

Actuator

LD3

LD3 features its compact design, which is suitable for various applications that require limited installation space, such as window or gate opener, adjustable seat tilting devices.



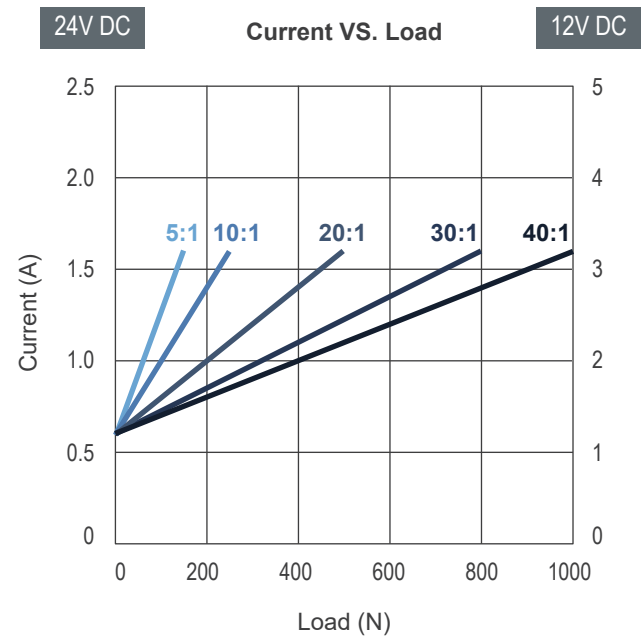
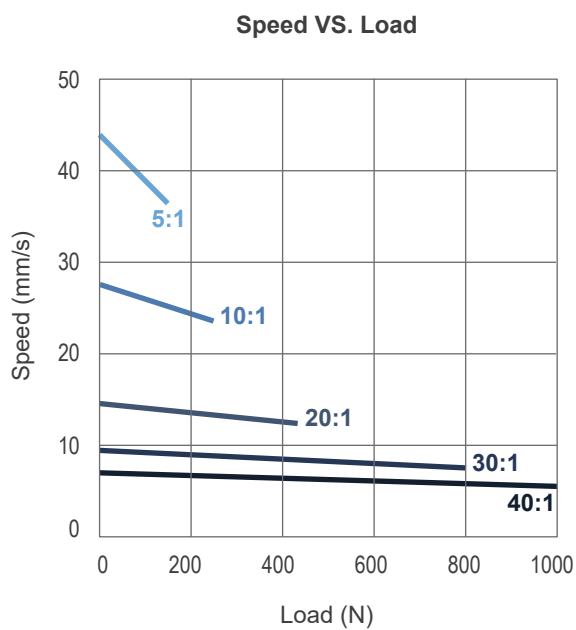
Features and Options

- Main applications: Industry, Furniture
- Input voltage: 12V DC / 24V DC
- Max. load: 1000N (Push / Pull)
- Max. static load: 2500N (Push / Pull)
- Max. speed at no load: 43.9mm/sec (Typical value)
- Speed at full load: 5.5mm/sec (Typical value @1000N loaded)
- Stroke: 50 / 100 / 150 / 200 / 250 / 300mm
- Noise level: Please refer to Performance Data
- IP level: IP54 (Standard) / IP65 (Static; no-action)
- 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, Electromagnetic Compatibility Directive 2014/30/EU (for LD3 only)
- Quiet version (LD3Q, noise level ≤ 55 dB)

Performance Data

Regular version (LD3)

| Model No. | Gear Ratio | Max.Push/Pull Load (N) | Max. Static Load (N) | * Typical Speed (mm/s) | | * Typical Current (A) | | | | Noise Level (dB) |
|-----------------|------------|------------------------|----------------------|------------------------|-----------|-----------------------|-----|-----------|-----|------------------|
| | | | | No Load | Full Load | No Load | | Full Load | | |
| | | | | | | 24V | 12V | 24V | 12V | |
| LD3-XX-05-K3... | 5:1 | 150 | 2500 | 43.9 | 36.5 | 0.6 | 1.2 | 1.6 | 3.2 | ≤70 |
| LD3-XX-10-K3... | 10:1 | 250 | 2500 | 27.6 | 23.5 | 0.6 | 1.2 | 1.6 | 3.2 | ≤70 |
| LD3-XX-20-K3... | 20:1 | 500 | 2500 | 14.6 | 12.3 | 0.6 | 1.2 | 1.6 | 3.2 | ≤70 |
| LD3-XX-30-K3... | 30:1 | 800 | 2500 | 9.5 | 7.5 | 0.6 | 1.2 | 1.6 | 3.2 | ≤70 |
| LD3-XX-40-K3... | 40:1 | 1000 | 2500 | 7.0 | 5.5 | 0.6 | 1.2 | 1.6 | 3.2 | ≤70 |

