

# Actuator

## LD3

LD3 features its compact design, which is suitable for various applications that require limited installation space, such as window opener, adjustable car driver set and medical equipment.



### Feature

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- Main applications: Industrial, home care, furniture, medical
- Input voltage: 12V DC / 24V DC
- Max. load: 1000N (Push / Pull)
- Max. static load: 2500N (Push / Pull)
- Typical speed at no load: 43.9 mm/sec
- Typical speed at full load: 5.5 mm/sec (1000N load)
- Stroke: 50 / 100 / 150 / 200 / 250 / 300 mm
- Noise level: Please refer to Performance Data
- IP Protection level: IP54
- Color: Aluminum grey
- Preset limit switches
- Duty cycle: 25%, max. 1 min. continuous operation in 4 min.
- Ambient operation temperature: -25°C ~ +65°C
- Certified: CE Marking, Electromagnetic Compatibility Directive 2014/30/EU (for LD3 only),  
Medical Device Directive 93/42/EEC (for LD3M only)

## Option

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- Medical version (LD3M, approved according to EN60601)
- Quiet version (LD3Q, noise level  $\leq 55$ dB)
- Positioning signal feedback with Hall effect sensor x 1
- Positioning signal feedback with Hall effect sensor x 2
- Analog positioning feedback with Potentiometer (POT)
- IP Protection level: IP65
- Clamp: Clamp connection is available if rear connector is not preferred (*Fig. 1*)
- Mounting bracket (MB22) (*Fig. 2*)



Fig. 1

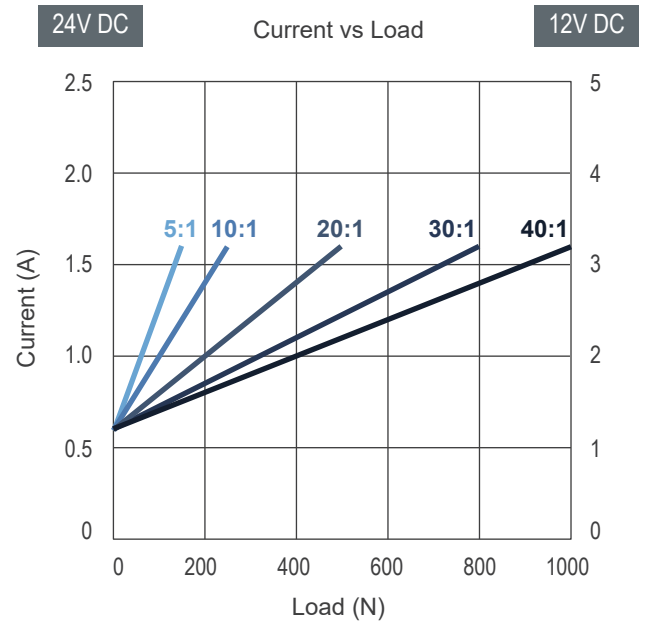
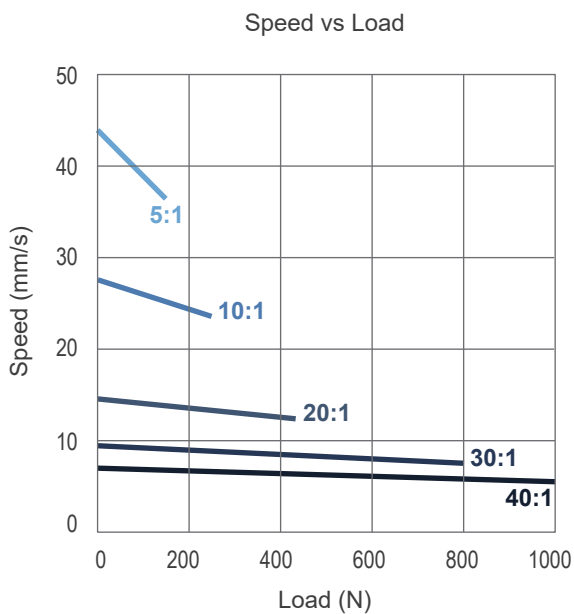


