

Lexium MDrive®

LMD•M42 programmable Motion Control

Product overview

Robust Lexium MDrive® Motion Control products integrate 1.8° 2-phase stepper motors with control electronics, including an on-board programmable motion controller for stand-alone operation. An optional encoder, internal to the product, delivers hMT closed loop performance.

With an RS-422/485 serial interface, settings can be downloaded and stored in nonvolatile memory. Commissioning, parameterization and monitoring is done via the user-friendly software provided.

Products with encoder feature hMT closed loop performance to maintain functional motor control and prevent loss of synchronization. Benefits include: variable current control, torque control, using the motor's full torque range without derating.

Application areas

Especially well suited for industrial applications,

products include an IP65 rated version with circular M12 connectors.

Lexium MDrive products can reduce machine complexity, size and cost in many stepper and servo motor applications. Their high degree of integration can increase system reliability by reducing the number of individual components, eliminating multiple potential failure points.



LMD•M42 Lexium MDrive Motion Control products: integrated NEMA17 motor and controls, IP65 & IP20-rated

General features

Robust control electronics, including programmable motion controller, integrated with NEMA17 1.8° 2-phase stepper motor	
Advanced current control for exceptional performance and smoothness	
RS-422/485 serial interface	
+12 to +48 VDC single supply	
20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes	
62 software addresses for multi-drop communications	
Protection	0...84°C temperature warning, user selectable
	IP20, IP65 ratings
I/O, sourcing or sinking	+5 to +24 VDC signal inputs
	12-bit analog input
	5.5mA high-speed signal output
Encoder	1000 lines / 4000 edges per rev
	internal magnetic
336 user program labels / 11,120 bytes flash memory	
0 to 2.56 MHz step clock rate selectable in 0.59 Hz increments	
Graphical user interface provided for quick and easy parameter setup	
4 year warranty	

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Specifications

Communication	Protocol type		RS-422/485	
Input power	Voltage	VDC	+12...+48	
	Current maximum (1)	Amp	2.0	
Motor	Frame size	NEMA	17	
		inches	1.7	
		mm	42	
	Performance level		standard torque	
	Holding torque	oz-in		44...88
N-cm			31 ... 62	
	Length	stack sizes	1, 2 & 3	
Thermal	Operating temp non-condensing	Heat sink maximum	85°C	
		Motor maximum	100°C	
Protection	Type	Temp warning	0...84°C, user selectable	
		IP rating	IP20, IP65	
		Earth grounding	via product chassis ground lug	
I/O sourcing or sinking	One analog input	Resolution	12 bit	
		Voltage range	0... +5 VDC, 0... +10 VDC, 0...20 mA, 4...20 mA	
	Three signal inputs	Voltage range	+5...+24 VDC, TTL level compatible	
		Protection	over temp, short circuit, transient, over voltage, inductive clamp	
	One high-speed signal output	Current open collector/emitter	5.5 mA	
		Voltage open collector	+60 VDC	
Voltage open emitter		+7 VDC		
Aux. logic input	Voltage range (2)		+12... +24 VDC	
Motion	Microstep resolution	Number of settings	20	
		Steps per revolution	200, 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 20000, 25000, 25600, 40000, 50000, 51200, 36000 (0.01 deg/μstep), 21600 (1 arc minute/μstep), 25400 (0.001mm/μstep)	
	Encoder	Line count		1000 lines / 4000 edges per rev
		Style		internal, magnetic
	Counters	Type		position, encoder/32 bit
		Edge rate maximum		5 MHz
	Velocity	Range		+/- 2,560,000
		Resolution		0.5961 steps per second
	Accel/Decel	Range		1.5 x 10 ⁹ steps persecond ²
		Resolution		90.9 steps per second ²
	Software	Program storage	Type/size	flash / 11,120
		User registers		four 32 bit
		User program labels & variable		336
Math functions			+, -, x, ÷, >, <, <=, >=, AND, OR, XOR, NOT	
Branch functions			Branch and Call	
General purpose I/O functions		Inputs		home, limit plus, limit minus, go, stop, pause, jog plus, jog minus, reset, capture, general purpose
		Outputs		moving, error, stall, velocity change, general purpose, locked rotor, moving to position, hMT active, make up active, attention
Trip functions			trip on input, trip on position, trip on time, trip capture, trip on relative position	
Party mode addresses		62		
			stall detection, position maintenance, find index	

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

(2) When input voltage is removed, maintains power only to control and feedback circuits.

