LMD eCylinder

Lexium MDrive® with electric cylinder

Integrated motors, control electronics, and captive shaft electric cylinder

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Lexium MDrive® with eCylinder
integrated motor, drive electronics and electric cylinder

Quiet, clean and compact, these LMD products integrate motor, drive electronics, and captive shaft electric cylinder to directly convert rotary motion to linear motion. Products deliver distinct benefits, including replacing pneumatics in some applications.

LMD•42 – NEMA 17 with eCylinder
pictured foot mounts (L) and flange mounts (R)

LMD•57 – NEMA 23 with eCylinder
pictured foot mounts (L) and flange mounts (R)

Product offer

Lexium MDrive® (LMD) products with eCylinder integrate a 1.8° 2-phase stepper motor, drive electronics, and inline mounted captive shaft electric cylinder. Linear motion is produced by a coated, stainless steel acme screw/PEEK-blend nut system coupled directly to the motor's driving shaft. These compact products offer many distinct benefits including competitive price, high accuracy and repeatability. They can also provide a cleaner, quieter alternative to pneumatics in some applications.

Four (4) communication versions are available:
■ Pulse/Direction: RS-422/485 serial interface products with 4 operating modes.
■ Programmable Motion Control: RS-422/485 interface with programmable controller.
■ CANopen: CANopen interface with programmable controller.
■ EthernetTCP/IP: supports user-selectable protocols EtherNet/IP, ModbusTCP, Profinet.

Easily integrated into motion control systems, fully programmable LMD products with on-board I/O do not require an external controller. Complex motion profiles are possible along with data feedback. An optional multi-turn absolute encoder can also detect and store position information, even when powered down.

Real time closed loop performance is available for enhanced performance and feedback. Closed loop products are equipped with 1000 line (4000 count/rev) encoders internal to the unit, requiring no extra space in an application. Encoders perform stall detection, position maintenance and find index mark, in addition to monitoring motor shaft position for real time closed loop feedback. Benefits also include:
■ no loss of synchronization/stalling
■ full use of motor torque
■ torque mode control
■ reduced motor heat *(1)*
■ lower energy consumption *(1)*

(1) Achieved with hMTechnology variable current control.

Application areas

Lexium MDrive® with eCylinder are compact motion control solutions for high reliability, enhanced performance, and reduced energy consumption. Products can be applied to a wide range of applications requiring linear motion.

Answering these simple questions can help determine your choice of linear motion solution:
■ What is the weight of the load to be moved?
■ What speed and distance is the load to be moved?
■ What is the load's orientation: vertical, horizontal?
■ What force is required?
■ How much space is available?
Discuss your linear motion requirements with a Schneider Electric Motion representative.

General features

■ Integrated microstepping drive, 1.8° 2-phase stepper motor and electric cylinder
■ NEMA 17 & 23 motors, single stack length
■ Stroke lengths from 2" up to 24" *(2)*
■ +12 up to +60 VDC input power range *(2)*
■ Fully programmable integrated motion controller *(3)*
■ Advanced current control for exceptional performance and smoothness
■ Multi-turn absolute encoder *(3)*
■ Closed loop control with 1000 line internal encoder and hMTechnology *(3)*
   – Prevents motor stalling while delivering numerous performance advantages
   – Variable current control reduces motor heat and lowers energy consumption
■ 20 microstep resolutions to 51,200 steps/rev including: Degrees, Metric, Arc Minutes
■ 0 to 2.56 MHz step clock rate selectable in 0.59 Hz increments
■ Graphical user interface provided for quick and easy parameter setup
■ Cost effective, compact design
■ Custom products available

(2) Determined by NEMA motor frame size.
(3) Unavailable in some products.

