

# MDX Integrated Servo Motors

Datasheet



## Description

The MDX Integrated Servo Motors combine the high torque-density, low rotor-inertia design of J Series Servo Motors with the all-digital servo drive technology of the SV200 Servo Drives. The result is an integrated, all-in-one servo motor where feedback, servo drive and servo controller are housed in the same package as the motor. There are no cables to connect the servo drive to the motor. Power, I/O, and communications can be plugged directly into the connectors on the motor.



## Features

- Servo Motor + Drive + Controller in a single, integrated motor package
- 24 to 60 VDC input
- Wide range of control options
- IP65 or IP20 environmental protection rating
- Up to 8 optically isolated digital inputs
- 4 digital outputs
- Encoder outputs (IP20 models)
- 2 analog inputs
- Dual-port communications on all models

## Where can MDX Integrated Servo Motors be used?

MDX Integrated Servo Motors can be used in any application requiring precision motion control, including applications for positioning, velocity control, and torque/force control. Anywhere an existing servo motor is being used can be considered for replacement with an MDX Integrated Servo Motor. Some of the applications where MDX Integrated Servo Motors are already being used include the following:

AGV, Mobile Robots

Printing

Packaging

Material Handling

Electronics Assembly

Medical



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## Model Numbers

The following tables list the available MDX Integrated Servo Motors by model number. All models feature *Q Programming* for the execution of stored motion profiles. “IP” and “R” models can run stored Q programs stand-alone. “C” models must be configured as slave nodes on a CANopen network; they cannot run stand-alone but can execute Q programs and motion profiles via Applied Motion-specific CANopen objects.

### MDXL – IP65 Rated

These IP65 rated MDXL model numbers include M12 connectors for DC power, I/O, and communications.

Model Number	Power Rating	Communication Protocols
MDXL61GN3CB000	200 W	CANopen
MDXL62GN3CB000	400 W	
MDXL61GN3IPB000	200 W	EtherNet/IP, Ethernet, Modbus TCP, SCL
MDXL62GN3IPB000	400 W	
MDXL61GN3RB000	200 W	RS-485, Modbus RTU, SCL
MDXL62GN3RB000	400 W	



### MDXK – IP20 Rated

These IP20 rated MDXK model numbers include crimp-type and screw-terminal connectors for DC power, I/O, and communications.

Model Number	Power Rating	Communication Protocols
MDXK61GN3CB000	200 W	CANopen
MDXK62GN3CB000	400 W	
MDXK61GN3RB000	200 W	RS-485, Modbus RTU, SCL
MDXK62GN3RB000	400 W	



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## Specifications

Model Number	MDXK61GN3...	MDXK62GN3...	MDXL61GN3...	MDXL62GN3...
IP Rating	IP20		IP65	
Power Rating	200 W	400 W	200 W	400 W
Input Voltage	24 – 60 VDC			
Recommend Input Voltage	48 VDC			
Encoder	Incremental encoder, 16,384 counts/rev.			
Communication Connectors	...CB000: CAN, RS-232 for programming, configuration and servo tuning ...IPB000: (MDXL only) dual-port Ethernet ...RB000: RS-485			
Communication Protocols	...CB000: CANopen (CiA301, CiA402) ...IPB000: (MDXL only) EtherNet/IP, Modbus TCP, Serial Command Language (SCL) ...RB000: Modbus RTU, Serial Command Language (SCL)			
Digital Inputs	8 optically isolated inputs: <ul style="list-style-type: none"> <li>• X1/X2: differential inputs; 5-24 VDC, up to 20 mA; 2 MHz max. frequency; 250 ns min. pulse width.</li> <li>• X3/X4/X5/X6: single-ended inputs; 5-24 VDC, up to 20 mA; 10 kHz max. frequency.</li> <li>• X7/X8: differential inputs; 5-24 VDC; up to 20 mA; 10 kHz max. frequency.</li> </ul>		5 optically isolated inputs: <ul style="list-style-type: none"> <li>• X1/X2: differential inputs; 5-24 VDC, up to 20 mA; 2 MHz max. frequency; 250 ns min. pulse width.</li> <li>• X3/X4/X5: single-ended inputs; 5-24 VDC, up to 20 mA; 10 kHz max. frequency.</li> </ul>	
Analog Inputs	2 single-ended inputs, 0-10 VDC each. Can be wired as 1 differential input, +/- 10 VDC.			
Digital Outputs	4 optically isolated outputs: <ul style="list-style-type: none"> <li>• Y1/Y2/Y3/Y4: open collector; 30 VDC, 100 mA max.</li> <li>• Encoder outputs A+, A-, B+, B-, Z+, Z-; 16,384 counts/rev.</li> </ul>		4 optically isolated outputs: <ul style="list-style-type: none"> <li>• Y1/Y2/Y3/Y4: open collector; 30 VDC, 100 mA max.</li> </ul>	
Protection	Over-temp, over-voltage, under-voltage, over-current			
Insulation Class	Class B			
Temperature	Ambient temperature: 0 to 40 °C. See Ambient Temperature Rating curves below for details.			
Humidity	10 to 85% non-condensing, operation and storage			
Weight, oz (kg)				
Std. Heatsink	43.5 (1.23)	57.0 (1.62)	46.1 (1.31)	59.6 (1.69)
Low Prof. Heatsink	40.8 (1.16)	54.3 (1.54)	43.4 (1.23)	56.9 (1.61)

