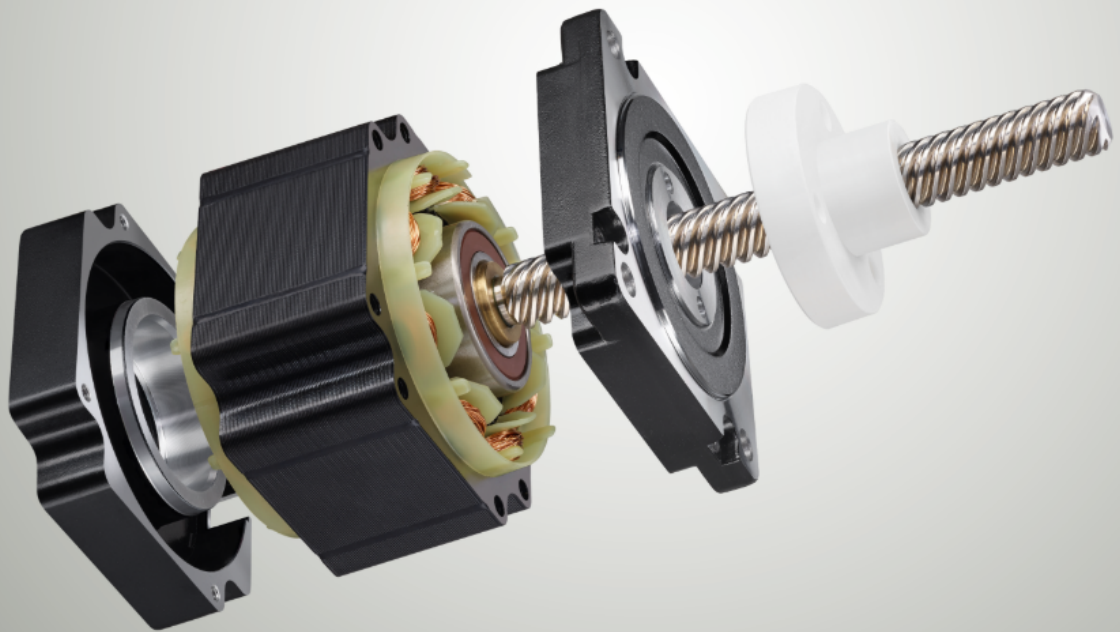




*Intelligence in motion*



Force. Accuracy. Lifetime.

# Linear Actuators and Gripper





# Linear Actuators and Gripper

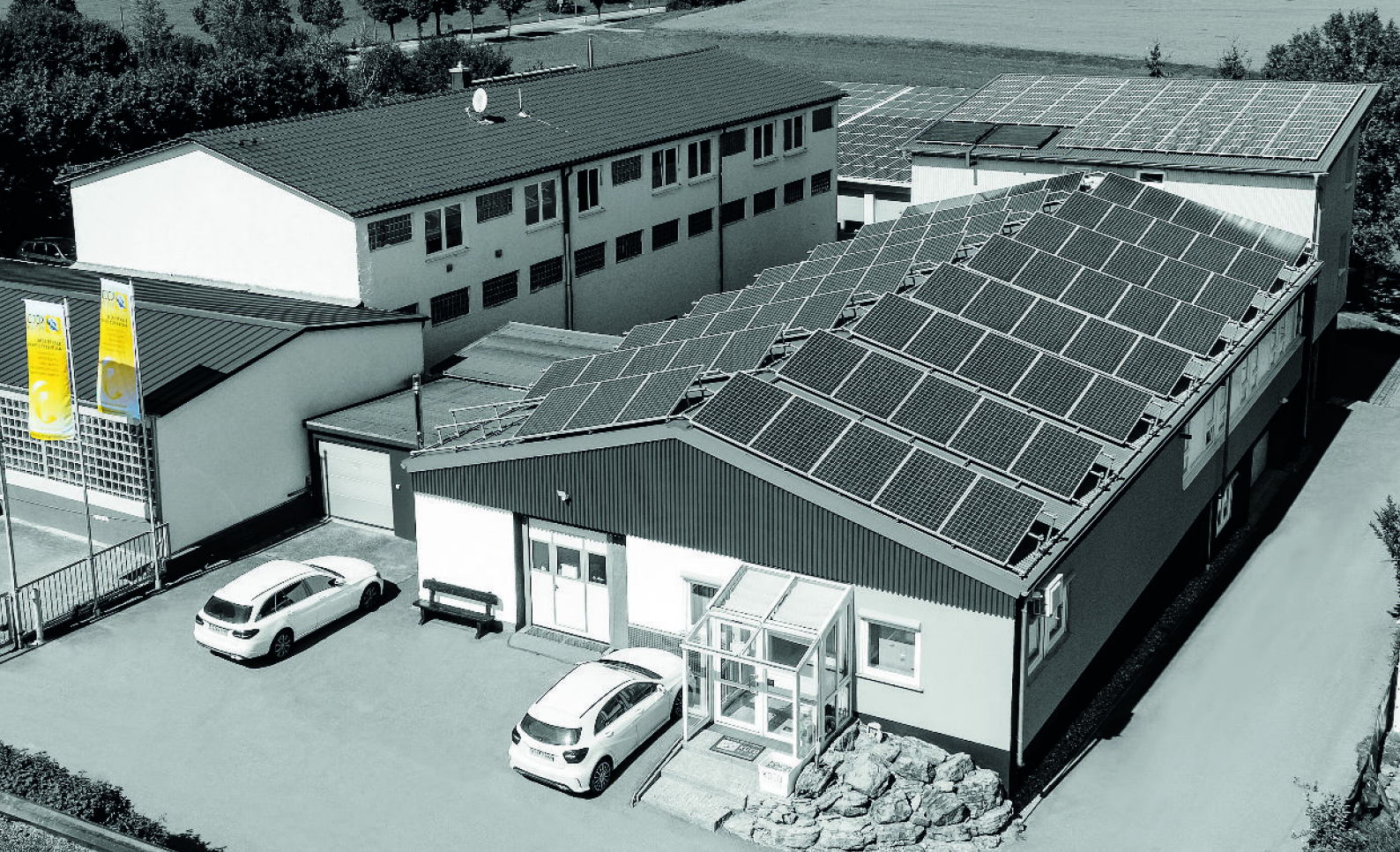
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## HIGH CUSTOMER SATISFACTION IS OUR MOTIVATION

From tailor-made drive solutions in small series to complex projects with large quantities - our KOCO MOTION team is ready to provide our customers with advice and support.

We collaborate with our customers to coordinate requirements and specifications and ensure compliance with those through close inspections. On-time delivery and tested quality are always our claim and are also proven by certifications according to DIN EN ISO 9001 and DIN EN ISO 14001.

## PERSONAL. ENVIRONMENTALLY FRIENDLY. AND WITH DRIVE.

Our employees are our greatest asset. Their motivation is not only based on good relationships with each other and with KOCO MOTION, but also lies in the opportunity to fully contribute their skills and achieve our company goals in an individual way.

We see ourselves as part of the environment and therefore treat the scarce natural resources we are given carefully. We actively look for ways to keep and improve our actions and behavior in an environmentally friendly manner.

# We are KOCO MOTION

*...Intelligence in motion*

We are only satisfied when the optimal solution has been found for our customers.

As a system house, we always offer our customers the best drive solution and can rely on a global network of motor and control technologies. We implement our customers' projects in a highly professional and extremely flexible manner in partnership with our customers. Our aim is always to achieve the highest quality within the agreed budget.

We draw on years of experience in the development and production of electric motors and respond individually to the wishes and ideas of our customers in project consulting. For us, the focus is on the personal relationship with customers, employees and suppliers. We understand our customers' needs exactly, achieve a high level of customer satisfaction and are THE partner for our customers when it comes to drives.

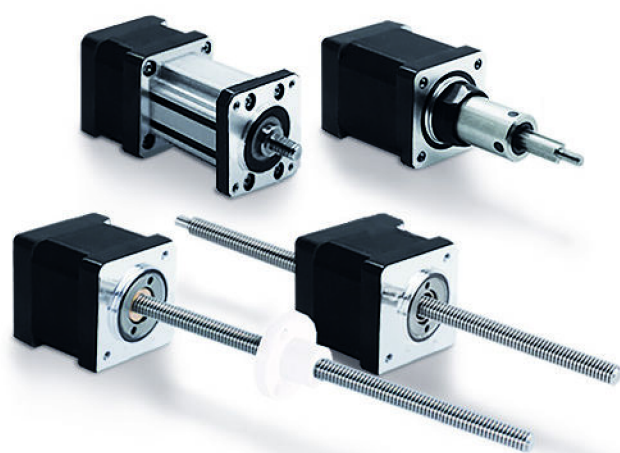


# Applications

Linear actuators are used, among other things, for lifting, lowering, positioning and for opening and closing valves. Essentially anywhere linear motion is needed - in machines, devices and automation.

The trend is for small linear axes to replace pneumatic cylinders.

- Analyzer
- Packaging machines
- Format adjuster
- Bottling plants
- Robots
- Dosing systems
- Laser systems
- Medical technology



## ADVANTAGES

- Great strength, high resilience
- Long lifetime
- High positioning accuracy
- Simple control
- Low noise
- Compact, efficient and reliable
- Flexibly adaptable for a variety of areas of application e.g. with nut-spindle combinations:
  - Cost-effective solutions with injection molded nuts for trapezoidal spindles
  - Versions with ball screw possible

# Basics

|                            |                       |
|----------------------------|-----------------------|
| F = Force                  | [N]                   |
| m = Mass                   | [kg]                  |
| a = Acceleration           | [m/s <sup>2</sup> ]   |
| M = Torque                 | [Nm]                  |
| J = Mass moment of inertia | [kg/m <sup>2</sup> ]  |
| α = Angular acceleration   | [rad/s <sup>2</sup> ] |
| W = Work - Energy          | [Nm]                  |
| ∂ = Adjustment angle       | [rad]                 |
| d = Travel path            | [m]                   |
| P = Mechanical power       | [N]                   |
| v = Speed                  | [m/s]                 |
| ω = Angular velocity       | [rad/s]               |

|                       |                      |
|-----------------------|----------------------|
| r = Radius            | [m]                  |
| t = Time              | [s]                  |
| ρ = Specific density  | [kg/m <sup>3</sup> ] |
| h = Height            | [m]                  |
| s = Distance traveled | [m]                  |
| p = Spindle pitch     | [m]                  |
| Z = Number of teeth   | [-]                  |
| i = Reduction ratio   | [-]                  |
| η = Efficiency        | [%]                  |

### Efficiency

Leadscrew = 30-70 % · Ballscrew = 90-95 %

### Force

$$F = m \cdot a \quad [N]$$

### Work - Energy

$$W = F \cdot d \quad [Nm]$$

$$W = M \cdot \partial \quad [Nm]$$

### Mechanical power

$$P_m = F \cdot v \quad [W]$$

$$P_m = M \cdot \omega \quad [W]$$

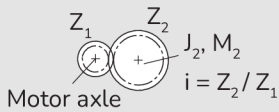
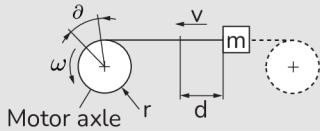
### Torque

$$M = J \cdot \alpha \quad [Nm]$$

### Mass moment of inertia

Moment of inertia of a ring

$$J = m \cdot r^2 \quad [\text{kg/m}^2]$$



Moment of inertia of a cylinder

$$J = \frac{1}{2} m \cdot r^2 = \frac{\pi}{2} \cdot r^4 \cdot h \cdot \rho \quad [\text{kg/m}^2]$$

$$J = m \cdot r^2 \quad [\text{kg/m}^2]$$

$$\vartheta = \frac{d}{r} \quad [\text{rad}]$$

$$\omega = \frac{v}{r} \quad [\text{rad/s}]$$

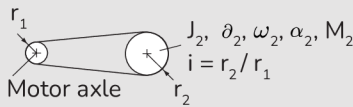
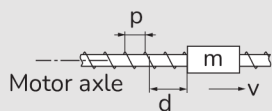
$$\alpha = \frac{a}{r} \quad [\text{rad/s}^2]$$

Moment of inertia of a hollow cylinder

$$J = \frac{1}{2} m(r^2 + r^2) = \frac{\pi}{2} (r^4 - r^4) \cdot h \cdot \rho \quad [\text{kg/m}^2]$$

$$M = F \cdot \frac{r}{\eta} \quad [\text{Nm}]$$

$$r_{\text{opt.}} = \sqrt{\frac{J_m}{m}} \quad [\text{m}]$$



$$J = m \left( \frac{p}{2\pi} \right)^2 \quad [\text{kg/m}^2]$$

$$\vartheta = 2\pi \cdot \frac{d}{p} \quad [\text{rad}]$$

$$\omega = 2\pi \cdot \frac{v}{p} \quad [\text{rad/s}]$$

$$\alpha = 2\pi \cdot \frac{a}{p} \quad [\text{rad/s}^2]$$

$$M = F \cdot \frac{p}{2\pi} \cdot \eta \quad [\text{Nm}]$$

$$p_{\text{opt.}} = 2\pi \sqrt{\frac{J_m}{m}} \quad [\text{m}]$$

$$J_1 = \frac{J_2}{i^2} \quad [\text{kg/m}^2]$$

$$\vartheta_1 = \vartheta_2 \cdot i \quad [\text{rad}]$$

$$\omega_1 = \omega_2 \cdot i \quad [\text{rad/s}]$$

$$\alpha_1 = \alpha_2 \cdot i \quad [\text{rad/s}^2]$$

$$M_1 = \frac{M_2}{i \cdot \eta} \quad [\text{Nm}]$$

$$i_{\text{opt.}} = \sqrt{\frac{J_2}{J_m}} \quad [\text{m}]$$

### Linear motion with constant acceleration $\alpha$ for initial speed $v_0$

The above mentioned relations change, when the accelerated body has already a finite (constant) speed  $v_0$ . The acceleration starts at time  $t_s = 0$  and lasts until time  $t_e$ . The time difference  $\Delta t = t_e - t_s = t_e$  is relevant for the resulting speed and travelled distance during the acceleration phase.

New speed after time  $\Delta t$

$$v(t_e) = \alpha \cdot t_e + v_0 = \alpha \cdot \Delta t + v_0$$

Travelled distance while accelerating

$$s(t_e) = (v(t) \cdot + v_0) \cdot \Delta t = (\alpha \cdot \Delta t + v_0) \Delta t = \alpha \cdot (\Delta t)^2 + v_0 \Delta t$$

Acceleration  $\alpha$  needed to reach a certain speed  $v(t_e)$  in time  $\Delta t$

$$\alpha = \frac{v(t_e) - v_0}{\Delta t}$$

Time needed to reach a certain speed  $v(t_e)$  applying a given acceleration  $\alpha$

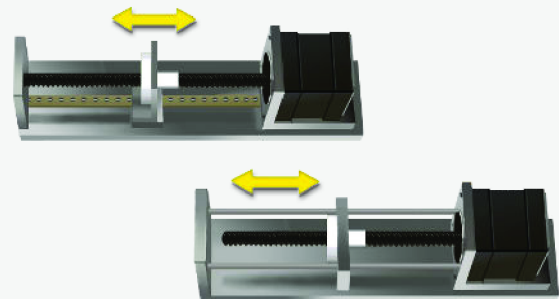
$$\Delta t = \frac{v(t_e) - v_0}{\alpha}$$

# Motor Design

EXTERNAL. NON-CAPTIVE. CAPTIVE. KAPTIVE.

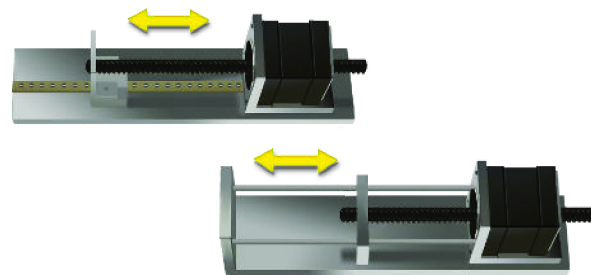
## External and lineare guide rail

The spindle is firmly connected to the rotor of the motor and rotates with the rotor. The rotational movement of the spindle moves the nut linearly back and forth. The twisting of the nut must be prevented by an external guide. The length of the required installation space is defined by the motor length and spindle length. The travel path of the nut is the spindle length minus the nut length.



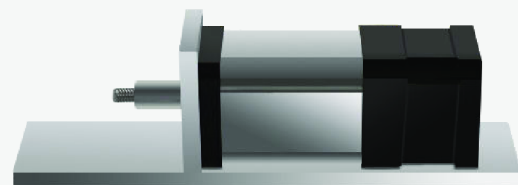
## Non-captive

The motor rotor and the spindle are not firmly connected. The rotating rotor moves the spindle linearly back and forth. A guide for the nut prevents the nut and spindle from twisting.



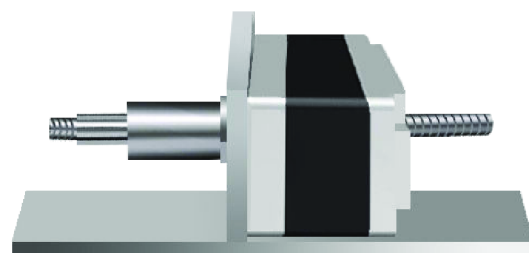
## Captive (electrical cylinder)

The spindle is firmly connected to the rotor of the motor and rotates with the rotor. The rotational movement of the spindle moves the nut running in the cylinder linearly back and forth. The internal nut is secured against twisting by the cylinder and thus generates the linear movement. The spindle end can be mechanically fixed. The required installation space of the electric cylinder is fixed.



## Kaptive

The motor rotor and the spindle are not firmly connected. The rotating rotor moves the spindle linearly back and forth. The integrated linear guide prevents the spindle from twisting.



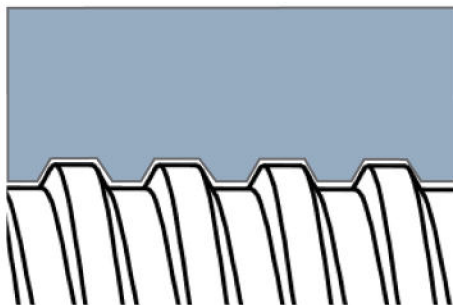
# Differences

## LEADSCREW

The simple threaded design where the nut moves along the screw threads convert the rotational movement of a stepper motor to linear motion. These linear actuators are available with strokes within 1000mm and can reach a max thrust of over 240kg.

Variety of customizations are available upon request, such as screw length, custom designed nuts, anti-backlash nut, safety brake, encoder and other customer special requirements.

Typical applications include X-Y tables, medical equipment, semiconductor handling, telecommunications equipment, valve control, and numerous other uses.



Sliding Friction

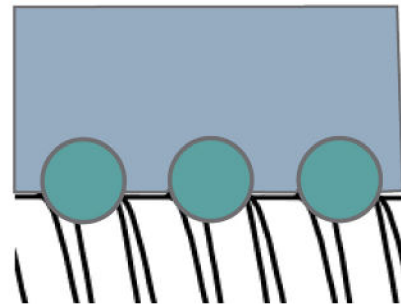
- Simple threaded design, easier to manufacture, lower manufacturing costs
- Sliding friction leads to higher overall screw friction compared to ballscrews. Thus, leadscrews show a lower efficiency which depends on materials, lubrication, coatings, lead pitch (typically around 30 - 70 %)
- Generally lower load capacity compared to ballscrews
- Typically, more backlash due to the clearance between the screw threads and the nut

## BALLSCREW

With the need for high performance, high precision and endurance in a small package, the ballscrews fit best for converting the rotational movement of a stepper motor to a linear motion. These linear actuators are ideal for applications that require a combination of accurate positioning, rapid motion and longer life cycle compared to leadscrew driven linear actuators.

The different available grades from C7 rolled balls to high precision C5/C3 grinded balls allow transmission efficiency up to 90-96 %, which is much better compared to conventional trapezoidal screw plastic nuts. This leads to lower driving powers for the stepper motor with the same amount of load to be moved.

The rolling friction of the balls decreases the former heat rise and so in general the ballscrew can do higher speed transmission tasks. In addition, the surface damage of rolling friction is lower than sliding friction which then leads to higher lifetime compared to trapezoidal screw.



Rolling Contact

- Uses balls that roll between the screw and the nut
- The balls are circulated in a closed loop which can handle higher loads, reduce friction, achieve higher precision and increase efficiency (typically 90 % or higher)
- Generates less heat and requires less power for the same load compared to leadscrews
- Generally more expensive due to the complexity of the design and manufacturing process
- Commonly used in high-precision applications such as CNC machines, 3D printers, and robotics

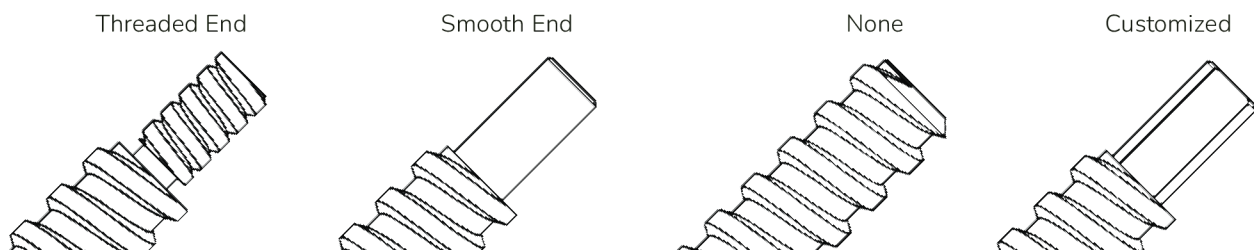
# Details

## LEAD SCREW SURFACE TREATMENT

Standard lead screws are coated with a thin layer of grease. When applications require greaseless screw and nut combination, we offer teflon coated lead screws. Teflon coated lead screws enable longer life cycle, lower friction and better thrust force generation against conventional lead screws made of stainless steel (SUS). Teflon coating can be applied for all lead screw options and all types of linear actuators such as External, Non-Captive, Electrical Cylinder and Kaptive. In addition, anti-backlash nuts also can be combined with teflon coated lead screws.

## END MACHINING

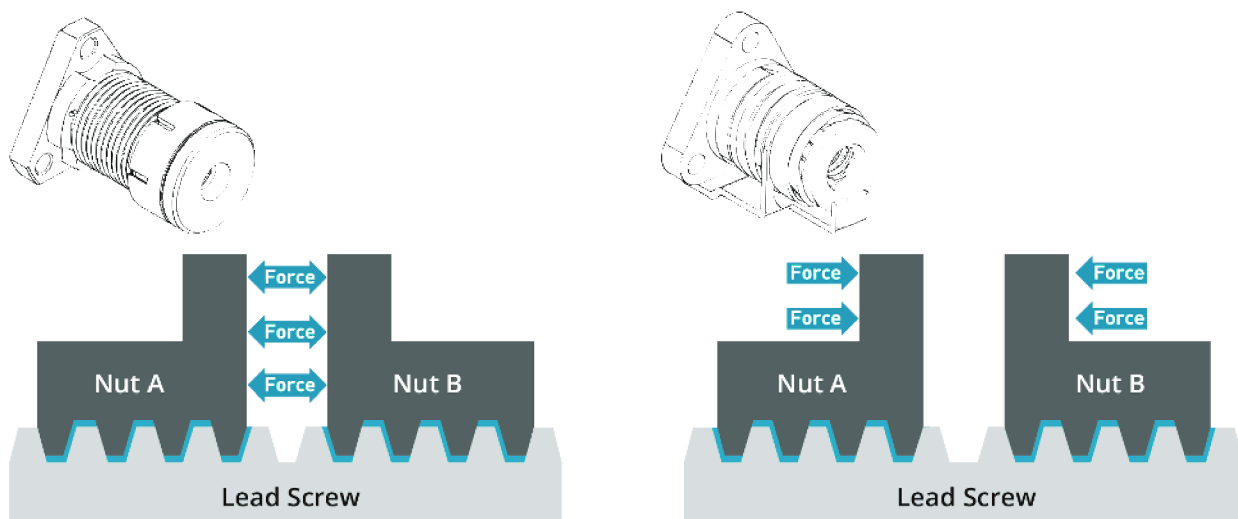
Screw end machining depends on the screw diameter.



## ANTI-BACKLASH-NUT

Backlash refers to the relative axial movement between a screw and a nut. It can be problematic in positioning tasks when movement stops, or the movement direction is changed. It is quite normal for backlash to increase over time due to wear. To counteract this play, an anti-backlash nut can be used, which allows for compensation or correction of the backlash. Generally, backlash is particularly relevant in applications that require bi-directional positioning.

Depending on the main load direction, the preload of the anti-backlash nut can be changed to free the relevant direction of movement from axial play and thus optimize the positioning accuracy of the application.

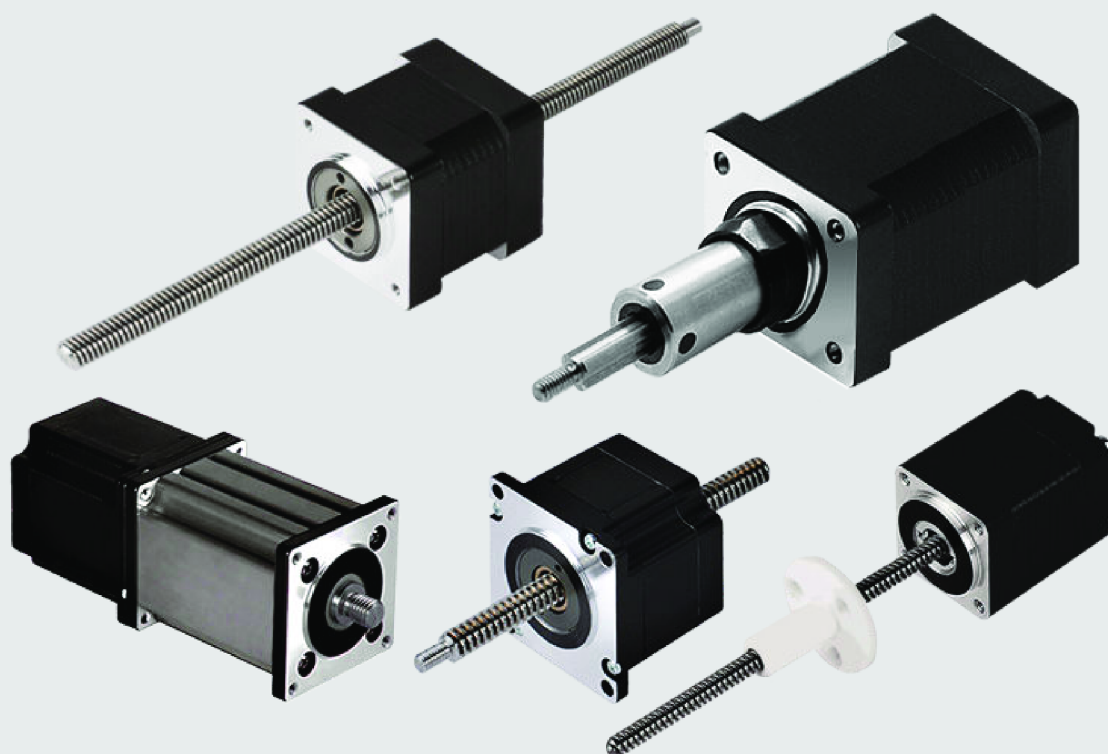




# Leadscrew

## OVERVIEW.

| Size (Nema) | Flange size (mm) | Stack | Motor length (mm) | Max. thrust at 60 rpm (kg) | Max. thrust at 60 rpm (N) | Lead pitch for max. thrust (mm) |
|-------------|------------------|-------|-------------------|----------------------------|---------------------------|---------------------------------|
| 6           | 14 x 14          | 1     | 32,0              | 1,9                        | 19                        | 0,3                             |
| 8           | 20 x 20          | 1     | 27,2              | 5,5                        | 54                        |                                 |
|             |                  | 2     | 38,1              | 8,3                        | 81                        |                                 |
| 11          | 28 x 28          | 1     | 33,35             | 16,0                       | 157                       | 0,3175                          |
|             |                  | 2     | 45,0              | 43,0                       | 422                       |                                 |
| 14          | 35 x 35          | 1     | 33,6              | 37,0                       | 363                       | 0,6096                          |
|             |                  | 2     | 45,6              | 69,0                       | 677                       |                                 |
| 17          | 42 x 42          | 1     | 34,1              | 58,0                       | 569                       |                                 |
|             |                  | 2     | 48,1              | 95,0                       | 932                       |                                 |
| 23          | 57 x 57          | 1     | 45,0              | 135,0                      | 1324                      | 0,635                           |
|             |                  | 2     | 65,0              | 255,0                      | 2502                      |                                 |
| 24          | 60 x 60          | 1     | 47,0              | 130,0                      | 1275                      |                                 |
|             |                  | 2     | 68,3              | 240,0                      | 2354                      |                                 |
| 34          | 86 x 86          | 1     | 76,0              | 220,0                      | 2158                      | 2,54                            |



## 14mm Stepper Lead Screw Linear Actuator

# SLSLA - Size 6 [14mm]

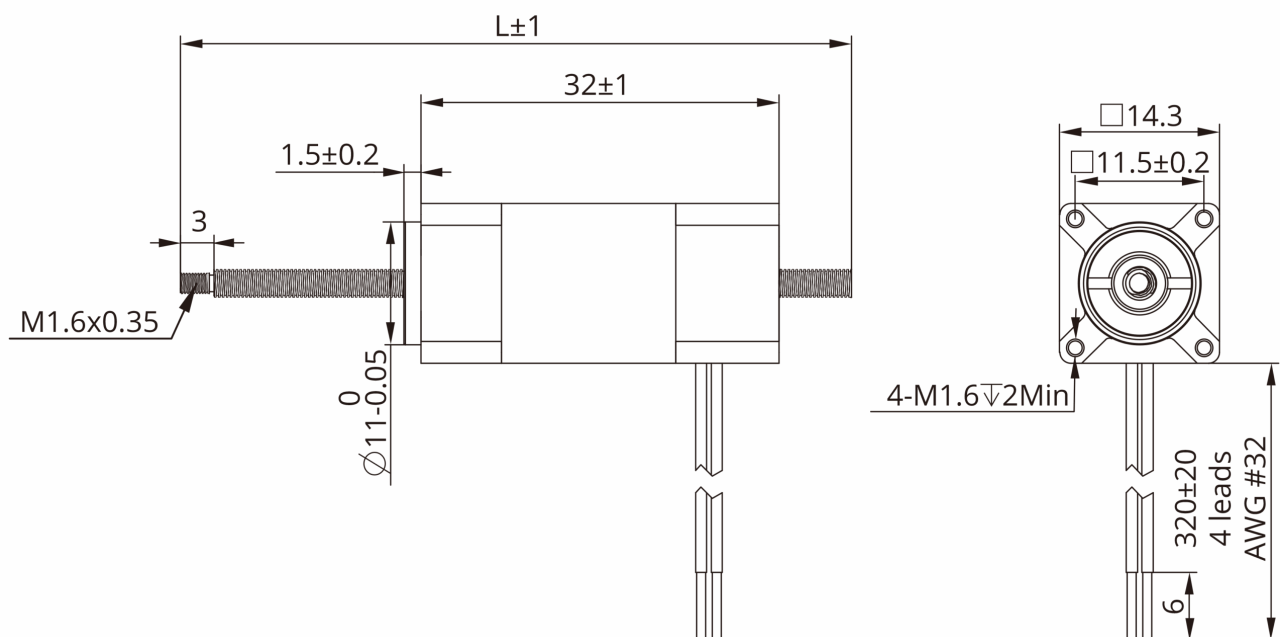
The SLSLA Size 6 [14mm] Stepper Lead Screw Linear Actuator delivers up to 19N thrust with a compact 14mm square footprint. Featuring multiple screw pitches (0.3-8mm) and thread diameters, it supports external, non-captive, and captive configurations. Key options include encoder feedback, customized machining, and Teflon coating for enhanced durability. Ideal for precision linear motion in space-constrained automation and instrumentation systems.


<https://www.kocomotion.de/produkt/slsla-size-6-14mm/>

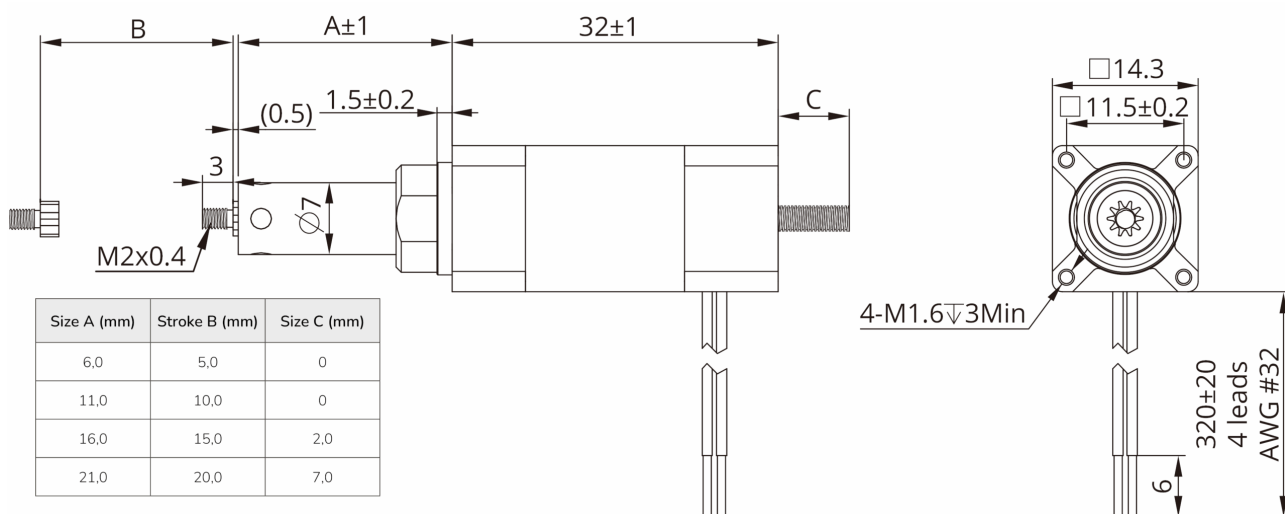
| Motor Characteristics | Unit | 6-2103 |
|-----------------------|------|--------|
| Size                  | Nema | 6      |
| Flange size           | mm   | 14     |
| Rated voltage         | V    | 6.6    |
| Current               | A    | 0.25   |
| Winding resistance    | Ω    | 22     |
| Inductance            | mH   | 4.5    |
| Weight                | g    | 60     |
| Lead Wire No.         |      | 4      |
| Motor length          | mm   | 32     |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [μm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| AA        | 0.6096          | 3.5                 | 3                         | -                          | -     |
| B         | 1.2192          | 3.5                 | 6.1                       | -                          | -     |
| J         | 2.4384          | 3.5                 | 12.2                      | -                          | -     |
| AF        | 0.3             | 3.5                 | 1.5                       | -                          | -     |
| AB        | 1               | 2.5                 | 5                         | -                          | *     |
| AB        | 1               | 3.24                | 5                         | -                          | *     |
| G         | 2               | 3.5                 | 10                        | yes                        | -     |
| M         | 4               | 3.5                 | 20                        | -                          | -     |
| T         | 8               | 3.5                 | 40                        | -                          | -     |
| AD        | 0.5             | 3                   | 2.5                       | -                          | -     |

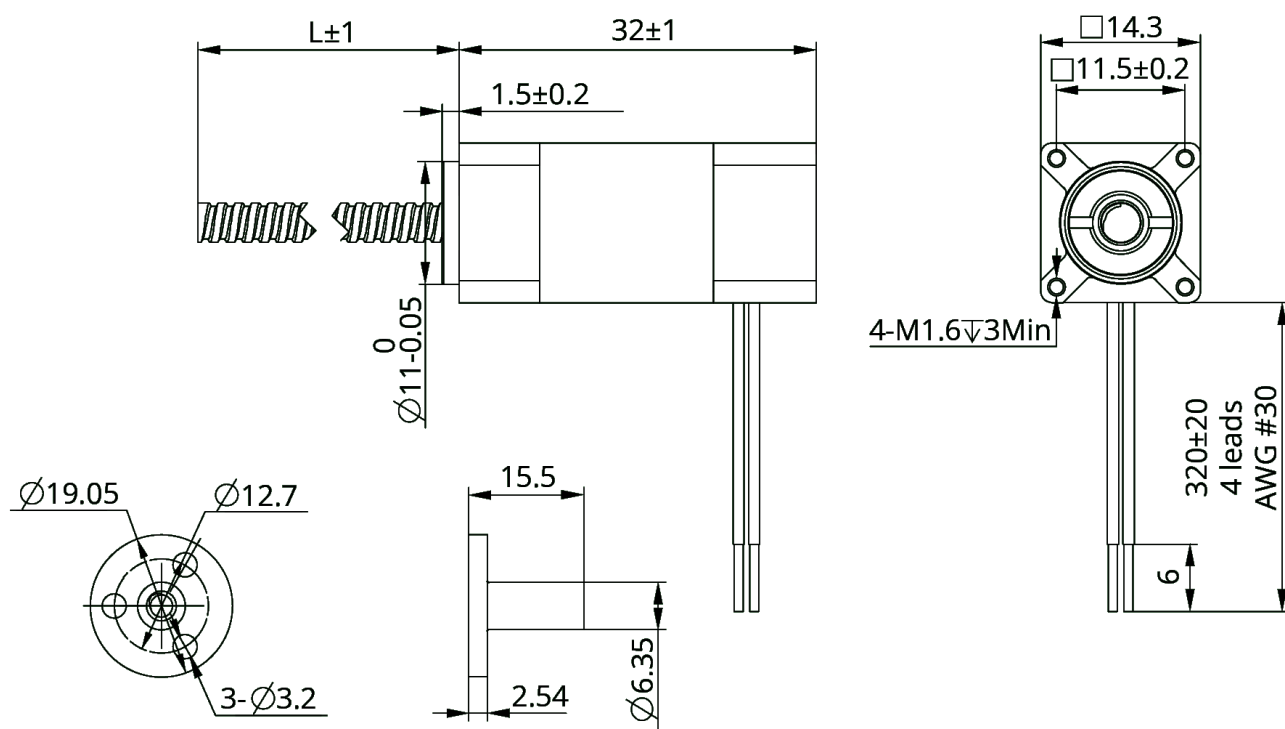
*\*only applicable screw for captive type*



*Non-Captive Actuator*

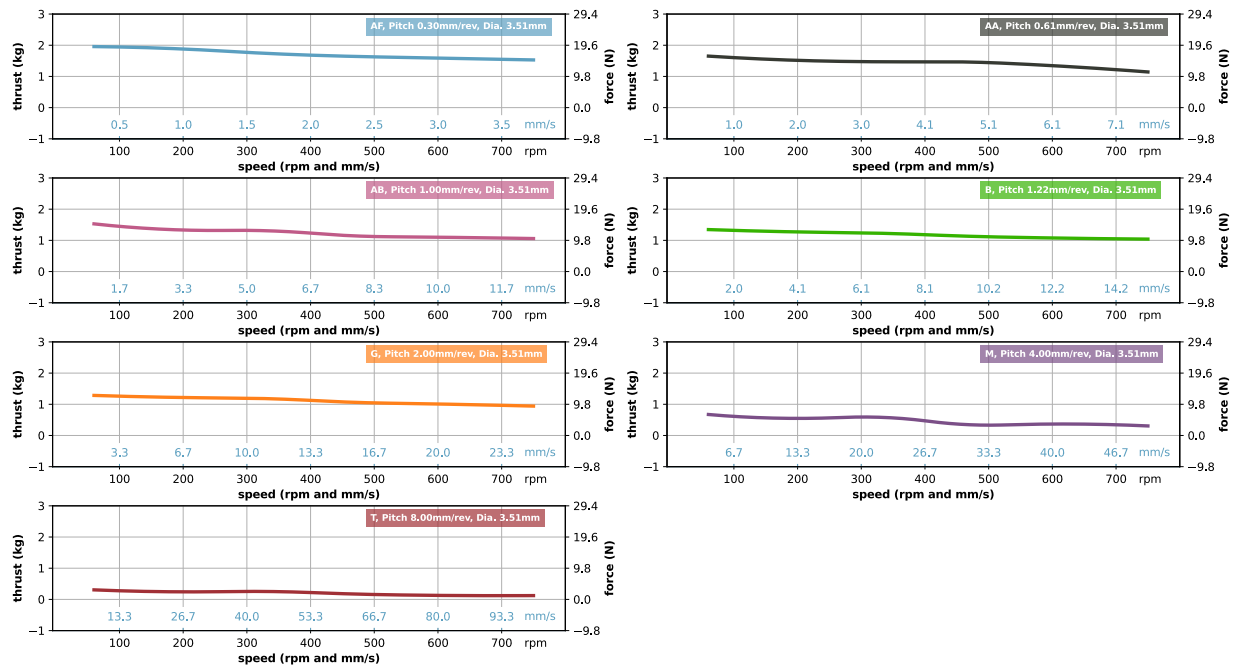


Kaptive Actuator



External Actuator

## Speed/Thrust Curves



Speed-thrust curves for available screws, motor Nema 6, 6-2103. Motor driven in two-phase operation with 0.25A



## Compact Stepper Linear Actuator

# SLSLA - Size 8 [20mm]

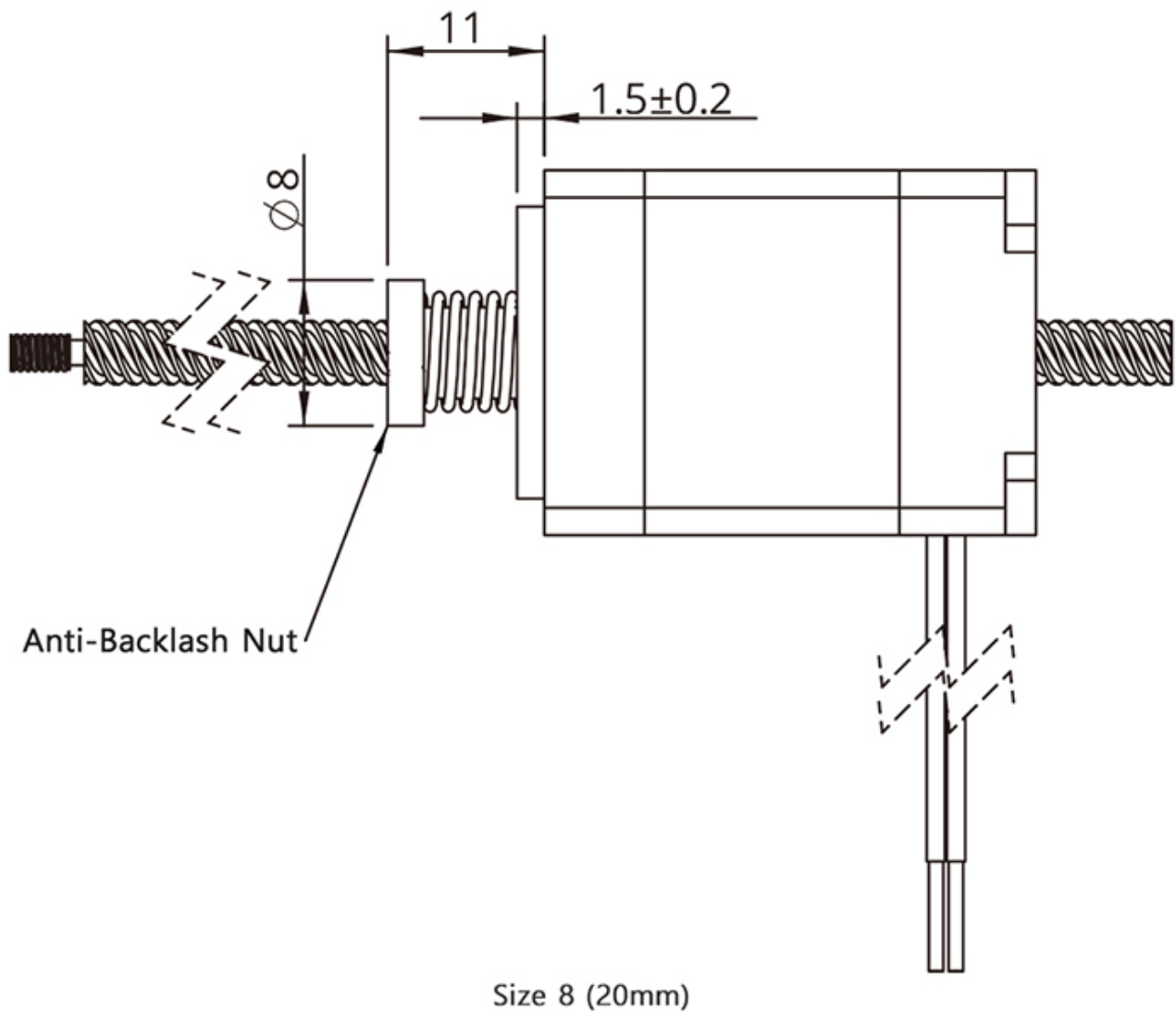


The SLSLA Size 8 [20mm] Stepper Lead Screw Linear Actuator offers precise linear motion in a compact package with a mounting area under 1 in<sup>2</sup>. It delivers up to 45N continuous thrust and supports multiple screw leads, stack configurations, encoder feedback, and anti-backlash options. Ideal for applications requiring high-precision, space-saving motion solutions in automation, instrumentation, and miniaturized equipment.

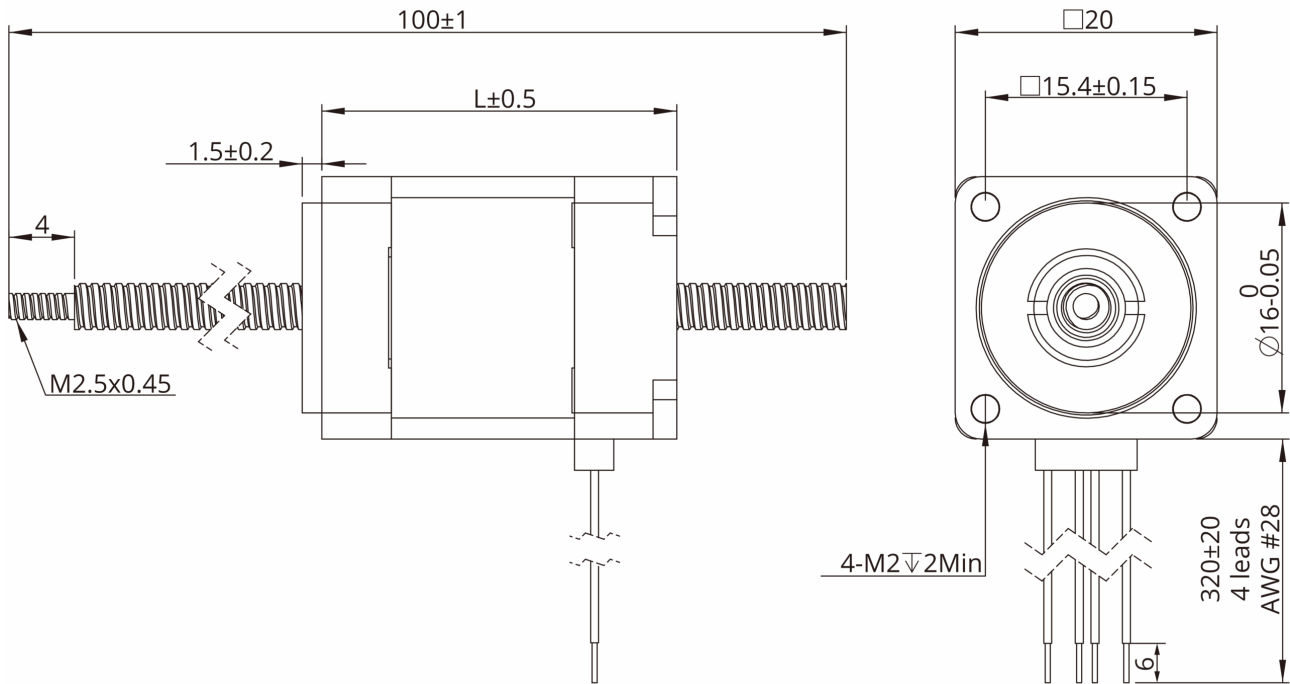

<https://www.kocomotion.de/produkt/slsla-size-8-20mm/>

| Motor Characteristics | Unit | 8-2105 | 8-2205 |
|-----------------------|------|--------|--------|
| Size                  | Nema | 8      | 8      |
| Flange size           | mm   | 20     | 20     |
| Rated voltage         | V    | 2.5    | 4.4    |
| Current               | A    | 0.5    | 0.5    |
| Winding resistance    | Ω    | 5.1    | 8.8    |
| Inductance            | mH   | 1.5    | 2.7    |
| Weight                | g    | 51     | 74     |
| Lead Wire No.         |      | 4      | 4      |
| Motor length          | mm   | 27.2   | 38.1   |

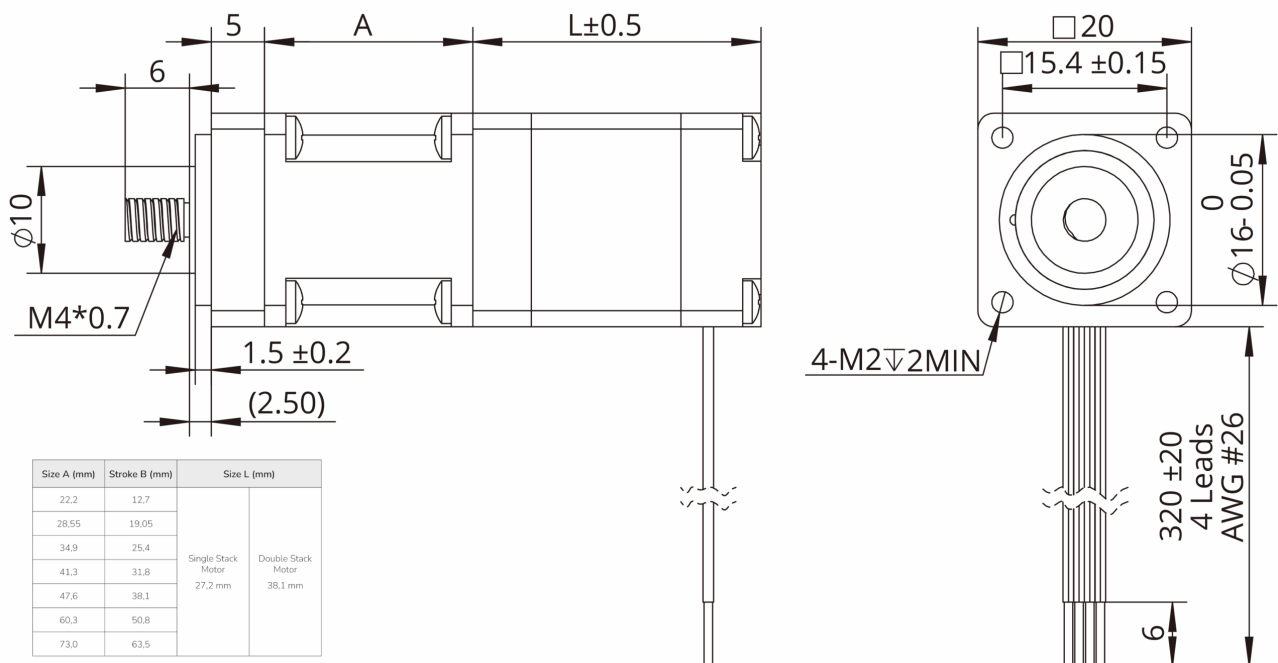
| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| AA        | 0.6096          | 3.5                 | 3                         | -                          | -     |
| B         | 1.2192          | 3.5                 | 6.1                       | -                          | -     |
| J         | 2.4384          | 3.5                 | 12.2                      | -                          | -     |
| AF        | 0.3             | 3.5                 | 1.5                       | -                          | -     |
| AB        | 1               | 3.24                | 5                         | -                          | -     |
| G         | 2               | 3.5                 | 10                        | yes                        | -     |
| M         | 4               | 3.5                 | 20                        | -                          | -     |
| T         | 8               | 3.5                 | 40                        | -                          | -     |
| AD        | 0.5             | 3                   | 2.5                       | -                          | -     |



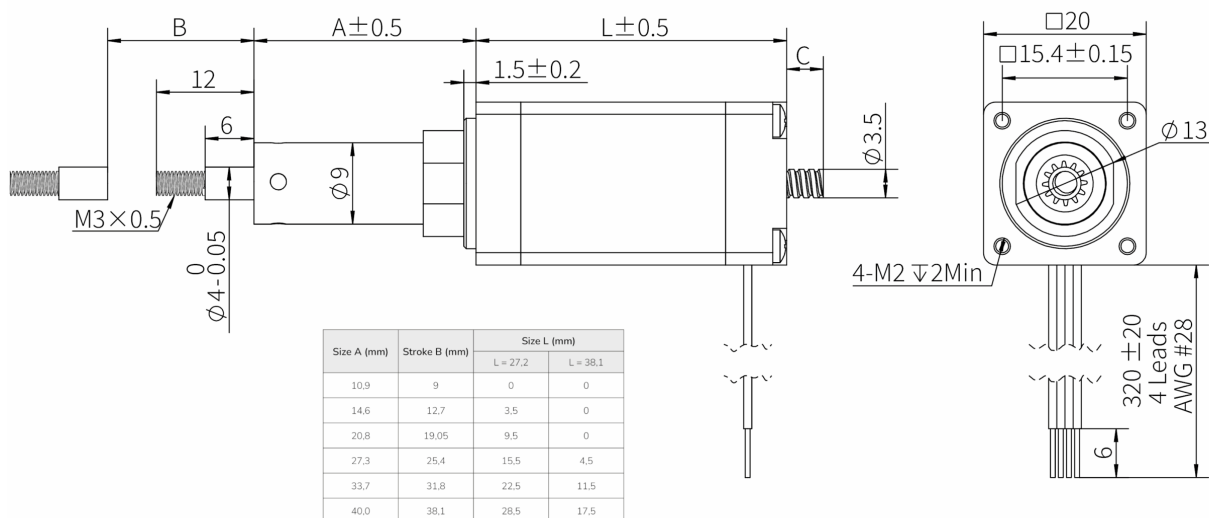
Non-Captive Anti-Backlash Nut



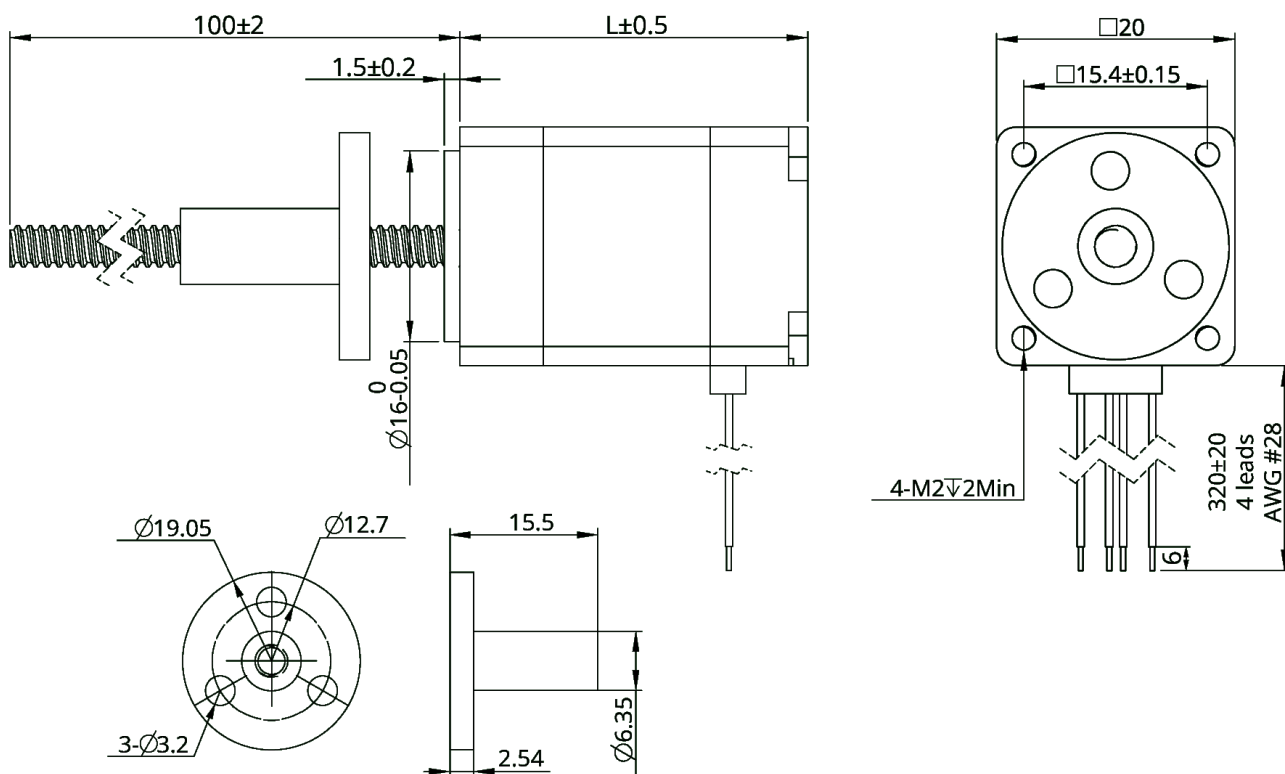
Non-Captive Actuator



Captive (Electrical Cylinder) Actuator

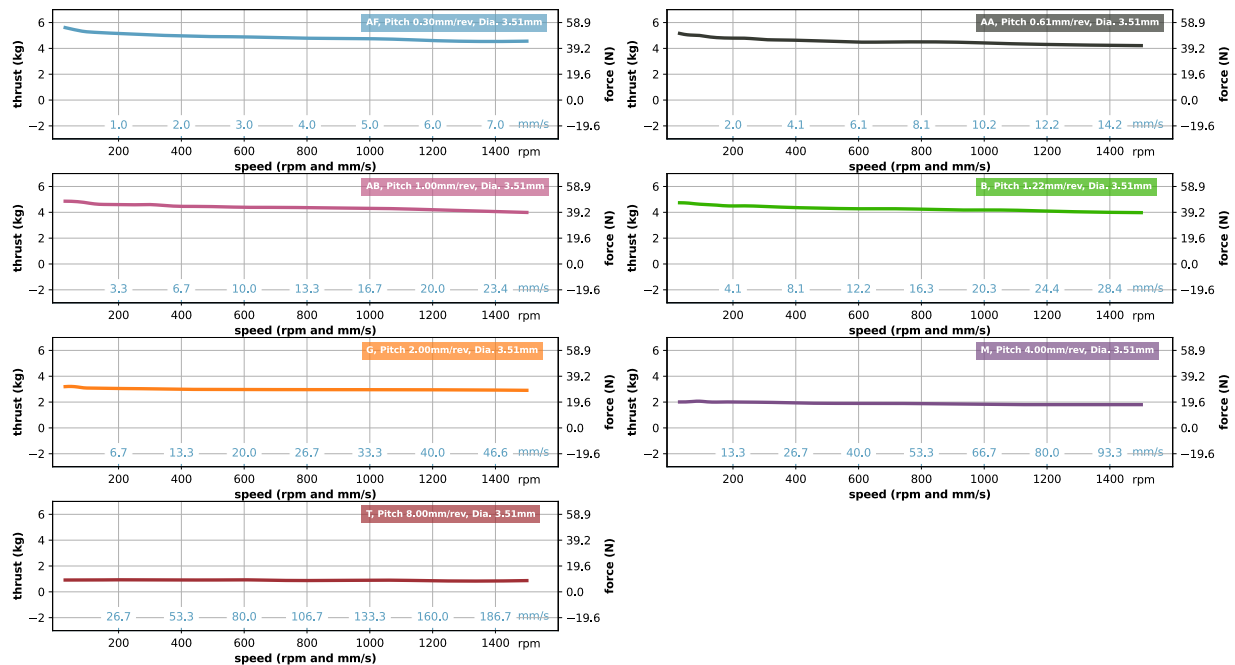


Kaptive Actuator

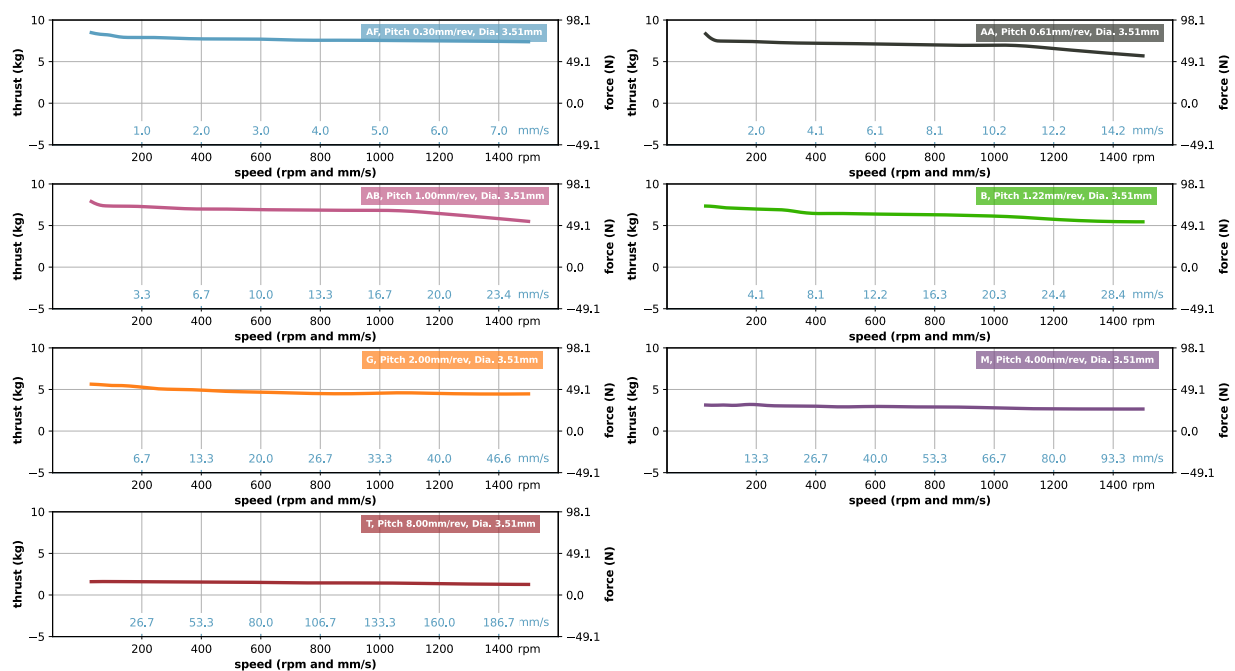


External Actuator

## Speed/Thrust Curves



Speed-thrust curves for available screws, motor Nema 8, 8-2105. Motor driven in two-phase operation with 0.5A



Speed-thrust curves for available screws, motor Nema 8, 8-2205. Motor driven in two-phase operation with 0.5A



Compact High-Force Stepper Linear Actuator

# SLSLA - Size 11 [28mm]

The SLSLA Size 11 (28mm) Stepper Lead Screw Linear Actuator provides over 140N continuous thrust in a compact, sub-1.1-inch footprint. Features include four screw configurations (External, Non-captive, Captive, Kaptive), multiple lead and diameter options, optional encoders, Teflon coating, anti-backlash nuts, and a power-off brake. Ideal for precision automation, medical, laboratory, and semiconductor handling applications.