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integrated motor, drive electronics and electric cylinder

Specifications

			LMD•42 (NEMA 17) **w/eCylinder**	**LMD•57** (NEMA 23) **w/eCylinder**
Input power	Voltage		+12…+48 VDC	+12…+60 VDC
	Current maximum (1)		2.0 A	3.5 A
Motor	Frame size	NEMA	17	23
		inches	1.7	2.22
		mm	42.7	56.4
	Length	stack size	single	single
Load limit (2)	PEEK-blend nut	lbs	225	250
		kg	102	113
Stroke length	Minimum	inch	2.0	2.0
		mm	51	51
	Maximum	inch	18.0	24.0
		mm	457	610
Accuracy	Maximum	±inches per inch	0.0003	0.0003
		±mm per cm	0.002	0.002
Backlash	Maximum	inch	0.002	0.002
		mm	0.05	0.05
Axial end play	Maximum	inches @ lbs	0.002 @ 2	0.002 @ 2
		mm @ N	0.05 @ 9	0.05 @ 9
Weight (without screw)		oz/g	13.6 / 385	24.8 / 703
Step angle α		°	1.8	1.8
Thermal	Operating temp non-condensing	Heat sink maximum	85°C	
		Motor maximum	100°C	
Protection	Type	Temp warning	0…84°C, user selectable	
		Earth grounding	via product chassis ground lug	
		IP rating	IP20	
Communication versions	Pulse/Direction		RS-422/485	
	Programmable Motion Control		RS-422/485 programmable with stored memory	
	CANopen		CANopen interface with programmable controller	
	Ethernet		EtherNetIP, ModbusTCP, Profinet	

(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.

Overview

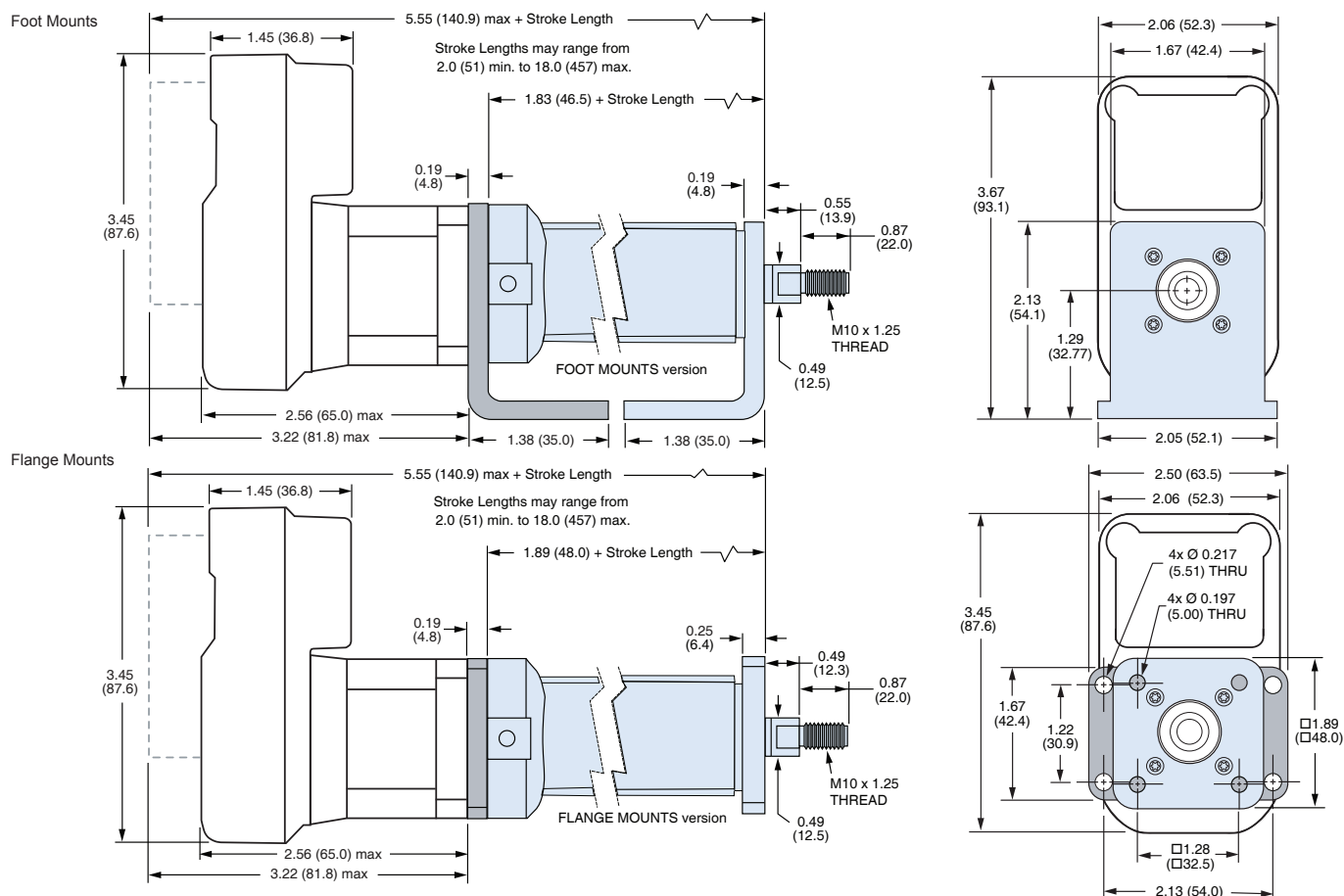|	eCylinder		LMD		
	Male rod end	Length – min & max	Flange size	Motor	Integrated components
Size 42 – NEMA 17	M10 x 1.25 thread Ø 0.3937" / 10 mm	min: 2.0" / 51 mm max: 18.0" / 457 mm	NEMA 17 1.7" / 42 mm	1.8° 2-phase full coil winding for bi-polar operation	Microstepping drive, programmable motion controller, encoder, and I/O may be included with choice of communication protocol
Size 57 – NEMA 23	M12 x 1.25 thread Ø 0.4724" / 12 mm	min: 2.0"/ 51 mm max: 24.0" / 610 mm	NEMA 23 2.22" / 57 mm	1.8° 2-phase full coil winding for bi-polar operation	Microstepping drive, programmable motion controller, encoder, and I/O may be included with choice of communication protocol