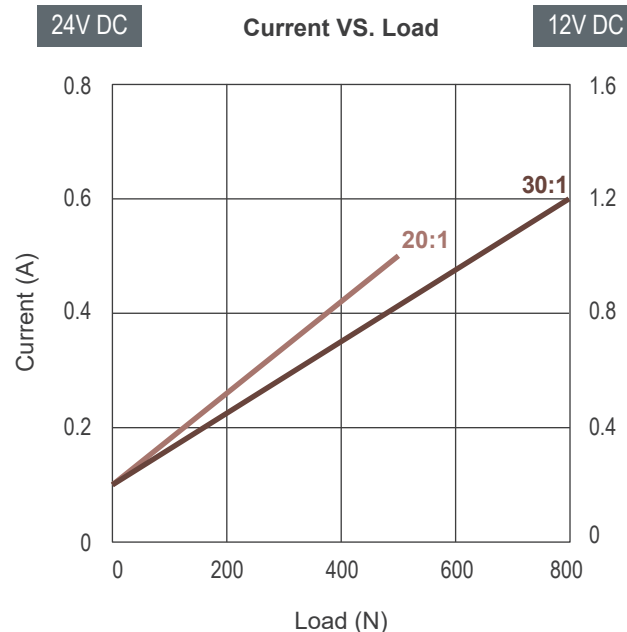
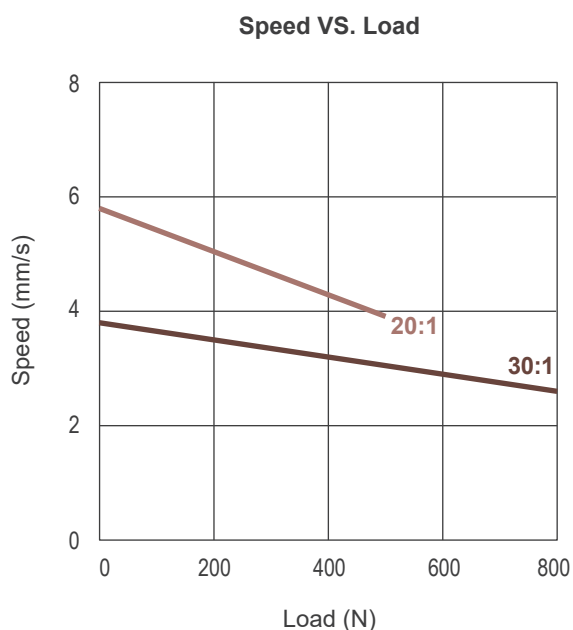


Remarks:

* 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.

Quiet version (LD3Q)

| Model No. | Gear Ratio | Max.Push/Pull Load (N) | Max. Static Load (N) | * Typical Speed (mm/s) | | * Typical Current (A) | | | | Noise Level (dB) |
|------------------|------------|------------------------|----------------------|------------------------|-----------|-----------------------|-----|-----------|-----|------------------|
| | | | | No Load | Full Load | No Load | | Full Load | | |
| | | | | | | 24V | 12V | 24V | 12V | |
| LD3Q-XX-20-D3... | 20:1 | 500 | 2500 | 5.8 | 3.9 | 0.1 | 0.2 | 0.5 | 1.0 | ≤55 |
| LD3Q-XX-30-D3... | 30:1 | 800 | 2500 | 3.8 | 2.6 | 0.1 | 0.2 | 0.6 | 1.2 | ≤55 |



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 LD3 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

Retracted length (A)

| | Option | Front connector code | Stroke (S) | | | | | |
|----------------------|---------------------------|----------------------|------------|-------|-------|-------|-------|-------|
| | | | 50 | 100 | 150 | 200 | 250 | 300 |
| Retracted length (A) | Basic or with Hall sensor | 1 | 158 | 209 | 260 | 311 | 362 | 413 |
| | | 3 | 199 | 250 | 301 | 352 | 403 | 454 |
| | | 6 | 168.5 | 219.5 | 270.5 | 321.5 | 372.5 | 423.5 |
| | With POT | 1 | 195 | 246 | 297 | 348 | 399 | 450 |
| | | 3 | 236 | 287 | 338 | 389 | 440 | 491 |
| | | 6 | 205.5 | 256.5 | 307.5 | 358.5 | 409.5 | 460.5 |

