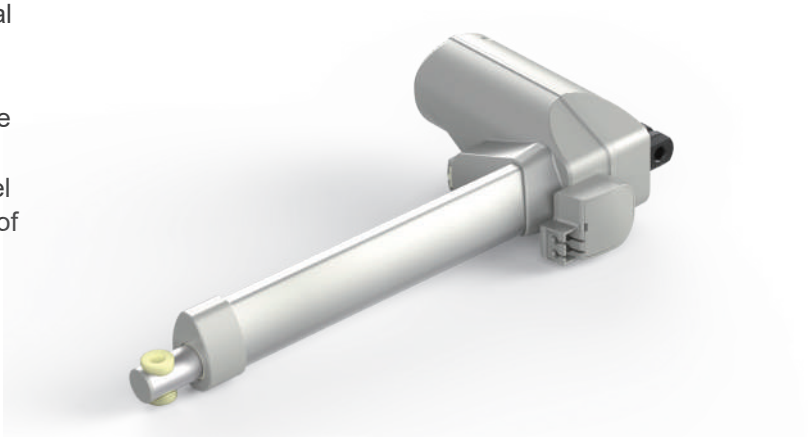
Actuator
MK31-QR

MK31-QR is an electric actuator designed for medical bed applications, with a maximum thrust of 4000N. It can support the mechanical emergency release handle design of the hospital bed, and the steel cable can be manually pulled to release the lead screw of the MK31-QR, so that the MK31-QR can quickly level the bed by gravity for medical emergency treatment of the patients in the bed.



Features and Options

Main applications: Medical, home care

Standard features:

- Input voltage: 24V DC
- Max. load: 4000N (For thrust applications only, not for use in pull)
- Self-locking ability: 4000N
- Max. speed at no load: 6.8 mm/sec (Typical value)
- Speed at full load: 4.9 mm/sec (Typical value @4000N Loaded)
- Quick Release function, Load: 50~200 kg
- Stroke: 50 ~ 400 mm
- Noise level: ≦50dB
- IP Protection level: IPX6 (static, non-action)
- Aluminum outer tube
- Detachable cable plug (Refer to p.8)
- Color: Light gray RAL 7035
- Duty cycle: 10%, max. 2 min. continuous operation in 20 min.
- Operating ambient temperature: +5°C ~ +40°C
- Storage ambient temperature: -25°C ~ +65°C
- Certified: CE Marking, EN 60601-1, EN 60601-1-2, BS EN 60601-1-2, IEC 60601-1-2

Options:

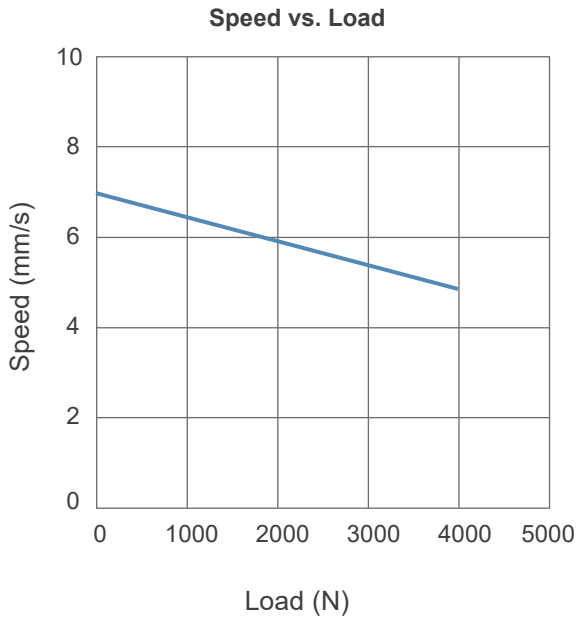
- Positioning signal feedback with Hall effect sensor x 2*
- Mechanical push only extension tube
- Safety nut (in push direction)

