

# Lexium MDrive®

## LMD•P85 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. A high torque motor (LMH•P85) 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•P85 Lexium MDrive Pulse/direction input products: integrated NEMA34 motor and controls, IP65 & IP20-rated

### General features

|   |  |
|---|--|
| Robust integrated microstepping drive and NEMA34 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 +70 VDC single supply  |  |
| 20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes             |  |
| Hardware I/O  | Sourcing or sinking  |
|   | Analog input, signal inputs, power outputs, high-speed signal output |
| Protection  | 0...84°C, user selectable  |
|   | IP20, IP65 ratings   |
| 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   |  |

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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  |   |
| Thermal             | Operating temp non-condensing | Heat sink maximum             | 85°C   |   |
|                     |                               | Motor maximum                 | 100°C  |   |
|                     |                               | Length                        | stack sizes  | 1, 2 & 3  |
| 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 (3) |  | 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) Contact the factory for product details.

(3) 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 (4)  | 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  |

(4) 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](http://motion.schneider-electric.com/manuals)

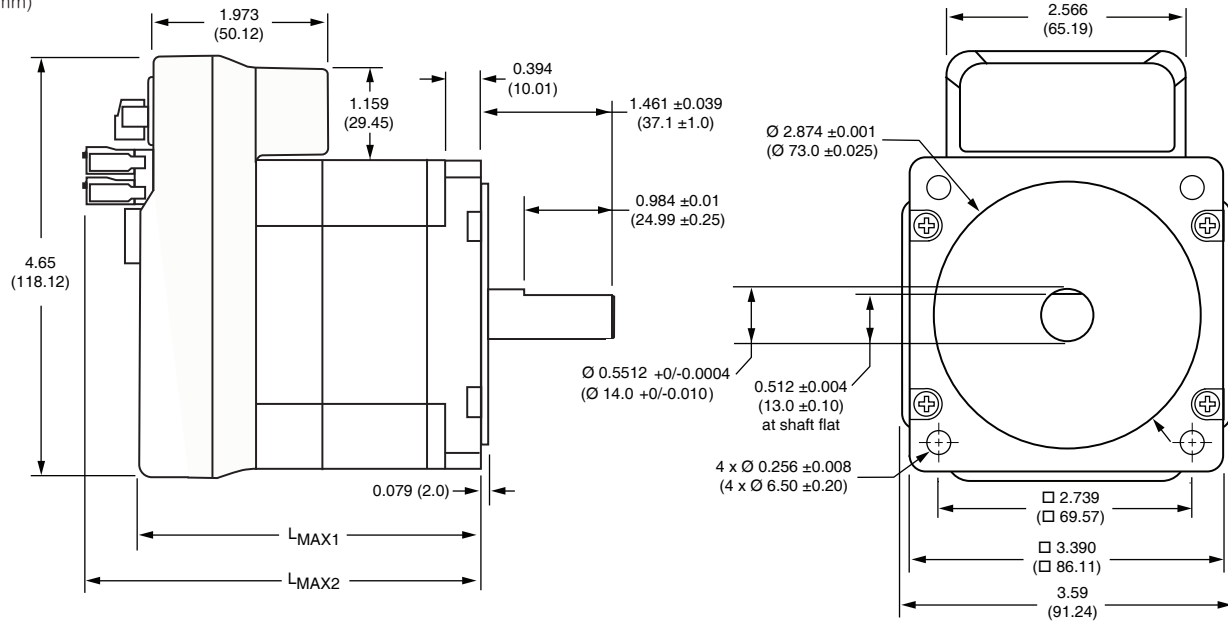
# Lexium MDrive

## LMD•P85 Pulse/direction input

### Dimensions

#### LMD•85 NEMA34 motor, IP20-rated

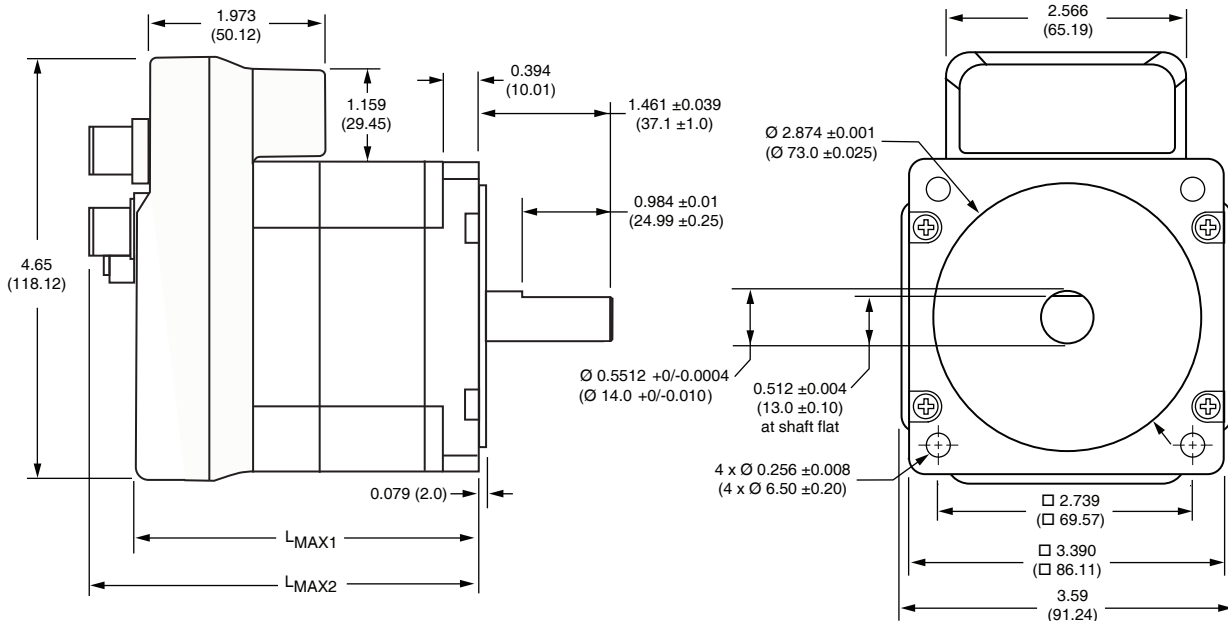
inches (mm)