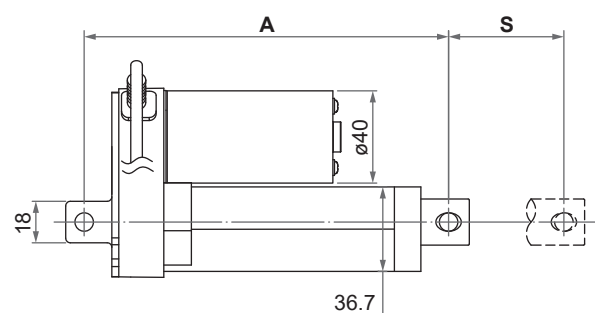
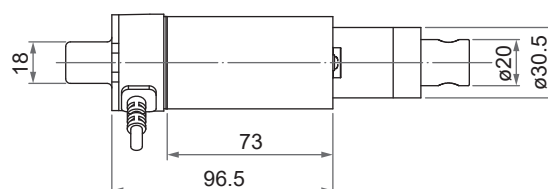
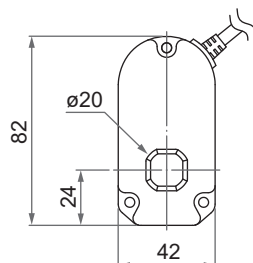
(tolerance: $\pm 3\text{mm}$)

Note: The dimension “A” is shown in page 5 & 6, as indicated in the figure below.

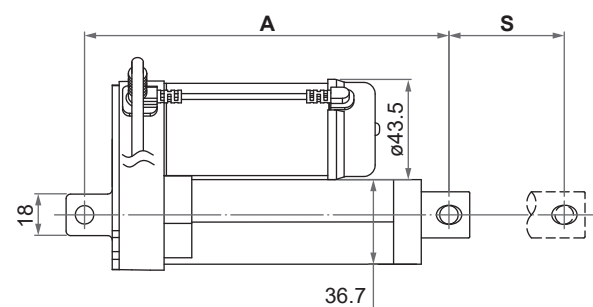
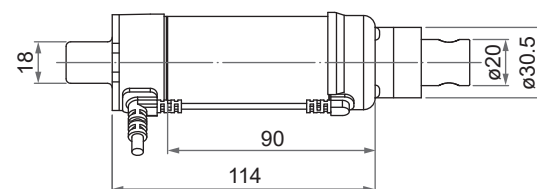
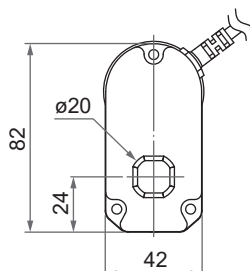
Drawing

• Regular version (LD3) & Quiet version (LD3Q)

- Basic, without positioning feedback.



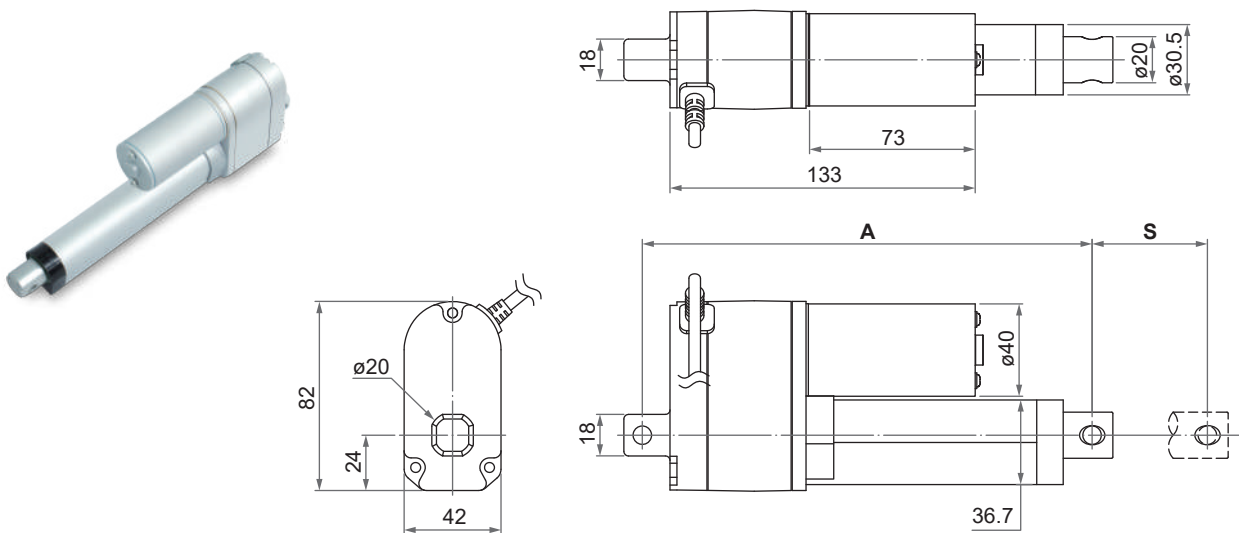
- With Hall effect sensor positioning feedback