Fig. 2

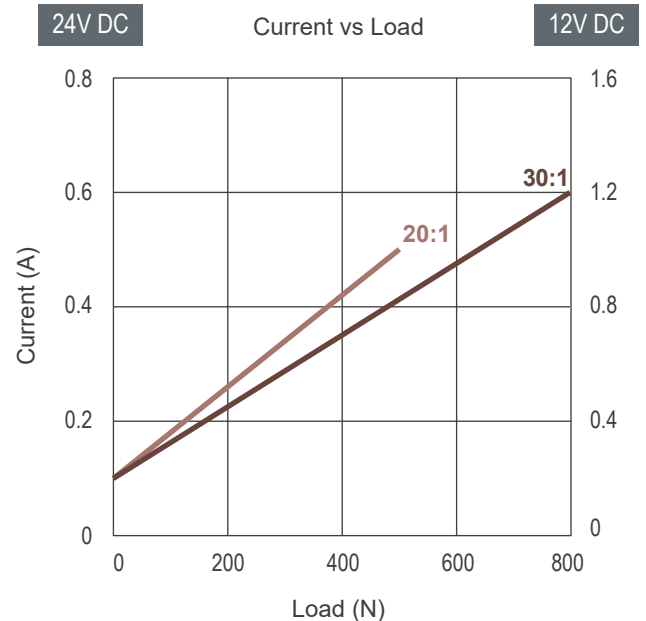
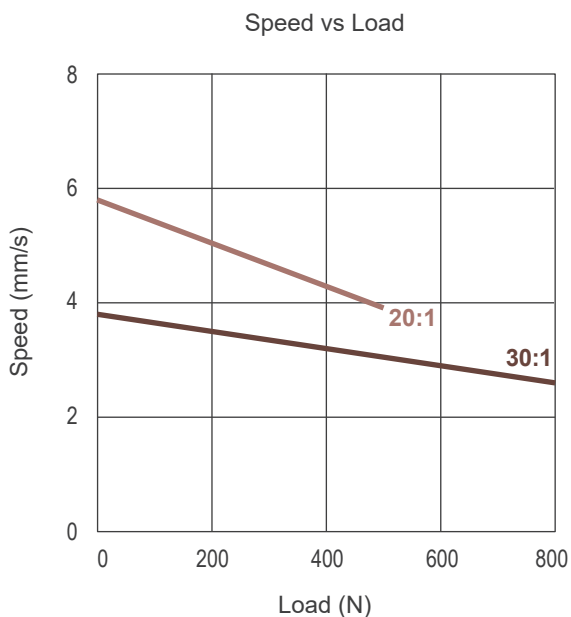
## Performance Data

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

### LD3 & LD3M



### LD3Q



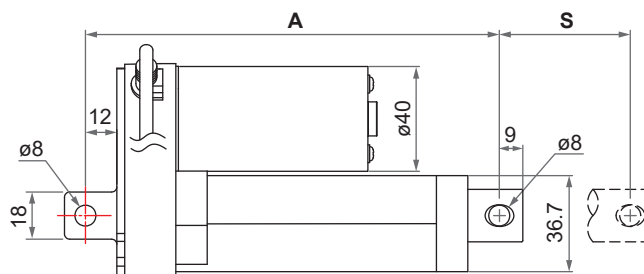
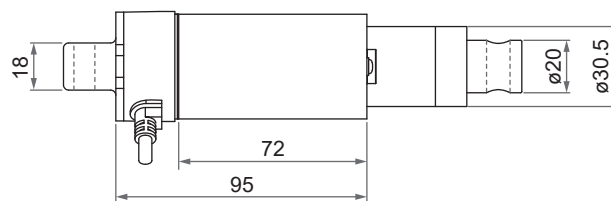
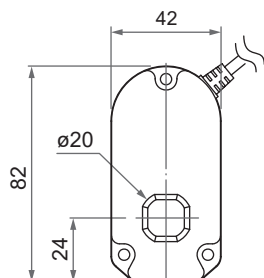
### Remarks:

