

Liberty MDrive 42mm Linear Actuator

NEMA 17 integrated 1.8° 2-phase stepper motor
with external shaft

PRODUCT OVERVIEW

Liberty MDrive (LMD) Linear Actuator products integrate a 1.8° 2-phase stepper motor, external shaft linear mechanicals and drive electronics to deliver long life, high accuracy, and repeatability in compact, low cost packages. A graphical user interface is provided for quick and easy parameter setup.

LMD linears may include a fully programmable motion controller with on-board I/O, enabling stand-alone motion control without need of an external controller. Real time closed loop performance is available for enhanced performance and feedback.

hMT closed loop performance is available in products with either a multi-turn absolute encoder or incremental magnetic encoder. Closed loop performance maintains functional motor control to prevent loss of synchronization, offers variable current control, torque control, and use more of the motor's full torque range.

Multi-turn absolute encoders may benefit users by retaining position information when powered down. This can eliminate homing routines and reduce setup time at system startup.

Liberty MDrive Linear Actuator products are ideal for machine builders who want a robust motor with integrated electronics and linear mechanicals. Reduced system cabling can minimize problems due to electrical noise, while closed loop products deliver enhanced performance. Fewer individual system components also eliminate multiple potential failure points.

   REACH IP20



FEATURES AND BENEFITS

- Quiet, clean and compact
- Integrated motor, drive electronics, and external shaft linear mechanicals to provide long life, accuracy, and repeatability in one affordable package
- Two (2) connection options available: Pluggable terminal and M12 circular. Pluggable and M12 models are IP20 rated.
- User interface available for download, providing quick & easy commissioning
- Multi-turn absolute or incremental magnetic encoder options
- Operating temperature of -20 to 50 °C (-4 ... 122 °F)
- Nominal operating voltage: 24/48 VDC
Maximum Current: 2.0A
- User selectable Temperature Warning (Range: 0° - 84° C (32° - 183.2° F))
- Stroke length of 2.0 to 18.0 inches (51 to 457 mm)
- Four (4) versions available: Pulse & Direction, Programmable Motion Control, CANopen, and Ethernet
- 24 month conditional warranty from date of purchase.



Additional setup, quick reference information, and supporting documents are available for download from the Novanta IMS download website <https://novantaims.com/downloads/>

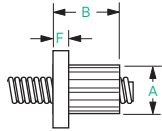
Three-dimensional depictions of this product are available for download from <https://novantaims.com/downloads/3dconfigurator/>



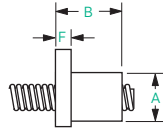
To select from the available features and build the LMD integrated stepper motor to fit your needs, use the Novanta IMS part number builder, available online at <https://novantaims.com/resources/part-number-builders/>

LMDx•42 with Linear Actuator

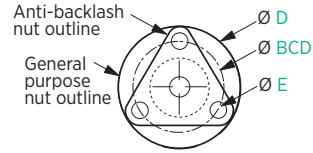
Nut Specifications



General Purpose Nut
Purpose: for applications not requiring anti-backlash and wear compensation
Flange shape: round



Anti-backlash Nut
Purpose: backlash free operation for high accuracy and low drag torque.
Flange shape: triangle



| | A | B | D | E | F | BCD | Drag Torque |
|-----------------|-------------|-----------------|------------|--------------|-------------|-------------|---------------------------|
| General Purpose | 0.50 (12.7) | 0.75 (19.1) | 1.0 (25.4) | 0.14 (3.6) | 0.15 (3.81) | 0.75 (19.1) | Free Wheeling |
| Anti-backlash | 0.50 (12.7) | 0.9 (22.86) max | 1.0 (25.4) | 0.143 (3.63) | 0.18 (4.57) | 0.75 (19.1) | < 1.0 oz-in < 0.7 N-cm |

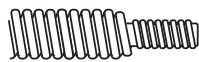
NOTE: Measurements shown are in inches (mm)

Lead Screw Specifications

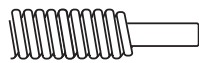
| | | Screw A | Screw B | Screw C |
|-------------|---------------------|----------------------|----------------------|----------------------|
| Travel | Per revolution | 0.25" / 6.35 mm | 0.125" / 3.175 mm | 0.063" / 1.588 mm |
| | Per full step | 0.00125" / 0.0317 mm | 0.00063" / 0.0158 mm | 0.00031" / 0.0079 mm |
| Load limit* | External shaft nuts | General purpose | 25 lbs / 11 kg | |
| | | Anti-backlash | 5 lbs / 2 kg | |

*Performance data for maximum force/load is based on a static load and will vary with a dynamic load.

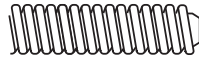
Threaded end



Smooth end

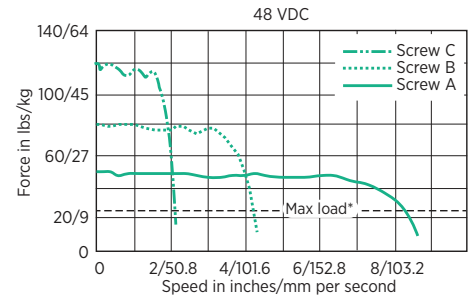
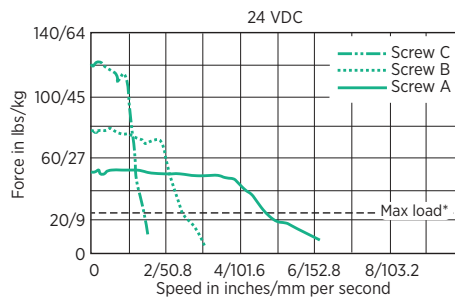
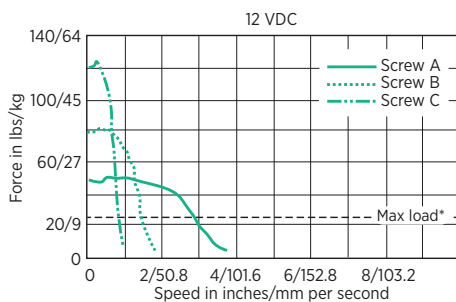


