MOTECK®
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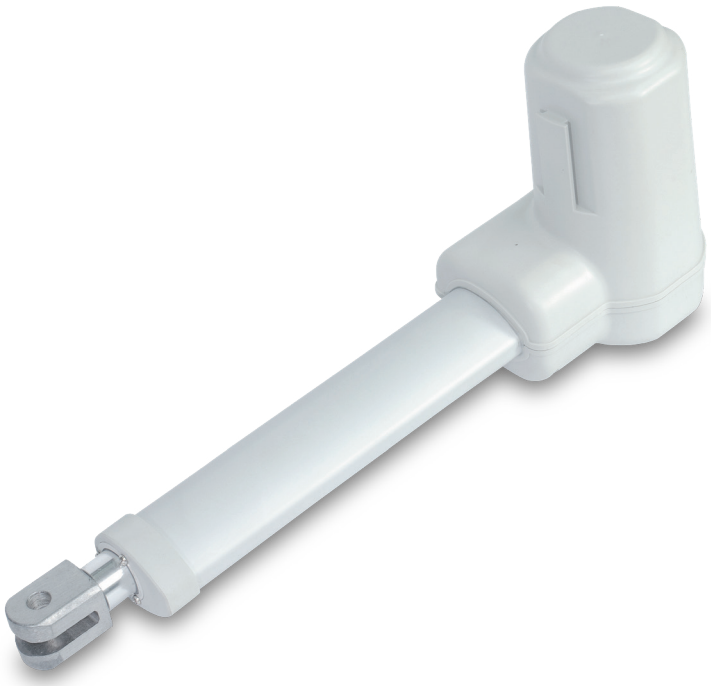
Actuator
MD60



MD60 is a quiet and powerful actuator up to 6000N thrust, designed for use in a variety of medical and home care applications such as patient hoist and bed.

Content

Features and Options

- Main applications: Home care, medical
- Input voltage: 24V DC
- Max. load: 6000N (push) / 4000N (pull)
- Typical speed at no load: 23 mm/sec
- Typical speed at full load: 5.0 mm/sec (6000N load)
- Stroke: 50 ~ 400 mm
- Noise level: ≦53dB
- IP Level: IPX4 (static, non-action)
- Rear connector's pivot orientation can be chosen in every 30 degrees.
- Preset limit switches
- Aluminum outer tube
- Color: Light gray RAL 7035
- Duty cycle: 10% and max. 2 min. continuous operation in 20 min.
- Ambient operation temperature: +5°C ~ +40°C
- Certified: CE Marking, EN 60601-1-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-8 RoHS, Directive 2011/65/EU and commission delegated Directive (EU)2015/863, (EU)2017/2102
- Optional dual hall effect sensors for positioning
- Optional Mechanical push only extension tube or Safety nut (in push direction)
- Optional IPX6
- Optional QR2 quick release: To retract actuator quickly by pinching the QR2 grip while emergency *(Fig. 1)*
- Optional MR3 manual release: To retract actuator slowly and put down the patient safely by turning the MR3 knob with hand when losing power in the application of patient hoist *(Fig. 2)*

