

PROmech™ LP28 Miniature Linear Positioner

Features:

- Miniature profile
- Optimal length to travel ratio
- Travels from 5 mm to 500 mm
- Fully assembled package
- Multi-axis platform
- Motor included

Attributes:

- Miniature cross section (28 mm x 28 mm)
- High-performance leadscrew drive train
- 1 mm, 3 mm, 10 mm, and 1" screw lead options
- Recirculating linear bearing
- Travels selectable by the mm from 5 mm to 500 mm
- NEMA 11 or NEMA 17 stepper motors included as standard
- Fully adjustable home and limit sensors



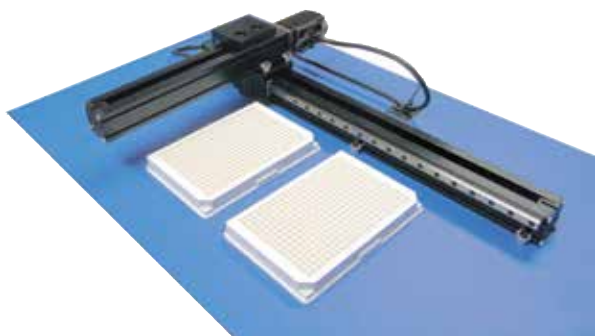
Designed for OEMs needing simple positioning solutions for instrument and light industrial applications, the PROmech family of positioners offers a complete positioning solution at a price OEMs can afford to design into their equipment.

The PROmech LP28 is a packaged linear positioner whose completeness reduces OEM component selection and system design time. Further, PROmech positioners minimize re-engineering requirements because the positioner's design is already fully tested. Together these benefits help engineering teams keep aggressive project time lines on schedule and reduce time to market.

Once a design goes into production PROmech positioners help reduce both costs and assembly time. Building a linear motion axis from scratch requires the procurement, tracking, receiving, inventorying, kiting, assembly, and testing of about a dozen parts. Every time a component must be "touched" to help it navigate this process, it consumes part of a resource and adds a hidden cost of both time and money. Instead of a dozen parts, a PROmech positioner is a single piece, sourced from a domestic supplier with short lead times. PROmech positioners are easy to procure and once on the assembly floor, are quick to install.

Multi-axis Systems: Beyond the single-axis positioner many applications require XY or XYZ configurations. PROmech positioners are designed for multi-axis mounting and include features and accessories to enable this. To further minimize your assembly time, Parker can provide PROmech™ systems where we mount and align multiple axes together into a systems per your specification.

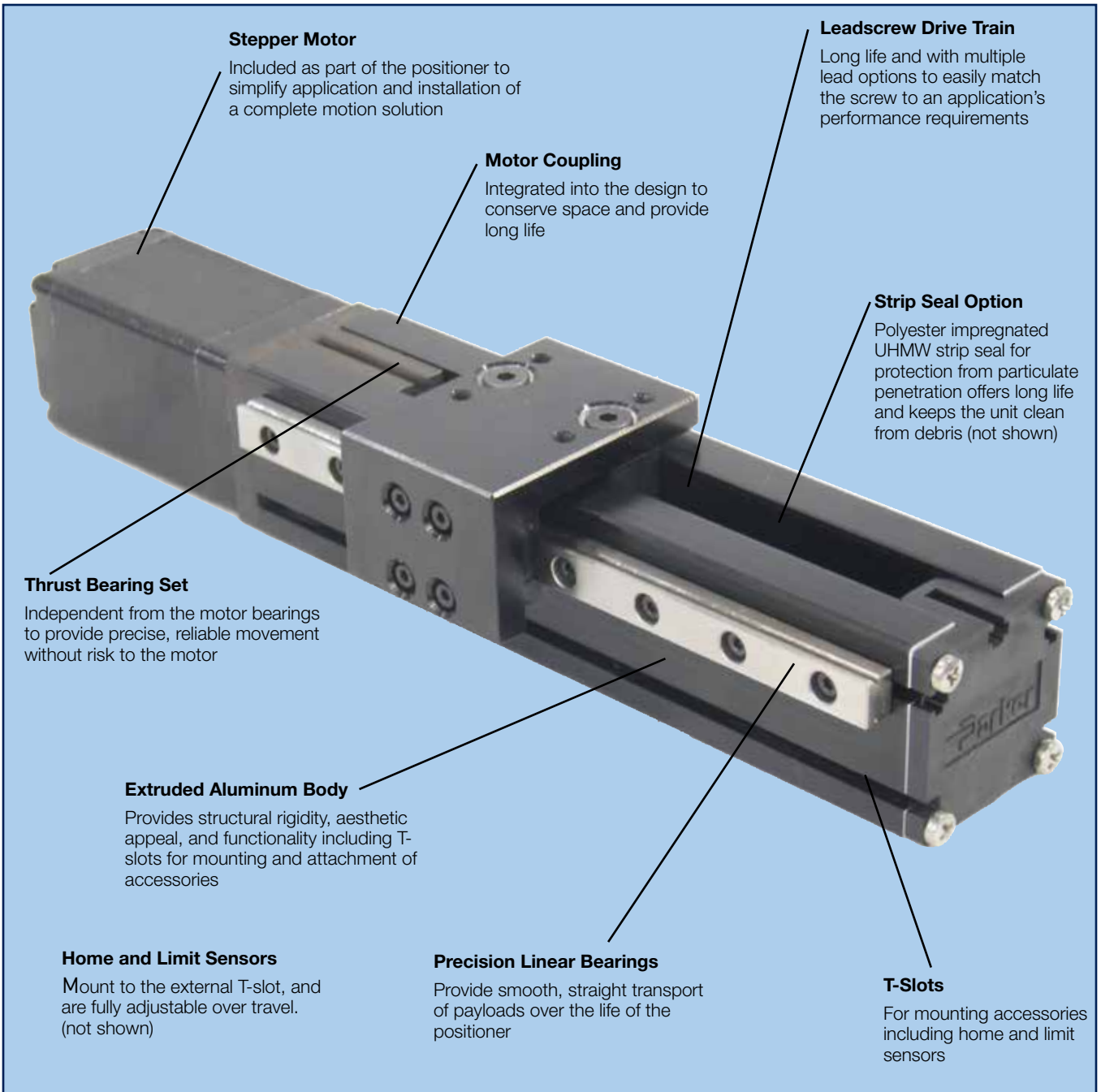
Whether you use 100 axes/year or 10,000 axes/year, Parker's PROmech series positioners offer the flexibility, reliability, and ease of use that will enable you to achieve your company's business objectives.





