

Lexium MDrive®

LMD•P42 Pulse /direction input

Product overview

Robust Lexium MDrive® Pulse/Direction products integrate 1.8° 2-phase stepper motors with on-board control electronics and hMT closed loop performance. Products have 4 modes of operation: pulse/direction input, variable speed control, constant velocity drive, and variable torque control.

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 may include an encoder, which is internal to the unit so no extra space is required. Encoders perform stall detection, position maintenance and find index mark, in addition to monitoring motor shaft position for real time closed loop feedback.

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•P42 Lexium MDrive Pulse/direction input products: integrated NEMA17 motor and controls, IP65 & IP20-rated

General features

Robust integrated microstepping drive and NEMA17 1.8° 2-phase stepper motor	
Advanced current control for exceptional performance and smoothness	
RS-422/485 serial interface with 4 operating modes: pulse/direction, speed, torque and velocity control	
+12 to +48 VDC single supply	
20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes	
Protection	0...84°C temperature warning, user selectable
	IP20, IP65 ratings
Hardware I/O	Sourcing or sinking
	1 analog input, 2 signal inputs, 1 attention output, 6 encoder outputs
Encoder	1000 lines / 4000 edges per rev
	internal magnetic
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	

Lexium MDrive

LMD•P42 Pulse/direction input

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	
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	
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
		Outputs		6 TTL level compatible
	Operating modes	Open loop configuration		pulse/direction input, speed control, velocity mode
		Closed loop configuration (2)		pulse/direction input, speed control, velocity mode, variable torque mode
	Digital filter range			50 nS... 12.9 μS (10 MHz... 38.8 kHz)
	Clock types (step mode)			step/direction, quadrature, step up/step down, clockwise/counterclockwise
	Step frequency	Maximum		2.56 MHz
		Minimum pulse width		100 ns

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

(2) Only with closed loop products.

Setup parameters

Operating modes	Basic	Pulse/direction	microstep resolution, run current, hold current, hold delay, clock mode, motion, enable active, input filters
	Advanced	Speed control	acceleration, deceleration, velocity, flags
		Torque mode (3)	set torque speed, % maintained motor torque, torque current, filtering
		Velocity control	acceleration, deceleration, velocity, slew, flags
Device parameters	Analog input settings		select range and resolution
	Communication bus settings		set baud rate, enable/disable party mode and features, check sum
	I/O settings		clock and filter settings, attention output with selectable pre-programmed fields
	Motion settings		select motion, analog and velocity settings as available by operating mode
	hMT settings (3)		hMT setup/status; hMT operation
Device ID			device information, restore settings

(3) Only with closed loop products.

An optional Communication Converter is recommended to facilitate prototyping.



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

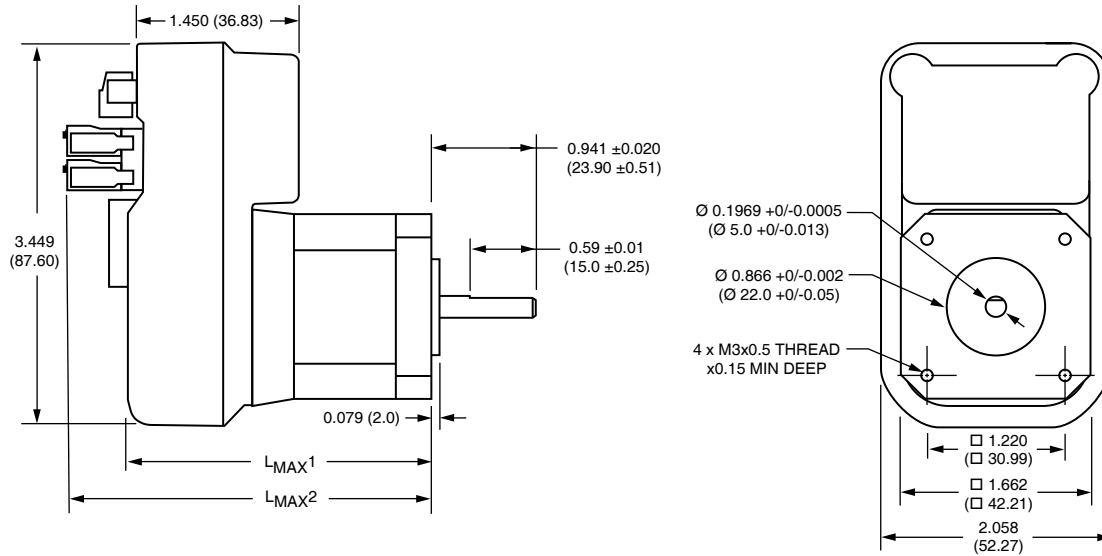
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LMD•P42 Pulse/direction input

