

# LMD Linear Actuator

NEMA 23 integrated 1.8° 2-phase stepper motor with external shaft

## Product overview

Lexium MDrive® 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 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® 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.



LMD-57 linear actuator: 2 connector options  
NEMA23 external shaft

## Specifications

Input power	Voltage		+12 ...+60 VDC
	Current maximum (1)		3.5 A
Motor	Frame size	NEMA	23
		inches	2.3
		mm	57
Maximum thrust (2)	General purpose nut	stack size	single
		lbs	60
		kg	27
Maximum repeatability	Anti-backlash nut	lbs	25
		kg	11
		inch	0.005
Weight (without screw)	Anti-backlash nut	mm	0.127
		inch	0.0005
		mm	0.0127
Step angle α	oz/g		24.8 / 703
	°		1.8
Thermal	Operating temp non-condensing	Heat sink maximum	85°C
		Motor maximum	100°C
Protection	Type	Temperature 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.

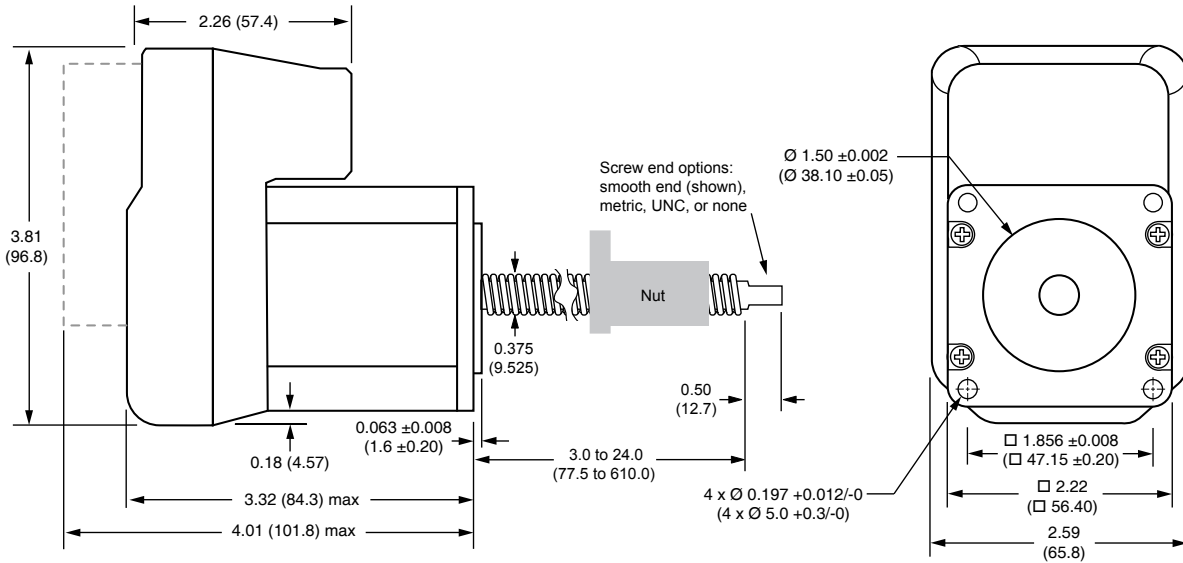
An optional Communication Converter is recommended with first orders.

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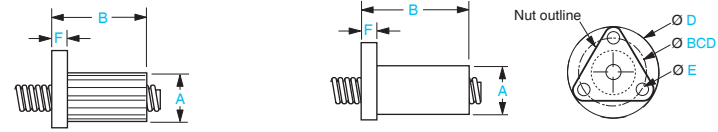
## LMD•57 Linear – external shaft, NEMA size 23

Dimensions in inches (mm), unless specified



NOTE  
Cantilevered loads  
MUST BE supported.  
Side loading is not  
recommended.

### Nut specifications



#### General purpose nut

For applications not requiring anti-backlash and wear compensation  
Flange shape: triangle

#### Anti-backlash nut

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

inches (mm)	A	B	D	E	F	BCD	drag torque
General purpose	0.71 (18.0)	1.50 (38.1)	1.5 (38.1)	0.20 (5.08)	0.20 (5.08)	1.125 (28.6)	free wheeling
Anti-backlash	0.82 (20.8)	1.875 (47.63)	1.5 (38.1)	0.20 (5.08)	0.20 (5.08)	1.125 (28.6)	1-to-3 oz-in / 0.7-2.1 Ncm