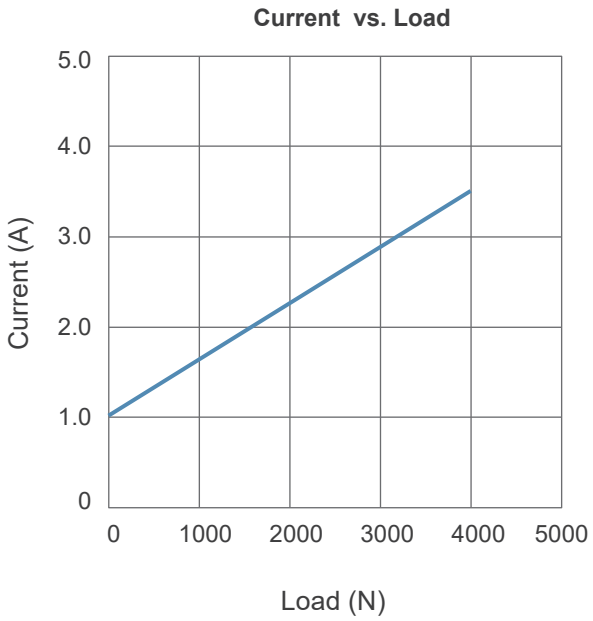
Note:

* Once the quick release has been activated, the positioning learning function of the control box must be operated again.

Performance Data

Model No.	Push Max.(N)	*Braking ability (N)	**Typical Speed (mm/s)		**Typical Current (A)	
			No load	Full load	No load	Full load
MK31-QR-24**A7**-XXX.XXX	4000	4000	6.8	4.9	1.0	3.5





Remarks:

* Equipped with brakes for thrust direction only.

** The typical speed or typical current means the average value neither upper limit nor lower limit.
The performance curves are made with typical values.

● **Inrush current**

- When the actuator starts to operate, an inrush current of about 0.2 seconds will be generated. The starting inrush current of MK31-QR 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.

