

Actuator

LD20

LD20 is a compact actuator with high load capability which is designed for use in industrial and furniture. It's an ideal solution for the applications where installation space is limited, such as window opener or adjustable car driver seat.



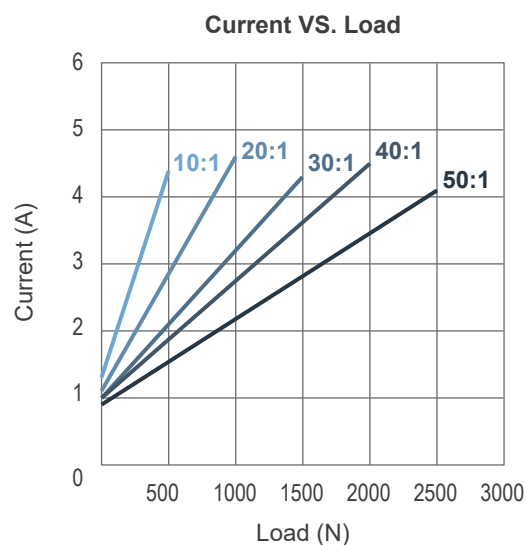
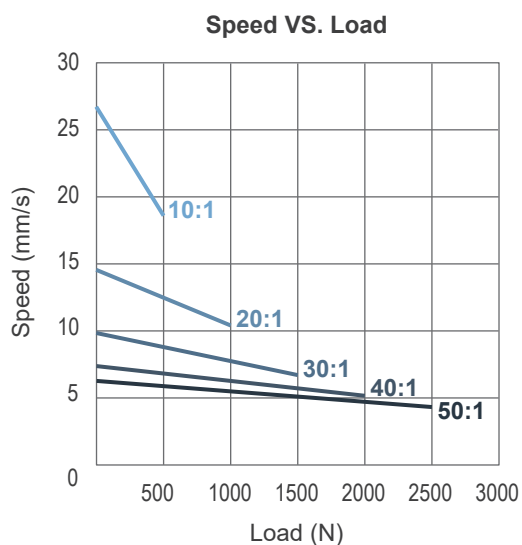
Features and Options

- Main applications: Industry, Furniture
- Input voltage: 12 / 24 / 48V DC
- Max. load: 2500N (Push / Pull)
- Max. speed at no load: 27.5mm/sec (Typical value)
- Speed at full load: 4.6mm/sec (Typical value @2500N Loaded)
- Stroke: 100 / 150 / 200 / 250 / 300mm (Max. 300mm)
- Noise level: ≤ 70 dB
- IP level: IP65 (Static; non-action)
- Color: Aluminum grey
- Preset limit switches
- Positioning:
 - Digital positioning feedback with dual Hall effect sensors
 - Analog positioning feedback with Potentiometer (POT)
- Duty cycle: 25%, max. 1 min continuous operation in 4 min.
- Operating ambient temperature: -25°C ~ +65°C
- Storage ambient temperature: -25°C ~ +65°C
- Certified: CE marking, EMC Directive 2014/30/EU.