None






















| | |
|---|---|
| Metric end: M4 x 0.7mm thread to within 0.03" / 0.76 mm of shoulder | UNC end: #8-32 UNC-2A thread to within 0.03" / 0.76 mm of shoulder |
| $\varnothing 0.1967" \pm 0.001$ $\varnothing 5 \text{ mm} \pm 0.003$ | |
| — | |

Speed-Force Curves



LMDx•42 with Linear Actuator

Accessories

| for pluggable connector products | | | | Comm Types ¹ | | | |
|--|-----------------|---------------|---|-------------------------|---|---|--|
| Description | Length feet (m) | Part Number | P | M | A | E | |
| Communication converters | | | | | | | |
| USB-pluggable converter to set/program communication parameters in 32- or 64-bit Windows® | | | | | | | |
|  Mates to DB9 connector. Includes: RS-485 converter and pre-wired mating cable | 6.0 (1.8) | MD-CC404-000 | • | • | | | |
|  Mates to DB9 connector. Includes: CAN dongle, terminating resistor, and pre-wired mating cables | 6.0 (1.8) | MD-CC501-000 | | | • | | |
| Replacement mating connector kits | | | | | | | |
|  Includes one 2-pin power mate, and one set (2 pieces) 7-pin multifunction mates | — | CK-14 | • | | | | |
|  Includes one 2-pin power mate, and one set (2 pieces) 7-pin multifunction mates | — | CK-15 | | • | • | • | |
| for M12 circular connector products | | | | Comm Types ¹ | | | |
| Description | Length feet (m) | Part Number | P | M | A | E | |
| Communication Converter | | | | | | | |
| USB-pluggable converter to set/program communication parameters in 32- or 64-bit Windows® | | | | | | | |
|  Mates to M12 5-pin female connector. Includes: RS-485 converter and pre-wired mating cable | 6.0 (1.8) | MD-CC405-000 | • | • | | | |
|  Mates to M12 5-pin male connector. Includes: CAN dongle, terminating resistor, and pre-wired mating cables | 6.0 (1.8) | MD-CC502-000 | | | • | | |
| Straight Configuration Cordsets | | | | | | | |
| Shielded cables pre-wired with straight M12 mating connectors | | | | | | | |
|  Communication cordset w/ leads, mates to 5-pin female connector | 10.0 (3.0) | MD-CS600-000 | • | • | | | |
|  Power cordset w/ leads, mates to 4-pin male connector | 10.0 (3.0) | MD-CS620-000 | • | • | • | • | |
|  I/O cordset w/ leads, mates to 12-pin female connector | 10.0 (3.0) | MD-CS630-000 | • | | | | |
|  I/O cordset mates w/ leads, to 12-pin male connector | 10.0 (3.0) | MD-CS610-000 | | • | • | • | |
|  Communication cordset w/ leads, mates to 4-pin female connector | 6.5 (2.0) | MD-CS640-000 | | | | • | |
|  Communication cordset w/ leads, mates to 5-pin male connector | 10.0 (3.0) | MD-CS650-000 | | | • | | |
| Right Angle Configuration Cordsets | | | | | | | |
| Shielded cables pre-wired with right angle M12 mating connectors | | | | | | | |
|  I/O cordset mates to 12-pin male connector | 10.0 (3.0) | MD-CS611-000 | | • | • | • | |
|  Power cordset mates to 4-pin male connector | 10.0 (3.0) | MD-CS621-000 | • | • | • | • | |
|  Communication cordset mates to 4-pin female connector | 6.5 (2.0) | MD-CS641-000 | | | | • | |
| Daisy Chaining | | | | | | | |
| Connect multiple units together in sequence with Y cable. The termination plug, sold separately, is required at end of run. | | | | | | | |
|  Y cable mates to M12 communication connector | 0.3 (1.0) | MD-CS660-000 | | | • | | |
|  M12 bus termination (resistor) plug | — | PLG-M12TP | | | • | | |
| Cable Accessory Kit | | | | | | | |
|  Includes two M12 screw plugs and one sealing cap | — | CK-16 | • | • | • | • | |
| for all product with Absolute Encoder | | | | | | | |
| Back-up Battery Pack for Absolute Encoder Models | | | | | | | |
| Extend stored position data up to 5-years for 1 to 6 LMDs with absolute encoder | | | | | | | |
|  Battery pack, DIN-rail mount. Uses 3 AA batteries, not provided | — | ICP0531 | | | | | |
| LMD mating cable(s) with crimp connector to flying lead end | 3.3 (1.0) | PD02-0531-FL1 | | | | | |
| PLC mating cable with crimp connector to flying lead end | 3.3 (1.0) | PD04-0531-FL1 | | | | | |

¹ Communication types:

P = Pulse/Direction via RS-422/485 serial interface

M = Programmable Motion Control via RS-422/485 serial interface

A = CANopen interface

E = EtherNet/IP, Modbus/TCP, Profinet, MCode/TCP