The PROmech design begins with an extruded aluminum body that provides aesthetic appeal, functionality, and structural strength. Internally, the drive train is highly integrated and includes the drive screw, screw nut, independent preloaded thrust bearing set, shaft coupling, and motor. Externally, an optional linear bearing may be used to support heavier or cantilevered payloads. Toe clamp mounting makes installation a snap. And finally, home and limit sensors which are triggered by a magnet in the carriage assembly may be mounted using the T-slot and are fully adjustable over travel.

The PROmech LP28 is engineered for transport of small payloads over distances as short as 5 mm and as long as 500 mm. The LP28 is commonly used in life sciences, medical, and semiconductor equipment although it is not limited to these markets. Typical applications include transport of 1 to 2 lb. payloads such as microplates, vials, and small syringe pumps. In inspection applications, the LP28 is excellent as a focus axis for adjusting the position of a camera, optics, or payload. The LP28's light weight also makes it suitable for mobile equipment as well.



Miniature Positioners

Common Performance Characteristics

| | | 1 mm Lead | 3 mm Lead | 10 mm Lead | 1" Lead |
|--------------------------------------|---|------------------|------------------|-------------------|----------------|
| Bidirectional Repeatability | µm | ±50 | ±50 | ±100 | ±100 |
| Duty Cycle | % | 100 | 100 | 100 | 100 |
| Maximum Acceleration | m/sec ² (ips ²) | 20 (787) | 20 (787) | 20 (787) | 20 (787) |
| Normal Load | | | | | |
| Single Bearing Carriage | Kgf (lb) | 5 (11) | 5 (11) | 5 (11) | 5 (11) |
| Double Bearing Carriage | | 10 (22) | 10 (22) | 10 (22) | 10 (22) |
| Moment Load – Roll | | | | | |
| Single Bearing | Nm (in-lb) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) |
| Double Bearing | | 1.0 (8.8) | 1.0 (8.8) | 1.0 (8.8) | 1.0 (8.8) |
| Moment Load – Pitch | | | | | |
| Single Bearing | Nm (in-lb) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) |
| Double Bearing | | 2.0 (18) | 2.0 (18) | 2.0 (18) | 2.0 (18) |
| Moment Load – Yaw | | | | | |
| Single Bearing | Nm (in-lb) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) | 0.5 (4.4) |
| Double Bearing | | 2.0 (18) | 2.0 (18) | 2.0 (18) | 2.0 (18) |
| Maximum Thrust ⁽¹⁾ | N (lbs) | 45 (10) | 45 (10) | 45 (10) | 45 (10) |
| Screw Efficiency | % | 40 | 65 | 75 | 80 |
| Breakaway Torque | Nm (oz-in) | 0.02 (2.8) | 0.02 (2.8) | 0.03 (4.2) | 0.06 (8.5) |
| Screw Diameter | mm | 6.35 | 6.35 | 6.35 | 6.35 |
| Coefficient of Friction | | 0.02 | 0.02 | 0.02 | 0.02 |

(1) See speed/thrust curves for combined motor-screw thrust capacity.

Travel Dependent Performance Characteristics

| Travel mm | Maximum Speed – mm/s | | | | Total Mass – Kg (lbs) | | |
|----------------------|-----------------------------|------------------|-------------------|------------------|------------------------------|--------------|--------------|
| | 1 mm Lead | 3 mm Lead | 10 mm Lead | 1.0" Lead | M11xx | M13xx | M71xx |
| 5 | 15 | 45 | 150 | 375 | 0.39 (0.85) | 0.48 (1.05) | 0.52 (1.14) |
| 25 | 15 | 45 | 150 | 375 | 0.42 (0.90) | 0.51 (1.12) | 0.55 (1.20) |
| 50 | 15 | 45 | 150 | 375 | 0.46 (1.00) | 0.55 (1.20) | 0.59 (1.29) |
| 75 | 15 | 45 | 150 | 375 | 0.49 (1.08) | 0.58 (1.28) | 0.62 (1.37) |
| 100 | 15 | 45 | 150 | 375 | 0.53 (1.17) | 0.62 (1.36) | 0.66 (1.45) |
| 150 | 15 | 45 | 150 | 375 | 0.61 (1.33) | 0.70 (1.53) | 0.74 (1.62) |
| 200 | 15 | 45 | 150 | 375 | 0.68 (1.50) | 0.77 (1.69) | 0.81 (1.78) |
| 250 | 15 | 45 | 150 | 375 | 0.76 (1.66) | 0.85 (1.86) | 0.89 (1.95) |
| 300 | 15 | 45 | 150 | 375 | 0.83 (1.83) | 0.92 (2.02) | 0.96 (2.11) |
| 350 | 15 | 45 | 150 | 375 | 0.91 (1.99) | 1.00 (2.19) | 1.04 (2.28) |
| 400 | 15 | 45 | 150 | 375 | 0.98 (2.16) | 1.07 (2.35) | 1.11 (2.44) |
| 450 | 15 | 45 | 150 | 375 | 1.06 (2.32) | 1.15 (2.52) | 1.19 (2.61) |
| 500 | 15 | 45 | 150 | 375 | 1.13 (2.49) | 1.22 (2.68) | 1.26 (2.77) |



Performance Graph Notes:

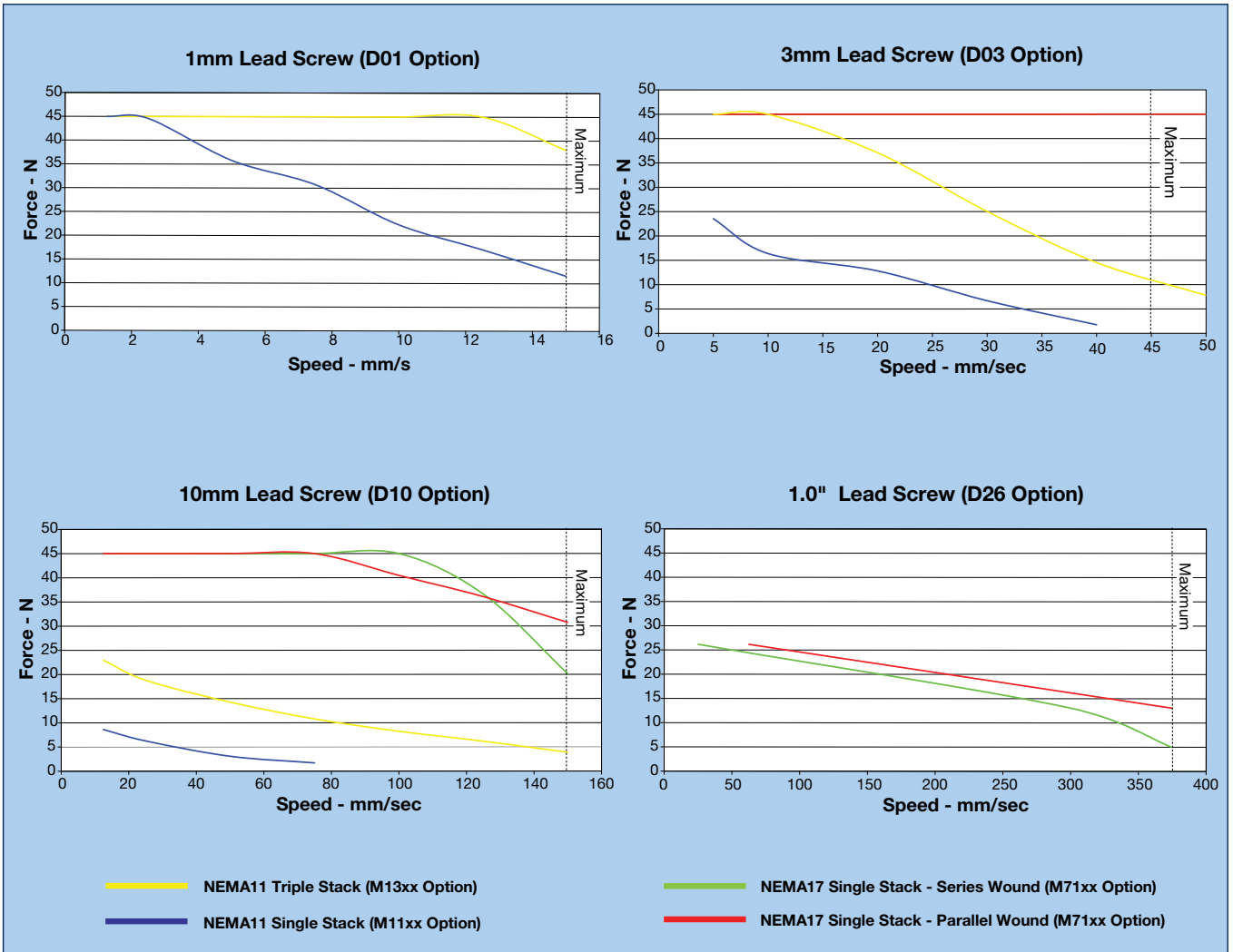
To simplify application, the different aspects of positioner performance, including motor torque, motor speed, screw efficiency, friction, safety margin, etc., have been consolidated into these speed versus thrust graphs. To make a selection first use the X axis scale of the different graphs to identify a screw lead that will deliver the desired peak velocity. Next, using the specific screw lead graph, identify the motor with enough torque to deliver the needed thrust to lift or accelerate the payload.

NEMA 11 stepper motor curves (M11xx and M13xx options) assume 24 VDC bus voltage at 0.67 amps. NEMA 17 stepper motor curves (M71xx options) assume 48 VDC bus voltage at 1.14 amps for series wound operation and 2.28 amps for parallel wound operation. All graphs

are limited to 45 N (10 lbs) of thrust due to mechanical limitations. Care should be taken not to stall the axis into the end of travel, particularly with the 1 mm lead screw (D01 options) as this motor-screw combination can generate significant amounts of thrust. All curves include a 10% safety margin.

The “Maximum Recommended Speed” is based on a maximum motor speed of 15 rps. Generally, the motors can rotate faster than 15 rps; however, at about 20 rps, they pass through a resonance which adversely and unpredictably affects usable motor torque. For applications requiring higher speeds, Parker recommends using a faster lead or a servo motor. Applications using a stepper motor above this recommended limit must be fully tested and qualified by the user.

Linear Speed-versus-Force Graphs



Miniature Positioners



Travel by the mm



Because the LP28 is miniature and must often fit into miniature spaces, the travel of the LP28 is selectable by the millimeter from 5 mm to 500 mm. This offers the greatest flexibility and enables designs to have the required travel with the minimum overall length.

Independent Thrust Bearings

Because high reliability and long life are critical requirements of OEM designs, the LP28 includes a pair of independent thrust bearings, dedicated to managing the positioner's axial loads. Some competitive miniaturized drive trains use the radial bearings in the step motor to contain the motor rotor, manage thermal expansion as the motor heats, and bear the axial loads generated by the application. In some cases this is an acceptable practice, but may prove to be a reliability risk down the road. The LP28's bearing design allows thrust bearings to be thrust bearings and motor bearings to be motor bearings resulting in a highly reliable and long life positioner.



Motor Coupling

Integrated into the PROmech design is a motor coupling. The innovative design minimizes part count and overall length, and, when necessary, enables a measure of flexibility when a special motor is required.



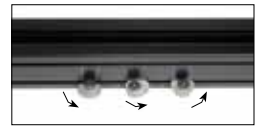
Optional Strip Seal

Promech offers a rugged polyester impregnated UHMW seal for anti-stretch and anti-wear characteristics providing protection for the lead screw and internal bearings. The seal provides protection to an IP30 rating and is matched to the black actuator body for optically sensitive environments. The strip seal is ordered under the bearing options and will slightly increase the overall length due to an extended length carriage.



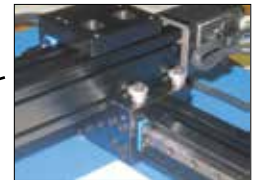
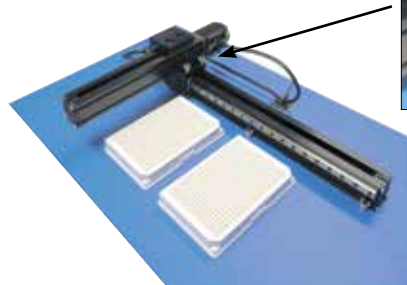
Toe Clamp Mounting

Installation of the LP28 is very simple with toe clamps that may be placed anywhere along the base extrusion offering flexibility in the base mounting pattern. The cam style toe clamps can be "loosely" installed without the positioner. This allows fingers to quickly and efficiently place the toe clamps and start the screws without interference. Once started, the positioner can be placed and the toe clamps rotated into the lower slot and tightened. Toe clamps are available as an accessory and may be purchased in a 4 pack (part #002-2530-01) which is ideal for shorter travel units. For OEMs, toe clamps may be purchased in bulk (part #002-2531-01).