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LMD•42 with eCylinder – NEMA size 17

Dimensions in inches (mm)

Foot Mounts

5.55 (140.9) max + Stroke Length
Stroke Lengths may range from 2.0 (51) min. to 18.0 (457) max.

1.45 (36.8)

1.83 (46.5) + Stroke Length

0.19 (4.8)

0.19 (4.8)

0.55 (13.9)

0.87 (22.0)

3.45 (87.6)

M10 x 1.25 THREAD

FOOT MOUNTS version

0.49 (12.5)

2.56 (65.0) max

3.22 (81.8) max

1.38 (35.0)

1.38 (35.0)

2.06 (52.3)
1.67 (42.4)

3.67 (93.1)

2.13 (54.1)

1.29 (32.77)

2.05 (52.1)

Flange Mounts

5.55 (140.9) max + Stroke Length
Stroke Lengths may range from 2.0 (51) min. to 18.0 (457) max.

1.45 (36.8)

1.89 (48.0) + Stroke Length

0.19 (4.8)

0.25 (6.4)

0.49 (12.3)

0.87 (22.0)

3.45 (87.6)

M10 x 1.25 THREAD

FLANGE MOUNTS version

0.49 (12.5)

2.56 (65.0) max

3.22 (81.8) max

2.50 (63.5)
2.06 (52.3)

4x Ø 0.217 (5.51) THRU
4x Ø 0.197 (5.00) THRU

3.45 (87.6)

1.67 (42.4)

1.22 (30.9)

□1.89 (□48.0)

□1.28 (□32.5)

2.13 (54.0)

Speed-force curves

Screw	A	B	C	D
Lead				
inches	0.100	0.250	0.500	1.000
mm	2.54	6.35	12.7	25.4
Diameter				
inches	0.25	0.25	0.25	0.25
mm	6.35	6.35	6.35	6.35
Travel per rev				
inches	0.375	0.20	0.167	0.0833
mm	9.525	5.08	4.233	2.116
Travel per full step				
inches	0.00125	0.0013	0.0025	0.0050
mm	0.03175	0.03302	0.0635	0.127

