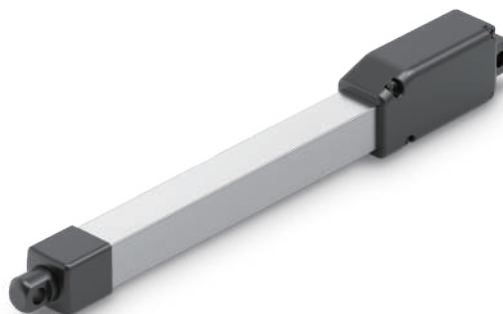# Actuator
MKS1

MKS1 is an in-line linear actuator characterized by its miniature size and waterproof. This model is available in four stroke and different speed options. In addition, there are two functional options, with end-of-stroke limit switches or with potentiometer for positioning.

Features and Options

- Main applications: Industry, Furniture, DIY application
- Input voltage: 12V DC
- Max. load: 80N (Push/Pull)
- Max. static load: 40N
- Max. speed at no load: 19.0mm/sec (Typical value)
- Speed at max load: 6.3mm/sec (Typical value @80N Loaded)
- Stroke: 10 / 30 / 50 / 100mm
- Noise level: ≦55dB
- IP level: IP66/IP69K (Static; non-action)
- Material: Aluminum extension and inner tube, plastic case.
- Duty cycle: 20%, max. 30 sec. continuous operation in 150 sec.
- Operating ambient temperature: -10°C ～ +50°C
- Storage ambient temperature: -25°C ～ +65°C
- Options:
  - MKS1-L version: With limit switches. When the actuator reaches the end of the stroke, the preset limit switch will cut off power and stop the motor automatically.
  - MKS1-P version: With potentiometer positioning info, so that the controller can detect the stroke position of the actuator at any time. And it is an absolute position information, which will not deviate due to power failure.

Performance Data

Model No.	Push/Pull Max. load (N)	Self-locking ability (N)	Typical speed (mm/s)		Typical current (A) @12V DC	
			No load	Full load	No load	Full load
MKS1-X-12-**E**-XXX-0XX	42	21	19.0	12.2	0.14	0.27
MKS1-X-12-**F**-XXX-0XX	80	40	9.5	6.3	0.12	0.22
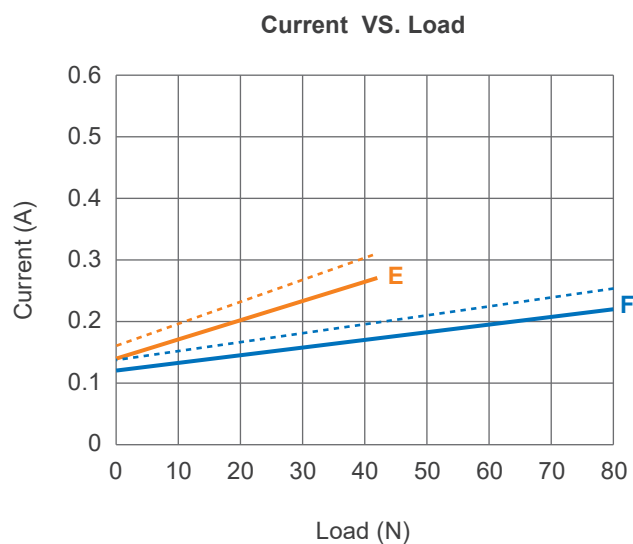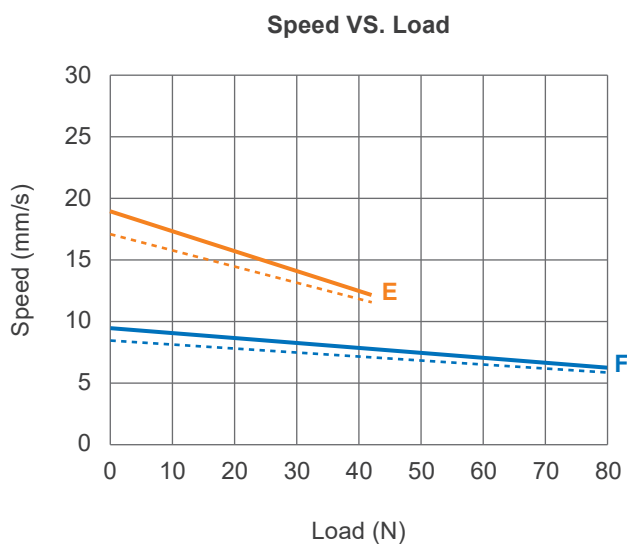
Speed VS. Load