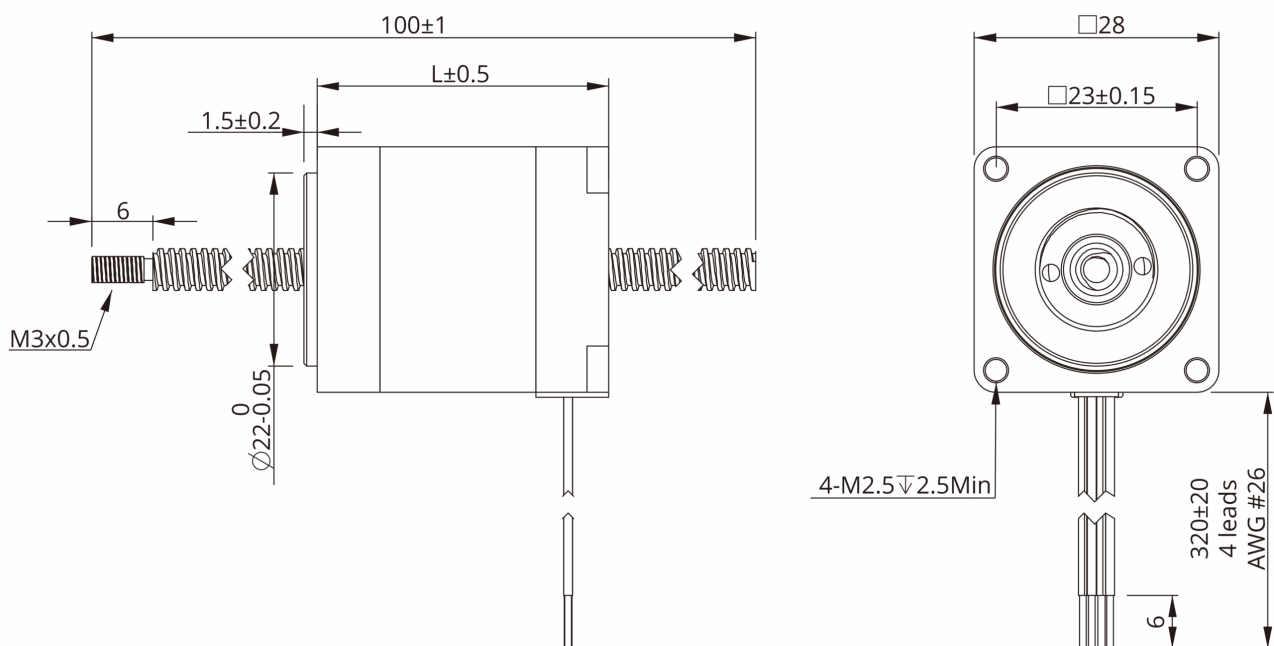


<https://www.kocomotion.de/produkt/slsla-size-11-28mm/>

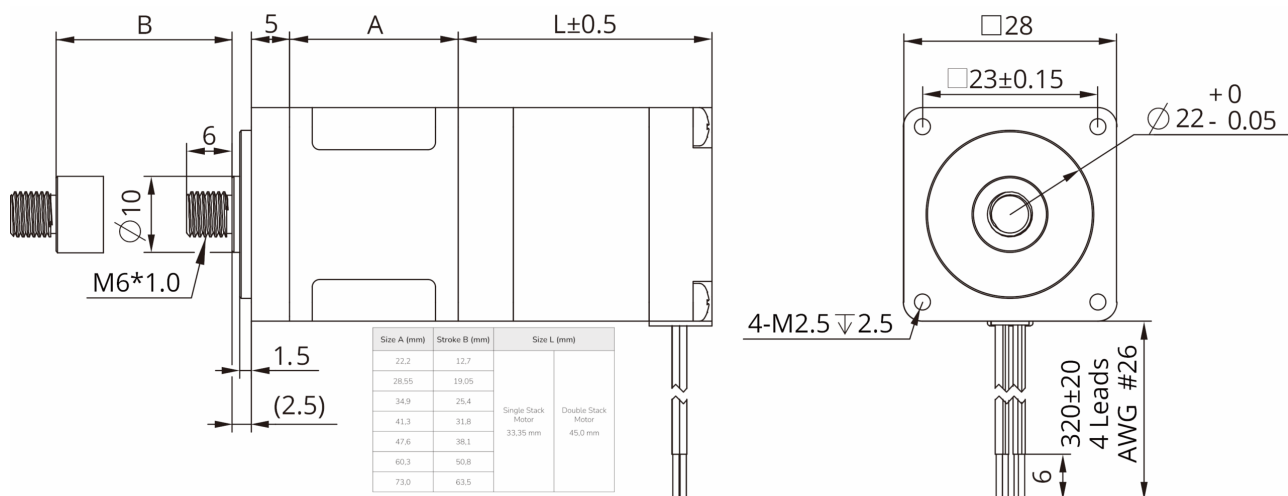
| Motor Characteristics | Unit | 11-2105 | 11-2110 | 11-2209 | 11-2216 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 11      | 11      | 11      | 11      |
| Flange size           | mm   | 28      | 28      | 28      | 28      |
| Rated voltage         | V    | 4.55    | 2.1     | 3.9     | 2.4     |
| Current               | A    | 0.5     | 1       | 0.95    | 1.6     |
| Winding resistance    | Ω    | 9.1     | 2.1     | 4.1     | 1.5     |
| Inductance            | mH   | 6       | 1.5     | 4       | 1.3     |
| Weight                | g    | 117     | 117     | 173     | 173     |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 33.35   | 33.35   | 45      | 45      |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [μm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| AL        | 0.3175          | 4.77                | 1.6                       | -                          | -     |
| A         | 0.635           | 4.77                | 3.2                       | -                          | -     |
| D         | 1.27            | 4.77                | 6.4                       | yes                        | -     |
| F         | 1.5875          | 4.77                | 7.9                       | -                          | -     |
| J         | 2.4384          | 5.56                | 12.2                      | -                          | *     |
| K         | 2.54            | 4.77                | 12.7                      | -                          | -     |
| Q         | 4.8768          | 4.77                | 24.4                      | -                          | -     |
| Q         | 4.8768          | 5.56                | 24.4                      | -                          | *     |
| R         | 5.08            | 4.77                | 25.4                      | -                          | -     |
| X         | 10.16           | 4.77                | 50.8                      | -                          | -     |
| AC        | 4.76            | 4.77                | 23.8                      | -                          | -     |

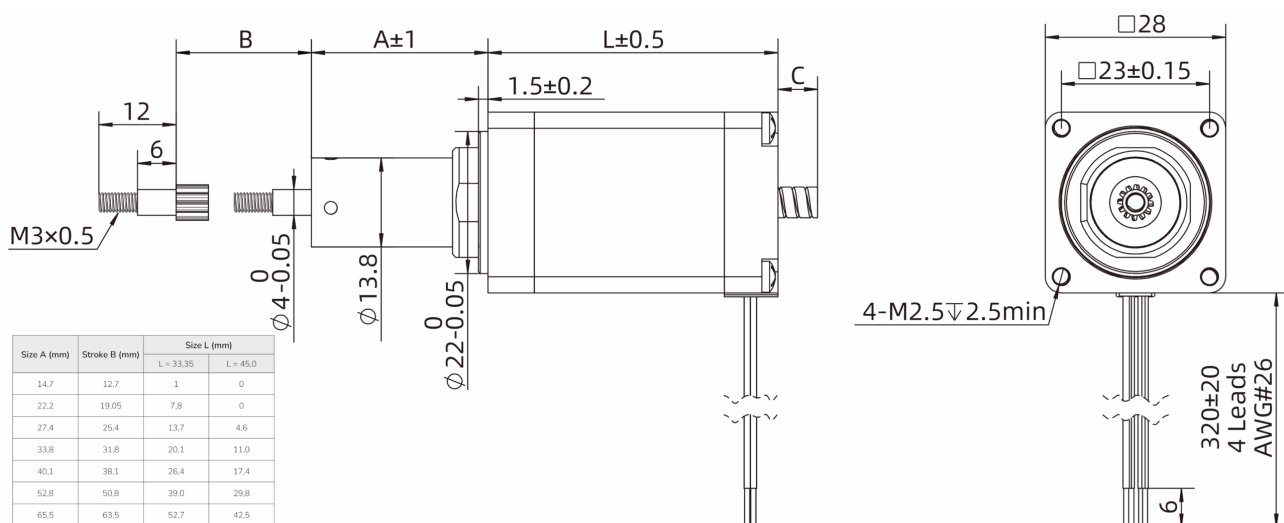
\*custom 5,56mm screw diameter available for external type



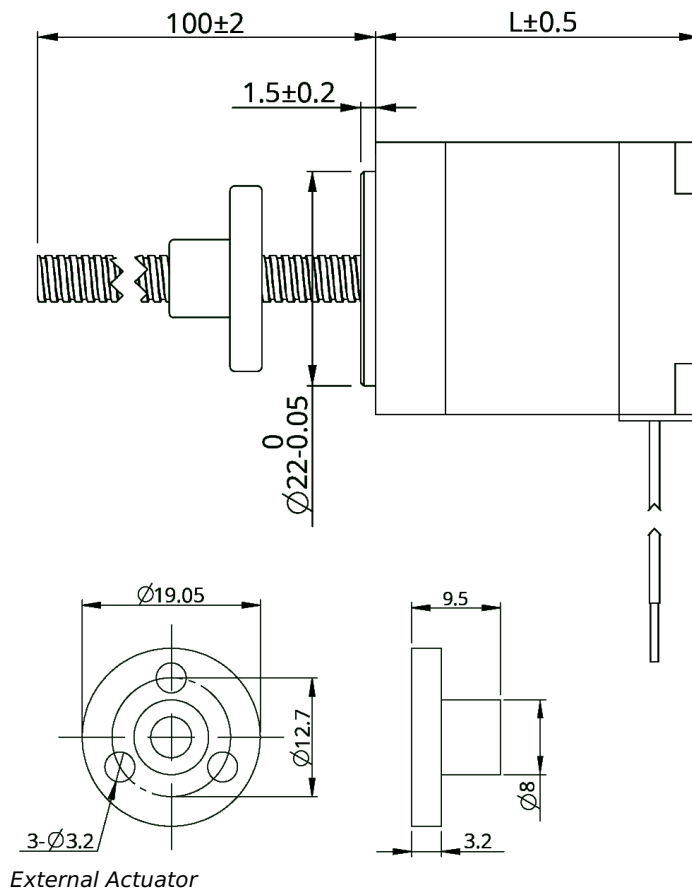
Non-Captive Actuator



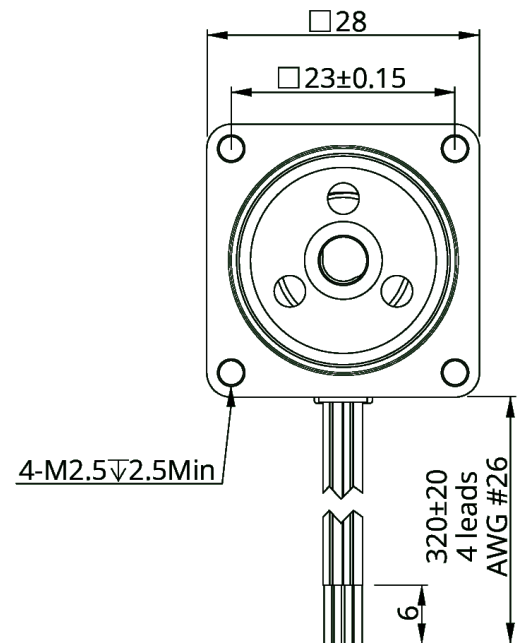
Captive (Electrical Cylinder) Actuator



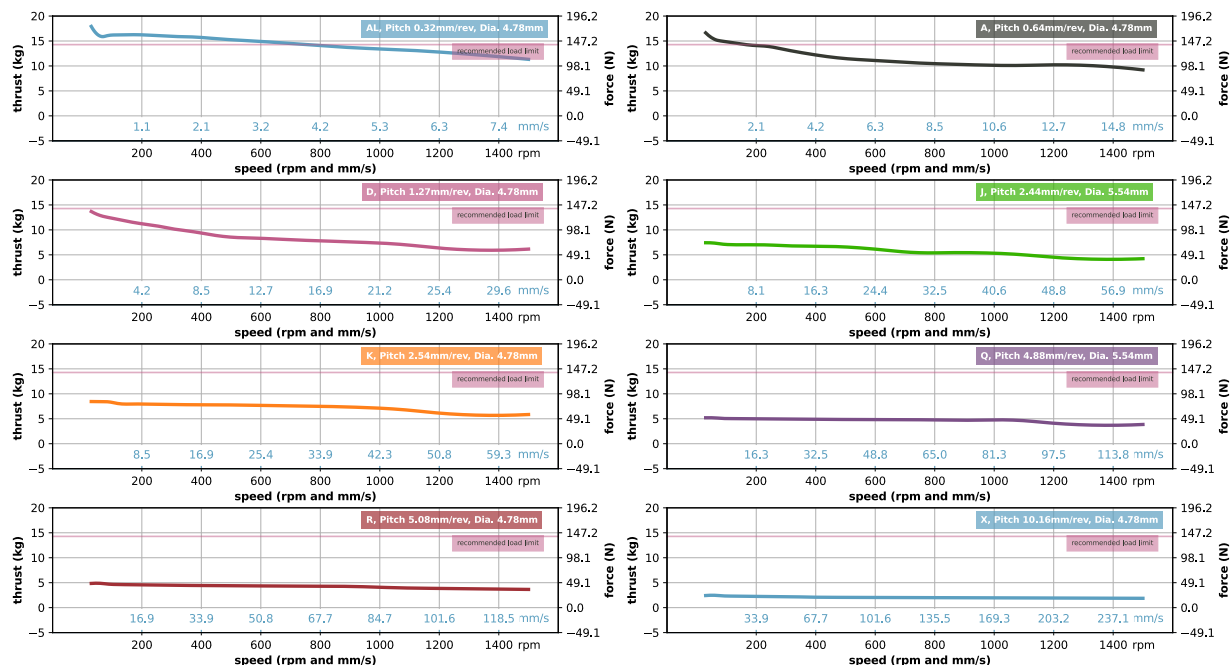
Kaptive Actuator



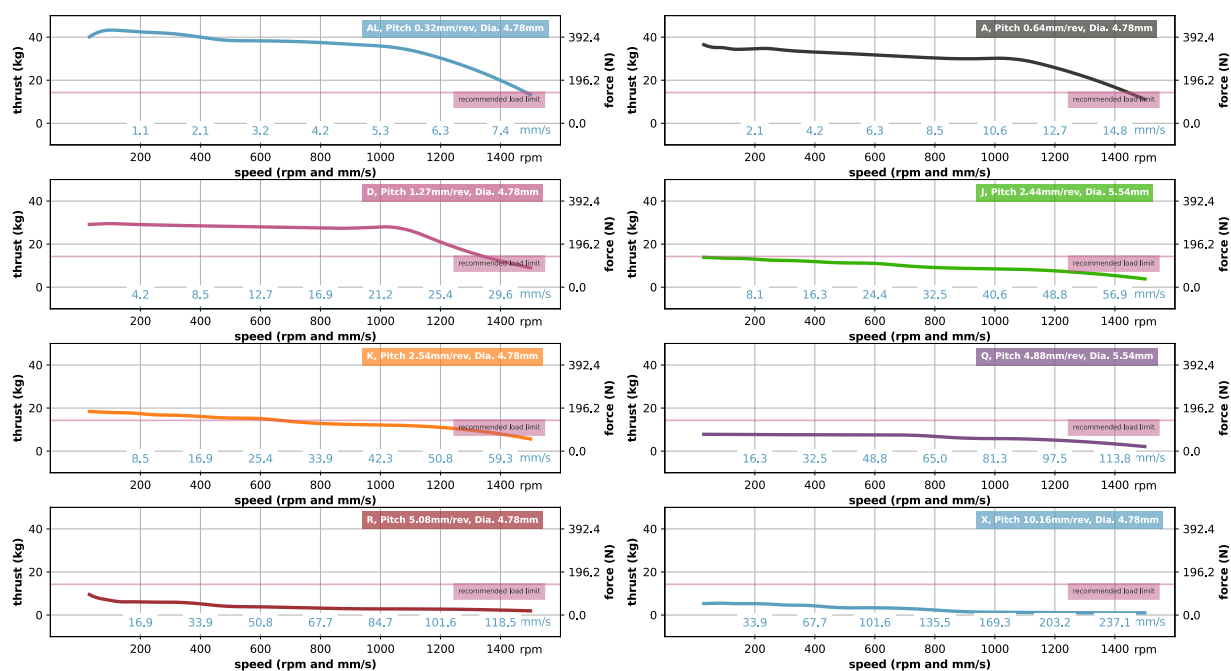
External Actuator



## Speed/Thrust Curves



Speed-thrust curves for available screws, motor Nema 11, 11-2110. Motor driven in two-phase operation with 1A

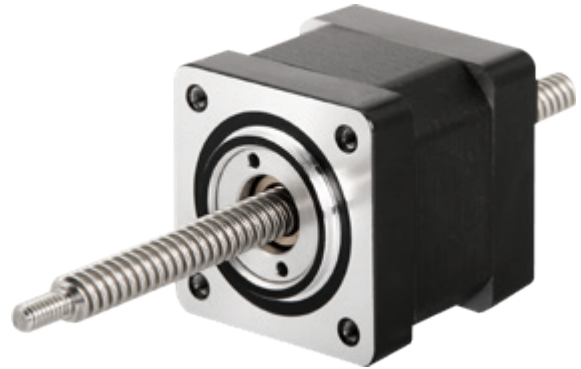


Speed-thrust curves for available screws, motor Nema 11, 11-2216. Motor driven in two-phase operation with 1.6A

## 35mm Stepper Lead Screw Linear Actuators

# SLSLA - Size 14 [35mm]

The SLSLA Size 14 (35mm) Stepper Lead Screw Linear Actuator delivers up to 230N continuous thrust, offering four adaptable form factors: External, Non-Captive, Electrical Cylinder (Captive), and Kaptive. With a 6.35 mm screw diameter, it supports diverse pitches from 0.61 to 25.4 mm and integrates options such as encoders, anti-backlash nuts, and Teflon coatings. Ideal for compact automation and high-precision OEM applications.

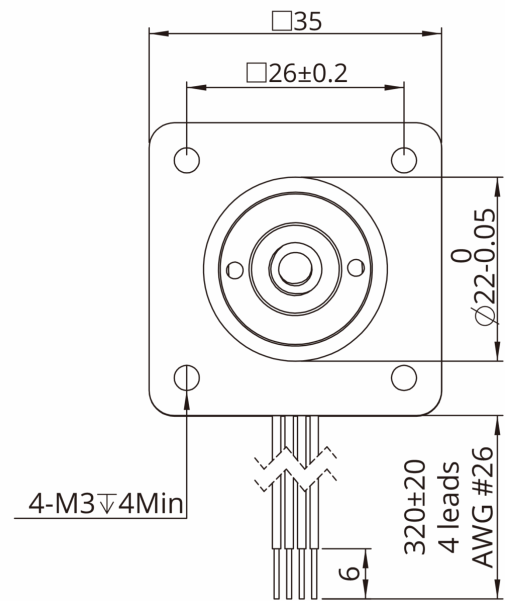
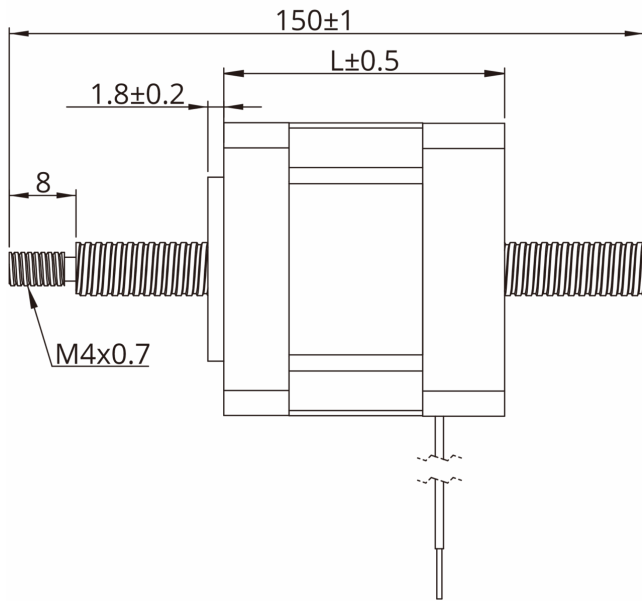

<https://www.kocomotion.de/produkt/slsla-size-14-35mm/>

| Motor Characteristics | Unit | 14-2105 | 14-2110 | 14-2115 | 14-2205 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 14      | 14      | 14      | 14      |
| Flange size           | mm   | 35      | 35      | 35      | 35      |
| Rated voltage         | V    | 6.6     | 3.5     | 2.7     | 12      |
| Current               | A    | 0.5     | 1       | 1.5     | 0.5     |
| Winding resistance    | Ω    | 13.2    | 3.5     | 1.8     | 24      |
| Inductance            | mH   | 14      | 3.6     | 1.9     | 29      |
| Weight                | g    | 189     | 189     | 189     | 210     |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 33.6    | 33.6    | 33.6    | 45.6    |

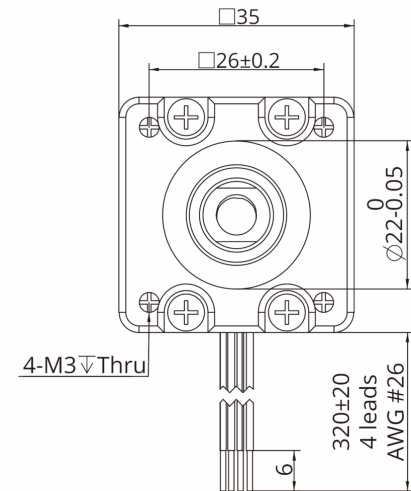
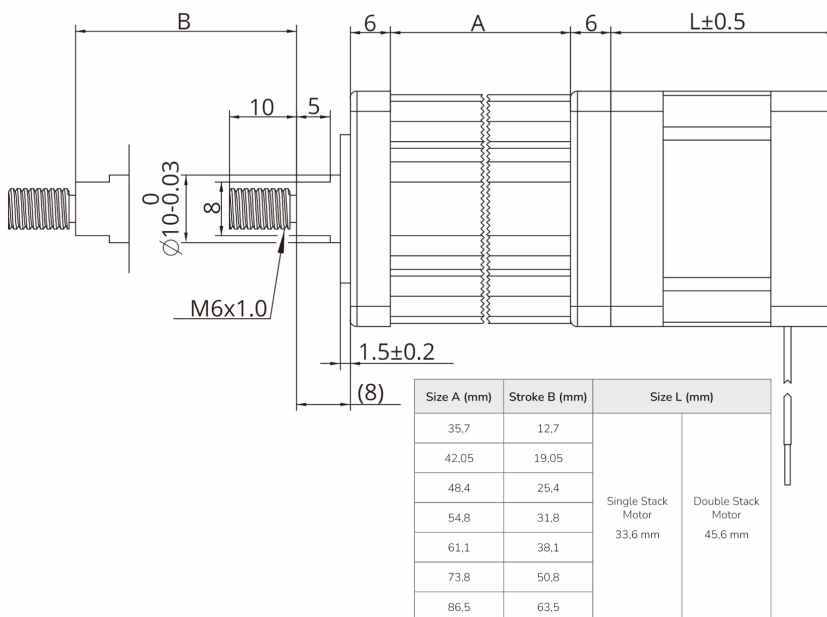
| Motor Characteristics | Unit | 14-2210 | 14-2215 |
|-----------------------|------|---------|---------|
| Size                  | Nema | 14      | 14      |
| Flange size           | mm   | 35      | 35      |
| Rated voltage         | V    | 6       | 4       |
| Current               | A    | 1       | 1.5     |
| Winding resistance    | Ω    | 6       | 2.7     |
| Inductance            | mH   | 7.2     | 3.2     |
| Weight                | g    | 210     | 210     |
| Lead Wire No.         |      | 4       | 4       |
| Motor length          | mm   | 45.6    | 45.6    |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| AA        | 0.6096          | 6.35                | 3                         | -                          | -     |
| A         | 0.635           | 6.35                | 3.2                       | -                          | *     |
| B         | 1.2192          | 6.35                | 6.1                       | -                          | -     |
| D         | 1.27            | 6.35                | 6.4                       | -                          | *     |
| F         | 1.5875          | 6.35                | 7.9                       | yes                        | *     |
| J         | 2.4384          | 6.35                | 12.2                      | -                          | -     |
| K         | 2.54            | 6.35                | 12.7                      | yes                        | *     |
| L         | 3.175           | 6.35                | 15.9                      | -                          | *     |
| Q         | 4.8768          | 6.35                | 24.4                      | -                          | -     |
| R         | 5.08            | 6.35                | 25.4                      | -                          | *     |
| S         | 6.35            | 6.35                | 31.8                      | -                          | *     |
| U         | 8.4667          | 6.35                | 42.3                      | -                          | -     |
| W         | 9.7536          | 6.35                | 48.8                      | -                          | *     |
| Y         | 12.7            | 6.35                | 63.5                      | -                          | *     |
| Z         | 25.4            | 6.35                | 127                       | -                          | *     |
| AB        | 1               | 6                   | 5                         | -                          | -     |
| AB        | 1               | 6.35                | 5                         | -                          | -     |
| AB        | 1               | 8                   | 5                         | -                          | -     |
| G         | 2               | 6.35                | 10                        | -                          | -     |
| G         | 2               | 8                   | 10                        | -                          | -     |
| M         | 4               | 8                   | 20                        | -                          | -     |
| T         | 8               | 8                   | 40                        | -                          | -     |
| E         | 5               | 6                   | 25                        | -                          | -     |
| E         | 5               | 8                   | 25                        | -                          | -     |
| C         | 10              | 8                   | 50                        | -                          | -     |
| N         | 0.794           | 6.35                | 4                         | -                          | -     |

*\*custom 9,525mm screw diameter available for external type*

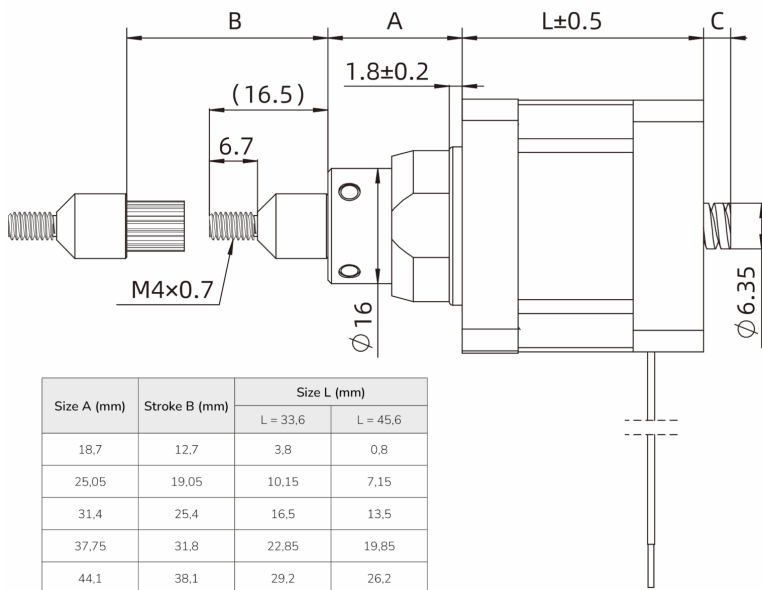


Non-Captive Actuator



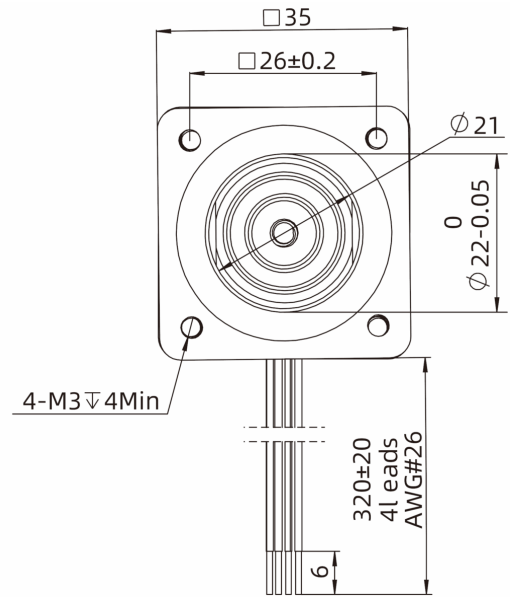
Captive (Electrical Cylinder) Actuator

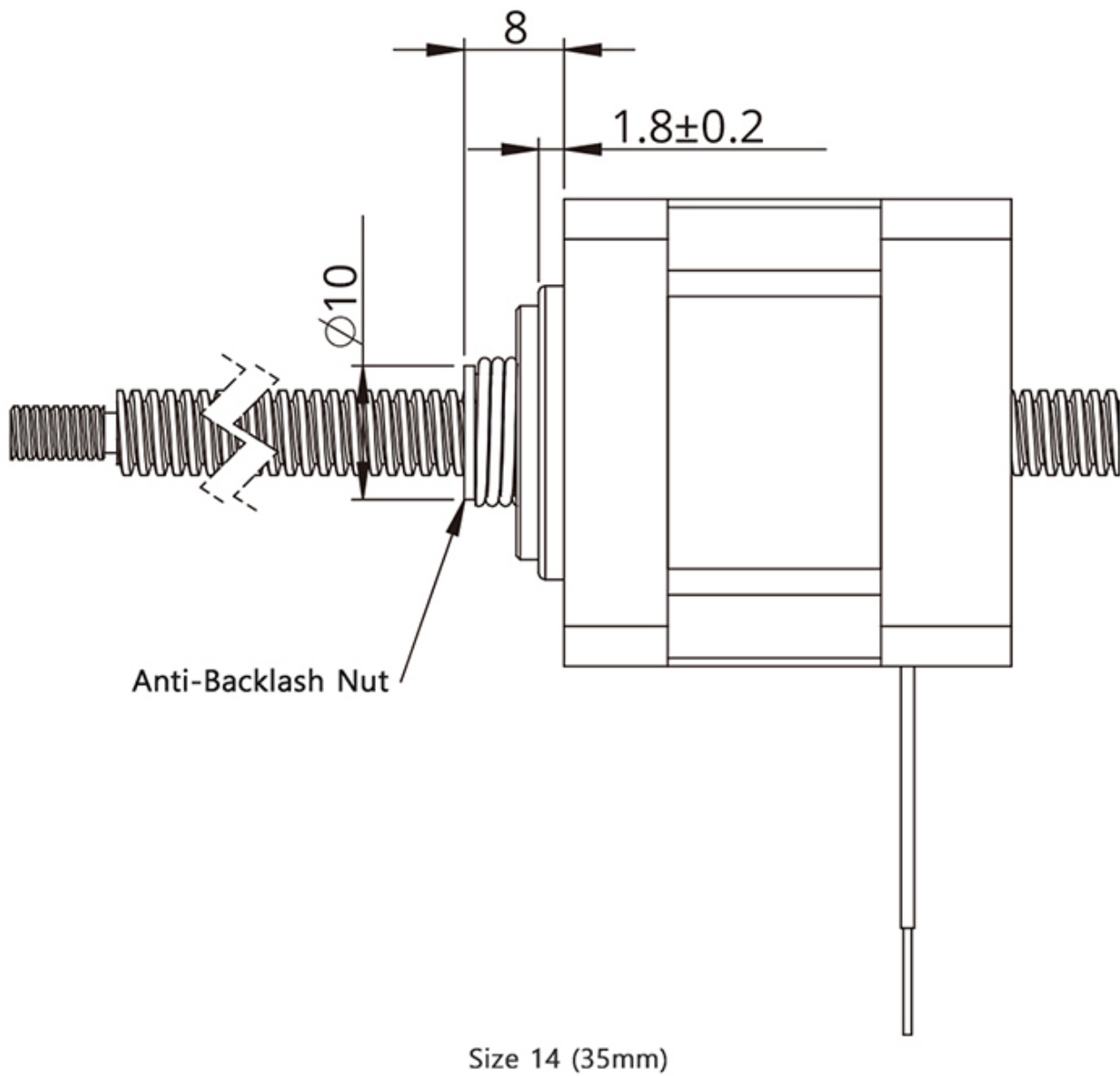




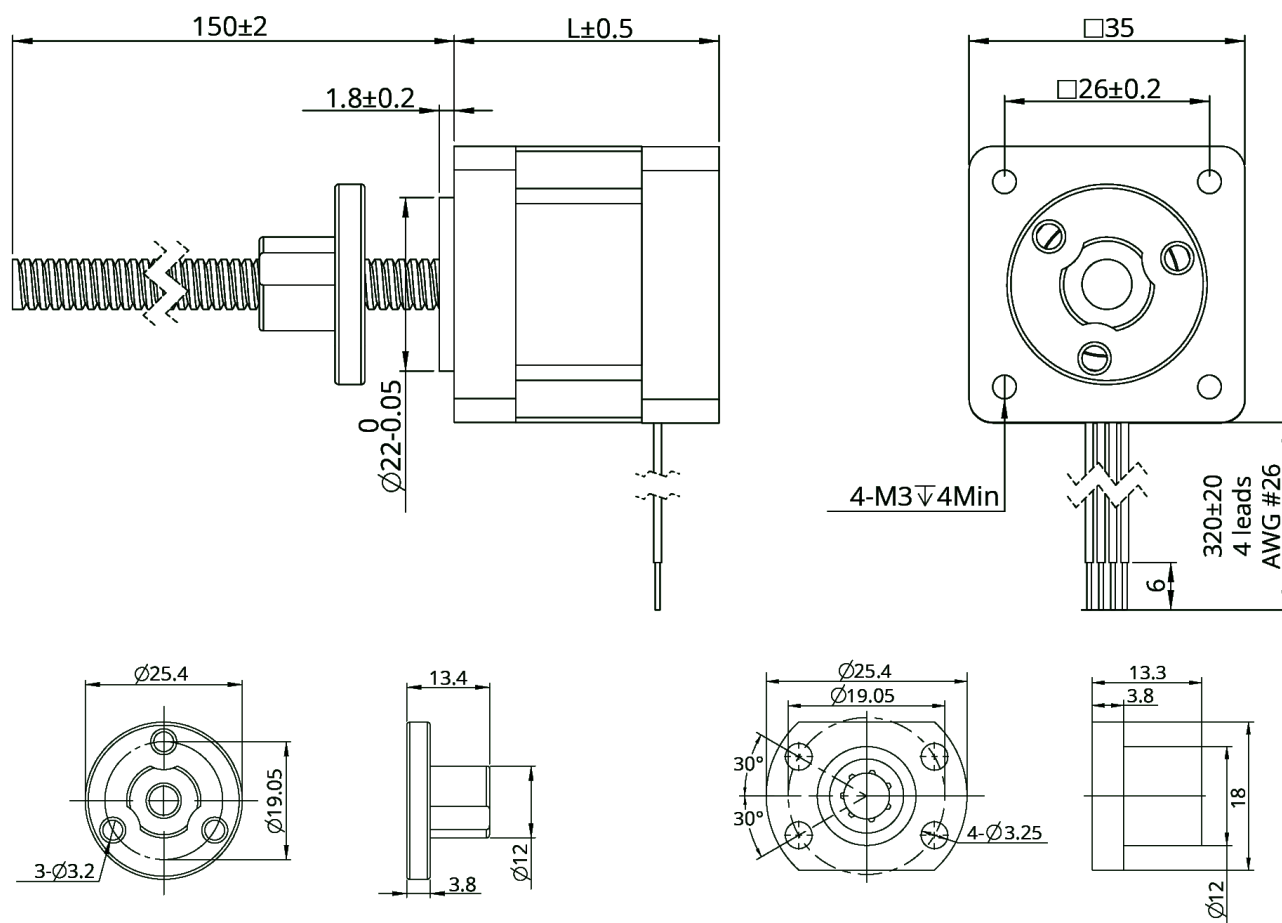
| Size A (mm) | Stroke B (mm) | Size L (mm) |          |
|-------------|---------------|-------------|----------|
|             |               | L = 33.6    | L = 45.6 |
| 18.7        | 12.7          | 3.8         | 0.8      |
| 25.05       | 19.05         | 10.15       | 7.15     |
| 31.4        | 25.4          | 16.5        | 13.5     |
| 37.75       | 31.8          | 22.85       | 19.85    |
| 44.1        | 38.1          | 29.2        | 26.2     |
| 56.8        | 50.8          | 41.9        | 38.9     |
| 69.5        | 63.5          | 54.6        | 51.6     |

Kaptive Actuator



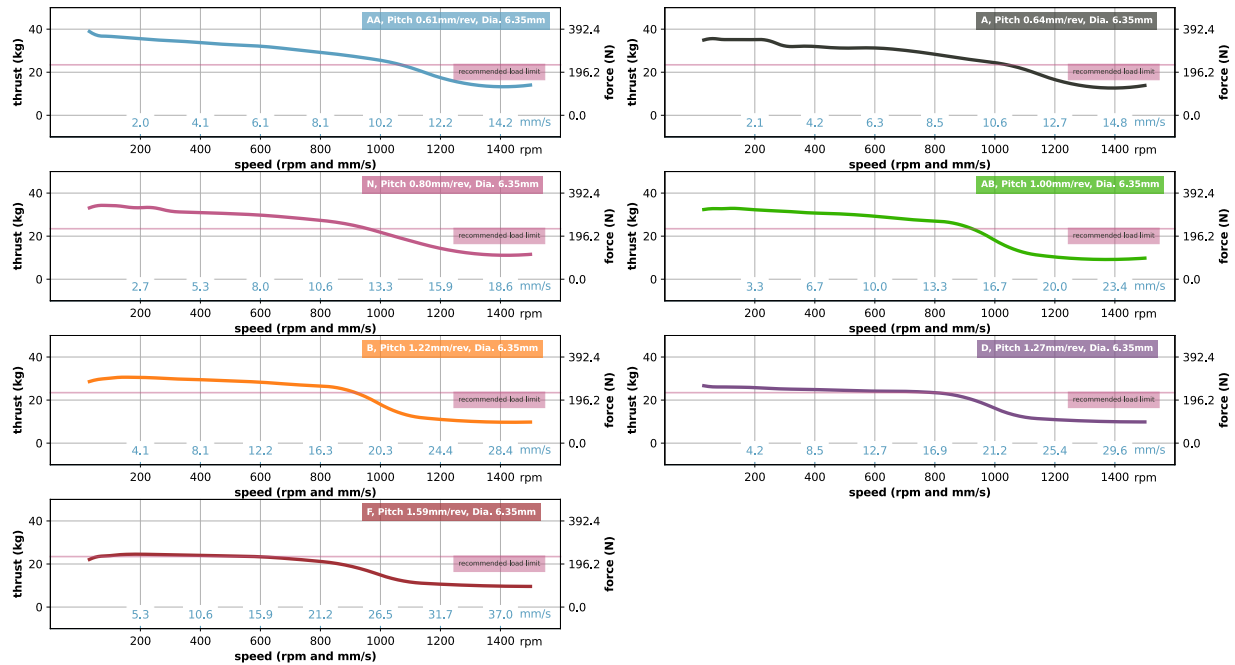


Non-Captive Anti-Backlash Nut

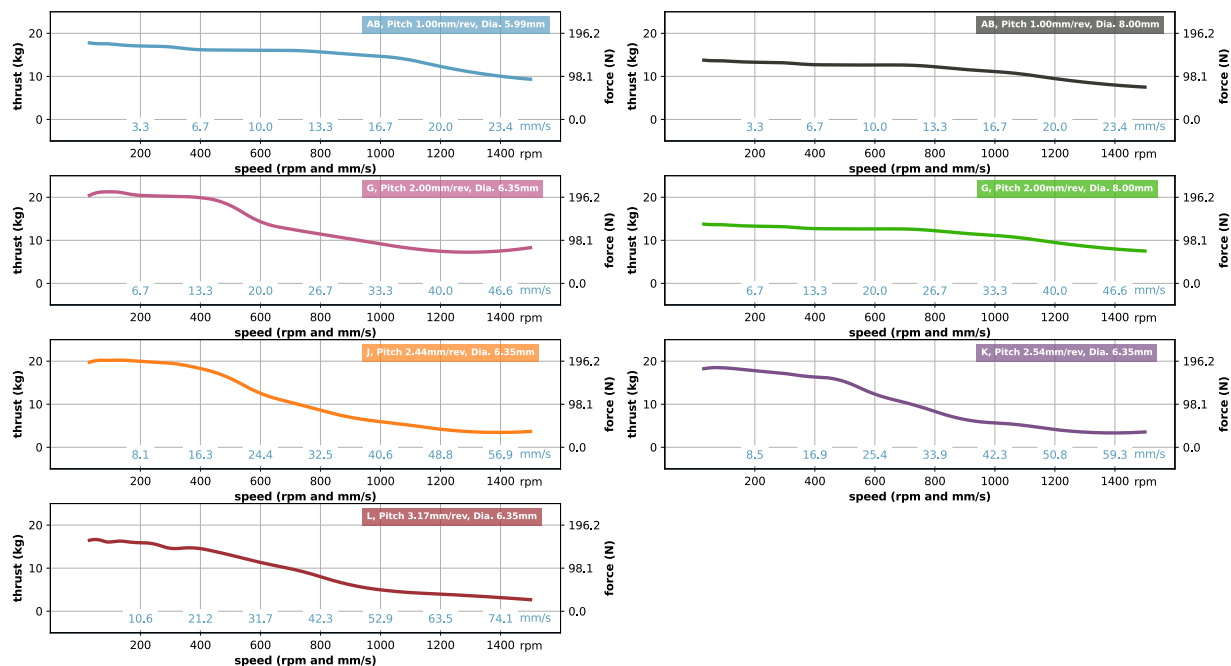


External Actuator

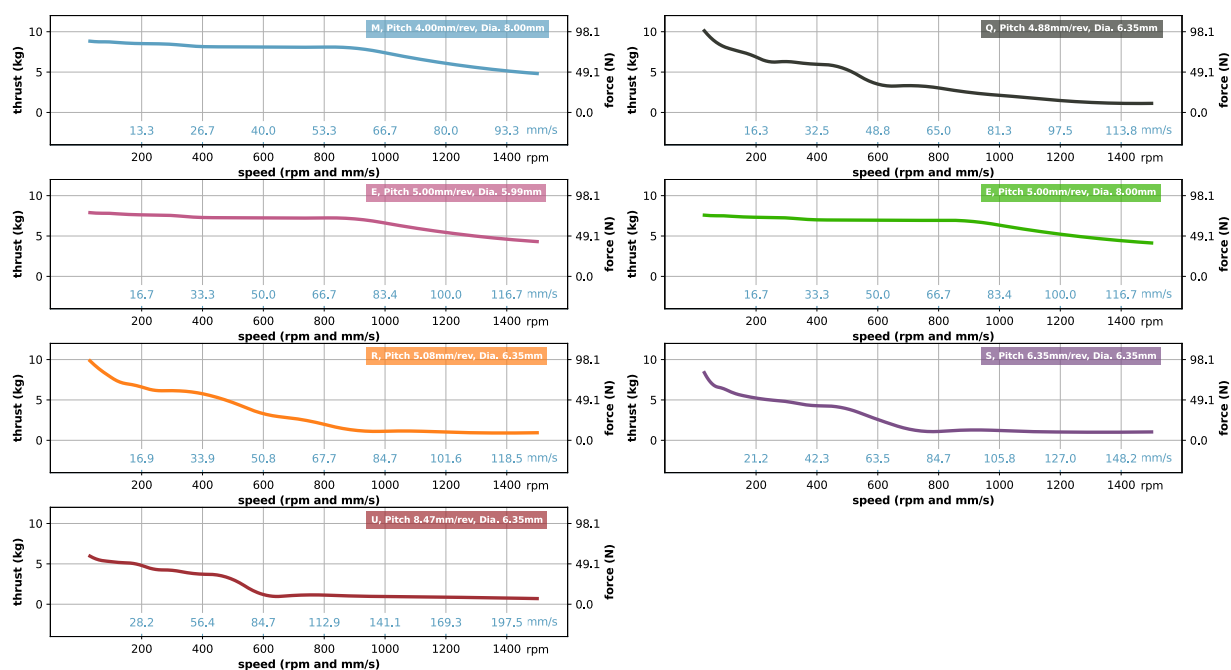
## Speed/Thrust Curves



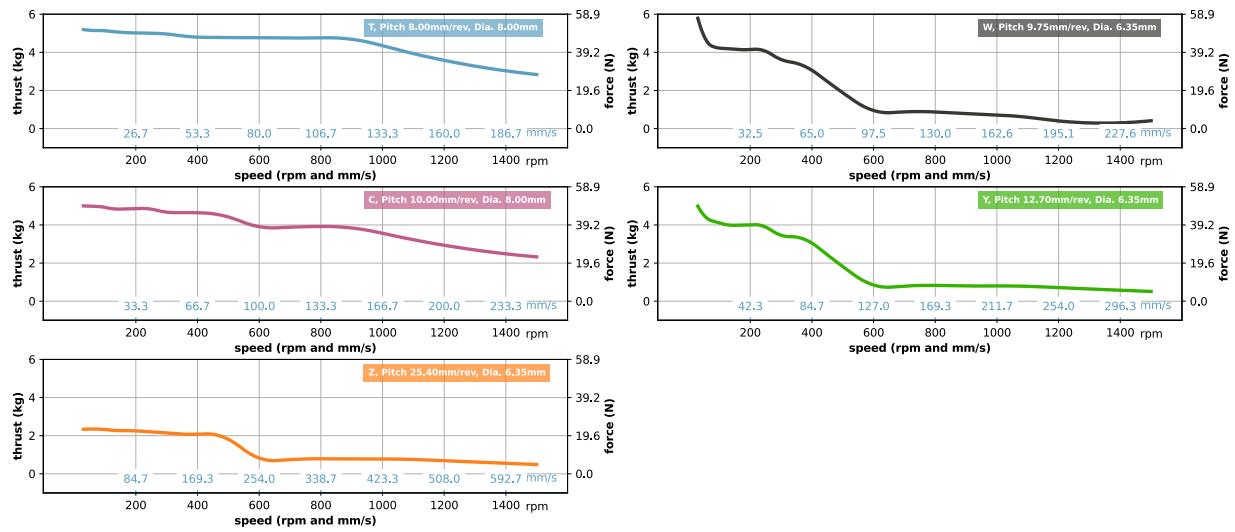
Speed-thrust curves for available screws, motor Nema 14, 14-2115, set 1. Motor driven in two-phase operation with 1.5A



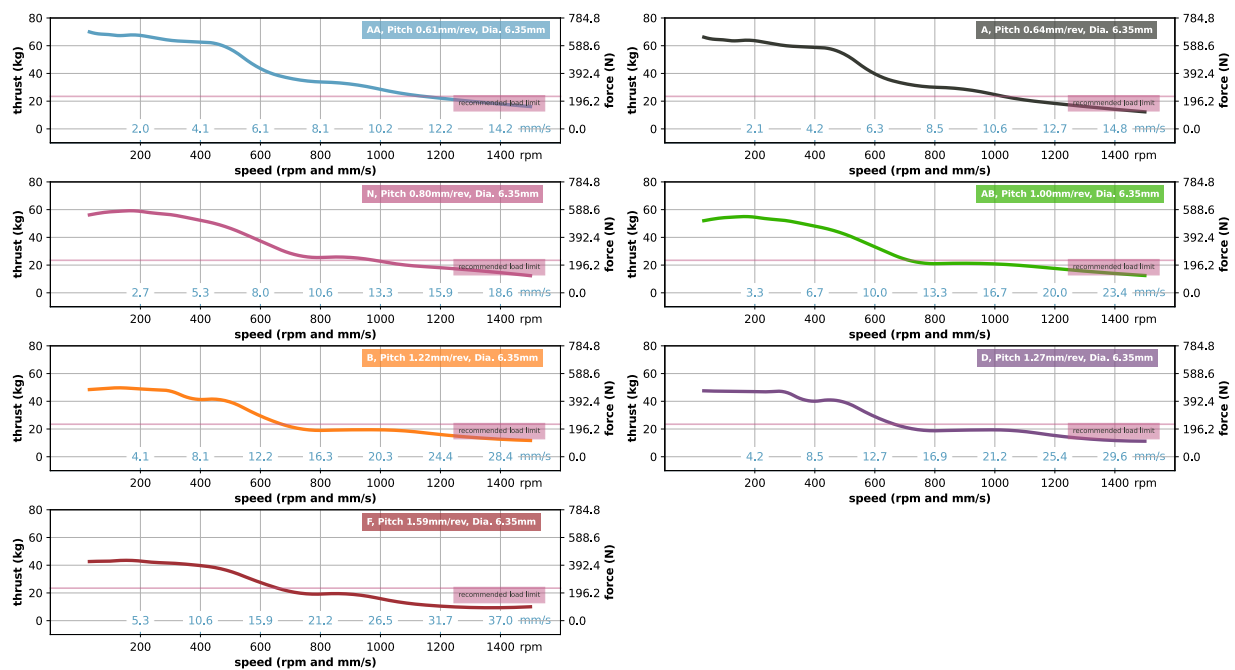
Speed-thrust curves for available screws, motor Nema 14, 14-2115, set 2. Motor driven in two-phase operation with 1.5A



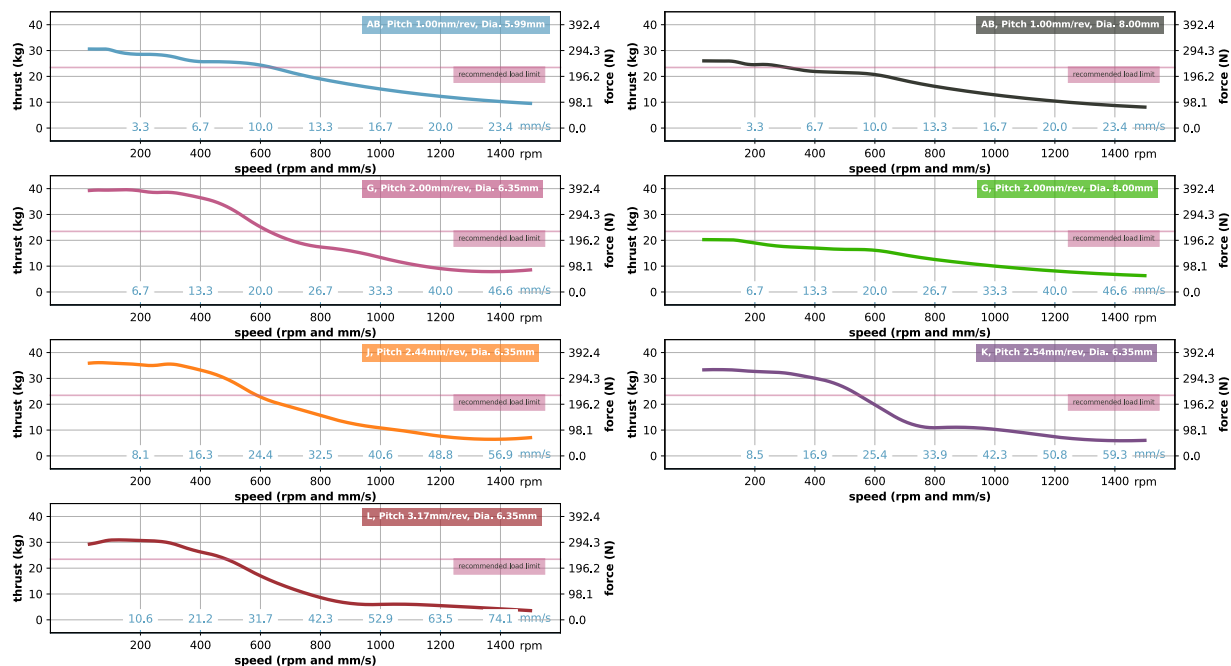
Speed-thrust curves for available screws, motor Nema 14, 14-2115, set 3. Motor driven in two-phase operation with 1.5A



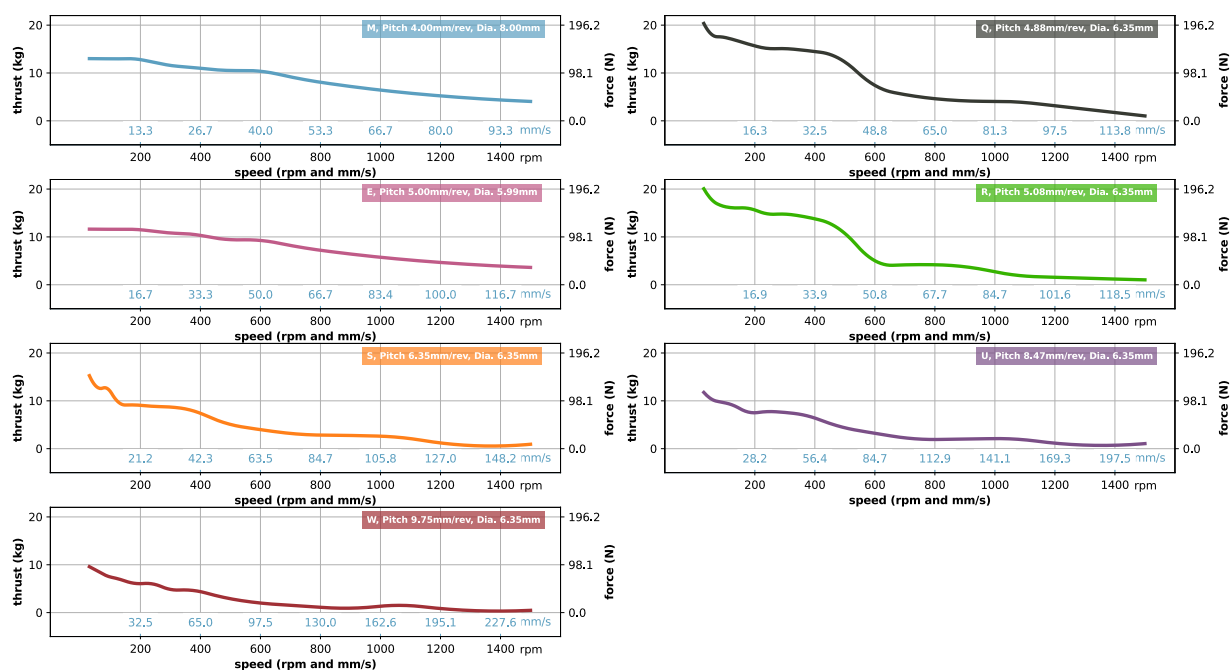
Speed-thrust curves for available screws, motor Nema 14, 14-2115, set 4. Motor driven in two-phase operation with 1.5A



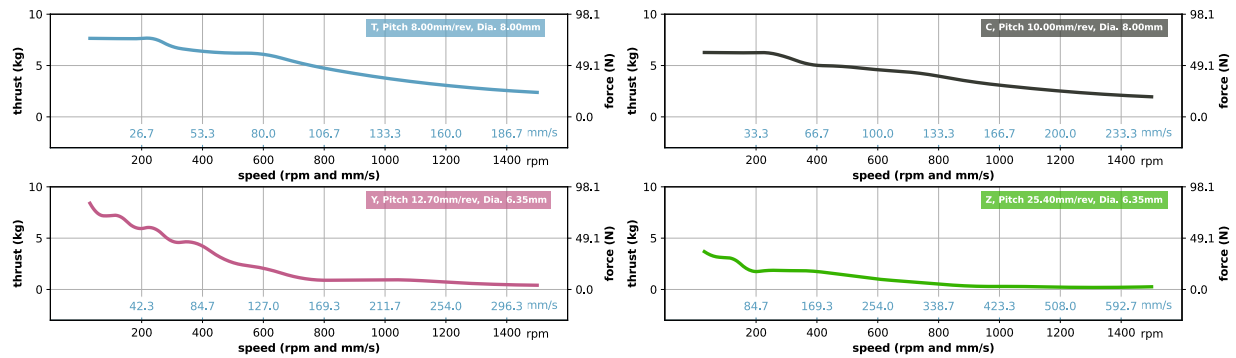
Speed-thrust curves for available screws, motor Nema 14, 14-2215, set 1. Motor driven in two-phase operation with 1.5A



Speed-thrust curves for available screws, motor Nema 14, 14-2215, set 2. Motor driven in two-phase operation with 1.5A



Speed-thrust curves for available screws, motor Nema 14, 14-2215, set 3. Motor driven in two-phase operation with 1.5A

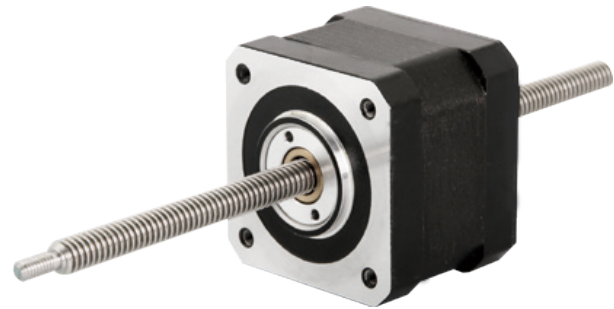


Speed-thrust curves for available screws, motor Nema 14, 14-2215, set 4. Motor driven in two-phase operation with 1.5A



## 42mm Stepper Lead Screw Linear Actuators

# SLSLA - Size 17 [42mm]



The SLSLA - Size 17 [42mm] series delivers up to 330N continuous thrust in a compact NEMA 17 frame for high-precision linear motion. Available in External, Non-Captive, Captive (Electrical Cylinder), and Kaptive form factors with a wide selection of screw pitches (0.6096-25.4 mm), encoder options, anti-backlash nuts, Teflon-coated screws, and power-off brake. Ideal for precision positioning in automation, laboratory, and medical environments.

