

TECHNICAL DATA

MB11 Actuator

Our most popular small actuator product. Designed with the most commonly available standard components. Presented as a bare bones product allowing you to incorporate it in your own instrument or machine.

Minibot Part Number: **MB11** - **Txxx** - **PS01** - **M112** - **L22**

TRAVEL

Carriage Travel (travel in mm)

xxx

LEAD SCREW DRIVE OPTIONS

Lead Screw: 1 mm lead

Standard

LS01

Preloaded

PS01

Lead Screw: 5 mm lead

LS05

PS01

BALL SCREW DRIVE OPTIONS

Ball Screw: 1 mm lead

Rolled

SR0401

Ground

SG0401

Ball Screw: 2 mm lead

SR0402

SG0402

MOTOR OPTIONS

Standard Stepper Motor

M112

Integrated Stepper Motor/Drive/Control with RS485

MK112

END OF TRAVEL SENSOR OPTIONS

Industrial Optical Slot Sensors

L22

Custom optical sensor arrangements can be made. This is generally reserved for OEM applications where multiple quantities (i.e., typically starting at 20 pieces) of the same product are purchased within a specific timeframe. Contact us for more information.

MB11 Minibot Actuator Series Product



TPA MOTION
LINEAR MOTION SOLUTIONS

800-284-9784