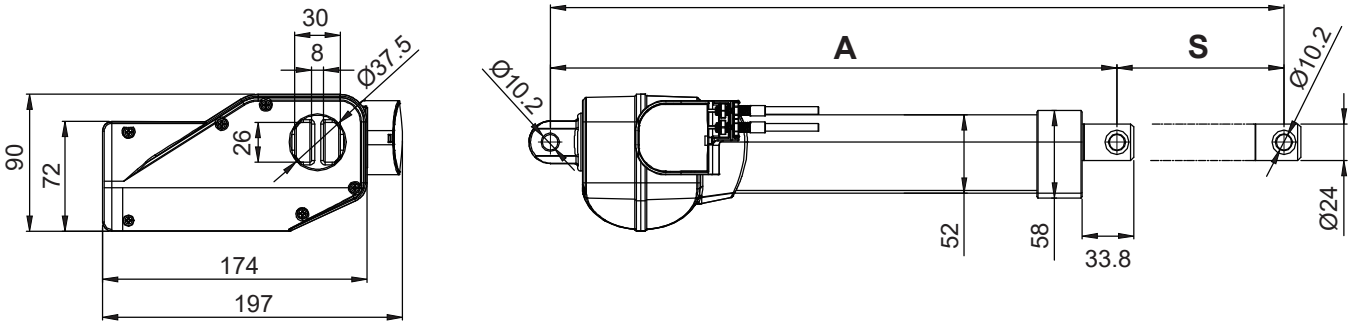
Dimensions

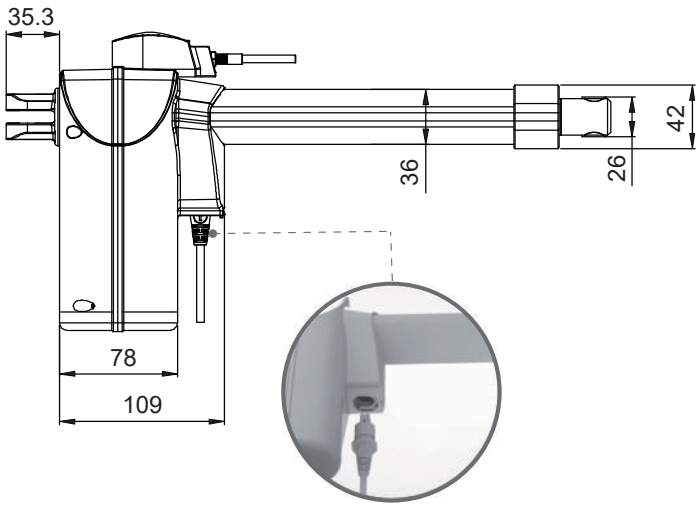
- Available stroke (S) range = 50 ~ 400mm
- Retracted length (A)≧170+S+L+D (mm)

Unit: mm

Stroke	L
50≦S≦300	0
301≦S≦350	20
351≦S≦400	35
Safety option	**D**
0, P	0
S, A	8

- S≧401mm, Please consult MOTECK sales representative for feasibility and the available retracted length.
- Extended length (B) = Retracted length (A) + Stroke (S)

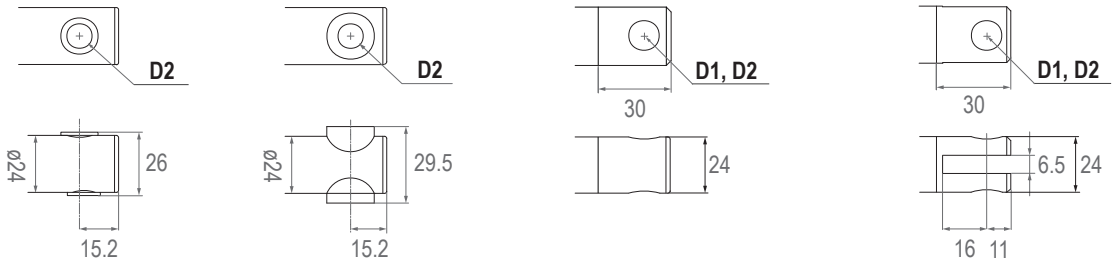




Detachable cable plug

● Front connector

3 : Drilled hole **7** : Plastic bushing **C** : Metal solid **D** : Metal slot

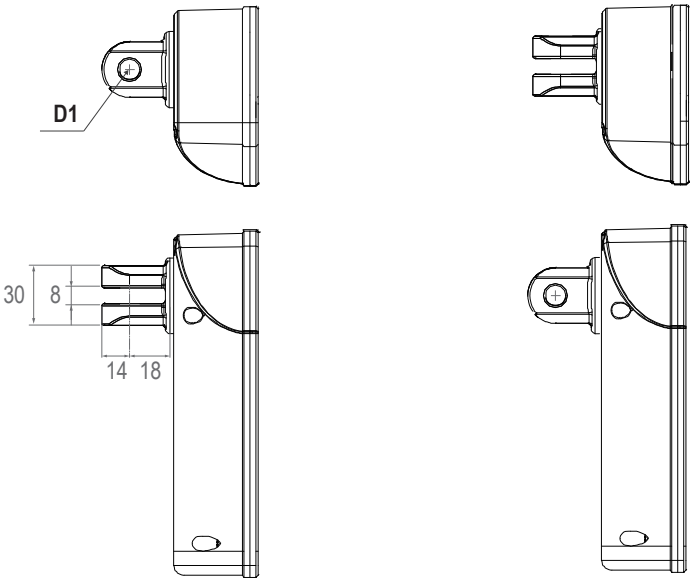


Front connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)
3	N/A	ø8.2, ø10.2
7	N/A	ø10
C	ø12	ø10
D	ø12	ø10

● Rear connector

1 : Plastic

0 : 0° (standard) **9** : 90°



Rear connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)
1	ø10.2	N/A

Compatibility

Product	Model	MK31-QR spec
Control box	MD6C-M	• With dual Hall effect sensors for positioning • MOTECK H-type or V-type DIN plug
	CM45	• MOTECK H-type DIN plug
	CM41-M*, CB5P-M	• With dual Hall effect sensors for positioning • MOTECK LR-type minifit plug

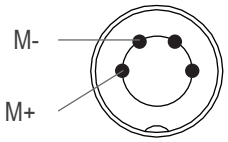
Remarks:

* CM41-M control box can be attached to MK31-QR actuator.