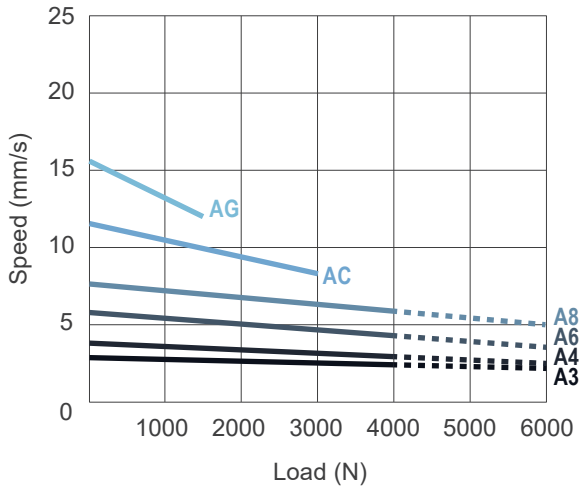
Fig. 1

Fig. 2

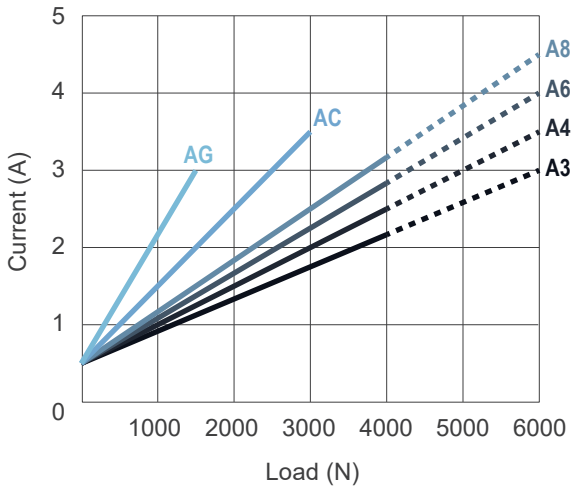
Performance Data

Model No.	Push Max. (N)	Pull Max. (N)	* Typical Speed (mm/s)		* Typical Current (A) @ 24V	
			No load	Full load	No load	Full load
MD60-24-**A3**-XXX.XXX-CXX	6000	4000	2.9	2.1	0.5	3.0
MD60-24-**A4**-XXX.XXX-CXX	6000	4000	3.8	2.5	0.5	3.5
MD60-24-**A6**-XXX.XXX-CXX	6000	4000	5.8	3.6	0.5	4.0
MD60-24-**A8**-XXX.XXX-CXX	6000	4000	7.6	5.0	0.5	4.5
MD60-24-**AC**-XXX.XXX-CXX	3000	3000	11.5	8.2	0.5	3.5
MD60-24-**AG**-XXX.XXX-CXX	1500	1500	15.3	12.0	0.5	3.0

Speed vs. Load



Current vs. Load

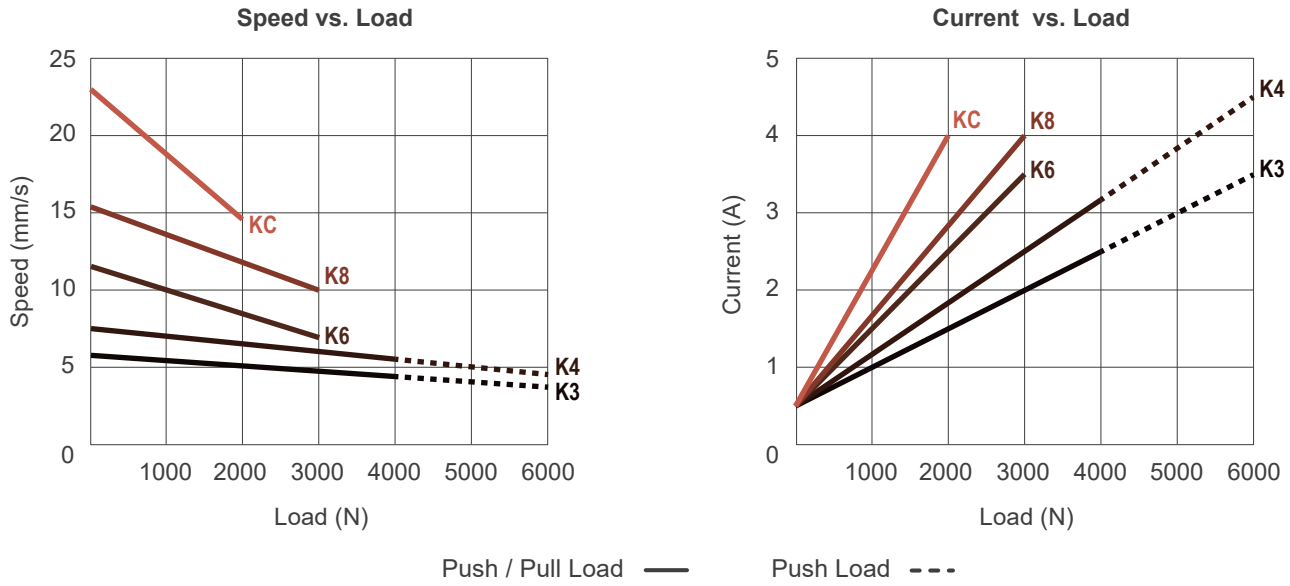


Push / Pull Load —— Push Load - - -

Remarks:

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

Model No.	Push Max. (N)	Pull Max. (N)	* Typical Speed (mm/s)		* Typical Current (A) @ 24V	
			No load	Full load	No load	Full load
MD60-24-**K3**-XXX.XXX-CXX	6000	4000	5.8	3.8	0.5	3.5
MD60-24-**K4**-XXX.XXX-CXX	6000	4000	7.5	4.5	0.5	4.5
MD60-24-**K6**-XXX.XXX-CXX	3000	3000	11.5	6.9	0.5	3.5
MD60-24-**K8**-XXX.XXX-CXX	3000	3000	15.3	10.0	0.5	4.0
MD60-24-**KC**-XXX.XXX-CXX	2000	2000	23.0	14.7	0.5	4.0



Remarks:

* 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 MD60 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

1. Installation Dimension

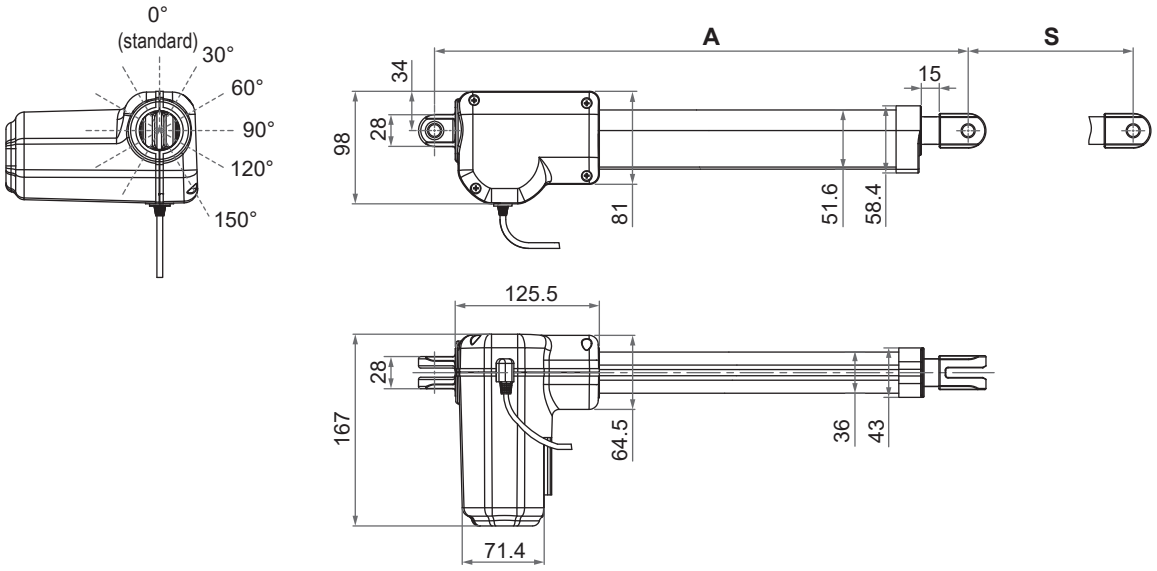
Unit: mm

Stroke (s)	50≦S≦300mm				
Retracted Length (A)	Front connector / Safety option	3, 7	1, 5, 8	Q (With QR2 quick release)	M, N (With MR3 manual release)
	No safety option	A≧S+155mm	A≧S+179mm	N/A	N/A
	With Safety Nut (SN)	A≧S+160mm	A≧S+185mm	A≧S+243mm	A≧S+250mm