<https://www.tpamotion.com>

Load Capacity

Normal Load: 210 N
Side Load: 210N

Moment Load Capacity

Roll: 1.5 N-m
Yaw: 0.75 N-m
Pitch: 0.75 N-m

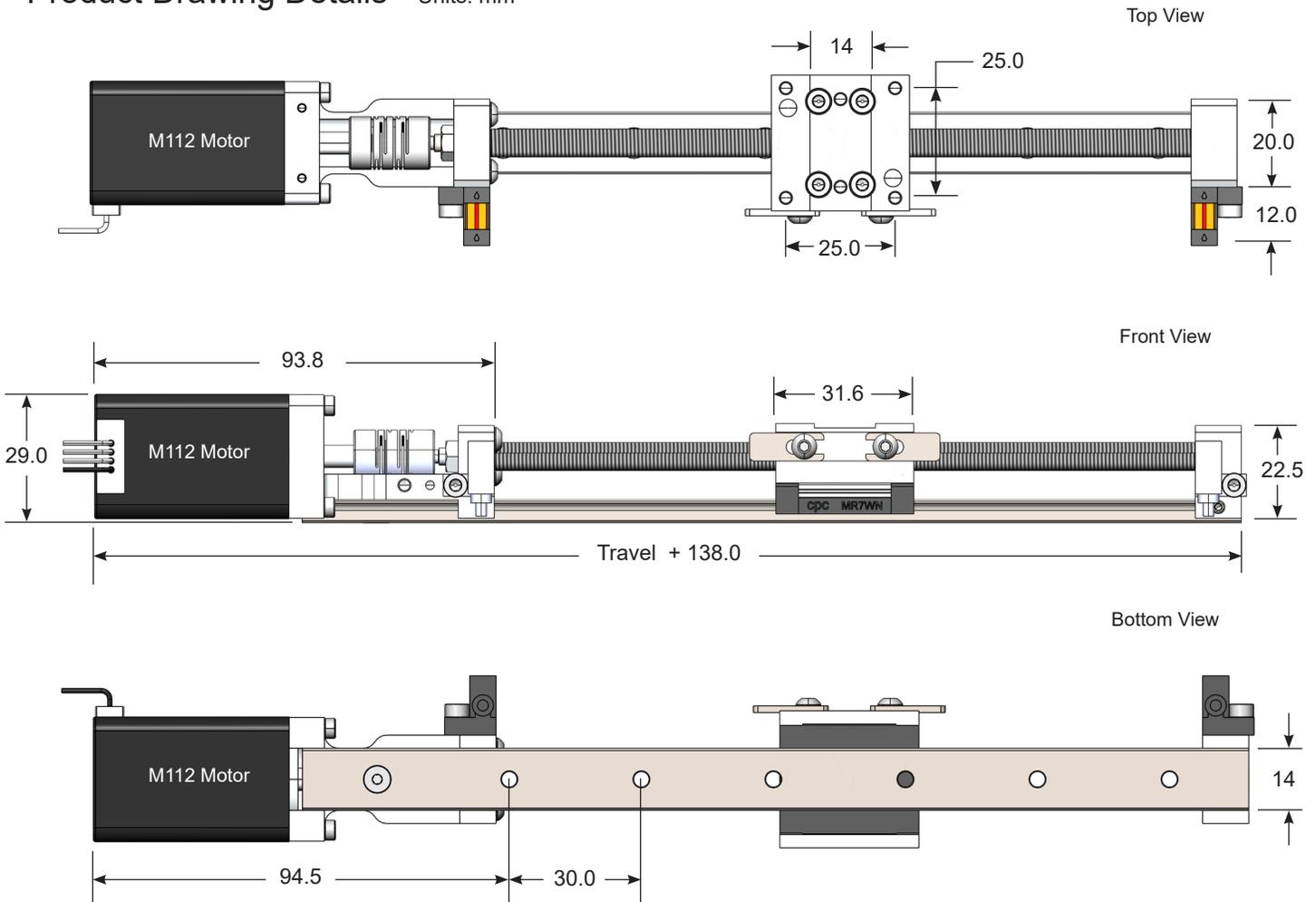
Performance Specifications

	LS01	PS01	LS05	PS05	SR0401	SG0401	SR0402	SG0402
Screw Lead (mm/rev)	1	1	5	5	1	1	2	2
Max Travel (mm) ¹	300	300	300	300	300	150	300	150
Max Speed (mm/sex) ²	15	15	75	75	15	15	30	30
Rated Thrust (N)	85	50	30	21	175	175	100	100
Lead Accuracy (µm/mm)	0.6	0.6	0.6	0.6	0.17	0.075	0.17	0.075
Repeatability (µm)	20	12	20	12	20	5	20	5
Theoretical Resolution ³	0.00031	0.00031	0.00156	0.00156	0.00031	0.00031	0.00063	0.00063

- 1) Based on 15 rps motor speed. Higher speed possible.
- 2) Contact us for longer travel.
- 3) Based on 3200 steps/rev. Actual minimum step size will vary.

Straightness along the horizontal and vertical plane is within 25 microns.

Product Drawing Details - Units: mm



MB11 Minibot Actuator Series Product

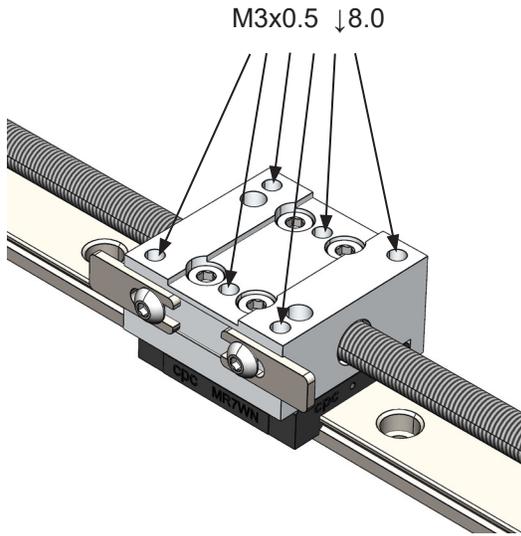


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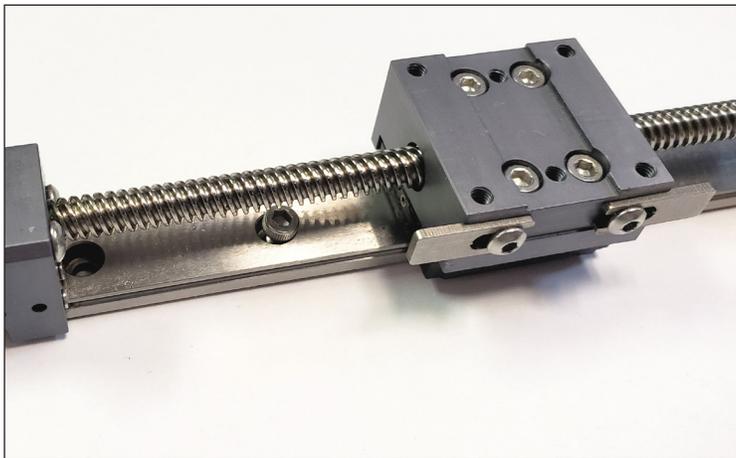
<https://www.tpamotion.com>