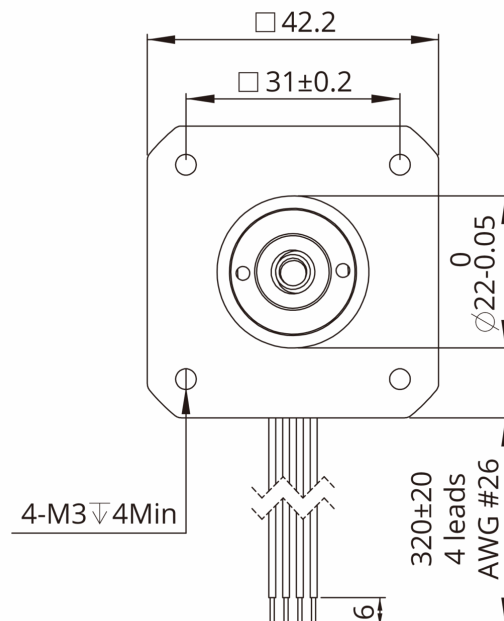
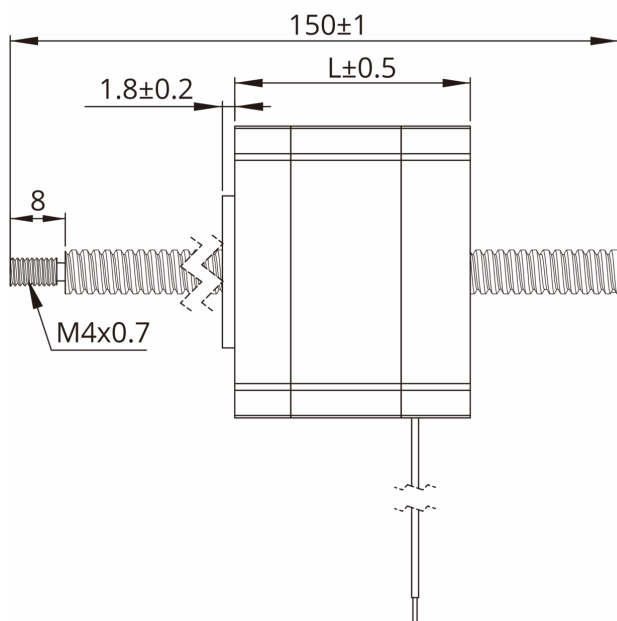

<https://www.kocomotion.de/produkt/slsa-size-17-42mm/>

| Motor Characteristics | Unit | 17-2105 | 17-2110 | 17-2115 | 17-2205 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 17      | 17      | 17      | 17      |
| Flange size           | mm   | 42      | 42      | 42      | 42      |
| Rated voltage         | V    | 7.2     | 3.8     | 2.85    | 11      |
| Current               | A    | 0.5     | 1       | 1.5     | 0.5     |
| Winding resistance    | Ω    | 14.4    | 3.8     | 1.9     | 22      |
| Inductance            | mH   | 19.8    | 5       | 2.2     | 46      |
| Weight                | g    | 254     | 254     | 254     | 386     |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 34.1    | 34.1    | 34.1    | 48.1    |

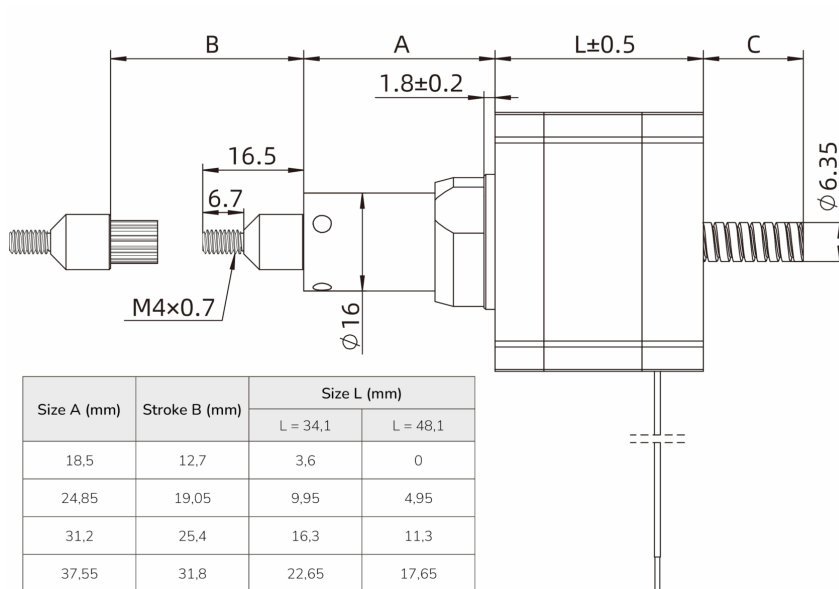
| Motor Characteristics | Unit | 17-2212 | 17-2225 |
|-----------------------|------|---------|---------|
| Size                  | Nema | 17      | 17      |
| Flange size           | mm   | 42      | 42      |
| Rated voltage         | V    | 4.5     | 2.2     |
| Current               | A    | 1.2     | 2.5     |
| Winding resistance    | Ω    | 3.8     | 1       |
| Inductance            | mH   | 8       | 1.8     |
| Weight                | g    | 386     | 386     |
| Lead Wire No.         |      | 4       | 4       |
| Motor length          | mm   | 48.1    | 48.1    |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| AA        | 0.6096          | 6.35                | 3                         | -                          | -     |
| A         | 0.635           | 6.35                | 3.2                       | -                          | *     |
| B         | 1.2192          | 6.35                | 6.1                       | -                          | -     |
| D         | 1.27            | 6.35                | 6.4                       | -                          | *     |
| F         | 1.5875          | 6.35                | 7.9                       | yes                        | *     |
| J         | 2.4384          | 6.35                | 12.2                      | -                          | -     |
| K         | 2.54            | 6.35                | 12.7                      | yes                        | *     |
| L         | 3.175           | 6.35                | 15.9                      | -                          | *     |
| Q         | 4.8768          | 6.35                | 24.4                      | -                          | -     |
| R         | 5.08            | 6.35                | 25.4                      | -                          | *     |
| S         | 6.35            | 6.35                | 31.8                      | -                          | *     |
| U         | 8.4667          | 6.35                | 42.3                      | -                          | -     |
| W         | 9.7536          | 6.35                | 48.8                      | -                          | *     |
| Y         | 12.7            | 6.35                | 63.5                      | -                          | *     |
| Z         | 25.4            | 6.35                | 127                       | -                          | *     |
| AB        | 1               | 6                   | 5                         | -                          | -     |
| AB        | 1               | 6.35                | 5                         | -                          | -     |
| AB        | 1               | 8                   | 5                         | -                          | -     |
| G         | 2               | 6.35                | 10                        | -                          | -     |
| G         | 2               | 8                   | 10                        | -                          | -     |
| M         | 4               | 8                   | 20                        | -                          | -     |
| T         | 8               | 8                   | 40                        | -                          | -     |
| E         | 5               | 6                   | 25                        | -                          | -     |
| E         | 5               | 8                   | 25                        | -                          | -     |
| C         | 10              | 8                   | 50                        | -                          | -     |
| N         | 0.794           | 6.35                | 4                         | -                          | -     |

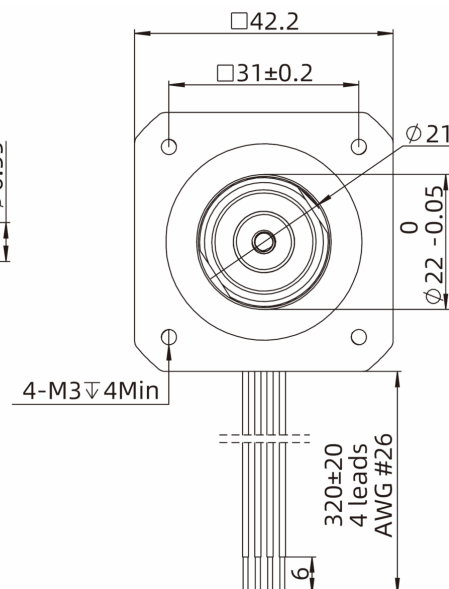
\*custom 9,525mm screw diameter available for external type



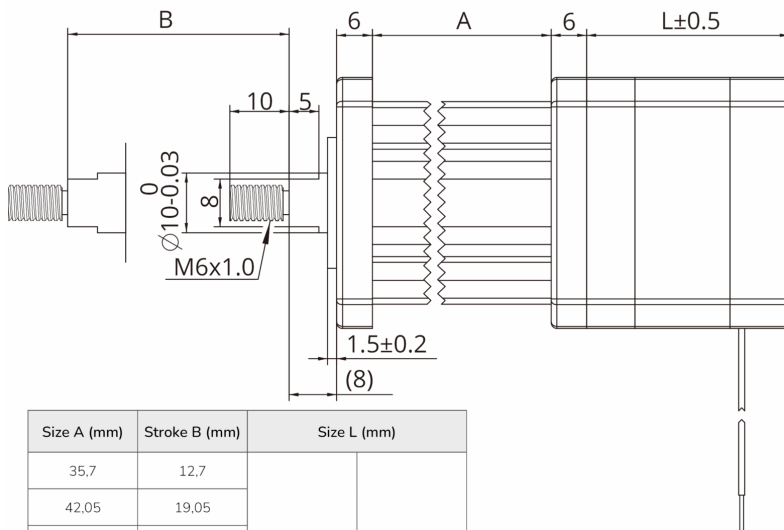
Non-Captive Actuator



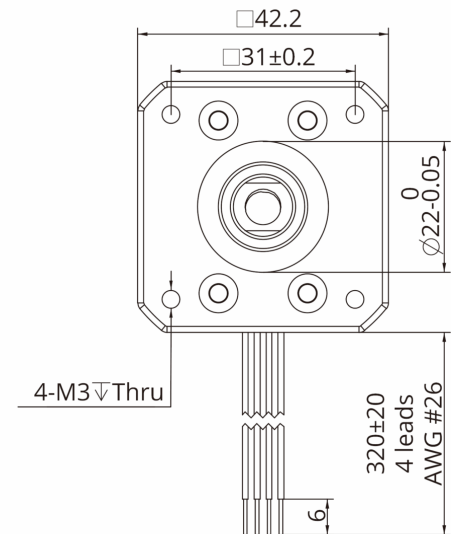
| Size A (mm) | Stroke B (mm) | Size L (mm) |          |
|-------------|---------------|-------------|----------|
|             |               | L = 34,1    | L = 48,1 |
| 18,5        | 12,7          | 3,6         | 0        |
| 24,85       | 19,05         | 9,95        | 4,95     |
| 31,2        | 25,4          | 16,3        | 11,3     |
| 37,55       | 31,8          | 22,65       | 17,65    |
| 43,9        | 38,1          | 29,0        | 24,0     |
| 56,6        | 50,8          | 41,7        | 36,7     |
| 69,3        | 63,5          | 54,4        | 49,4     |



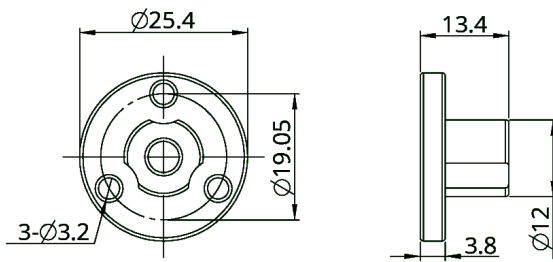
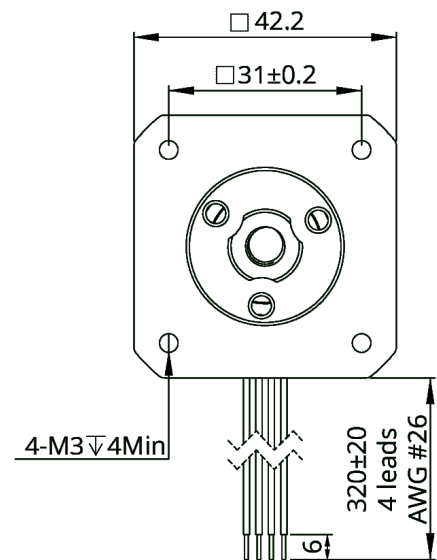
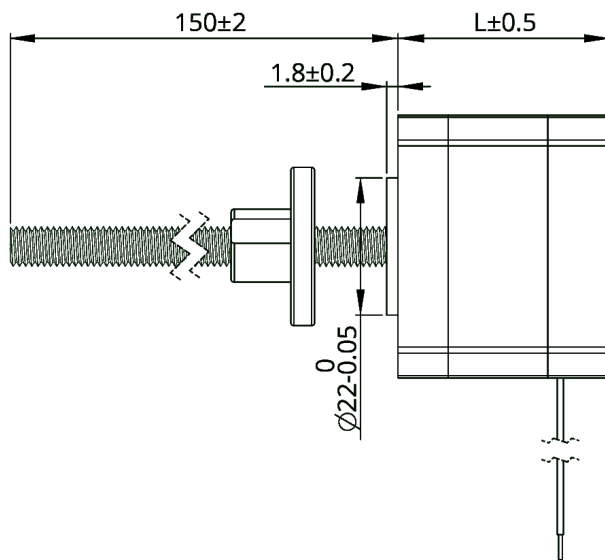
Kaptive Actuator



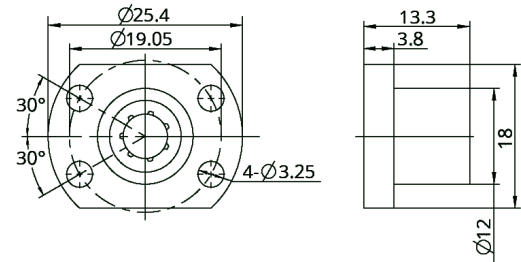
| Size A (mm) | Stroke B (mm) | Size L (mm)                   |                               |
|-------------|---------------|-------------------------------|-------------------------------|
| 35,7        | 12,7          | Single Stack Motor<br>34,1 mm | Double Stack Motor<br>48,1 mm |
| 42,05       | 19,05         |                               |                               |
| 48,4        | 25,4          |                               |                               |
| 54,8        | 31,8          |                               |                               |
| 61,1        | 38,1          |                               |                               |
| 73,8        | 50,8          |                               |                               |
| 86,5        | 63,5          |                               |                               |



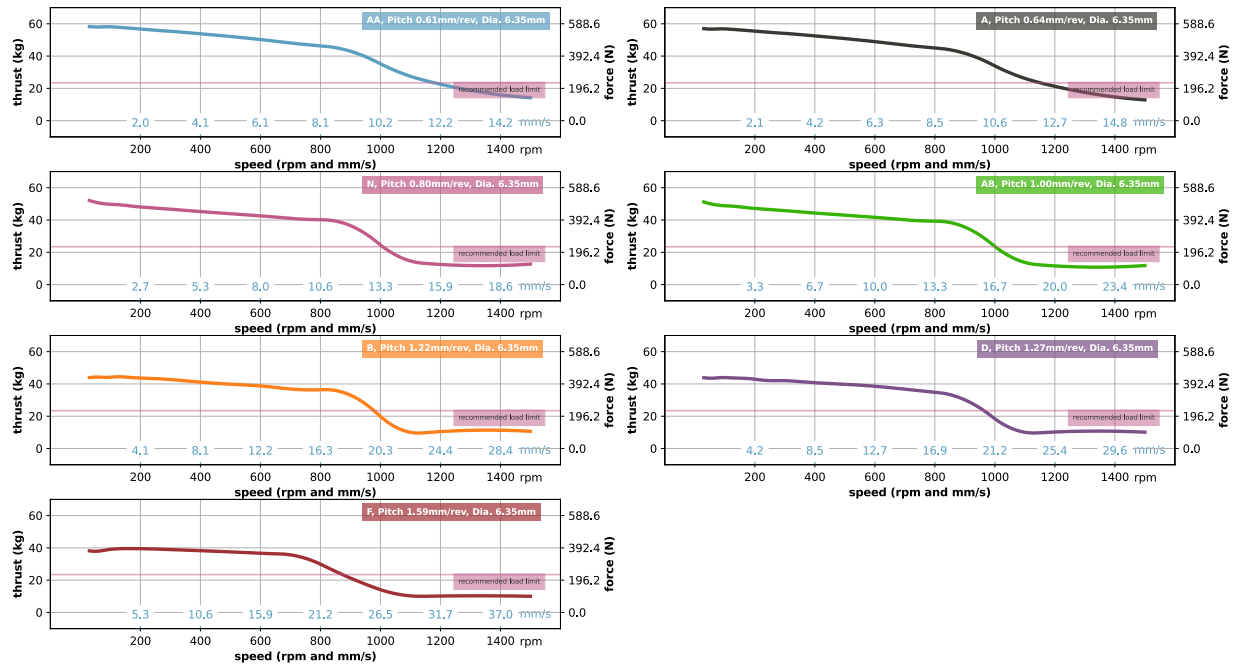
Captive (Electrical Cylinder) Actuator



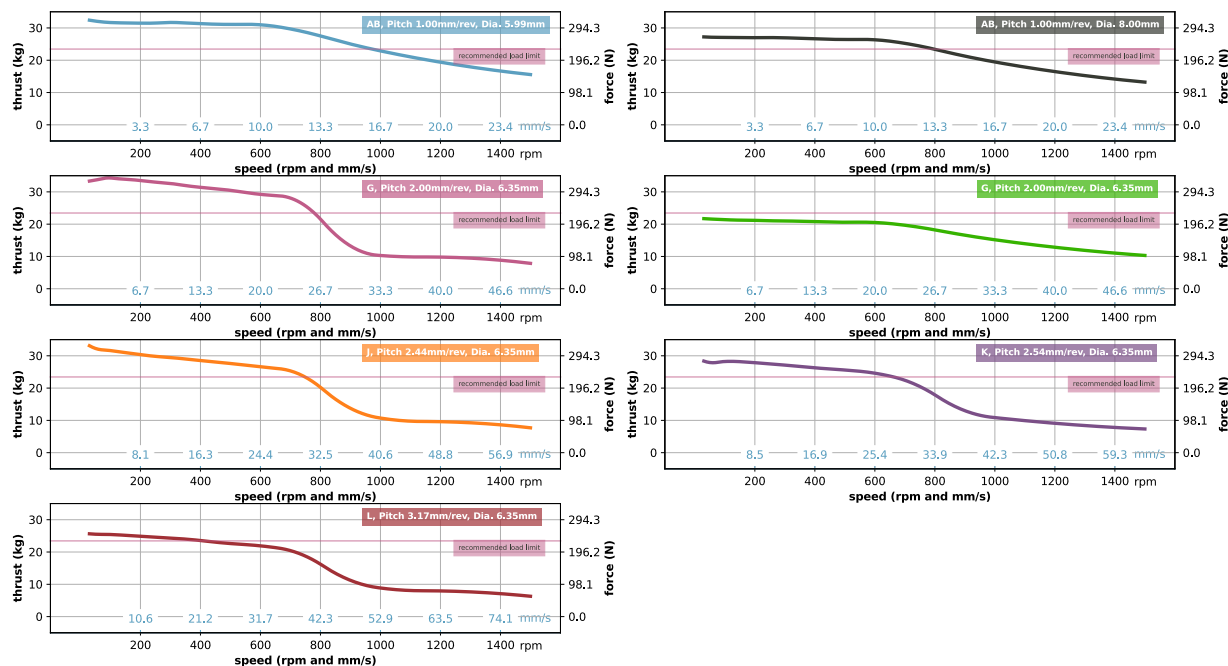
External Actuator



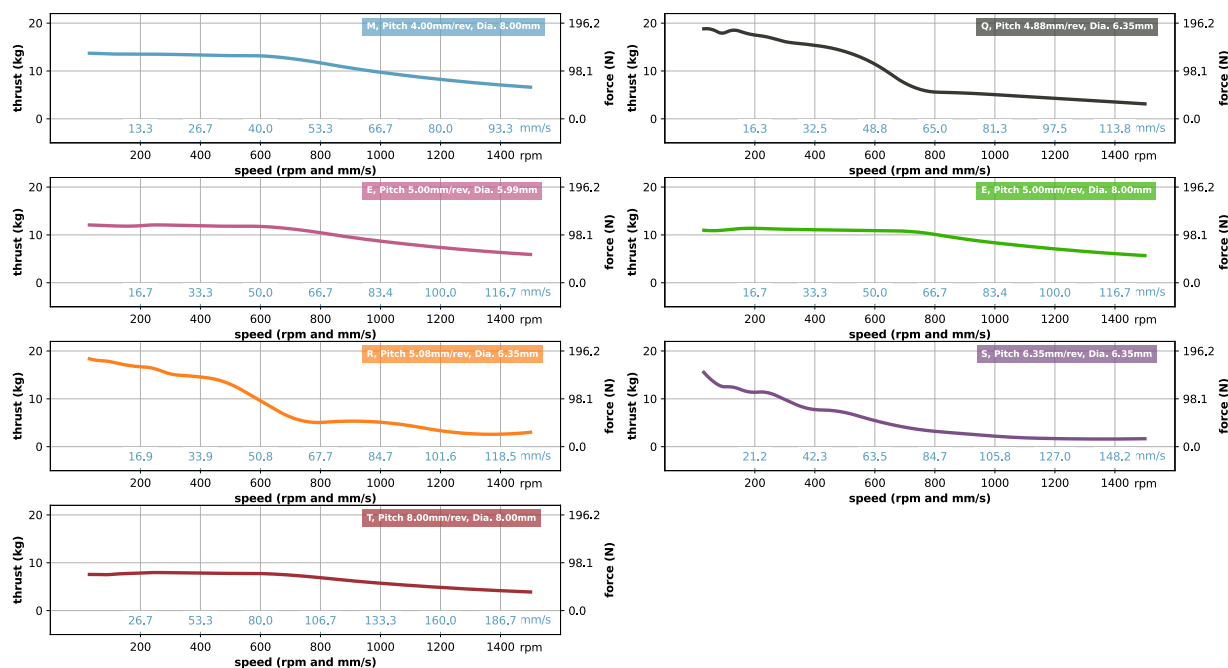
## Speed/Thrust Curves



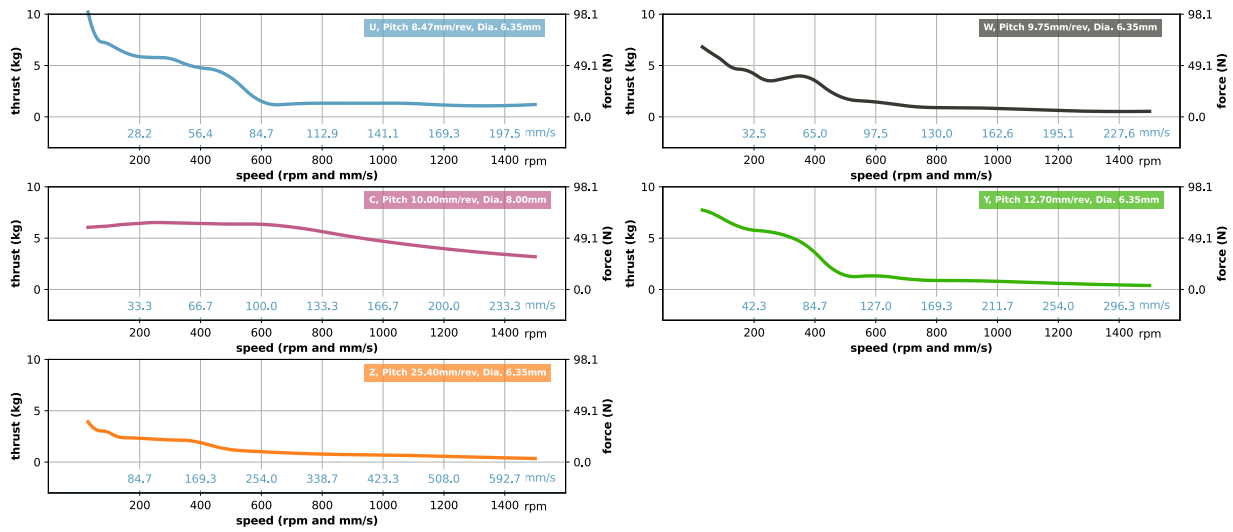
Speed-thrust curves for available screws, motor Nema 17, 17-2115, set 1. Motor driven in two-phase operation with 1.5A



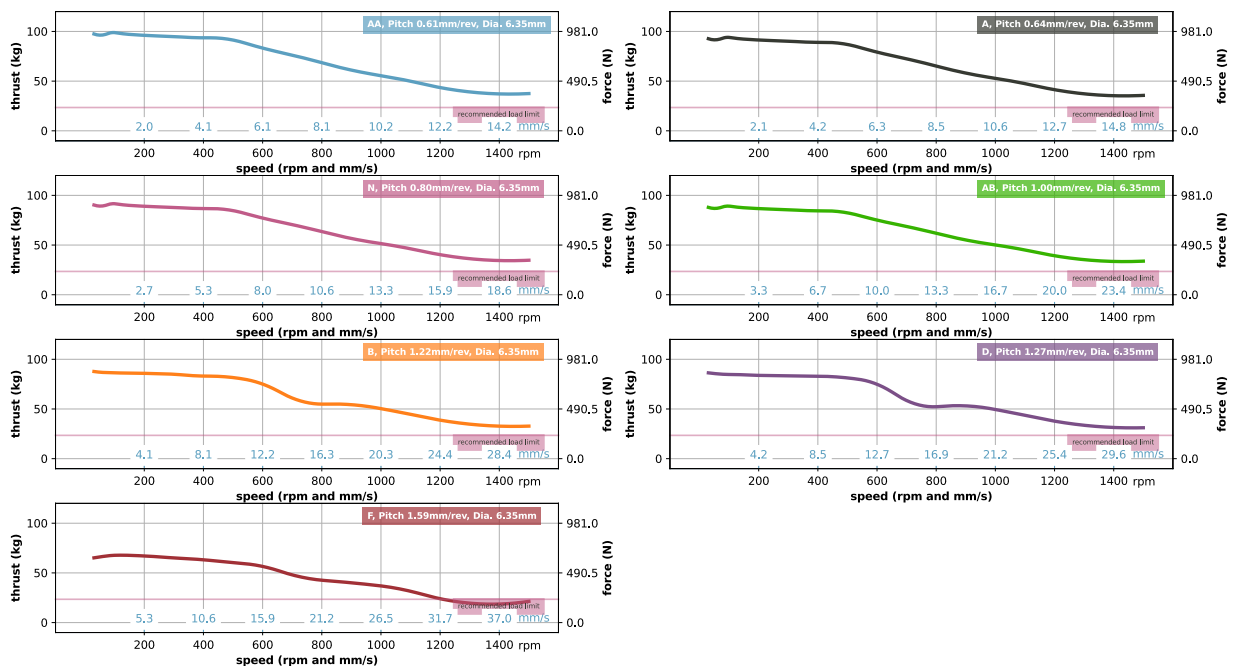
Speed-thrust curves for available screws, motor Nema 17, 17-2115, set 2. Motor driven in two-phase operation with 1.5A



Speed-thrust curves for available screws, motor Nema 17, 17-2115, set 3. Motor driven in two-phase operation with 1.5A

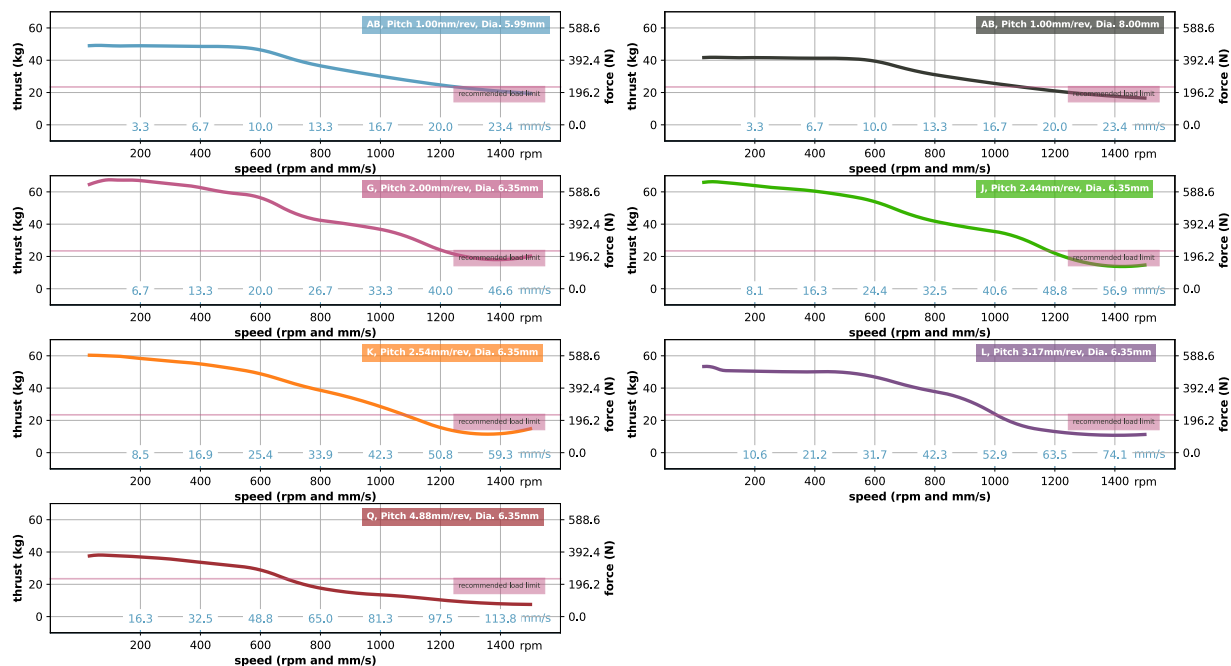


Speed-thrust curves for available screws, motor Nema 17, 17-2115, set 4. Motor driven in two-phase operation with 1.5A

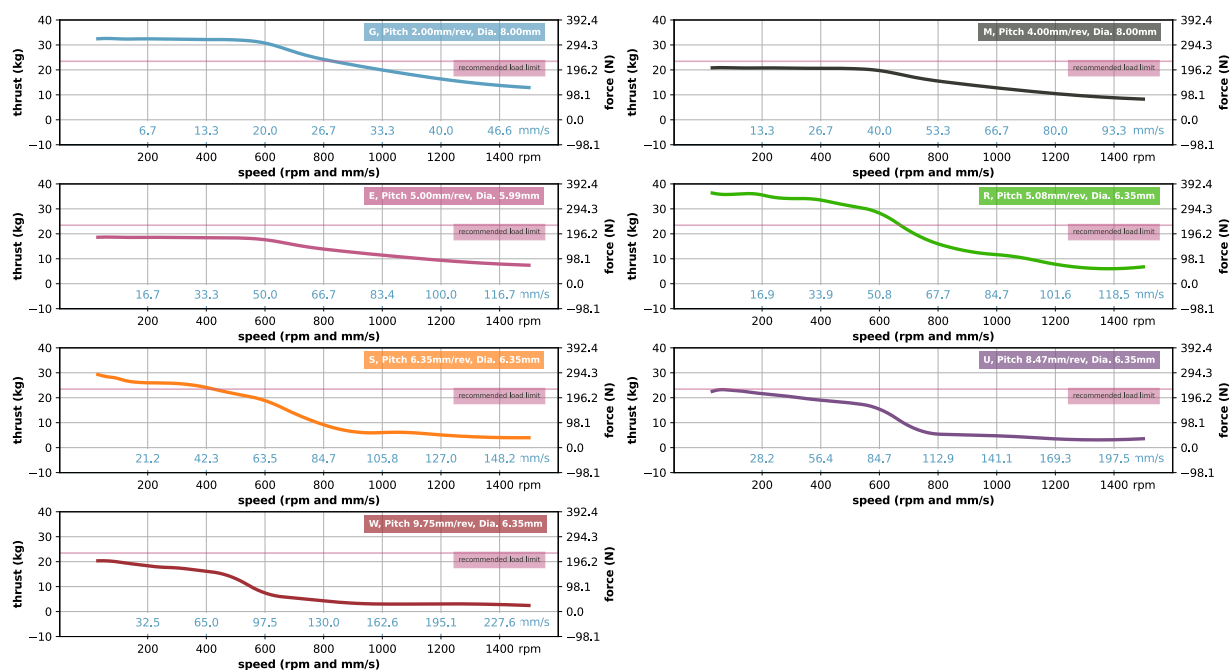


Speed-thrust curves for available screws, motor Nema 17, 17-2225, set 1. Motor driven in two-phase operation with 2.5A

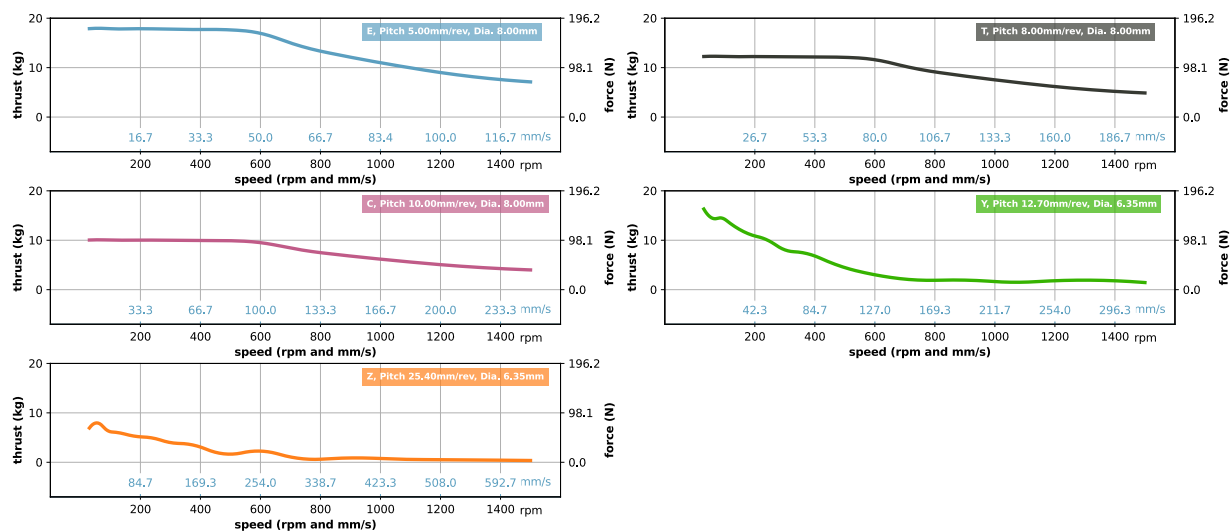




Speed-thrust curves for available screws, motor Nema 17, 17-2225, set 2. Motor driven in two-phase operation with 2.5A



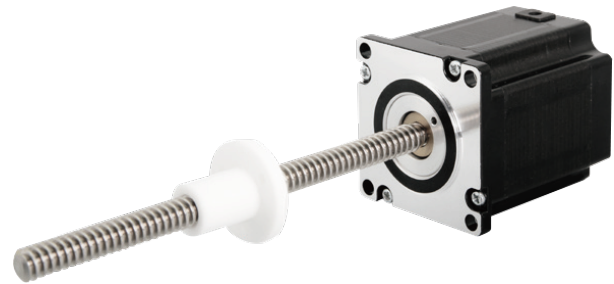
Speed-thrust curves for available screws, motor Nema 17, 17-2225, set 3. Motor driven in two-phase operation with 2.5A



Speed-thrust curves for available screws, motor Nema 17, 17-2225, set 4. Motor driven in two-phase operation with 2.5A

Stepper Lead Screw Linear Actuators, Size 23

# SLSLA - Size 23 [57mm]



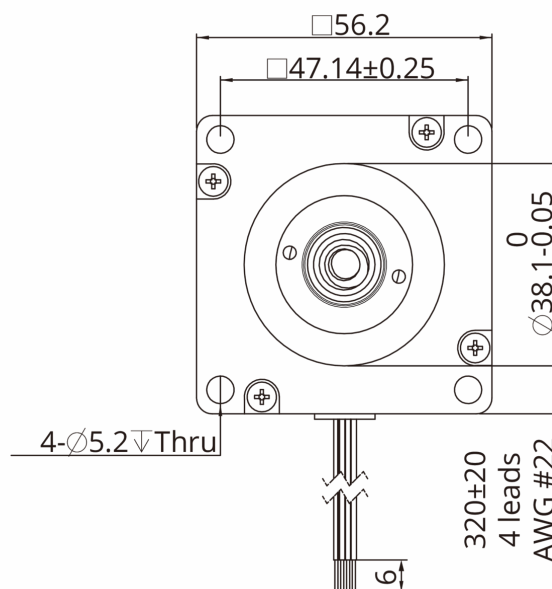
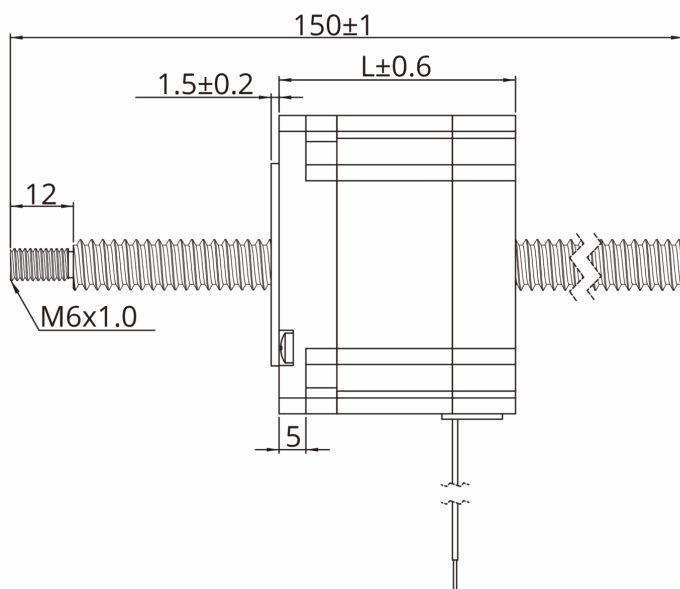
The SLSLA - Size 23 [57mm] Stepper Lead Screw Linear Actuator delivers high performance and extended duty cycles, supporting thrust loads up to 910N. Offered in External, Non-Captive, Captive (Electrical Cylinder), and Kaptive configurations, this family provides multiple screw lead and pitch options, Teflon coating availability, encoder feedback, and customizable screw ends, making it ideal for demanding precision linear motion applications.


<https://www.kocomotion.de/produkt/sls-la-size-23-57mm/>

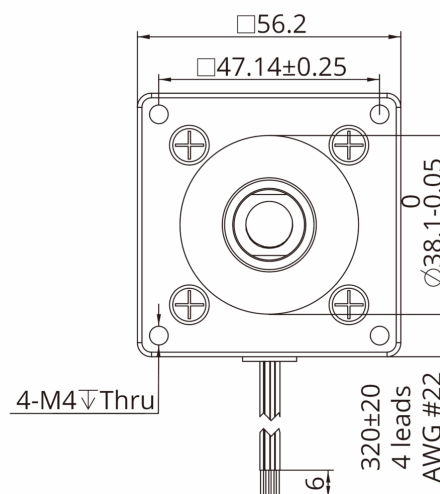
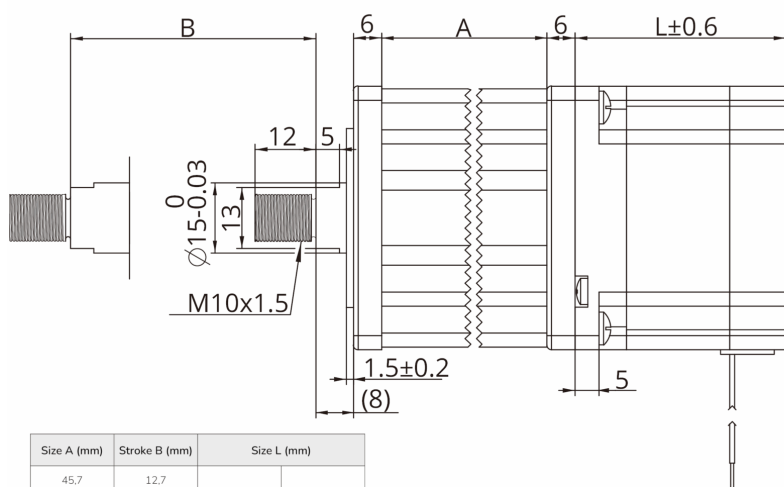
| Motor Characteristics | Unit | 23-2110 | 23-2120 | 23-2130 | 23-2210 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 23      | 23      | 23      | 23      |
| Flange size           | mm   | 57      | 57      | 57      | 57      |
| Rated voltage         | V    | 6.4     | 3.5     | 2.4     | 11.5    |
| Current               | A    | 1       | 2       | 3       | 1       |
| Winding resistance    | Ω    | 6.4     | 1.75    | 0.8     | 11.5    |
| Inductance            | mH   | 16.4    | 4.1     | 1.7     | 32      |
| Weight                | g    | 585     | 585     | 585     | 880     |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 45      | 45      | 45      | 65      |

| Motor Characteristics | Unit | 23-2225 | 23-2240 |
|-----------------------|------|---------|---------|
| Size                  | Nema | 23      | 23      |
| Flange size           | mm   | 57      | 57      |
| Rated voltage         | V    | 5       | 2.8     |
| Current               | A    | 2.5     | 4       |
| Winding resistance    | Ω    | 2       | 0.7     |
| Inductance            | mH   | 5.2     | 2       |
| Weight                | g    | 880     | 880     |
| Lead Wire No.         |      | 4       | 4       |
| Motor length          | mm   | 65      | 65      |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| A         | 0.635           | 9.525               | 3.2                       | -                          | -     |
| D         | 1.27            | 9.525               | 6.4                       | -                          | -     |
| F         | 1.5875          | 9.525               | 7.9                       | -                          | -     |
| H         | 2.1167          | 9.525               | 10.6                      | -                          | -     |
| K         | 2.54            | 9.525               | 12.7                      | yes                        | *     |
| L         | 3.175           | 9.525               | 15.9                      | -                          | *     |
| P         | 4.2333          | 9.525               | 21.2                      | -                          | -     |
| R         | 5.08            | 9.525               | 25.4                      | -                          | *     |
| S         | 6.35            | 9.525               | 31.8                      | -                          | *     |
| V         | 9.525           | 9.525               | 47.6                      | -                          | -     |
| W         | 9.7536          | 9.525               | 48.8                      | -                          | -     |
| X         | 10.16           | 9.525               | 50.8                      | -                          | -     |
| Y         | 12.7            | 9.525               | 63.5                      | -                          | *     |
| Z         | 25.4            | 9.525               | 127                       | -                          | *     |
| Z         | 25.4            | 12.7                | 127                       | -                          | -     |
| G         | 2               | 10                  | 10                        | -                          | -     |
| G         | 2               | 12                  | 10                        | -                          | -     |
| E         | 5               | 12                  | 25                        | -                          | -     |
| C         | 10              | 10                  | 50                        | -                          | -     |
| C         | 10              | 12                  | 50                        | -                          | -     |
| I         | 20              | 10                  | 100                       | -                          | -     |
| CE        | 15              | 12                  | 75                        | -                          | -     |
| IE        | 25              | 12                  | 125                       | -                          | -     |

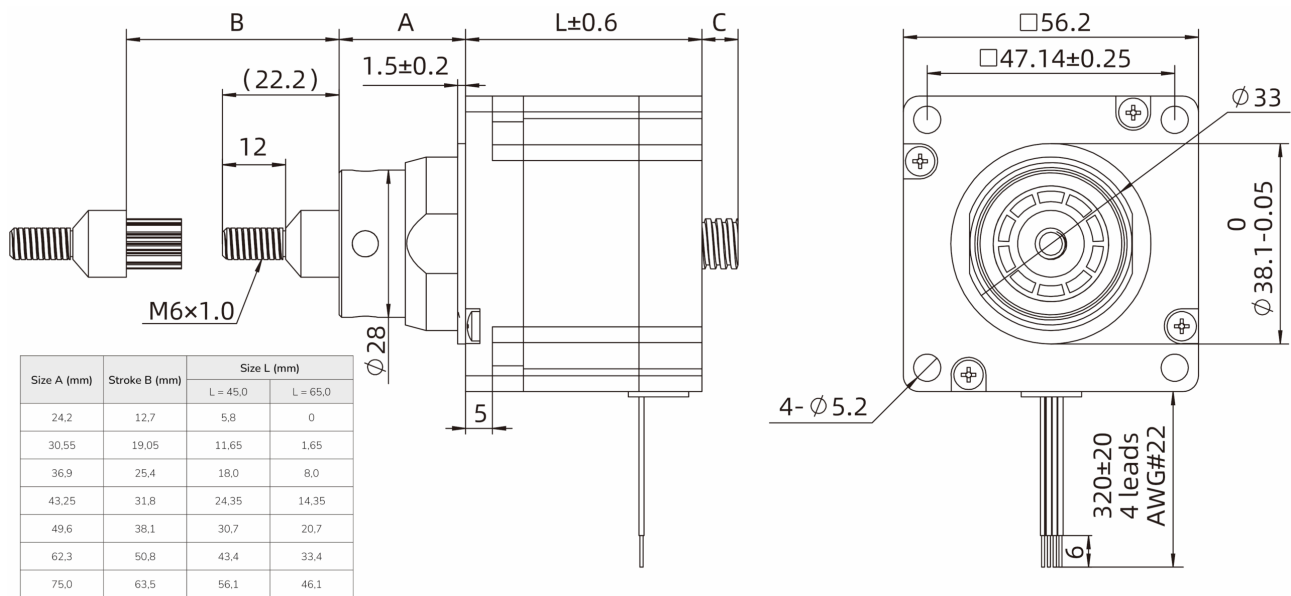


Non-Captive Actuator

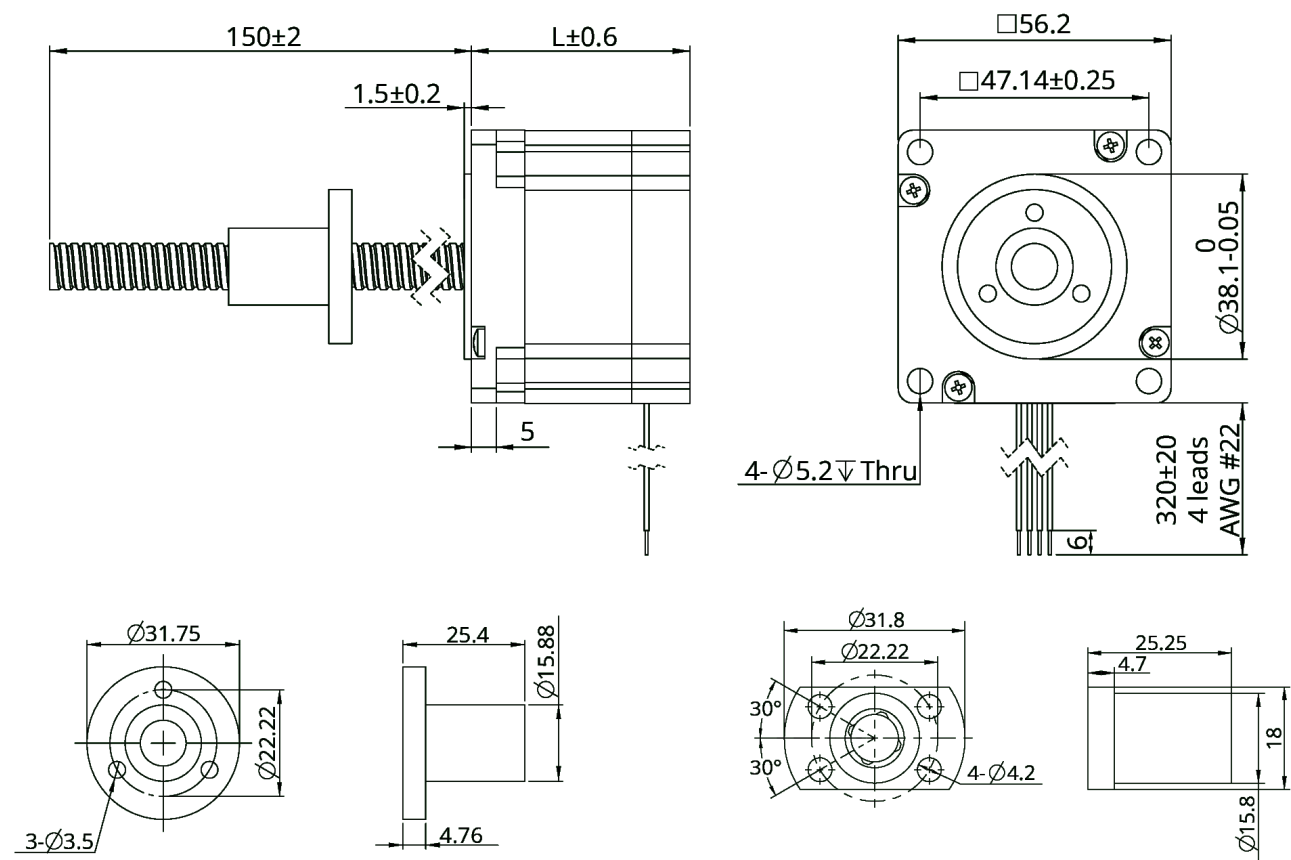


| Size A (mm) | Stroke B (mm) | Size L (mm)                   |                               |
|-------------|---------------|-------------------------------|-------------------------------|
| 45.7        | 12.7          | Single Stack Motor<br>45.0 mm | Double Stack Motor<br>65.0 mm |
| 52.05       | 19.05         |                               |                               |
| 58.4        | 25.4          |                               |                               |
| 64.8        | 31.8          |                               |                               |
| 71.1        | 38.1          |                               |                               |
| 83.8        | 50.8          |                               |                               |
| 96.5        | 63.5          |                               |                               |