## Specifications, continued

Model Number		MDX...61...		MDX...62...	
Power Rating		200 W		400 W	
Winding Type	VDC	48		48	
Nominal Supply Voltage	VDC	24	48	24	48
Rated Speed	rpm	2000	3000	1600	3000
Motor Continuous Torque	N-m (in-lb)	0.64 (5.66)		1.27 (11.2)	
Motor Peak Torque	N-m (in-lb)	1.6 (14.2)		3.0 (26.6)	

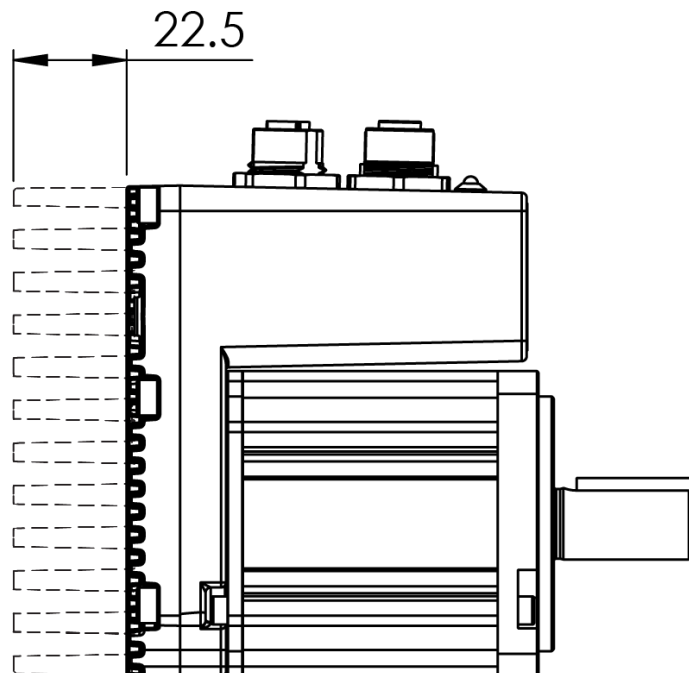
## Low Profile Heatsink Option

For applications where the length of the motor is critical, a version of each MDX Integrated Servo Motor is available with a low profile heatsink. The shorter fins on the low profile heatsink do not dissipate as much heat as the standard heatsink and as a result, motor performance must be de-rated. For this reason, the standard heatsink is recommended wherever possible. See the Ambient Temperature Rating charts on the following page for de-rating details.

The low profile heatsink, which is 22.5 mm shorter than the standard heatsink, is designated in the MDX part number with an “A” before the “000”. The standard heatsink is designated with a “B”.

Example part numbers:

- Standard heatsink part number:  
MDXL62GN3RB000
- Low profile heatsink part number:  
MDXL62GN3RA000