Current VS. Load

- **Inrush current**

⚠️

- When the actuator starts to operate, an inrush current of about 0.2 seconds will be generated. The starting inrush current of MKS1 can reach about 3 times of the typical current under the actuator load.

- If a circuit board power supply is used, the specifications must be sufficient to handle the inrush current. If batteries are used as the power source, inrush current will not be a problem.

- MOTECK controllers are designed to take into account the inrush current when the actuator starts. If the user provides his or her own controller, this feature must be considered in the specifications and protection mechanisms. Besides, the connectors, switches and relays selected by users must also be able to withstand the starting currents.
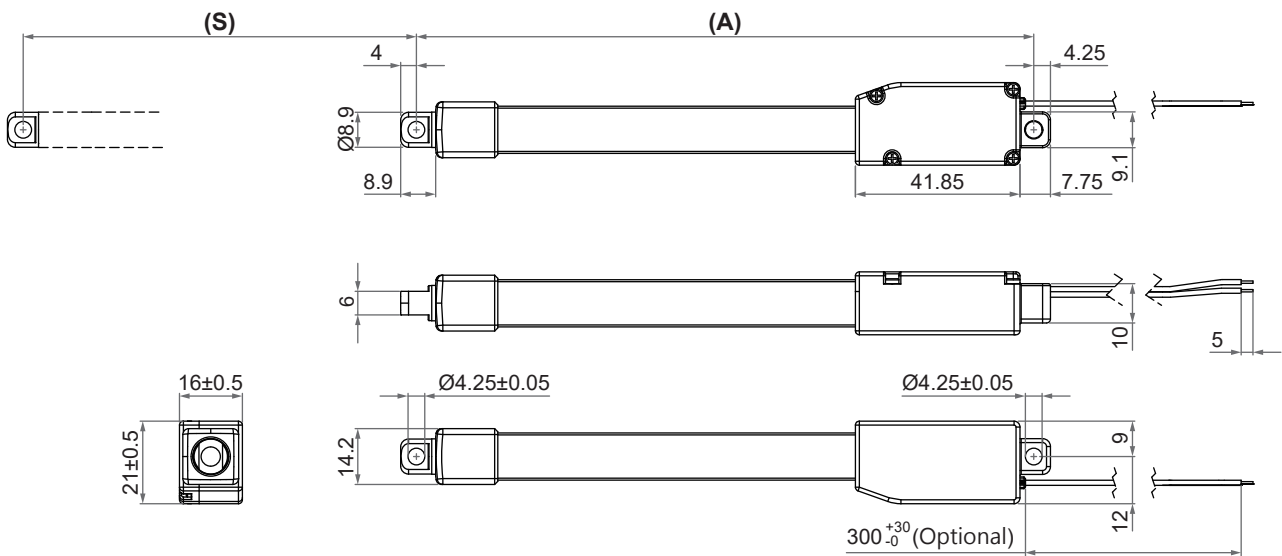
Dimensions

Installation dimension:
- Extended length = Retracted length (A) + Stroke (S)
- Minimum retracted length (A) of various options