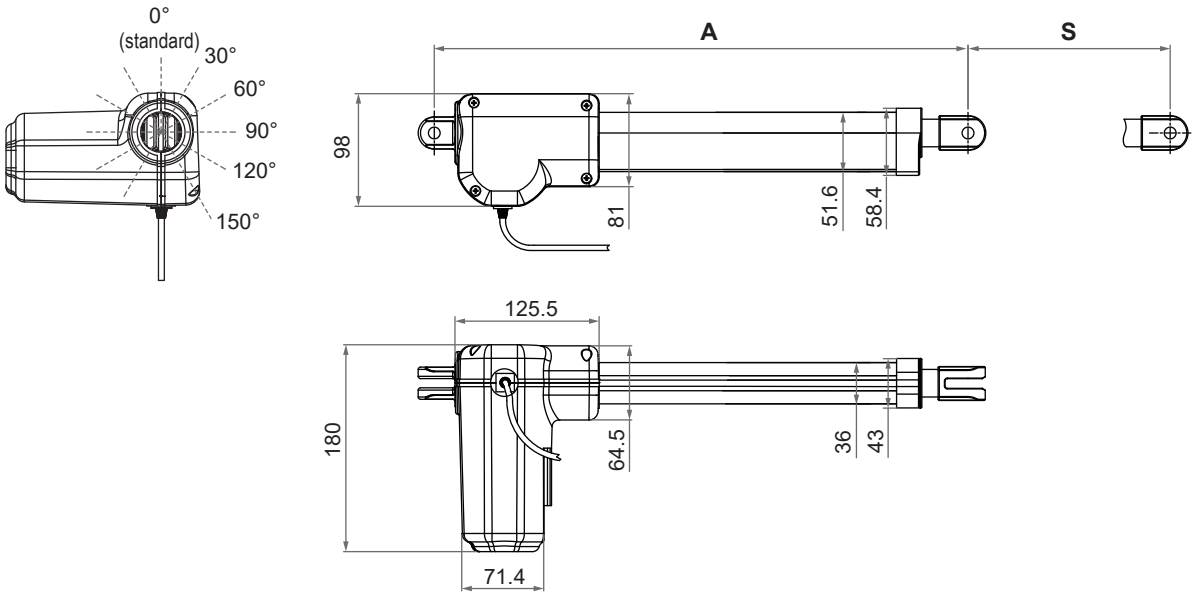
• 301≦S≦400mm, retracted length (A) + 30mm • Extended length (B) = Retracted length (A) + Stroke (S) • Tolerance: ±3mm
• S≧401mm, Customized retracted length (A)

2. Drawing

- Standard



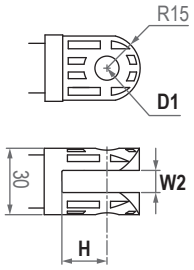
- With dual hall effect sensors for positioning



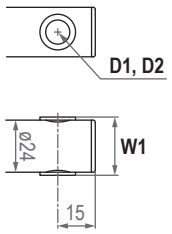
Note: As an example in 0° pivot of rear connector.