Performance Data

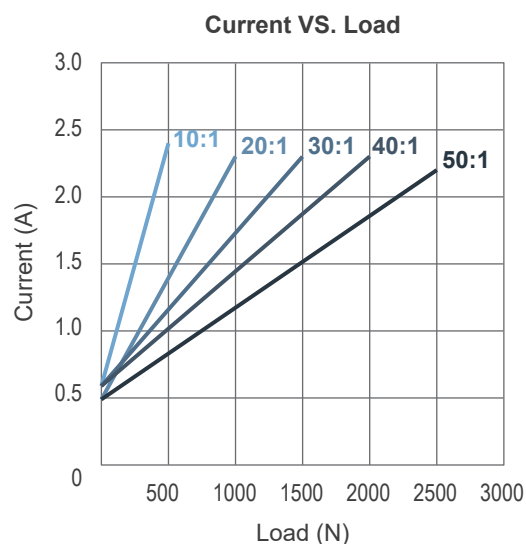
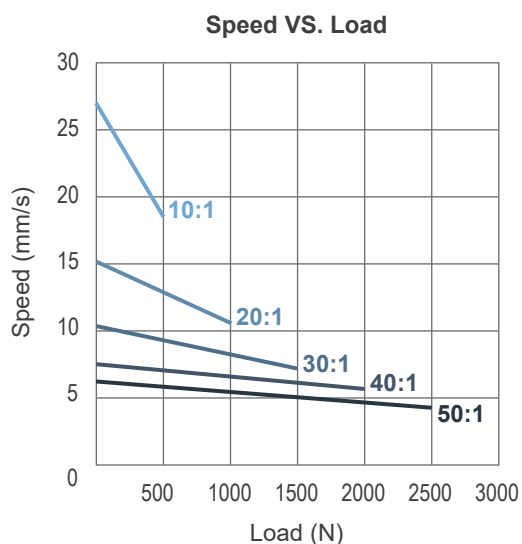
• 12V DC motor

| Model No. | Gear ratio | Push/Pull Max. (N) | Self-locking force Max. (N) | Typical speed (mm/s) * | | Typical current (A) * | |
|-------------------------|------------|--------------------|-----------------------------|------------------------|-----------|-----------------------|-----------|
| | | | | No load | Full load | No load | Full load |
| LD20-12-10-G4-XXX-XXX0X | 10:1 | 500 | 1500 | 26.8 | 18.6 | 1.3 | 4.4 |
| LD20-12-20-G4-XXX-XXX0X | 20:1 | 1000 | 4500 | 14.7 | 10.4 | 1.1 | 4.6 |
| LD20-12-30-G4-XXX-XXX0X | 30:1 | 1500 | 4500 | 9.9 | 6.8 | 1.0 | 4.3 |
| LD20-12-40-G4-XXX-XXX0X | 40:1 | 2000 | 4500 | 7.4 | 5.1 | 1.0 | 4.5 |
| LD20-12-50-G4-XXX-XXX0X | 50:1 | 2500 | 4500 | 6.2 | 4.4 | 0.9 | 4.1 |



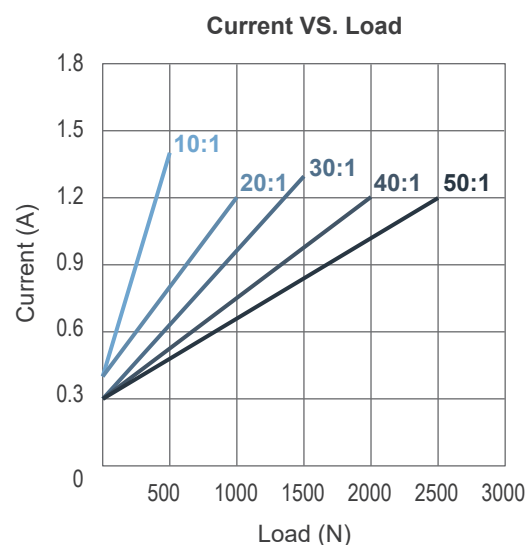
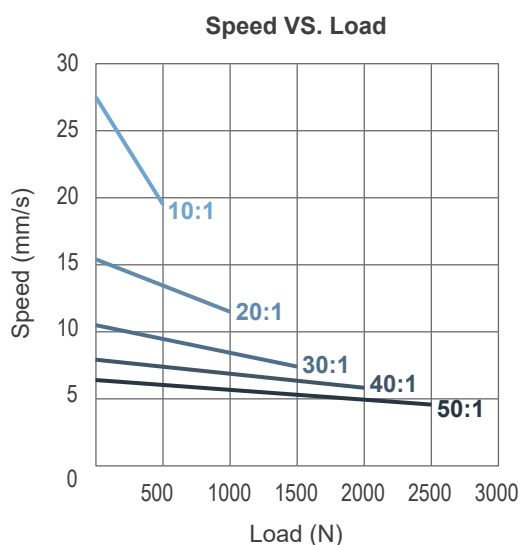
• 24V DC motor