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

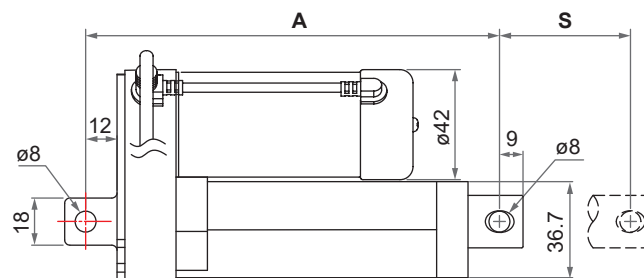
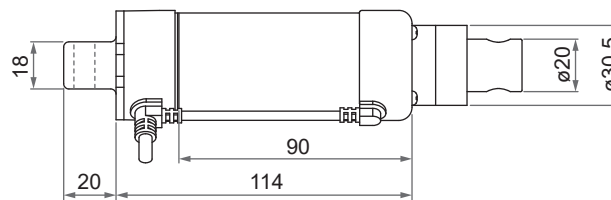
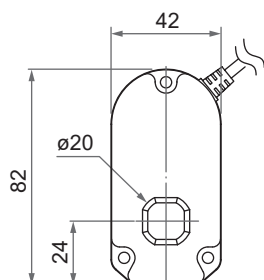
## Dimensions

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

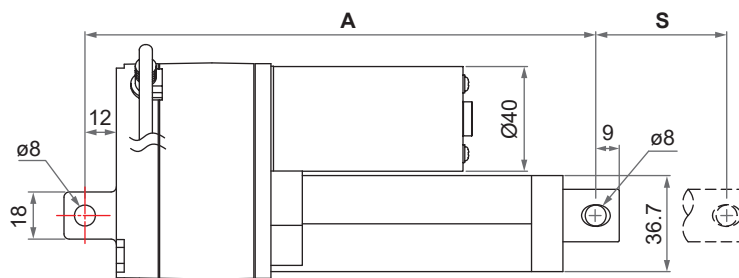
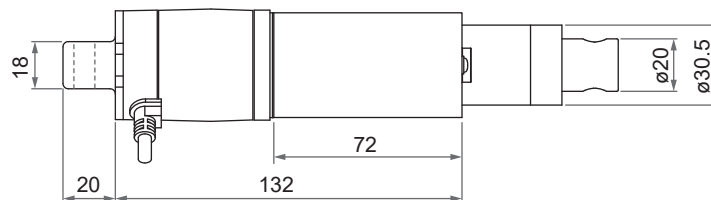
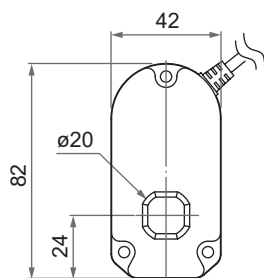
#### • Basic