Cable Plug (Detachable)

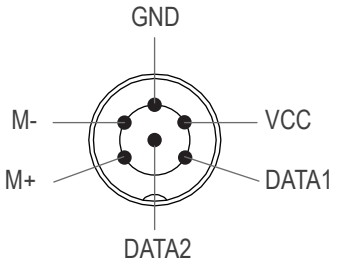
- **MOTECK H-type or V-type plug**

  - Without positioning feedback



4-pin DIN plug

  - With dual Hall effect sensors for positioning



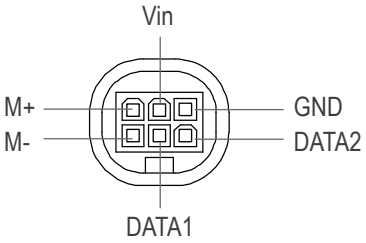
6-pin DIN plug

H-type

V-type

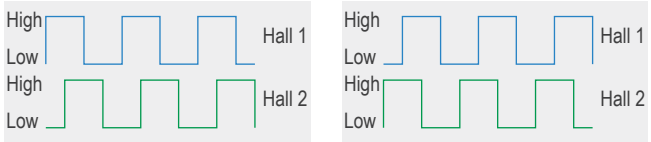
LR-type

- **MOTECK LR-type plug**



6-pin minifit plug

- **Note:**

	Definition	Comments
Power	M+	Connect M+ to “+” & M- to “-“ of DC power, the actuator will extend.
	M-	
Signal	Vin	Voltage input range (Vin): 5 ~ 20V
	Hall 1 output	High= Input - 1.2V (±0.6V) Low= GND Hall signal data:  Hall effect sensor resolution: 5.72 pulses/mm
	Hall 2 output	
	GND	

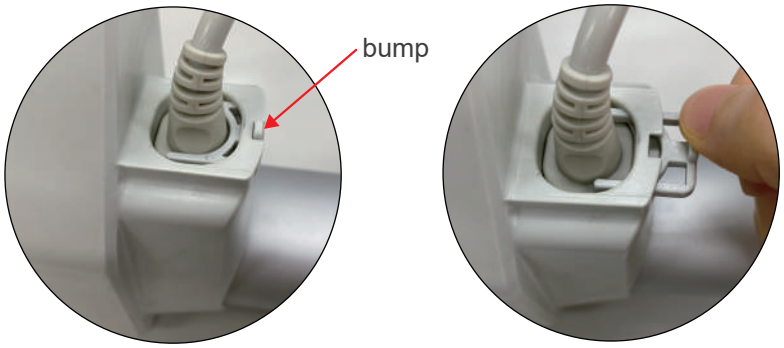
Ordering Key

MK31- QR - 24 A7 - 220 . 270 - 3 1 0 0 0 0 0

Function	**QR**: Quick Release
Input voltage	**24**: 24V DC
Motor and Spindle type	**A7**: 2500rpm / 7 mm pitch
Retracted length	**XXX** *(refer to page 3)*
Extended length	**XXX** *(refer to page 3)*
Front connector	**3**: Drilled hole **7**: Plastic bushing **C**: Metal solid **D**: Metal slot *(refer to page 4)*
Rear connector	**1**: Plastic *(refer to page 4)*
Pivot orientation of rear connector	**0**: 0° (standard) **9**: 90°
Positioning feedback	**0:** None **H:** Hall effect sensor x 2
Safety Option	**0**: None **S**: Safety nut **P**: Push only extension tube **A**: Safety nut + Push only
Reserved	**0**
Cable	**0**: 300mm straight **3**: 1000mm straight **A**: 450mm with 300mm coiled

