Lexium MDrive®

LMD•M85 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 non-volitile memory. Parameterization, programming and monitoring is all 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. A high torque motor (LMH•85) is also available, increasing torque up to 50%.

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•M85 Lexium MDrive Motion Control products: integrated NEMA34 motor and controls, IP65 & IP20-rated

General features

Robust control electronics, including programmable motion controller, integrated with NEMA34 1.8° 2-phase stepper motor	
Advanced current control for exceptional performance and smoothness	
RS-422/485 serial interface	
+12 to +70 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
	100mA power outputs
	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...+70
	Current maximum (1)	Amp	4.0
Motor	Frame size	NEMA	34
		inches	3.4
		mm	85
	Performance levels		standard torque or premium high torque (2)
	Holding torque	oz-in	336...920
		N-cm	237...650
	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
	Four signal inputs	Voltage range	+5...+24 VDC, TTL level compatible
		Protection	over temp, short circuit, transient, over voltage, inductive clamp
	Two power outputs	Current rating	-100...+100 mA
		Voltage range	-24...+24 VDC
	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 (3)		+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
		Types	linear, triangle s-curve, sinusoidal s-curve
Software	Program storage	Type/size	flash / 11,120
	User registers	Number/resolution	4 / 32-bit
	Floating point registers	Number/precision	8 / double
	Math functions	Arithmetic	+, -, x, ÷, >, <, =, >=, <=
		Logic	AND, OR, XOR, NOT
		Trigonometric	ABS, COS, ACOS, LOG2, LOG10, PI, SIN, ASIN, SQRT, TAN, ATAN
	Branch functions		Branch & call
	I/O functions	Inputs	Home, limit plus, limit minus, go, stop, pause, jog plus, jog minus, general purpose, capture
		Outputs	Moving, error, velocity change,, moving position, trip, attention. general purpose
	Trip functions		Trip on input, trip on position, trip on time, trip capture, trip on relative position, trip on main power loss
	Party-mode addresses		62
	Encoder functions (4)		stall detection, position maintenance, find index, hMT

(1) Actual power supply current will depend on voltage and load.
(2) Contact the factory for product details.
(3) When input voltage is removed, maintains power only to control and feedback circuits.
(4) Closed-loop models with encoder only

An optional Communication Converter is recommended to facilitate prototyping.

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

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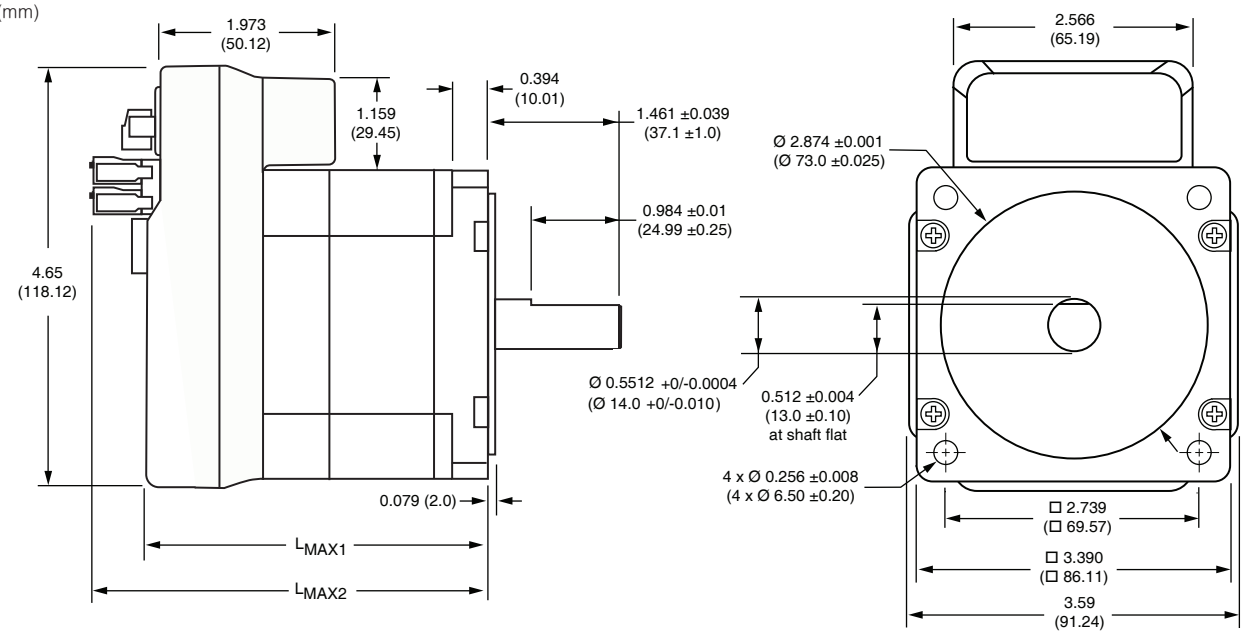
Dimensions