Captive (Electrical Cylinder) Actuator

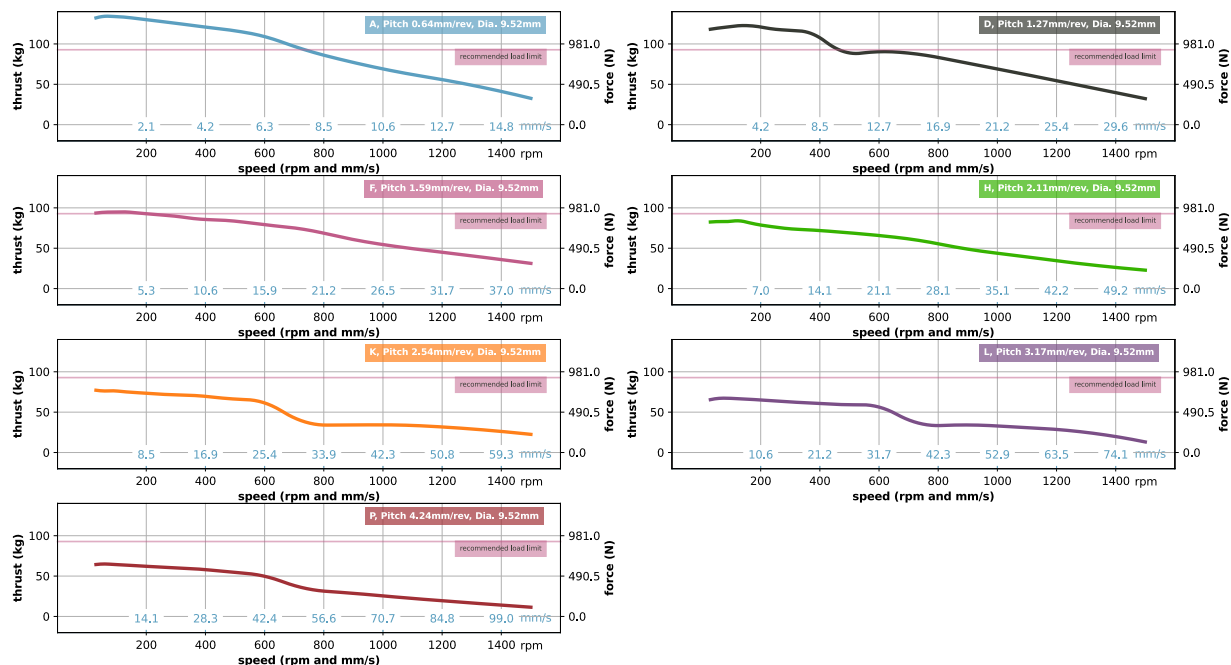


Kaptive Actuator

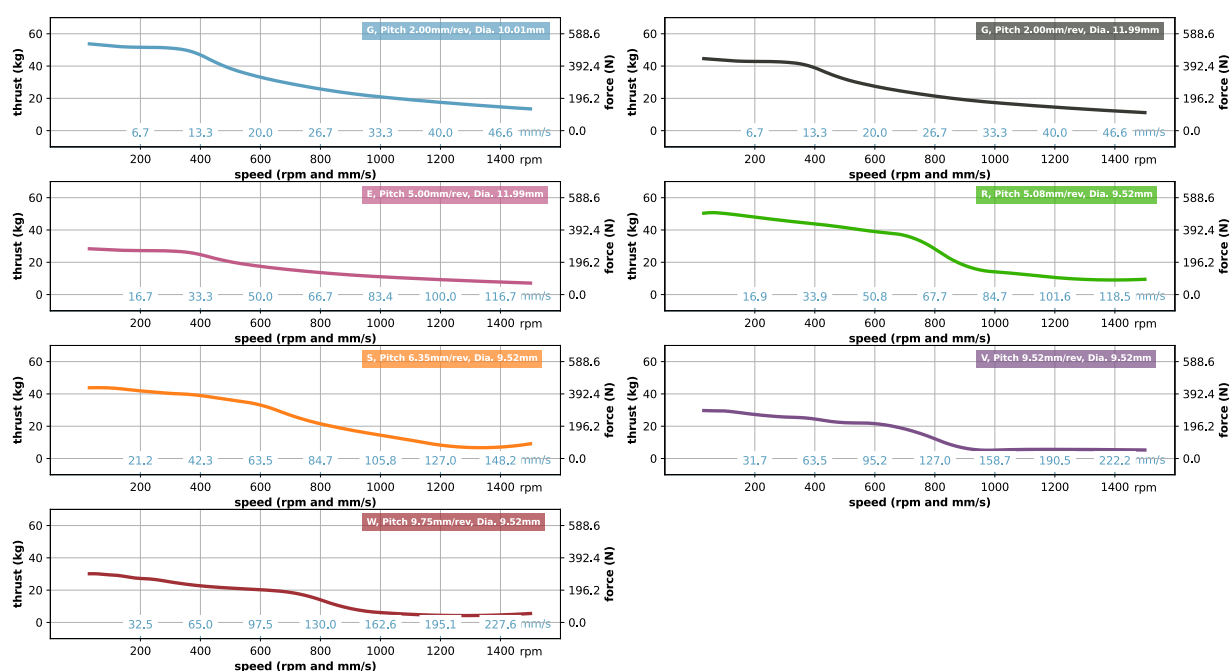


External Actuator

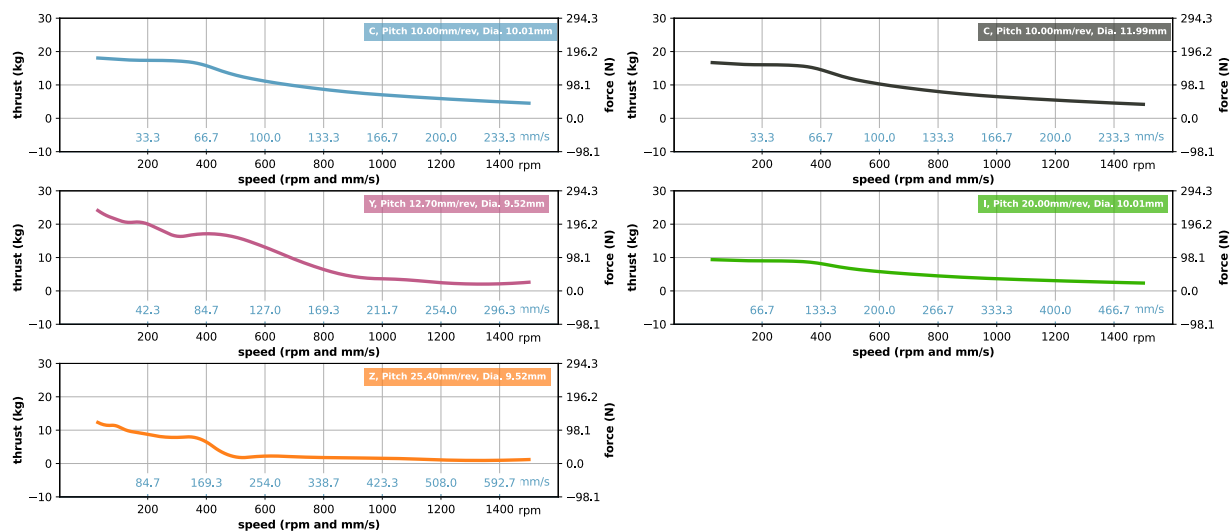
## Speed/Thrust Curves



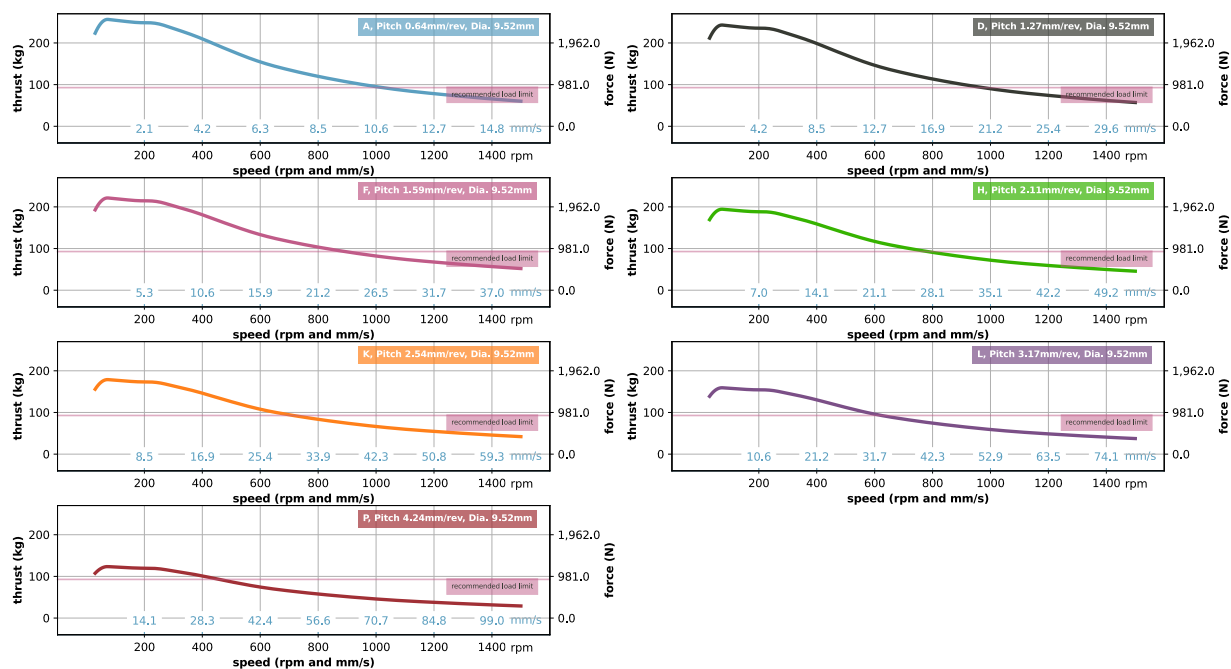
Speed-thrust curves for available screws, motor Nema 23, 23-2120, set 1. Motor driven in two-phase operation with 2A



Speed-thrust curves for available screws, motor Nema 23, 23-2120, set 2. Motor driven in two-phase operation with 2A

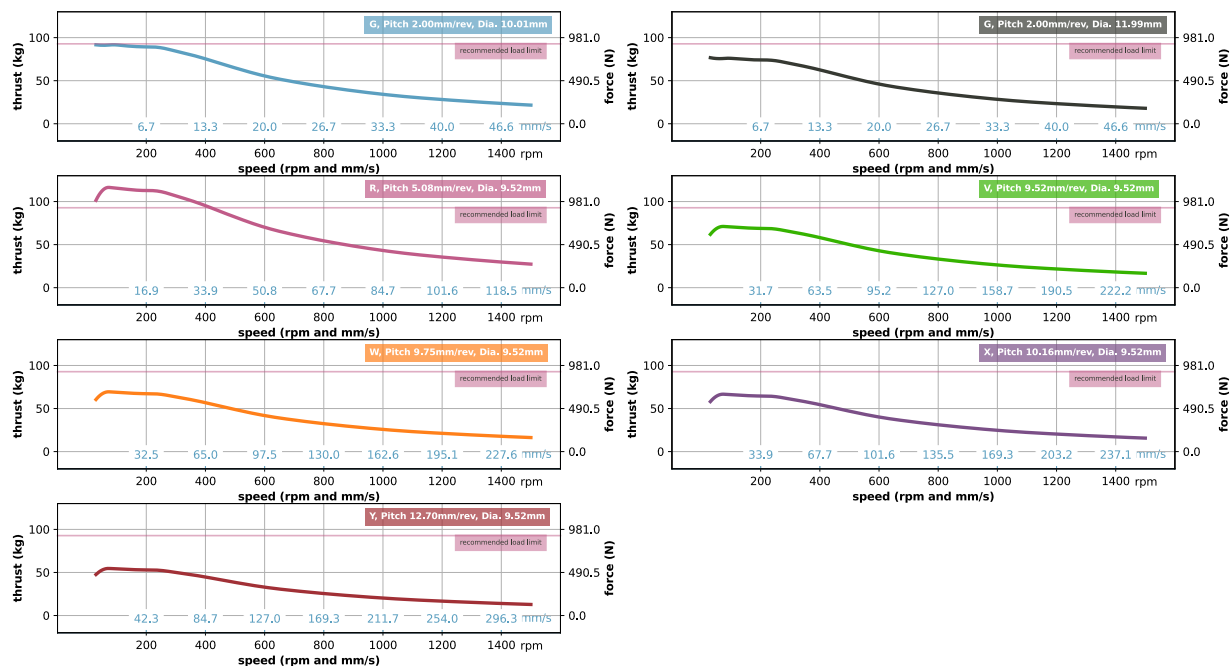


Speed-thrust curves for available screws, motor Nema 23, 23-2120, set 3. Motor driven in two-phase operation with 2A

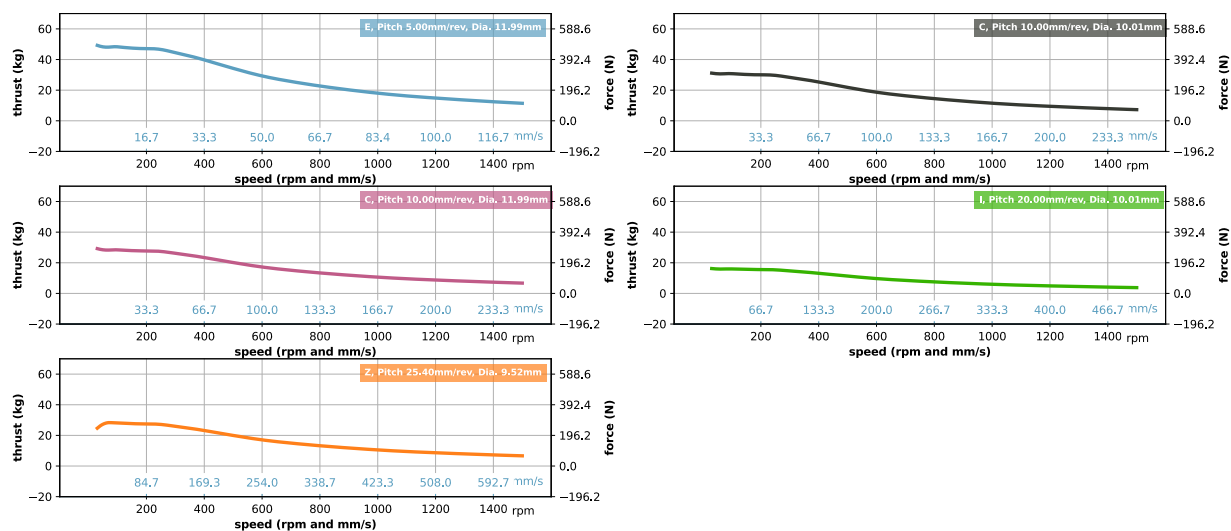


Speed-thrust curves for available screws, motor Nema 23, 23-2225, set 1. Motor driven in two-phase operation with 2.5A





Speed-thrust curves for available screws, motor Nema 23, 23-2225, set 2. Motor driven in two-phase operation with 2.5A



Speed-thrust curves for available screws, motor Nema 23, 23-2225, set 3. Motor driven in two-phase operation with 2.5A

High-Force Stepper Lead Screw Linear Actuator, 60mm  
(NEMA 24)

## SLSLA - Size 24 [60mm]

The SLSLA - Size 24 [60mm] Stepper Lead Screw Linear Actuator delivers high performance, a long working cycle, and can handle loads up to 1050N. Available in four distinct form factors, it features multiple screw pitches and encoder options. Designed for versatile automation, this actuator supports precise linear motion in demanding industrial environments.



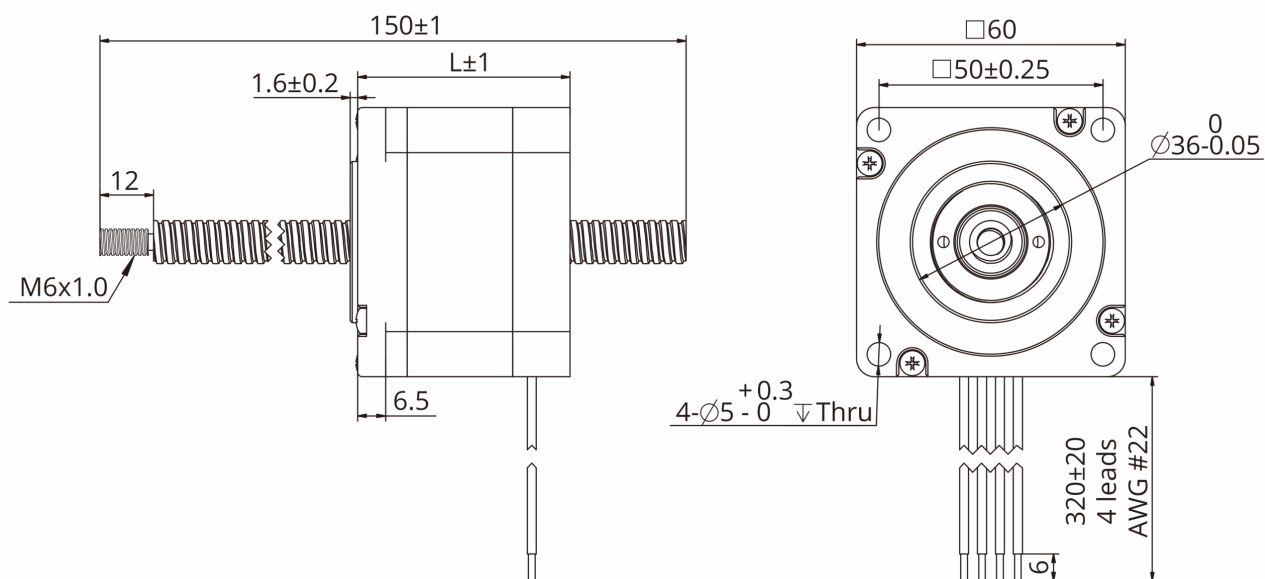
<https://www.kocomotion.de/produkt/slsla-size-24-60mm/>

| Motor Characteristics | Unit | 24-2120 | 24-2130 | 24-2140 | 24-2230 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 24      | 24      | 24      | 24      |
| Flange size           | mm   | 60      | 60      | 60      | 60      |
| Rated voltage         | V    | 3       | 1.8     | 1.6     | 3       |
| Current               | A    | 2       | 3       | 4       | 3       |
| Winding resistance    | Ω    | 1.5     | 0.6     | 0.4     | 1       |
| Inductance            | mH   | 3.9     | 1.6     | 0.9     | 3.4     |
| Weight                | g    | 680     | 680     | 680     | 1080    |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 47      | 47      | 47      | 68.3    |

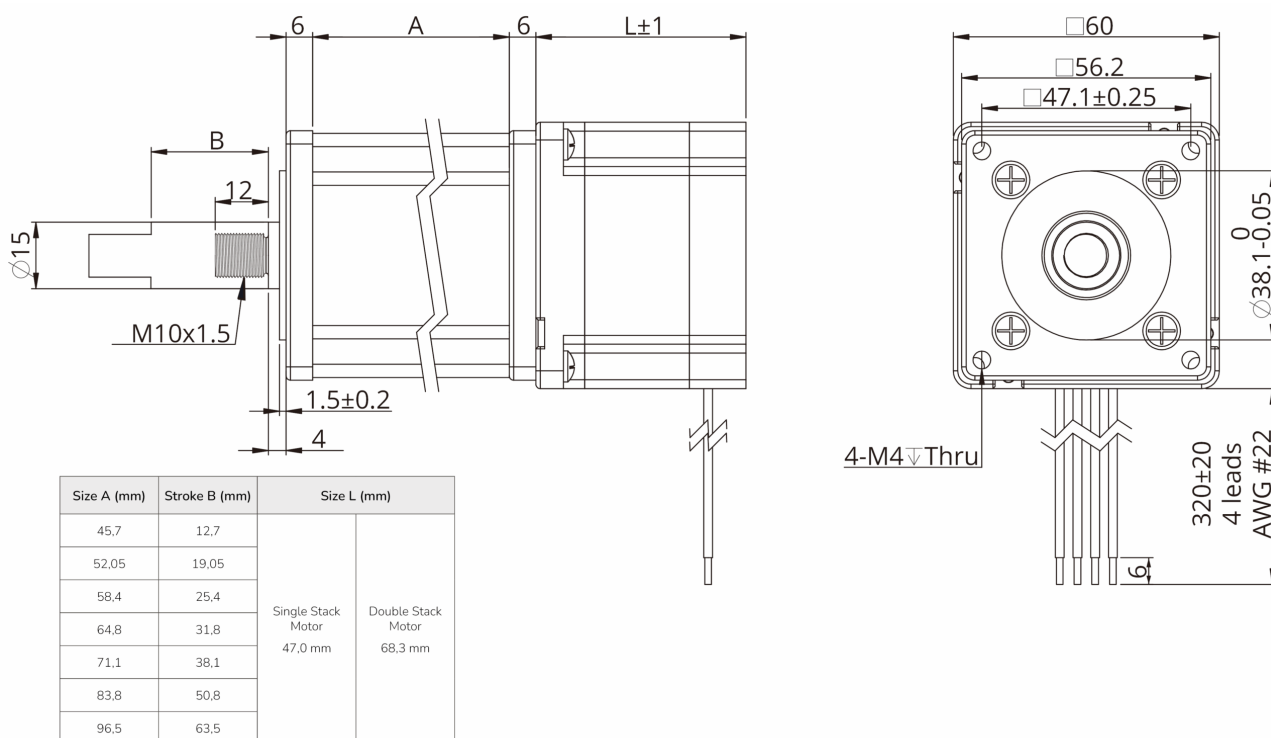
| Motor Characteristics | Unit     | 24-2240 | 24-2250 |
|-----------------------|----------|---------|---------|
| Size                  | Nema     | 24      | 24      |
| Flange size           | mm       | 60      | 60      |
| Rated voltage         | V        | 2.4     | 1.5     |
| Current               | A        | 4       | 5       |
| Winding resistance    | $\Omega$ | 0.6     | 0.3     |
| Inductance            | mH       | 1.9     | 1.2     |
| Weight                | g        | 1080    | 1080    |
| Lead Wire No.         |          | 4       | 4       |
| Motor length          | mm       | 68.3    | 68.3    |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| A         | 0.635           | 9.525               | 3.2                       | -                          | -     |
| D         | 1.27            | 9.525               | 6.4                       | -                          | -     |
| F         | 1.5875          | 9.525               | 7.9                       | -                          | -     |
| H         | 2.1167          | 9.525               | 10.6                      | -                          | -     |
| K         | 2.54            | 9.525               | 12.7                      | Yes                        | *     |
| L         | 3.175           | 9.525               | 15.9                      | -                          | *     |
| P         | 4.2333          | 9.525               | 21.2                      | -                          | -     |
| R         | 5.08            | 9.525               | 25.4                      | -                          | *     |
| S         | 6.35            | 9.525               | 31.8                      | -                          | *     |
| V         | 9.525           | 9.525               | 47.6                      | -                          | -     |
| W         | 9.7536          | 9.525               | 48.8                      | -                          | -     |
| X         | 10.16           | 9.525               | 50.8                      | -                          | -     |
| Y         | 12.7            | 9.525               | 63.5                      | -                          | *     |
| Z         | 25.4            | 9.525               | 127                       | -                          | *     |
| Z         | 25.4            | 12.7                | 127                       | -                          | *     |
| G         | 2               | 10                  | 10                        | -                          | -     |
| G         | 2               | 12                  | 10                        | -                          | -     |
| E         | 5               | 12                  | 25                        | -                          | -     |
| C         | 10              | 10                  | 50                        | -                          | -     |
| C         | 10              | 12                  | 50                        | -                          | -     |
| I         | 20              | 10                  | 100                       | -                          | -     |
| CE        | 15              | 12                  | 75                        | -                          | -     |
| IE        | 25              | 12                  | 125                       | -                          | -     |

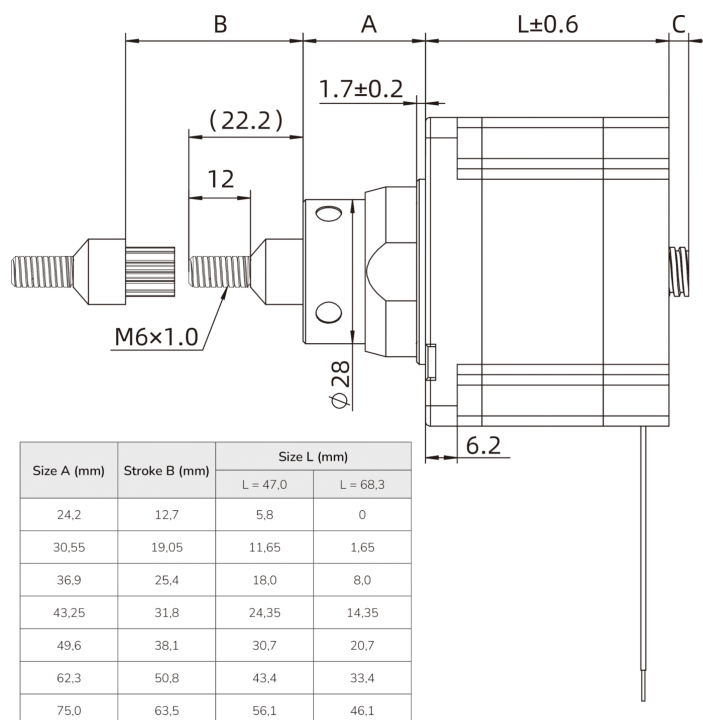
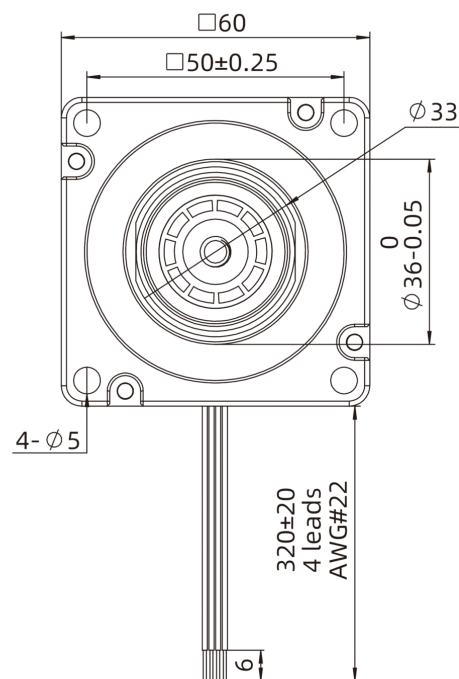
\*custom 15,875mm screw diameter available for external type

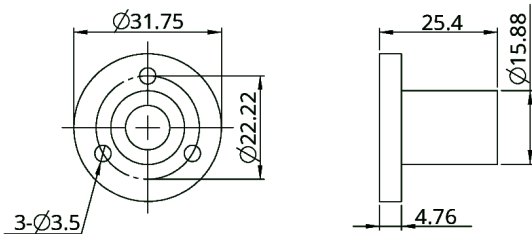
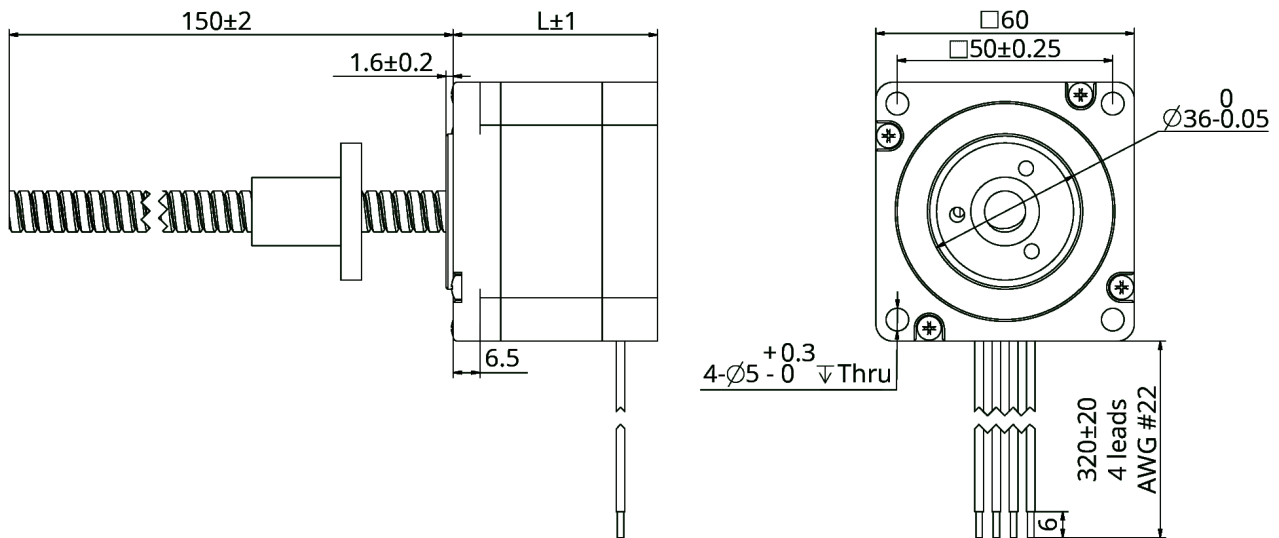


Non-Captive Actuator

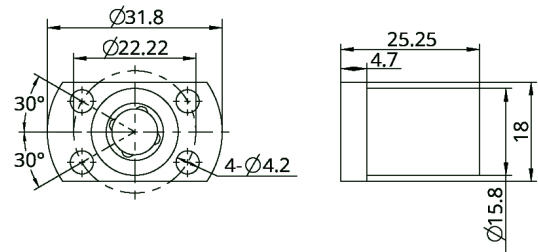


Captive (Electrical Cylinder) Actuator

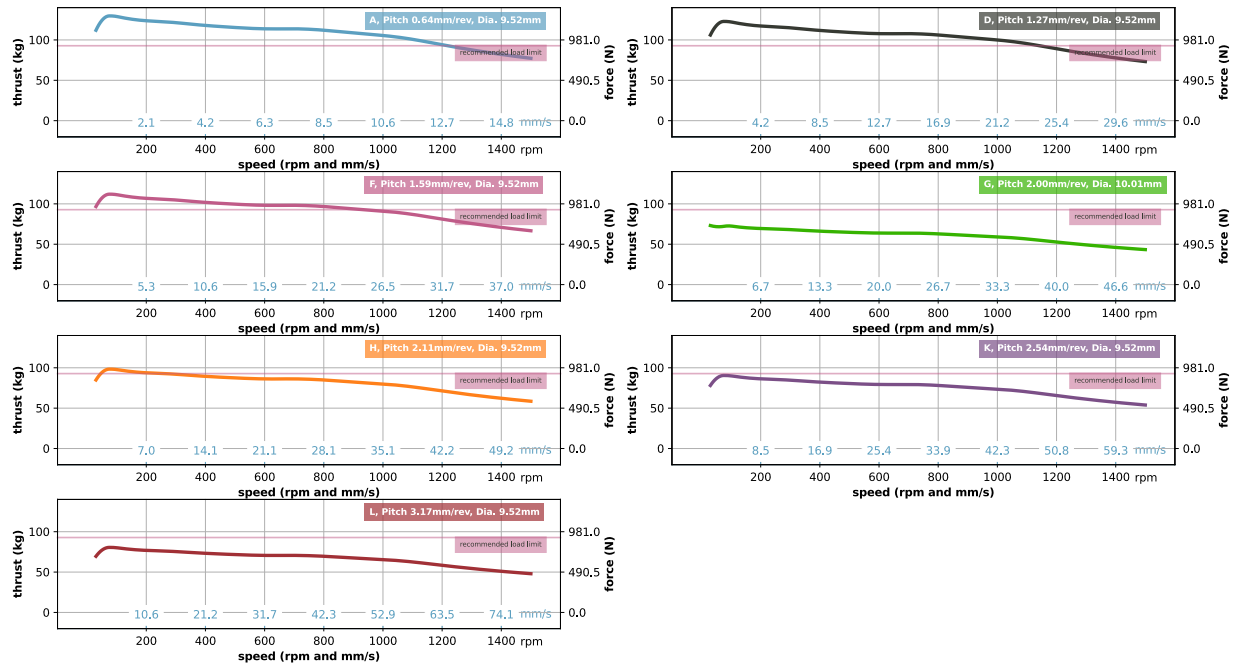
*Kaptive Actuator*



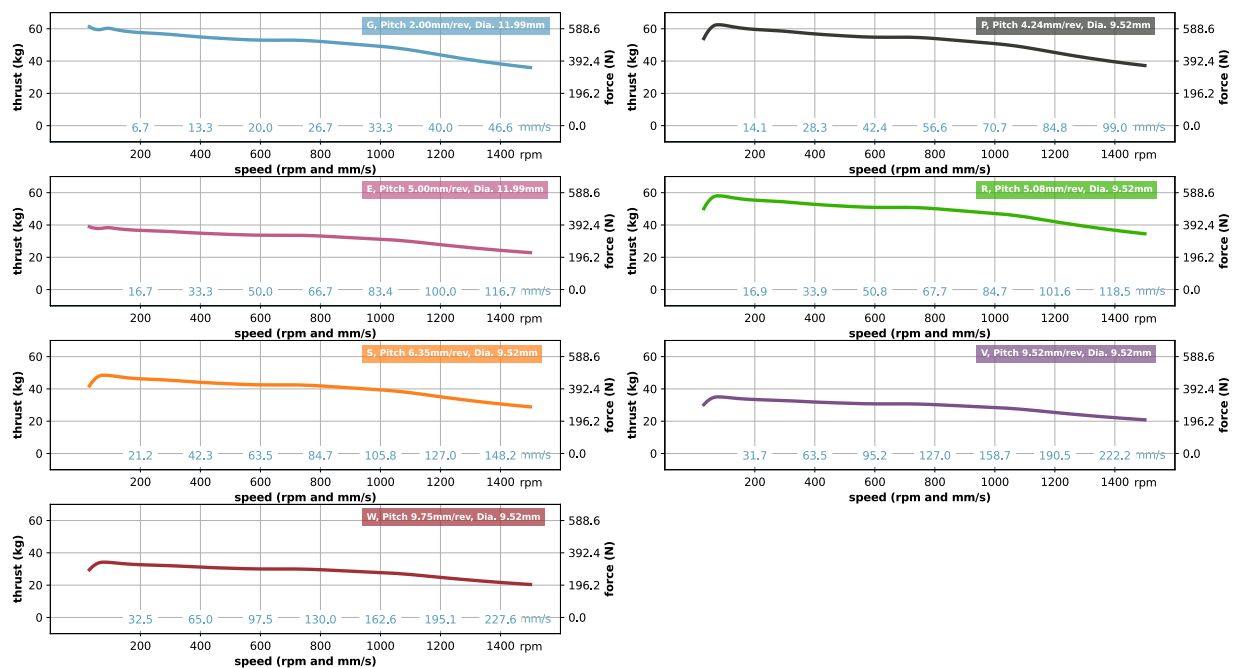
External Actuator



## Speed/Thrust Curves

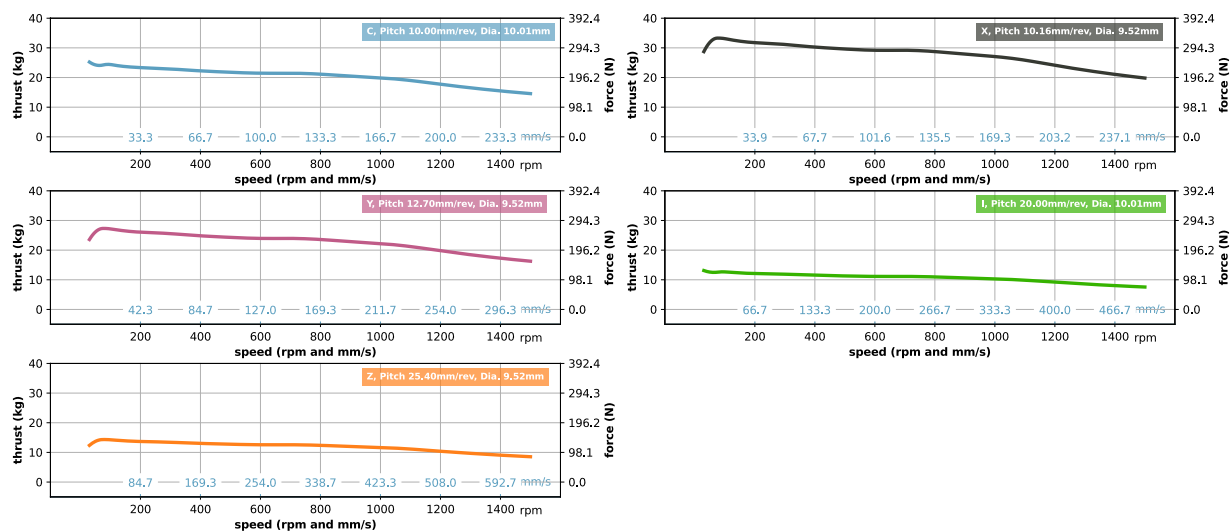


Speed-thrust curves for available screws, motor Nema 24, 24-2130, set 1. Motor driven in two-phase operation with 3A

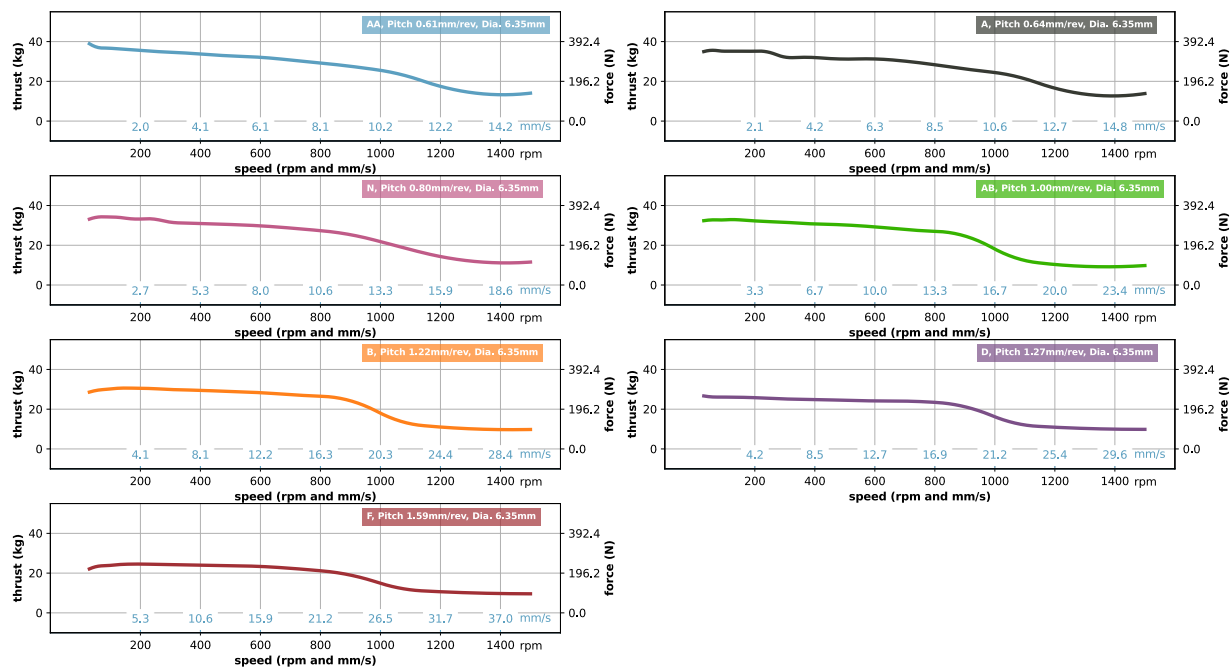


Speed-thrust curves for available screws, motor Nema 24, 24-2130, set 2. Motor driven in two-phase operation with 3A

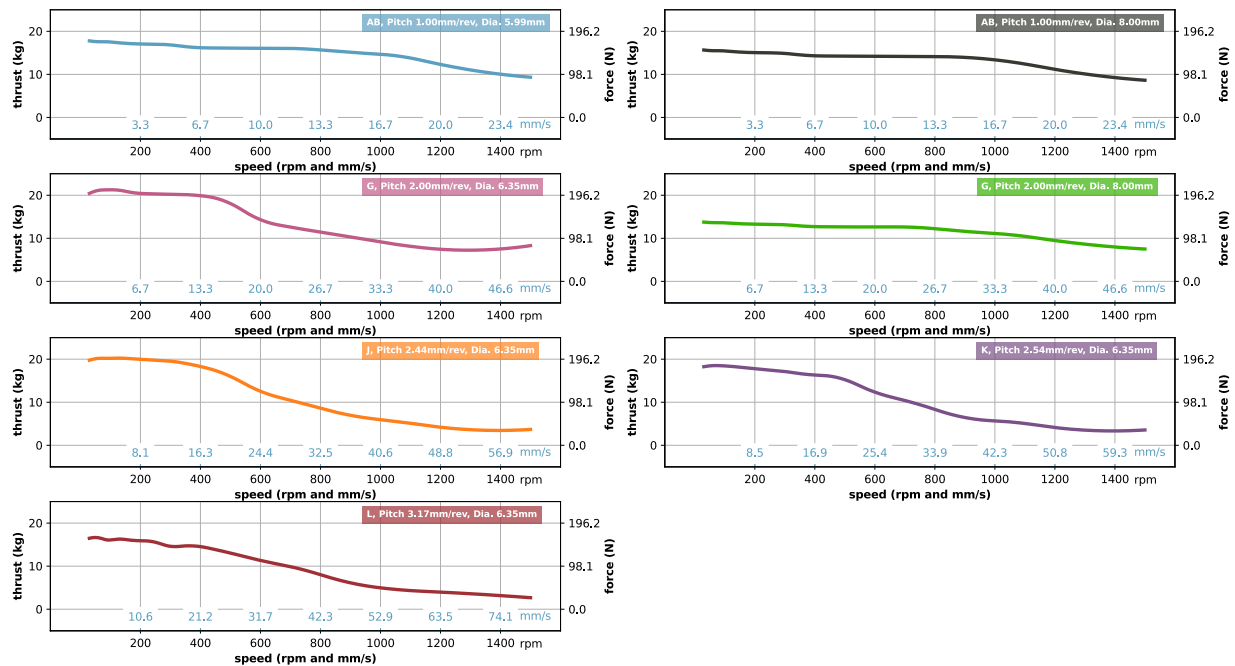




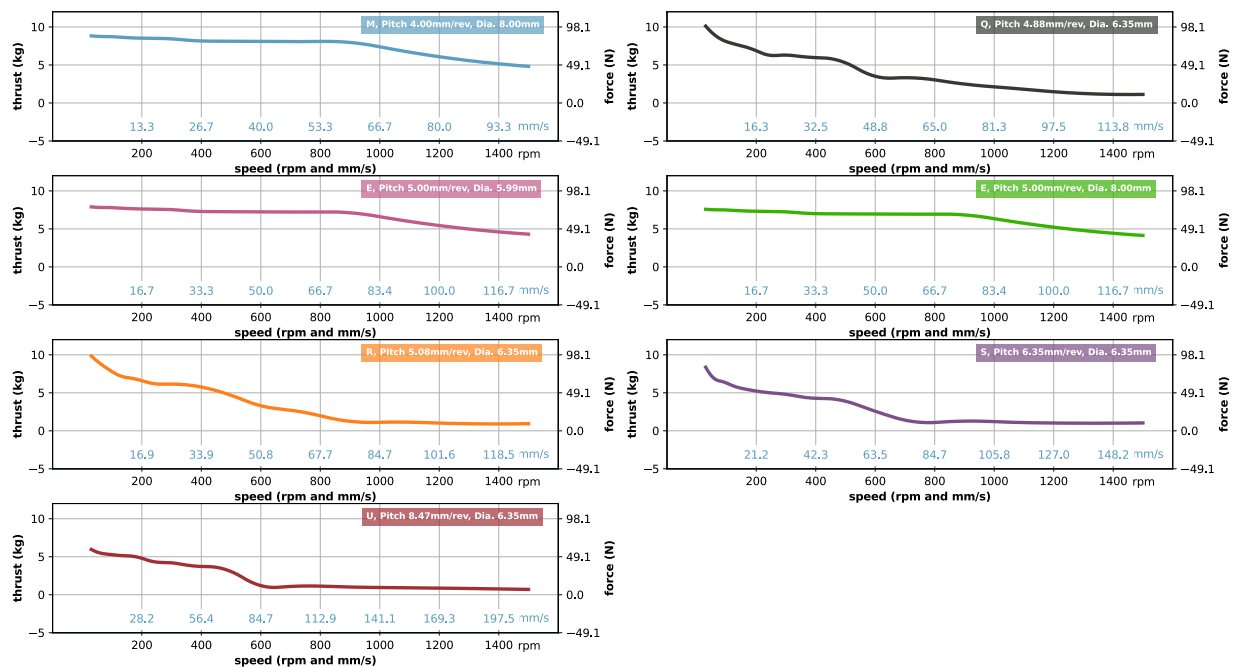
Speed-thrust curves for available screws, motor Nema 24, 24-2130, set 3. Motor driven in two-phase operation with 3A



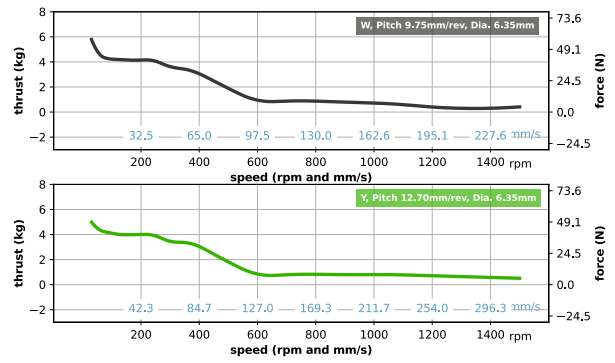
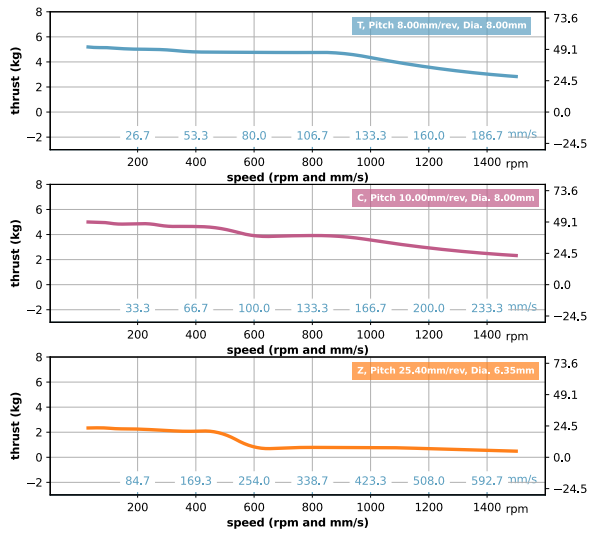
Speed-thrust curves for available screws, motor Nema 24, 24-2240, set 1. Motor driven in two-phase operation with 4A



Speed-thrust curves for available screws, motor Nema 24, 24-2240, set 2. Motor driven in two-phase operation with 4A



Speed-thrust curves for available screws, motor Nema 24, 24-2240, set 3. Motor driven in two-phase operation with 4A

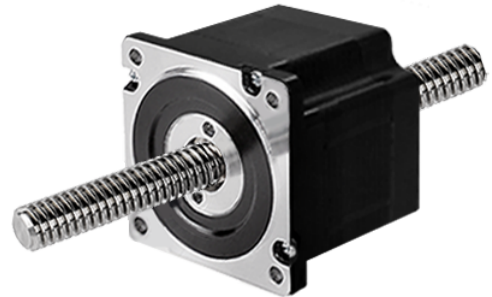


Speed-thrust curves for available screws, motor Nema 24, 24-2240, set 4. Motor driven in two-phase operation with 4A

High-Thrust Stepper Linear Actuators

# SLSLA - Size 34 [86mm]

The SLSLA Size 34 [86mm] Stepper Lead Screw Linear Actuator delivers up to 2270N of continuous thrust, making it ideal for demanding automation tasks. Available in External and Non-Captive layouts, this largest-format actuator series features 15.875mm screw diameter, multiple lead pitches, encoder options, Teflon coating, and custom screw end machining. Engineered for reliability in industrial, packaging, and material handling applications.

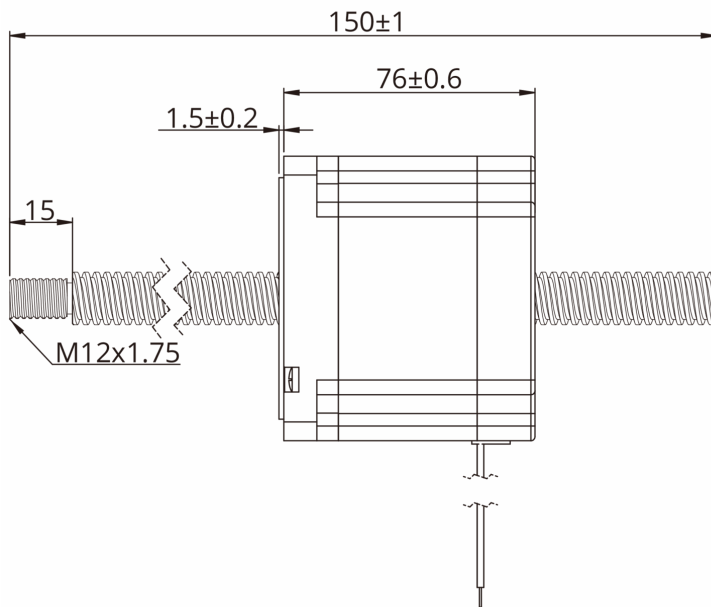

<https://www.kocomotion.de/produkt/slsla-size-34-86mm/>

| Motor Characteristics | Unit | 34-2113 | 34-2130 | 34-2155 |
|-----------------------|------|---------|---------|---------|
| Size                  | Nema | 34      | 34      | 34      |
| Flange size           | mm   | 86      | 86      | 86      |
| Rated voltage         | V    | 12      | 5.7     | 2.85    |
| Current               | A    | 1.3     | 3       | 5.5     |
| Winding resistance    | Ω    | 9.2     | 1.9     | 0.52    |
| Inductance            | mH   | 71      | 15      | 4.5     |
| Weight                | g    | 2370    | 2370    | 2370    |
| Lead Wire No.         |      | 4       | 4       | 4       |
| Motor length          | mm   | 76      | 76      | 76      |

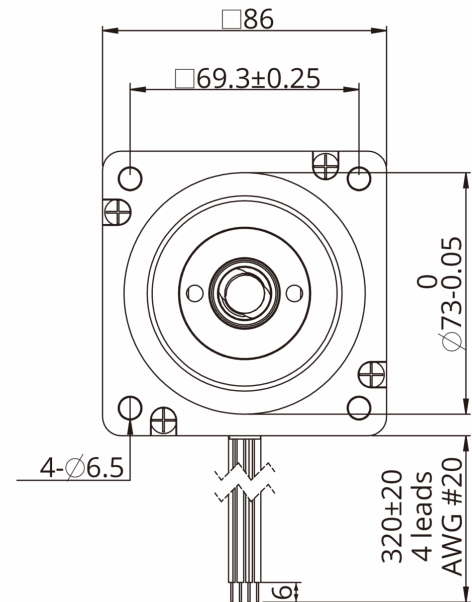
| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [μm] | Left-hand thread available | Notes |
|-----------|-----------------|---------------------|---------------------------|----------------------------|-------|
| K         | 2.54            | 15.875              | 12.7                      | -                          | *     |
| L         | 3.175           | 15.875              | 15.9                      | -                          | *     |
| R         | 5.08            | 15.875              | 25.4                      | -                          | *     |
| S         | 6.35            | 15.875              | 31.8                      | -                          | *     |
| Y         | 12.7            | 15.875              | 63.5                      | -                          | *     |
| Z         | 25.4            | 15.875              | 127                       | -                          | *     |

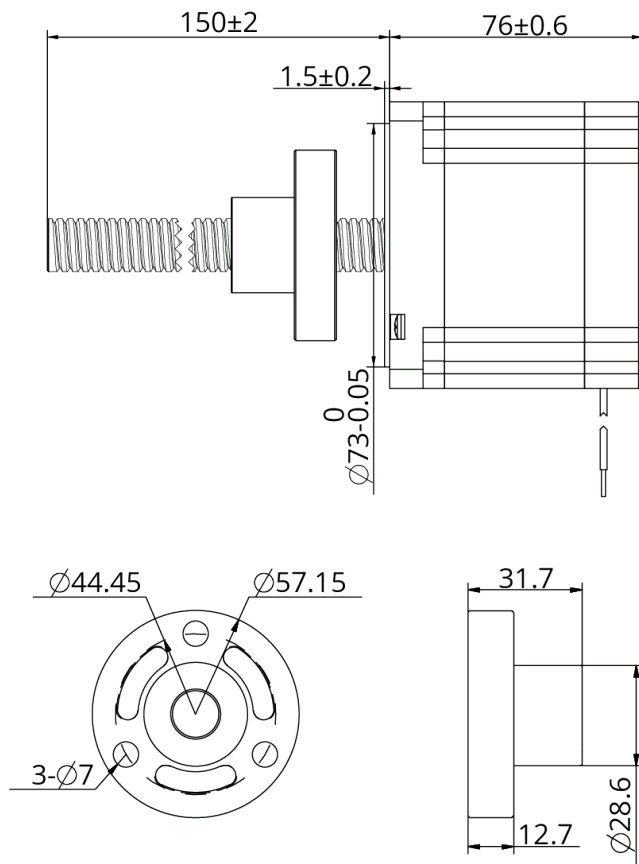
\*only available for external and non captive type

## Drawings

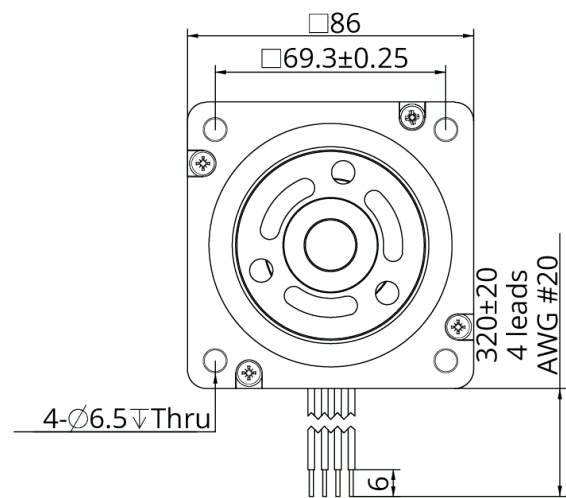


Non-Captive Actuator

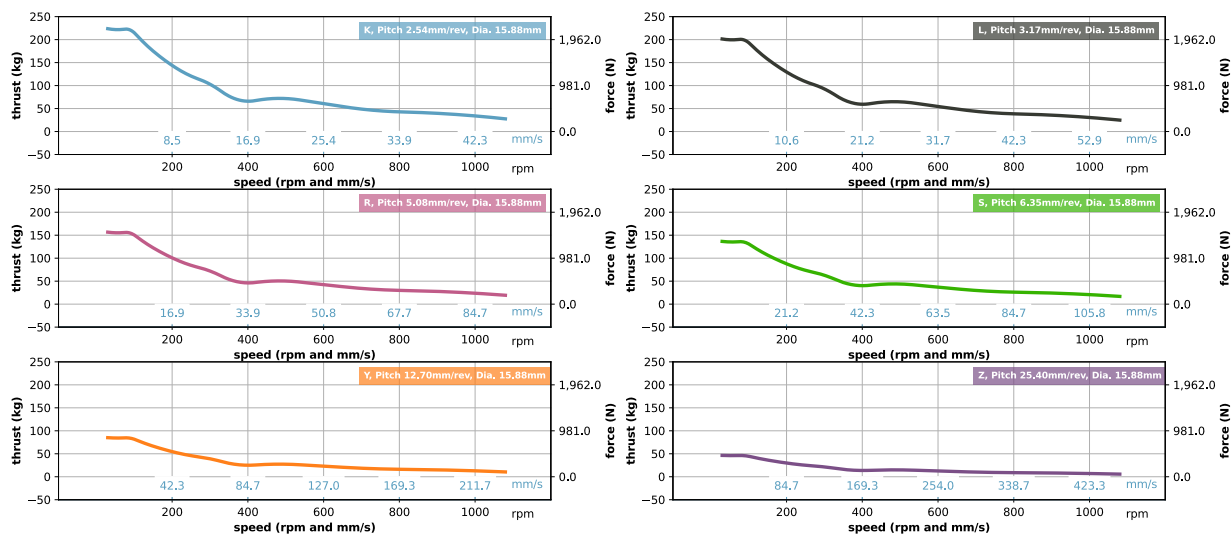




External Actuator



## Speed/Thrust Curves

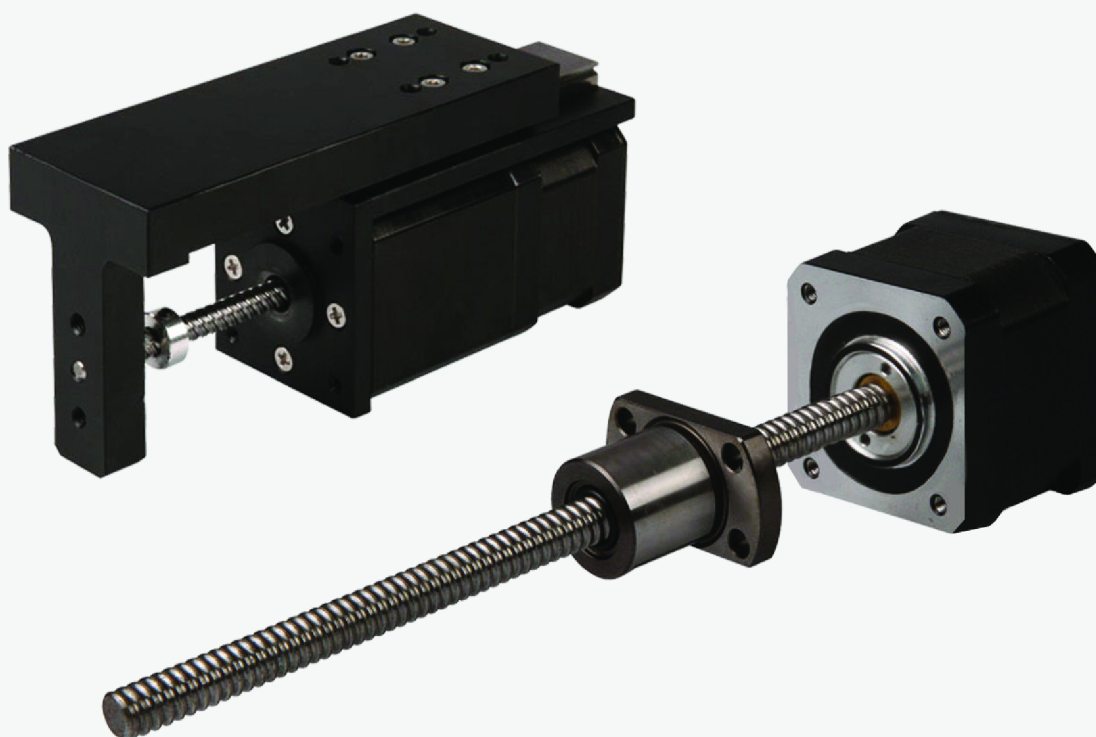


Speed-thrust curves for available screws, motor Nema 34, 34-2130. Motor driven in two-phase operation with 5.5A

# Ballscrew

## OVERVIEW.

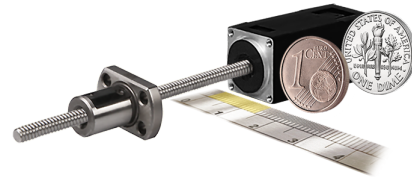
| Size (Nema) | Flange size (mm) | Stack | Motor length (mm) | Max. thrust at 60 rpm (kg) | Max. thrust at 60 rpm (N) | Lead pitch for max. thrust (mm) |
|-------------|------------------|-------|-------------------|----------------------------|---------------------------|---------------------------------|
| 6           | 14 x 14          | 1     | 32,0              | 1,1                        | 11                        | 1,0                             |
| 8           | 20 x 20          | 1     | 27,2              | 1,4                        | 14                        |                                 |
|             |                  | 2     | 38,1              | 2,5                        | 25                        |                                 |
| 11          | 28 x 28          | 1     | 33,35             | 14,1                       | 138                       |                                 |
|             |                  | 2     | 45,0              | 19,4                       | 190                       |                                 |
| 14          | 35 x 35          | 1     | 33,6              | 20,9                       | 205                       |                                 |
|             |                  | 2     | 45,6              | 40,3                       | 395                       |                                 |
| 17          | 42 x 42          | 1     | 34,1              | 45,9                       | 450                       |                                 |
|             |                  | 2     | 48,1              | 74,9                       | 735                       |                                 |
| 23          | 57 x 57          | 1     | 45,0              | 86,6                       | 850                       | 2,0                             |
|             |                  | 2     | 65,0              | 168,2                      | 1650                      |                                 |





Miniature Stepper Ball Screw Linear Actuators

## SBSLA - Size 6 [14mm]



The SBSLA Size 6 [14mm] is KOCO's most compact Stepper Ball Screw Linear Actuator, offering precision motion in a miniature form factor. Standard screw types (0401, 0402), right-hand thread, and hardened SCM415H materials ensure reliability. Customizable screw end machining and encoder options provide flexibility. Ideal for tight-space automation, medical devices, and miniature equipment requiring accurate, repeatable linear positioning.