Screw A   0.100"/2.54mm REV

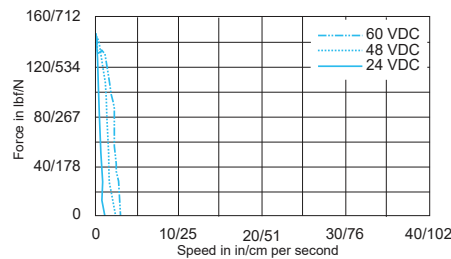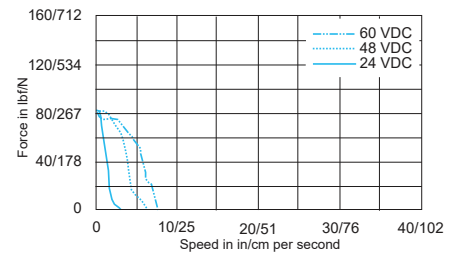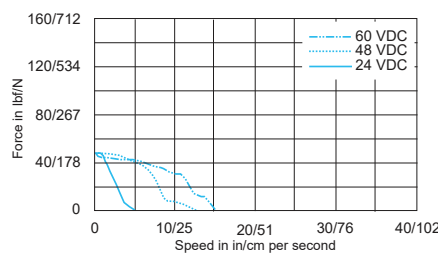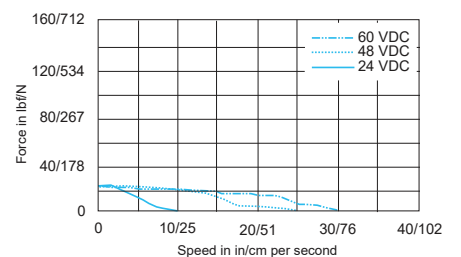**Screw B**   0.250"/6.35mm REV

Screw C   0.500"/12.7mm REV

Screw D   1.000"/25.4mm REV

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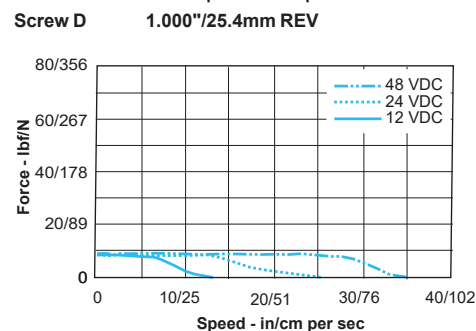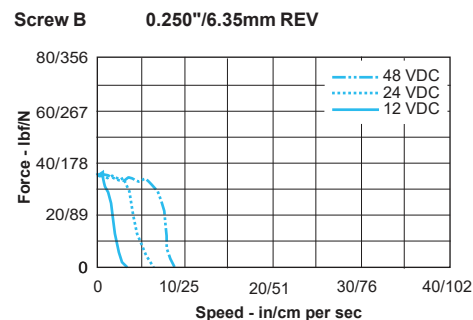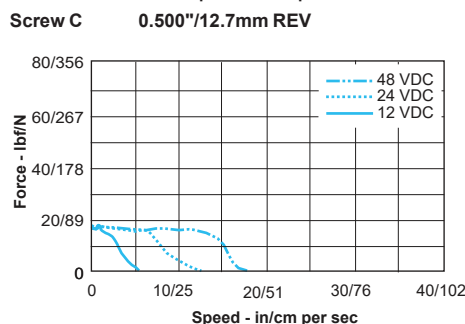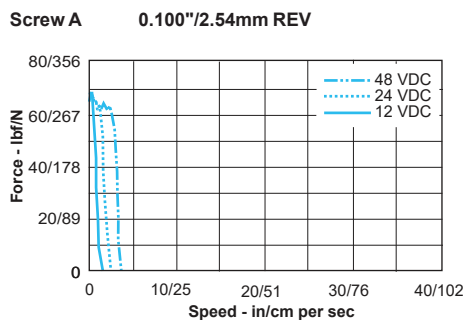
LMD•57 with eCylinder – NEMA size 23

