Lexium MDrive®

LMD•A42 CANopen

Product overview

Robust Lexium MDrive® CANopen products integrate 1.8° 2-phase stepper motors with I/O, motion controller, drive electronics, and encoder delivering hMT closed loop performance.

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.

CANopen products support CiA 301 and 402 Device Profile for Drives and Motion Control. Direct configuration via either an included GUI or Layer Setting Services (LSS) simplifies interface to CANopen networks.

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•A42 Lexium MDrive CANopen products: integrated NEMA17 motor and controls, IP65 & IP20-rated

Features overview

General	NEMA17 1.8° 2-phase stepper motor integrated with robust control electronics, including programmable motion controller
	Advanced current control for exceptional performance and smoothness
Input power	+12 to +48 VDC single supply
Communication	CANopen CAN Bus 2.0b Active
	CiA 301 CANopen application layer and communication profile
	CiA 402 CANOpen device profile for drives and motion control
	Graphical user interface provided for quick and easy comissioning
Encoder options	Multi-turn absolute or incremental magnetic
Motion	20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes
	336 user program labels / 11,120 bytes flash memory
	0 to 2.56 MHz step clock rate selectable in 0.59 Hz increments
I/O, sourcing or sinking	+5 to +24 VDC signal inputs
	12-bit analog input (1)
	5.5mA high-speed signal output
Protection	0...84°C temperature warning, user selectable
	IP20, IP65 ratings
Warranty	4 year, conditional

(1) Not available on products with multi-turn absolute encoder.

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Specifications

Communication	Protocol type		CANopen CiA 301, CiA 402, CAN bus 2.0B active
	Baud rate		10…1000 kbps
	ID		11 and/or 29 bit
	Isolation		galvanic
	Features		node guarding, heartbeat, SDOs, PDOs (variable mapping)
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(2)	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 (3)		+12…+24 VDC
Encoder options	Multi-turn absolute	Position update / retention	30 days on internal power; 5 years with optional battery pack
	Incremental magnetic	Line count	1000 lines / 4000 edges per rev
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)
	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 per second^2
		Resolution	90.9 steps per second^2
Software	Setup parameters		storable to nonvolatile memory
	Transmit PDOs		4 dynamically mappable
	Receive PDOs		4 dynamically mappable
	Manufacturer specific objects		I/O configuration, run/hold current
	Modes of operation (4)		profile position, homing mode, profile velocity, profile torque, cyclic synch position
	Input functions		general purpose, homing mode profiles
	Output functions		general purpose

(1) Actual power supply current will depend on voltage and load.
(2) Not available on products with multi-turn absolute encoder.
(3) When input voltage is removed, maintains power only to control and feedback circuits.
(4) Profile torque is only available on products with an encoder.

An optional Communication Converter is recommended to facilitate prototyping.

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

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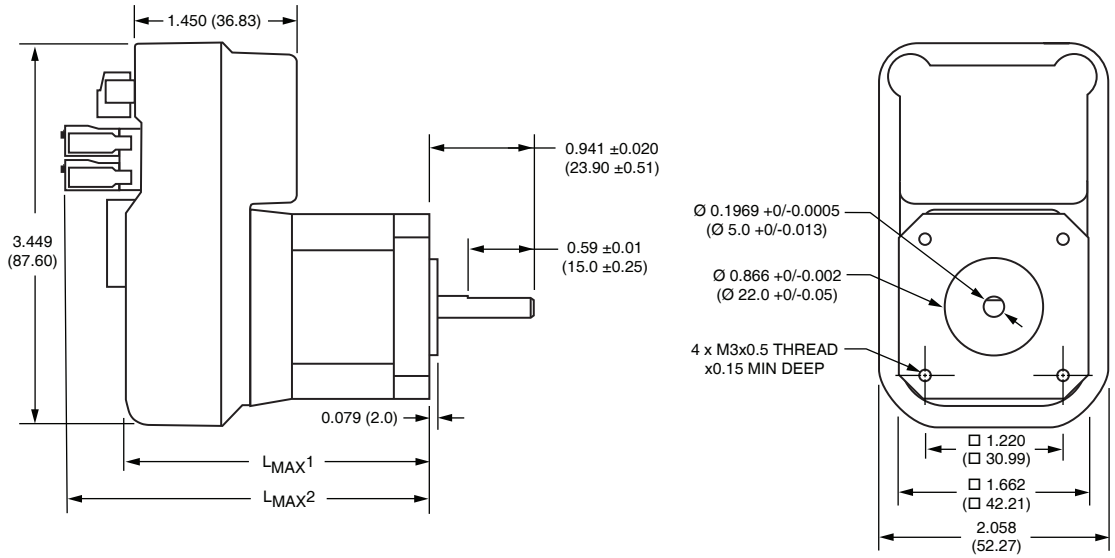
Dimensions