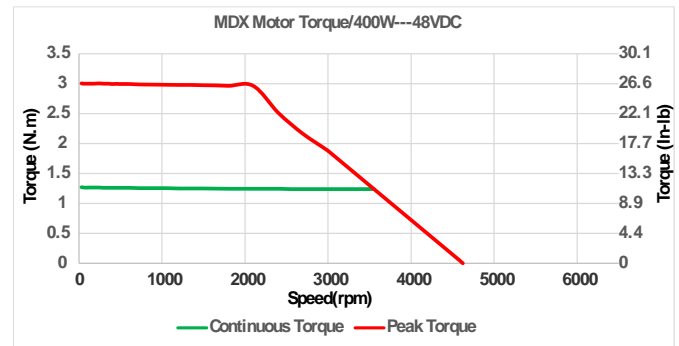
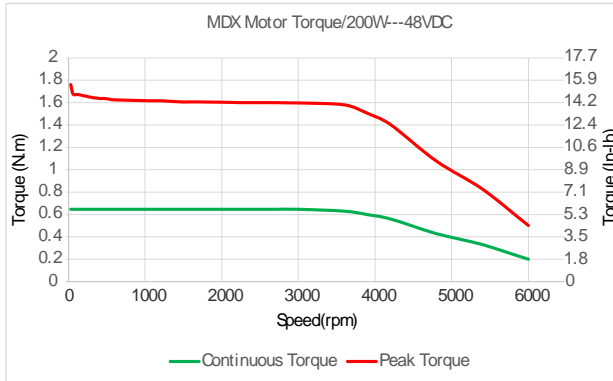
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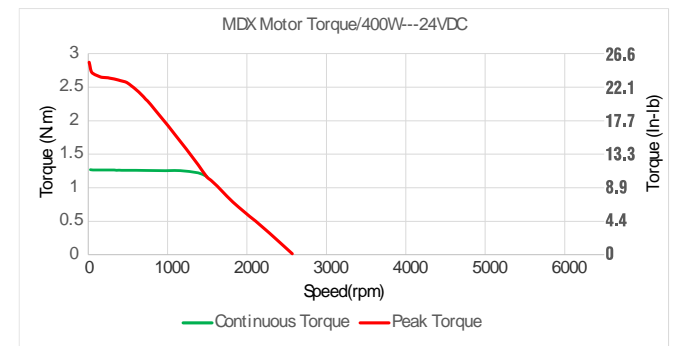
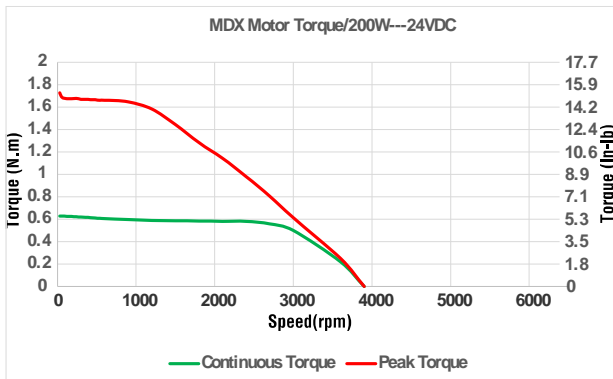


## Torque-Speed Curves

Curves with 48 volts DC power supply (recommended):