Dimensions in inches (mm)
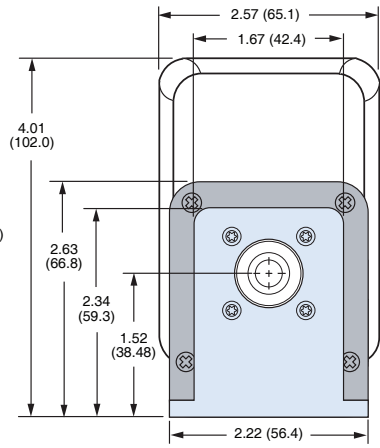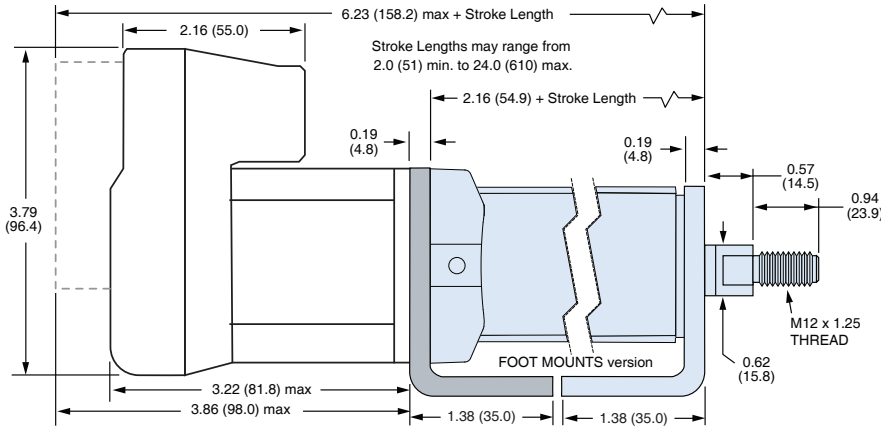
Foot Mounts

FOOT MOUNTS version
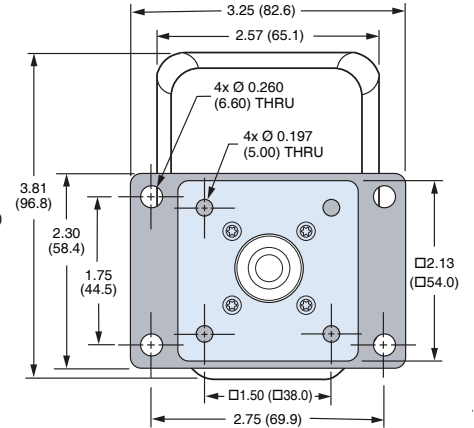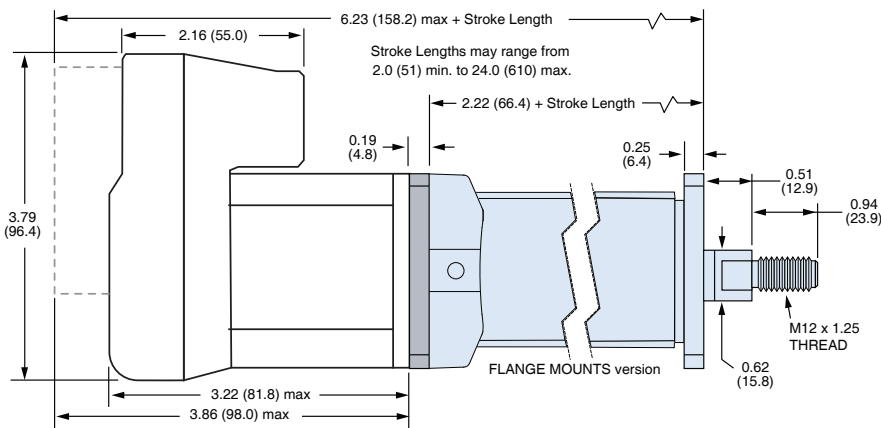
M12 x 1.25 THREAD

Flange Mounts

FLANGE MOUNTS version

M12 x 1.25 THREAD

Speed-force curves

Screw	A	B	C	D
Lead				
inches	0.100	0.250	0.500	1.000
mm	2.54	6.35	12.7	25.4
Diameter				
inches	0.375	0.375	0.375	0.375
mm	9.525	9.525	9.525	9.525
Travel per rev				
inches	0.375	0.20	0.167	0.0833
mm	9.525	5.08	4.233	2.116
Travel per full step				
inches	0.00125	0.0013	0.0025	0.0050
mm	0.03175	0.03302	0.0635	0.127

Screw A   0.100"/2.54mm REV

Screw B   0.250"/6.35mm REV

Screw C   0.500"/12.7mm REV

Screw D   1.000"/25.4mm REV

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LMD•42 NEMA 17
above left to right: eCylinder with flange mounts,
M12 circular connectors, pluggable connectors