| Model No. | Gear ratio | Push/Pull Max. (N) | Self-locking force Max. (N) | Typical speed (mm/s) * | | Typical current (A) * | |
|-------------------------|------------|--------------------|-----------------------------|------------------------|-----------|-----------------------|-----------|
| | | | | No load | Full load | No load | Full load |
| LD20-24-10-G4-XXX-XXX0X | 10:1 | 500 | 1500 | 27.0 | 18.7 | 0.6 | 2.4 |
| LD20-24-20-G4-XXX-XXX0X | 20:1 | 1000 | 4500 | 15.1 | 10.7 | 0.5 | 2.3 |
| LD20-24-30-G4-XXX-XXX0X | 30:1 | 1500 | 4500 | 10.3 | 7.2 | 0.6 | 2.3 |
| LD20-24-40-G4-XXX-XXX0X | 40:1 | 2000 | 4500 | 7.6 | 5.7 | 0.6 | 2.3 |
| LD20-24-50-G4-XXX-XXX0X | 50:1 | 2500 | 4500 | 6.1 | 4.4 | 0.5 | 2.2 |



• 48V DC motor

| Model No. | Gear ratio | Push/Pull Max. (N) | Self-locking force Max. (N) | Typical speed (mm/s) * | | Typical current (A) * | |
|-------------------------|------------|--------------------|-----------------------------|------------------------|-----------|-----------------------|-----------|
| | | | | No load | Full load | No load | Full load |
| LD20-48-10-G4-XXX-XXX0X | 10:1 | 500 | 1500 | 27.5 | 19.5 | 0.4 | 1.4 |
| LD20-48-20-G4-XXX-XXX0X | 20:1 | 1000 | 4500 | 15.4 | 11.5 | 0.4 | 1.2 |
| LD20-48-30-G4-XXX-XXX0X | 30:1 | 1500 | 4500 | 10.5 | 7.4 | 0.3 | 1.3 |
| LD20-48-40-G4-XXX-XXX0X | 40:1 | 2000 | 4500 | 7.9 | 5.8 | 0.3 | 1.2 |
| LD20-48-50-G4-XXX-XXX0X | 50:1 | 2500 | 4500 | 6.4 | 4.6 | 0.3 | 1.2 |



Remarks:

* The typical speed or typical current means the average value neither upper limit nor lower limit, which measured under room temperature and stable power. 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 LD20 can reach about 3 times of the typical current under the actuator maximum 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

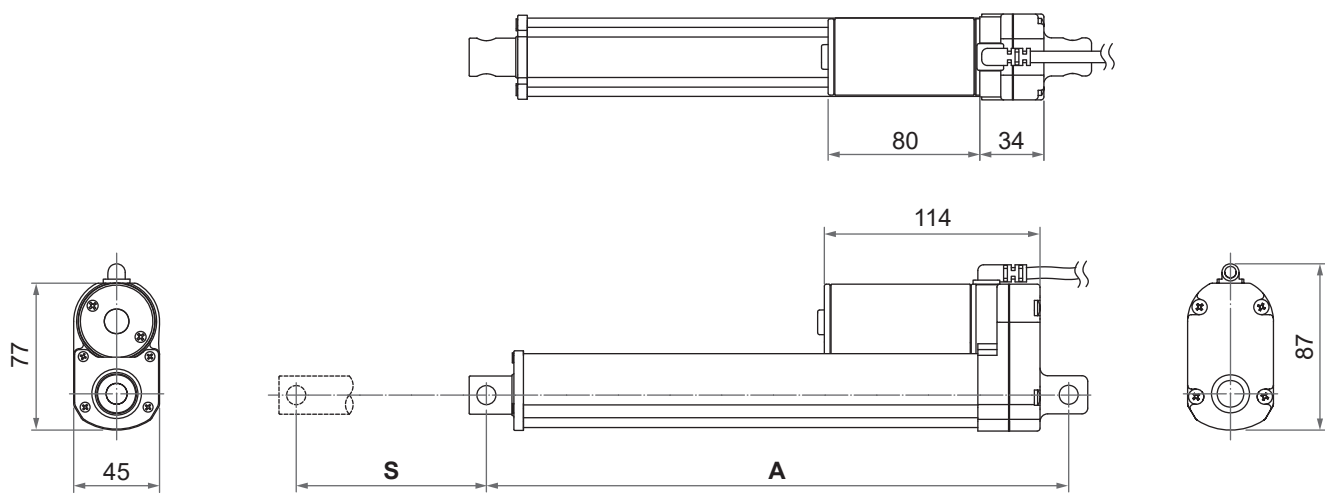
Retracted length (A)