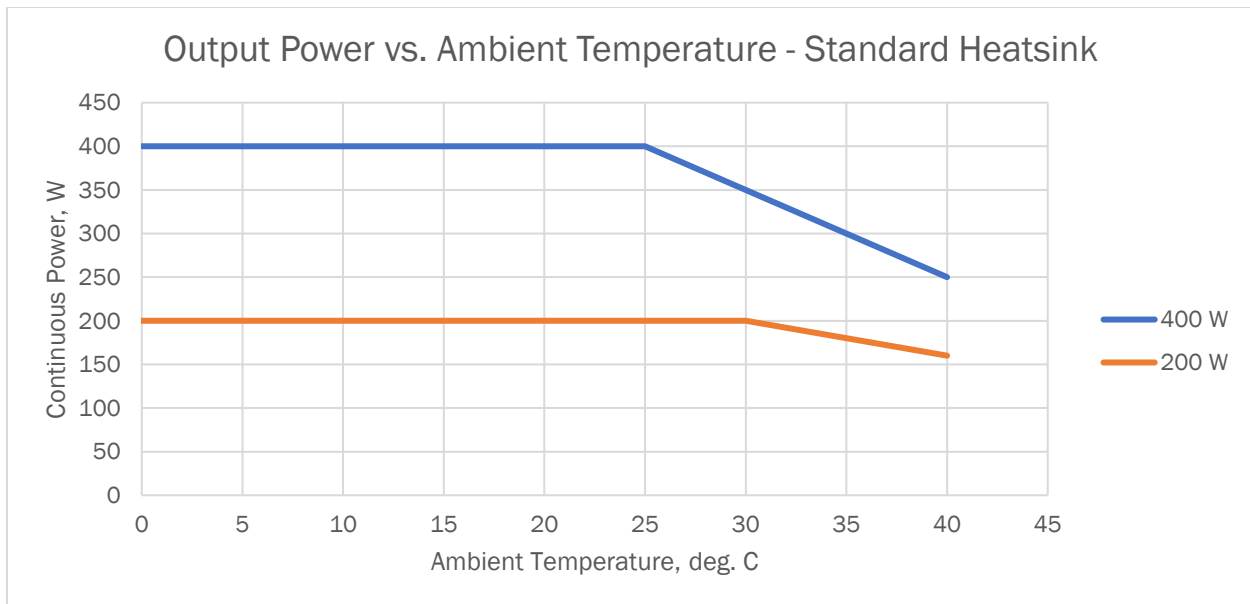


Curves with 24 volts DC power supply:

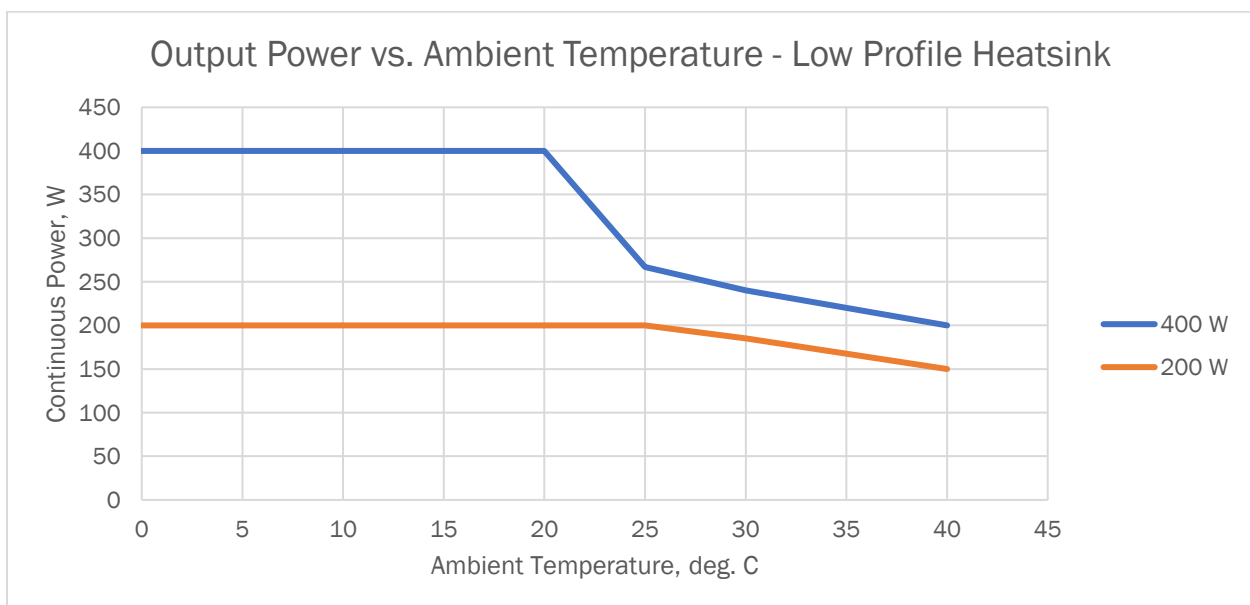


## Ambient Temperature Ratings

Standard Heatsink – 100% duty cycle



Low Profile Heatsink – 100% duty cycle



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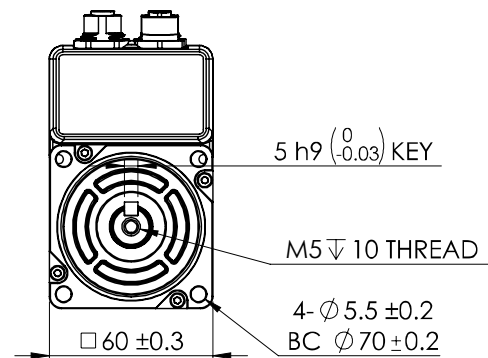
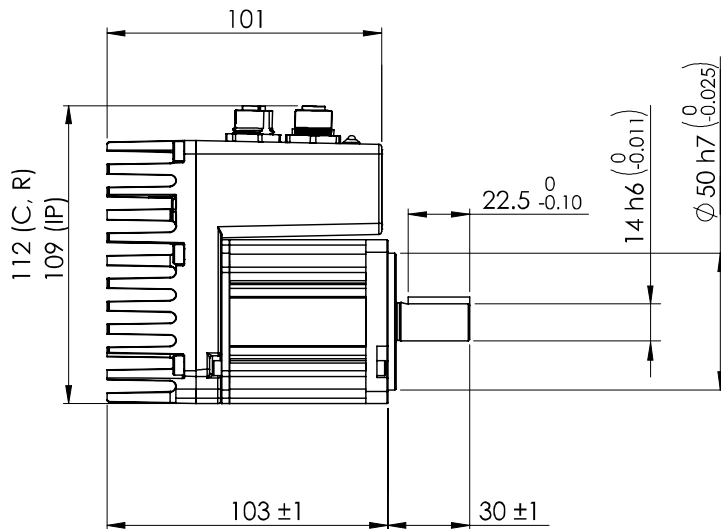
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## Dimensions – Standard Heatsink

