

**MOTECK<sup>®</sup>**  
**ID10 Series Linear**  
**Actuator**



# MOTECK ID10 Series Linear Actuator Instruction Manual

[Home](#) » [MOTECK](#) » MOTECK ID10 Series Linear Actuator Instruction Manual 

## Contents

- [1 MOTECK ID10 Series Linear Actuator](#)
- [2 Specifications](#)
- [3 Product Usage Instructions](#)
- [4 FAQ](#)
- [5 Important Information](#)
- [6 Installation](#)
- [7 Restraining Torque](#)
- [8 Manual Drive Connector](#)
- [9 Wiring with Flying Leads](#)
- [10 Documents / Resources](#)
  - [10.1 References](#)

**MOTECK<sup>®</sup>**

## MOTECK ID10 Series Linear Actuator



## Specifications

- **Product:** Actuator ID10 series
- **Manufacturer:** [www.moteck.com](http://www.moteck.com)
- **Revision:** 2024.08\_V3.0

## Product Usage Instructions

### Important Information

- Only qualified personnel are allowed to carry out the mechanical and electrical installation of this product. Qualified personnel should be familiar with the mechanical or electrical installation work and have corresponding work qualifications.
- Do not perform mechanical installation when the actuator is powered. Complete the mechanical installation first, and then perform the electrical installation.
- Do not hold the extension tube when the actuator is powered. Never disconnect any wires or connectors during operation or when power is applied.
- If you find any malfunction or damage to the actuator, please stop using it immediately and notify qualified personnel to take corrective measures.
- This appliance cannot be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

### Installation

#### Terminology

- Rear connector
- Outer tube
- Extension tube
- Front connector
- Power cable

#### Mechanical Installation

1. Be sure that the load acts on the actuator in the axial direction and it isn't recommended to apply side load to the actuator.
2. If the actuator is jammed by an obstruction or the load is severely overweight, the actuator's clutch protection device will trip and run idly to protect the actuator or the customer's mechanical equipment from damage. Please be careful to avoid obstructions and do not exceed the rated load of the actuator.
3. Users are forbidden to open the outer cover of the limit switch so as not to affect the original protection level of the actuator, resulting in the immediate failure of the original factory protection commitment.

#### Restraining Torque

If the actuator needs to be test run before being installed on the operating frame, the front and rear connectors must be fixed first to limit the rotation of the extension tube. The torque is very large. If the front and rear connectors are not fixed, the extension tube (or the actuator) will rotate instead of moving. Please be careful of the

rotation force of the extension tube and pay attention to personal safety.

## FAQ

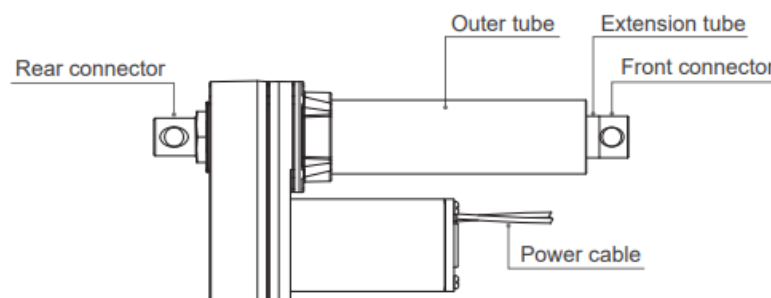
- **Q:** Who is allowed to carry out the installation of this product?
- **A:** Only qualified personnel with corresponding work qualifications are allowed to carry out the mechanical and electrical installation of this product.
- **Q:** What should be done if a malfunction or damage is found in the actuator?
- **A:** Stop using it immediately and notify qualified personnel to take corrective measures.

## Important Information

- Only qualified personnel are allowed to carry out the mechanical and electrical installation of this product. Qualified personnel should be familiar with the mechanical or electrical installation work and have corresponding work qualifications.
- Do not perform mechanical installation when the actuator is powered. Complete the mechanical installation first, and then perform the electrical installation.
- Do not hold the extension tube when the actuator is powered.
- Never disconnect any wires or connectors during operation or when power is applied.
- If you find any malfunction or damage to the actuator, please stop using it immediately and notify qualified personnel to take corrective measures. This appliance cannot be used by children or persons with reduced physical, sensory or mental capabilities, or
- lack of experience and knowledge, unless they have been given supervision or instruction.