Note: As an example in 0° orientation for rear connector.

Unit: mm

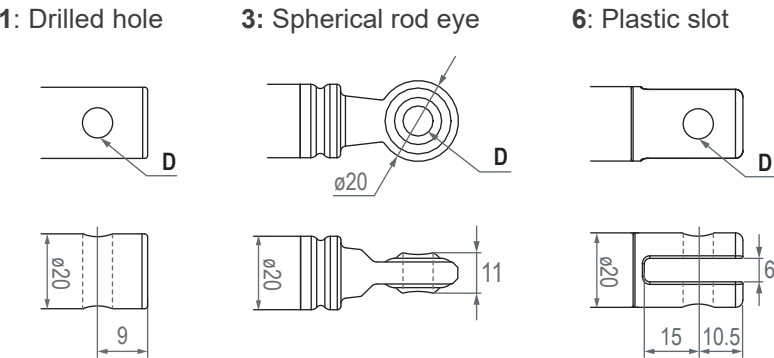
- With Potentiometer (POT) absolute positioning feedback



Note: As an example in 0° orientation for rear connector.

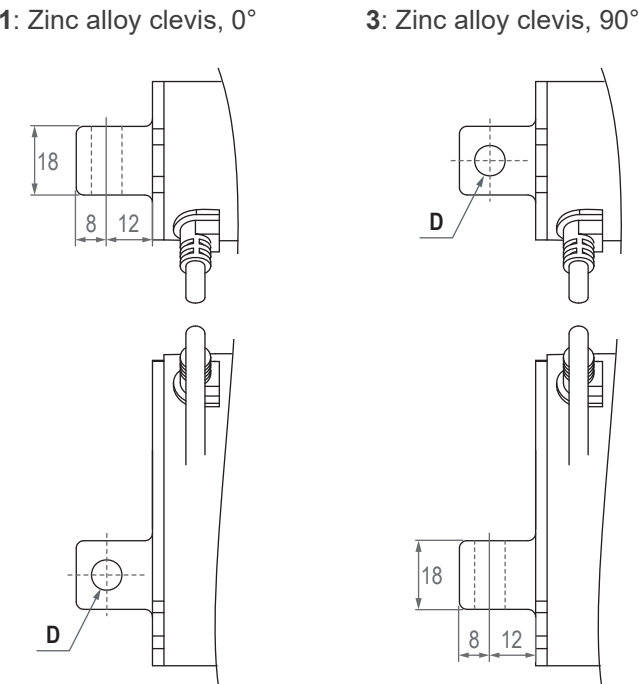
Unit: mm

● Front connector



| Front connector code | Diameter of pivot without bushing (D) |
|----------------------|---------------------------------------|
| 1 | ø6.4, ø8, ø10 |
| 3 | ø8 |
| 6 | ø8, ø10 |

● Rear connector



| Rear connector code | Diameter of pivot without bushing (D) |
|---------------------|---------------------------------------|
| 1, 3 | ø6.4, ø8, ø10 |

Unit: mm

Compatibility

| Product | Model | LD3 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 $\varnothing 6.4\text{mm}$, $\varnothing 8\text{mm}$ or $\varnothing 10\text{mm}$ |
| | C15 clamp (Fig. 2) | Comply with the section shape and size of the outer tube |