An optional Communication Converter is recommended to facilitate prototyping.



See User Manual for complete details: www.motion.schneider-electric.com/manuals.html

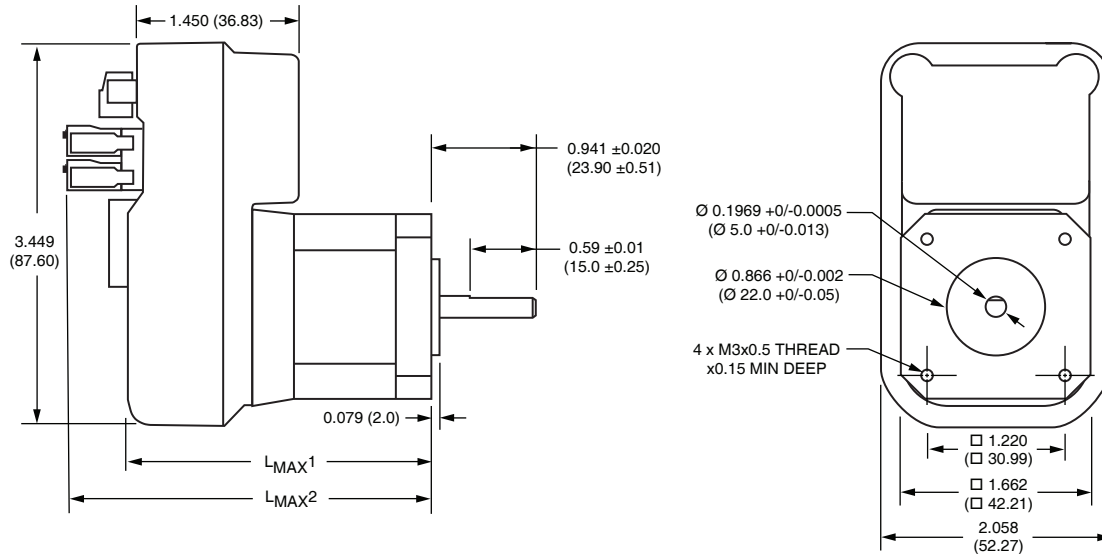
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Dimensions

LMD•42 NEMA17 motor, IP20-rated

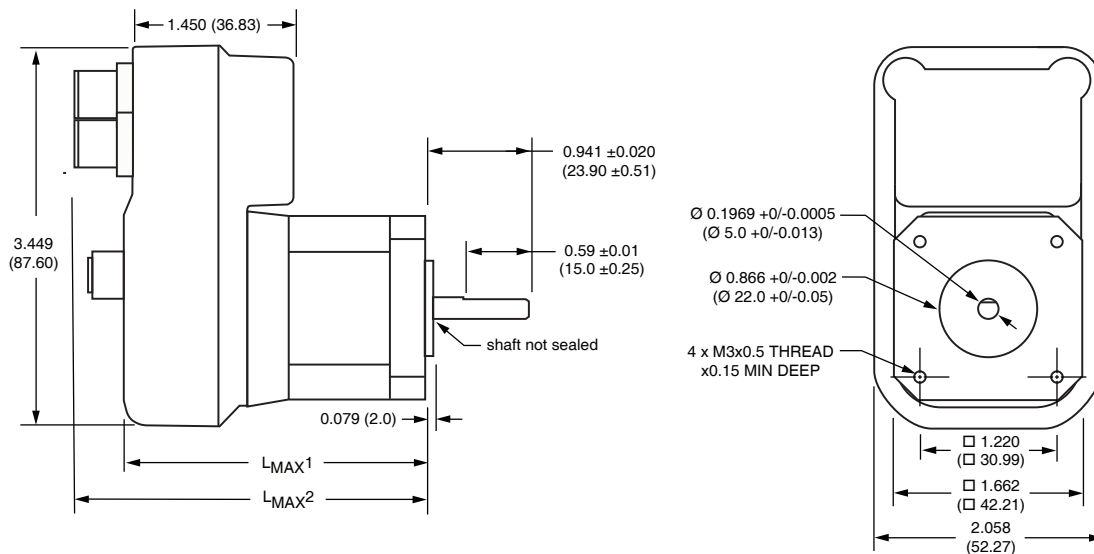
inches (mm)



Motor stack length	L _{max1}	L _{max2}
Single	2.40 (61.0)	3.22 (81.8)
Double	2.64 (67.0)	3.46 (88.0)
Triple	2.96 (75.3)	3.78 (96.0)

