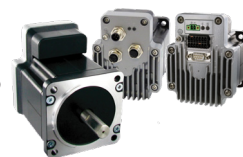


# LIBERTY MD<sub>RI</sub>VE STEPPER MOTOR

## LMD•P85 CANopen



### Specifications

Communication	Protocol type	RS-422/485 serial interface with 4 operating modes: pulse/direction, speed, torque, and velocity control		
Input power	Voltage	VDC	+12 ... +70	
	Current maximum <sup>(1)</sup>	Amp	4.0	
Motor	Frame size	NEMA	34	
		inches	3.4	
		mm	85	
	Performance level	Standard torque		
	Holding torque	oz-in	336 ... 920	
Thermal	Temperature Maximums	Power stage maximum	85°C (185°F)	
		Motor maximum	100°C (212°F)	
	Ambient Operating Conditions	Operating Temperature	-20° to 50°C (-4° to 122°F)	
		Temperature Variation	0.5°C (32.9°F) min	
		Humidity	5% to 95% (non-condensing)	
	Storage & Transport	Temperature	-25° to 70°C (-13° to 158°F)	
		Temperature Variation	-25° to 30°C (-13° to 86°F)	
Humidity		0.5°C (32.9°F) min		
Altitude	Installation Altitude	Up to 3280 ft (1000 m) above sea level <sup>(6)</sup>		
Protection	Type	Temperature warning	0...84°C, user selectable	
		IP rating	IP20, IP65	
		Earth grounding	Via product chassis ground lug	
Hardware I/O, sourcing or sinking	One analog input <sup>(2)</sup>	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 <sup>(3)</sup>	Current range	-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 <sup>(4)</sup>	+12 ... +24 VDC		
Encoder options	Multi-turn absolute	Position update/retention	Up to 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	1.1 x 10 <sup>9</sup> steps per second <sup>2</sup>	
		Resolution	90.9 steps per second <sup>2</sup>	
Software	Setup parameters	Storable to nonvolatile memory		
	Transmit PDOs	Four (4) dynamically mappable		
	Receive PDOs	Four (4) dynamically mappable		
	Manufacturer specific objects	I/O configuration, run/hold current		
	Modes of operation <sup>(5)</sup>	Profile position, homing mode, profile velocity, profile torque, cyclic synch position		
	Input functions	General purpose, homing mode profiles		
	Output functions	General purpose		

<sup>1</sup> Actual power supply current will depend on voltage and load.

<sup>2</sup> Not available on products with multi-turn absolute encoder.

<sup>3</sup> Products with multi-turn absolute encoder have one power output.

<sup>4</sup> When input voltage is removed, maintains power only to control and feedback circuits.

<sup>5</sup> Profile torque is only available on products with an encoder.

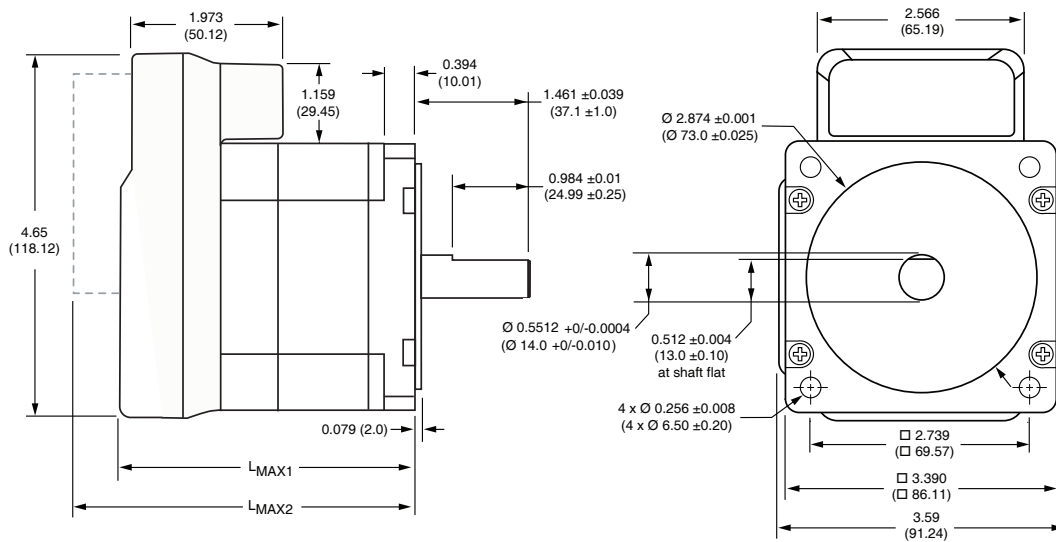
<sup>6</sup> Installation above 3280 ft (1000 m) may require derating output current and maximum ambient temperature.

