LMD Linear Actuator

NEMA 17 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.
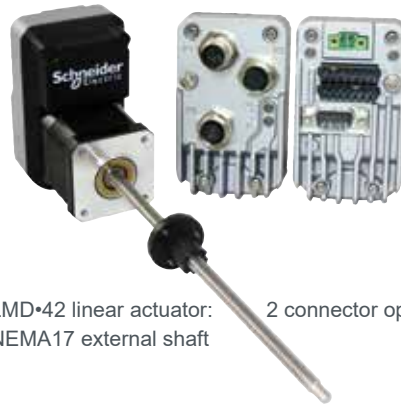
LMD•42 linear actuator: 2 connector options
NEMA17 external shaft

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)	General purpose nut	lbs	25
		kg	11
	Anti-backlash nut	lbs	5
		kg	2
Maximum repeatability	General purpose nut	inch	0.005
		mm	0.127
	Anti-backlash nut	inch	0.0005
		mm	0.0127
Weight (without screw)		oz/g	13.6 / 385
Step angle α		°	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		EtherNetIP, 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.
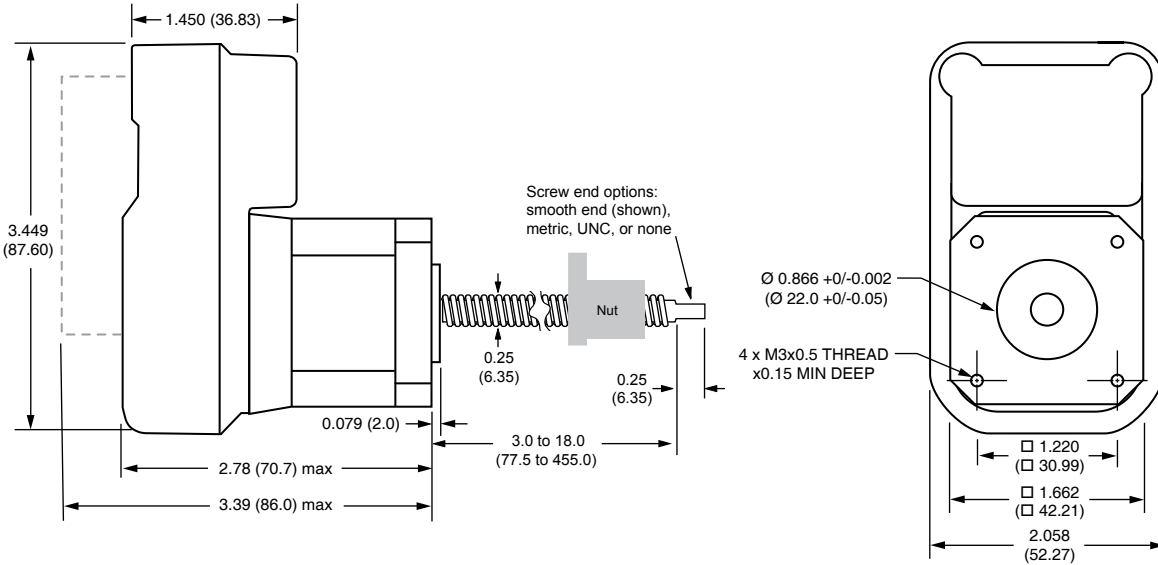
An optional Communication Converter is recommended with first orders.

Intelligent motion systems | Schneider Electric
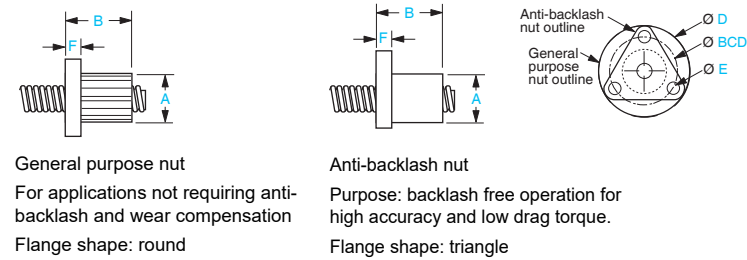
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LMD•42 Linear – external shaft, NEMA size 17

Dimensions in inches (mm), unless specified

1.450 (36.83)

3.449 (87.60)

Screw end options: smooth end (shown), metric, UNC, or none

Nut

0.25 (6.35)

0.079 (2.0)

0.25 (6.35)

2.78 (70.7) max

3.39 (86.0) max

3.0 to 18.0 (77.5 to 455.0)

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

Ø 0.866 +0/-0.002 (Ø 22.0 +0/-0.05)

4 x M3x0.5 THREAD x0.15 MIN DEEP

□ 1.220 (□ 30.99)