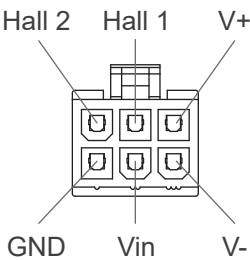
Fig. 1



Fig. 2

Cable Plug

- Positioning feedback with Hall effect sensor



With minifit 6-pin plug

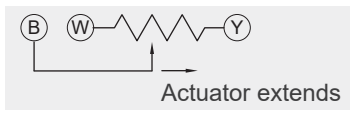


Wiring with Flying Leads


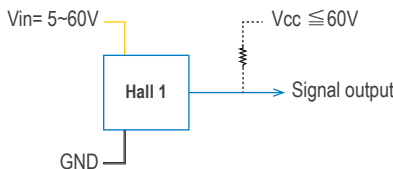
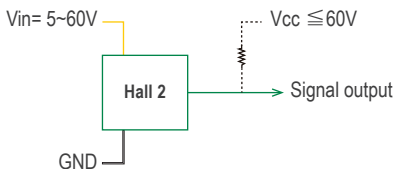
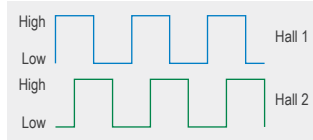
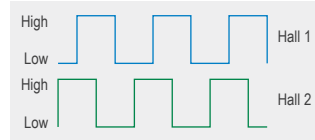
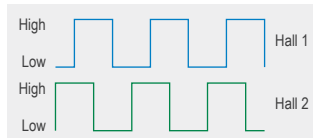
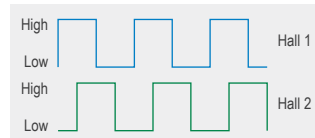
• Basic, without positioning feedback.

| | 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><p>1. Potentiometer specification:</p><ul style="list-style-type: none">- 10K ohm, 10 turns.- Total resistance tolerance $\pm 5\%$- Independent linearity $\pm 0.25\%$<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><div></div><p>3. There are different resolutions according to the stroke length (as table below)</p><table><thead><tr><th>Stroke</th><th>Resistance (tolerance: $\pm 0.3K\Omega$)</th></tr></thead><tbody><tr><td>50mm</td><td>0.3 ~ 9.3K</td></tr><tr><td>100mm</td><td>0.3 ~ 9.7K</td></tr><tr><td>150mm</td><td>0.3 ~ 8.6K</td></tr><tr><td>200mm</td><td>0.3 ~ 9.6K</td></tr><tr><td>250mm</td><td>0.3 ~ 9.3K</td></tr><tr><td>300mm</td><td>0.3 ~ 9.3K</td></tr></tbody></table></div> | Stroke | Resistance (tolerance: $\pm 0.3K\Omega$) | 50mm | 0.3 ~ 9.3K | 100mm | 0.3 ~ 9.7K | 150mm | 0.3 ~ 8.6K | 200mm | 0.3 ~ 9.6K | 250mm | 0.3 ~ 9.3K | 300mm | 0.3 ~ 9.3K |
| | Stroke | Resistance (tolerance: $\pm 0.3K\Omega$) | | | | | | | | | | | | | | | |
| 50mm | 0.3 ~ 9.3K | | | | | | | | | | | | | | | | |
| 100mm | 0.3 ~ 9.7K | | | | | | | | | | | | | | | | |
| 150mm | 0.3 ~ 8.6K | | | | | | | | | | | | | | | | |
| 200mm | 0.3 ~ 9.6K | | | | | | | | | | | | | | | | |
| 250mm | 0.3 ~ 9.3K | | | | | | | | | | | | | | | | |
| 300mm | 0.3 ~ 9.3K | | | | | | | | | | | | | | | | |
| | White | GND | | | | | | | | | | | | | | | |