<https://www.kocomotion.de/produkt/sbsla-size-6-14mm/>

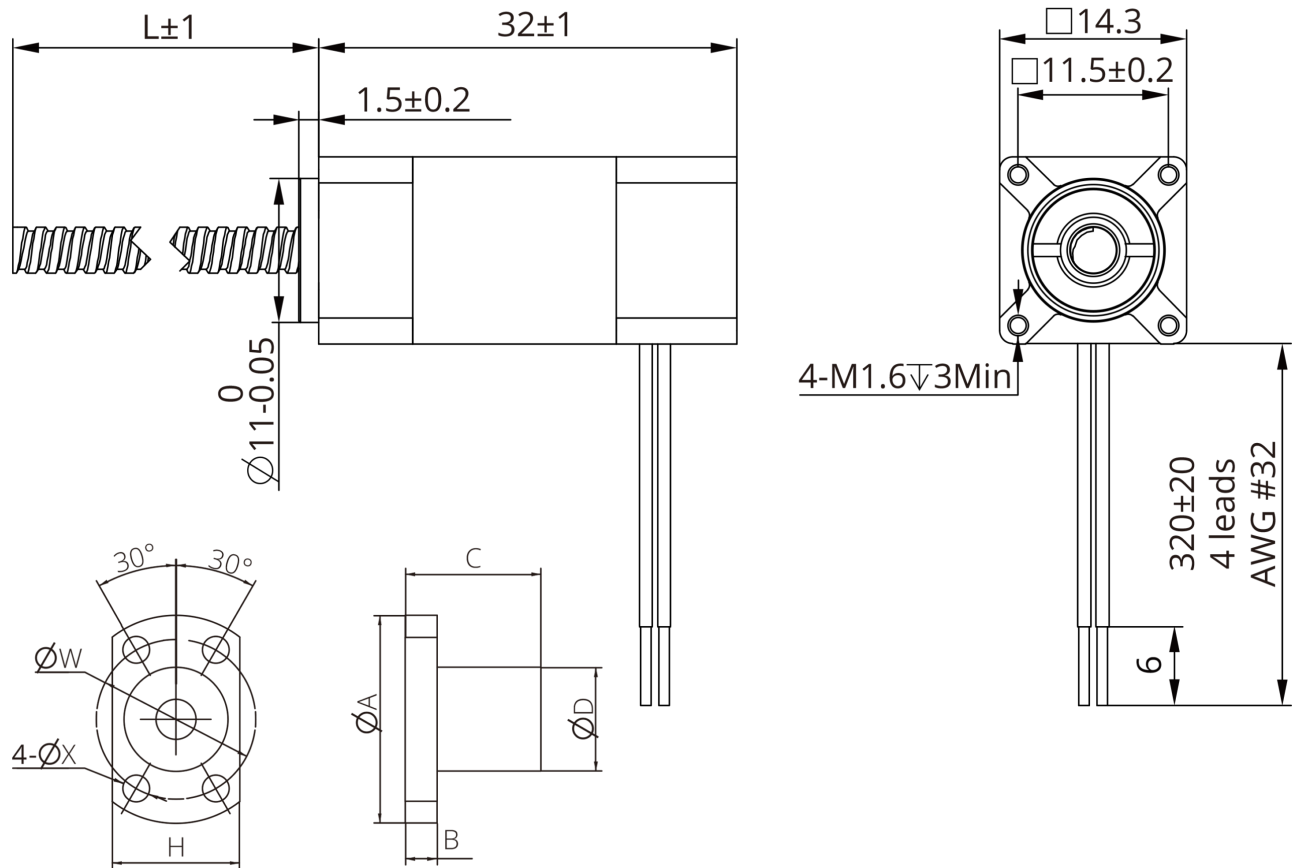
| Motor Characteristics | Unit     | 6E2103 |
|-----------------------|----------|--------|
| Size                  | Nema     | 6      |
| Flange size           | mm       | 14     |
| Rated voltage         | V        | 6.6    |
| Current               | A        | 0.25   |
| Winding resistance    | $\Omega$ | 22     |
| Inductance            | mH       | 3.6    |
| Lead Wire No.         |          | 4      |
| Motor length          | mm       | 30     |

| Ball screw type     | 0401          | 0402          |
|---------------------|---------------|---------------|
| Ball size           | Ø0.8          | Ø0.8          |
| Number of threads   | 1             | 1             |
| Thread direction    | Right         | Right         |
| Shaft root dia.     | Ø3.3          | Ø3.3          |
| Number of circuits  | 3.7x1         | 2.7x1         |
| Shaft nut material  | SCM415H       | SCM415H       |
| Surface hardness    | HRC58-62      | HRC58-62      |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil |
| Grade               | C7            | C7            |

| Nut size | A  | B | C  | D  | H  | W  | X   | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|---|----|----|----|----|-----|------------|------------------|-----------------|
| BS0401   | 19 | 3 | 13 | 9  | 13 | 14 | 2.9 | ≤0.02      | 560              | 790             |
| BS0402   | 23 | 4 | 19 | 11 | 15 | 17 | 3.4 | ≤0.02      | 420              | 570             |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 0401      | 1               | 4                   | 5                         | 1                 |
| 0402      | 2               | 4                   | 10                        | 1                 |

## Drawings



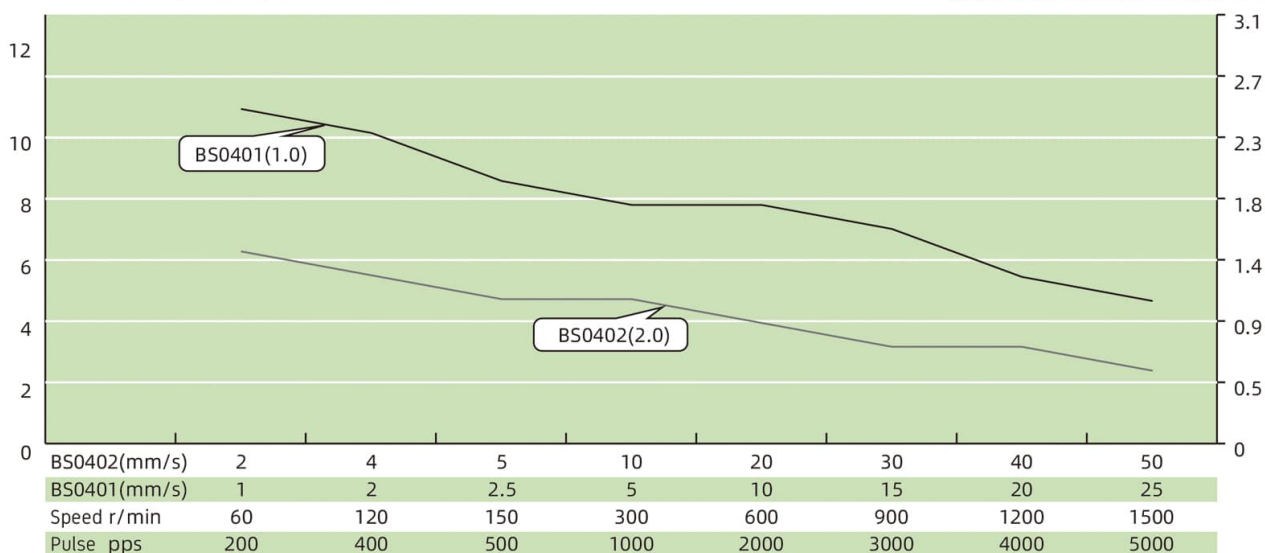
External Actuator

## Speed/Thrust Curves

Size 6 Single Stack Speed Thrust Curves

N ※Bipolar, Chopper Driver, 100% Rated Current

(Recommended Load Limit 15N) lbs



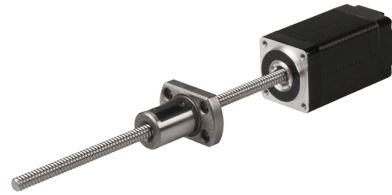
### TEST CONDITION

Testing Voltage: 12Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Speed-thrust curves for available screws, motor Nema 6, 6E2103

20mm Stepper Ball Screw Linear Actuator

# SBSLA - Size 8 [20mm]



The SBSLA - Size 8 [20mm] External Stepper Ball Screw Linear Actuator delivers precise motion control in a compact form factor. Available with multiple screw end machining and encoder options, it features high-grade SCM415H nut material, Ø0.8 mm ball size, and C7 accuracy. Ideal for demanding automation applications requiring reliable, accurate linear movement and customizable configurations.


<https://www.kocomotion.de/produkt/sbsla-size-8-20mm/>

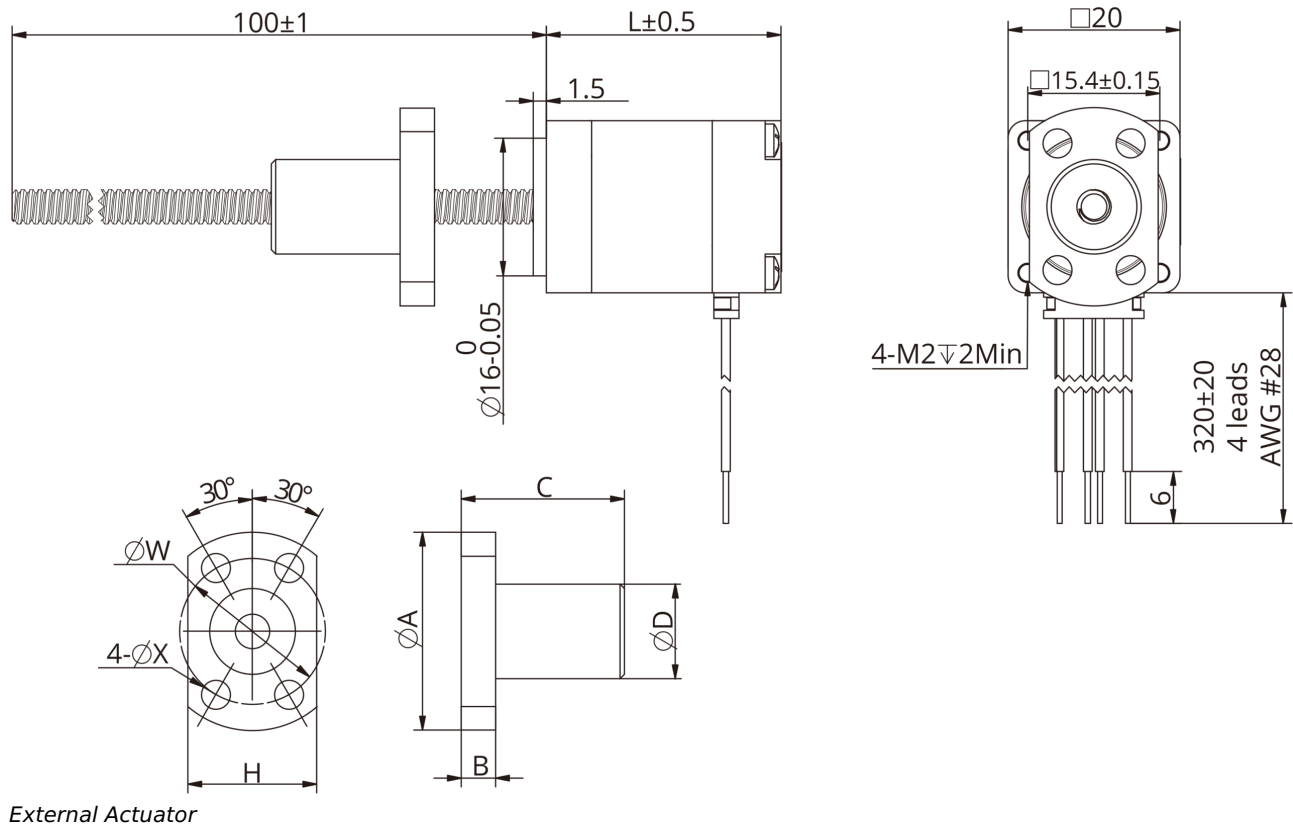
| Motor Characteristics | Unit | 8E2105 | 8E2205 |
|-----------------------|------|--------|--------|
| Size                  | Nema | 8      | 8      |
| Flange size           | mm   | 20     | 20     |
| Rated voltage         | V    | 2.5    | 4.4    |
| Current               | A    | 0.5    | 0.5    |
| Winding resistance    | Ω    | 5.1    | 8.8    |
| Inductance            | mH   | 1.5    | 2.7    |
| Motor length          | mm   | 27.2   | 38.1   |
| Lead Wire No.         |      | 4      | 4      |

| Ball screw type     | 0401          | 0402          |
|---------------------|---------------|---------------|
| Ball size           | Ø0.8          | Ø0.8          |
| Number of threads   | 1             | 1             |
| Thread direction    | Right         | Right         |
| Shaft root dia.     | Ø3.3          | Ø3.3          |
| Number of circuits  | 3.7x1         | 2.7x1         |
| Shaft nut material  | SCM415H       | SCM415H       |
| Surface hardness    | HRC58-62      | HRC58-62      |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil |
| Grade               | C7            | C7            |

| Nut size | A  | B | C  | D  | H  | W  | X   | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|---|----|----|----|----|-----|------------|------------------|-----------------|
| BS0401   | 19 | 3 | 13 | 9  | 13 | 14 | 2.9 | ≤0.02      | 560              | 790             |
| BS0402   | 23 | 4 | 19 | 11 | 15 | 17 | 3.4 | ≤0.02      | 420              | 570             |

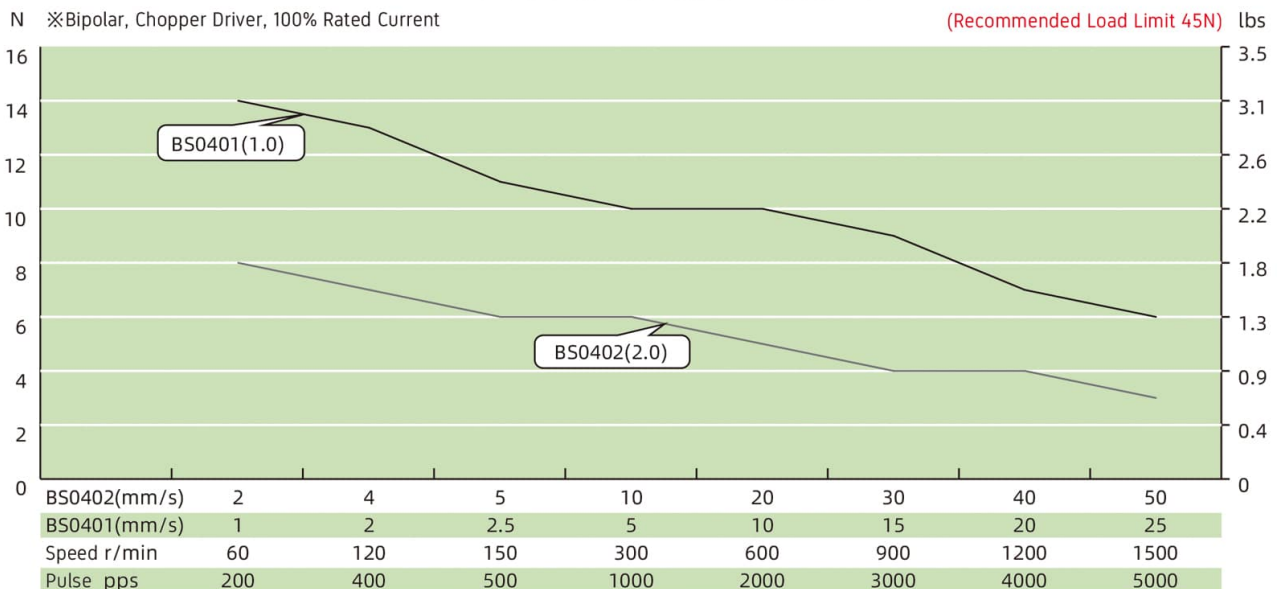
| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 0401      | 1               | 4                   | 5                         | 1                 |
| 0402      | 2               | 4                   | 10                        | 1                 |

## Drawings



## Speed/Thrust Curves

Size 8 Single Stack Speed Thrust Curves

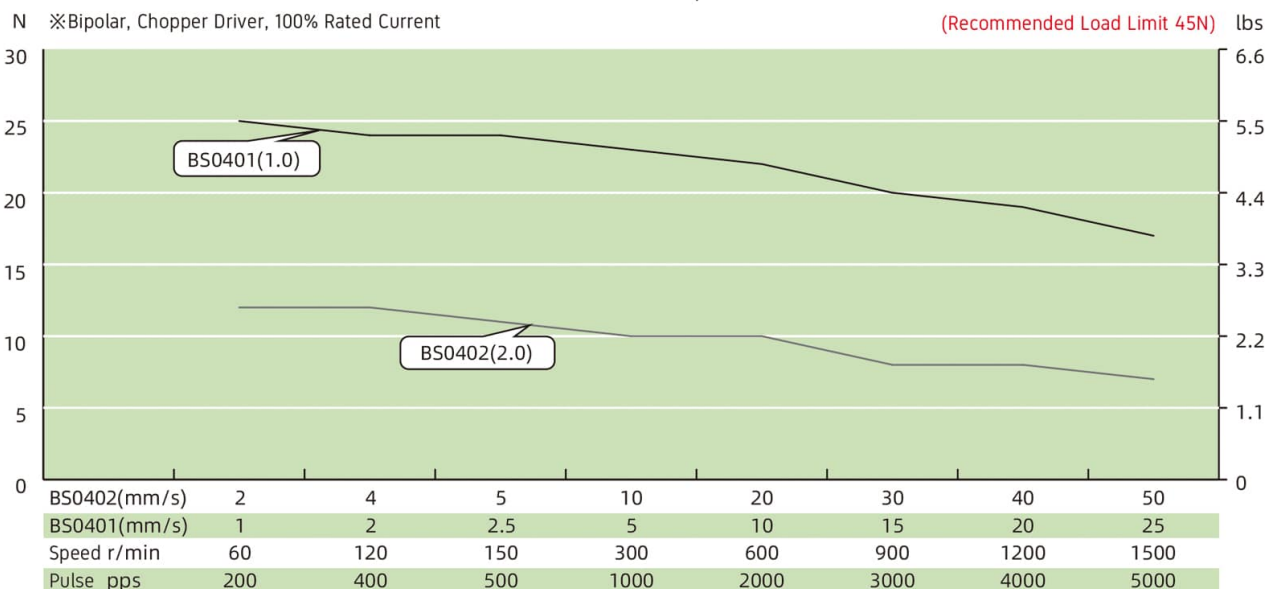


### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Speed-thrust curves for available screws, motor Nema 8, 8E2105

Size 8 Double Stack Speed Thrust Curves



### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Speed-thrust curves for available screws, motor Nema 8, 8E2205



## Size 11 Stepper Ball Screw Linear Actuator

# SBSLA - Size 11

## [28mm]



The SBSLA Size 11 (28mm) External Stepper Ball Screw Linear Actuator combines compact form with high-precision motion. Featuring C7-grade ball screws (0601/0602/0606/0610/0504), robust SCM415H construction, and options for encoder feedback, power-off brake, and various screw end machinations, this actuator is ideal for demanding positioning applications in automation, lab equipment, and miniature machinery.


<https://www.kocomotion.de/produkt/sbsla-size-11-28mm/>

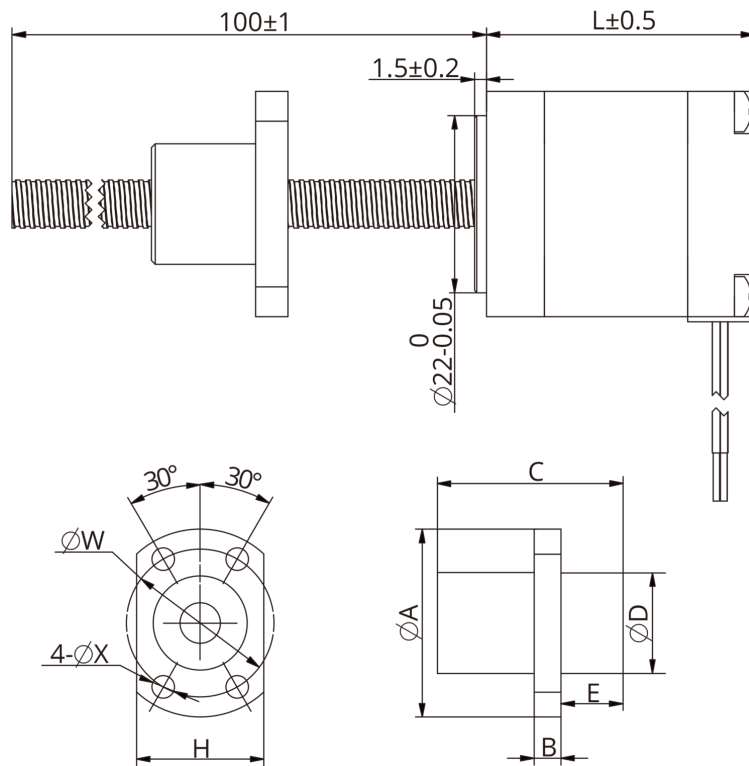
| Motor Characteristics | Unit | 11E2110 | 11E2209 |
|-----------------------|------|---------|---------|
| Size                  | Nema | 11      | 11      |
| Flange size           | mm   | 28      | 28      |
| Rated voltage         | V    | 2.1     | 3.9     |
| Current               | A    | 1       | 0.95    |
| Winding resistance    | Ω    | 2.1     | 4.1     |
| Inductance            | mH   | 1.5     | 4       |
| Motor length          | mm   | 33.35   | 45      |
| Lead Wire No.         |      | 4       | 4       |

| Ball screw type     | 0601          | 0602          | 0606          |
|---------------------|---------------|---------------|---------------|
| Ball size           | Ø0.8          | Ø0.8          | Ø0.8          |
| Number of threads   | 1             | 1             | 2             |
| Thread direction    | Right         | Right         | Right         |
| Shaft root dia.     | Ø5.3          | Ø5.1          | Ø5.2          |
| Number of circuits  | 3.7x1         | 2.7x1         | 1.6x2         |
| Shaft nut material  | SCM415H       | SCM415H       | SCM415H       |
| Surface hardness    | HRC58-62      | HRC58-62      | HRC58-62      |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil | Anti-rust oil |
| Grade               | C7            | C7            | C7            |

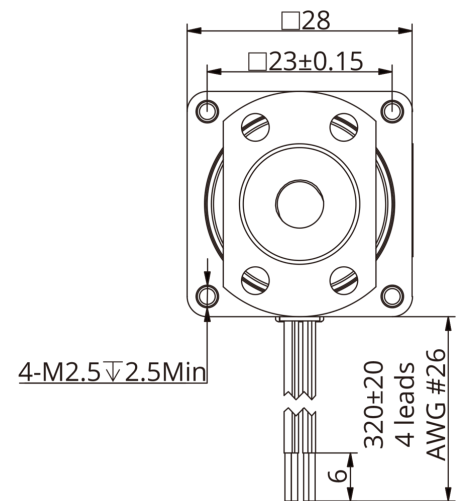
| Nut size | A  | B   | C    | D  | H  | W  | X   | E   | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|-----|------|----|----|----|-----|-----|------------|------------------|-----------------|
| BS0601   | 24 | 3.5 | 15   | 12 | 16 | 18 | 3.4 | -   | ≤0.02      | 680              | 1200            |
| BS0602   | 29 | 4   | 17   | 15 | 19 | 22 | 3.4 | -   | ≤0.02      | 880              | 1500            |
| BS0606   | 27 | 4   | 17.2 | 14 | 16 | 21 | 3.4 | 5.2 | ≤0.02      | 870              | 1450            |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 0601      | 1               | 6                   | 5                         | 1                 |
| 0602      | 2               | 6                   | 10                        | 1                 |
| 0606      | 6               | 6                   | 30                        | 2                 |

## Drawings



External Actuator

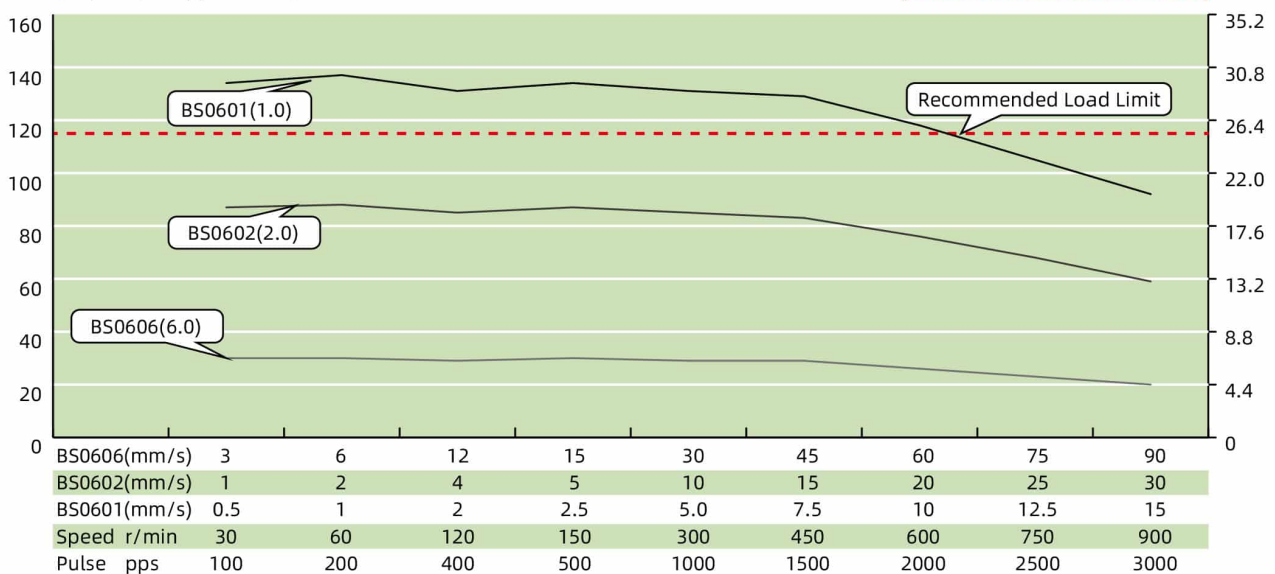


## Speed/Thrust Curves

Size 11 Single Stack Speed Thrust Curves

N ※Bipolar, Chopper Driver, 100% Rated Current

(Recommended Load Limit 115N) lbs

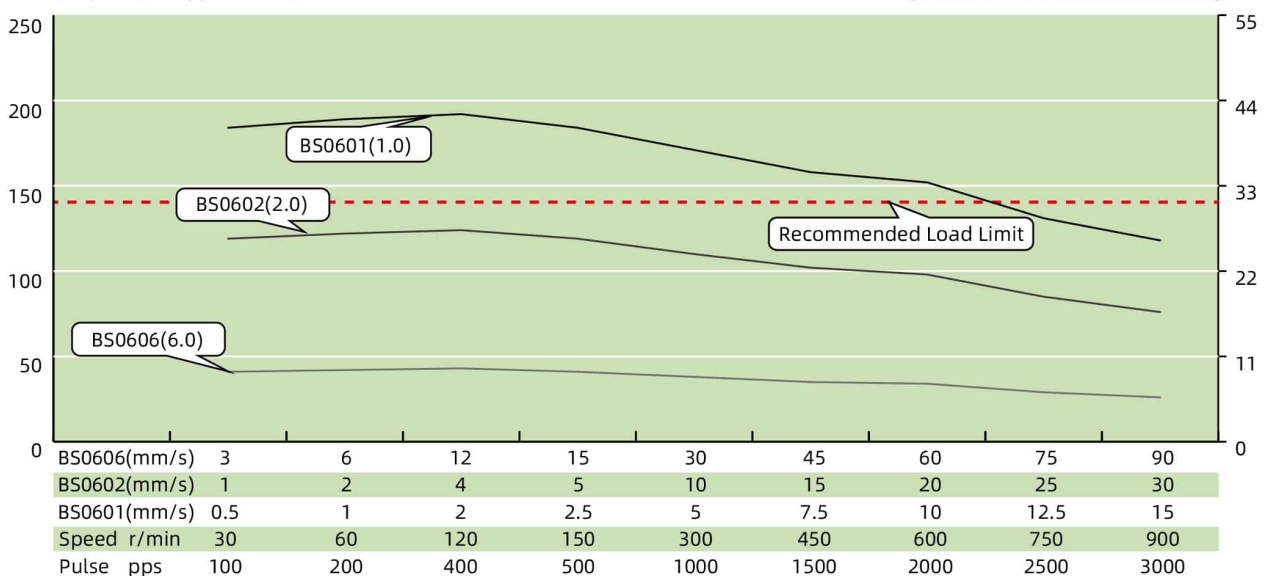


Speed-thrust curves for available screws, motor Nema 11, 11E2110

Size 11 Double Stack Speed Thrust Curves

N ※Bipolar, Chopper Driver, 100% Rated Current

(Recommended Load Limit 140N) lbs



Speed-thrust curves for available screws, motor Nema 11, 11E2209

## 35mm Stepper Ball Screw Linear Actuators

# SBSLA - Size 14 [35mm]



The SBSLA Size 14 (35mm) external stepper ball screw linear actuator family delivers high-precision linear motion with integrated stepper motor drive. Available in multiple ball screw types and nut sizes, these actuators offer customizable screw end machining, encoder options (EK1, EK2, EK5), and a range of thread designs. Ideal for compact automation applications requiring accuracy and robust construction with C7-grade ball screws and anti-rust treatment.


<https://www.kocomotion.de/produkt/sbsla-size-14-35mm/>

| Motor Characteristics | Unit | 14E2110 | 14E2115 | 14E2210 | 14E2215 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 14      | 14      | 14      | 14      |
| Flange size           | mm   | 35      | 35      | 35      | 35      |
| Rated voltage         | V    | 3.5     | 2.7     | 6.0     | 4.0     |
| Current               | A    | 1.0     | 1.5     | 1.0     | 1.5     |
| Winding resistance    | Ω    | 3.5     | 1.8     | 6.0     | 2.7     |
| Inductance            | mH   | 3.6     | 1.9     | 7.2     | 3.2     |
| Motor length          | mm   | 33.6    | 33.6    | 45.6    | 45.6    |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |

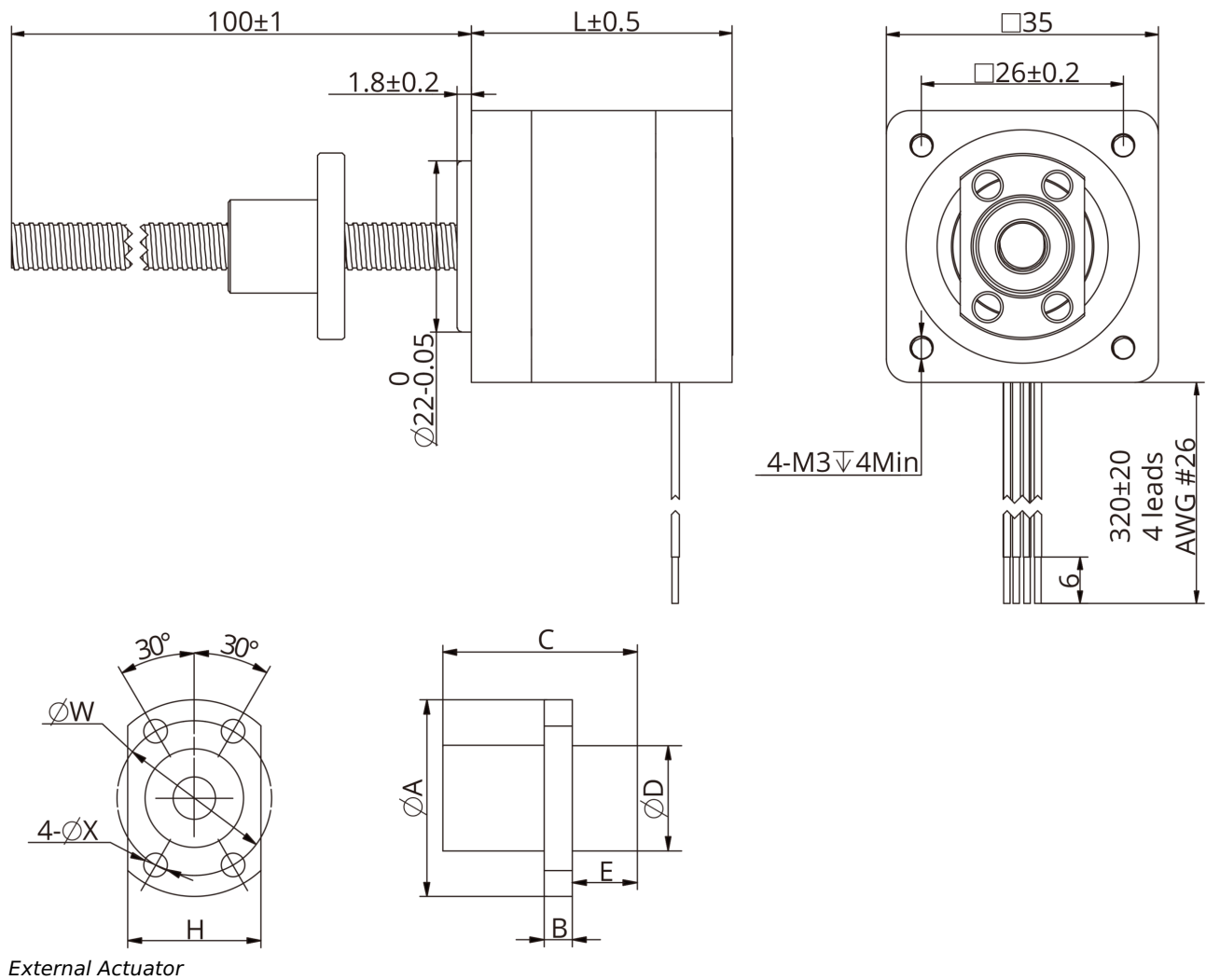
| Ball screw type     | 0601          | 0602          | 0606          | - | 0801          | 0802          | - |
|---------------------|---------------|---------------|---------------|---|---------------|---------------|---|
| Ball size           | Ø0.8          | Ø0.8          | Ø0.8          | - | Ø0.8          | Ø1.5875       | - |
| Number of threads   | 1             | 1             | 2             | - | 1             | 1             | - |
| Thread direction    | Right         | Right         | Right         | - | Right         | Right         | - |
| Shaft root dia.     | Ø5.3          | Ø5.1          | Ø5.2          | - | Ø7.3          | Ø6.6          | - |
| Number of circuits  | 3.7x1         | 2.7x1         | 1.6x2         | - | 3.7x1         | 3.7x1         | - |
| Shaft nut material  | SCM415H       | SCM415H       | SCM415H       | - | SCM415H       | SCM415H       | - |
| Surface hardness    | HRC58-62      | HRC58-62      | HRC58-62      | - | HRC58-62      | HRC58-62      | - |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil | Anti-rust oil | - | Anti-rust oil | Anti-rust oil | - |
| Grade               | C7            | C7            | C7            | - | C7            | C7            | - |

| Ball screw type     | 0805          | 0808          | 0810          | - |
|---------------------|---------------|---------------|---------------|---|
| Ball size           | Ø1.5875       | Ø1.5875       | Ø1.5875       | - |
| Number of threads   | 1             | 2             | 2             | - |
| Thread direction    | Right         | Right         | Right         | - |
| Shaft root dia.     | Ø6.6          | Ø6.7          | Ø6.7          | - |
| Number of circuits  | 2.7x1         | 1.6x2         | 1.6x2         | - |
| Shaft nut material  | SCM415H       | SCM415H       | SCM415H       | - |
| Surface hardness    | HRC58-62      | HRC58-62      | HRC58-62      | - |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil | Anti-rust oil | - |
| Grade               | C7            | C7            | C7            | - |

| Nut size | A  | B   | C    | D  | H  | W  | X   | E   | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|-----|------|----|----|----|-----|-----|------------|------------------|-----------------|
| BS0601   | 24 | 3.5 | 15   | 12 | 16 | 18 | 3.4 | -   | ≤0.02      | 680              | 1200            |
| BS0602   | 29 | 4   | 17   | 15 | 19 | 22 | 3.4 | -   | ≤0.02      | 880              | 1500            |
| BS0606   | 27 | 4   | 17.2 | 14 | 16 | 21 | 3.4 | 5.2 | ≤0.02      | 870              | 1450            |
| BS0801   | 26 | 4   | 16   | 13 | 17 | 20 | 3.4 | -   | ≤0.02      | 780              | 1650            |
| BS0802   | 27 | 4   | 16   | 14 | 18 | 21 | 3.4 | -   | ≤0.02      | 1300             | 2300            |
| BS0805   | 31 | 4   | 28   | 18 | 20 | 25 | 3.4 | -   | ≤0.02      | 1850             | 3000            |
| BS0808   | 31 | 4   | 21.5 | 18 | 20 | 25 | 3.4 | 6   | ≤0.02      | 2200             | 3800            |
| BS0810   | 31 | 4   | 24   | 18 | 20 | 25 | 3.4 | 7   | ≤0.02      | 2200             | 3900            |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 0601      | 1               | 6                   | 5                         | 1                 |
| 0602      | 2               | 6                   | 10                        | 1                 |
| 0606      | 6               | 6                   | 30                        | 2                 |
| 0801      | 1               | 8                   | 5                         | 1                 |
| 0802      | 2               | 8                   | 10                        | 1                 |
| 0805      | 5               | 8                   | 25                        | 1                 |
| 0808      | 8               | 8                   | 40                        | 2                 |
| 0810      | 10              | 8                   | 50                        | 2                 |

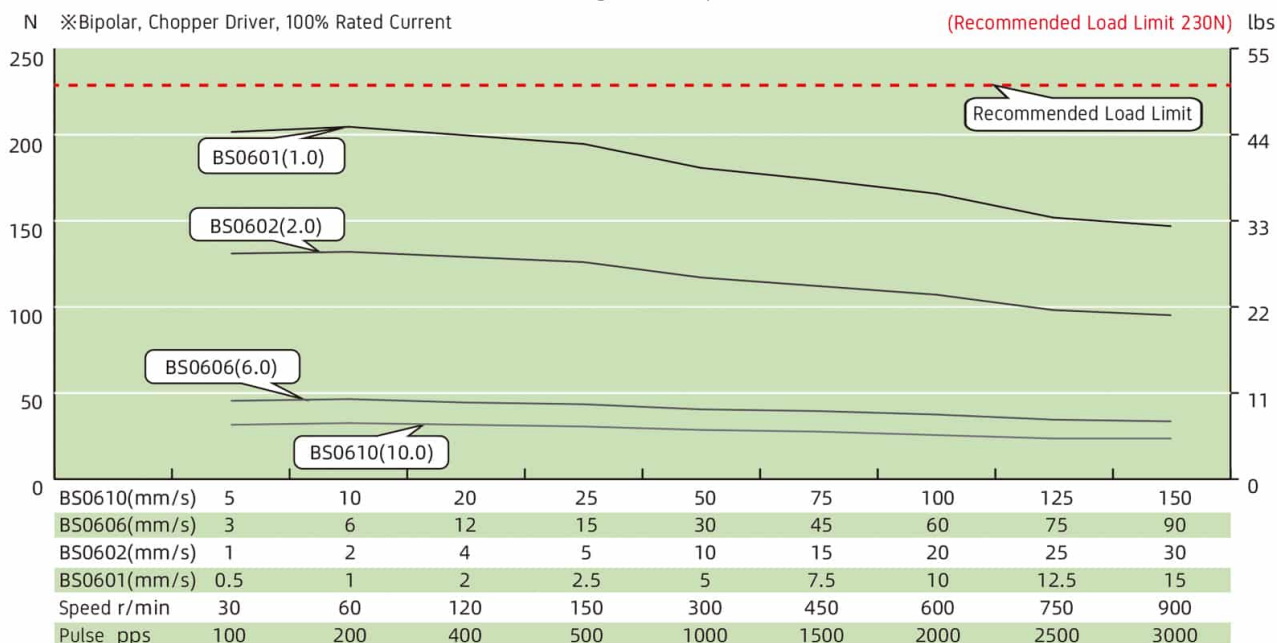
## Drawings





## Speed/Thrust Curves

Size 14 Single Stack Speed Thrust Curves

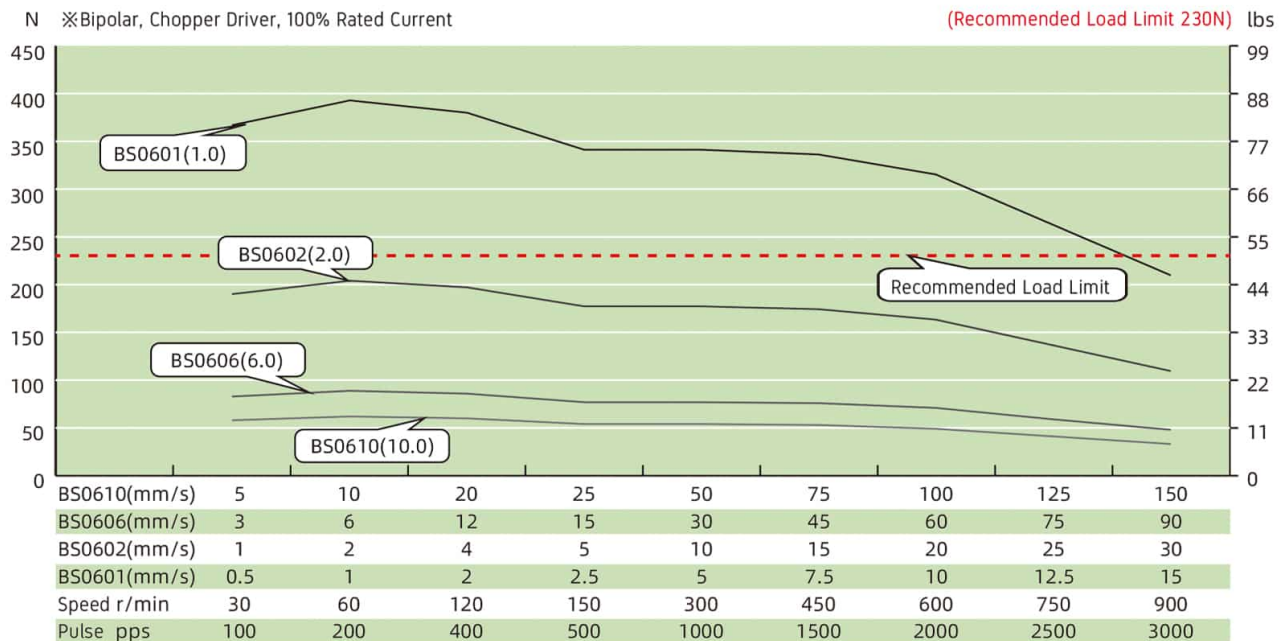


### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Speed-thrust curves for available screws, motor Nema 14, 14E2115

Size 14 Double Stack Speed Thrust Curves

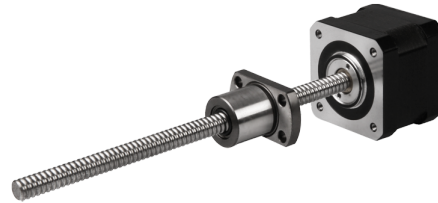
**TEST CONDITION**

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Speed-thrust curves for available screws, motor Nema 14, 14E2215

## Size 17 Stepper Ball Screw Linear Actuator

# SBSLA - Size 17 [42mm]



The SBSLA Size 17 [42mm] series features high-precision stepper-driven external ball screw linear actuators, available with multiple ball screw leads (0801-0812) and nut profiles. Standard options include threaded, smooth, or customizable screw ends, a wide range of incremental encoders (EK1/EK2/EK4/EK5), and optional power-off brakes. Suited for precise linear motion tasks demanding compact size, durability, and flexible configuration across automation and motion control applications.


<https://www.kocomotion.de/produkt/sbsla-size-17-42mm/>

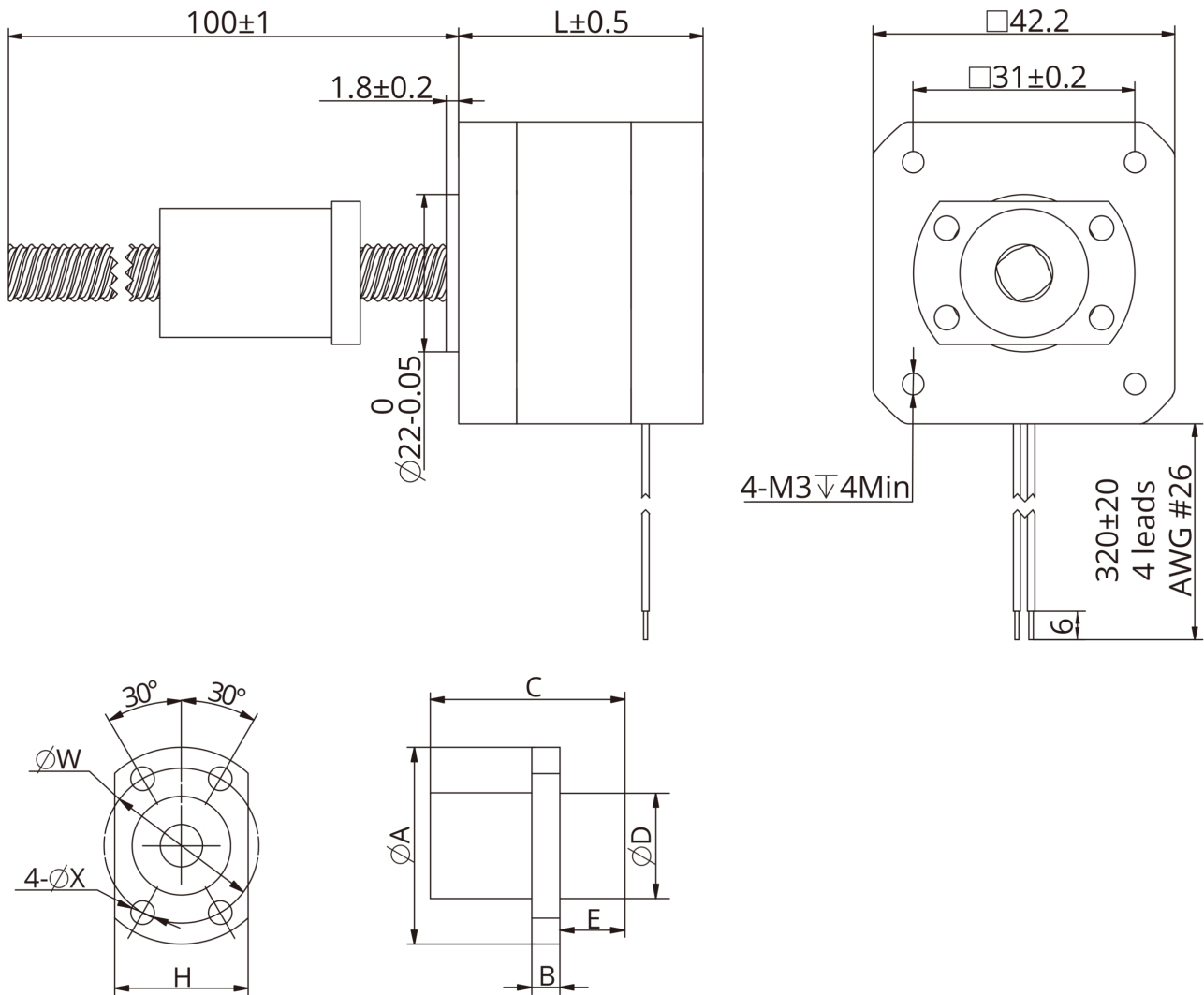
| Motor Characteristics | Unit | 17E2110 | 17E2115 | 17E2212 | 17E2225 |
|-----------------------|------|---------|---------|---------|---------|
| Size                  | Nema | 17      | 17      | 17      | 17      |
| Flange size           | mm   | 42      | 42      | 42      | 42      |
| Rated voltage         | V    | 3.8     | 2.78    | 4.56    | 2.5     |
| Current               | A    | 1.0     | 1.5     | 1.2     | 2.5     |
| Winding resistance    | Ω    | 3.8     | 1.85    | 3.8     | 1.0     |
| Inductance            | mH   | 5       | 2.2     | 8.0     | 1.8     |
| Motor length          | mm   | 34.1    | 34.1    | 48.1    | 48.1    |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |

| Ball screw type     | 0801          | 0802          | - | 0805          | 0808          | 0810          | - |
|---------------------|---------------|---------------|---|---------------|---------------|---------------|---|
| Ball size           | Ø1.5875       | Ø1.5875       | - | Ø1.5875       | Ø1.5875       | Ø1.5875       | - |
| Number of threads   | 1             | 1             | - | 1             | 2             | 2             | - |
| Thread direction    | Right         | Right         | - | Right         | Right         | Right         | - |
| Shaft root dia.     | Ø7.3          | Ø6.6          | - | Ø6.6          | Ø6.7          | Ø6.7          | - |
| Number of circuits  | 3.7x1         | 3.7x1         | - | 2.7x1         | 1.6x2         | 1.6x2         | - |
| Shaft nut material  | SCM415H       | SCM415H       | - | SCM415H       | SCM415H       | SCM415H       | - |
| Surface hardness    | HRC58-62      | HRC58-62      | - | HRC58-62      | HRC58-62      | HRC58-62      | - |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil | - | Anti-rust oil | Anti-rust oil | Anti-rust oil | - |
| Grade               | C7            | C7            | - | C7            | C7            | C7            | - |

| Nut size | A  | B | C    | D  | H  | W  | X   | E | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|---|------|----|----|----|-----|---|------------|------------------|-----------------|
| BS0801   | 26 | 4 | 16   | 13 | 17 | 20 | 3.4 | - | ≤0.02      | 780              | 1650            |
| BS0802   | 27 | 4 | 16   | 14 | 18 | 21 | 3.4 | - | ≤0.02      | 1300             | 2300            |
| BS0805   | 31 | 4 | 28   | 18 | 20 | 25 | 3.4 | - | ≤0.02      | 1850             | 3000            |
| BS0808   | 31 | 4 | 21.5 | 18 | 20 | 25 | 3.4 | 6 | ≤0.02      | 2200             | 3800            |
| BS0810   | 31 | 4 | 24   | 18 | 20 | 25 | 3.4 | 7 | ≤0.02      | 2200             | 3900            |

| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 0801      | 1               | 8                   | 5                         | 1                 |
| 0802      | 2               | 8                   | 10                        | 1                 |
| 0805      | 5               | 8                   | 25                        | 1                 |
| 0808      | 8               | 8                   | 40                        | 2                 |
| 0810      | 10              | 8                   | 50                        | 2                 |

## Drawings



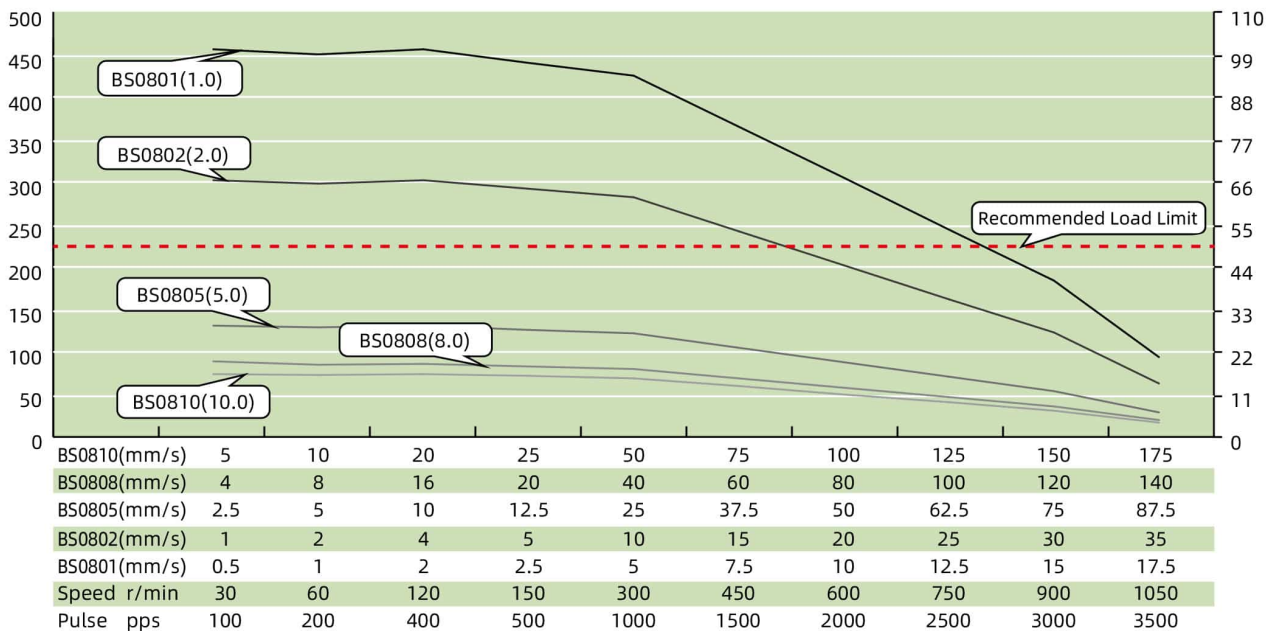
External Actuator

## Speed/Thrust Curves

### Size 17 Single Stack Speed Thrust Curves

N ※ Bipolar, Chopper Driver, 100% Rated Current

(Recommended Load Limit 230N) lbs

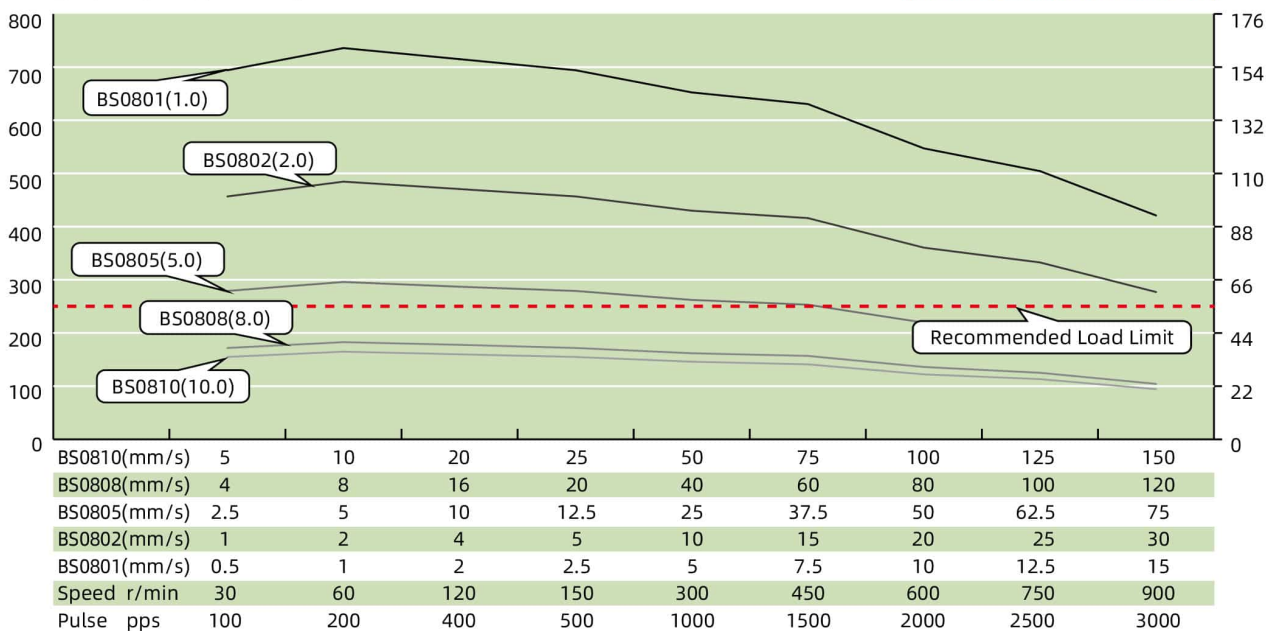


Speed-thrust curves for available screws, motor Nema 17, 17E2115

### Size 17 Double Stack Speed Thrust Curves

N ※ Bipolar, Chopper Driver, 100% Rated Current

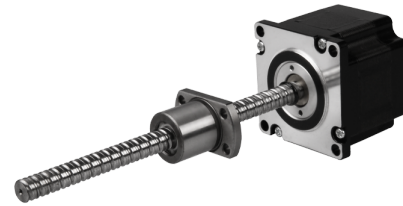
(Recommended Load Limit 230N) lbs



Speed-thrust curves for available screws, motor Nema 17, 17E2225

Stepper Ball Screw Linear Actuator, Size 23

# SBSLA - Size 23 [57mm]



The SBSLA Size 23 [57mm] external stepper ball screw linear actuator integrates a stepper motor with high-performance precision ball screws. Available in multiple ball screw types and nut sizes, it offers various screw end machinations, encoder options (EK2/EK3), and customizable configurations. Suitable for automation applications needing compact, accurate, and reliable linear motion with the benefit of encoder and brake integration.