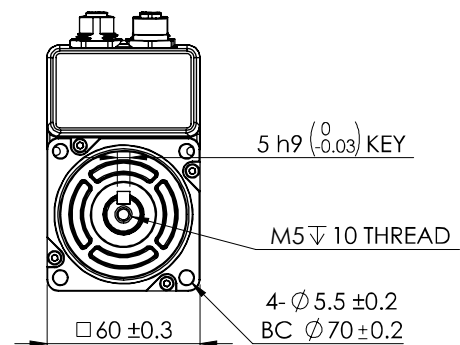
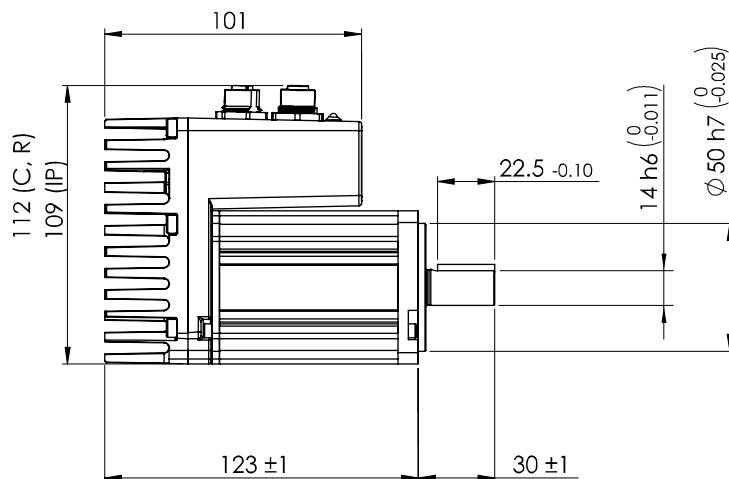
MDXL61GN3CB..., MDXL61GNRB..., MDXL61GNIPB...

Dimensions in millimeters.



MDXL62GN3CB..., MDXL62GNRB..., MDXL62GNIPB...

Dimensions in millimeters.



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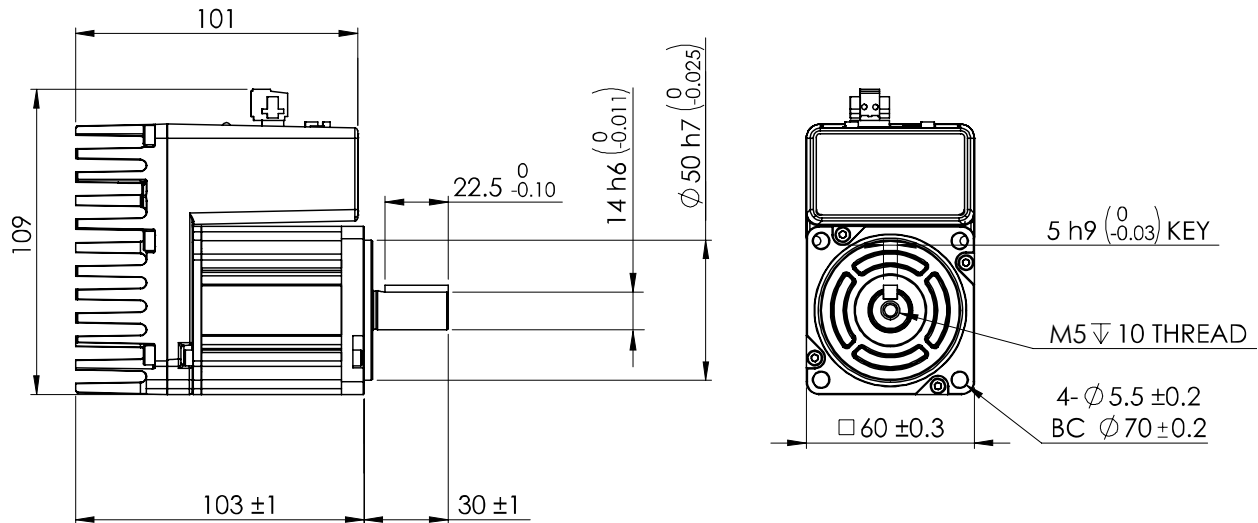
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## Dimensions – Standard Heatsink, cont'd.