#### • With Hall effect sensor



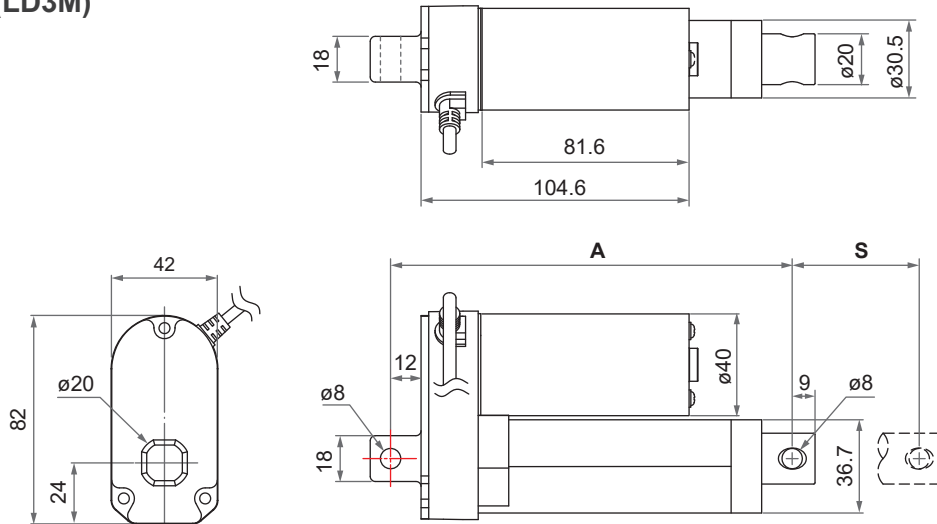
#### • With Potentiometer



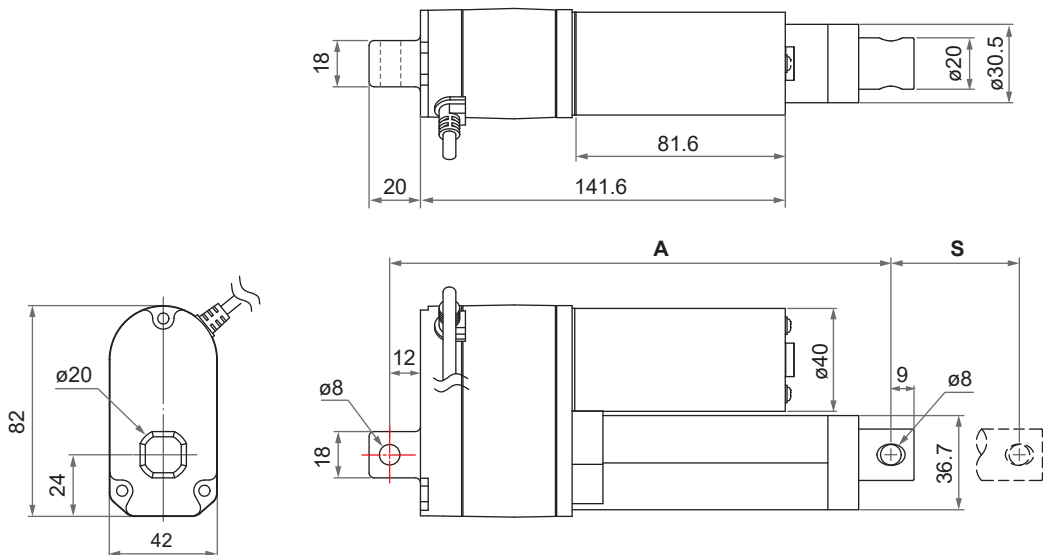
**Note:** As an example in 0° orientation for rear connector.

## Medical version (LD3M)

### • Basic



### • With Potentiometer



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

### • Installation Dimension

#### Retracted length (A)

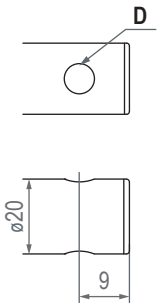
Option	Front connector code	Stroke (S)					
		50	100	150	200	250	300
Standard or Hall sensor	1	158	209	260	311	362	413
	3	199	250	301	352	403	454
	6	168.5	219.5	270.5	321.5	372.5	423.5
POT	1	195	246	297	348	399	450
	3	236	287	338	389	440	491
	6	205.5	256.5	307.5	358.5	409.5	460.5

(tolerance: ±3mm)

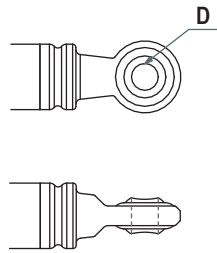
**Note:** The dimension "A" is shown in page 4 & 5, as indicated in the figure above.