LMD•42 NEMA17 motor, IP20-rated

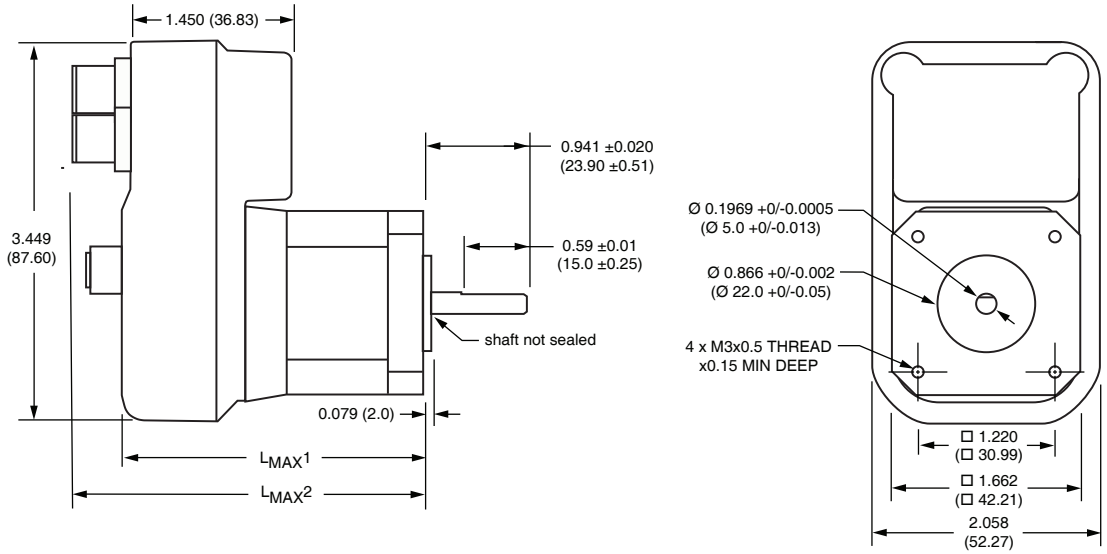
inches (mm)



Motor stack length	Lmax1	Lmax2
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	Lmax1	Lmax2
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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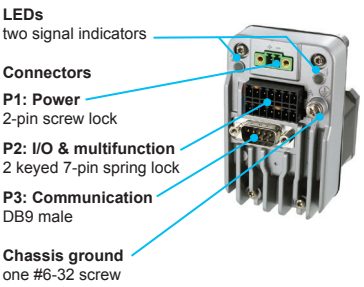
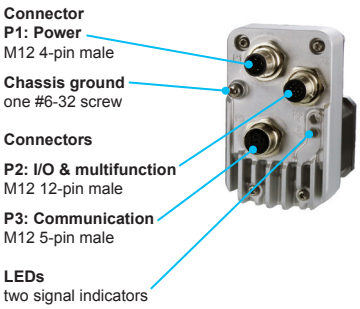
IP20-rated products



IP65-rated products



Part numbers

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

Accessories


MD-CC501-000


MD-CC502-000


PLG-M12TP

MD-CS660-000


MD-CS650-000


MD-CS620-000


MD-CS610-000

description	length feet (m)	part number
Communication converter USB-pluggable CANopen converter to set/program communication parameters in 32- or 64-bit. Includes: CAN dongle, terminating resistor, and pre-wired mating cables		
Mates to DB9 connector	6.0 (1.8)	MD-CC501-000
Mates to M12 5-pin male connector.	6.0 (1.8)	MD-CC502-000
Daisy chaining IP65 products Connect multiple CAN 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
IP65 cordsets Shielded cables pre-wired with straight M12 mating connectors		
Communication cordset mates to 5-pin male connector	10.0 (3.0)	MD-CS650-000
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-CS630-000
Back-up battery pack for Absolute Encoder models Extend stored position data up to 5-years for 1 to 6 LMDs with absolute encoder.		
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
PLCC mating cable with crimp connector to fl ying lead end	3.3 (1.0)	PD04-0531-FL1
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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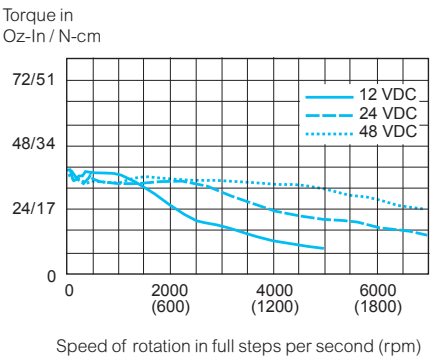
Motor performance

LMD•42 NEMA 17 motor specifications

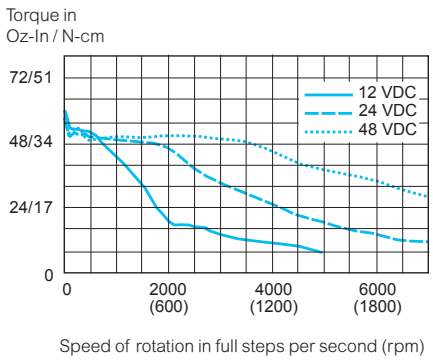
Motor	Stack length	Single	Double	Triple
Holding torque	oz-in	44	58	88
	N-cm	31	41	62
Detent torque	oz-in	1.7	2.1	3.5
	N-cm	1.2	1.5	2.5
Rotor inertia	oz-in-sec^2	0.0005	0.0008	0.0012
	kg-cm^2	0.038	0.057	0.082
Radial load limit, center of shaft	lbs	8.5	8.5	8.5
	kg	3.8	3.8	3.8
Axial load limit @ 1500rpm (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)

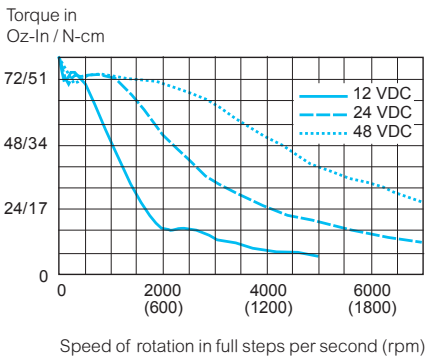
Single stack length



Double stack length



Triple stack length



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

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