LMD•57 NEMA 23
above left to right eCylinder shown with foot mounts,
M12 circular connectors, pluggable connectors

Part numbers

	Example	**L M D C M 4 2 1 P -C S A 0 6 0 M N N**
Product **LMD** = Lexium MDrive		**L M D** C M 4 2 1 P -C S A 0 6 0 M N N
Control type **C** = Closed loop / with hMT *(1)* **A** = Absolute Encoder and closed loop / with hMT *(1) (2)* **O** = Open loop / no hMT or encoder		L M D **C** M 4 2 1 P -C S A 0 6 0 M N N
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 **D** = Dual Port EtherNet/IP, ModbusTCP, Profinet, MCode/TCP *(3)*		L M D C **M** 4 2 1 P -C S A 0 6 0 M N N
Flange size **42** = NEMA 17 / 42mm **57** = NEMA 23 / 57mm		L M D C M **4 2** 1 P -C S A 0 6 0 M N N
Motor length **1** = single stack		L M D C M 4 2 **1** P -C S A 0 6 0 M N N
Connector style **P** = Pluggable connectors, IP20 rating **C** = M12 circular connectors, IP20 rating		L M D C M 4 2 1 **P** -C S A 0 6 0 M N N
Linear style **-C** = electric cylinder		L M D C M 4 2 1 P **-C** S A 0 6 0 M N N
Nut **S** = PEEK-blend		L M D C M 4 2 1 P -C **S** A 0 6 0 M N N
Screw lead **A** = 0.100" / 2.54 mm **B** = 0.250" / 6.35 mm **C** = 0.500" / 12.7 mm **D** = 1.000" / 25.4 mm		L M D C M 4 2 1 P -C S **A** 0 6 0 M N N
Stroke length *available in 0.1" increments* **020** = 02.0" / 51 mm minimum **180** = 18.0" / 457 mm maximum (for size 42/NEMA17) **240** = 24.0" / 610 mm maximum (for size 57/NEMA23)		L M D C M 4 2 1 P -C S A **0 6 0** M N N
Mounts **M** = flange mounts **F** = foot mounts		L M D C M 4 2 1 P -C S A 0 6 0 **M** N N

(1) Closed loop control delivers encoder feedback and hMT enhanced motor performance.
(2) Pulse/Direction products are not available with Absolute Encoder.
(3) Dual Port configuration is only available for NEMA 23 products with M12 circular connectors.

Options

Customization

Options are available for customizing LMD eCylinder products to your specific application needs.
These include:

- positioning sensors
- mounting hardware
- cylinder ends
- ball screw configuration
- screw sizes

FlexCenter

Our FlexCenter is dedicated to finding custom solutions. To begin a discussion of your special application needs, please complete the custom product inquiry form at https://motion.schneider-electric.com/contacts/

Lexium MDrive® with eCylinder
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MD-CC404-000

MD-CC501-000

MD-CC405-000

MD-CC502-000

MD-CS600-000

MD-CS650-000

MD-CS610-000

MD-CS611-000

MD-CS620-000

MD-CS621-000

MD-CS640-000

MD-CS641-000

MD-CS670-0xx

MD-CS671-0xx

PLG-M12TP

MD-CS660-000

ICP0531

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			•	
Straight Configuration 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			•	
Right Angle Configuration Cordsets Shielded cables pre-wired with right angle M12 mating connectors						
I/O cordset mates to 12-pin male connector	10.0 (3.0)	MD-CS611-000		•	•	•
Power cordset mates to 4-pin male connector	10.0 (3.0)	MD-CS621-000	•	•	•	•
Communication cordset mates to 4-pin female connector	6.5 (2.0)	MD-CS641-000				•
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			•	
Daisy chaining - Dual Port Ethernet products Connect multiple dual port ethernet units together in sequence with interconnect cables.						
Straight Configuration Interconnect cables	1.6 (0.5) 3.3 (1.0) 10.0 (3.0)	MD-CS670-005 MD-CS670-010 MD-CS670-030				•
Right Angle Configuration Interconnect cables	1.6 (0.5) 3.3 (1.0) 10.0 (3.0)	MD-CS671-005 MD-CS671-010 MD-CS671-030				•

(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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