Multi-axis Mounting

The LP28 is designed to mount in XY and Cartesian arrangements with only toe clamps. Short travel Z axes can be attached using only toe clamps with longer travels requiring a standard Z-Bracket. Contact Parker for more information.





Screw Lead Flexibility

The PROmech Series offers 4 standard screw lead options: 1 mm lead, 3 mm lead, 10 mm lead, and 1.0" lead. Whether your application is slow and precise, long and fast, or somewhere in between, the options will allow you to performance match the drive train to your application.



Home and Limit Sensor Options

Home and Limit Sensors are available as a standard option. These attach to the side of the actuator using the T-slot and are activated by a magnet imbedded inside the carriage assembly. Four sensor types are available with all the N.O., N.C., NPN, and PNP variations. The sensors include 3.0 meters of cable. Home sensor options include 1 sensor and mounting hardware. Limit sensor options include 2 sensors and mounting hardware.



| | |
|------------------------------|---|
| Input Power | 10-30VDC |
| Voltage Drop | ≤ 2.5V |
| Cont. Current | 100mA |
| Electrical Protection | Short Circuit, Reverse Polarity, and Power Up Pulse Suppression |
| Enclosure | IP67 Rated Polyamide Housing with PVC Cable Jacket |
| Wire Colors | Brown – Power (+) Black – Signal Blue – Ground (-) |
| Cable Length | 3.0 meter to flying leads |

| Order Code | Spare Part Number | Switch Type | Logic | Cable Type |
|-----------------|-------------------|-------------|----------|---------------------------|
| H2 or L2 | P8SAMMFAZ | N.C. | Sinking | 3.0 meter to flying leads |
| H3 or L3 | P8SAMNFAZ | N.O. | Sinking | 3.0 meter to flying leads |
| H4 or L4 | P8SAMPFAZ | N.C. | Sourcing | 3.0 meter to flying leads |
| H5 or L5 | P8SAMQFAZ | N.O. | Sourcing | 3.0 meter to flying leads |

Motor Options

The PROmech Series includes a number of standard motors. For most applications the NEMA 11 motors options will easily fulfill requirements. These are available in multiple stack lengths. The motors may include a rear shaft for encoder mounting or for manually positioning the stage. You may also choose between 12" flying motor leads or a 10' long cable. Further, the faster lead screw options will require the higher torque capacities of the standard NEMA 17 stepper. If you have special motor requirements such as a servo or DC motor, contact Parker as these can be accommodated as well.



Encoder Options

Rotary encoders on the back of the motor are available. Contact Parker for more information.

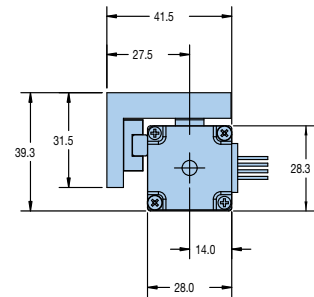
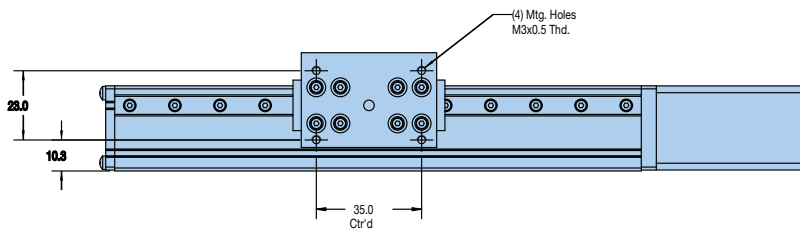
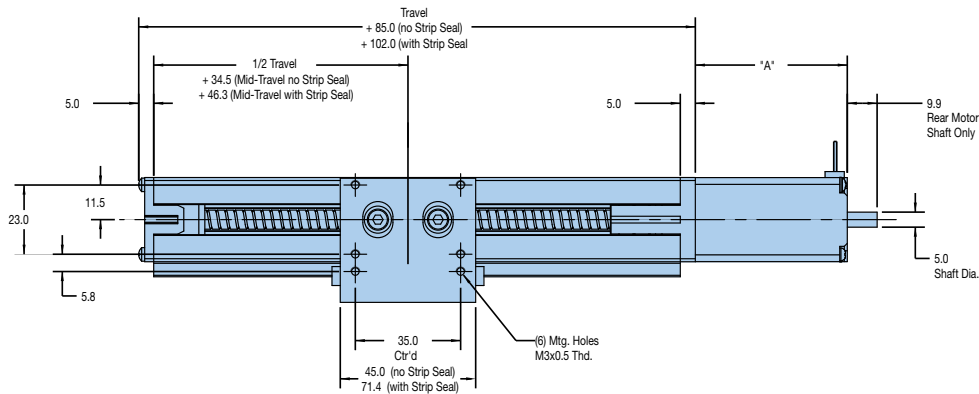


Miniature Positioners

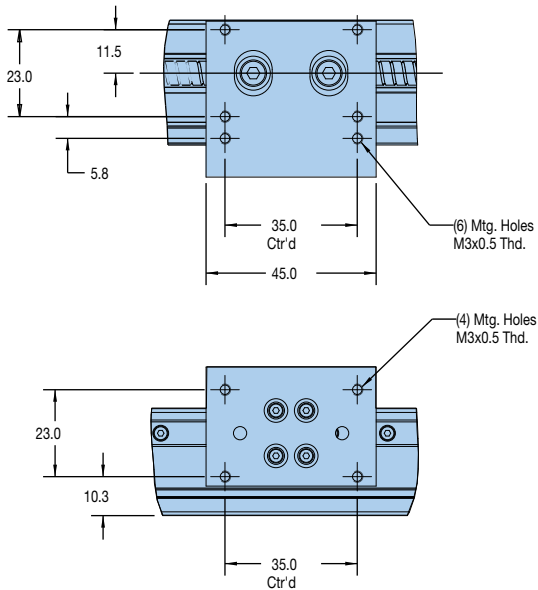
Linear Bearing Options

The PROmech Series offers 2 standard bearing options: a single linear rail with a single bearing truck or with two bearing trucks. These options provide flexibility to performance match the linear bearing system to your application.