LMD•42•C NEMA17 motor, IP65-rated

inches (mm)

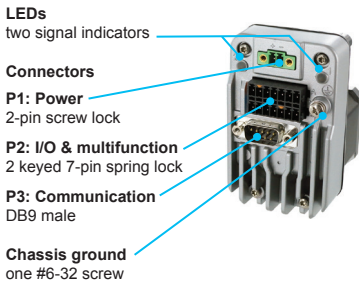


Motor stack length	L _{max1}	L _{max2}
Single	2.78 (70.7)	3.39 (86.0)
Double	2.98 (75.7)	3.58 (91.0)
Triple	3.33 (84.7)	3.94 (100.0)

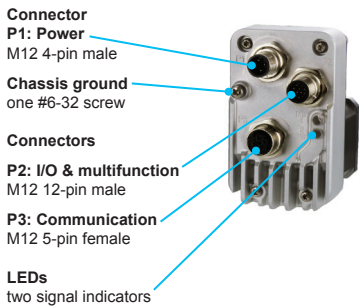
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IP20-rated products



IP65-rated products



Part numbers

example part number	L	M	D	C	M	4	2	1	C
Product LMD = Lexium MDrive with standard hybrid stepper motor	L	M	D	C	M	4	2	1	C
Control type C = Closed loop / with hMT and encoder (1) O = Open loop / no hMT or encoder	L	M	D	C	M	4	2	1	C
Communication type M = programmable Motion Control via RS-422/485 serial interface	L	M	D	C	M	4	2	1	C
Flange size 42 = NEMA 17 1.7" / 42mm	L	M	D	C	M	4	2	1	C
Motor length 1 = single stack 2 = double stack 3 = triple stack	L	M	D	C	M	4	2	1	C
Variation — omit from part number if unwanted C = M12 circular connectors and IP65 rating	L	M	D	C	M	4	2	1	C

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

Accessories

description	length feet (m)	part number
Communication converter 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 M12 5-pin female connector	6.0 (1.8)	MD-CC405-000
IP65 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 male connector	10.0 (3.0)	MD-CS610-000
Replacement mating connector kit Kits are for IP20 products. They include one 2-pin power mate, and one set (2 pieces) 7-pin multifunction mates		
	—	CK-15

MDrive Plus

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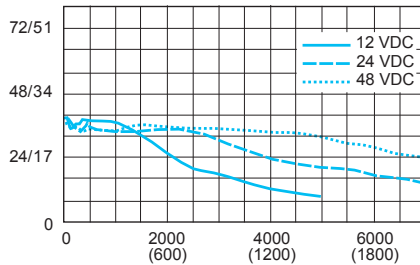
Motor performance

LMD•42 NEMA 17 motor specifications	Motor	Stack length	Single	Double	Triple
	Holding torque	oz-in		44	58
N-cm			31	41	62
Detent torque	oz-in		1.7	2.1	3.5
	N-cm		1.2	1.5	2.5
Rotor inertia	oz-in-sec ²		0.0005	0.0008	0.0012
	kg-cm ²		0.038	0.057	0.082
Radial load limit, center of shaft	lbs		8.5	8.5	8.5
	kg		3.8	3.8	3.8
Axial load limit @ 1500rpm (5000 full steps/sec)	lbs		10	10	10
	kg		4.5	4.5	4.5
Weight (motor+driver)	oz		13.6	16.0	18.4
	g		385	454	522

LMD•42 NEMA 17 speed torque (1)

Single stack length

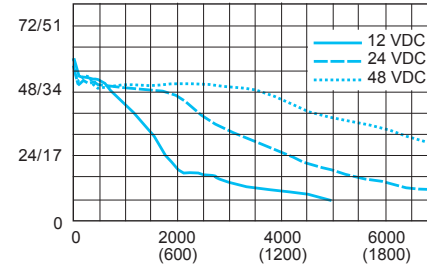
Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

Double stack length

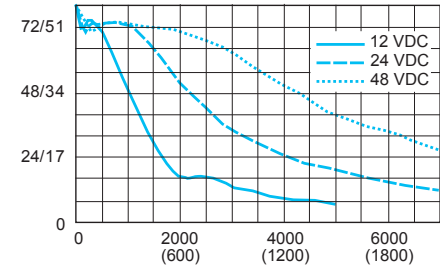
Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

Triple stack length

Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

(1) Test conditions: 100% current with damper simulating load.