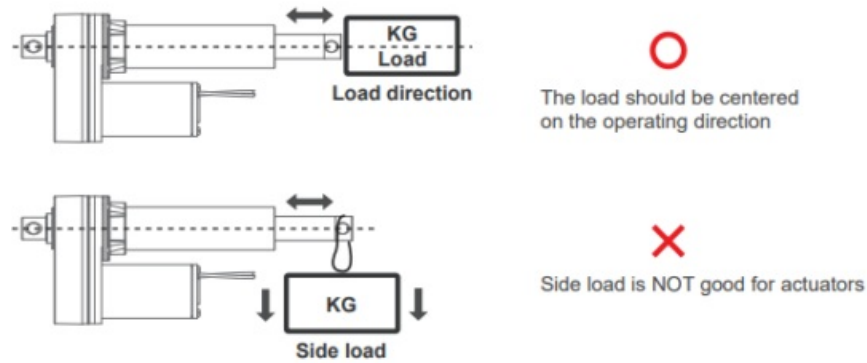
## Installation

### Terminology



### Mechanical installation

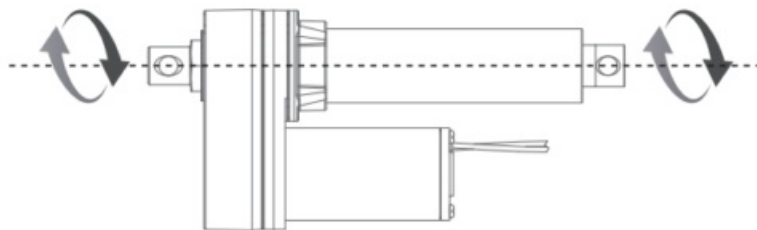
1. Be sure that the load acts on the actuator in the axial direction and it isn't recommended to apply side load to the actuator.



2. If the actuator is jammed by an obstruction or the load is severely overweight, the actuator's clutch protection device will trip and run idly to protect the actuator or the customer's mechanical equipment from damage. Please be careful to avoid obstructions and do not exceed the rated load of the actuator.
3. Users are forbidden to open the outer cover of the limit switch so as not to affect the original protection level of the actuator, resulting in the immediate failure of the original factory protection commitment.

## Restraining Torque

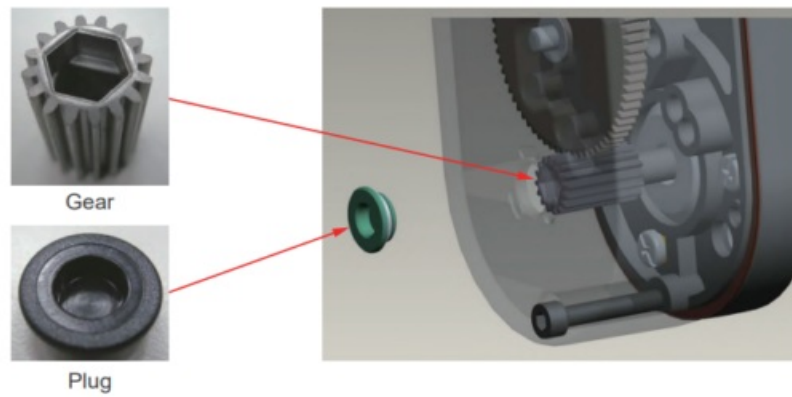
- If the actuator needs to be test run before being installed on the operating frame, the front and rear connectors must be fixed first to limit the rotation of the extension tube. The torque is very large. If the front and rear connectors are not fixed, the extension tube (or the actuator) will rotate instead of moving.
- Please be careful of the rotation force of the extension tube and pay attention to personal safety.



## Manual Drive Connector

### For ID10 only

- The MD (manual drive) is an alternative way to drive the motor directly, if the power is not available.
  - Step 1. Remove the plug on the gearbox cover.
  - Step 2. Use a 8.0mm hex bit or electric screwdriver (recommended) to drive the gear directly.
  - Step 3. Insert the plug into the hole, and confirm the plug is installed properly.
- The Max. drive torque is 6kg-cm with 4500N load (Ball screw).



## Wiring with Flying Leads

### 5.1 ID10

For ID10 actuator, connection rule of power wires varies according to different types and gear ratio(s). Please follow the instructions below.

Basic (Without limit switch nor positioning feedback)

- Gear ratio: 5:1, 10:1, 20:1

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		


**Gear ratio: 30:1, 40:1**

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		

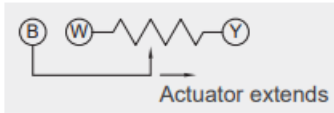
**With limit switches**

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		

#### With single Hall effect sensor positioning feedback

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		
<b>Signal wires</b>	White	Vin	Voltage input range: 5 ~ 20V
	Yellow	Hall output	<p>High= Input – 1.2V (<math>\pm 0.6V</math>)</p> <p>Low= GND</p> <p>Hall signal data:</p>  <p>Hall effect sensor resolution: 20ppi, 1.27mm/pulse (0.787pulses/mm)</p>
	Blue	GND	