| | Option | Front connector code | Stroke (S) | | | | |
|----------------------|---------------------------|----------------------|------------|-----|-----|-----|-----|
| | | | 100 | 150 | 200 | 250 | 300 |
| Retracted length (A) | Basic or with Hall sensor | 1, 8 | 205 | 255 | 305 | 355 | 405 |
| | With POT | 1, 8 | 242 | 292 | 342 | 392 | 442 |

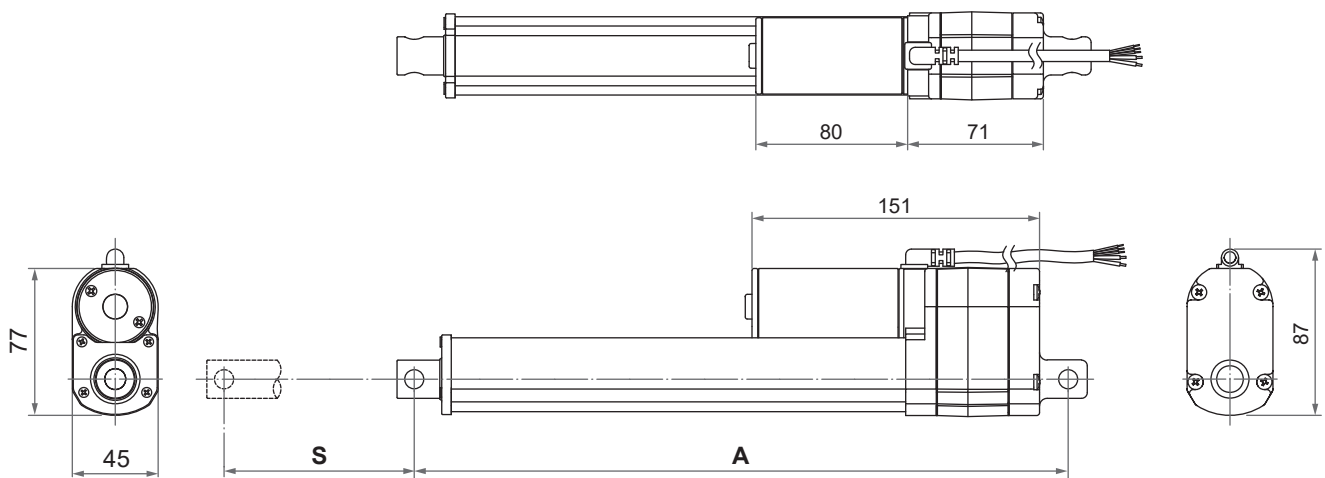
(Tolerance: ±3mm)

Drawing

- Basic / With Hall effect sensor positioning feedback



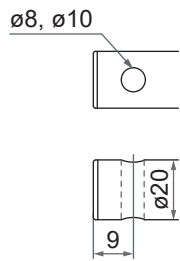
- With Potentiometer (POT) absolute positioning feedback



