

Lexium MDrive[®] with eCylinder

NEMA 17 integrated 1.8° 2-phase stepper motor, control electronics, and captive shaft electric cylinder

Product overview

Lexium MDrive[®] (LMD) products with eCylinder integrate a 1.8° 2-phase stepper motor, drive electronics, and inline mounted captive shaft electric cylinder. Linear motion is produced by a coated, stainless steel acme screw / PEEK-blend nut system coupled directly to the motor's driving shaft. These compact products offer many distinct benefits including competitive price, high accuracy and repeatability. They may also provide a cleaner, quieter alternative to pneumatics.

Some LMD products 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 of the motor's full torque range without derating.

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

Application areas

Lexium MDrive[®] with eCylinder 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.



Quiet, clean and compact, these LMD products integrate motor, drive electronics, and captive shaft electric cylinder to directly convert rotary motion to linear motion. Products deliver distinct benefits, including replacing pneumatics in some applications.

Specifications

| | | | |
|------------------------|-----------------------------|--|--------------------------------|
| Input power | Voltage | +12...+48 VDC | |
| | Current maximum (1) | 2.0 A | |
| Motor | Frame size | NEMA | 17 |
| | | inches | 1.7 |
| | | mm | 42.7 |
| | Length | stack size | single |
| Maximum thrust (2) | PEEK-blend nut | lbs | 225 |
| | | kg | 102 |
| Stroke length | Min/Max | inch | 2.0/18.0 |
| | | mm | 51/457 |
| Backlash | Maximum | inch | 0.002 |
| | | mm | 0.05 |
| Accuracy | Maximum | ±inches per inch | 0.0003 |
| | | ±mm per cm | 0.002 |
| Axial end play | Maximum | inches @ lbs | 0.002 @ 2 |
| | | mm @ kg | 0.05 @ 0.9 |
| Weight (without screw) | | oz/g | 13.6 / 385 |
| Step angle α | | ° | 1.8 |
| | Thermal | Operating temp non-condensing | Heat sink maximum |
| Motor maximum | | | 100°C |
| Protection | Type | Temp warning | 0...84°C, user selectable |
| | | Earth grounding | via product chassis ground lug |
| | | IP rating | IP20 |
| Communication versions | Pulse/Direction | RS-422/485 serial interface, 4 operating modes | |
| | Programmable Motion Control | RS-422/485 programmable with stored memory | |
| | CANopen | CANopen with programmable controller | |
| | Ethernet | EtherNet/IP, Profinet, ModbusTCP | |

(1) Actual power supply current will depend on voltage and load.

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

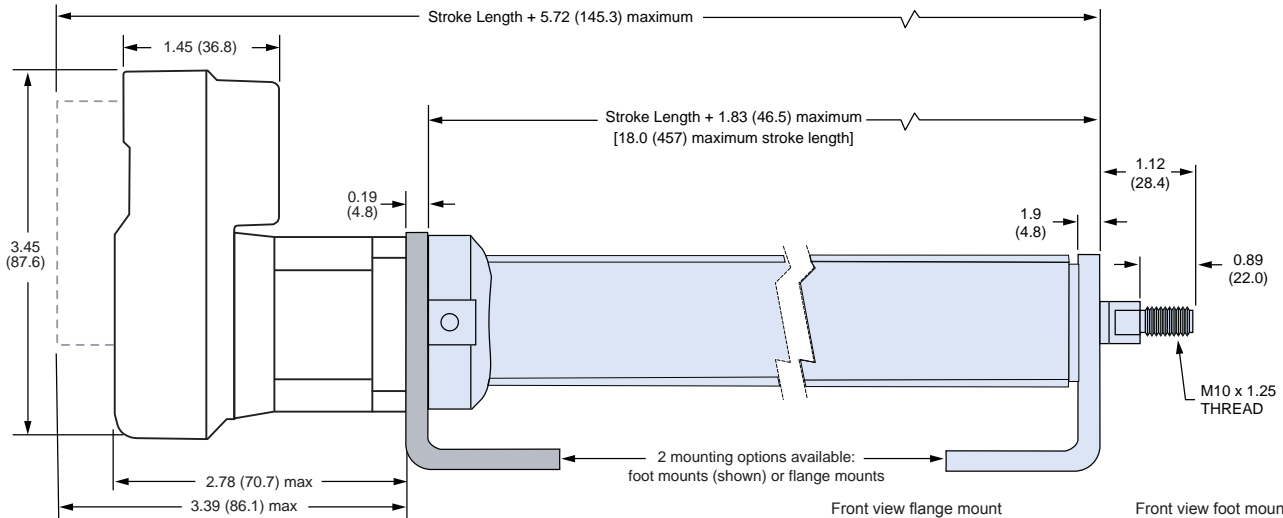
An optional Communication Converter is recommended with first orders.