#### With Potentiometer (POT) absolute positioning feedback


	Wire color	Definition	Descriptions
<b>Power wires</b>	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		
<b>Signal wires</b>	Yellow	Vin	Input voltage 70V max.
	Blue	POT output	<p>1. Potentiometer specification:</p> <ul style="list-style-type: none"> <li>– 10K ohm, 10 turns.</li> <li>– Total resistance tolerance <math>\pm 5\%</math></li> <li>– Independent linearity <math>\pm 0.25\%</math></li> </ul> <p>2. Output voltage: The voltage (resistance) between blue and white increases linearly from about 0 when the actuator extends, and decreases when it retracts.</p>  <p>3. There are different resolutions according to the stroke length (as table below)</p>
	White	GND	

## 5.2 ID10BT

Basic (Without positioning feedback)

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		
	Wire color	Definition	Descriptions
<b>Power wires</b>	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		

With Potentiometer (POT) absolute positioning feedback

	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 voltage 70V max.														
	Blue	POT output	<div>1. Potentiometer specification:<ul style="list-style-type: none"><li>- 10K ohm, 10 turns.</li><li>- Total resistance tolerance <math>\pm 5\%</math></li><li>- Independent linearity <math>\pm 0.25\%</math></li></ul></div> <div>2. Output voltage: The voltage (resistance) between blue and white increases linearly from about 0 when the actuator extends, and decreases when it retracts.</div> <div></div> <div>3. There are different resolutions according to the stroke length (as table below)</div> <table><thead><tr><th>Stroke (mm)</th><th>Resistance (tolerance: <math>\pm 0.3K\Omega</math>)</th></tr></thead><tbody><tr><td>102 (4")</td><td>0.3 ~ 8.1K</td></tr><tr><td>153 (6")</td><td>0.3 ~ 8.7K</td></tr><tr><td>203 (8")</td><td>0.3 ~ 9.2K</td></tr><tr><td>254 (10")</td><td>0.3 ~ 7.4K</td></tr><tr><td>305 (12")</td><td>0.3 ~ 8.8K</td></tr><tr><td>457 (18")</td><td>0.3 ~ 9.4K</td></tr></tbody></table>	Stroke (mm)	Resistance (tolerance: $\pm 0.3K\Omega$ )	102 (4")	0.3 ~ 8.1K	153 (6")	0.3 ~ 8.7K	203 (8")	0.3 ~ 9.2K	254 (10")	0.3 ~ 7.4K	305 (12")	0.3 ~ 8.8K	457 (18")	0.3 ~ 9.4K
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305 (12")	0.3 ~ 8.8K																
457 (18")	0.3 ~ 9.4K																
	White	GND															


### 5.3 ID10G

Basic, 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		

With single Hall effect sensor positioning feedback



	Wire color	Definition	Descriptions
<b>Power wires</b>	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		
<b>Signal wires</b>	Yellow	Vin	Voltage input range: 5 ~ 20V
	Blue	Hall output	<p>High= Input – 1.2V (<math>\pm 0.6V</math>)</p> <p>Low= GND</p> <p>Hall signal data:</p>  <p>Hall effect sensor resolution: 0.5 pulse/mm</p>
	White	GND	

With Potentiometer (POT) absolute positioning feedback

	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 voltage 70V max.																
	Blue	POT output	<div>1. Potentiometer specification:<ul style="list-style-type: none"><li>- 10K ohm, 10 turns.</li><li>- Total resistance tolerance <math>\pm 5\%</math></li><li>- Independent linearity <math>\pm 0.25\%</math></li></ul></div> <div>2. Output voltage: The voltage (resistance) between blue and white increases linearly from about 0 when the actuator extends, and decreases when it retracts.</div> <div></div> <div>3. There are different resolutions according to the stroke length (as table below)</div> <table><thead><tr><th>Stroke (mm)</th><th>Resistance (Tolerance: <math>\pm 0.3K\Omega</math>)</th></tr></thead><tbody><tr><td>102 (4")</td><td>0.3 ~ 5.2K</td></tr><tr><td>153 (6")</td><td>0.3 ~ 5.5K</td></tr><tr><td>203 (8")</td><td>0.3 ~ 5.9K</td></tr><tr><td>254 (10")</td><td>0.3 ~ 7.3K</td></tr><tr><td>305 (12")</td><td>0.3 ~ 5.6K</td></tr><tr><td>457 (18")</td><td>0.3 ~ 6.0K</td></tr><tr><td>610 (24")</td><td>0.3 ~ 6.4K</td></tr></tbody></table>	Stroke (mm)	Resistance (Tolerance: $\pm 0.3K\Omega$ )	102 (4")	0.3 ~ 5.2K	153 (6")	0.3 ~ 5.5K	203 (8")	0.3 ~ 5.9K	254 (10")	0.3 ~ 7.3K	305 (12")	0.3 ~ 5.6K	457 (18")	0.3 ~ 6.0K	610 (24")	0.3 ~ 6.4K
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305 (12")	0.3 ~ 5.6K																		
457 (18")	0.3 ~ 6.0K																		
610 (24")	0.3 ~ 6.4K																		
	White	GND																	

#### 5.4 ID10K

For ID10K actuator, connection rule of power wires varies according to different types and gear ratio(s). Please follow the instructions below.