3. Front Connector

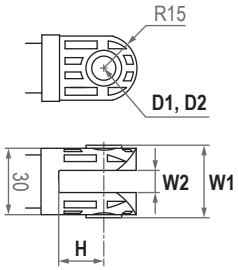
1: Plastic



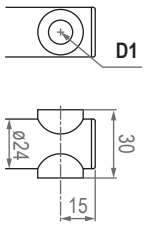
3: Drilled hole



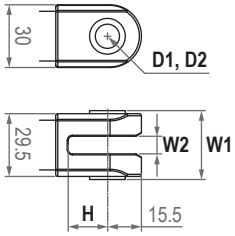
5: Zinc alloy clevis



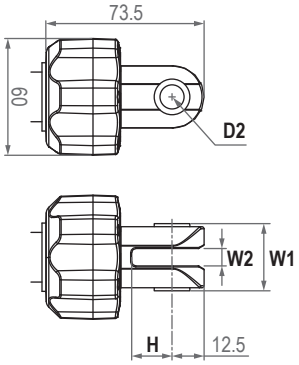
7: Plastic bushing



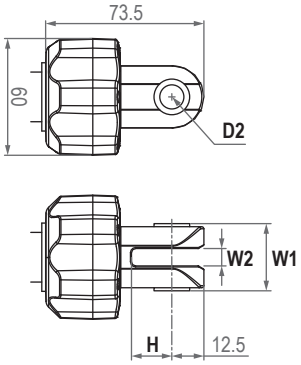
8: Aluminum alloy clevis



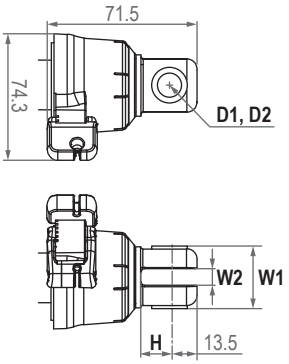
M: Aluminum alloy clevis with MR3 manual release



N: Zinc alloy clevis with MR3 manual release



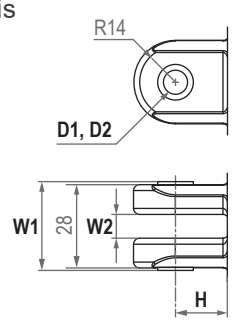
Q: Zinc alloy clevis with QR2 quick release



Front connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)	Width with bushing (W1)	Slot width (W2)	Slot depth (H)
1	ø8, ø10, ø12	N/A	N/A	10	20
3	N/A	ø8, ø10	26	N/A	N/A
5	ø8, ø10, ø12	ø8, ø10	32	10	20
7	N/A	ø10	N/A	N/A	N/A
8	ø10, ø12	ø8, ø10	31.5	8.3	19.5
M	N/A	ø10	29.5	8.4	19.5
N	N/A	ø10	29.5	8.4	19.5
Q	ø12	ø10	29.6	8.2	14

4. Rear Connector

1: Aluminum alloy clevis
2: Zinc alloy clevis

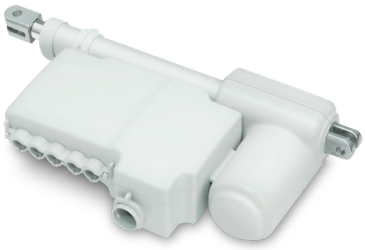


Rear connector code	Diameter of pivot without bushing (D1)	Diameter of pivot with bushing (D2)	Width with bushing (W1)	Slot width (W2)	Slot depth (H)
1	ø10, ø12	ø8, ø10	30	8	18
2	ø10, ø12	ø8, ø10	30	8	18

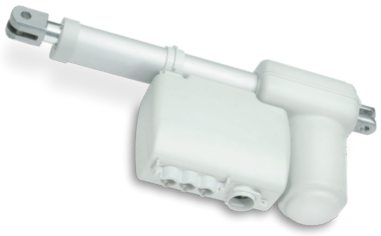
Compatibility

Product	Model	Application condition	MD60 spec
Control box	MD6C	- Max. 5A current per channel	- Without positioning sensor feedback - 4-pin Moteck H-type or V-type DIN plug
	CB2P, CB4P, MD7C	- Max. 3A current per channel	- Without positioning sensor feedback - 4-pin Moteck H-type or V-type DIN plug
	CB4P-SY (Synchronization)	- Max. 4.5A current 2 channels	- With dual Hall effect sensors for positioning - 6-pin Moteck H-type or V-type DIN plug
	CB5P-M	- Max. 5A current per channel	- With dual Hall effect sensors for positioning - 6-pin Moteck LR-type minifit plug

Remarks:
If the current limit of the selected control box is lower than the typical current of the actuator model under full load, the actuator could not be operated in full performance.