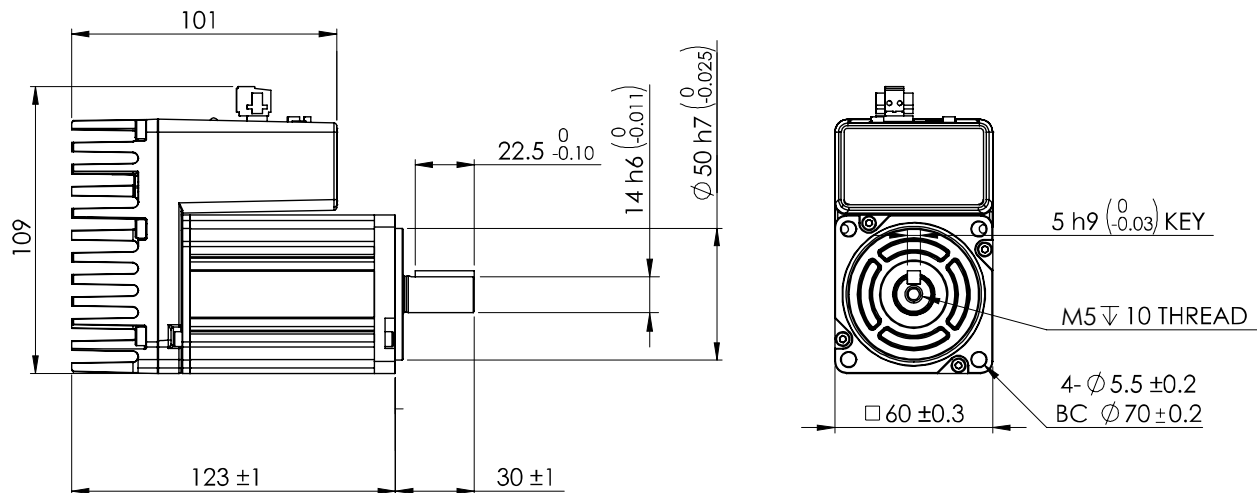
### MDXK61GN3CB..., MDXK61GN3RB...

Dimensions in millimeters.



### MDXK62GN3CB..., MDXK62GN3RB...

Dimension in millimeters.