Lexium MDrive[®] with eCylinder

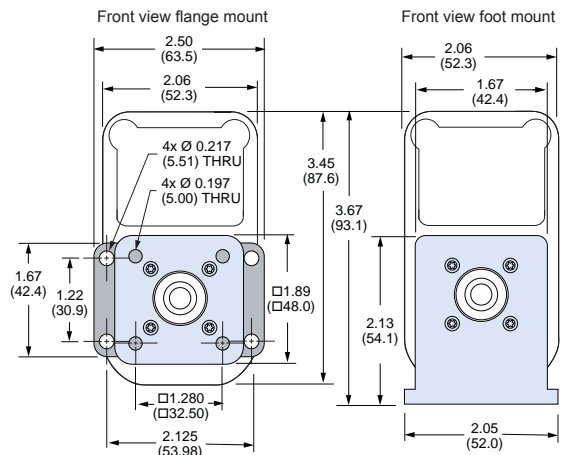
NEMA 17 integrated 1.8° 2-phase stepper motor, drive electronics and electric cylinder

LMD•42 with eCylinder – NEMA size 17

Dimensions in inches (mm)

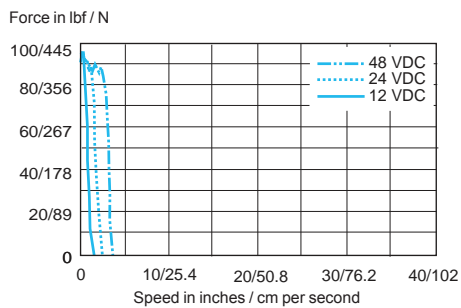


| | | Screw A | Screw B | Screw C | Screw D | |
|--------|---------------|---------|---------|---------|---------|--------|
| Screw | Diameter | inches | 0.375 | 0.375 | 0.375 | 0.375 |
| | | mm | 9.525 | 9.525 | 9.525 | 9.525 |
| Travel | Per rev | inches | 0.100 | 0.250 | 0.500 | 1.000 |
| | | mm | 2.54 | 6.35 | 12.7 | 25.4 |
| | Per full step | inches | 0.00125 | 0.0013 | 0.0025 | 0.0050 |
| | | mm | 0.03175 | 0.03302 | 0.0635 | 0.127 |

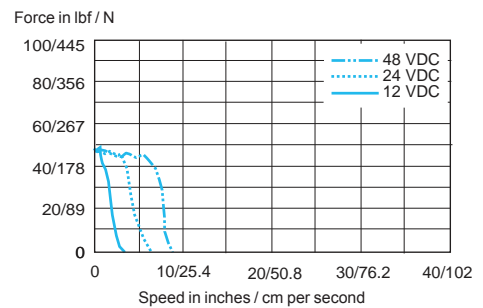


Speed-force curves

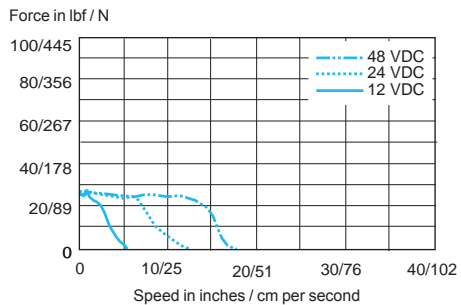
Screw A
0.100" lead



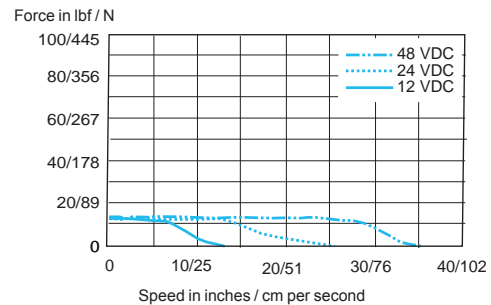
Screw B
0.250" lead



Screw C
0.500" lead



Screw D
1.000" lead



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Accessories



MD-CC404-000



MD-CC501-000



MD-CC405-000



MD-CC502-000



MD-CS600-000



MD-CS620-000



MD-CS630-000



MD-CS610-000



MD-CS640-000



MD-CS650-000



PLG-M12TP

MD-CS660-000



ICP0531

| 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 | | | | | | |
| Mates to DB9 connector | 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 | | | comm types (1) | | | |
|---|-----------------|-------------|----------------|---|---|---|
| description | length feet (m) | part number | P | M | A | E |
| 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 converters USB-pluggable converter to set/program communication parameters in 32- or 64-bit | | | | | | |
| Mates to M12 5-pin female connector | 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 | | | • | |

