR ROBOT CO., LTD.

+82-32-326-3466
+82-32-326-3468



MINI,
BUT MIGHTY.

Position
Control

- Micro Size with Built in Drive Circuit
- Precision position accuracy (50~90µm)
- Data Communication and Position Feedback
- Stroke Options (26 to 96mm)
- Force Options (6 to 100N)
- Speed Options (7.7 to 110mm/sec)



Size Comparison