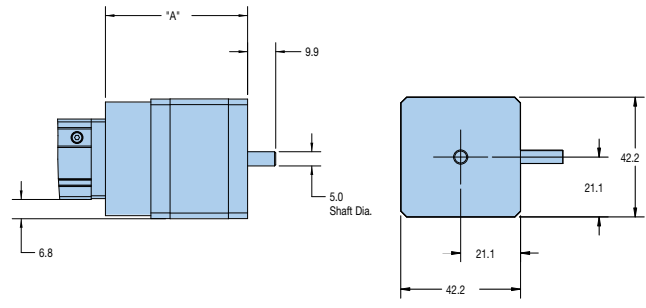




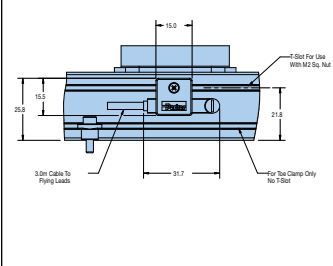
Single Bearing Truck (G21 Option)



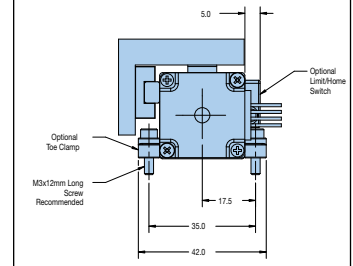
NEMA17 Motor Option (M71xx Option)



Limit Switch Accessories



Toe Clamp Accessories



| Model | "A" mm | Amps/Phase | Torque Nm (oz-in) | Resistance ohm/phase | Inductance mH | Rotor Inertia oz-in ² | Weight Kg (lb) | Wire Color |
|------------------|--------|-------------------|-------------------|----------------------|---------------|----------------------------------|----------------|-----------------|
| M11xx | 31.5 | 0.67 Peak/0.5 RMS | 0.06 (9.2) | 5.6 | 3.4 | 0.05 | 0.11 (0.24) | A+ Red |
| M12xx | 44.5 | 0.67 Peak/0.5 RMS | 0.10 (13.7) | 7.1 | 4.8 | 0.07 | 0.14 (0.31) | A- Black |
| M13xx | 50.6 | 0.67 Peak/0.5 RMS | 0.14 (16.6) | 8.6 | 6.7 | 0.10 | 0.20 (0.40) | B+ White |
| M71xx (Series) | 50 | 0.14 Peak/0.8 RMS | 0.40 (56.0) | 11.09 | 14.29 | 0.18 | 0.18 (0.40) | B- Green |
| M71xx (Parallel) | 50 | 2.28 | 0.40 (56.0) | 2.77 | 3.57 | 0.18 | 0.18 (0.40) | Refer to Manual |



Fill in an order code from each of the numbered fields to create a complete model order code.

| | | | | | | | |
|-----------------------|------|-------|-----|-----|-------|----|----|
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| Order Example: | LP28 | T0050 | D01 | G31 | M1111 | H3 | L2 |

- ① **Series**
LP28
- ② **Travel – mm**
Txxxx Specify length in mm
- ③ **Drive**
D00 Idler only
D01 1 mm lead screw ⁽¹⁾
D03 3 mm lead screw
D10 10 mm lead screw
D26 1" lead screw ⁽²⁾
- ④ **Guide System**
G21 Linear Rail with 1 Bearing Truck, no seal
G22 Linear Rail with 1 Bearing Truck, with strip seal
G31 Linear Rail with 2 Bearing Trucks, no seal
G32 Linear Rail with 2 Bearing Trucks, with strip seal
- ⑤ **Motor**
M1111 Stepper, NEMA 11, 1 Stack, 12" Leads ⁽²⁾
M1112 Stepper, NEMA 11, 1 Stack, 10' Cable ⁽²⁾
M1321 Stepper, NEMA 11, 3 Stack, Rear Shaft, 12" Leads ⁽²⁾
M1322 Stepper, NEMA 11, 3 Stack, Rear Shaft, 10' Cable ⁽²⁾
Stepper, NEMA 17, 1 Stack, Rear Shaft, 10' Cable ⁽¹⁾
- ⑥ **Home Sensors ⁽³⁾**
H1 No Sensor
H2 N.C., Current Sinking, 3.0 m cable to flying leads
H3 N.O., Current Sinking, 3.0 m cable to flying leads
H4 N.C., Current Sourcing, 3.0 m cable to flying leads
H5 N.O., Current Sourcing, 3.0 m cable to flying leads
- ⑦ **Limit Sensors (quantity 2) ⁽³⁾**
L1 No Sensor
L2 N.C., Current Sinking, 3.0 m cable to flying leads
L3 N.O., Current Sinking, 3.0 m cable to flying leads
L4 N.C., Current Sourcing, 3.0 m cable to flying leads
L5 N.O., Current Sourcing, 3.0 m cable to flying leads

(1) D01 not available with M7xxx
 (2) D26 not available with M1xxx
 (3) Tables with travel 75 mm or less may have limited sensor capabilities and may be limited to 0, 1 or 2 sensors

Miniature Positioners



PROmech™ LD28 Miniature Linear Positioner

Features

- Miniature profile
- Independent thrust bearing set
- High thrust per package size
- Stepper or servo motor
- Stroke from 5 mm to 300 mm
- Backlash compensation

Attributes

- Miniature cross section (28 mm x 28 mm)
- High-performance leadscrew drive train
- 1 mm, 3 mm, 10 mm, and 1" screw lead options
- Anti-backlash nut design
- Travels selectable by the mm from 5 mm to 300 mm
- NEMA 11 or NEMA 17 stepper motors included as standard
- Independent, preloaded thrust bearing set for long life

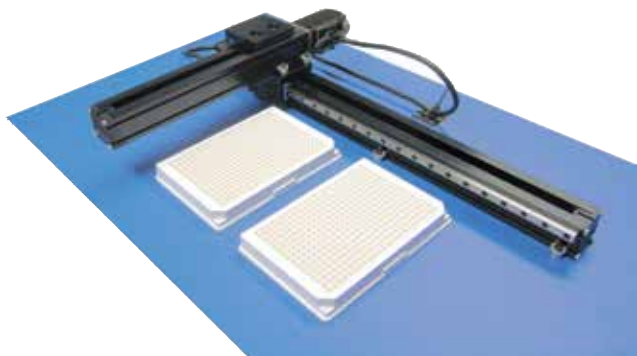


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The PROmech LD28 is engineered for thrusting small payloads over distances as short as 5 mm and as long as 300 mm. The LD28 is commonly used in life sciences, medical, and semiconductor equipment although it is not limited to these markets. Typical applications include syringe pumps and positioning stages. The LD28's light weight also makes it suitable for mobile equipment.