Basic (Without limit switch nor positioning feedback)

Gear ratio: 20:1

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		

Gear ratio: 40:1

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		


With limit switches

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		

With single Hall effect sensor positioning feedback

	Wire color	Definition	Descriptions
<b>Power wires</b>	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		
<b>Signal wires</b>	Yellow	Vin	Voltage input range: 5 ~ 20V
	Blue	Hall output	<p>High= Input – 1.2V (<math>\pm 0.6V</math>)</p> <p>Low= GND</p> <p>Hall signal data:</p> <p>High</p> <p>Hall</p> <p>Low</p> <p>Hall effect sensor resolution: 1.0 pulse/mm</p>
	White	GND	

With Potentiometer (POT) absolute positioning feedback


	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 voltage 70V max.																
	Blue	POT output	<div>1. Potentiometer specification:<ul style="list-style-type: none"><li>- 10K ohm, 10 turns.</li><li>- Total resistance tolerance <math>\pm 5\%</math></li><li>- Independent linearity <math>\pm 0.25\%</math></li></ul></div> <div>2. Output voltage: The voltage (resistance) between blue and white increases linearly from about 0 when the actuator extends, and decreases when it retracts.</div> <div></div> <div>3. There are different resolutions according to the stroke length (as table below)</div> <table><thead><tr><th>Stroke (mm)</th><th>Resistance (Tolerance: <math>\pm 0.3K\Omega</math>)</th></tr></thead><tbody><tr><td>102 (4")</td><td>0.3 ~ 7.3K</td></tr><tr><td>153 (6")</td><td>0.3 ~ 8.7K</td></tr><tr><td>203 (8")</td><td>0.3 ~ 7.3K</td></tr><tr><td>254 (10")</td><td>0.3 ~ 9.1K</td></tr><tr><td>305 (12")</td><td>0.3 ~ 7.9K</td></tr><tr><td>457 (18")</td><td>0.3 ~ 9.4K</td></tr><tr><td>610 (24")</td><td>0.3 ~ 8.2K</td></tr></tbody></table>	Stroke (mm)	Resistance (Tolerance: $\pm 0.3K\Omega$ )	102 (4")	0.3 ~ 7.3K	153 (6")	0.3 ~ 8.7K	203 (8")	0.3 ~ 7.3K	254 (10")	0.3 ~ 9.1K	305 (12")	0.3 ~ 7.9K	457 (18")	0.3 ~ 9.4K	610 (24")	0.3 ~ 8.2K
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457 (18")	0.3 ~ 9.4K																		
610 (24")	0.3 ~ 8.2K																		
	White	GND																	

## 5.5 ID10P

Basic, 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		

With Potentiometer (POT) absolute positioning feedback


	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 voltage 70V max.								
	Blue	POT output	<div>1. Potentiometer specification:<ul style="list-style-type: none"><li>- 10K ohm, 10 turns.</li><li>- Total resistance tolerance <math>\pm 5\%</math></li><li>- Independent linearity <math>\pm 0.25\%</math></li></ul></div> <div>2. Output voltage: The voltage (resistance) between blue and white increases linearly from about 0 when the actuator extends, and decreases when it retracts.</div> <div></div> <div>3. There are different resolutions according to the stroke length (as table below)</div> <table><tr><th>Stroke (mm)</th><th>Resistance (tolerance: <math>\pm 0.3K\Omega</math>)</th></tr><tr><td>102 (4")</td><td>0.3 ~ 8.1K</td></tr><tr><td>203 (8")</td><td>0.3 ~ 9.2K</td></tr><tr><td>305 (12")</td><td>0.3 ~ 8.8K</td></tr></table>	Stroke (mm)	Resistance (tolerance: $\pm 0.3K\Omega$ )	102 (4")	0.3 ~ 8.1K	203 (8")	0.3 ~ 9.2K	305 (12")	0.3 ~ 8.8K
	Stroke (mm)	Resistance (tolerance: $\pm 0.3K\Omega$ )									
102 (4")	0.3 ~ 8.1K										
203 (8")	0.3 ~ 9.2K										
305 (12")	0.3 ~ 8.8K										
	White	GND									

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### Documents / Resources

	<a href="#">MOTECK ID10 Series Linear Actuator</a> [pdf] Instruction Manual ID10 Series, ID10 Series Linear Actuator, Linear Actuator, Actuator
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## References

-  [Electric Linear Actuators | Moteck Professional Linear Actuator Company](#)
- [User Manual](#)

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