<https://www.kocomotion.de/produkt/sbsla-size-23-57mm/>

| Motor Characteristics | Unit     | 23E2120 | 23E2130 | 23E2225 | 23E2240 |
|-----------------------|----------|---------|---------|---------|---------|
| Size                  | Nema     | 23      | 23      | 23      | 23      |
| Flange size           | mm       | 57      | 57      | 57      | 57      |
| Rated voltage         | V        | 3.5     | 2.4     | 5.0     | 2.8     |
| Current               | A        | 2.0     | 3.0     | 2.5     | 4.0     |
| Winding resistance    | $\Omega$ | 1.75    | 0.8     | 2.0     | 0.7     |
| Inductance            | mH       | 4.1     | 1.7     | 5.2     | 2.0     |
| Motor length          | mm       | 45      | 45      | 65      | 65      |
| Lead Wire No.         |          | 4       | 4       | 4       | 4       |

| Ball screw type     | 1002          | 1004          | 1005          | 1010          | 1015          | 1020          | 1202          |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Ball size           | Ø1.5875       | Ø2.0          | Ø2.0          | Ø2.0          | Ø2.0          | Ø1.5875       | Ø1.5875       |
| Number of threads   | 1             | 1             | 1             | 2             | 2             | 4             | 1             |
| Thread direction    | Right         | Right         | Right         | Right         | Right         | Right         | Right         |
| Shaft root dia.     | Ø8.6          | Ø8.2          | Ø8.2          | Ø8.4          | Ø8.4          | Ø8.7          | Ø10.6         |
| Number of circuits  | 3.7x1         | 2.7x1         | 2.7x1         | 1.6x2         | 1.6x2         | 0.7x4         | 3.7x1         |
| Shaft nut material  | SCM415H       | SCM415H       | SCM415H       | SCM415H       | SCM415H       | SCM415H       | SCM415H       |
| Surface hardness    | HRC58-62      | HRC58-62      | HRC58-62      | HRC58-62      | HRC58-62      | HRC58-62      | HRC58-62      |
| Anti-rust treatment | Anti-rust oil | Anti-rust oil | Anti-rust oil | Anti-rust oil | Anti-rust oil | Anti-rust oil | Anti-rust oil |
| Grade               | C7            | C7            | C7            | C7            | C7            | C7            | C7            |

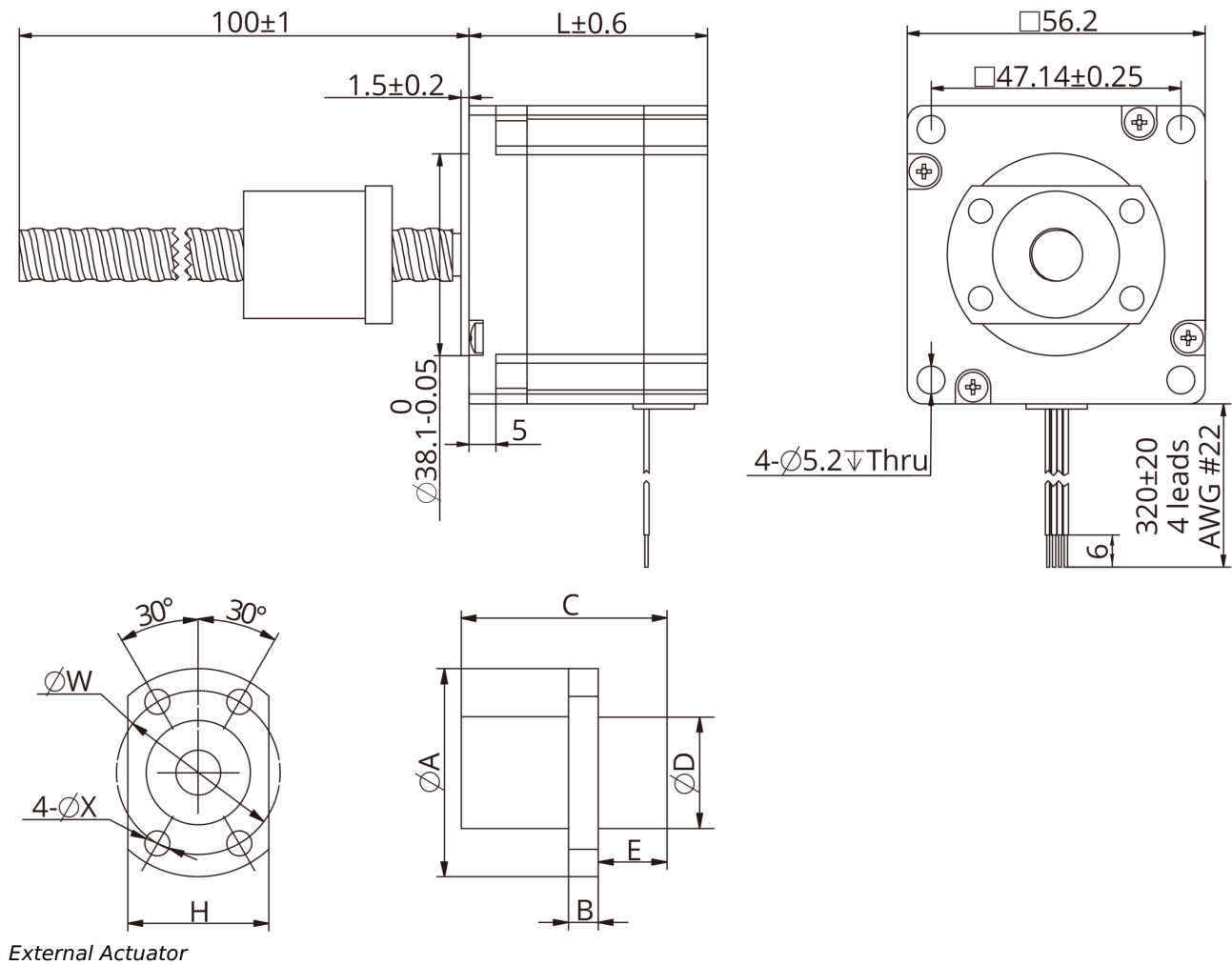
| Ball screw type     | 1210          |
|---------------------|---------------|
| Ball size           | Ø2.381        |
| Number of threads   | 2             |
| Thread direction    | Right         |
| Shaft root dia.     | Ø10.2         |
| Number of circuits  | 3.7x2         |
| Shaft nut material  | SCM415H       |
| Surface hardness    | HRC58-62      |
| Anti-rust treatment | Anti-rust oil |
| Grade               | C7            |

| Nut size | A  | B  | C  | D  | H  | W  | X   | E  | Axial play | Dynamic load [N] | Static load [N] |
|----------|----|----|----|----|----|----|-----|----|------------|------------------|-----------------|
| BS1202   | 37 | 5  | 28 | 20 | 24 | 29 | 4.5 | -  | ≤0.02      | 1600             | 3700            |
| BS1205   | 40 | 10 | 30 | 24 | 30 | 32 | 4.5 | 15 | ≤0.02      | 6610             | 13160           |
| BS1210   | 40 | 10 | 42 | 24 | 30 | 32 | 4.5 | 27 | ≤0.02      | 6420             | 12870           |
| BS1220   | 40 | 5  | 46 | 24 | 24 | 32 | 4.5 | 37 | ≤0.02      | 6700             | 10100           |



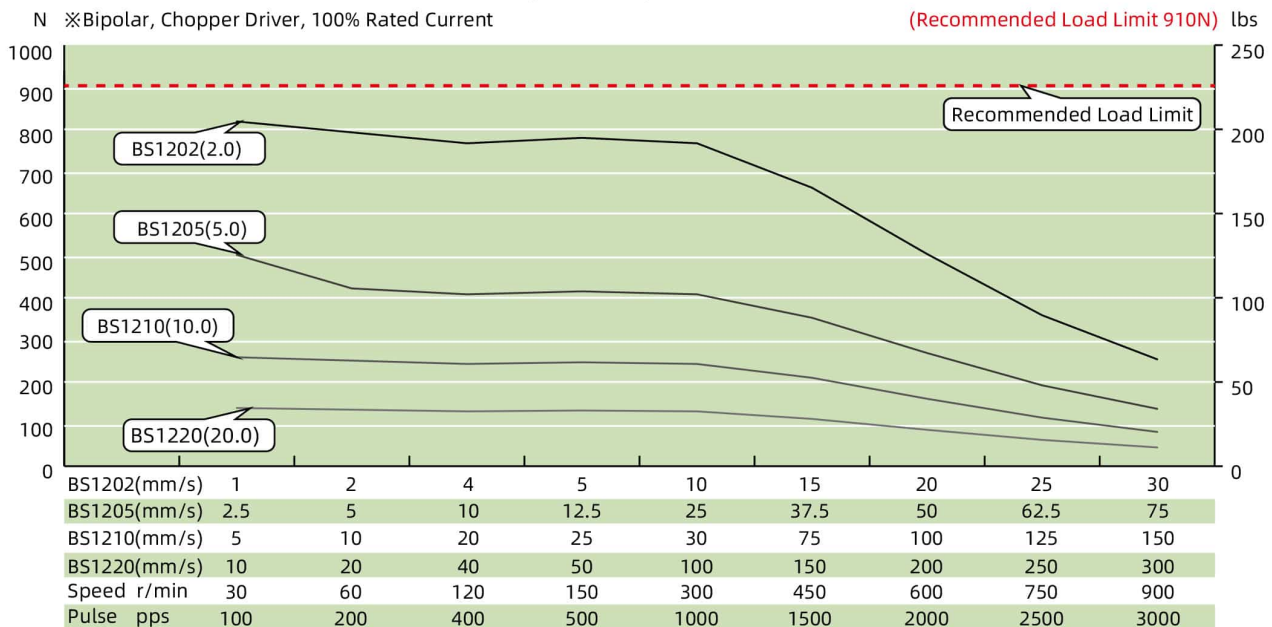
| Lead Code | Lead Pitch [mm] | Screw Diameter [mm] | Travel per 1.8° Step [µm] | Number of threads |
|-----------|-----------------|---------------------|---------------------------|-------------------|
| 1002      | 2               | 10                  | 10                        | 1                 |
| 1004      | 4               | 10                  | 20                        | 1                 |
| 1005      | 5               | 10                  | 25                        | 1                 |
| 1010      | 10              | 10                  | 50                        | 2                 |
| 1015      | 15              | 10                  | 75                        | 2                 |
| 1020      | 20              | 10                  | 100                       | 4                 |
| 1202      | 2               | 12                  | 10                        | 1                 |
| 1210      | 10              | 12                  | 50                        | 2                 |

## Drawings



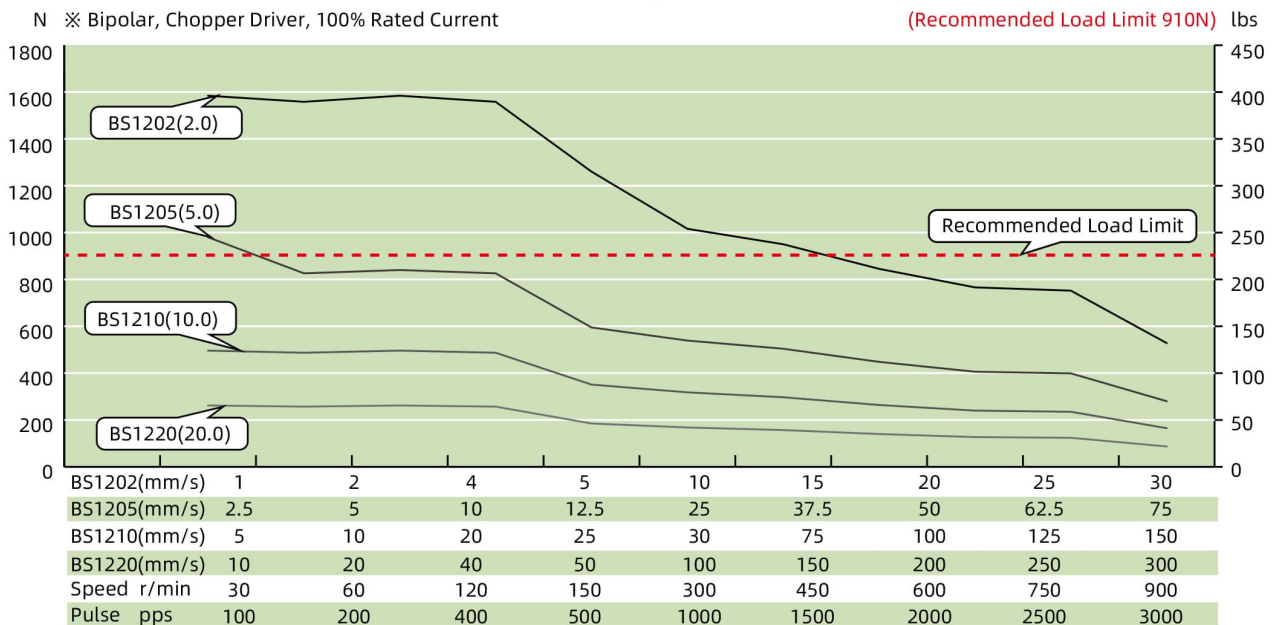
## Speed/Thrust Curves

Size 23 Single Stack Speed Thrust Curves



Speed-thrust curves for available screws, motor Nema 23, 23E2130

Size 23 Double Stack Speed Thrust Curves



Speed-thrust curves for available screws, motor Nema 23, 23E2240

## Incremental Encoders for Stepper Systems

# Encoder

KOCO MOTION encoders are engineered for seamless integration with stepper motors and linear actuators. They offer selectable resolutions, single-ended or differential outputs, and are ideal for precise positioning, speed regulation, and defined movement control. Flexible output options and customizable resolutions enable accurate motion feedback across automation and precision engineering applications.


<https://www.kocomotion.de/produkt/encoder/>

| Encoder characteristics | Unit | ER14S-P                          | ER20M-P                          | ER28C-P                          |
|-------------------------|------|----------------------------------|----------------------------------|----------------------------------|
| Flange size             |      | 14                               | 20                               | 28                               |
| Supply voltage          | V    | T: TTL 5                         | T: TTL 5                         | T: TTL 5V; H: HTL 8-30           |
| Matching motor          | NEMA | 14                               | 20                               | 28/35/42                         |
| Shape                   |      | S: square                        | M/N                              | C: circle                        |
| Resolution              | cpr  | 1000                             | 1000                             | 1000                             |
| Remark                  |      | optical encoder                  | optical encoder                  | optical encoder                  |
| Special IP class        |      | no                               | no                               | no                               |
| Detection principle     |      | ER: reflective                   | ER: reflective                   | ER: reflective                   |
| Channel                 |      | 2: A/B; 3: A/B/Z                 | 2: A/B; 3: A/B/Z                 | 2: A/B; 3: A/B/Z                 |
| Output                  |      | D: Differential; S: Single-ended | D: Differential; S: Single-ended | D: Differential; S: Single-ended |

| Encoder characteristics | Unit | ER40M-P                          | EM20M-P                          | EM28C-P                          |
|-------------------------|------|----------------------------------|----------------------------------|----------------------------------|
| Flange size             |      | 40                               | 20                               | 28                               |
| Supply voltage          | V    | T: TTL 5V; H: HTL 12-24          | T: TTL 5                         | T: TTL 5; H: HTL 8-30            |
| Matching motor          | NEMA | 57/60                            | 20                               | 28/35/42                         |
| Shape                   |      | M/N                              | M/N                              | C: circle                        |
| Resolution              | cpr  | 1000                             | 1000                             | 1000                             |
| Remark                  |      | optical encoder                  | magnetic encoder                 | magnetic encoder                 |
| Special IP class        |      | no                               | no                               | no                               |
| Detection principle     |      | ER: reflective                   | EM: magnet                       | EM: magnet                       |
| Channel                 |      | 2: A/B; 3: A/B/Z                 | 2: A/B; 3: A/B/Z                 | 2: A/B; 3: A/B/Z                 |
| Output                  |      | D: Differential; S: Single-ended | D: Differential; S: Single-ended | D: Differential; S: Single-ended |

| Encoder characteristics | Unit | KPL28                            | KPL40                            | KPL56                            |
|-------------------------|------|----------------------------------|----------------------------------|----------------------------------|
| Flange size             |      | Ø28                              | Ø40                              | Ø56                              |
| Supply voltage          | V    | 5                                | 5                                | 5                                |
| Matching motor          | NEMA | 28/35                            | 42                               | 57/60/86                         |
| Shape                   |      | C: circle                        | C: circle                        | C: circle                        |
| Resolution              | cpr  | 1000                             | 1000                             | 1000                             |
| Remark                  |      | optical encoder                  | optical encoder                  | optical encoder                  |
| Special IP class        |      | no                               | no                               | no                               |
| Detection principle     |      | -                                | -                                | -                                |
| Channel                 |      | A/B/Z                            | A/B/Z                            | A/B/Z                            |
| Output                  |      | D: Differential; S: Single-ended | D: Differential; S: Single-ended | D: Differential; S: Single-ended |

## DC Power-Off Motor Brakes

# Power/off Brakes

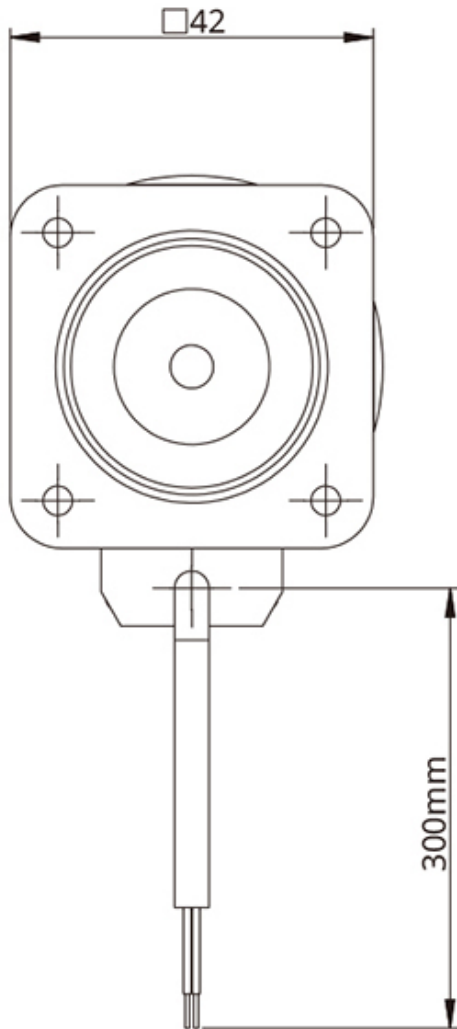
KOCO MOTION's power-off Brakes provide secure holding and emergency stopping for motors in vertical, safety-critical, or power-loss applications. Compatible with NEMA 8, 11, 14, 17, 23, 24, and 34 motor sizes, these 24VDC magnetic brakes deliver reliable performance with hold torques from 0.06Nm to 5Nm, low noise (60dB), and up to 500,000 cycles lifetime for dependable motion control and machine safety.


<https://www.kocomotion.de/produkt/power-off-brakes/>

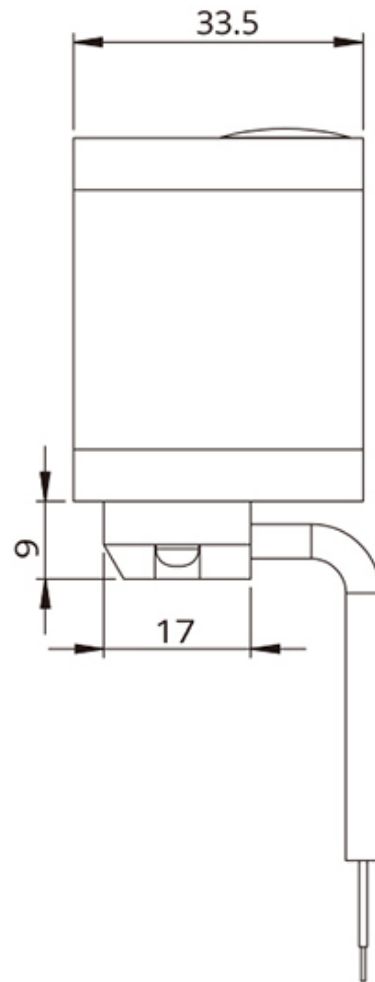
| Parameter                       | Unit   | 0.06Nm for Size 8 Motor | 0.3Nm for Size 11 Motor | 0.3Nm for Size 14 Motor | 0.5Nm for Size 17 Motor |
|---------------------------------|--------|-------------------------|-------------------------|-------------------------|-------------------------|
| Rated voltage                   | VDC    | 24 +/- 5%               | 24 +/- 5%               | 24 +/- 5%               | 24 +/- 5%               |
| Gyration gap                    | °      | 1                       | 1                       | 1                       | 1                       |
| Emergency Brake Cycles          | cycles | 200                     | 200                     | 200                     | 200                     |
| Lifetime                        | cycles | 500000                  | 500000                  | 500000                  | 500000                  |
| Noise Level                     | dB     | <60                     | <60                     | <60                     | <60                     |
| Winding resistance              | Ω      | 55 +/- 10%              | 143.7 +/- 10%           | 217 +/- 10%             | 145 +/- 10%             |
| Power Consumption               | W      | 9.6                     | 5.5                     | 4                       | 5                       |
| Holding torque                  | Nm     | >0.06                   | >0.3                    | >0.3                    | >0.5                    |
| Insulation Class                |        | B                       | B                       | B                       | B                       |
| Insulation resistance (@500VDC) | MΩ     | >100                    | >100                    | >100                    | >100                    |
| Dielectrical Strength (for 1s)  | VAC    | 1000                    | 1000                    | 1000                    | 1000                    |
| Retraction Time                 | ms     | 50                      | 50                      | 50                      | 50                      |
| Release Time                    | ms     | 50                      | 50                      | 50                      | 50                      |

| Parameter                       | Unit   | 2.3Nm for Size 23 Motor | 2.3Nm for Size 24 Motor | 5.0Nm for Size 34 Motor |
|---------------------------------|--------|-------------------------|-------------------------|-------------------------|
| Rated voltage                   | VDC    | 24 +/- 5%               | 24 +/- 5%               | 24 +/- 5%               |
| Gyratation gap                  | °      | 1                       | 1                       | 1                       |
| Emergency Brake Cycles          | cycles | 200                     | 200                     | 200                     |
| Lifetime                        | cycles | 500000                  | 500000                  | 500000                  |
| Noise Level                     | dB     | <60                     | <60                     | <60                     |
| Winding resistance              | Ω      | 141 +/- 10%             | 141 +/- 10%             | 69 +/- 10%              |
| Power Consumption               | W      | 5                       | 5                       | 12                      |
| Holding torque                  | Nm     | >2.3                    | >2.3                    | >5                      |
| Insulation Class                |        | B                       | B                       | B                       |
| Insulation resistance (@500VDC) | MΩ     | >100                    | >100                    | >100                    |
| Dielectrical Strength (for 1s)  | VAC    | 1000                    | 1000                    | 1000                    |
| Retraction Time                 | ms     | 50                      | 50                      | 50                      |
| Release Time                    | ms     | 50                      | 30                      | 50                      |

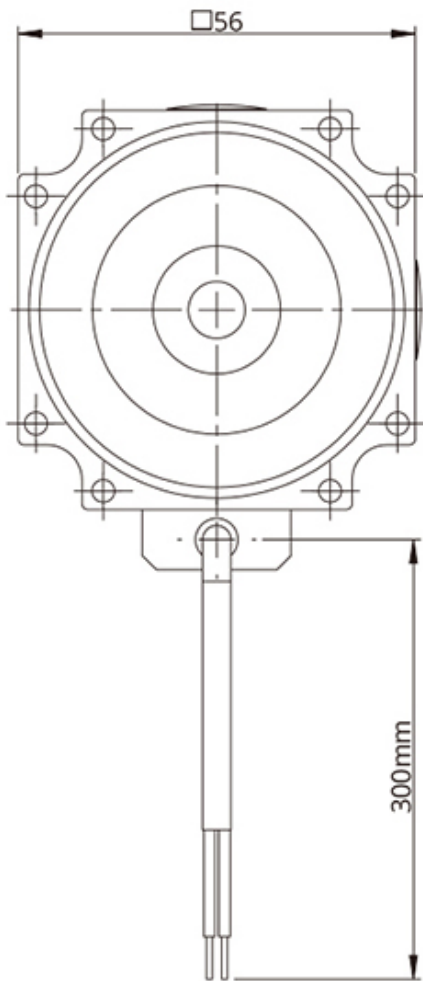
## Drawings



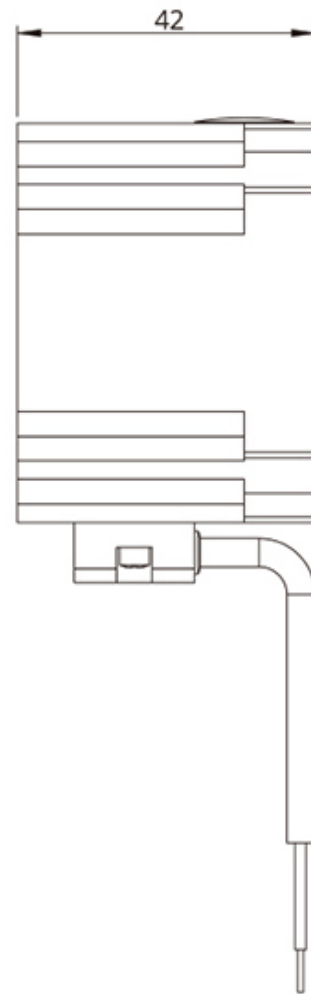
0.5Nm for Size 17 Motor

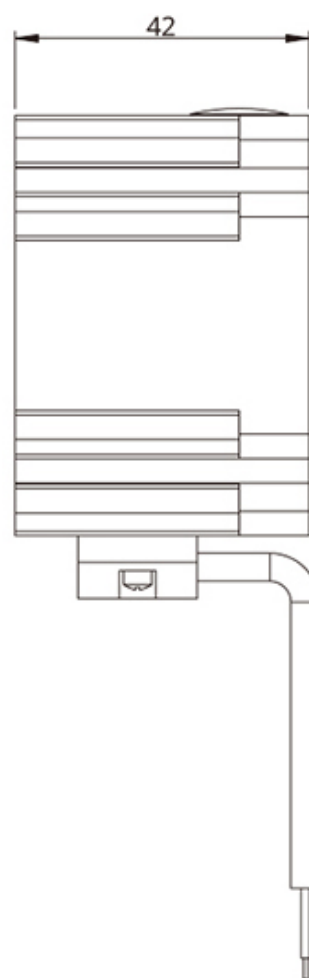
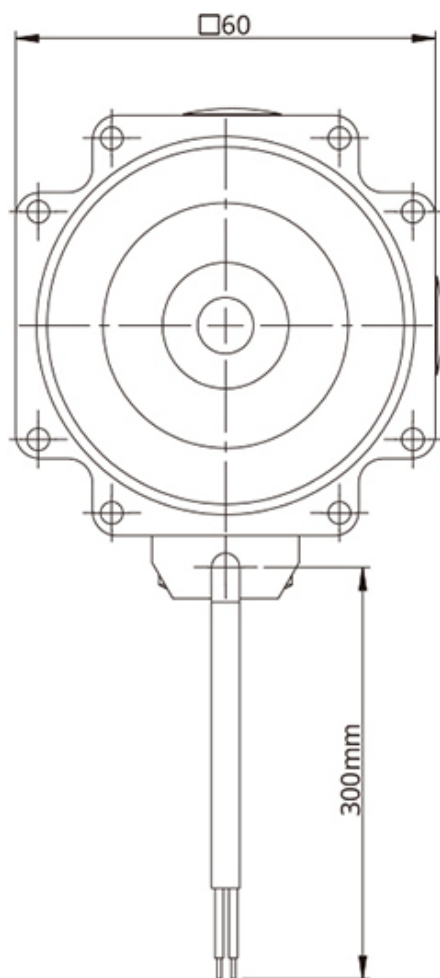




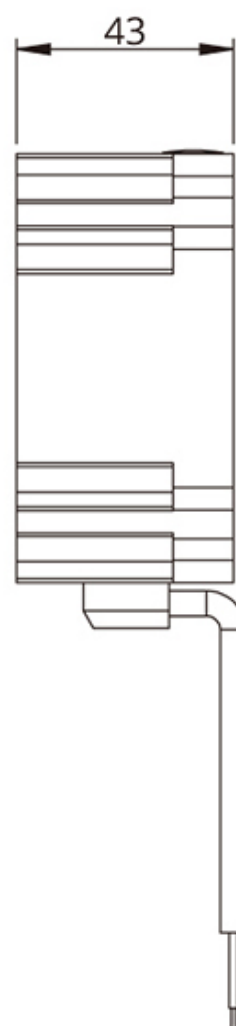
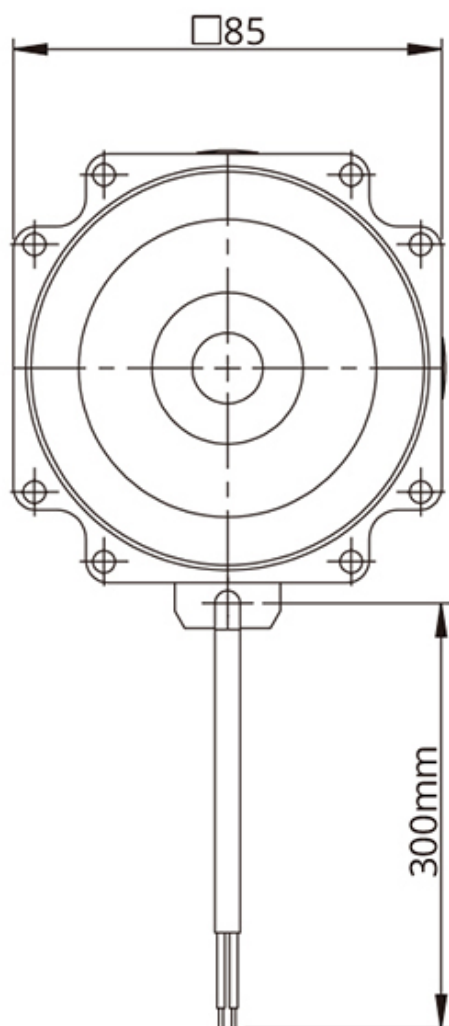


2.3Nm for Size 23 Motor





2.3Nm for Size 24 Motor



5.0Nm for Size 34 Motor

# 20mm Gripper (6mm Stroke)

Based on our own design and development of through motor foundation, for 20mm motor size, the stroke of 6mm Gripper can be selected. The structure is compact and simple, which can replace the pneumatic clamping claw, reduce the use noise, and effectively improve the accuracy. High resolution of encoder based closed loop torque control is optional (DS-CLS9-FRS4-01).

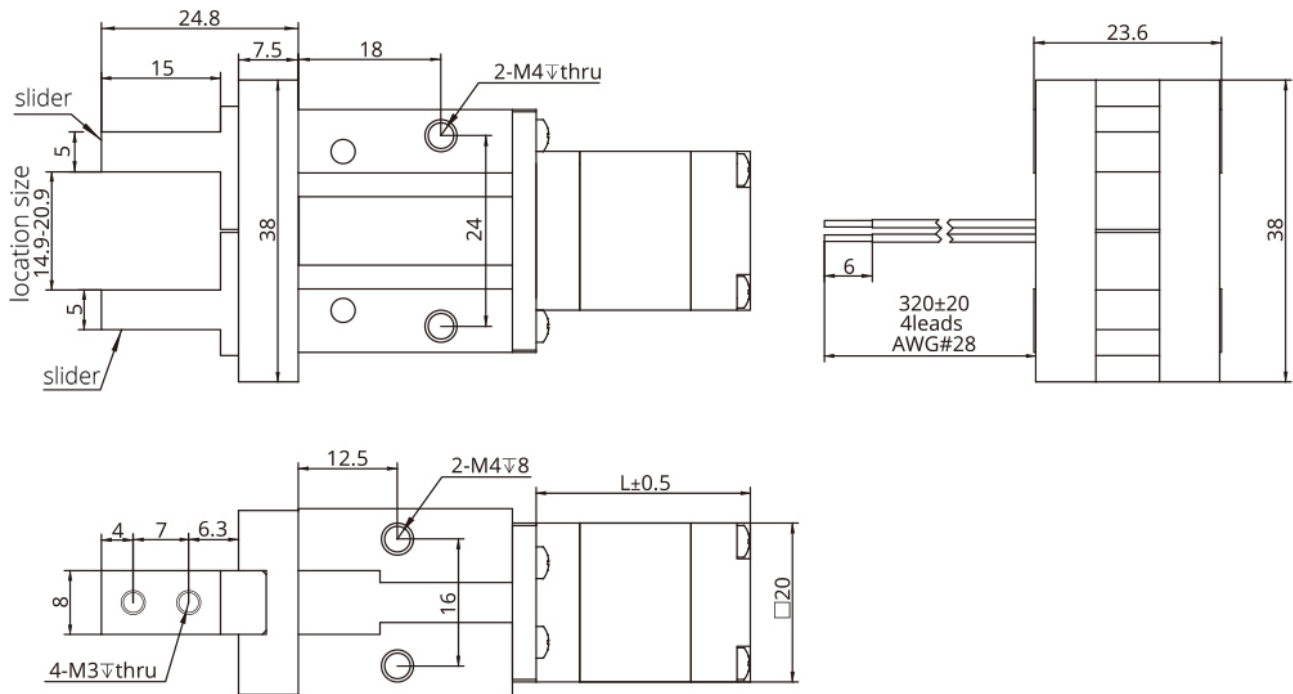


<https://www.kocomotion.de/produkt/gripper-size-20mm/>

| Motor Characteristics | Unit | 8N2105 | 8N2205 |
|-----------------------|------|--------|--------|
| Rated voltage         | V    | 2.5    | 4.4    |
| Current               | A    | 0.5    | 0.5    |
| Winding resistance    | Ω    | 5.1    | 8.8    |
| Inductance            | mH   | 1.5    | 2.7    |
| Lead Wire No.         |      | 4      | 4      |
| Motor length          | mm   | 27.2   | 38.1   |

| Motor Size | Body Length | Part Code | Stroke | Lead Code | Lead | Max. Gripping Force | Rec. Gripping Force |
|------------|-------------|-----------|--------|-----------|------|---------------------|---------------------|
| 20 mm      | 27.2 mm     | 8N2105    | 6 mm   | AB        | 1 mm | 25 N                | 13 N                |
| 20 mm      | 27.2 mm     | 8N2105    | 6 mm   | G         | 2 mm | 21 N                | 11 N                |
| 20 mm      | 27.2 mm     | 8N2105    | 6 mm   | M         | 4 mm | 11 N                | 6 N                 |
| 20 mm      | 38.1 mm     | 8N2205    | 6 mm   | AB        | 1 mm | 50 N                | 25 N                |
| 20 mm      | 38.1 mm     | 8N2205    | 6 mm   | G         | 2 mm | 36 N                | 18 N                |
| 20 mm      | 38.1 mm     | 8N2205    | 6 mm   | M         | 4 mm | 32 N                | 16 N                |

## Drawings



For stroke customization, please contact DINGS' or local representative

Size 20mm Gripper.jpg

# 28mm Gripper (6mm, 12mm Stroke)



Based on our own design and development of through motor foundation, for 28mm motor size, the stroke of 6mm/12mm Gripper can be selected. The structure is compact and simple, which can replace the pneumatic clamping claw, reduce the use noise, and effectively improve the accuracy. High resolution of encoder based closed loop torque control is optional (DS-CLS9-FRS4-01).

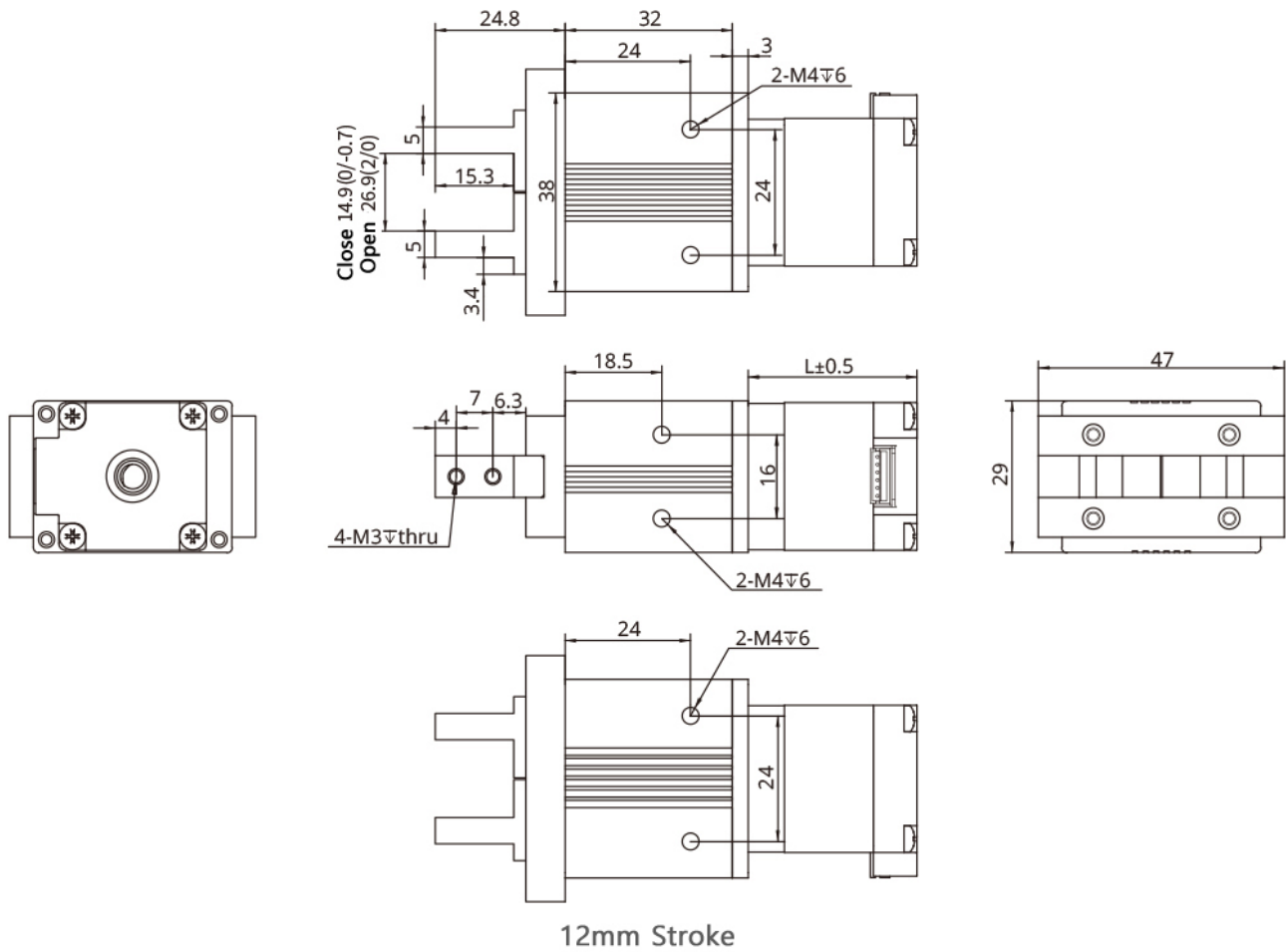


<https://www.kocomotion.de/produkt/gripper-size-28mm/>

| Motor Characteristics | Unit     | 11N2105 | 11N2110 | 11N2210 | 11N2216 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 4.5     | 2.2     | 4.1     | 2.4     |
| Current               | A        | 0.5     | 1       | 1       | 1.6     |
| Winding resistance    | $\Omega$ | 9.1     | 2.1     | 4.1     | 1.5     |
| Inductance            | mH       | 6       | 1.5     | 4       | 1.3     |
| Lead Wire No.         |          | 4       | 4       | 4       | 4       |
| Motor length          | mm       | 33.5    | 33.5    | 45      | 45      |

| Motor Size | Body Length | Part Code           | Stroke      | Lead Code | Lead     | Max. Gripping Force | Rec. Gripping Force |
|------------|-------------|---------------------|-------------|-----------|----------|---------------------|---------------------|
| 28 mm      | 33.5 mm     | 11N2105,<br>11N2110 | 6 mm, 12 mm | A         | 0.635 mm | 110 N               | 55 N                |
| 28 mm      | 33.5 mm     | 11N2105,<br>11N2110 | 6 mm, 12 mm | D         | 1.27 mm  | 84 N                | 42 N                |
| 28 mm      | 33.5 mm     | 11N2105,<br>11N2110 | 6 mm, 12 mm | K         | 2.54 mm  | 56 N                | 28 N                |
| 28 mm      | 33.5 mm     | 11N2105,<br>11N2110 | 6 mm, 12 mm | R         | 5.08 mm  | 36 N                | 18 N                |
| 28 mm      | 45 mm       | 11N2210,<br>11N2216 | 6 mm, 12 mm | A         | 0.635 mm | 140 N               | 70 N                |
| 28 mm      | 45 mm       | 11N2210,<br>11N2216 | 6 mm, 12 mm | D         | 1.27 mm  | 120 N               | 60 N                |
| 28 mm      | 45 mm       | 11N2210,<br>11N2216 | 6 mm, 12 mm | K         | 2.54 mm  | 100 N               | 50 N                |
| 28 mm      | 45 mm       | 11N2210,<br>11N2216 | 6 mm, 12 mm | R         | 5.08 mm  | 60 N                | 30 N                |

## Drawings

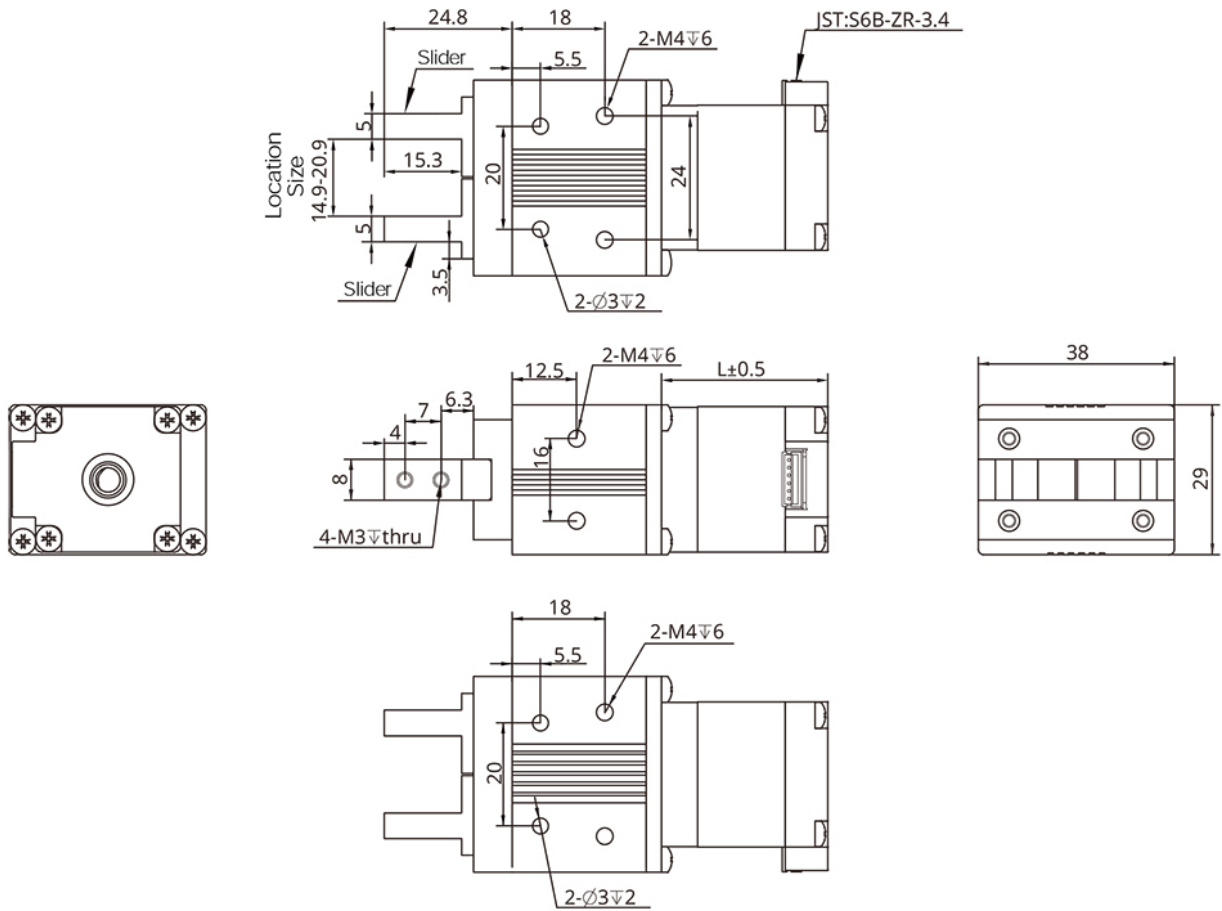


12mm Stroke

Note : All drawings are 1<sup>st</sup> angle view - ISO Compliant (3D models available)

12mm Stroke.jpg



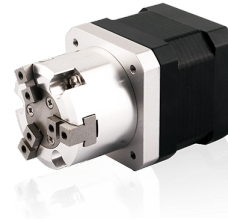


### 6mm Stroke

Note : All drawings are 1<sup>st</sup> angle view - ISO Compliant (3D models available)

6mm Stroke.jpg

# 35mm Gripper (3-Finger)

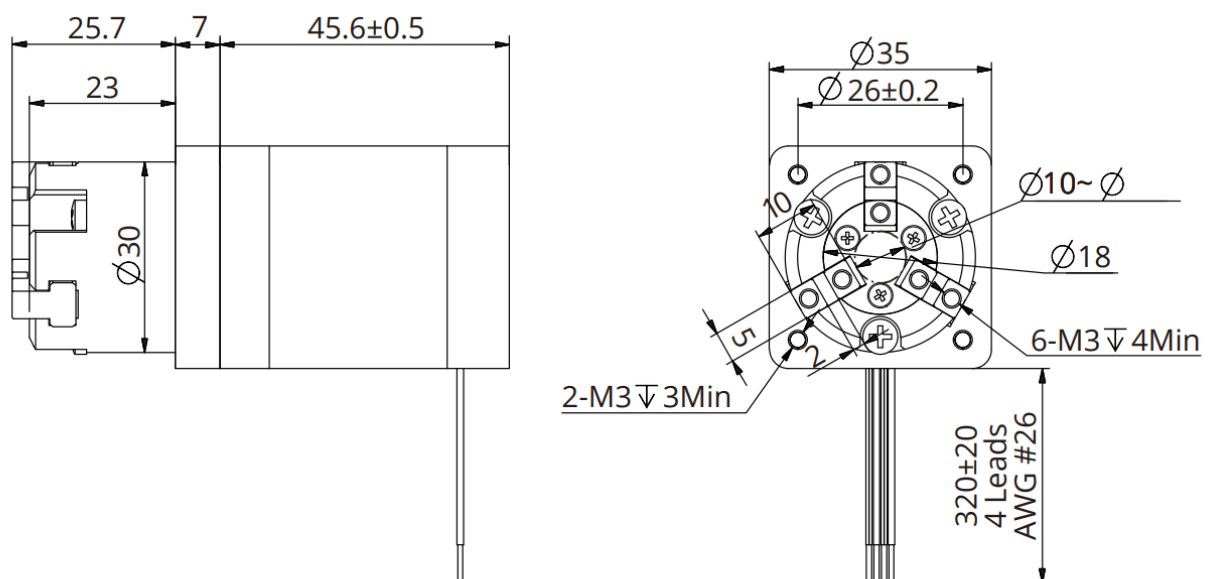

<https://www.kocomotion.de/produkt/35mm-3-finger-gripper/>


| Motor Characteristics | Unit     | 14N2105 | 14N2110 | 14N2115 | 14N2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 6.6     | 3.5     | 2.7     | 12.0    |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 13.2    | 3.5     | 1.8     | 24.0    |
| Inductance            | mH       | 14.0    | 3.6     | 1.9     | 29.0    |
| Weight                | g        | 189     | 189     | 189     | 210     |
| Lead wire No.         |          | 4       | 4       | 4       | 4       |
| Motor length          | mm       | 33.6    | 33.6    | 33.6    | 33.6    |

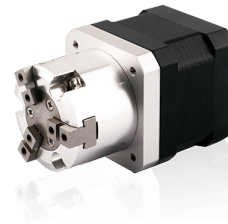
| Motor Characteristics | Unit     | 14N2210 | 14N2215 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 6.0     | 4.0     |
| Current               | A        | 1.0     | 1.5     |
| Winding resistance    | $\Omega$ | 6.0     | 2.7     |
| Inductance            | mH       | 7.2     | 3.2     |
| Weight                | g        | 210     | 210     |
| Lead wire No.         |          | 4       | 4       |
| Motor length          | mm       | 45.6    | 45.6    |

| Motor Size | Body Length | Part Code                 | Stroke | Screw Code | Lead      | Max. Gripping Force | Rec. Gripping Force |
|------------|-------------|---------------------------|--------|------------|-----------|---------------------|---------------------|
| 35 mm      | 33.6        | 14N2105, 14N2110, 14N2115 | 6 mm   | AA         | 0.6096 mm | 85 N                | 42.5 N              |
| 35 mm      | 33.6        | 14N2105, 14N2110, 14N2115 | 6 mm   | D          | 1.27 mm   | 73 N                | 36.5 N              |
| 35 mm      | 33.6        | 14N2105, 14N2110, 14N2115 | 6 mm   | K          | 2.54 mm   | 42 N                | 21 N                |
| 35 mm      | 33.6        | 14N2105, 14N2110, 14N2115 | 6 mm   | R          | 5.08 mm   | 21 N                | 10.5 N              |
| 35 mm      | 45.6        | 14N2205, 14N2210, 14N2215 | 6 mm   | AA         | 0.6096 mm | 193 N               | 96.5 N              |
| 35 mm      | 45.6        | 14N2205, 14N2210, 14N2215 | 6 mm   | D          | 1.27 mm   | 184 N               | 92 N                |
| 35 mm      | 45.6        | 14N2205, 14N2210, 14N2215 | 6 mm   | K          | 2.54 mm   | 110 N               | 55 N                |
| 35 mm      | 45.6        | 14N2205, 14N2210, 14N2215 | 6 mm   | R          | 5.08 mm   | 67 N                | 33.5 N              |

## Drawings



# 42mm Gripper (3-Finger)

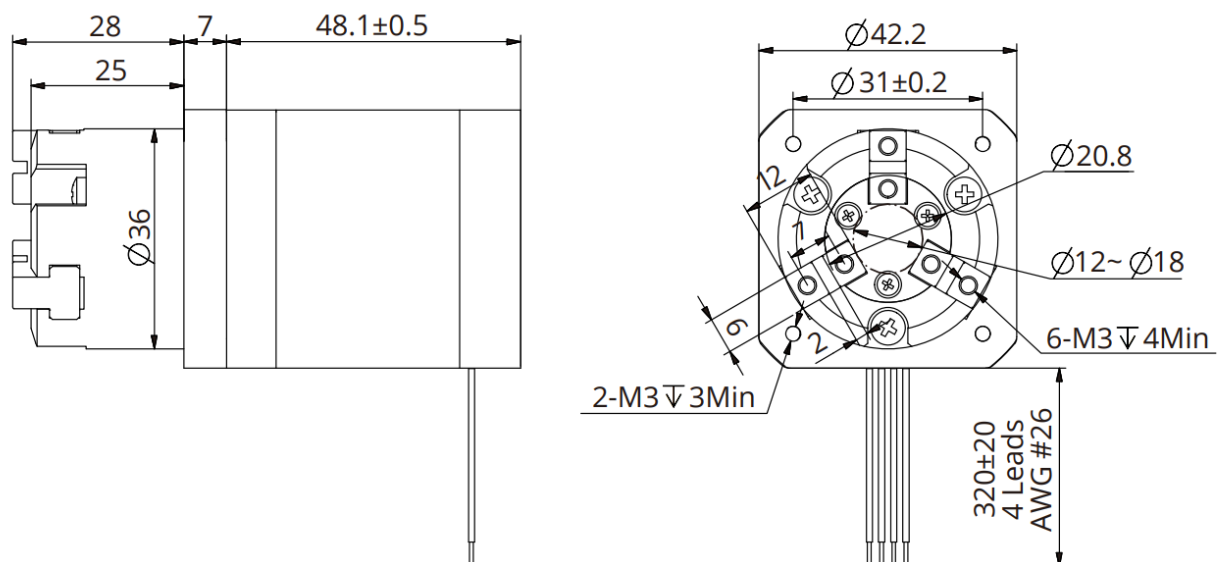

<https://www.kocomotion.de/produkt/42mm-gripper-3-finger/>


| Motor Characteristics | Unit     | 17N2105 | 17N2110 | 17N2115 | 17N2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 7.2     | 3.8     | 2.85    | 11.0    |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 14.4    | 3.8     | 1.9     | 22.0    |
| Inductance            | mH       | 19.8    | 5.0     | 2.2     | 46.0    |
| Weight                | g        | 254     | 254     | 254     | 386     |
| Lead wire No.         |          | 4       | 4       | 4       | 4       |
| Motor length          | mm       | 34.1    | 34.1    | 34.1    | 48.1    |

| Motor Characteristics | Unit     | 17N2212 | 17N2225 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 4.5     | 2.5     |
| Current               | A        | 1.2     | 2.5     |
| Winding resistance    | $\Omega$ | 3.8     | 1.0     |
| Inductance            | mH       | 8.0     | 1.8     |
| Weight                | g        | 386     | 386     |
| Lead wire No.         |          | 4       | 4       |
| Motor length          | mm       | 48.1    | 48.1    |

| Motor Size | Body Length | Part Code                 | Stroke | Screw Code | Lead      | Max. Gripping Force | Rec. Gripping Force |
|------------|-------------|---------------------------|--------|------------|-----------|---------------------|---------------------|
| 42 mm      | 34.1 mm     | 17N2105, 17N2110, 17N2115 | 6 mm   | AA         | 0.6096 mm | 270 N               | 135 N               |
| 42 mm      | 34.1 mm     | 17N2105, 17N2110, 17N2115 | 6 mm   | D          | 1.27 mm   | 163 N               | 81.5 N              |
| 42 mm      | 34.1 mm     | 17N2105, 17N2110, 17N2115 | 6 mm   | K          | 2.54 mm   | 91 N                | 45.5 N              |
| 42 mm      | 34.1 mm     | 17N2105, 17N2110, 17N2115 | 6 mm   | R          | 5.08 mm   | 56 N                | 28 N                |
| 42 mm      | 48.1 mm     | 17N2205, 17N2212, 17N2225 | 6 mm   | AA         | 0.6096 mm | 371 N               | 185.5 N             |
| 42 mm      | 48.1 mm     | 17N2205, 17N2212, 17N2225 | 6 mm   | D          | 1.27 mm   | 336 N               | 168 N               |
| 42 mm      | 48.1 mm     | 17N2205, 17N2212, 17N2225 | 6 mm   | K          | 2.54 mm   | 204 N               | 102 N               |
| 42 mm      | 48.1 mm     | 17N2205, 17N2212, 17N2225 | 6 mm   | R          | 5.08 mm   | 146 N               | 73 N                |

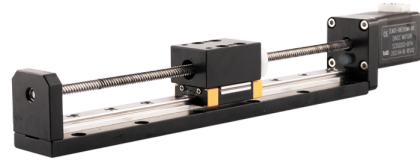
## Drawings



DLM

## DLM - Size 20mm

DLM Size 20 mm is a compact, reliable lead screw linear module for precise linear motion and customized integrated solutions. It offers multiple lead and stroke options, dynamic force up to 445 N, static force up to 720 N, and travel per step from 0.0015 to 0.04 mm.


<https://www.kocomotion.de/produkt/dlm-size-20mm/>

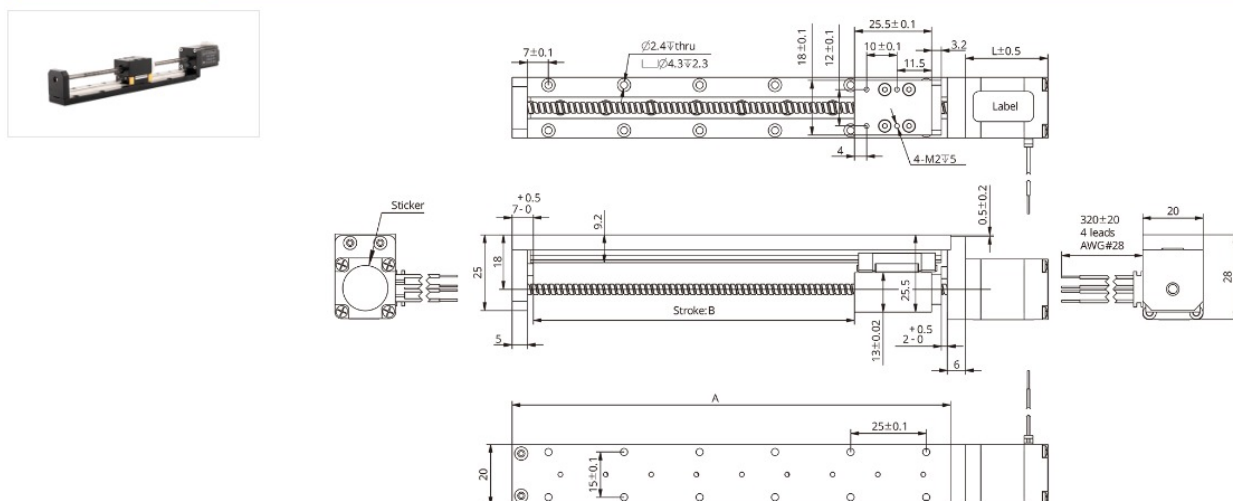
| Motor Characteristics | Unit | 8E2105 | 8E2205 |
|-----------------------|------|--------|--------|
| Rated voltage         | V    | 2.5    | 4.4    |
| Current               | A    | 0.5    | 0.5    |
| Winding resistance    | Ω    | 5.1    | 8.8    |
| Inductance            | mH   | 1.5    | 2.7    |
| Motor length          | mm   | 27.2   | 38.1   |
| Lead Wire No.         |      | 4      | 4      |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 3.5 mm     | 0.3 mm    | AF        | 0.0015 mm              |
| 3.5 mm     | 0.6096 mm | AA        | 0.003048 mm            |
| 3.5 mm     | 1 mm      | AB        | 0.005 mm               |
| 3.5 mm     | 1.2192 mm | B         | 0.006096 mm            |
| 3.5 mm     | 2 mm      | G         | 0.01 mm                |
| 3.5 mm     | 2.4384 mm | J         | 0.012192 mm            |
| 3.5 mm     | 4 mm      | M         | 0.02 mm                |
| 3.5 mm     | 8 mm      | T         | 0.04 mm                |

| Mechanical Specifications                                    |         |
|--------------------------------------------------------------|---------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 445 N   |
| Max static force in movement direction Co(stat)              | 720 N   |
| Max torque around roll axis (M_roll)                         | 2.6 Nm  |
| Max torque around pitch axis (M_pitch)                       | 1.65 Nm |
| Max torque around yaw axis (M_yaw)                           | 1.65 Nm |

## Drawings

Size 20mm DLM

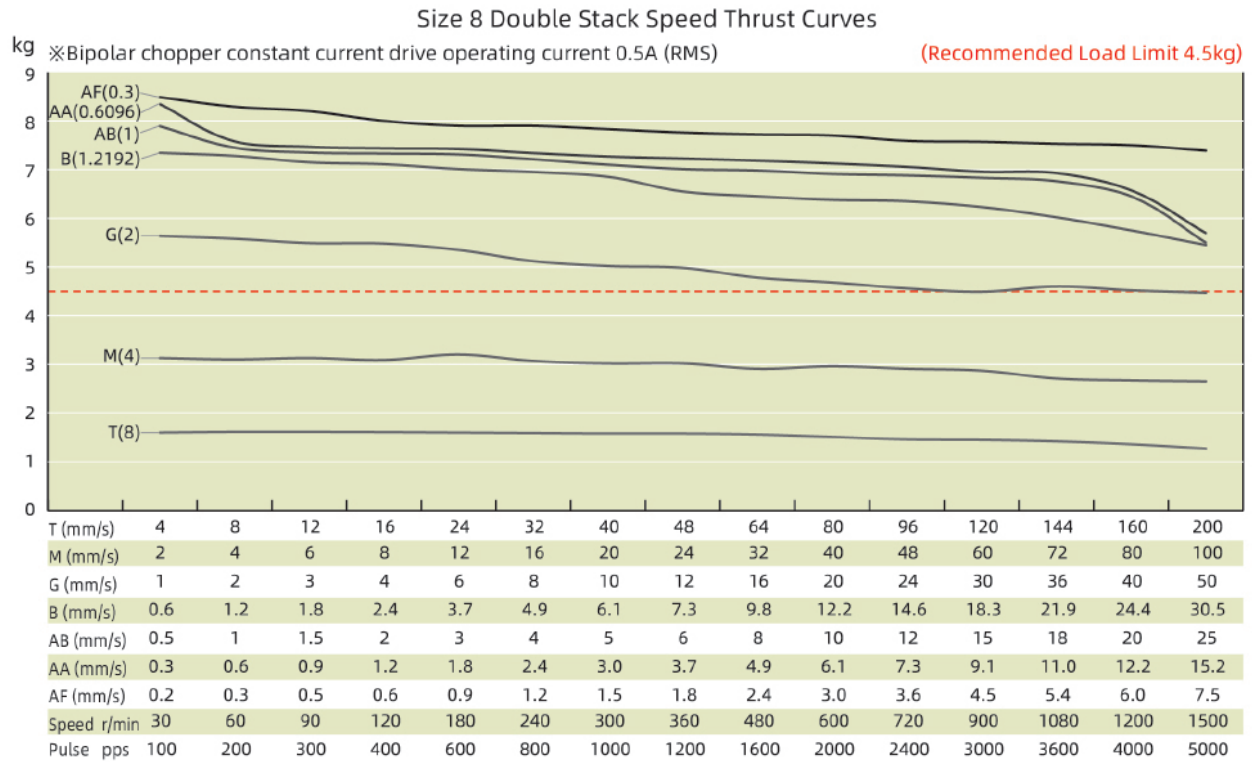


## Available Stroke Selection

| Size A | Stroke B | Motor Length L1 (Option) |
|--------|----------|--------------------------|
| 60     | 20       |                          |
| 80     | 40       |                          |
| 100    | 60       |                          |
| 120    | 80       |                          |
| 140    | 100      |                          |
| 160    | 120      |                          |
| 190    | 150      |                          |

Size 20mm DLM.jpg

## Speed/Thrust Curves



### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).