LMD•85 NEMA34 motor, IP20-rated

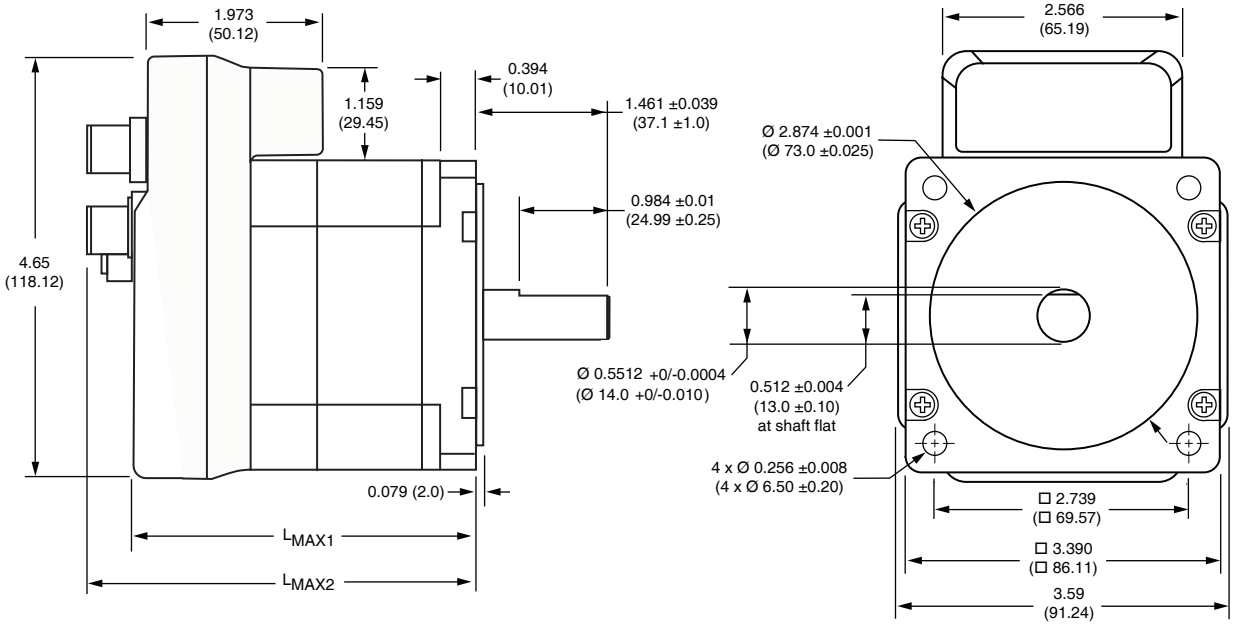
inches (mm)



Motor stack length	Lmax1	Lmax2
Single	3.79 (96.2)	4.55 (115.7)
Double	4.33 (110.0)	5.07 (128.8)
Triple	5.90 (149.9)	6.65 (168.9)

LMD•85•C NEMA34 motor, IP65-rated

inches (mm)



Motor stack length	Lmax1	Lmax2
Single	4.04 (102.7)	4.65 (118.2)
Double	4.57 (116.2)	5.18 (131.7)
Triple	6.14 (156.1)	6.75 (171.5)