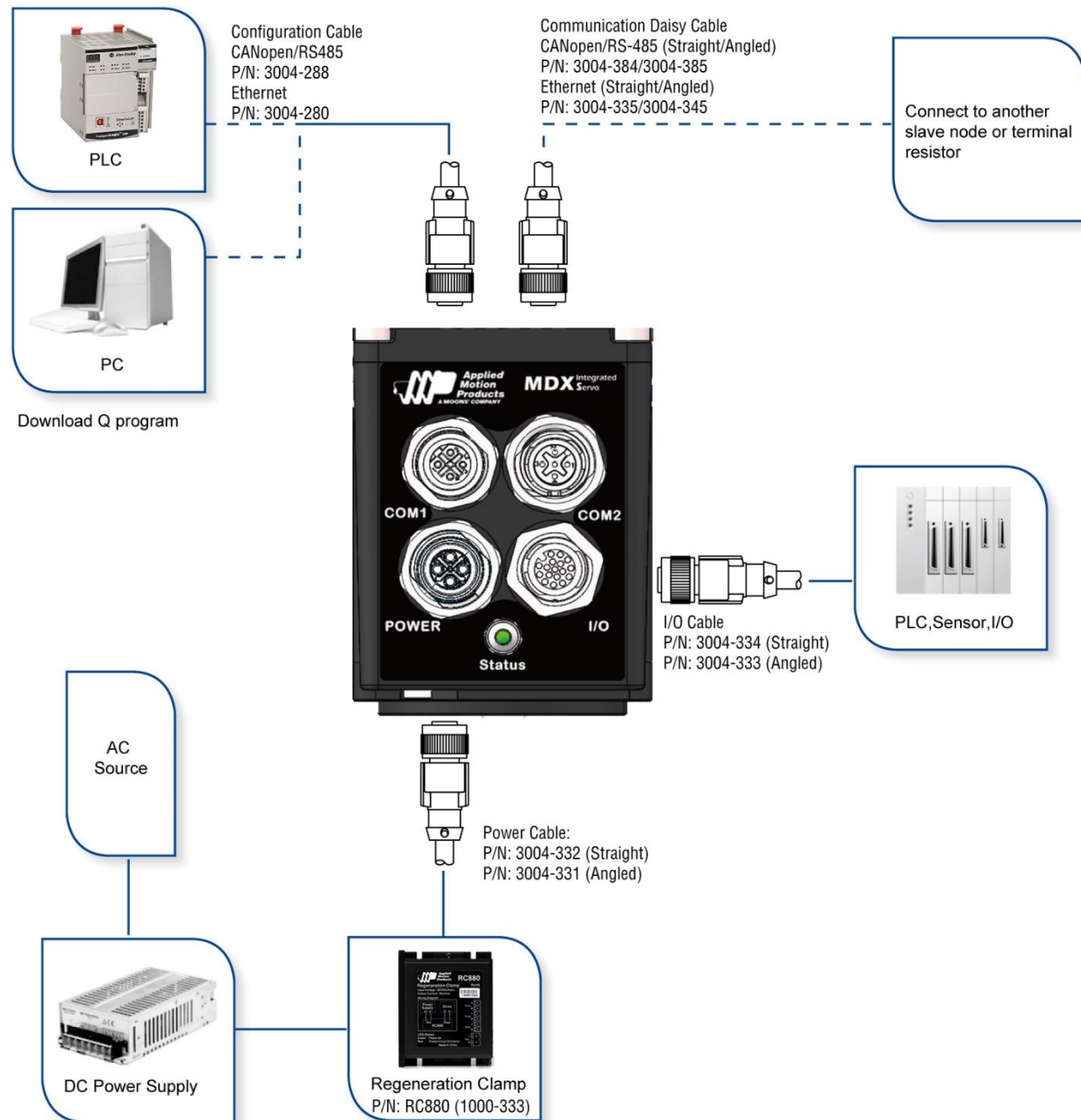


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## System Configuration – MDXL (IP65 Rated)