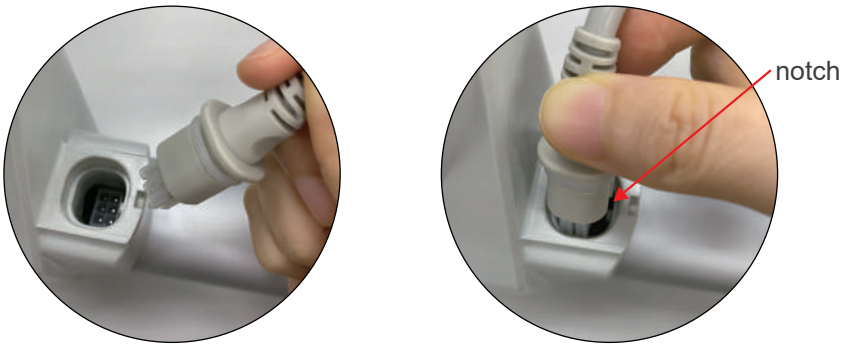
Install/Remove Cable Plug

- **Remove**
  - Push the bump of the anti-pull clip outward to remove it



  - Hold the motor and remove the cable plug

- **Install**
  - Align the notch of the socket and insert the plug

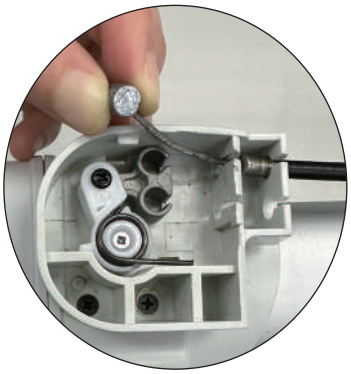


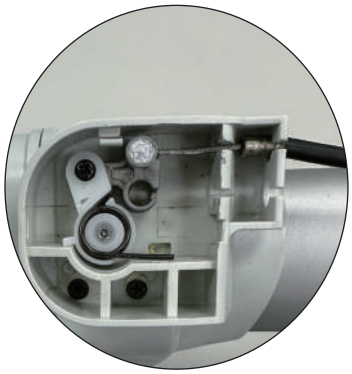
  - Put the anti-pull clip back to lock the plug

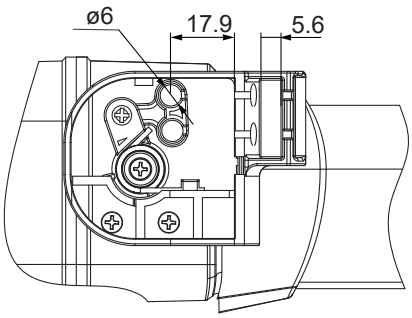
Mounting of the quick release cable

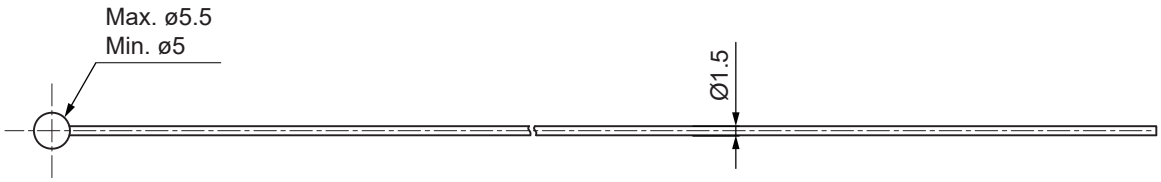
1. Make sure the actuator is unloaded and the stroke is fully retracted.
2. Open the lid of quick release device.

3. Feed the cable through the slot of the mounting hole, and place the cylindrical cable end into the cable fixture. Then, adjust the cable jacket so that it stays in the mounting hole. Repeat the process if using two release cables.









(Not included with the purchase of the actuator.)

4. Close the lid and test that the cable stretches properly to complete the installation.

5. When operating the quick release mechanism, make sure that the cable stretches smoothly to the end and does not get stuck halfway.