● **Front Connector**

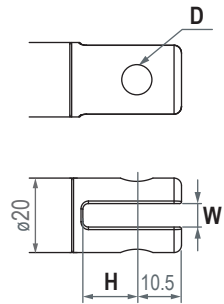
1: Drilled hole



3: Spherical rod eye

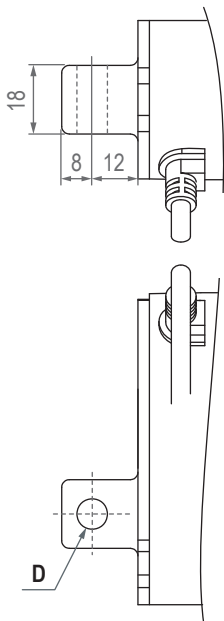


6: Plastic slot

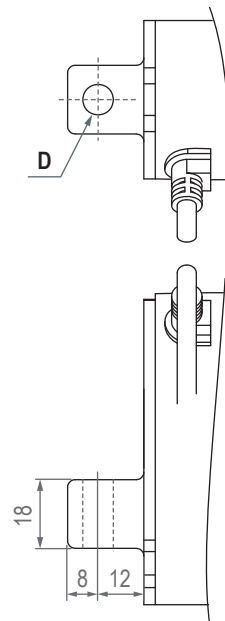


● **Rear connector**

1: Zinc alloy clevis, 0°

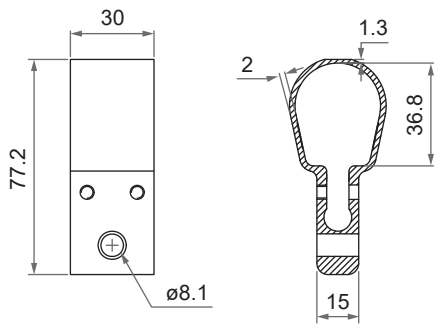


3: Zinc alloy clevis, 90°

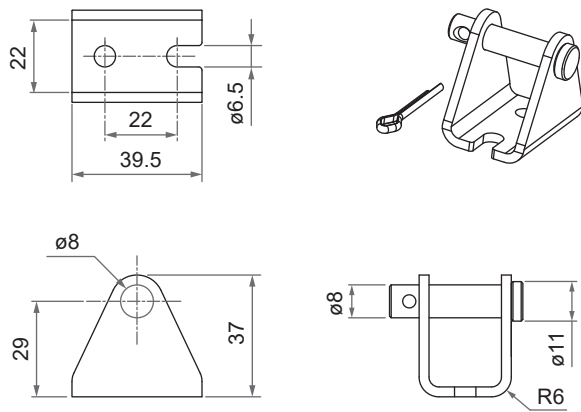


Front connector code	Diameter of pivot without bushing (D)	Slot width (W)	Slot depth (H)
1	ø6.4, ø8, ø10	N/A	N/A
3	ø8	N/A	N/A
6	ø8, ø10	6	15
Rear connector code			
1	ø6.4, ø8, ø10	N/A	N/A
3	ø6.4, ø8, ø10	N/A	N/A

• Clamp



• Mounting bracket (MB22)



## Compatibility

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

Product	Model	LD3 & LD3Q spec
Control box	T Control, CS1, CS2, CBT2, CB3T, CB4M	- Without positioning sensor feedback - 4-Pin Moteck F-type DIN plug
	CB2P, CB4P, CB4P-HP, MD6C, MD7C	- Without positioning sensor feedback - 4-Pin Moteck H-type or V-type DIN plug
	CB3T-SY, CB3T-SYD, CB4M-S, CB4M-B	- With dual Hall effect sensors - 6-Pin Moteck F-type DIN plug

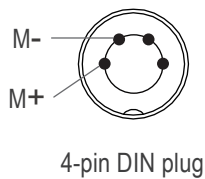
### Medical version (LD3M)

Product	Model	LD3M spec
Control box	CB2P, CB4P, CB4P-HP, MD6C, MD7C	- Without positioning sensor feedback - 4-Pin Moteck H-type or V-type DIN plug

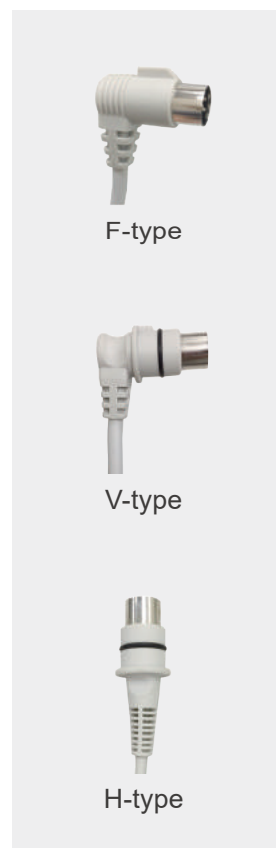
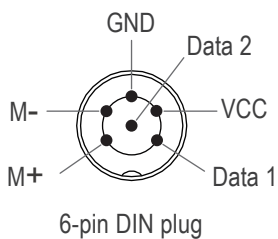
## Cable Plug