Unit: mm

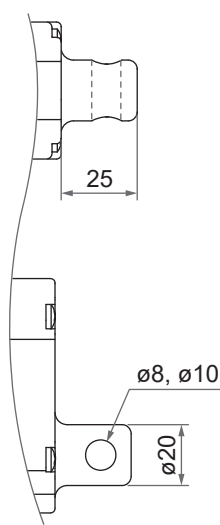
● Front connector

- 1: Drilled hole, ø10mm
- 8: Drilled hole, ø8mm



● Rear connector

- 1: Zinc alloy clevis, ø10mm
- 8: Zinc alloy clevis, ø8mm



Unit: mm

Compatibility

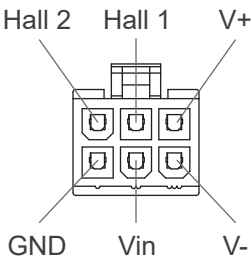
| Product | Model | LD20 spec |
|------------|--------------------------------|---|
| Controller | CI72 | <ul style="list-style-type: none">• All standard positioning feedback option• Cable with flying leads |
| | CI73 | <ul style="list-style-type: none">• With dual Hall effect sensors for positioning• Cable with flying leads |
| | CI74 | <ul style="list-style-type: none">• With dual Hall effect sensors for positioning• With minifit 6-pin plug |
| Accessory | MB22 mounting bracket (Fig. 1) | Standard, mounting hole ø8mm or ø10mm |



Fig. 1

Cable Plug

● Positioning feedback with dual Hall effect sensors



With minifit 6-pin plug



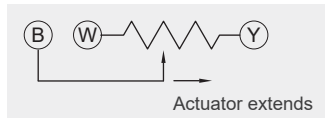
Minifit plug

Cable with Flying Leads


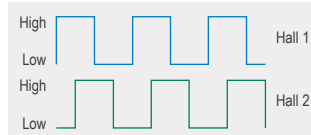
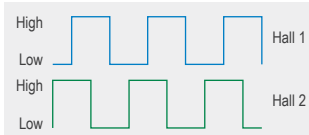
• Basic, without positioning feedback.

| | Wire color | Definition | Descriptions |
|-------------|------------|------------|--|
| Power wires | Red | DC power | Connect red wire to "Vdc +" & black wire to "Vdc -" of 12 or 24V 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 12 or 24V 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">- 10K ohm, 10 turns.- Total resistance tolerance $\pm 5\%$- Independent linearity $\pm 0.25\%$</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</th><th>Resistance (tolerance: $\pm 0.3K\Omega$)</th></tr></thead><tbody><tr><td>100mm</td><td>0.3 ~ 8.8K</td></tr><tr><td>150mm</td><td>0.3 ~ 9.6K</td></tr><tr><td>200mm</td><td>0.3 ~ 8.9K</td></tr><tr><td>250mm</td><td>0.3 ~ 9.5K</td></tr><tr><td>300mm</td><td>0.3 ~ 9.5K</td></tr></tbody></table> | Stroke | Resistance (tolerance: $\pm 0.3K\Omega$) | 100mm | 0.3 ~ 8.8K | 150mm | 0.3 ~ 9.6K | 200mm | 0.3 ~ 8.9K | 250mm | 0.3 ~ 9.5K | 300mm | 0.3 ~ 9.5K |
| | Stroke | Resistance (tolerance: $\pm 0.3K\Omega$) | | | | | | | | | | | | | |
| | 100mm | 0.3 ~ 8.8K | | | | | | | | | | | | | |
| 150mm | 0.3 ~ 9.6K | | | | | | | | | | | | | | |
| 200mm | 0.3 ~ 8.9K | | | | | | | | | | | | | | |
| 250mm | 0.3 ~ 9.5K | | | | | | | | | | | | | | |
| 300mm | 0.3 ~ 9.5K | | | | | | | | | | | | | | |
| | White | GND | | | | | | | | | | | | | |