### Lead screw specifications

Travel	Per revolution	Screw G	Screw A	Screw B	Screw D
		0.375" / 9.525 mm	0.20" / 5.08 mm	0.167" / 4.233 mm	0.0833" / 2.116 mm
Load limit*	External shaft nuts	General purpose	60 lbs / 27 kg		
		Anti-backlash	25 lbs / 11 kg		

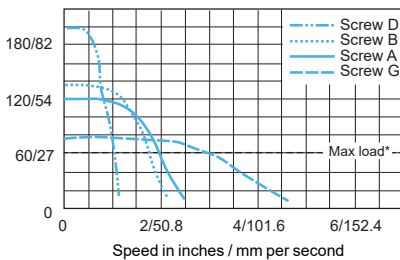
\*Performance data for maximum force/load is based on a static load and will vary with a dynamic load.

Threaded end	Metric end: M6 x 1.0mm thread to within 0.03" / 0.76 mm of shoulder	UNC end: 1/4-20 UNC-2A thread to within 0.05" / 1.3 mm of shoulder
Smooth end	Ø 0.2362" ± 0.001 Ø 6mm ± 0.003	
None	—	

### Speed-force curves

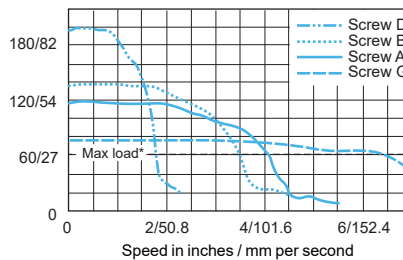
#### 24 VDC

Force in lbs / kg



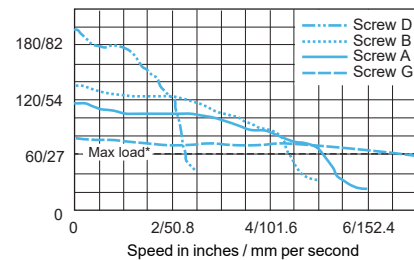
#### 48 VDC

Force in lbs / kg



#### 60 VDC

Force in lbs / kg



\*Load limit is determined by selected nut. Performance data for maximum force/load is based on a static load and will vary with a dynamic load.

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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



MD-CS660-000



ICP0531

for pluggable connector products			comm types (1)			
description	length feet (m)	part number	P	M	A	E
<b>Communication converters</b> 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			•	

<b>Replacement mating connector kits</b>						
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
<b>Communication converters</b> 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			•	

<b>Cordsets</b> 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				

<b>Daisy chaining</b> 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		
description	length feet (m)	part number
<b>Back-up battery pack</b> 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

# LMD Linear Actuator

NEMA 23 integrated 1.8° 2-phase stepper motor with external shaft



## pluggable connectors

### LEDs

two signal indicators

### Chassis ground

one #6-32 screw

### Connectors

#### P1: Power

2-pin screw lock

#### P2: I/O & multifunction

2 keyed 7-pin spring lock

#### P3: Communication

DB9 male

## M12 circular connectors

### LEDs

two signal indicators

### Chassis ground

one #6-32 screw

### Connectors

#### P1: Power

M12 4-pin male

#### P3: Communication

M12 5-pin female

#### P2: I/O & multifunction

M12 12-pin male

## Part numbers

Example	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Product</b> LMD = Lexium MDrive, with linear actuator external shaft	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Control type</b> C = Closed loop / with hMT and encoder (1) A = Closed loop / with hMT and multi-turn absolute encoder O = Open loop / no hMT or encoder	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Communication type</b> 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 5 7 1 P -LA 3 M 0 6 0 G T
<b>Flange size</b> 57 = NEMA 23 / 57mm	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Motor length</b> 1 = single stack	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Connector style</b> P = pluggable connectors, IP20 rating C = M12 circular connectors, IP20 rating	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Lead screw</b> -LG=0.375"/9.525 mm -LA=0.20"/5.08 mm -LB=0.167"/4.233 mm -LD=0.083"/2.116 mm	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Shaft style</b> 3 = external shaft	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Screw end finish</b> M = metric U = UNC S = smooth Z = none	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Screw length (3)</b> <i>lengths available in 0.1" increments</i> 030 = 03.0" / 76 mm minimum 240 = 24.0" / 610 mm maximum	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Nut</b> G = general purpose A = anti-backlash	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T
<b>Screw coating</b> T = Teflon® Z = none	L M D C M 5 7 1 P -LA 3 M 0 6 0 G T

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

(2) Open or closed loop only, not available with absolute encoder.

(3) To calculate screw length: screw length = [desired stroke length] + [nut length] + [mounting surface plate thickness]

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Intelligent motion systems