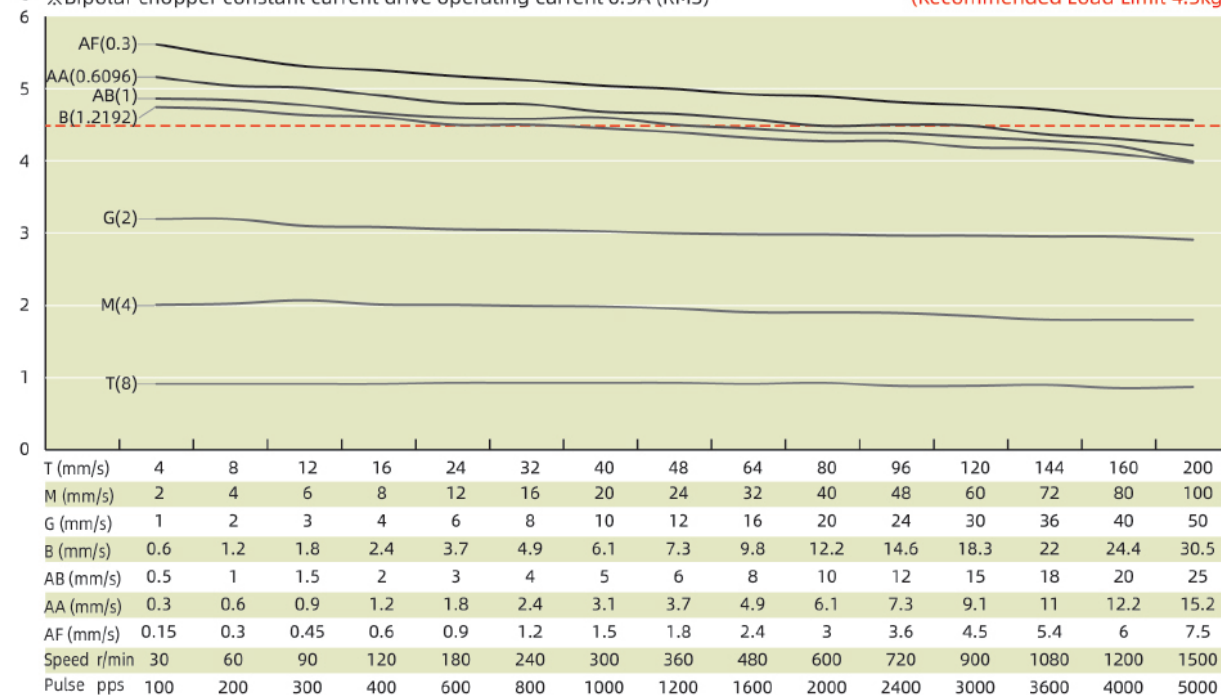
Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Double Stack Speed Thrust Curves



### Size 8 Single Stack Speed Thrust Curves

kg ※Bipolar chopper constant current drive operating current 0.5A (RMS) (Recommended Load Limit 4.5kg)



#### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).

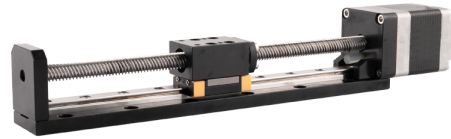
Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Single Stack Speed Thrust Curves

DLM

## DLM - Size 28mm

DLM 28mm is a compact lead screw linear module for precise, reliable linear motion. It supports customized stroke and lead options, with travel per step from 0.0016 to 0.0508 mm. The series delivers up to 445 N dynamic force and 720 N static force for integrated linear positioning solutions.


<https://www.kocomotion.de/produkt/dlm-size-28mm/>

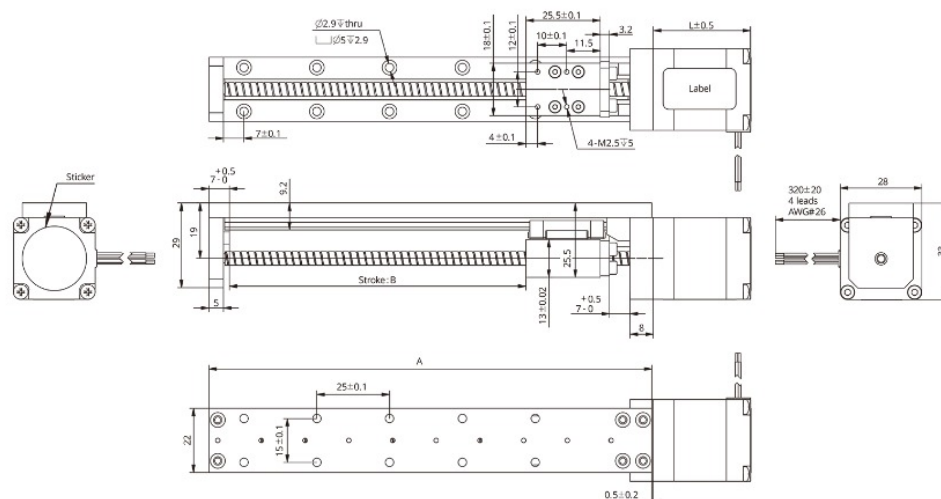
| Motor Characteristics | Unit | 11E2105 | 11E2110 | 11E2210 | 11E2216 |
|-----------------------|------|---------|---------|---------|---------|
| Rated voltage         | V    | 4.55    | 2.1     | 3.9     | 2.4     |
| Current               | A    | 0.5     | 1       | 0.95    | 1.6     |
| Winding resistance    | Ω    | 9.1     | 2.1     | 4.1     | 1.5     |
| Inductance            | mH   | 6       | 1.5     | 4       | 1.3     |
| Motor length          | mm   | 33.35   | 33.35   | 45      | 45      |
| Lead Wire No.         |      | 4       | 4       | 4       | 4       |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 4.77 mm    | 0.3175 mm | AL        | 0.0016 mm              |
| 4.77 mm    | 0.635 mm  | A         | 0.003175 mm            |
| 4.77 mm    | 1.27 mm   | D         | 0.00635 mm             |
| 4.77 mm    | 1.5875 mm | F         | 0.0079 mm              |
| 4.77 mm    | 2.54 mm   | X         | 0.0127 mm              |
| 4.77 mm    | 4.8768 mm | Q         | 0.0244 mm              |
| 4.77 mm    | 5.08 mm   | R         | 0.0254 mm              |
| 4.77 mm    | 10.16 mm  | X         | 0.0508 mm              |

| Mechanical Specifications                                    |         |
|--------------------------------------------------------------|---------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 445 N   |
| Max static force in movement direction Co(stat)              | 720 N   |
| Max torque around roll axis (M_roll)                         | 2.6 Nm  |
| Max torque around pitch axis (M_pitch)                       | 1.65 Nm |
| Max torque around yaw axis (M_yaw)                           | 1.65 Nm |

## Drawings

Size 28mm DLM

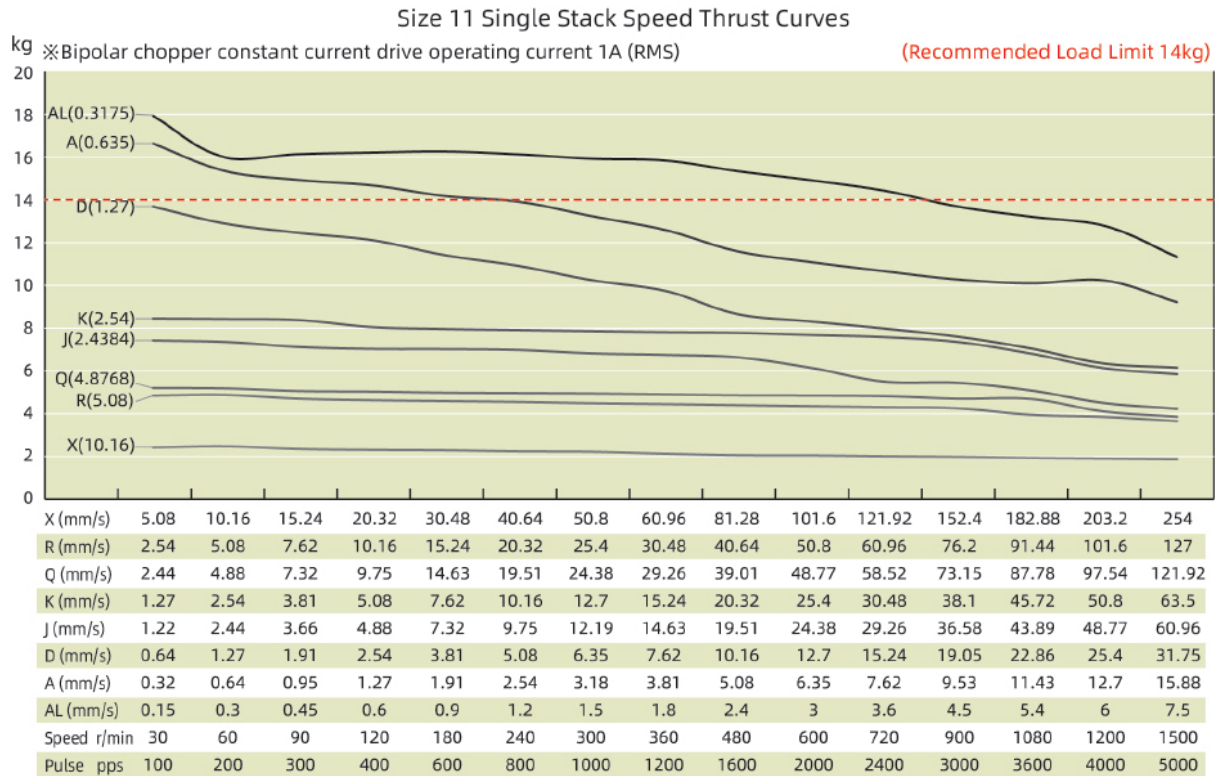


## Available Stroke Selection

| Size A | Stroke B | Motor Length L1 (Option) |
|--------|----------|--------------------------|
| 72     | 20       |                          |
| 92     | 40       |                          |
| 112    | 60       |                          |
| 132    | 80       |                          |
| 152    | 100      |                          |
| 202    | 150      |                          |
| 252    | 200      |                          |
| 302    | 250      |                          |

Size 28mm DLM.jpg

## Speed/Thrust Curves

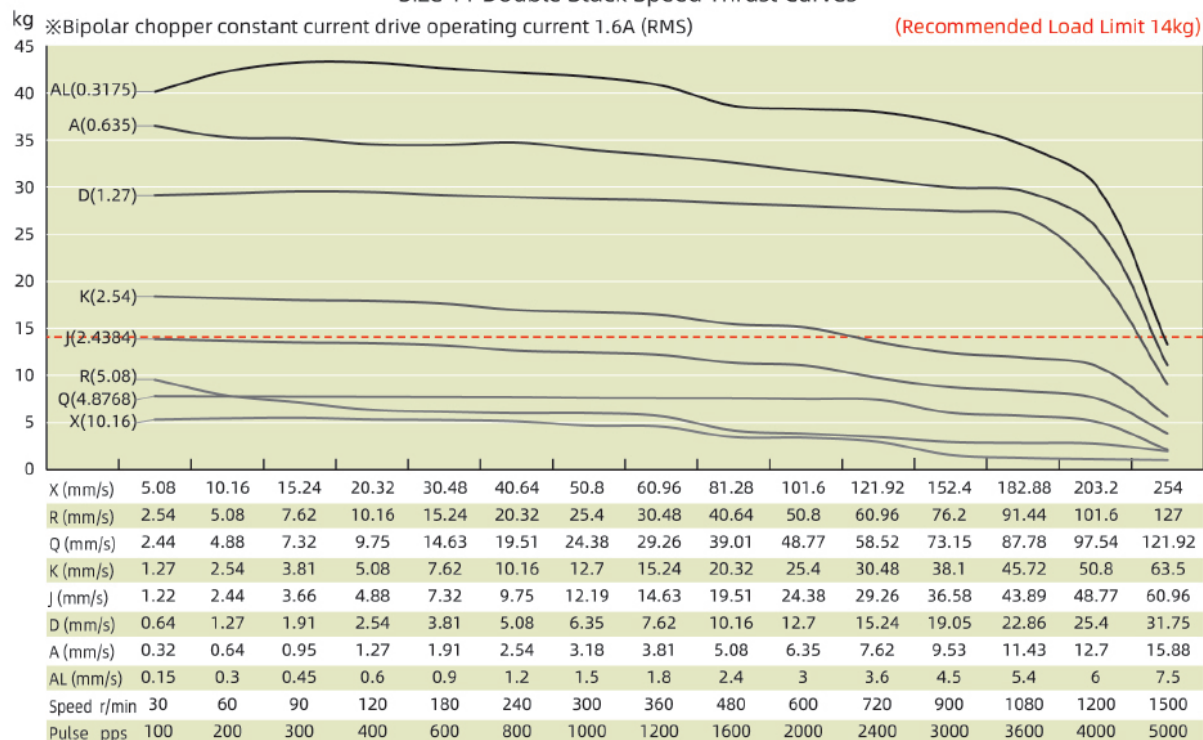


### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).  
Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Single Stack Speed Thrust Curves

### Size 11 Double Stack Speed Thrust Curves



### TEST CONDITION

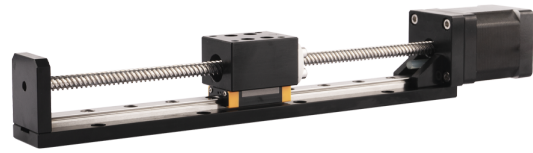
Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).  
Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Double Stack Speed Thrust Curves

DLM

## DLM - Size 35mm

DLM 35mm is a compact lead screw linear module for precise linear motion in integrated machine designs. It offers customizable stroke and lead options, with max dynamic force up to 785 N, max static force up to 1247.5 N, and multiple travel-per-step configurations for application-specific positioning.


<https://www.kocomotion.de/produkt/dlm-size-35mm/>

| Motor Characteristics | Unit     | 14E2105 | 14E2110 | 14E2115 | 14E2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 6.6     | 3.5     | 2.7     | 12      |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 13.2    | 3.5     | 1.8     | 24      |
| Inductance            | mH       | 14      | 3.6     | 1.9     | 29      |
| Motor length          | mm       | 33.6    | 33.6    | 33.6    | 45.6    |
| Lead Wire No.         |          | 4       | 4       | 4       | 4       |

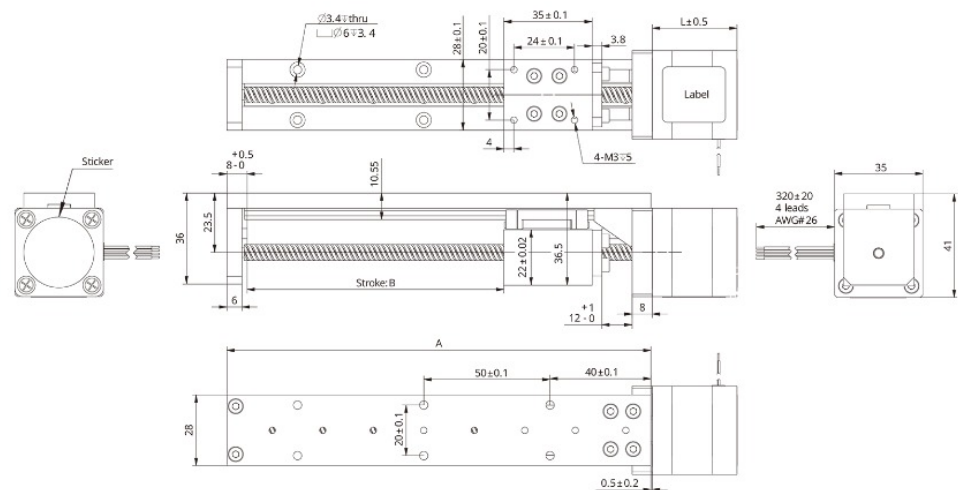
| Motor Characteristics | Unit     | 14E2210 | 14E2215 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 6.0     | 4.0     |
| Current               | A        | 1.0     | 1.5     |
| Winding resistance    | $\Omega$ | 6.0     | 2.7     |
| Inductance            | mH       | 7.2     | 3.2     |
| Motor length          | mm       | 45.6    | 45.6    |
| Lead Wire No.         |          | 4       | 4       |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 6.35 mm    | 0.024 mm  | AA        | 0.003048 mm            |
| 6.35 mm    | 0.0394 mm | AB        | 0.005 mm               |
| 6.35 mm    | 0.025 mm  | A         | 0.003175 mm            |
| 6.35 mm    | 0.048 mm  | B         | 0.006096 mm            |
| 6.35 mm    | 0.05 mm   | D         | 0.00635 mm             |
| 6.35 mm    | 0.0625 mm | F         | 0.0079 mm              |
| 6.35 mm    | 0.096 mm  | J         | 0.0122 mm              |
| 6.35 mm    | 0.1 mm    | K         | 0.0127 mm              |
| 6.35 mm    | 0.125 mm  | L         | 0.0159 mm              |
| 6.35 mm    | 0.192 mm  | Q         | 0.024 mm               |
| 6.35 mm    | 0.2 mm    | R         | 0.0254 mm              |
| 6.35 mm    | 0.25 mm   | S         | 0.0318 mm              |
| 6.35 mm    | 0.333 mm  | U         | 0.0423 mm              |
| 6.35 mm    | 0.384 mm  | W         | 0.0488 mm              |
| 6.35 mm    | 0.5 mm    | Y         | 0.0635 mm              |
| 6.35 mm    | 1 mm      | Z         | 0.127 mm               |
| 8 mm       | 0.1575 mm | M         | 0.02 mm                |
| 8 mm       | 0.315 mm  | T         | 0.04 mm                |
| 8 mm       | 0.0787 mm | G         | 0.01 mm                |
| 8 mm       | 0.3937 mm | C         | 0.05 mm                |

| Mechanical Specifications                                    |          |
|--------------------------------------------------------------|----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 785 N    |
| Max static force in movement direction Co(stat)              | 1247.5 N |
| Max torque around roll axis (M_roll)                         | 5.85 Nm  |
| Max torque around pitch axis (M_pitch)                       | 3.2 Nm   |
| Max torque around yaw axis (M_yaw)                           | 3.2 Nm   |

## Drawings

### Size 35mm DLM



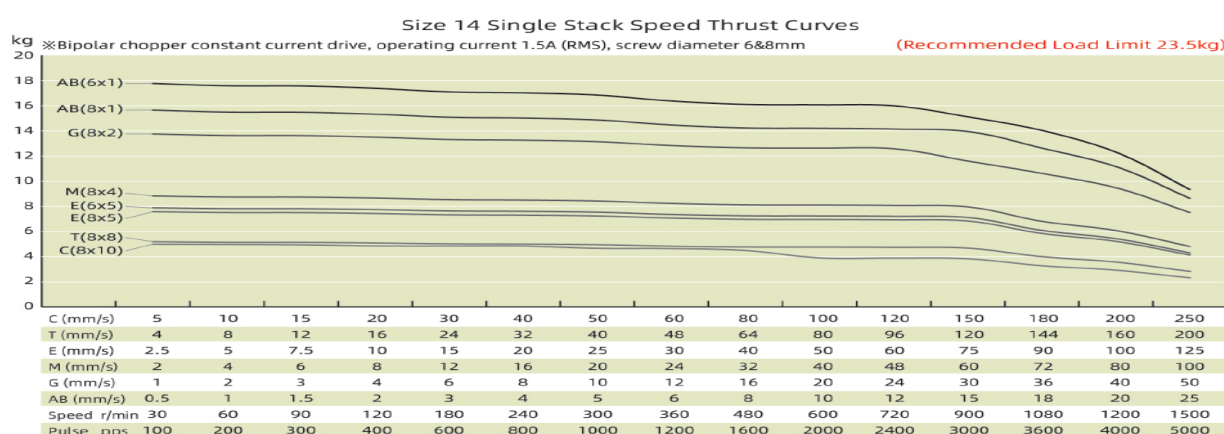
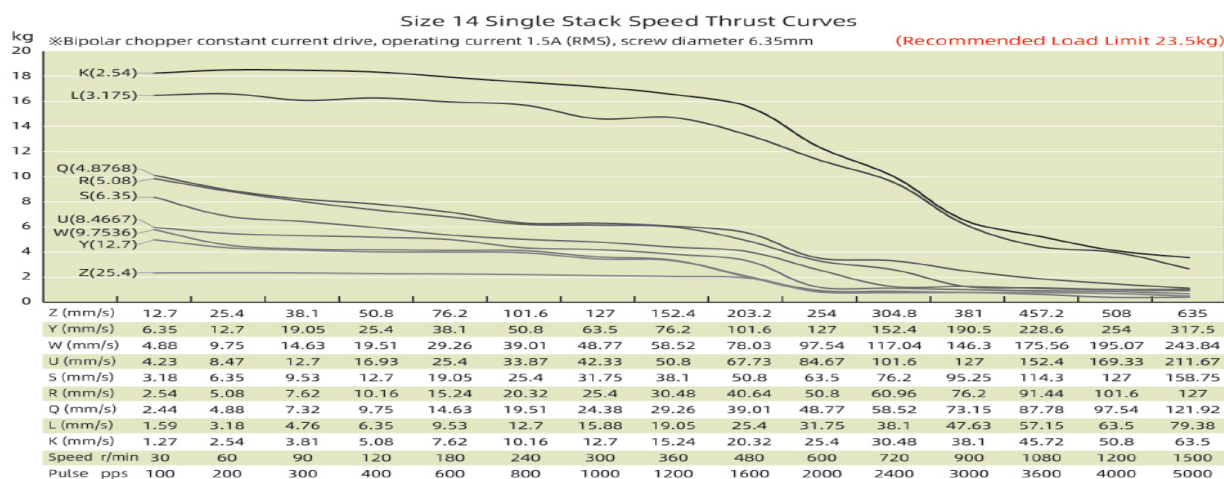
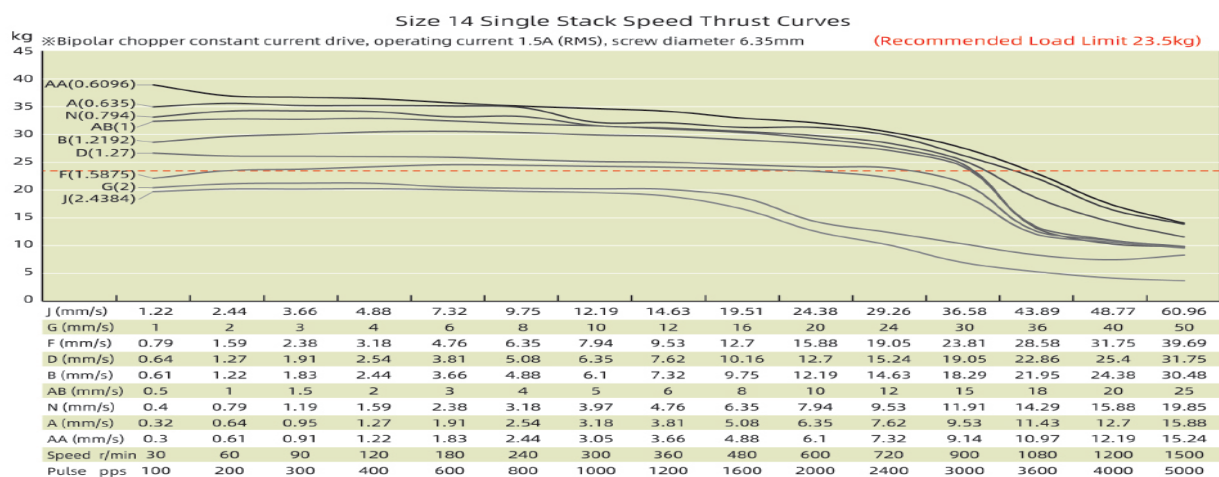
### Available Stroke Selection

| Size A | Stroke B | Motor Length L1<br>(Option) |
|--------|----------|-----------------------------|
| 118    | 50       |                             |
| 168    | 100      |                             |
| 218    | 150      |                             |
| 268    | 200      |                             |
| 318    | 250      |                             |
| 368    | 300      |                             |
| 418    | 350      |                             |
| 468    | 400      |                             |

Size 35mm DLM.jpg



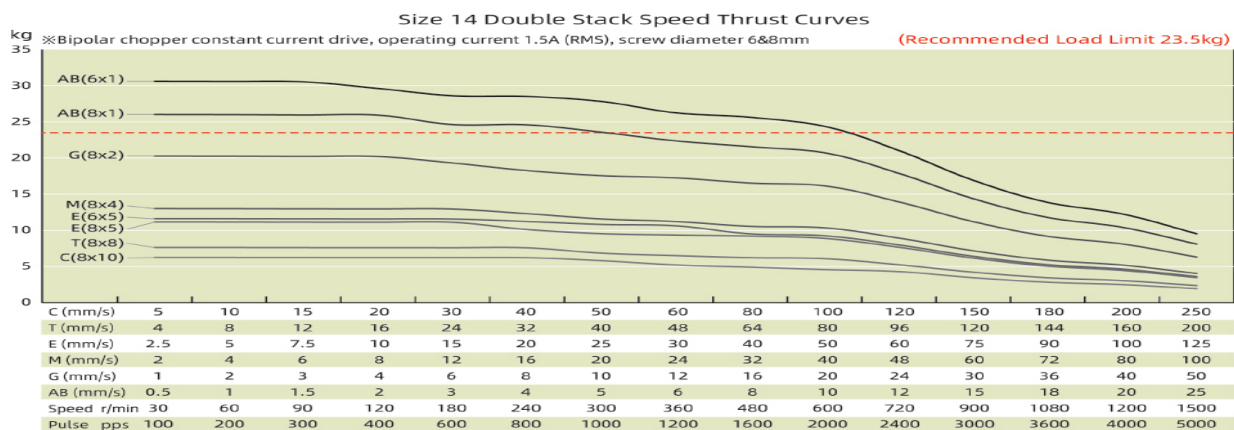
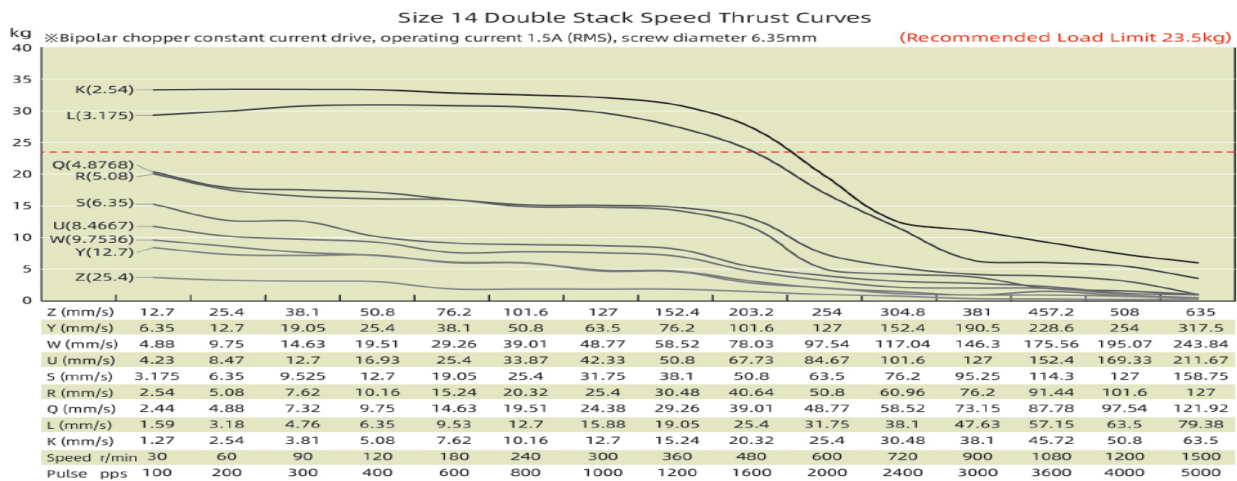
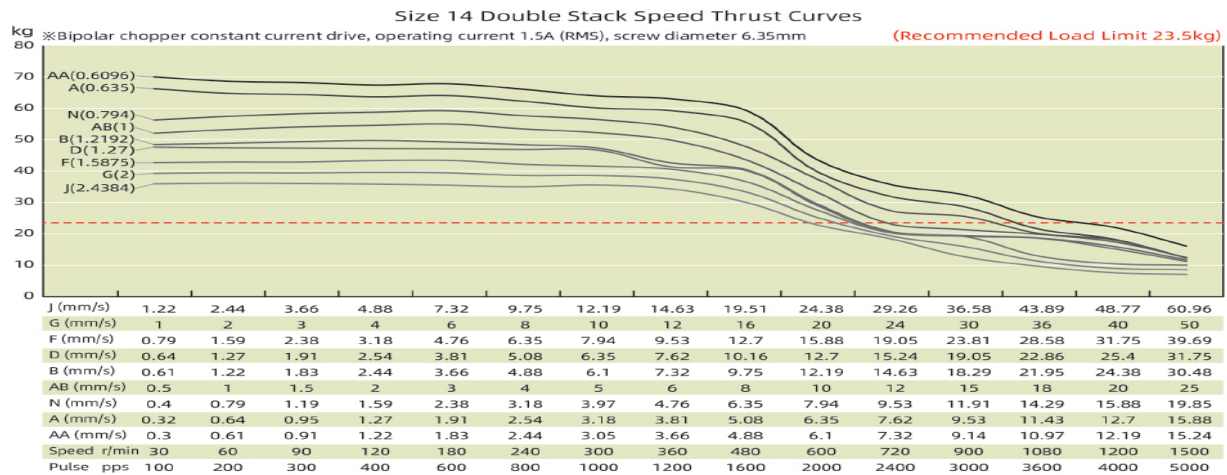
## Speed/Thrust Curves



### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).  
 Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

### Single Stack Speed Thrust Curves

**TEST CONDITION**

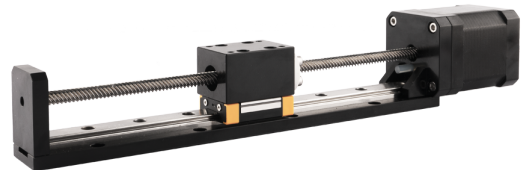
Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).  
Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Double Stack Speed Thrust Curves

DLM

## DLM - Size 42mm

DLM 42 mm linear modules combine a lead screw linear actuator with a compact, reliable structure for precise linear motion. The series supports customizable stroke and lead options, with travel per step from 0.003048 to 0.127 mm, enabling integrated linear solutions for varied application requirements.


<https://www.kocomotion.de/produkt/dlm-size-42mm/>

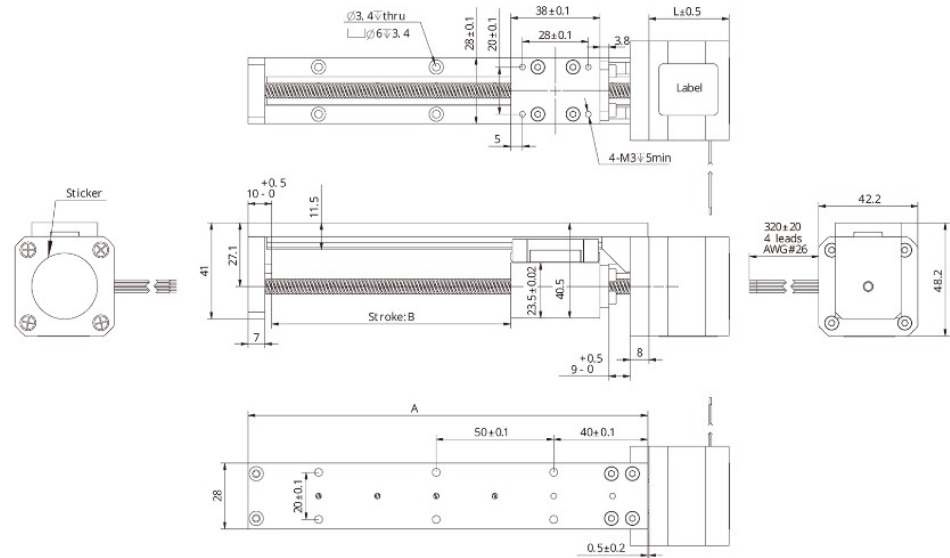
| Motor Characteristics | Unit     | 17E2105 | 17E2110 | 17E2115 | 17E2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 7.2     | 3.8     | 2.85    | 11.0    |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 14.4    | 3.8     | 1.9     | 22.0    |
| Inductance            | mH       | 19.8    | 5       | 2.2     | 46      |
| Motor length          | mm       | 34.1    | 34.1    | 34.1    | 48.1    |
| Lead Wire No.         |          | 4       | 4       | 4       | 4       |

| Motor Characteristics | Unit     | 17E2212 | 17E2225 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 4.5     | 2.5     |
| Current               | A        | 1.2     | 2.5     |
| Winding resistance    | $\Omega$ | 3.8     | 1.0     |
| Inductance            | mH       | 8.0     | 1.8     |
| Motor length          | mm       | 48.1    | 48.1    |
| Lead Wire No.         |          | 4       | 4       |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 6.35 mm    | 0.6096 mm | AA        | 0.003048 mm            |
| 6.35 mm    | 1.0 mm    | AB        | 0.005 mm               |
| 6.35 mm    | 0.635 mm  | A         | 0.003175 mm            |
| 6.35 mm    | 1.2192 mm | B         | 0.006096 mm            |
| 6.35 mm    | 1.27      | D         | 0.00635 mm             |
| 6.35 mm    | 1.5875    | F         | 0.0079 mm              |
| 6.35 mm    | 2.4384    | J         | 0.0122 mm              |
| 6.35 mm    | 2.54      | K         | 0.0127 mm              |
| 6.35 mm    | 3.175     | L         | 0.0159 mm              |
| 6.35 mm    | 4.8768    | Q         | 0.024 mm               |
| 6.35 mm    | 5.08      | R         | 0.0254 mm              |
| 6.35 mm    | 6.35      | S         | 0.0318 mm              |
| 6.35 mm    | 8.4667    | U         | 0.0423 mm              |
| 6.35 mm    | 9.7536    | W         | 0.0488 mm              |
| 6.35 mm    | 12.7      | Y         | 0.0635 mm              |
| 6.35 mm    | 25.4      | Z         | 0.127 mm               |
| 8 mm       | 4         | M         | 0.02 mm                |
| 8 mm       | 8         | T         | 0.04 mm                |
| 8 mm       | 2         | G         | 0.01 mm                |
| 8 mm       | 10        | C         | 0.05 mm                |

| Mechanical Specifications |          |
|---------------------------|----------|
| C100B(dyn)                | 1154 N   |
| Co(stat)                  | 1732.5 N |
| Mro                       | 10.75 Nm |
| Mpo                       | 6.45 Nm  |
| Myo                       | 6.45 Nm  |

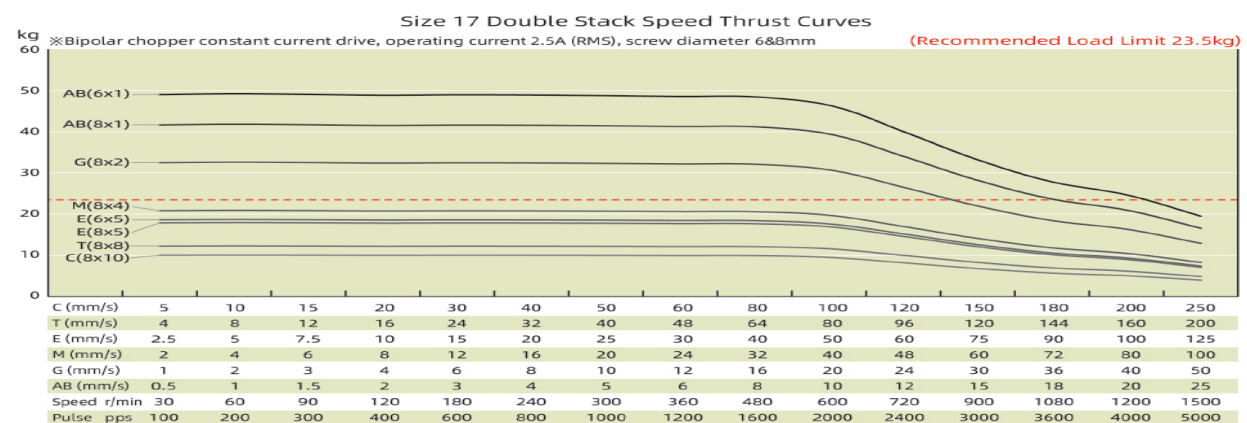
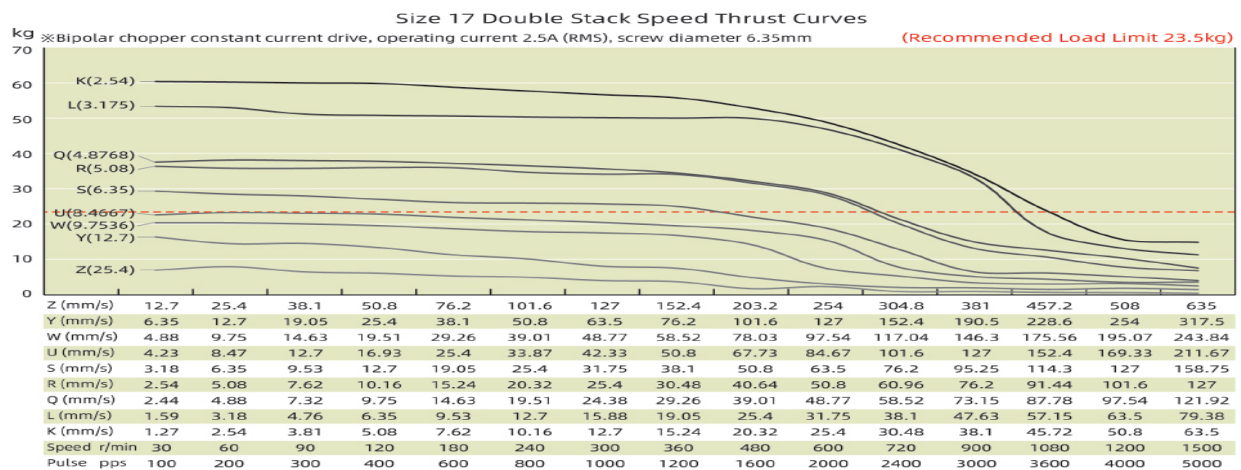
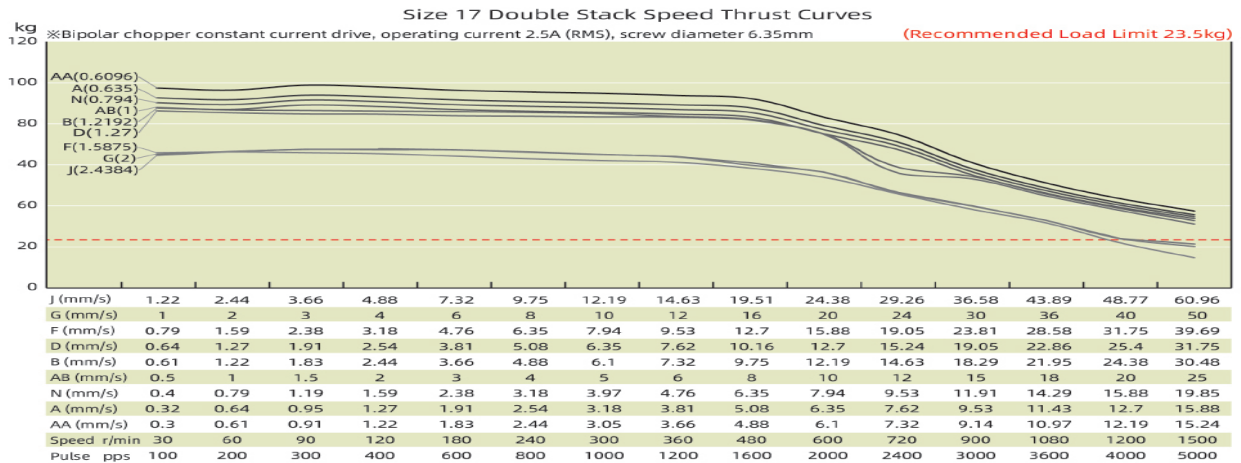
## Size 42mm DLM



| Size A | Stroke B | Motor Length L1 (Option) |
|--------|----------|--------------------------|
| 120    | 50       |                          |
| 170    | 100      |                          |
| 220    | 150      |                          |
| 270    | 200      |                          |
| 320    | 250      |                          |
| 370    | 300      |                          |
| 420    | 350      |                          |
| 470    | 400      |                          |
| 520    | 450      |                          |
| 570    | 500      |                          |

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## Speed/Thrust Curves



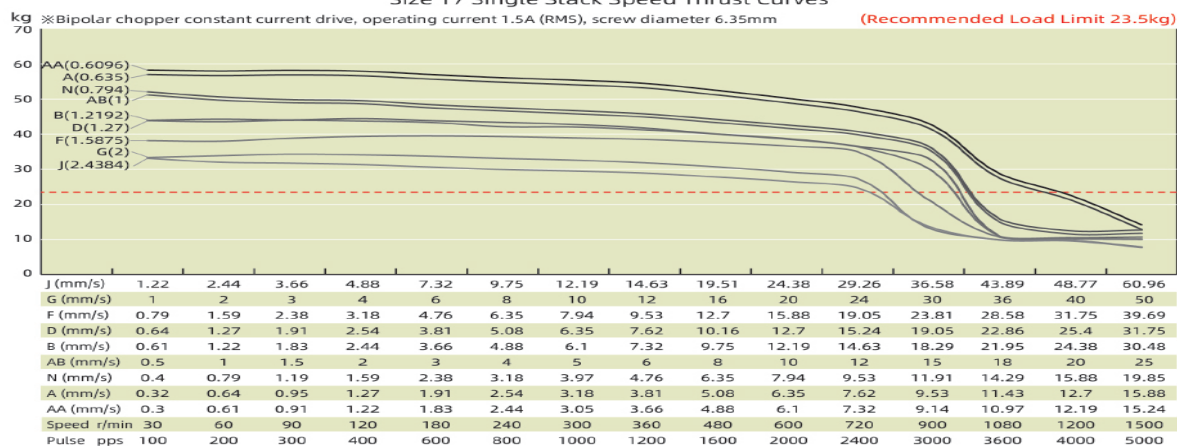
### TEST CONDITION

Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms).  
 Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

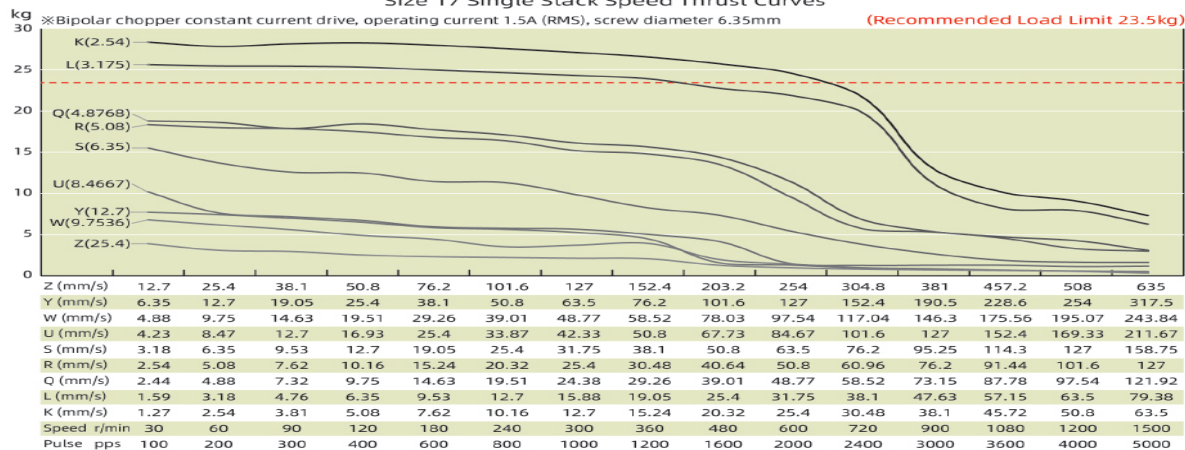
### Double Stack Speed Thrust Curves



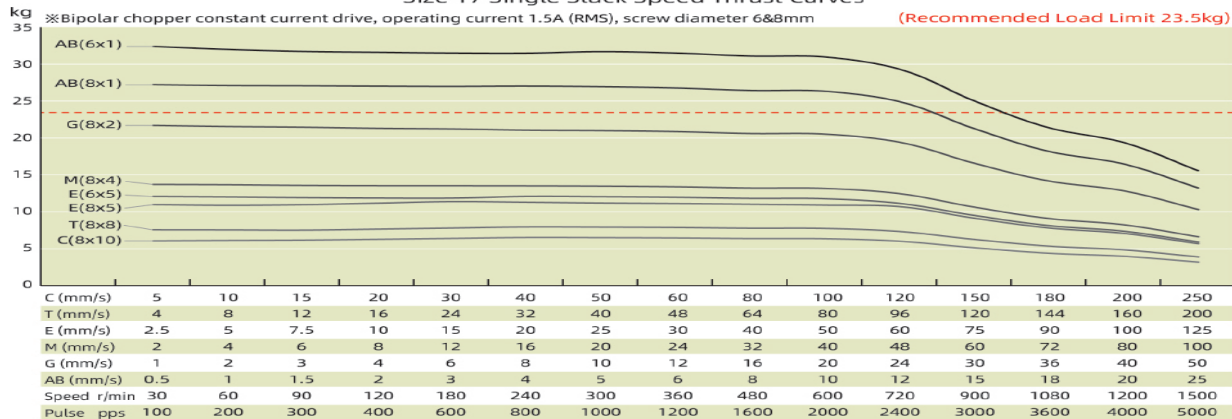
Size 17 Single Stack Speed Thrust Curves



Size 17 Single Stack Speed Thrust Curves



Size 17 Single Stack Speed Thrust Curves



#### TEST CONDITION

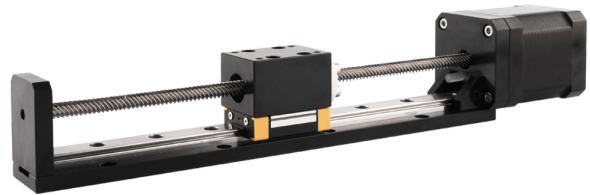
Testing Voltage: 24Vdc, Driver Model: DS-OLS2-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

Single Stack Speed Thrust Curves

DLM

## DLM - Size 57mm

DLM 57mm is a compact lead screw linear module for precise, customizable linear motion. Built on KOCO platform products, it offers a reliable structure, optional stroke and lead configurations, and integrated customization. Mechanical capacity reaches 1905 N dynamic force and 2795 N static force.


<https://www.kocomotion.de/produkt/dlm-size-57mm/>

| Motor Characteristics | Unit     | 23E2110 | 23E2120 | 23E2130 | 23E2210 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 6.4     | 3.5     | 2.4     | 11.5    |
| Current               | A        | 1.0     | 2.0     | 3.0     | 1.0     |
| Winding resistance    | $\Omega$ | 6.4     | 1.75    | 0.8     | 11.5    |
| Inductance            | mH       | 16.4    | 4.1     | 1.7     | 32      |
| Motor length          | mm       | 45      | 45      | 45      | 65      |
| Lead Wire No.         |          | 4       | 4       | 4       | 4       |

| Motor Characteristics | Unit     | 23E2225 | 23E2240 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 5.0     | 2.8     |
| Current               | A        | 2.5     | 4.0     |
| Winding resistance    | $\Omega$ | 2.0     | 0.7     |
| Inductance            | mH       | 5.2     | 2.0     |
| Motor length          | mm       | 65      | 65      |
| Lead Wire No.         |          | 4       | 4       |



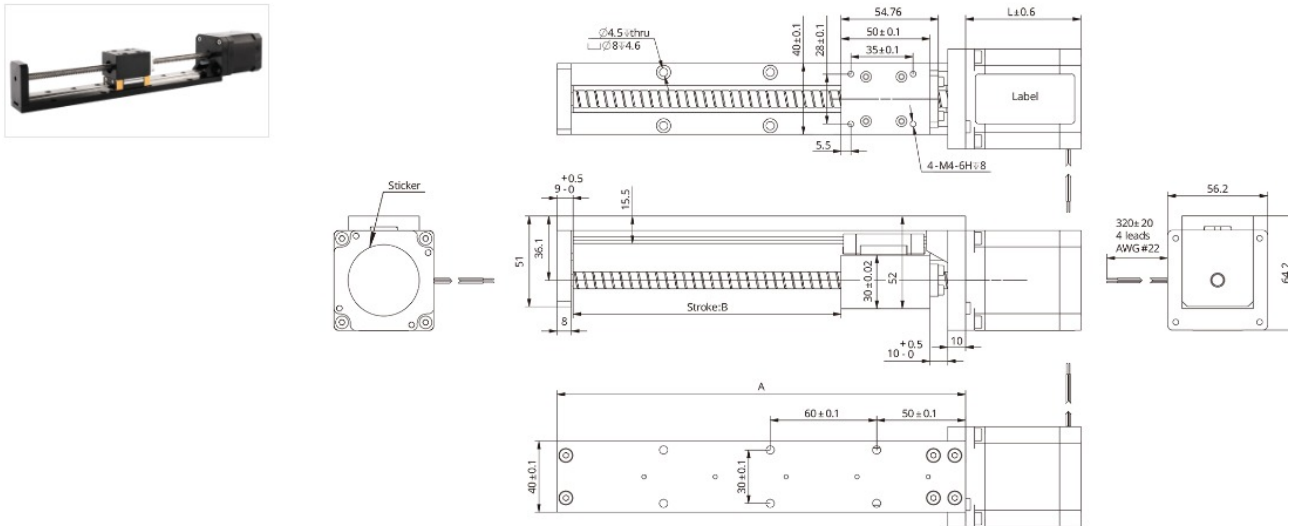
| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 9.525 mm   | 0.635 mm  | A         | 0.0032                 |
| 9.525 mm   | 1.27 mm   | D         | 0.0064                 |
| 9.525 mm   | 1.5875 mm | F         | 0.0079                 |
| 9.525 mm   | 2.1167 mm | H         | 0.0106                 |
| 9.525 mm   | 2.54 mm   | K         | 0.0127                 |
| 9.525 mm   | 3.175 mm  | L         | 0.0159                 |
| 9.525 mm   | 4.233 mm  | P         | 0.0212                 |
| 9.525 mm   | 5.08 mm   | R         | 0.0254                 |
| 9.525 mm   | 6.35 mm   | S         | 0.0318                 |
| 9.525 mm   | 9.525 mm  | V         | 0.0476                 |
| 9.525 mm   | 9.7536 mm | W         | 0.0488                 |
| 9.525 mm   | 10.16 mm  | X         | 0.0508                 |
| 9.525 mm   | 12.7 mm   | Y         | 0.0635                 |
| 9.525 mm   | 25.4 mm   | Z         | 0.127                  |
| 10 mm      | 2         | G         | 0.01                   |
| 10 mm      | 10        | C         | 0.05                   |
| 10 mm      | 20        | I         | 0.1                    |

#### Mechanical Specifications

|                                                              |         |
|--------------------------------------------------------------|---------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 1905 N  |
| Max static force in movement direction Co(stat)              | 2795 N  |
| Max torque around roll axis (M_roll)                         | 21.8 Nm |
| Max torque around pitch axis (M_pitch)                       | 13.8 Nm |
| Max torque around yaw axis (M_yaw)                           | 13.5 Nm |

## Drawings

### Size 57mm DLM

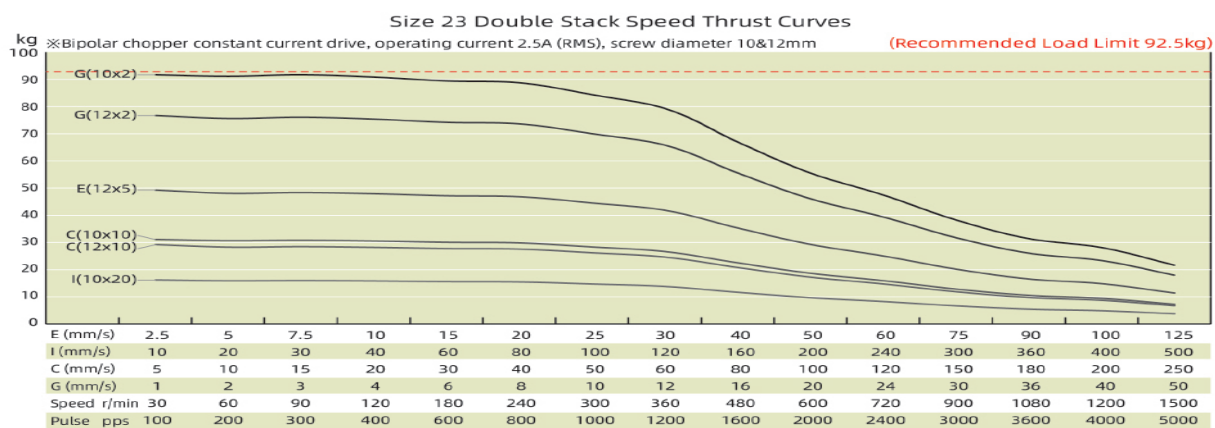
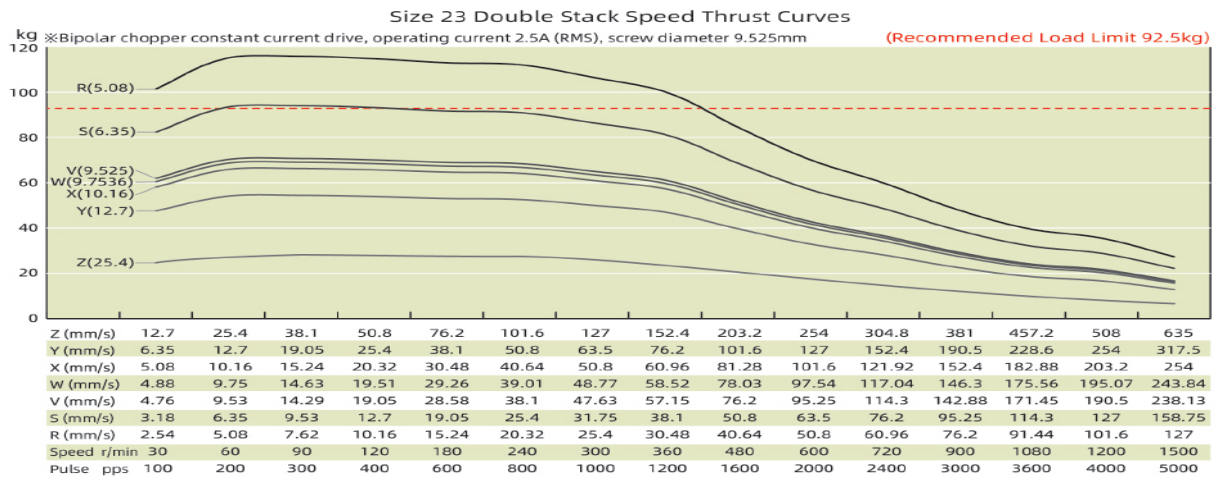
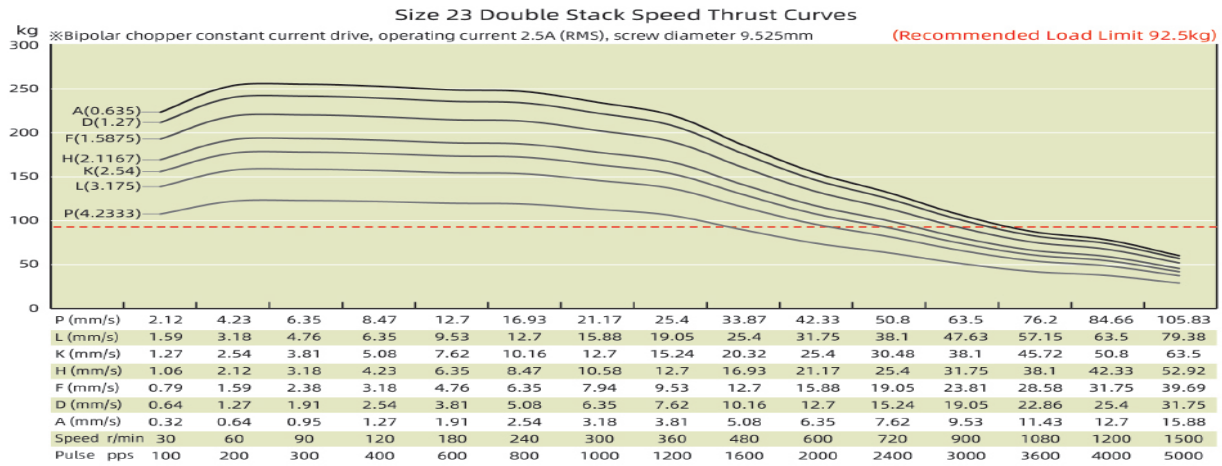


### Available Stroke Selection

| Size A | Stroke B | Motor Length L1<br>(Option) |
|--------|----------|-----------------------------|
| 130    | 50       |                             |
| 180    | 100      |                             |
| 230    | 150      |                             |
| 280    | 200      |                             |
| 330    | 250      |                             |
| 380    | 300      |                             |
| 430    | 350      |                             |
| 480    | 400      |                             |
| 530    | 450      |                             |
| 580    | 500      |                             |
| 630    | 550      |                             |
| 680    | 600      |                             |

Size 57mm DLM.jpg

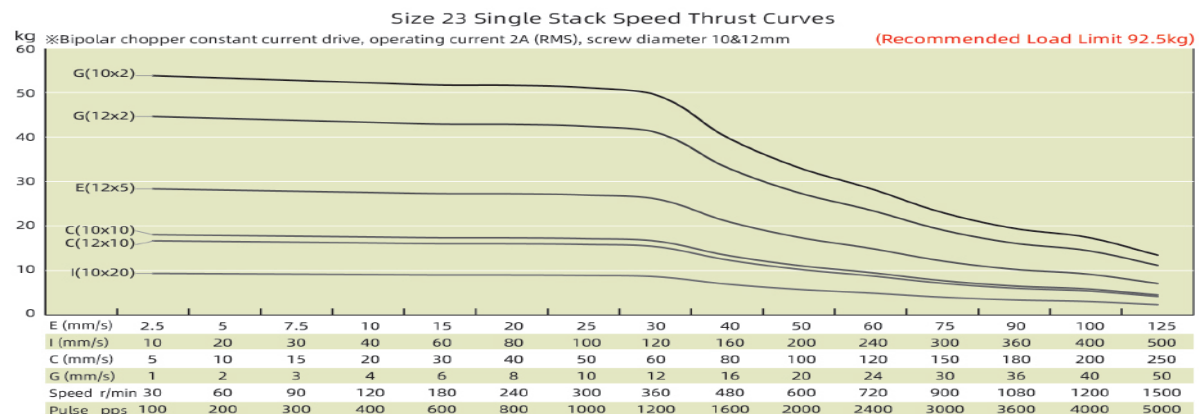
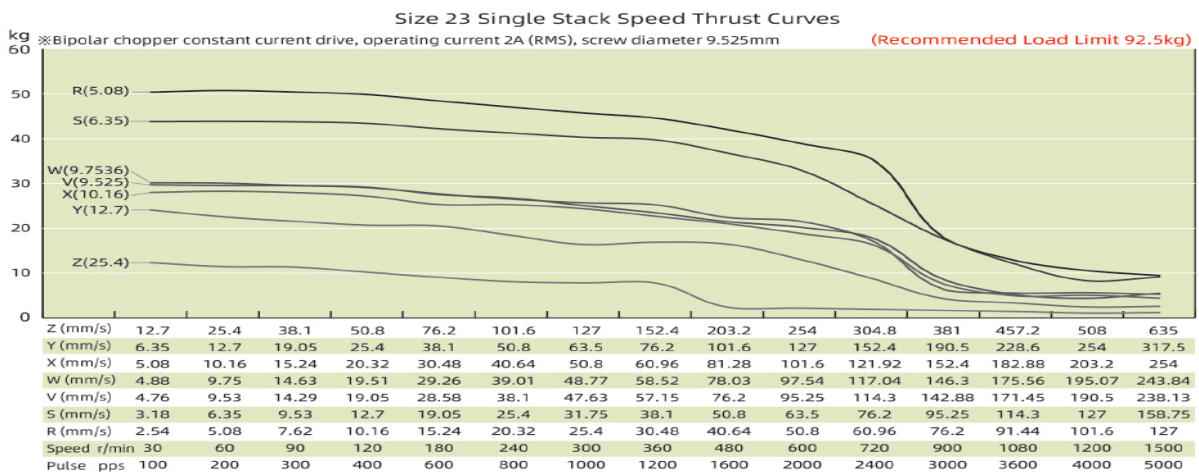
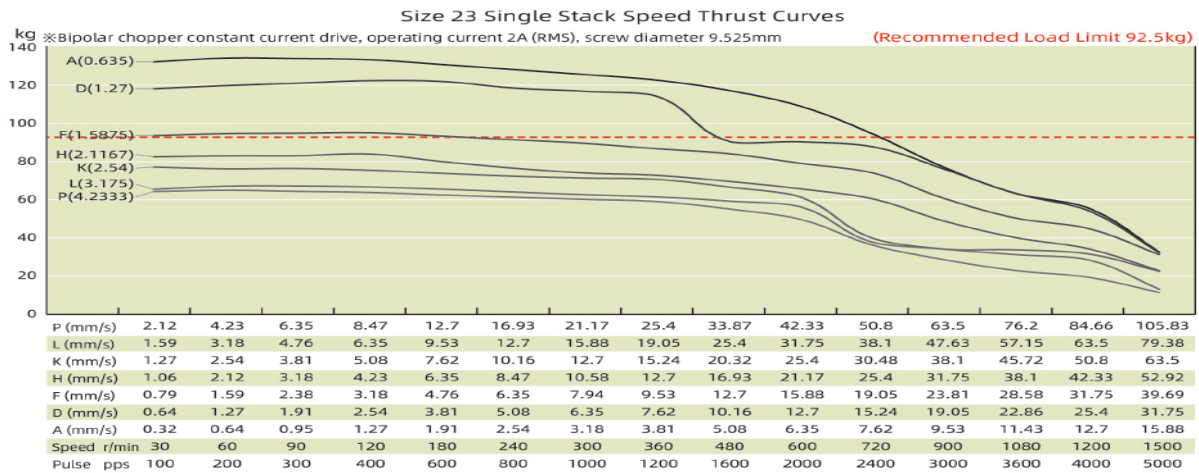
## Speed/Thrust Curves



### TEST CONDITION

Testing Voltage: 48Vdc, Driver Model: DS-OLS4-FPD bipolar, chopper driver at rated current (rms).  
 Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

### Double Stack Speed Thrust Curves



#### TEST CONDITION

Testing Voltage: 48Vdc, Driver Model: DS-OLS4-FPD bipolar, chopper driver at rated current (rms). Motor's thrust will be changed with different voltage and driver. 50% thrust margin is recommended.