# LMD•P85 CANopen

## Dimensions

### LM•85 NEMA 34 Motor, IP20-rated

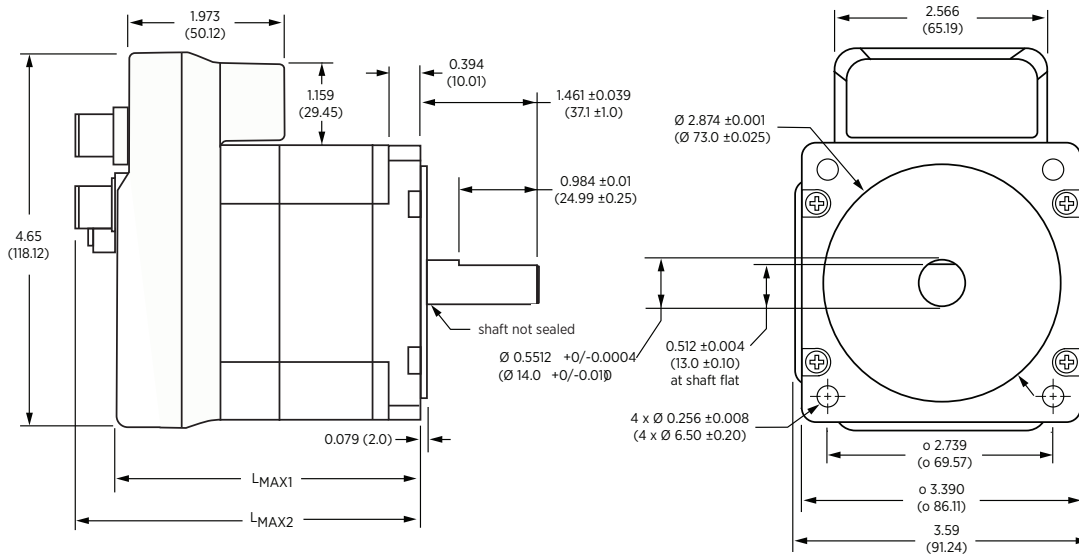
inches (mm)



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)

### LM•85•C NEMA 34 Motor, IP65-rated<sup>(1)</sup>

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)

<sup>1</sup> Motor shaft is not sealed. To meet an IP65 rating, ensure that the shaft end of the motor is properly sealed.

Three-dimensional depictions of this product are available for download from <https://novantaims.com/downloads/3dconfigurator/>



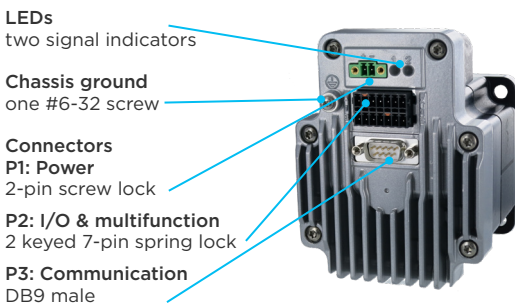
# LMD•P85 CANopen

## Motor Performance

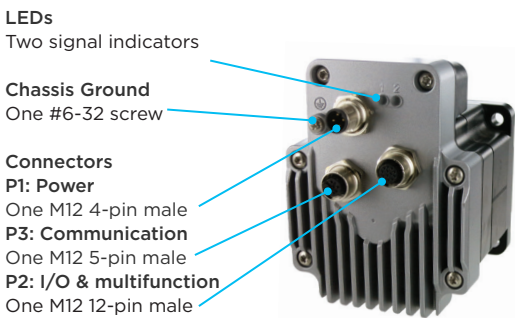
Motor	Stack length	LMD•85 Standard Torque		
		Single	Double	Triple
Holding torque	oz-in	336	480	920
	N-cm	237	339	650
Detent torque	oz-in	10.9	14.16	19.83
	N-cm	7.7	10.0	14.0
Rotor inertia	oz-in-sec <sup>2</sup>	0.0127	0.0191	0.0382
	kg-cm <sup>2</sup>	0.90	1.35	2.70
Radial load limit, center of shaft	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)	oz	4.45	5.65	9.0
	g	2.02	2.56	4.08

## Connector & Indicator Layout

### IP20-rated Models



### IP65-rated Models



## Part Number Breakdown

Example part number	L	M	D	C	A	8	5	1	C
<b>Product</b> LMD = Liberty MDrive with standard hybrid stepper motor	L	M	D	C	A	8	5	1	C
<b>Control type</b> C = Closed loop / with hMT and incremental magnetic encoder <sup>(1)</sup> A = Closed loop / with hMT and multi-turn absolute encoder <sup>(1)</sup> O = Open loop / no hMT or encoder	L	M	D	C	A	8	5	1	C
<b>Communication type</b> A = CANopen interface	L	M	D	C	A	8	5	1	C
<b>Flange size</b> 85 = NEMA 34 3.4" / 85mm	L	M	D	C	A	8	5	1	C
<b>Motor length</b> 1 = single stack 2 = double stack 3 = triple stack	L	M	D	C	A	8	5	1	C
<b>Variation</b> — omit from part number if unwanted C = M12 circular connectors and IP65 rating	L	M	D	C	A	8	5	1	C

<sup>1</sup> Closed loop control delivers encoder feedback and hMT enhanced motor performance.



To select from the available features and build the LMD integrated stepper motor to fit your needs, use the Novanta IMS part number builder, available online from <https://novantaims.com/resources/part-number-builders/>



Additional setup, quick reference information, and supporting documents are available for download from the Novanta IMS download website <https://novantaims.com/downloads/>