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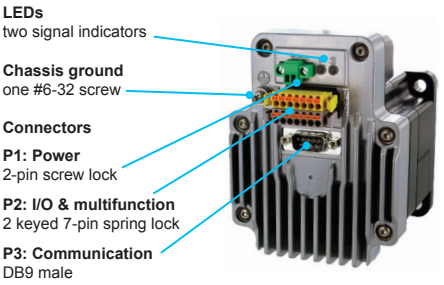
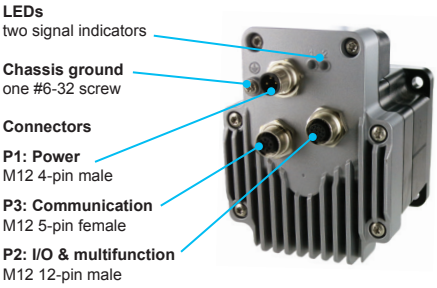
IP20-rated products



IP65-rated products



MD-CC404-000

MD-CC405-000

MD-CS600-000

MD-CS620-000

MD-CS610-000

Part numbers

example part number	L	M	D	C	M	8	5	1	C
Product LMD = Lexium MDrive with standard hybrid stepper motor LMH = Lexium MDrive with high torque stepper motor (1)	L	M	D	C	M	8	5	1	C
Control type C = Closed loop / with hMT and encoder (2) O = Open loop / no hMT or encoder	L	M	D	C	M	8	5	1	C
Communication type M = programmable Motion Control via RS-422/485 serial interface	L	M	D	C	M	8	5	1	C
Flange size 85 = NEMA 34 3.4" / 85mm	L	M	D	C	M	8	5	1	C
Motor length 1 = single stack 2 = double stack 3 = triple stack	L	M	D	C	M	8	5	1	C
Variation — omit from part number if unwanted C = M12 circular connectors and IP65 rating	L	M	D	C	M	8	5	1	C

(1) Contact the factory for product details.

(2) 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

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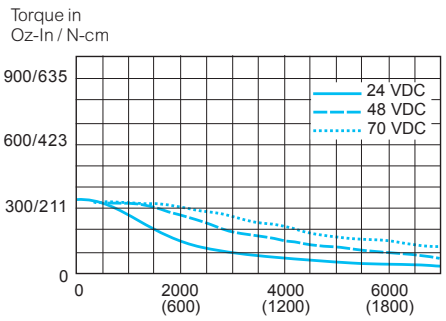
Motor performance

LMD•85 NEMA 34 motor specifications

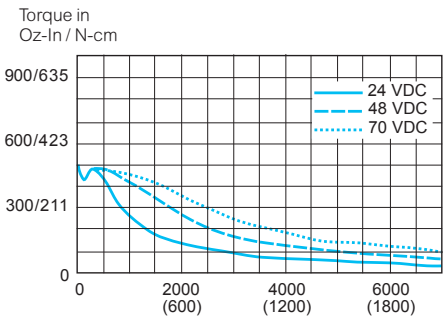
Motor	Stack length	Single	Double	Triple
Holding torque	oz-in	336	480	920
	N-cm	237	339	650
Detent torque	oz-in	10.9	14.16	19.83
	N-cm	7.7	10.0	14.0
Rotor inertia	oz-in-sec^2	0.0127	0.0191	0.0382
	kg-cm^2	0.90	1.35	2.70
Radial load limit, center of shaft	lbs	65	65	65
	kg	29.4	29.4	29.4
Axial load limit @ 1500rpm (5000 full steps/sec)	lbs	20	20	20
	kg	9	9	9
Weight (motor+driver)	lb	4.45	5.65	9.0
	kg	2.02	2.56	4.08

LMD•85 NEMA 34 speed torque (1)

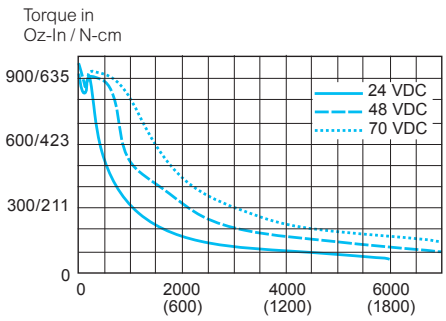
Single stack length



Double stack length



Triple stack length



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

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