With Moteck F-type, V-type or H-type DIN plug (required to be connected to the control box):

- Without positioning sensor feedback



- With dual Hall effect sensors



**Note:** Connect Pin (M+) to “+” & Pin (M-) to “-“ of DC power, the actuator will extend.



# Wiring

## Wire definitions:

### • Without positioning sensor feedback

Power	
Red	Black
M+	M-

**Note:**

1. Connect Red (M+) to '+' & Black (M-) to '-' of DC power, the actuator will extend.



### • With Hall effect sensor x 1

Power		Signal		
Red	Black	White	Yellow	Blue
M+	M-	GND	VCC	DATA

**Note:**

1. Connect Red (M+) to '+' & Black (M-) to '-' of DC power, the actuator will extend.
2. Hall effect sensor resolution

Gear ratio	Resolution (pulses/mm)
5:1	2.27
10:1	3.62
20:1	6.86
30:1	11.0
40:1	14.5

3. Voltage input range (VCC): 3.5~20V
4. Output voltage of signal (Data) = Input voltage of VCC
5. Hall signal data



### • With Hall effect sensor x 2

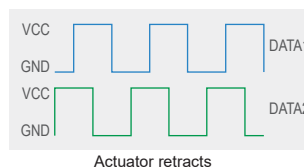
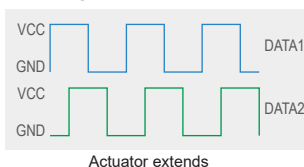
Power		Signal			
Red	Black	White	Yellow	Blue	Green
M+	M-	GND	VCC	DATA1	DATA2

**Note:**

1. Connect Red (M+) to '+' & Black (M-) to '-' of DC power, the actuator will extend.
2. Hall effect sensor resolution

Gear ratio	Resolution (pulses/mm)
5:1	2.27
10:1	3.62
20:1	6.86
30:1	11.0
40:1	14.5

3. Voltage input range (VCC): 3.5~20V
4. Output voltage of signal (Data) = Input voltage of VCC
5. Hall signal data



● With Potentiometer (POT)

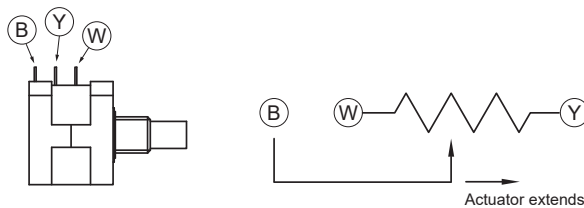
Power		Signal		
Red	Black	White	Yellow	Blue
M+	M-	GND	VCC	Data

**Note:**

1. Connect Red (M+) to '+' & Black (M-) to '-' of DC power, the actuator will extend.
2. The resistance between blue and white wires increases when the actuator extends, and decreases when it retracts.
3. Potentiometer resistance

Stroke (mm)	Resistance (tolerance: $\pm 0.3K\Omega$ )
50	0.3 ~ 9.3K
100	0.3 ~ 9.7K
150	0.3 ~ 8.6K
200	0.3 ~ 9.6K
250	0.3 ~ 9.3K
300	0.3 ~ 9.3K

4. Voltage input range (VCC): 70V/0.007A(10K)
5. Output voltage of signal (Data) = Input voltage of VCC
6. Potentiometer data