Threaded M3 holes available to mount products to top of carriage

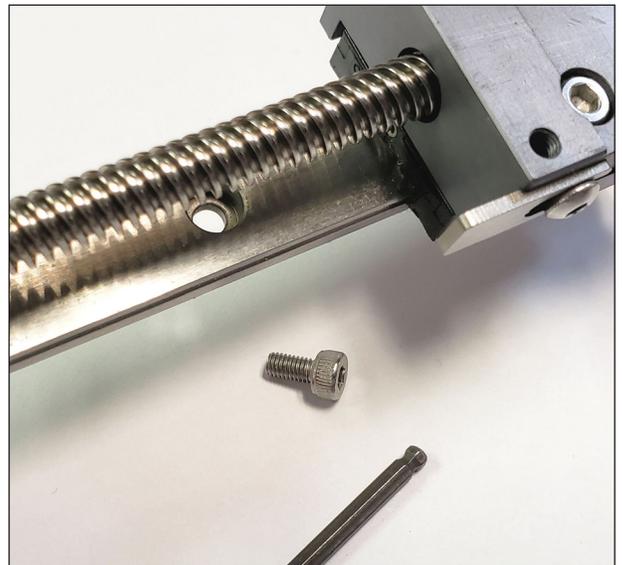


Actual Product Photo

If you wish to add a 2nd axis of motion, no problem! Carriage is machined with 14 mm wide slot with tapped holes in perfect position to attached another MB11 series product.



Actual Product Photo



Actual Product Photo

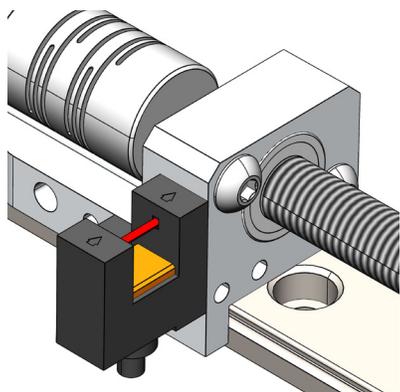
M3 Socket Head Cap Screws are typically used to secure the rail to your machine or instrument base structure. A ball end Allen wrench tool works best for tightening each socket head cap screw.

3D Models are available for download. Visit the following web page for details.

<https://www.tpamotion.com/small-linear-actuators.html>

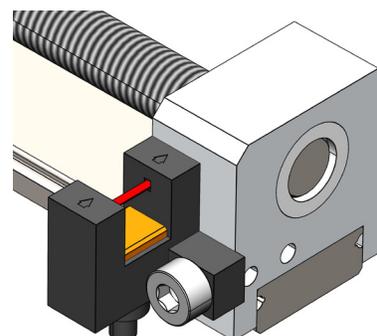


L22 - Industrial Slot Sensor Information



U-shaped micro photoelectric sensors are ideal for wiring to motion controllers and PLCs.

Sensors are easy to setup as end of travel limits with the adjustable flags on the carriage.



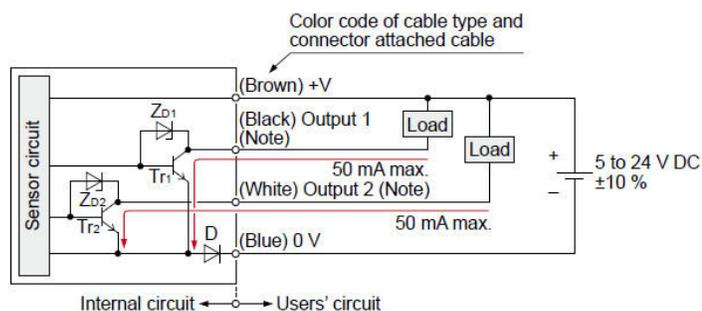
Length of each sensor cable is about 1 m (3.2 ft). Cable end has a short section of the outer insulation removed to expose the four wires for connecting to your controller.

Details of the wiring can be found in the diagrams below.