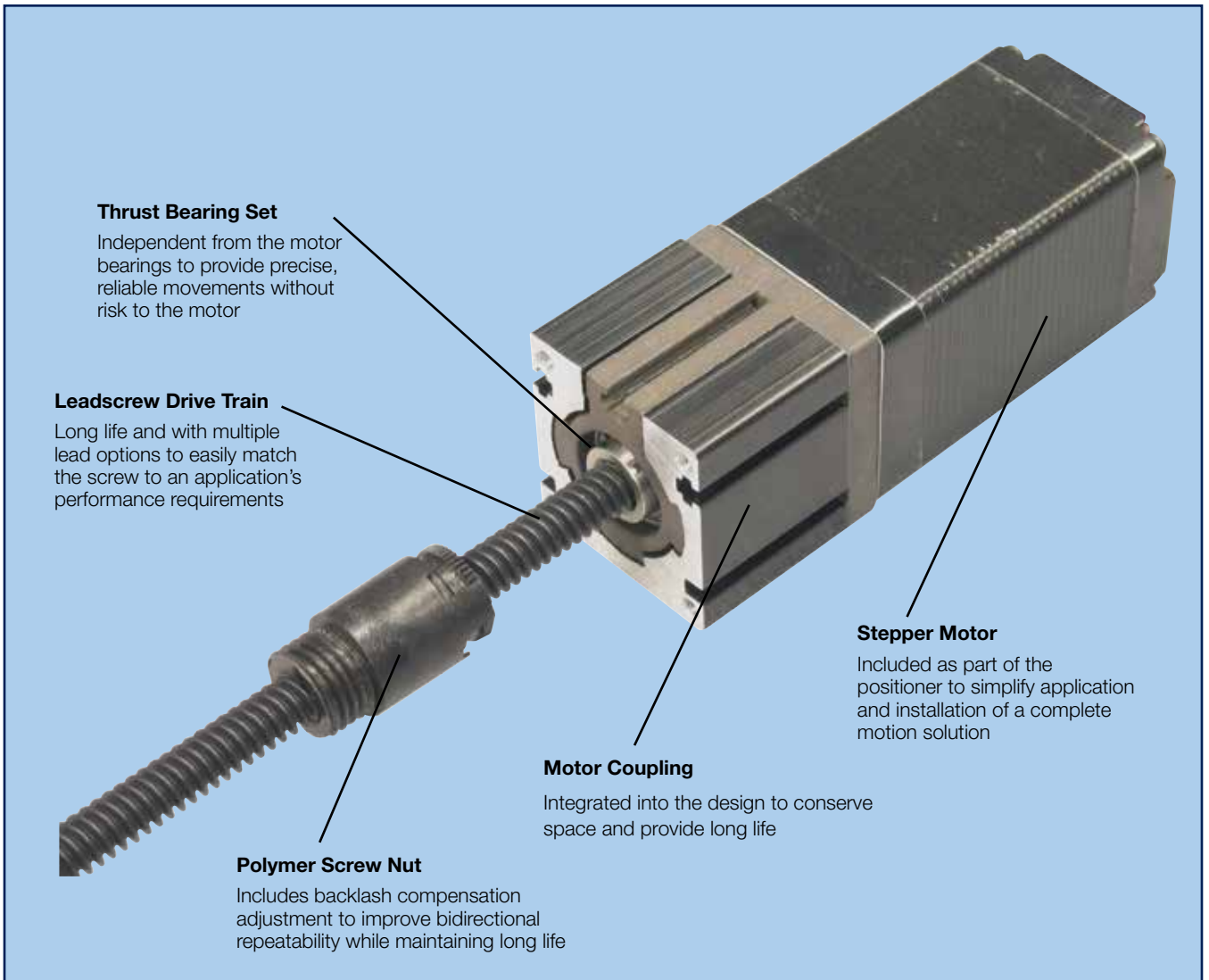




Customizable

Beyond the standard configurations, PROmech LD28 actuators can be customized to address the unique requirements of a particular high-volume application. These modifications may further reduce the installed cost and could include special motors (stepper, servo, or DC), special screws (finer leads, ballscrews, special nuts, etc.), and environmental preparation (vacuum, high temperature, etc.) just to mention a few.

Whether you use 10 axes/year or 10,000 axes/year, Parker’s PROmech series positioners offer the flexibility, reliability, and ease of use that will enable you to achieve your company’s business objectives.



Miniature Positioners

Common Performance Characteristics

| | | 1 mm Lead | 3 mm Lead | 10 mm Lead | 1" Lead |
|--|---|------------------|------------------|-------------------|----------------|
| Bidirectional Repeatability | µm | ±50 | ±50 | ±100 | ±100 |
| Duty Cycle | % | 100 | 100 | 100 | 100 |
| Maximum Acceleration | m/sec ² (ips ²) | 20 (787) | 20 (787) | 20 (787) | 20 (787) |
| Maximum Axial Load ⁽¹⁾ | N (lb) | 45 (10) | 45 (10) | 45 (10) | 45 (10) |
| Screw Efficiency | % | 40 | 65 | 75 | 80 |
| Breakaway Torque | Nm (oz-in) | 0.02 (2.8) | 0.02 (2.8) | 0.03 (4.2) | 0.06 (8.5) |
| Screw Diameter | mm | 6.35 | 6.35 | 6.35 | 6.35 |

(1) See speed/thrust curves for combined motor-screw thrust capacity.