## Ordering Key

Regular version

**LD3 - 24 - 10 - K3 - 100 - C 1 1 - HS2 - 54 - M2 - C**

<b>Input voltage</b>	<b>12:</b> 12V DC <b>24:</b> 24V DC
<b>Gear ratio</b>	<b>05, 10, 20, 30, 40</b> (Refer to Performance Data)
<b>Motor and Spindle type</b>	<b>K3</b> (Refer to Performance Data)
<b>Stroke</b>	<b>050:</b> 50 mm <b>100:</b> 100 mm <b>150:</b> 150 mm <b>200:</b> 200 mm <b>250:</b> 250 mm <b>300:</b> 300 mm
<b>Front connector</b>	<b>1:</b> Drilled hole <b>3:</b> Spherical rod eye <b>6:</b> Plastic slot (Refer to page 6)
<b>Rear connector</b>	<b>1:</b> Zinc alloy clevis, 0° <b>3:</b> Zinc alloy clevis, 90° (Refer to page 6)
<b>Positioning feedback</b>	<b>Blank:</b> None <b>HS1:</b> Hall effect sensor x 1 <b>HS2:</b> Hall effect sensor x 2 <b>POT:</b> Potentiometer
<b>IP Protection level</b>	<b>54:</b> IP54 (standard) <b>65:</b> IP65
<b>Mounting bracket (MB22)</b>	<b>Blank:</b> None <b>M1:</b> Mounting bracket x 1 <b>M2:</b> Mounting bracket x 2
<b>Clamp</b>	<b>Blank:</b> None <b>C:</b> Clamp

Quiet version

**LD3Q - 24 - 10 - D3 - 100 - C 1 1 - HS2 - 54 - M2 - C**

<b>Input voltage</b>	<b>12:</b> 12V DC <b>24:</b> 24V DC
<b>Gear ratio</b>	<b>20, 30</b> (Refer to Performance Data)
<b>Motor and Spindle type</b>	<b>D3</b> (Refer to Performance Data)
<b>Stroke</b>	<b>050:</b> 50 mm <b>100:</b> 100 mm <b>150:</b> 150 mm <b>200:</b> 200 mm <b>250:</b> 250 mm <b>300:</b> 300 mm
<b>Front connector</b>	<b>1:</b> Drilled hole <b>3:</b> Spherical rod eye <b>6:</b> Plastic slot (Refer to page 6)
<b>Rear connector</b>	<b>1:</b> Zinc alloy clevis, 0° <b>3:</b> Zinc alloy clevis, 90° (Refer to page 6)
<b>Positioning feedback</b>	<b>Blank:</b> None <b>HS1:</b> Hall effect sensor x 1 <b>HS2:</b> Hall effect sensor x 2
<b>IP Protection level</b>	<b>54:</b> IP54 (standard) <b>65:</b> IP65
<b>Mounting bracket (MB22)</b>	<b>Blank:</b> None <b>M1:</b> Mounting bracket x 1 <b>M2:</b> Mounting bracket x 2
<b>Clamp</b>	<b>Blank:</b> None <b>C:</b> Clamp

Medical version

LD3M - 24 - 10 - K3 - 100 - C 1 1 - POT - 65 - M2 - C

<b>Input voltage</b>	12: 12V DC 24: 24V DC
<b>Gear ratio</b>	05, 10, 20, 30, 40 (Refer to Performance Data)
<b>Motor and Spindle type</b>	K3 (Refer to Performance Data)
<b>Stroke</b>	050: 50 mm 100: 100 mm 150: 150 mm 200: 200 mm 250: 250 mm 300: 300 mm
<b>Front connector</b>	1: Drilled hole 3: Spherical rod eye 6: Plastic slot (Refer to page 6)
<b>Rear connector</b>	1: Zinc alloy clevis, 0° 3: Zinc alloy clevis, 90° (Refer to page 6)
<b>Positioning feedback</b>	Blank: None POT: Potentiometer
<b>IP Protection level</b>	54: IP54 (standard) 65: IP65
<b>Mounting bracket (MB22)</b>	Blank: None M1: Mounting bracket x 1 M2: Mounting bracket x 2
<b>Clamp</b>	Blank: None C: Clamp

## Certifications

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### Regular version

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

Emission	Immunity
EN 55014-1:2006+A1:2009+A2:2011	EN 55014-2:1997+A1:2001+A2+:2008 Catagory I

### Medical version

The LD3M actuator is compliant with the following regulations, in terms of the essential conformity requirements of MDD Directive of 93/42/EEC.

Emission	Immunity
EN 60601-1-2:2015 CISPR 11:2009+A1:2010 GROUP I CLASS B	EN 60601-1:2006+A1:2013

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