| Motor stack length | $L_{max1}$   | $L_{max2}$   |
|--------------------|--------------|--------------|
| 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)

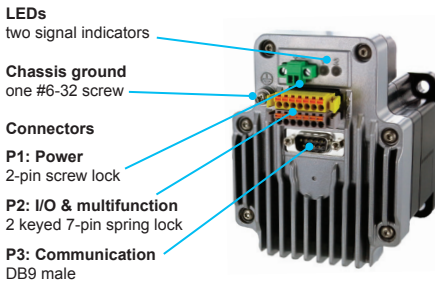


| Motor stack length | $L_{max1}$   | $L_{max2}$   |
|--------------------|--------------|--------------|
| Single             | 4.04 (102.7) | 4.65 (118.2) |
| Double             | 4.57 (116.2) | 5.18 (131.7) |
| Triple             | 6.14 (156.1) | 6.75 (171.5) |

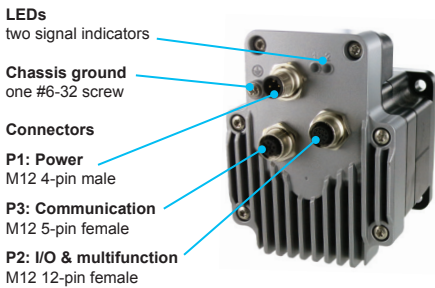
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## LMD•P85 Pulse/direction input

### IP20-rated products



### IP65-rated products



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

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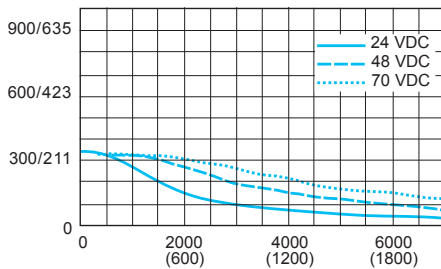
### Motor performance

| LMD•85 NEMA 34 motor specifications | Motor  | Stack length  | Single  | Double   | Triple   |
|-------------------------------------|--|---|---|--|--|
|                                     | Holding torque<br>Detent torque<br>Rotor inertia<br>Radial load limit, center of shaft<br>Axial load limit @ 1500rpm<br>(5000 full steps/sec)<br>Weight (motor+driver) | oz-in<br>N-cm<br>oz-in<br>N-cm<br>oz-in-sec <sup>2</sup><br>kg-cm <sup>2</sup><br>lbs<br>kg<br>lbs<br>kg<br>lbs<br>kg | oz-in<br>N-cm<br>oz-in-sec <sup>2</sup><br>kg-cm <sup>2</sup><br>lbs<br>kg<br>lbs<br>kg | 336<br>237<br>10.9<br>7.7<br>0.0127<br>0.90<br>65<br>29.4<br>20<br>9<br>4.45<br>2.02 | 480<br>339<br>14.16<br>10.0<br>0.0191<br>1.35<br>65<br>29.4<br>20<br>9<br>5.65<br>2.56 |

### LMD•85 NEMA 34 speed torque (1)

#### Single stack length

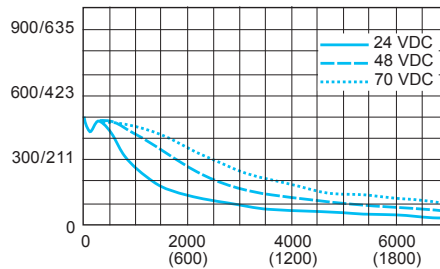
Torque in  
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

#### Double stack length

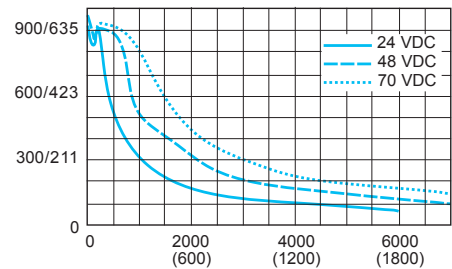
Torque in  
Oz-In / N-cm



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.