Travel Dependent Performance Characteristics

| Travel mm | Maximum Speed – mm/s | | | | Total Mass – Kg (lbs) | | |
|----------------------|-----------------------------|------------------|-------------------|------------------|------------------------------|--------------|--------------|
| | 1 mm Lead | 3 mm Lead | 10 mm Lead | 1.0" Lead | M11xx | M13xx | M71xx |
| 5 | 15 | 45 | 150 | 375 | 0.39 (0.85) | 0.48 (1.05) | 0.52 (1.14) |
| 25 | 15 | 45 | 150 | 375 | 0.42 (0.90) | 0.51 (1.12) | 0.55 (1.20) |
| 50 | 15 | 45 | 150 | 375 | 0.46 (1.00) | 0.55 (1.20) | 0.59 (1.29) |
| 75 | 15 | 45 | 150 | 375 | 0.49 (1.08) | 0.58 (1.28) | 0.62 (1.37) |
| 100 | 15 | 45 | 150 | 375 | 0.53 (1.17) | 0.62 (1.36) | 0.66 (1.45) |
| 150 | 15 | 45 | 150 | 375 | 0.61 (1.33) | 0.70 (1.53) | 0.74 (1.62) |
| 200 | 15 | 45 | 150 | 375 | 0.68 (1.50) | 0.77 (1.69) | 0.81 (1.78) |
| 250 | 15 | 45 | 150 | 375 | 0.76 (1.66) | 0.85 (1.86) | 0.89 (1.95) |
| 300 | 15 | 45 | 150 | 375 | 0.83 (1.83) | 0.92 (2.02) | 0.96 (2.11) |
| 350 | 15 | 45 | 150 | 375 | 0.91 (1.99) | 1.00 (2.19) | 1.04 (2.28) |
| 400 | 15 | 45 | 150 | 375 | 0.98 (2.16) | 1.07 (2.35) | 1.11 (2.44) |
| 450 | 15 | 45 | 150 | 375 | 1.06 (2.32) | 1.15 (2.52) | 1.19 (2.61) |
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Independent Thrust Bearings

Because high reliability and long life are critical requirements of OEM designs, the LD28 includes a pair of independent thrust bearings, dedicated to managing the positioner's axial loads. Some competitive miniaturized drive trains use the radial bearings in the step motor to contain the motor rotor, manage thermal expansion as the motor heats, and bear the axial loads generated by the application. In some cases this is an acceptable practice, but may prove to be a reliability risk down the road. The LD28's bearing design allows thrust bearings to be thrust bearings and motor bearings to be motor bearings resulting in a highly reliable and long life positioner.



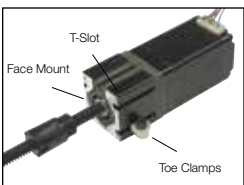
Motor Coupling

Integrated into the PROmech design is a motor coupling. The innovative design minimizes part count and overall length. And when necessary, enables a measure of flexibility when a special motor is required.



Toe Clamp or Tapped Face Mounting

Installation of the LD28 is very simple with the option to use toe clamps or T-Slots for mounting on surfaces that are parallel with the axis or a tapped face mount for surfaces that are perpendicular to the axis. The cam style toe clamps can be "loosely" installed without the positioner allowing fingers to quickly and efficiently place the toe clamps and start the screws without interference. Once started, the actuator can be placed and the toe clamps rotated into the lower slot and tightened. Toe clamps are available as an accessory and may be purchased in a 4 pack (part #002-2530-01) or in bulk (part #002-2531-01). The T-Slot enables a bolt to come through a surface into a T-nut and for the face mount, the LD28 includes four M2.5 tapped holes in a 23.1 mm square pattern.



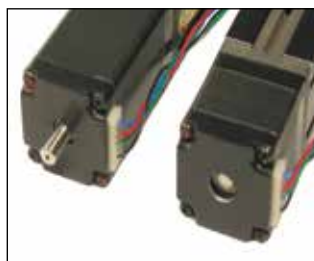
Motor Options

The PROmech Series includes a number of standard motors. For most applications the NEMA 11 motors options will easily fulfill requirements. These are available in multiple stack lengths. The motors may include a rear shaft for encoder mounting or for manually positioning the stage. You may also choose between 12" flying motor leads or a 10' long cable. Further, the faster lead screw options will require the higher torque capacities of the standard NEMA 17 stepper. If you have special motor requirements such as a servo or DC motor, contact Parker as these can be accommodated as well.



Encoder Options

Rotary encoders on the back of the motor are available. Contact Parker for more information.



Screw Lead Flexibility

The PROmech Series offers 4 standard screw lead options: 1 mm lead, 3 mm lead, 10 mm lead, and 1.0" lead. Whether your application is slow and precise, long and fast, or somewhere in between, the options will allow you to performance match the drive train to your application.