□ 1.662 (□ 42.21)

2.058 (52.27)

Nut specifications

General purpose nut

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

Anti-backlash nut outline

General purpose nut outline

Ø D
Ø BCD
Ø E

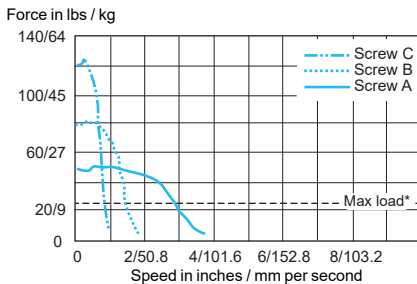| inches (mm)	A	B	D	E	F	BCD	drag torque
General purpose	0.50 (12.7)	0.75 (19.1)	1.0 (25.4)	0.14 (3.6)	0.15 (3.81)	0.75 (19.1)	free wheeling
Anti-backlash	0.50 (12.7)	0.9 (22.86) max	1.0 (25.4)	0.143 (3.63)	0.18 (4.57)	0.75 (19.1)	< 1.0 oz-in < 0.7 N-cm

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.
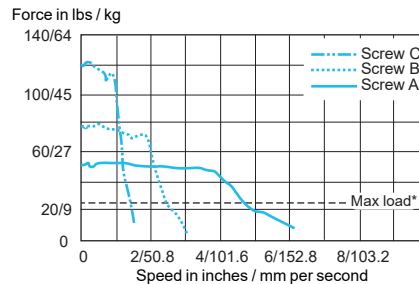
Threaded end	Metric end: M4 x 0.7mm thread to within 0.03"/ 0.76 mm of shoulder	UNC end: #8-32 UNC-2A thread to within 0.03"/ 0.76 mm of shoulder
Smooth end	Ø 0.1967" ±0.001 Ø 5 mm ±0.003	
None	—	

Speed-force curves

12 VDC

Force in lbs / kg

Screw C
Screw B
Screw A

Max load*

Speed in inches / mm per second

24 VDC

Force in lbs / kg

Screw C
Screw B
Screw A

Max load*

Speed in inches / mm per second

48 VDC

Force in lbs / kg
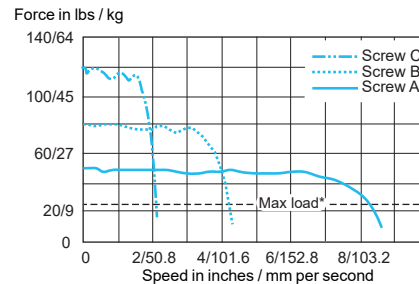

Screw C
Screw B
Screw A

Max load*

Speed in inches / mm per second

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

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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

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						
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						
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 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 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
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

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Part numbers

Example	L M D C M 4 2 1 P -LA 3 M 0 6 0 G T
Product **LMD** = Lexium MDrive, with linear actuator external shaft	**L M D** C M 4 2 1 P -LA 3 M 0 6 0 G T
Control type **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 4 2 1 P -LA 3 M 0 6 0 G T
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 -LA 3 M 0 6 0 G T
Flange size **42** = NEMA 17 / 42mm	L M D C M **4 2** 1 P -LA 3 M 0 6 0 G T
Motor length **1** = single stack	L M D C M 4 2 **1** P -LA 3 M 0 6 0 G T
Connector style **P** = pluggable connectors, IP20 rating **C** = M12 circular connectors, IP20 rating	L M D C M 4 2 1 **P** -LA 3 M 0 6 0 G T
Lead screw **-LA** = 0.25" / 6.35 mm **-LB** = 0.125" / 3.175 mm **-LC** = 0.063" / 1.588 mm	L M D C M 4 2 1 P **-LA** 3 M 0 6 0 G T
Shaft style **3** = external shaft	L M D C M 4 2 1 P -LA **3** M 0 6 0 G T
Screw end finish **M** = metric **U** = UNC **S** = smooth **Z** = none	L M D C M 4 2 1 P -LA 3 **M** 0 6 0 G T
Screw length (3) *lengths available in 0.1" increments* **030** = 03.0" / 76 mm minimum **180** = 18.0" / 457 mm maximum	L M D C M 4 2 1 P -LA 3 M **0 6 0** G T
Nut **G** = general purpose **A** = anti-backlash	L M D C M 4 2 1 P -LA 3 M 0 6 0 **G** T
Screw coating **T** = Teflon® **Z** = none	L M D C M 4 2 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]

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

Chassis ground one #6-32 screw
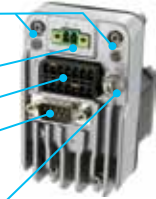
M12 circular connectors

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