#### Single Stack Speed Thrust Curves

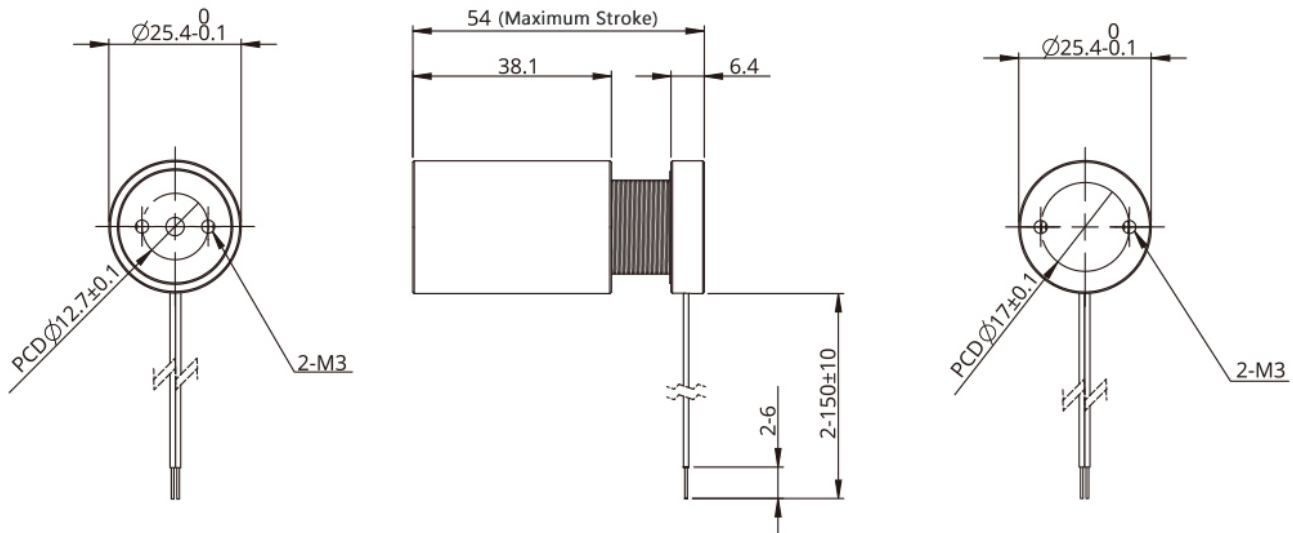
## VC - Size 25.4mm

Size 25.4mm Voice Coil Motor is smallest solution from KOCO at this moment. Not only standard 9.5mm stroke, different stroke of voice coil motor can be customized. Also CANOpen and EtherCAT supported Voice Coil Motor Electronics, DS-BVM-FCAO and DS-BVM-FETC are available. For details, please check KOCO website motion control products section.


<https://www.kocomotion.de/produkt/vc-size-25-4mm/>

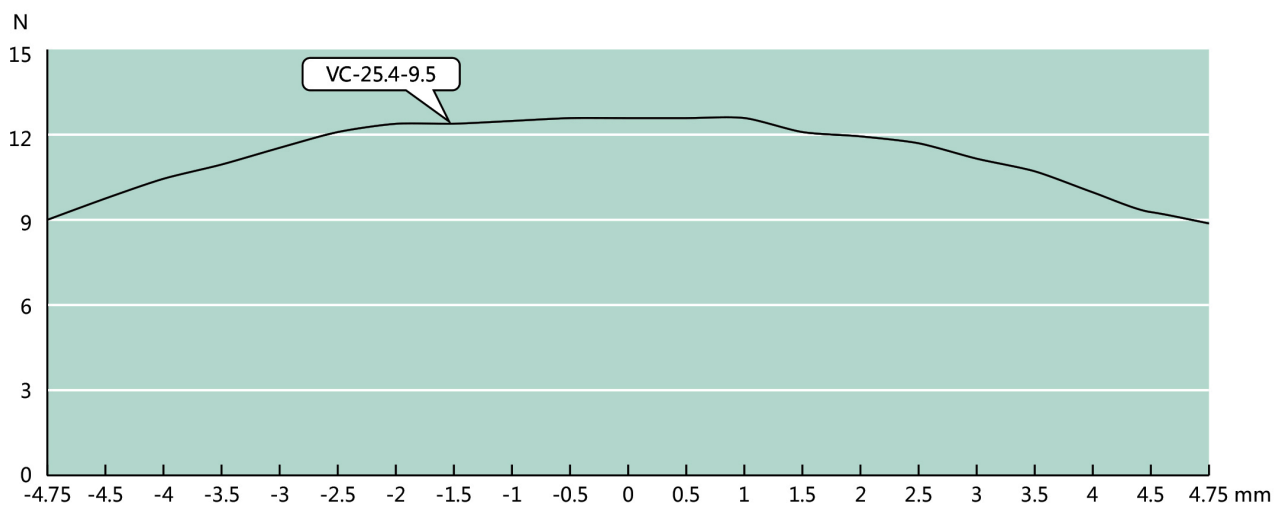
| Motor Characteristics                   | Unit  | Voice Coil Motor 25.4mm |
|-----------------------------------------|-------|-------------------------|
| Stroke                                  | mm    | 9.5                     |
| Coil Max. Temperature                   | °C    | 100                     |
| Coil assembly mass                      | g     | 33                      |
| Body assembly mass                      | g     | 102                     |
| Back-EMF constant                       | V/m/s | 9                       |
| Continuous Force                        | N     | 11                      |
| Continuous Current Coil@100             | °C    | 1.25                    |
| Peak Thrust Force                       | N     | 31                      |
| Force Sensitivity(N/A)(Middle Position) |       | 9                       |
| Phase resistance                        | Ω     | 6.9                     |
| Phase inductance                        | mH    | 2                       |
| Coil Gap                                | mm    | 0.38                    |

## Drawings



Size 25.4mm.png

## Speed/Thrust Curves



Force Curve

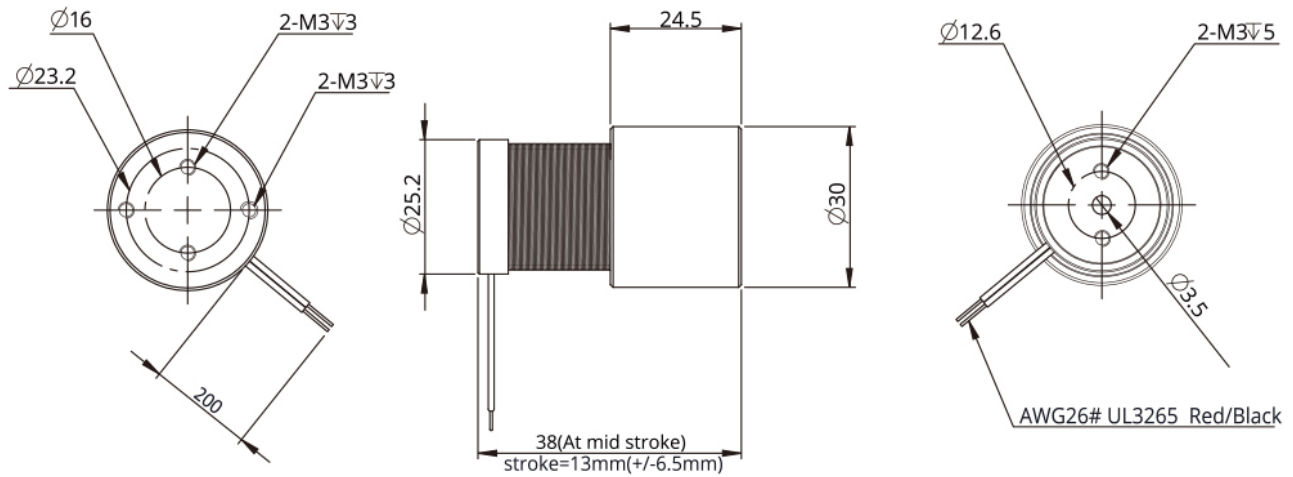
## VC - Size 30mm

Size 30mm Voice Coil Motor is also popular solution among KOCO VCM Series. Not only standard 13, 15mm stroke, different stroke of voice coil motor can be customized. Also CANOpen and EtherCAT supported Voice Coil Motor Electronics, DS-BVM-FCAO and DS-BVM-FETC are available. For details, please check KOCO website motion control products section.

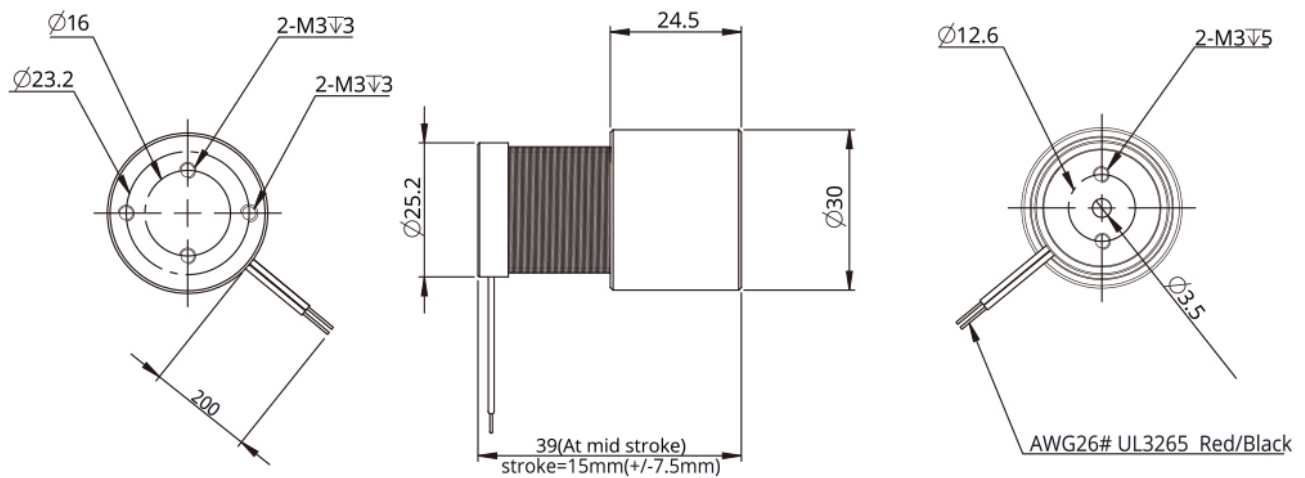

<https://www.kocomotion.de/produkt/vc-size-30mm/>

| Motor Characteristics                   | Unit  | Voice Coil Motor 30-13 | Voice Coil Motor 30-15 |
|-----------------------------------------|-------|------------------------|------------------------|
| Stroke                                  | mm    | 13                     | 15                     |
| Coil Max. Temperature                   | °C    | 100                    | 100                    |
| Coil assembly mass                      | g     | 25                     | 25                     |
| Body assembly mass                      | g     | 96                     | 96                     |
| Back-EMF constant                       | V/m/s | 7.35                   | 7.35                   |
| Continuous Force                        | N     | 4.63                   | 4.63                   |
| Continuous Current Coil@100             | °C    | 0.63                   | 0.63                   |
| Peak Thrust Force                       | N     | 29.4                   | 29.4                   |
| Force Sensitivity(N/A)(Middle Position) |       | 7.35                   | 7.35                   |
| Phase resistance                        | Ω     | 10.2                   | 10.2                   |
| Phase inductance                        | mH    | 2.63                   | 2.63                   |
| Coil Gap                                | mm    | 0.6                    | 0.6                    |

## Drawings



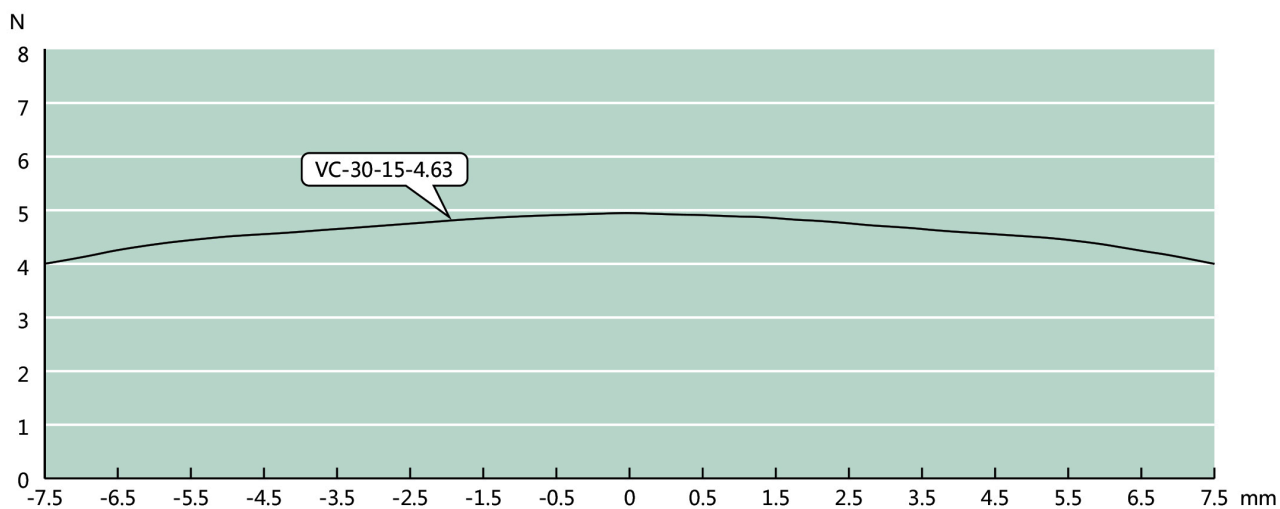
Size 30mm-Stroke 13mm.png



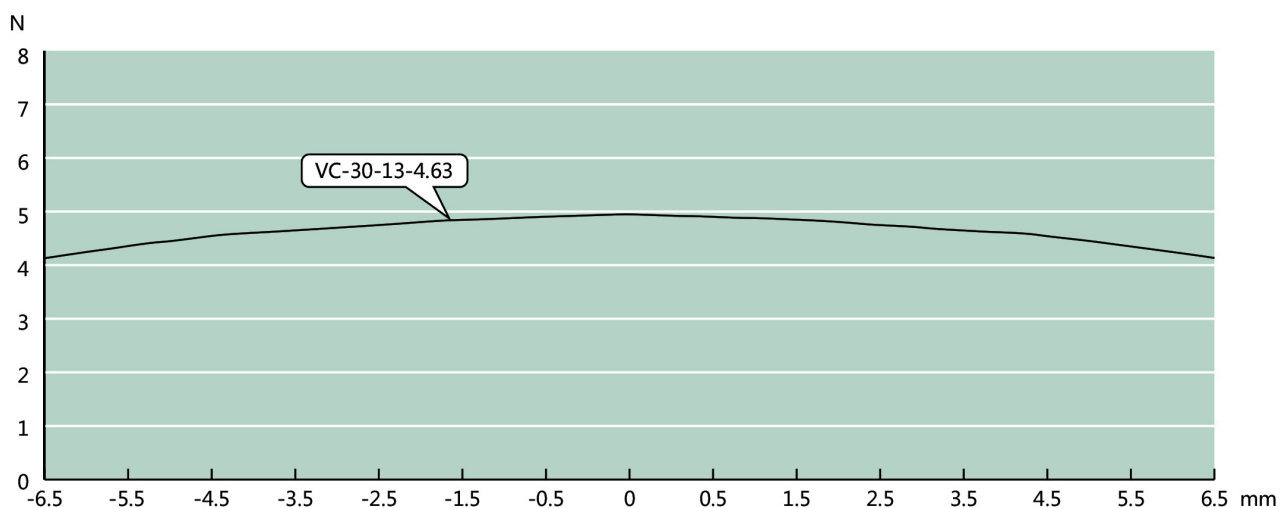
Size 30mm-Stroke 15mm.png



## Speed/Thrust Curves



Force Curve Stroke 15mm



Force Curve Stroke 13mm

## VC - Size 38mm

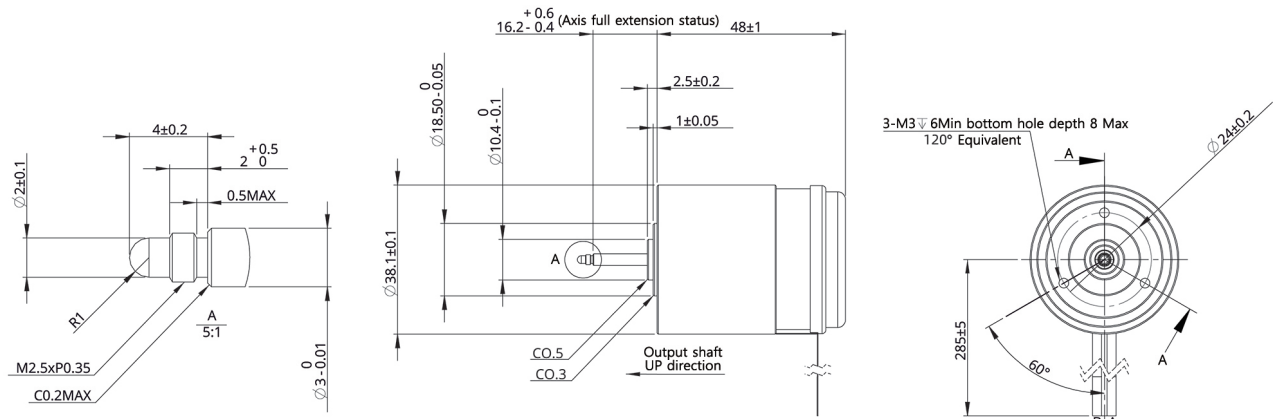
Size 38mm Voice Coil Motor is also popular solution among KOCO VCM Series. Not only standard 7.7mm stroke, different stroke of voice coil motor can be customized. Also CANOpen and EtherCAT supported Voice Coil Motor Electronics, DS-BVM-FCAO and DS-BVM-FETC are available. For details, please check KOCO website motion control products section.



<https://www.kocomotion.de/produkt/vc-size-38mm/>

| Motor Characteristics    | Unit       | Voice Coil Motor 38mm |
|--------------------------|------------|-----------------------|
| Stroke                   | mm         | 7.7                   |
| Operating temperature    | °C         | 2.63                  |
| Coil Maximum Temperature | °C         | 120                   |
| Gas Leakage              | sccm@12Kpa | <10                   |
| Force Constant           |            | 4.8                   |
| Continuous Force         | N          | 5                     |
| Peak Thrust Force        | N          | 22.5                  |
| Insulation resistance    | MΩ         | 100                   |
| Dynamic Response         | ms         | <20                   |
| Retarding Force          | mN         | <40                   |
| Frictional Force         | mN         | <50                   |
| Life Cycle               | Mil        | >30                   |

## Drawings

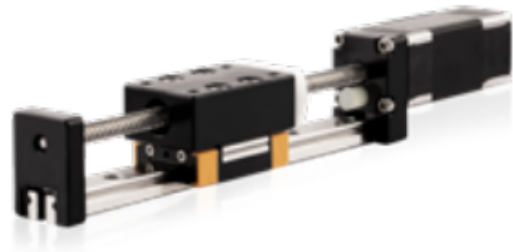


Size 38mm.png

DSM

## DSM - Size 14mm

DSM Size 14 mm is a compact lead screw linear actuator and simple linear module for precise, reliable linear motion. It supports integrated customization with multiple lead and stroke options. Available 3.5 mm screw leads from 0.3 to 8 mm provide travel per 1.8° step from 0.0015 to 0.04 mm.

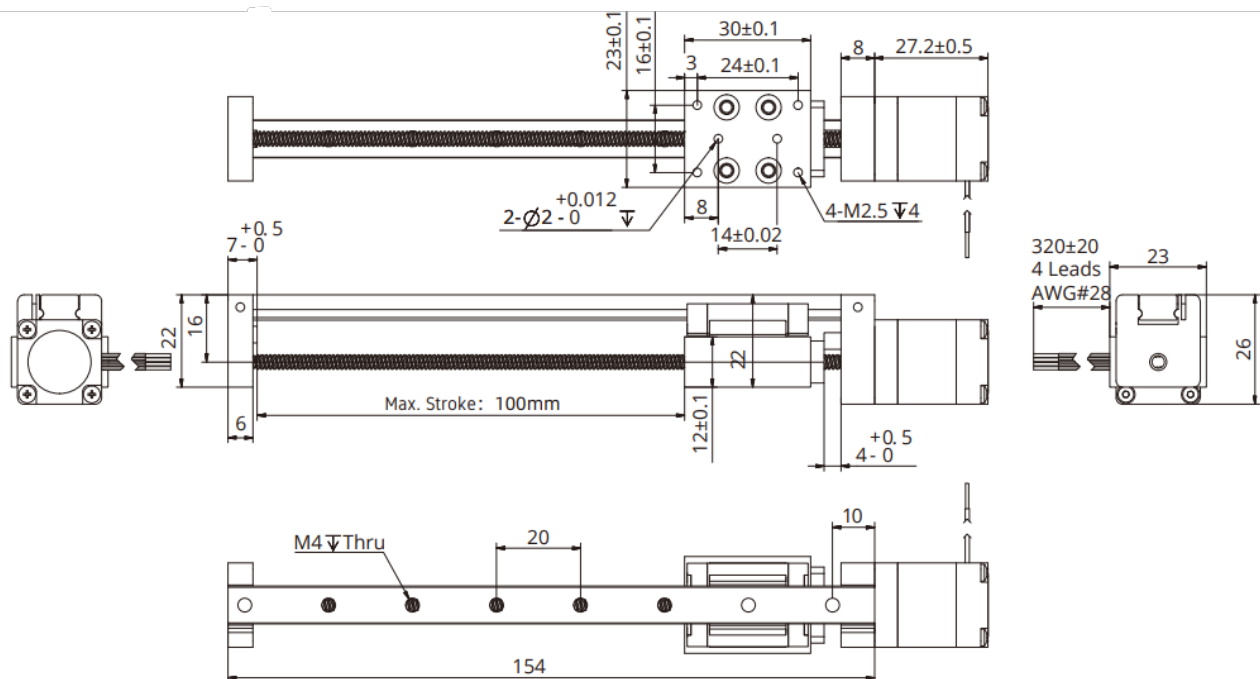

<https://www.kocomotion.de/produkt/dsm-size-14mm/>

| Motor Characteristics | Unit | 6E2103 |
|-----------------------|------|--------|
| Rated voltage         | V    | 6.6    |
| Current               | A    | 0.3    |
| Winding resistance    | Ω    | 22     |
| Inductance            | mH   | 4.5    |
| Weight                | g    | 60     |
| Lead wire No.         |      | 4      |
| Motor length          | mm   | 32     |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 3.5 mm     | 0.3 mm    | AF        | 0.0015                 |
| 3.5 mm     | 0.6096 mm | AA        | 0.003048               |
| 3.5 mm     | 1.2192 mm | B         | 0.006096               |
| 3.5 mm     | 2         | G         | 0.01                   |
| 3.5 mm     | 4         | M         | 0.02                   |
| 3.5 mm     | 8         | T         | 0.04                   |

| Mechanical Specifications                                    |          |
|--------------------------------------------------------------|----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 714 N    |
| Max static force in movement direction Co(stat)              | 1071 N   |
| Max torque around roll axis (M_roll)                         | 3.794 Nm |
| Max torque around pitch axis (M_pitch)                       | 2.219 Nm |
| Max torque around yaw axis (M_yaw)                           | 2.219 Nm |

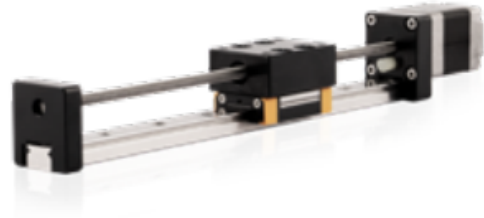
## Drawings



DSM

## DSM - Size 20mm

DSM Size 20 mm is a compact lead screw linear module for precise, customizable linear motion. It combines a high-precision lead screw actuator with a simple, reliable structure, offering multiple lead and stroke options. The series supports integrated linear solutions with up to 1379 N dynamic force and 1820 N static force.

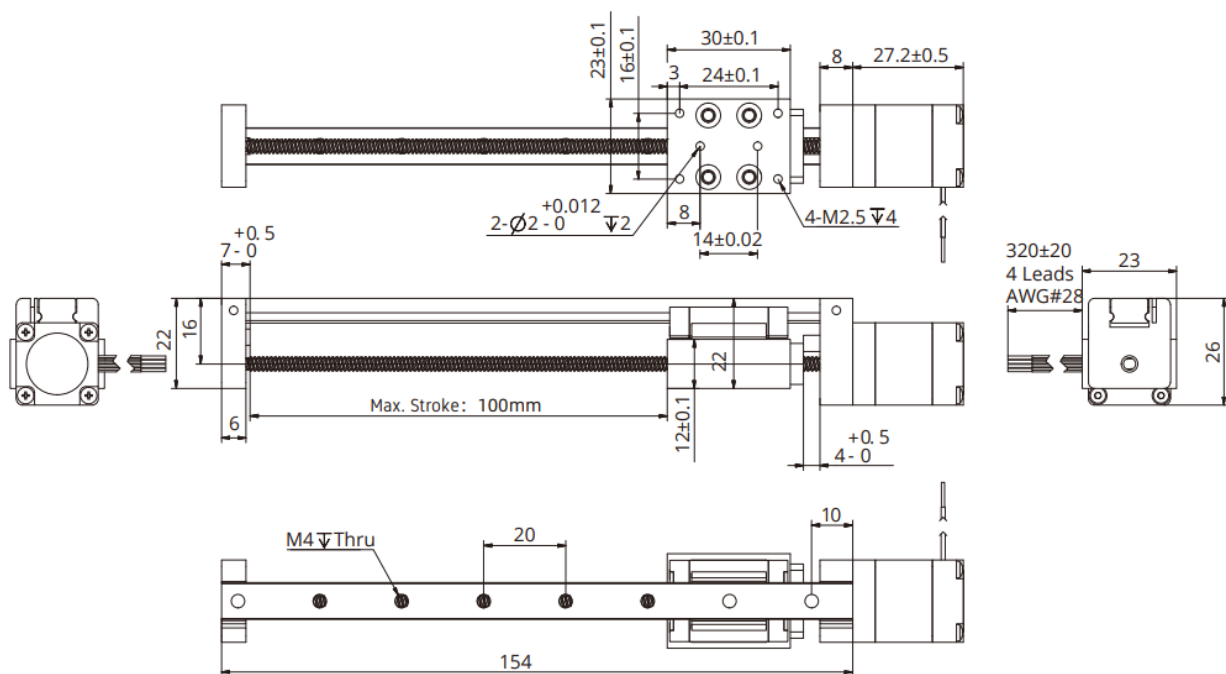

<https://www.kocomotion.de/produkt/dsm-size-20mm/>

| Motor Characteristics | Unit     | 8E2105 | 8E2205 |
|-----------------------|----------|--------|--------|
| Rated voltage         | V        | 2.5    | 4.4    |
| Current               | A        | 0.5    | 0.5    |
| Winding resistance    | $\Omega$ | 5.1    | 8.8    |
| Inductance            | mH       | 1.5    | 2.7    |
| Lead wire No.         |          | 4      | 4      |
| Motor length          | mm       | 27.2   | 38.1   |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 3.5 mm     | 0.3 mm    | AF        | 0.0015 mm              |
| 3.5 mm     | 0.6096 mm | AA        | 0.003048 mm            |
| 3.24 mm    | 1 mm      | AB        | 0.005 mm               |
| 3.5 mm     | 1.2192 mm | B         | 0.006096 mm            |
| 3.5 mm     | 2 mm      | G         | 0.01 mm                |
| 3.5 mm     | 2.4384 mm | J         | 0.012192 mm            |
| 3.5 mm     | 4 mm      | M         | 0.02 mm                |
| 3.5 mm     | 8 mm      | T         | 0.04 mm                |

| Mechanical Specifications                                    |          |
|--------------------------------------------------------------|----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 1379 N   |
| Max static force in movement direction Co(stat)              | 1820 N   |
| Max torque around roll axis (M_roll)                         | 8.288 Nm |
| Max torque around pitch axis (M_pitch)                       | 5.733 Nm |
| Max torque around yaw axis (M_yaw)                           | 5.733 Nm |

## Drawings

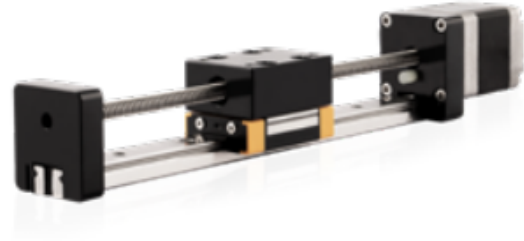


F

DSM

## DSM - Size 28mm

DSM Size 28 mm is a compact lead screw linear module for precise linear motion in customized automation solutions. It offers multiple lead options from 0.3175 to 10.16 mm, travel per step from 0.0016 to 0.0508 mm, and supports high loads up to 2128 N dynamic and 2702 N static.


<https://www.kocomotion.de/produkt/dsm-size-28mm/>

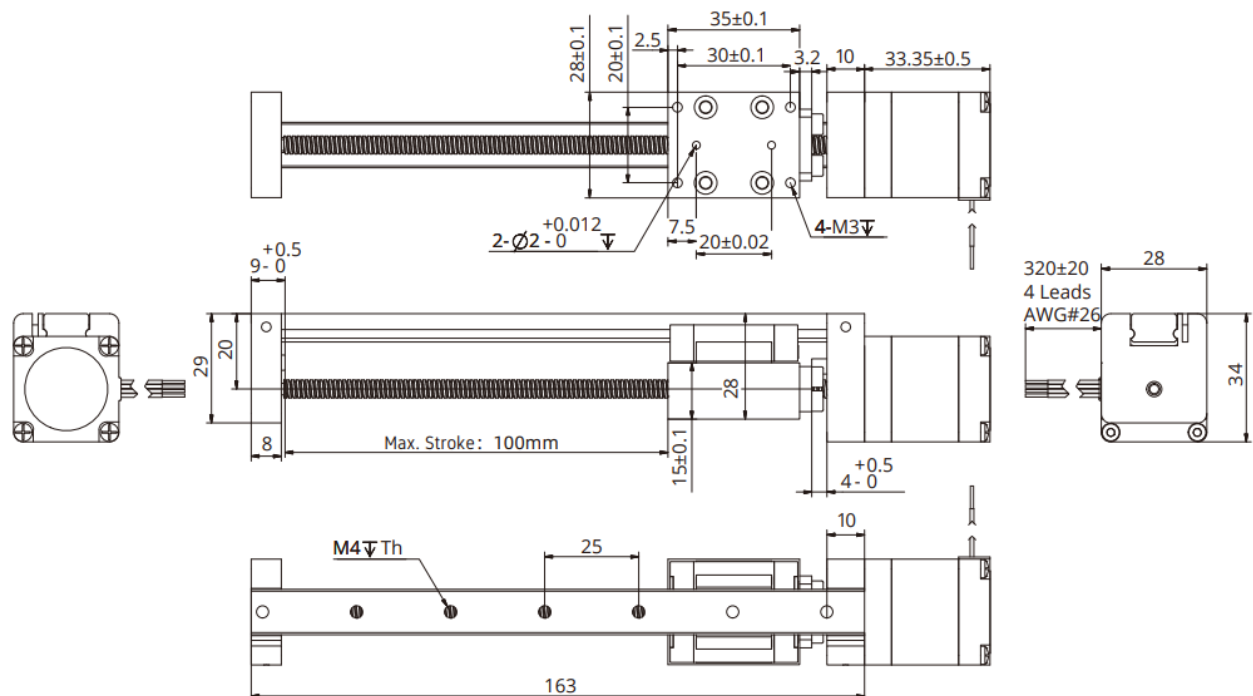
| Motor Characteristics | Unit | 11E2105 | 11E2110 | 11E2209 | 11E2216 |
|-----------------------|------|---------|---------|---------|---------|
| Rated voltage         | V    | 4.55    | 2.1     | 3.9     | 2.4     |
| Current               | A    | 0.5     | 1.0     | 0.95    | 1.6     |
| Winding resistance    | Ω    | 9.1     | 2.1     | 4.1     | 1.5     |
| Inductance            | mH   | 6.0     | 1.5     | 4.0     | 1.3     |
| Lead wire No.         |      | 4       | 4       | 4       | 4       |
| Motor length          | mm   | 33.35   | 33.35   | 45      | 45      |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 4.77 mm    | 0.3175 mm | AL        | 0.0016 mm              |
| 4.77 mm    | 0.635 mm  | A         | 0.003175 mm            |
| 4.77 mm    | 1.27 mm   | D         | 0.00635 mm             |
| 4.77 mm    | 1.5875 mm | F         | 0.0079 mm              |
| 4.77 mm    | 2.54 mm   | K         | 0.0127 mm              |
| 4.77 mm    | 4.8768 mm | Q         | 0.0244 mm              |
| 4.77 mm    | 5.08 mm   | R         | 0.0254 mm              |
| 4.77 mm    | 10.16 mm  | X         | 0.0508 mm              |



| Mechanical Specifications                                    |           |
|--------------------------------------------------------------|-----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 2128 N    |
| Max static force in movement direction Co(stat)              | 2702 N    |
| Max torque around roll axis (M_roll)                         | 16.541 Nm |
| Max torque around pitch axis (M_pitch)                       | 8.799 Nm  |
| Max torque around yaw axis (M_yaw)                           | 8.799 Nm  |

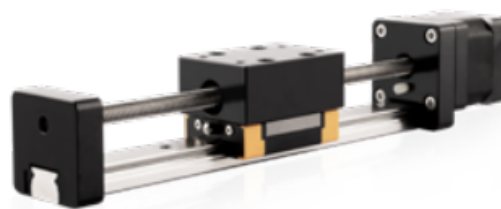
## Drawings



DSM

## DSM - Size 35mm

DSM 35mm is a compact linear actuator module for precise linear motion with customizable lead and stroke options. Based on KOCO platform products, it combines a lead screw actuator with a simple linear module design for reliable integration. Mechanical capacity reaches 2989 N dynamic and 3990 N static force.


<https://www.kocomotion.de/produkt/dsm-size-35mm/>

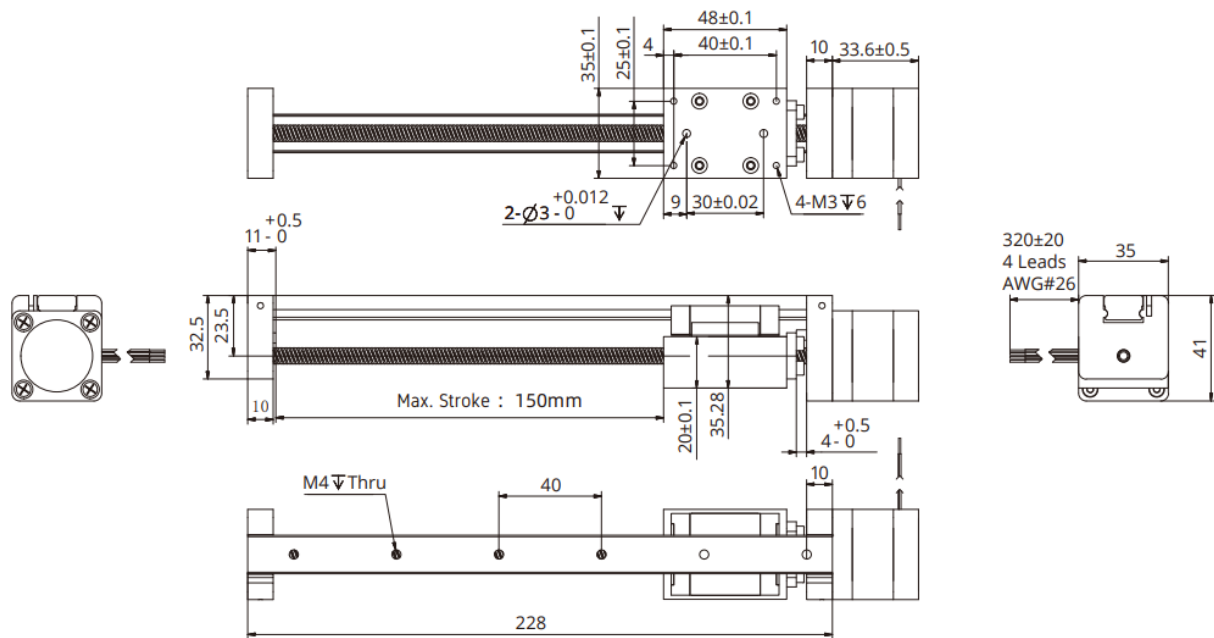
| Motor Characteristics | Unit     | 14E2105 | 14E2110 | 14E2115 | 14E2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 6.6     | 3.5     | 2.7     | 12.0    |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 13.2    | 3.5     | 1.8     | 24.0    |
| Inductance            | mH       | 14      | 3.6     | 1.9     | 29      |
| Lead wire No.         |          | 4       | 4       | 4       | 4       |
| Motor length          | mm       | 33.6    | 33.6    | 33.6    | 45.6    |

| Motor Characteristics | Unit     | 14E2210 | 14E2215 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 6.0     | 4.0     |
| Current               | A        | 1.0     | 1.5     |
| Winding resistance    | $\Omega$ | 6.0     | 2.7     |
| Inductance            | mH       | 7.2     | 3.2     |
| Lead wire No.         |          | 4       | 4       |
| Motor length          | mm       | 45.6    | 45.6    |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 6.35 mm    | 0.6096 mm | AA        | 0.003048 mm            |
| 6.35 mm    | 1.0 mm    | AB        | 0.005 mm               |
| 6.35 mm    | 1.2192 mm | B         | 0.006096 mm            |
| 6.35 mm    | 1.27 mm   | D         | 0.00635 mm             |
| 6.35 mm    | 1.5875 mm | F         | 0.0079 mm              |
| 6.35 mm    | 2.4384 mm | J         | 0.0122 mm              |
| 6.35 mm    | 2.54 mm   | K         | 0.0127 mm              |
| 6.35 mm    | 3.175 mm  | L         | 0.0259 mm              |
| 6.35 mm    | 4.8768 mm | Q         | 0.024 mm               |
| 6.35 mm    | 5.08 mm   | R         | 0.0254 mm              |
| 6.35 mm    | 6.35 mm   | S         | 0.0318 mm              |
| 6.35 mm    | 8.4667 mm | U         | 0.0423 mm              |
| 6.35 mm    | 9.7536 mm | W         | 0.0488 mm              |
| 6.35 mm    | 12.7 mm   | Y         | 0.0635 mm              |
| 6.35 mm    | 25.4 mm   | Z         | 0.0127 mm              |
| 8 mm       | 4 mm      | M         | 0.02 mm                |
| 8 mm       | 8 mm      | T         | 0.04 mm                |
| 8 mm       | 2 mm      | G         | 0.01 mm                |
| 8 mm       | 10 mm     | C         | 0.05 mm                |

| Mechanical Specifications                                    |           |
|--------------------------------------------------------------|-----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 2989 N    |
| Max static force in movement direction Co(stat)              | 3990 N    |
| Max torque around roll axis (M_roll)                         | 31.535 Nm |
| Max torque around pitch axis (M_pitch)                       | 16.135 Nm |
| Max torque around yaw axis (M_yaw)                           | 16.135 Nm |

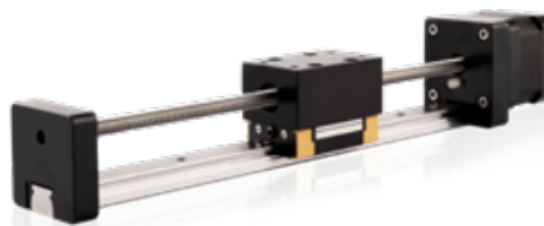
## Drawings



DSM

## DSM - Size 42mm

DSM Size 42 mm is a compact lead screw linear actuator module for precise linear motion in integrated machine designs. It combines a reliable structure with configurable lead and stroke options, offering travel per step from 0.003048 to 0.127 mm and high force capacity up to 2989 N dynamic.


<https://www.kocomotion.de/produkt/dsm-size-42mm/>

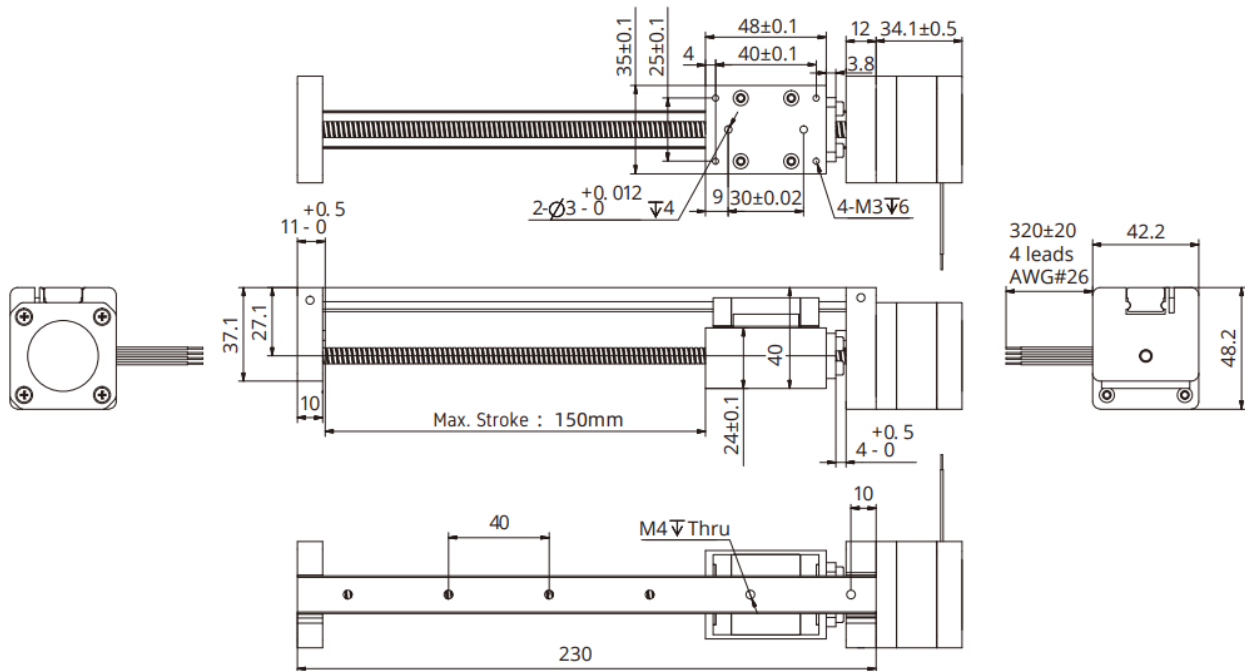
| Motor Characteristics | Unit     | 17E2105 | 17E2110 | 17E2115 | 17E2205 |
|-----------------------|----------|---------|---------|---------|---------|
| Rated voltage         | V        | 7.2     | 3.8     | 2.85    | 11.0    |
| Current               | A        | 0.5     | 1.0     | 1.5     | 0.5     |
| Winding resistance    | $\Omega$ | 14.4    | 3.8     | 1.9     | 22      |
| Inductance            | mH       | 19.8    | 5.0     | 2.2     | 46      |
| Lead wire No.         |          | 4       | 4       | 4       | 4       |
| Motor length          | mm       | 34.1    | 34.1    | 34.1    | 48.1    |

| Motor Characteristics | Unit     | 17E2212 | 17E2225 |
|-----------------------|----------|---------|---------|
| Rated voltage         | V        | 4.5     | 2.5     |
| Current               | A        | 1.2     | 2.5     |
| Winding resistance    | $\Omega$ | 3.8     | 1.0     |
| Inductance            | mH       | 8.0     | 1.8     |
| Lead wire No.         |          | 4       | 4       |
| Motor length          | mm       | 48.1    | 48.1    |

| Screw Dia. | Lead      | Lead Code | Travel Per Step @ 1.8° |
|------------|-----------|-----------|------------------------|
| 6.35 mm    | 0.6096 mm | AA        | 0.003048 mm            |
| 6.35 mm    | 1.0 mm    | AB        | 0.005 mm               |
| 6.35 mm    | 1.2192 mm | B         | 0.006096 mm            |
| 6.35 mm    | 1.27 mm   | D         | 0.00635 mm             |
| 6.35 mm    | 1.5875 mm | F         | 0.0079 mm              |
| 6.35 mm    | 2.4384 mm | J         | 0.0122 mm              |
| 6.35 mm    | 2.54 mm   | K         | 0.0127 mm              |
| 6.35 mm    | 3.175 mm  | L         | 0.0159 mm              |
| 6.35 mm    | 4.8768 mm | Q         | 0.024 mm               |
| 6.35 mm    | 5.08 mm   | R         | 0.0254 mm              |
| 6.35 mm    | 6.35 mm   | S         | 0.0318 mm              |
| 6.35 mm    | 8.4667 mm | U         | 0.0423 mm              |
| 6.35 mm    | 9.7536 mm | W         | 0.0488 mm              |
| 6.35 mm    | 12.7 mm   | Y         | 0.0635 mm              |
| 6.35 mm    | 25.4 mm   | Z         | 0.127 mm               |
| 8 mm       | 4 mm      | M         | 0.02 mm                |
| 8 mm       | 8 mm      | T         | 0.04 mm                |
| 8 mm       | 2 mm      | G         | 0.01 mm                |
| 8 mm       | 10 mm     | C         | 0.05 mm                |

| Mechanical Specifications                                    |           |
|--------------------------------------------------------------|-----------|
| Max dynamic force for 100km stage travel distance C100B(dyn) | 2989 N    |
| Max static force in movement direction Co(stat)              | 3990 N    |
| Max torque around roll axis (M_roll)                         | 31.535 Nm |
| Max torque around pitch axis (M_pitch)                       | 16.135 Nm |
| Max torque around yaw axis (M_yaw)                           | 16.135 Nm |

## Drawings



# SKA DDL

Based on direct drive iron core technology, SKA DDL linear electric motors provide the typical advantages of direct drive motors. No kinematic chain means improved performance and positioning accuracy, increased energy savings, minimised maintenance, got higher velocity control. In their frameless version (i.e. primary and secondary parts), SKA DDL linear motors offer the possibility to integrate the motion into the mechanics of the machine in a completely immersive way. No energy losses associated with mechanical transmissions, resulting in higher overall system efficiency. Complete integration can be particularly useful in applications where space is limited or where precision is critical.



<https://www.kocomotion.de/produkt/ska-ddl/>

| Specification       | Unit             | SKA DDL 30.40 | SKA DDL 30.80 | SKA DDL 50.75 | SKA DDL 50.150 |
|---------------------|------------------|---------------|---------------|---------------|----------------|
| Peak force          | N                | 134.8         | 269.5         | 247           | 495            |
| Magnet track width  | mm               | 50            | 50            | 70            | 70             |
| Magnet track height | mm               | 10.8          | 10.8          | 10.8          | 10.8           |
| Magnet track weight | kg/m             | 3.3           | 3.3           | 5             | 5              |
| Continuous force    | N                | 40            | 80            | 75            | 150            |
| Magnetic attraction | N                | 260           | 520           | 430           | 860            |
| Speed               | m/s              | 5             | 5             | 5             | 5              |
| Acceleration        | m/s <sup>2</sup> | 50            | 50            | 50            | 50             |
| Coil length         | mm               | 102           | 186           | 102           | 186            |
| Coil width          | mm               | 56            | 56            | 76            | 76             |
| Coil height         | mm               | 23            | 23            | 23            | 23             |
| Coil weight         | kg               | 0.55          | 1             | 0.8           | 1.6            |



| Specification       | Unit             | SKA DDL 55.275 | SKA DDL 55.550 | SKA DDL 75.660 | SKA DDL 75.990 |
|---------------------|------------------|----------------|----------------|----------------|----------------|
| Peak force          | N                | 825            | 1650           | 1980           | 2970           |
| Magnet track width  | mm               | 90             | 90             | 120            | 120            |
| Magnet track height | mm               | 14.8           | 14.8           | 14.8           | 14.8           |
| Magnet track weight | kg/m             | 9.1            | 9.1            | 12.2           | 12.2           |
| Continuous force    | N                | 275            | 550            | 660            | 990            |
| Magnetic attraction | N                | 1202           | 2405           | 3143           | 4663           |
| Speed               | m/s              | 5              | 5              | 5              | 5              |
| Acceleration        | m/s <sup>2</sup> | 50             | 50             | 50             | 50             |
| Coil length         | mm               | 186            | 354            | 354            | 522            |
| Coil width          | mm               | 80             | 80             | 100            | 100            |
| Coil height         | mm               | 47.5           | 47.5           | 47.5           | 47.5           |
| Coil weight         | kg               | 3              | 7              | 10             | 14             |

| Specification       | Unit             | SKA DDL 100.1200 | SKA DDL 100.1600 | SKA DDL 125.2000 | SKA DDL 150.2400 |
|---------------------|------------------|------------------|------------------|------------------|------------------|
| Peak force          | N                | 3600             | 4800             | 6000             | 7200             |
| Magnet track width  | mm               | 140              | 140              | 175              | 200              |
| Magnet track height | mm               | 14.8             | 14.8             | 14.8             | 14.8             |
| Magnet track weight | kg/m             | 14.6             | 14.6             | 18               | 21.4             |
| Continuous force    | N                | 1200             | 1600             | 2000             | 2400             |
| Magnetic attraction | N                | 5831             | 7774             | 9829             | 11790            |
| Speed               | m/s              | 5                | 5                | 3                | 3                |
| Acceleration        | m/s <sup>2</sup> | 50               | 50               | 50               | 50               |
| Coil length         | mm               | 522              | 690              | 690              | 690              |
| Coil width          | mm               | 125              | 125              | 150              | 175              |
| Coil height         | mm               | 47.5             | 47.5             | 47.5             | 47.5             |
| Coil weight         | kg               | 18               | 25               | 31               | 38               |

## SKA COMPACT

# SKA COMPACT

SKA COMPACT is a compact linear motor family for high-dynamic positioning and motion tasks. The range delivers up to 550 N continuous force and 1625 N peak force, with speeds up to 5 m/s and acceleration up to 50 m/s<sup>2</sup>. Available stroke lengths reach 3000 mm.


<https://www.kocomotion.de/produkt/ska-compact/>


| Specification    | Unit             | SKA COMPACT 140.275 | SKA COMPACT 140.550 |
|------------------|------------------|---------------------|---------------------|
| Peak force       | N                | 825                 | 1625                |
| Continuous force | N                | 275                 | 550                 |
| Speed            | m/s              | 5                   | 5                   |
| Acceleration     | m/s <sup>2</sup> | 50                  | 50                  |
| Stroke           | mm               | 500 ÷ 3000          | -                   |



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Version 09/2025 – technical and optical  
changes reserved