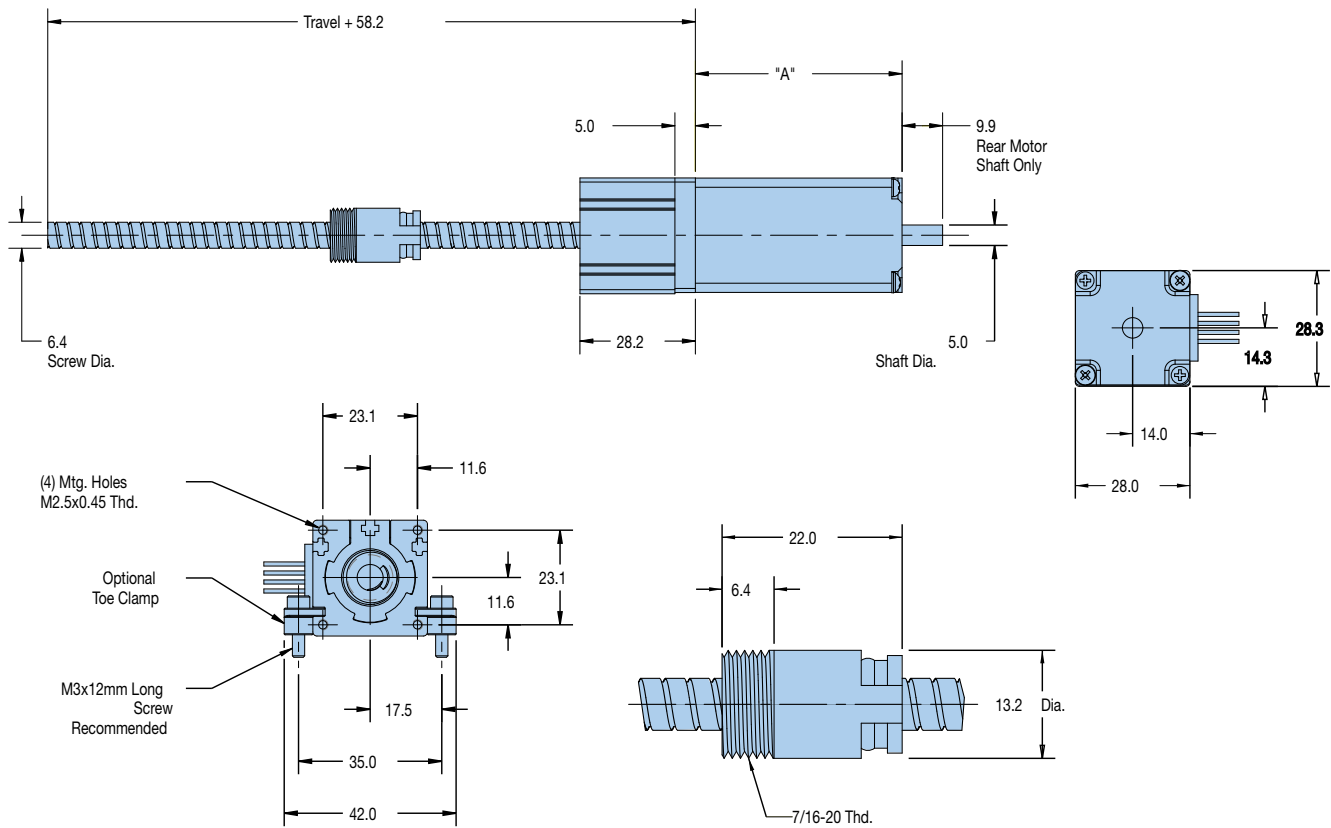
Travel by the mm

Because the LD28 is miniature and must often fit into miniature spaces, the travel of the LD28 is selectable by the millimeter from 5 mm to 300 mm. This offers the greatest flexibility and enables designs to have the required travel with the minimum overall length.

Miniature Positioners



Dimensions (mm)



| Model | "A" mm | Amps/Phase | Torque Nm (oz-in) | Resistance ohm/phase | Inductance mH | Rotor Inertia oz-in ² | Weight Kg (lb) | Wire Color |
|------------------|--------|-------------------|-------------------|----------------------|---------------|----------------------------------|----------------|-----------------|
| M11xx | 31.5 | 0.67 Peak/0.5 RMS | 0.06 (9.2) | 5.6 | 3.4 | 0.05 | 0.11 (0.24) | A+ Red |
| M12xx | 44.5 | 0.67 Peak/0.5 RMS | 0.10 (13.7) | 7.1 | 4.8 | 0.07 | 0.14 (0.31) | A- Black |
| M13xx | 50.6 | 0.67 Peak/0.5 RMS | 0.14 (16.6) | 8.6 | 6.7 | 0.10 | 0.20 (0.40) | B+ White |
| M71xx (Series) | 50 | 0.14 Peak/0.8 RMS | 0.40 (56.0) | 11.09 | 14.29 | 0.18 | 0.18 (0.40) | B- Green |
| M71xx (Parallel) | 50 | 2.28 | 0.40 (56.0) | 2.77 | 3.57 | 0.18 | 0.18 (0.40) | Refer to Manual |



Fill in an order code from each of the numbered fields to create a complete model order code.

① ② ③ ④

Order Example: LD28 T0050 D01 M1111

- ① **Series**
LD28

- ② **Travel – mm**
Txxxx Specify length in mm

- ③ **Drive**
 - D00 Idler only
 - D01 1 mm lead screw ⁽¹⁾
 - D03 3 mm lead screw
 - D10 10 mm lead screw
 - D26 1" lead screw ⁽²⁾

- ④ **Motor**
 - M1111 Stepper, NEMA 11, 1 Stack, 12" Leads ⁽²⁾
 - M1112 Stepper, NEMA 11, 1 Stack, 10' Cable ⁽²⁾
 - M1321 Stepper, NEMA 11, 3 Stack, Rear Shaft, 12" Leads ⁽²⁾
 - M1322 Stepper, NEMA 11, 3 Stack, Rear Shaft, 10' Cable ⁽²⁾
 - M7122 Stepper, NEMA 17, 1 Stack, Rear Shaft, 10' Cable ⁽¹⁾

(1) D01 not available with M7xxx
 (2) D26 not available with M1xxx

Accessories & Spare Parts

| Availability | | Part Number | Description |
|--------------|------|---------------|--|
| LP28 | LD28 | | |
| • | • | 002-2530-01 | Toe Clamp Kit - Includes (4) Toe Clamps and (4) M3x12 SHCS |
| • | • | 002-2531-01 | Bulk Toe Clamps - Includes (100) Toe Clamps Only |
| • | | 002-2532-01 | Sensor Mounting Kit - Includes Mounting Clip, M2 Square Nut, and M2x5 Pan Head Screw |
| • | • | 002-2533-01 | T-Nut Kit - Includes (10) M2 Square Nuts |
| • | • | 002-2534-01 | NEMA 17 Motor Adapter Kit - Includes Adapter, (4) M2.5x20 SHCS, and (4) M3x16 SHCS |
| • | • | 003-3550-01 | Motor, NEMA 11 Triple Stack, Rear Shaft, 12' Leads - For M1321 Option |
| • | • | 003-3550-08 | Motor, NEMA 11 Single Stack, 12' Leads - For M111 Option |
| • | • | 003-3550-09 | Motor, NEMA 11 Triple Stack, Rear Shaft, 10' Cable - For M1322 Option |
| • | • | 003-3550-12 | Motor, NEMA 11 Single Stack, 10' Cable - For M1112 Option |
| • | • | 003-3551-01 | M2.5x60 Pan Head Screw, Mounts NEMA 11 Triple Stack Motor |
| • | • | 003-3551-02 | M2.5x40 Pan Head Screw, Mounts NEMA 11 Single Stack Motor |
| • | • | 003-3558-03 | Coupling Hub, 5 mm Bore |
| • | • | 003-3560-01 | Coupling Torque Disk |
| • | | P8SAMMFAZ | Sensor, N.C. Current Sinking, 3 m Cable to Flying Leads - For H2 or L2 Option |
| • | | P8SAMNFAZ | Sensor, N.O. Current Sinking, 3 m Cable to Flying Leads - For H3 or L3 Option |
| • | | P8SAMPFAZ | Sensor, N.C. Current Sourcing, 3 m Cable to Flying Leads - For H4 or L4 Option |
| • | | P8SAMQFAZ | Sensor, N.O. Current Sourcing, 3 m Cable to Flying Leads - For H5 or L5 Option |
| • | • | 003-3908-01 | M2 Square Nut |
| • | • | 101-1564-01 | Toe Clamp |
| • | • | 101-1567-01 | NEMA 17 Motor Adapter |
| • | • | C*LV171-02-10 | Motor, NEMA 17 Single Stack, Rear Shaft, 10' Cable - For M7122 Option |
| • | • | 101-1564-01 | Toe Clamp 101-1567-01 NEMA 17 Motor Adapter |
| • | | 002-2535-01 | Strip Seal kit including 600 mm strip seal, and all necessary mounting hardware |