• With 60V dual Hall effect sensors positioning feedback (Motek special B-type Hall signal phase shift)

| | Wire color | Definition | Descriptions | | | | | | | | | | | | |
|--------------|------------|------------------------|--|------------|------------------------|------|------|------|------|------|------|------|------|------|-------|
| Power wires | Red | DC power | Connect red wire to “Vdc +” & black wire to “Vdc -” of 12 or 24V DC power to extend the actuator. Switch the polarity of DC input to retract it. | | | | | | | | | | | | |
| | Black | | | | | | | | | | | | | | |
| Signal wires | Yellow | Vin | Voltage input range: 5~60V <div> If this voltage input must share the motor's power supply, be sure to use a separate power cord to draw power from the source, not tapping it from the control board's power input. Otherwise, the motor's inrush current will cause the Hall IC circuit to malfunction.</div> | | | | | | | | | | | | |
| | Blue | Hall 1 output | High= Input - 1.2V (±0.6V) Low= GND Hall signal data: Moteck B-type phase shift. i.e. when the actuator is extended, the Hall 2 wave signal is ahead of Hall 1. (Different from Moteck's standard A-type) <div><div></div><div>Actuator extendsActuator retracts</div></div> | | | | | | | | | | | | |
| | Green | Hall 2 output | Hall effect sensor resolution: <table><thead><tr><th>Gear ratio</th><th>Resolution (pulses/mm)</th></tr></thead><tbody><tr><td>10:1</td><td>2.56</td></tr><tr><td>20:1</td><td>4.75</td></tr><tr><td>30:1</td><td>7.16</td></tr><tr><td>40:1</td><td>9.66</td></tr><tr><td>50:1</td><td>11.82</td></tr></tbody></table> | Gear ratio | Resolution (pulses/mm) | 10:1 | 2.56 | 20:1 | 4.75 | 30:1 | 7.16 | 40:1 | 9.66 | 50:1 | 11.82 |
| | Gear ratio | Resolution (pulses/mm) | | | | | | | | | | | | | |
| 10:1 | 2.56 | | | | | | | | | | | | | | |
| 20:1 | 4.75 | | | | | | | | | | | | | | |
| 30:1 | 7.16 | | | | | | | | | | | | | | |
| 40:1 | 9.66 | | | | | | | | | | | | | | |
| 50:1 | 11.82 | | | | | | | | | | | | | | |
| White | GND | | | | | | | | | | | | | | |

Note: The single Hall option is no longer provided starting from Dec. 1st 2024

Ordering Key

| | | | | | | | | | | | |
|--------------------------------------|--|---------------------------------------|--|--|--|--|--|--|--|--|--|
| | | LD20 - 24 - 20 - G4 - 100 - 1 1 H 0 3 | | | | | | | | | |
| Input voltage | 12: 12V DC 24: 24V DC 48: 48V DC | | | | | | | | | | |
| Gear ratio | 10: 10:1 20: 20:1 30: 30:1 40: 40:1 50: 50:1 | | | | | | | | | | |
| Motor and Spindle type | G4: 4600rpm / Spindle pitch 4.23mm | | | | | | | | | | |
| Stroke | 100: 100mm 150: 150mm 200: 200mm 250: 250mm 300: 300mm | | | | | | | | | | |
| Front connector (Refer to Page 5) | 1: Drilled hole, ø10mm 8: Drilled hole, ø8mm | | | | | | | | | | |
| Rear connector (Refer to Page 5) | 1: Zinc alloy clevis, ø10mm 8: Zinc alloy clevis, ø8mm | | | | | | | | | | |
| Positioning feedback | 0: None P: Potentiometer (POT) H: 60V dual Hall effect sensors | | | | | | | | | | |
| Reserved | 0 | | | | | | | | | | |
| Cable length | 3: 300mm 9: 900mm | | | | | | | | | | |

Certifications

LD20 actuator is compliant with the following regulations, in terms of the essential conformity requirements of EMC Directive of 2014/30/EU.

| Emission | Immunity |
|-----------------------------|---|
| EN 61000-6-3:2007 + A1:2011 | EN 61000-6-1:2007 IEC 61000-4-2:2008 IEC 61000-4-3:2006+A1:2007+A2:2010 IEC 61000-4-8:2009 |