Power	5 to 24 VDC +/- 10%
Current	15 mA or less
Output	NPN Open Collector Transistor Max Sink Current: 50 mA Applied Voltage: 30 VDC or less Residual Voltage: 2 V or less at 50 mA 1 V or less at 16 mA
Repeatability	0.01 mm (0.0004 inch) or less
Environmental	-25 to + 55° C, non-condensing humidity
Material	Enclosure: PBT, Display section: Polycarbonate
Mounting Fastener	M2 x 6 Socket Head Cap Screw

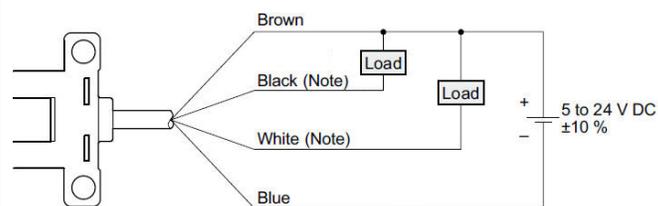
NPN output type

I/O circuit diagram



Symbols...D: Reverse supply polarity protection diode
ZD1, ZD2: Surge absorption zener diode
Tr1, Tr2: NPN output transistor

Wiring diagram



Note: Ensure to insulate the unused output wire.

Output operation

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

For OEM applications we can offer alternative type optical sensors. Please call us to discuss the options.



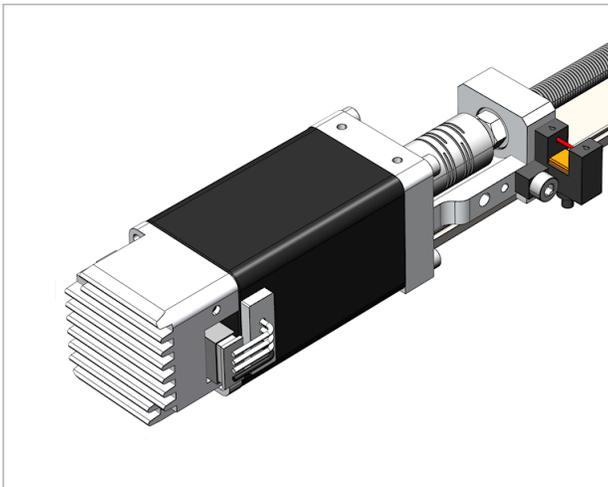
M11x - Stepper Motor Options

	M112
Rated Current	0.67 A _{RMS}
Resistance	6.8 ohms ± 10%
Inductance	4.9 mH ± 20%
Rated Voltage	4.56 V
Step Angle	1.8° ± 5%, Rotation Clockwise from front
Temperature	Ambient: -20° C to +50° C, Max Rise 80° C
Rotor Inertia	12E-7 Kg-m ²
Weight	0.14 Kg
Length	44.5 mm
Mounting Fastener	M2.5 x 12 Socket Head Cap Screw
Wires	4x Leads, AWG26, 300 mm long, A+ (red), A- (blue), B+ (black), B- (green)

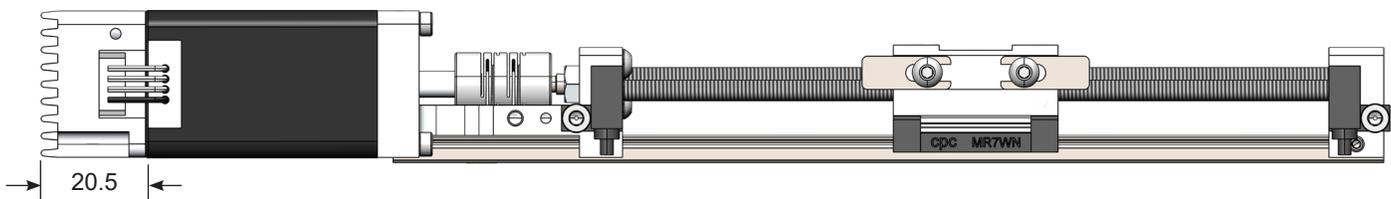
The M112 stepper motor is most frequently use with this small linear actuator.

Other options such as M111 (shorter) or M113 (longer) can be use. Please consult one of our application engineers for availability.

MK112 - Stepper Motor with Integrated Controller/Drive Option



	MK112
Communications	RS485
Power	12 TO 24 VDC, 1.5 A max.
Inputs	Limit +, Limit -, Home 12 to 24 VDC, NPN, 0.45 mA
Output	1x Opto-isolated PNP Output +24 VDC Max; 90 mA Max
Resolution	3200 Steps/rev max
Max Speed	15 rps
Encoder	Integrated 256 count/rev (Optional: Single Turn Absolute)
Operating Temp	0° C to +70° C
Length	65.5 mm
Mounting Fastener	M2.5 x 12 SHCS



MK112 motor option adds an additional length of 20.5 mm to the assembly.