## Accessory Cables – MDXL (IP65 Rated)

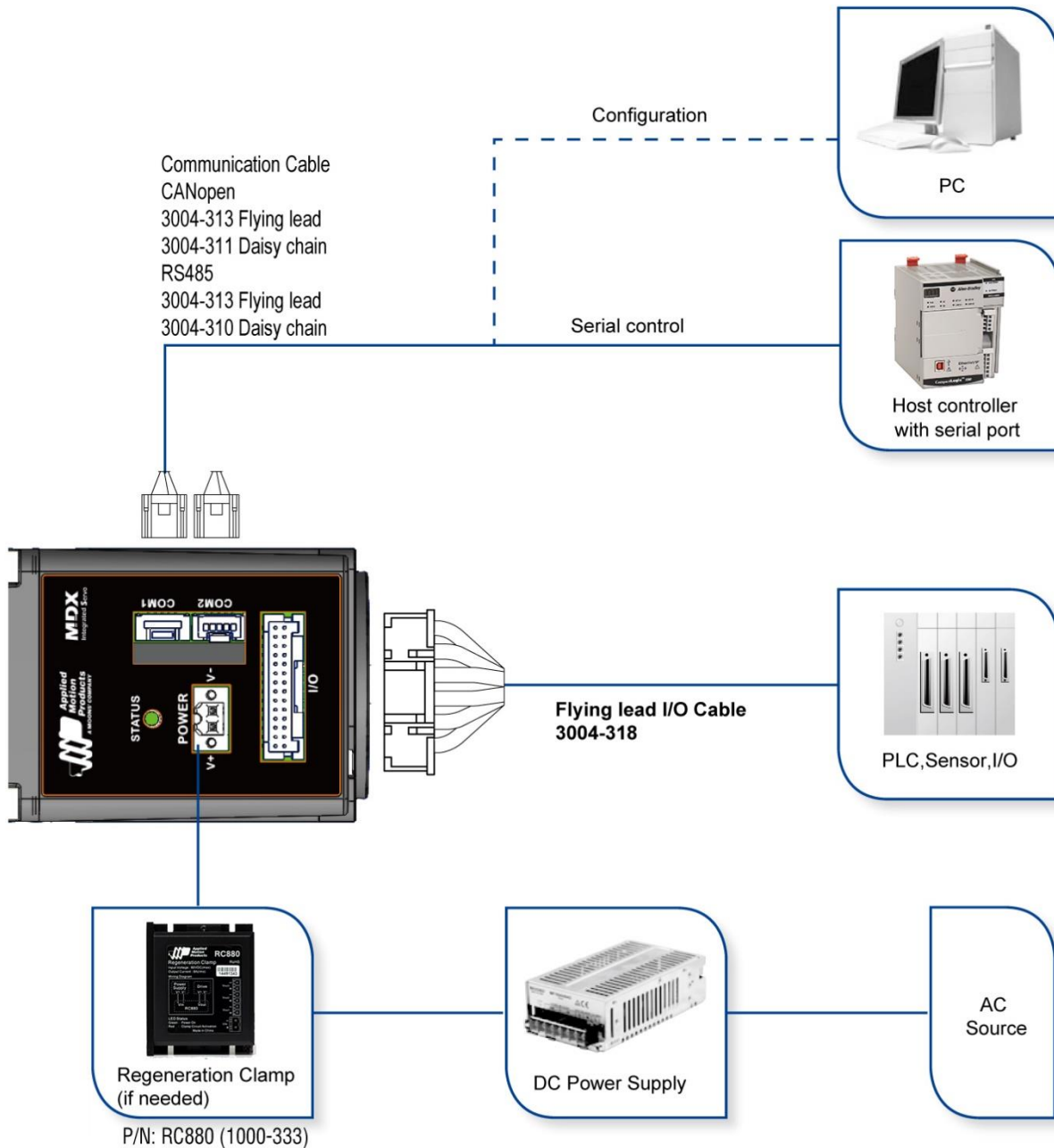
	Model	Length (m)	Description
Power Cables	3004-331-2M	2	DC power cable, angled M12 to pigtail
	3004-331-3M	3	
	3004-331-5M	5	
	3004-332-2M	2	DC power cable, straight M12 to pigtail
	3004-332-3M	3	
	3004-332-5M	5	
I/O Cables	3004-333-3M	3	I/O cable, angled M12 to pigtail
	3004-333-5M	5	
	3004-334-3M	3	I/O cable, straight M12 to pigtail
	3004-334-5M	5	
Communication Cables RS-485, CANopen	3004-288-5M	5	Programming cable, straight M12 to pigtail
	3004-382	N/A	Terminating resistor (120 ohm), female-threaded, fits COM2
	3004-383	N/A	Terminating resistor (120 ohm), male-threaded, fits COM1
	3004-384-1M	1	Communication cable, daisy-chain, straight M12 to straight M12
	3004-384-2M	2	
	3004-384-3M	3	
	3004-384-5M	5	
	3004-385-1M	1	Communication cable, daisy-chain, angled M12 to angled M12
	3004-385-2M	2	
	3004-385-3M	3	
3004-385-5M	5		
Communication Cables Ethernet	3004-280-5M	5	Programming cable, straight M12 to RJ45
	3004-335-0.5M	0.5	Communication cable, daisy-chain, straight M12 to straight M12
	3004-335-1M	1	
	3004-335-5M	5	
	3004-345-0.5M	0.5	Communication cable, daisy-chain, angled M12 to angled M12
	3004-345-1M	1	
	3004-345-5M	5	

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## System Configuration – MDXK (IP20 Rated)



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## Accessory Cables – MDXK (IP20 Rated)

	Model	Length (m)	Description
I/O Cables	3004-318-2M	2	I/O cable, mating connector to pigtail
	3004-318-3M	3	
	3004-318-5M	5	
	3004-318-10M	10	
Communication Cables RS-485, CANopen	3004-310-1M	1	RS-485 communication cable, daisy-chain
	3004-310-5M	5	
	3004-311-1M	1	CANopen communication cable, daisy-chain
	3004-311-5M	5	
	3004-313-1M	1	RS-485 and CANopen programming cable, mating connector to pigtail



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