MD60+MD6C

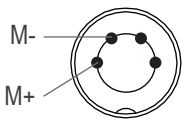


MD60+CB2P

Cable Plug

1. Standard

- Moteck V-type or H-type DIN plug

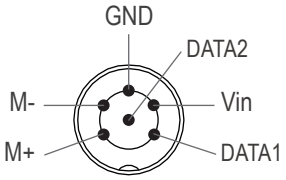


4-pin DIN plug

V-type

2. With dual hall effect sensors for positioning

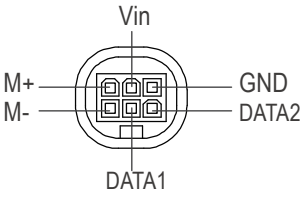
- Moteck V-type or H-type DIN plug



6-pin DIN plug

H-type

- Moteck LR-type minifit plug



6-pin minifit plug

LR-type

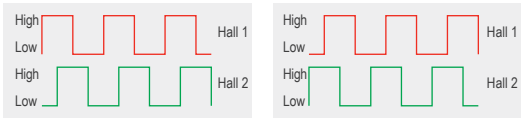
Note:
Connect M+ to “Vdc +” & M- to “Vdc -“ of DC power to extend the actuator.
Switch the polarity of DC input to retract it.

Cable with Flying Leads

1. Standard

	Wire color	Definition	Comments
Power wires	White	DC power	Connect white wire to “Vdc +” & black wire to “Vdc -“ of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Black		

2. With dual hall effect sensors for positioning

	Wire color	Definition	Comments
Power wires	Blue	DC power	Connect blue wire to “Vdc +” & Brown wire to “Vdc -“ of DC power to extend the actuator. Switch the polarity of DC input to retract it.
	Brown		
Signal wires	Yellow	Vin	Voltage input range: 5 ~ 20V
	Red	Hall 1 output	High= Input - 1.2V (±0.6V) Low= GND Hall signal data:  Hall effect sensor resolution:
	Green	Hall 2 output	
	Black	GND	

Model No.	Resolution (pulses/mm)
MD60-24-A3-XXX.XXX-CXX-HSX	13.33
MD60-24-A4-XXX.XXX-CXX-HSX	10.0
MD60-24-A6-XXX.XXX-CXX-HSX	6.67
MD60-24-A8-XXX.XXX-CXX-HSX	5.0
MD60-24-AC-XXX.XXX-CXX-HSX	3.34
MD60-24-AG-XXX.XXX-CXX-HSX	2.5
MD60-24-K3-XXX.XXX-CXX-HSX	6.67
MD60-24-K4-XXX.XXX-CXX-HSX	5.0
MD60-24-K6-XXX.XXX-CXX-HSX	3.34
MD60-24-K8-XXX.XXX-CXX-HSX	2.5
MD60-24-KC-XXX.XXX-CXX-HSX	1.66

Ordering Key

MD60- 24 - A8 - 560 . 850 - C Q 2 - HS - PO - A

Input voltage	**24**: 24V DC
Motor and Spindle type	**A3:** 2500rpm / 3mm pitch **A4:** 2500rpm / 4mm pitch **A6:** 2500rpm / 6mm pitch **A8:** 2500rpm / 8mm pitch **AC:** 2500rpm / 12mm pitch **AG:** 2500rpm / 16mm pitch **K3:** 2500rpm / 3mm pitch **K4:** 2500rpm / 4mm pitch **K6:** 2500rpm / 6mm pitch **K8:** 2500rpm / 8mm pitch **KC:** 2500rpm / 12mm pitch
Retracted length *(Refer to Page 6)*	**XXX**
Extended length *(Refer to Page 6)*	**XXX**
Front connector *(Refer to Page 7)*	**1**: Plastic **3**: Drilled hole **5**: Zinc alloy clevis **7**: Plastic bushing **8**: Aluminum alloy clevis **M**: Aluminum alloy clevis with MR3 manual release (must with options of Push only and Safety nut, A8 or AC spindle) **N**: Zinc alloy clevis with MR3 manual release (must with options of Push only and Safety nut, A8 or AC spindle) **Q**: Zinc alloy clevis with QR2 quick release (must with options of Push only and Safety nut, A8 or AC spindle)
Rear connector *(Refer to Page 7)*	**1**: Aluminum alloy clevis **2**: Zinc alloy clevis
Positioning feedback	**Blank**: None **HS**: Dual hall effect sensors for positioning
Options *(multiple choice is allowed)*	**Blank**: None **SN**: Safety nut **PO**: Push only **X6**: IPX6 Protection level
Cable length	**0**: 300mm straight **1**: 1000mm straight **A**: 400mm with 200mm coiled