Dimensions

LMD•42 NEMA17 motor, IP20-rated

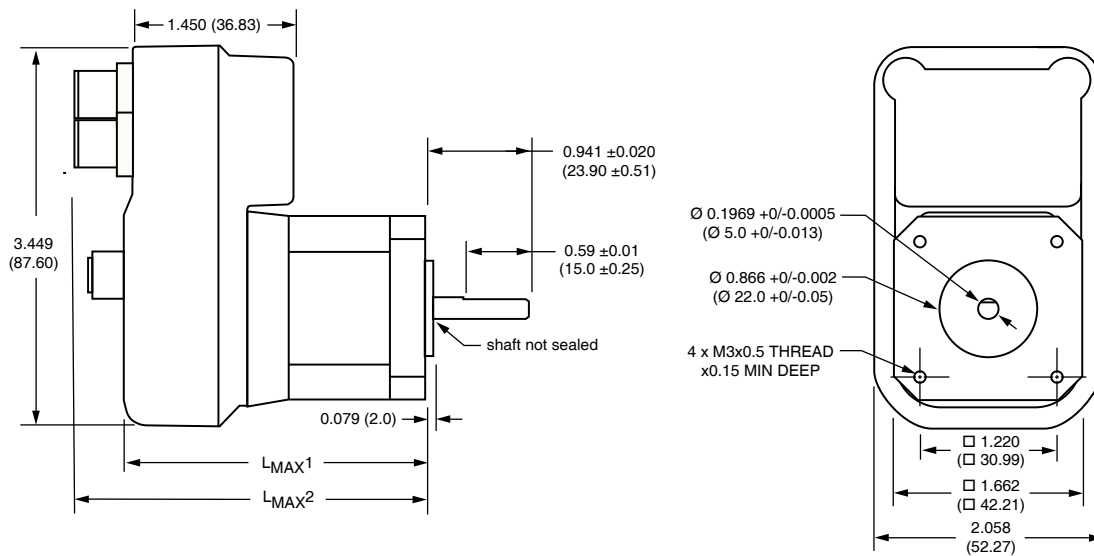
inches (mm)



Motor stack length	L _{max1}	L _{max2}
Single	2.48 (63.0)	3.22 (81.8)
Double	2.71 (69.0)	3.46 (88.0)
Triple	3.04 (77.3)	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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LMD•P42 Pulse/direction input

IP20-rated products

LEDs

two signal indicators

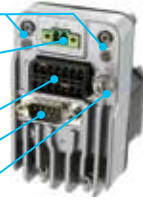
Connectors

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



IP65-rated products

Connector

P1: Power
M12 4-pin male

Chassis ground
one #6-32 screw

Connectors

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

P3: Communication
M12 5-pin female

LEDs

two signal indicators



MD-CC404-000



MD-CC405-000



MD-CS600-000



MD-CS620-000



MD-CS630-000

Part numbers

example part number	L	M	D	C	P	4	2	1	C
Product LMD = Lexium MDrive with standard hybrid stepper motor	L	M	D	C	P	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	P	4	2	1	C
Communication type P = Pulse/Direction via RS-422/485 serial interface	L	M	D	C	P	4	2	1	C
Flange size 42 = NEMA 17 1.7" / 42mm	L	M	D	C	P	4	2	1	C
Motor length 1 = single stack 2 = double stack 3 = triple stack	L	M	D	C	P	4	2	1	C
Variation — omit from part number if unwanted C = M12 circular connectors and IP65 rating	L	M	D	C	P	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 female connector	10.0 (3.0)	MD-CS630-000
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-14

Lexium MDrive

LMD•P42 Pulse/direction input

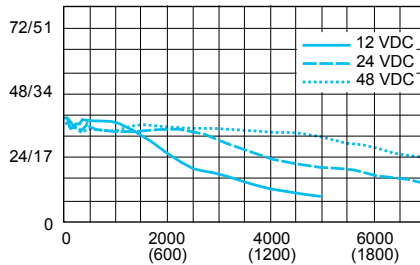
Motor performance

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

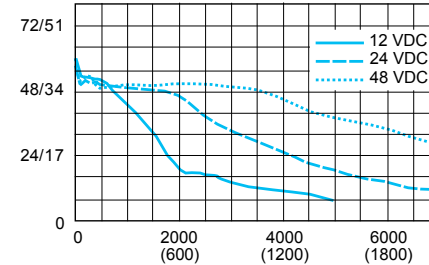
Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

Double stack length

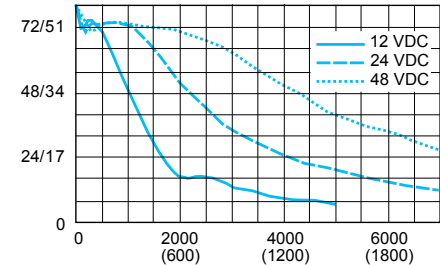
Torque in
Oz-In / N-cm



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.