• With 60V dual Hall effect sensors 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 | 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 | <p>The default Hall signal is NPN type without pull-up resistor. The signal output wires should connect a pull-up resistor to the operating voltage (Vcc) of the system. (10KΩ resistor is recommended, or the result of the voltage of Vcc divided by the resistance of the pull-up resistor is lower than 20mA)</p> <p>Wiring:</p> <div><div></div><div></div></div> <p>High= Determined by Vcc and the pull-up resistor. Low= GND</p> <p>Hall signal data:</p> <p>- A type</p> <div><div></div><div></div></div> <p>- B type</p> <div><div></div><div></div></div> | | | | | | | | | | | | | | | | | | |
| | Green | Hall 2 output | | | | | | | | | | | | | | | | | | | |
| | | White | GND | | | | | | | | | | | | | | | | | | |
| | | | Hall effect sensor resolution: <table><tr><th>Gear type</th><th>Resolution (pulses/mm)</th><th>Hall signal data type</th></tr><tr><td>5</td><td>2.27</td><td>B type</td></tr><tr><td>10</td><td>3.62</td><td>A type</td></tr><tr><td>20</td><td>6.86</td><td>A type</td></tr><tr><td>30</td><td>10.57</td><td>A type</td></tr><tr><td>40</td><td>14.27</td><td>B type</td></tr></table> | Gear type | Resolution (pulses/mm) | Hall signal data type | 5 | 2.27 | B type | 10 | 3.62 | A type | 20 | 6.86 | A type | 30 | 10.57 | A type | 40 | 14.27 | B type |
| Gear type | Resolution (pulses/mm) | Hall signal data type | | | | | | | | | | | | | | | | | | | |
| 5 | 2.27 | B type | | | | | | | | | | | | | | | | | | | |
| 10 | 3.62 | A type | | | | | | | | | | | | | | | | | | | |
| 20 | 6.86 | A type | | | | | | | | | | | | | | | | | | | |
| 30 | 10.57 | A type | | | | | | | | | | | | | | | | | | | |
| 40 | 14.27 | B type | | | | | | | | | | | | | | | | | | | |

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

Ordering Key

Regular version

| | | | | | | | | | | | | |
|--------------------------------------|---|---------------------------------------|--|--|--|--|--|--|--|--|--|--|
| | | LD3- 24 - 05 - K3 - 150 - 1 1 H 4 0 3 | | | | | | | | | | |
| Input voltage | 12: 12V DC 24: 24V DC | | | | | | | | | | | |
| Gear type | 05: 5:1 10: 10:1 20: 20:1 30: 30:1 40: 40:1 | | | | | | | | | | | |
| Motor and Spindle type | K3: 6000rpm / 3mm pitch | | | | | | | | | | | |
| Stroke | 050: 50mm 100: 100mm 150: 150mm 200: 200mm 250: 250mm 300: 300mm | | | | | | | | | | | |
| Front connector (Refer to Page 5) | 1: Drilled hole 3: Spherical rod eye 6: Plastic slot | | | | | | | | | | | |
| Rear connector (Refer to Page 5) | 1: Zinc alloy clevis, 0° 3: Zinc alloy clevis, 90° | | | | | | | | | | | |
| Positioning feedback | 0: None P: Potentiometer (POT) H: 60V dual Hall effect sensors | | | | | | | | | | | |
| IP level | 4: IP54 (standard) 5: IP65 | | | | | | | | | | | |
| Reserved | 0 | | | | | | | | | | | |
| Cable length | 3: 900mm straight 5: 1500mm straight 6: 2000mm straight | | | | | | | | | | | |

Quiet version

| | | | | | | | | | | | | |
|--------------------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| | | LD3Q- 24 - 20 - D3 - 150 - 1 1 P 4 0 3 | | | | | | | | | | |
| Input voltage | 12: 12V DC 24: 24V DC | | | | | | | | | | | |
| Gear type | 20: 20:1 30: 30:1 | | | | | | | | | | | |
| Motor and Spindle type | D3: 2400rpm / 3mm pitch | | | | | | | | | | | |
| Stroke | 050: 50mm 100: 100mm 150: 150mm 200: 200mm 250: 250mm 300: 300mm | | | | | | | | | | | |
| Front connector (Refer to Page 5) | 1: Drilled hole 3: Spherical rod eye 6: Plastic slot | | | | | | | | | | | |
| Rear connector (Refer to Page 5) | 1: Zinc alloy clevis, 0° 3: Zinc alloy clevis, 90° | | | | | | | | | | | |
| Positioning feedback | 0: None P: Potentiometer (POT) H: 60V dual Hall effect sensors | | | | | | | | | | | |
| IP level | 4: IP54 (standard) 5: IP65 | | | | | | | | | | | |
| Reserved | 0 | | | | | | | | | | | |
| Cable length | 3: 900mm straight 5: 1500mm straight 6: 2000mm straight | | | | | | | | | | | |

Certifications

Regular version

LD3 actuator is compliant with the following regulations, in terms of the essential conformity requirements of EMC Directive of 2014/30/EU.

| Emission | Immunity |
|-------------------------|-----------------|
| EN55014-1:2017+A11:2020 | EN 55014-2:2015 |