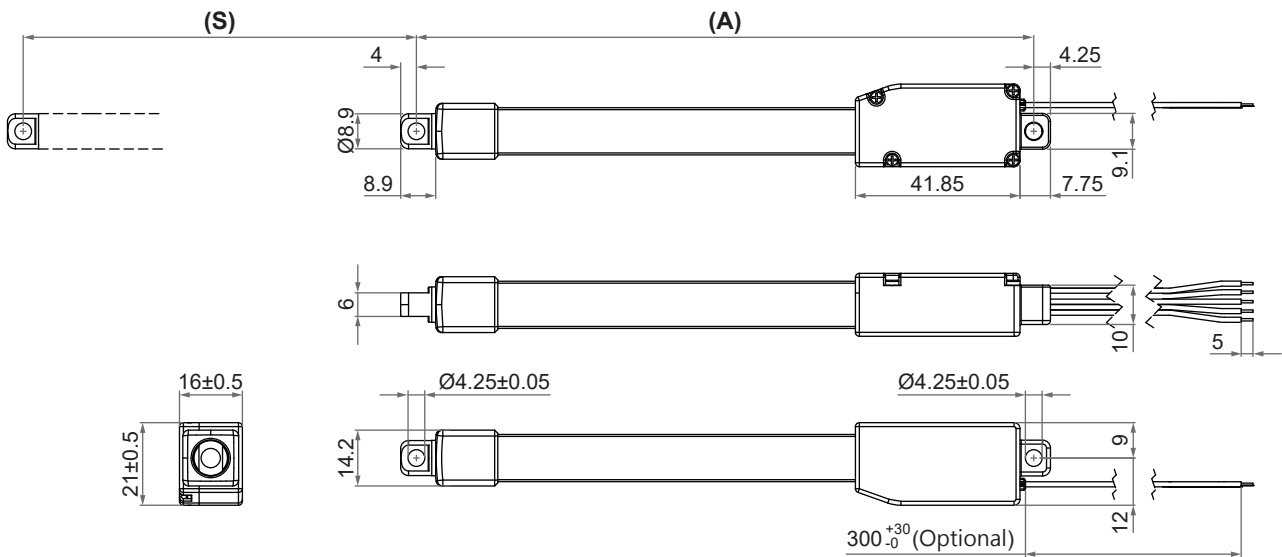|	Version	Stroke (S)			
		10	30	50	100
Retracted length (A)	MKS1-L	67	87	107	157
	MKS1-P	N/A	87	107	157

(Tolerance: ±1mm)

Drawing

- MKS1-L

- MKS1-P
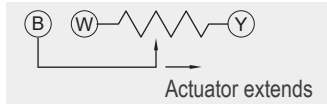
Unit: mm

Wiring with Flying Leads

● MKS1-L (With limit switches)

Wire color		Definition	Descriptions
Power wires	Red	DC power	Connect red wire to "Vdc +" & black wire to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Black		

● MKS1-P (With potentiometer positioning info)

Wire color		Definition	Descriptions
Power wires	Red	DC power	Connect red wire to "Vdc +" & black wire to "Vdc -" of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Black		
Signal wires	Yellow	Vin	Input any stable high reference voltage <30V
	Blue	POT output	1. Potentiometer specifications: There are different total resistance according to the stroke options (as table below). 2. Output voltage: As the actuator extends, the voltage (resistance) measurement between the blue and white wires increases linearly. Conversely, decrement when retracting. 3. When using for the first time (or when the actuator is replaced), after correctly connecting the wires, measure the output voltage at the beginning and end of the actuator stroke from the blue line (more sampling points can be added in the middle) to calculate the linear conversion formula between the POT output voltage and the stroke position. By building the formula into the control system's program parameters, the measured voltage can be converted into stroke position in real time.
	White	GND	Any stable low reference voltage (e.g. grounding)

Detail for the Blue (POT output) cell:

1. Potentiometer specifications: There are different total resistance according to the stroke options (as table below).

Stroke option	* Max. resistance
30 mm	3KΩ±40%
50 mm	6KΩ±40%
100 mm	11KΩ±40%

* **Remarks:** It is the resistance value between the blue and the white wires when the actuator is extended to its longest position.

2. Output voltage: As the actuator extends, the voltage (resistance) measurement between the blue and white wires increases linearly. Conversely, decrement when retracting.

Actuator extends

Ordering Key

MKS1- L - 12 - E - 030 - 0 0 3

Version	**L:** With limit switches **P:** With potentiometer positioning info
Input voltage	**12:** 12V DC
Performance	**E, F** (refer to p.2 Performance Data)
Stroke	**010:** 10mm (MKS1-L only) **030:** 30mm **050:** 50mm **100:** 100mm
Reserved	**0**
Reserved	**0**
Cable length	**0:** 300mm straight **3:** 900mm straight

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