| Cordsets | | | comm types (1) | | | |
|---|-----------------|--------------|----------------|---|---|---|
| description | length feet (m) | part number | P | M | A | E |
| Shielded cables pre-wired with straight M12 mating connectors | | | | | | |
| Communication cordset mates to 5-pin female connector | 10.0 (3.0) | MD-CS600-000 | • | • | | |
| Power cordset mates to 4-pin male connector | 10.0 (3.0) | MD-CS620-000 | • | • | • | • |
| I/O cordset mates to 12-pin female connector | 10.0 (3.0) | MD-CS630-000 | • | | | |
| I/O cordset mates to 12-pin male connector | 10.0 (3.0) | MD-CS610-000 | | • | • | • |
| Communication cordset mates to 4-pin female connector | 6.5 (2.0) | MD-CS640-000 | | | | • |
| Communication cordset mates to 5-pin male connector | 10.0 (3.0) | MD-CS650-000 | | | | |

| Daisy chaining | | | comm types (1) | | | |
|---|-----------------|--------------|----------------|---|---|---|
| description | length feet (m) | part number | P | M | A | E |
| Connect multiple units together in sequence with Y cable. 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 | | | • | |

(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, ModbusTCP, Profinet, MCode/TCP

| for all products with Absolute Encoder | | | comm types (1) | | | |
|---|-----------------|---------------|----------------|---|---|---|
| description | length feet (m) | part number | P | M | A | E |
| Back-up battery pack Extend stored position data up to 5-years for 1 to 6 LMD units | | | | | | |
| 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 | | | | |

Lexium MDrive[®] with eCylinder

NEMA 17 integrated 1.8° 2-phase stepper motor, drive electronics and electric cylinder



LMD42 NEMA 17 with eCylinder pictured with foot mounts (L) and flange mounts (R)

pluggable connectors

LEDs two signal indicators

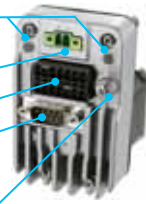
Connectors

P1: Power 2-pin screw lock

P2: I/O & multifunction
2 keyed 7-pin spring lock

P3: Communication
DB9 male or RJ45

Chassis ground one #6-32 screw



M12 circular connectors

Chassis ground one #6-32 screw

Connectors

P1: Power M12 4-pin male

P2: I/O & multifunction
M12 12-pin male

P3: Communication
M12 5-pin female

LEDs two signal indicators



Part numbers

| Example | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
|---|---------------------------------------|
| Product LMD = Lexium MDrive | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Control type C = Closed loop / with hMT (1) A = Absolute Encoder and closed loop / with hMT (1) (2) O = Open loop / no hMT or encoder | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Communication type P = Pulse/Direction via RS-422/485 serial interface (2) M = Programmable Motion Control via RS-422/485 serial interface A = CANopen interface E = EtherNet/IP, ModbusTCP, Profinet, MCode/TCP | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Flange size 42 = NEMA 17 / 42mm | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Motor length 1 = single stack | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Connector style P = Pluggable connectors, IP20 rating C = M12 circular connectors, IP20 rating | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Linear style -C = electric cylinder | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Nut S = PEEK-blend | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Screw lead A = 0.100" / 2.54 mm B = 0.250" / 6.35 mm C = 0.500" / 12.7 mm D = 1.000" / 25.4 mm | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Stroke length available in 0.1" increments 020 = 02.0" / 51 mm minimum 180 = 18.0" / 457 mm maximum | L M D C M 4 2 1 P - C S A 0 6 0 M N N |
| Mounts M = flange mounts F = foot mounts | L M D C M 4 2 1 P - C S A 0 6 0 M N N |

(1) Closed loop control delivers encoder feedback and hMT enhanced motor performance.

(2) Pulse/Direction products are not available with Absolute Encoder.

Options

Customization

Options are available for customizing LMD eCylinder products to your specific application needs. These include:

- positioning sensors
- mounting hardware
- cylinder ends
- ball screw configuration
- screw sizes

FlexCenter

Our FlexCenter is dedicated to finding custom solutions. To begin a discussion of your special application needs, please complete the custom product inquiry form at <https://motion.schneider-electric.com/contacts/>

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