

Orientalmotor

***α*STEP**
AZ Series
mini Driver
DC Input

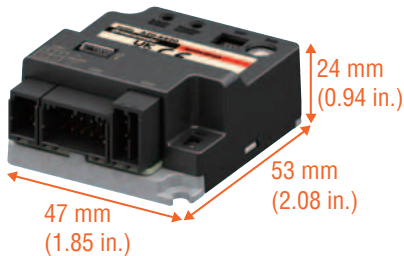
Modular Automation Products



The ***α*STEP AZ Series** now includes a **mini driver** option.
Compatible with battery power operations for use in a wider range of applications.

The mini Driver Allows for Smaller and More

Compact Design to Fit in Small Spaces



Installation Space is Minimized

No DIN rail required. Can be installed directly to equipment with 2 screws.



Light Weight Design Reduces Load on Equipment

56 g (1.98 oz)

Approx. 60 g (2.11 oz)



1 medium egg

When mounted inside the self-propelled devices

Reduce overall equipment mass
Reduce Power Consumption for Drive Wheels

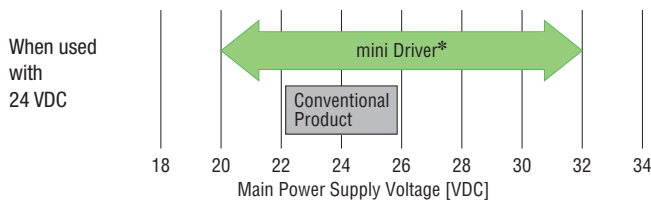
→ See use examples (Page 4)



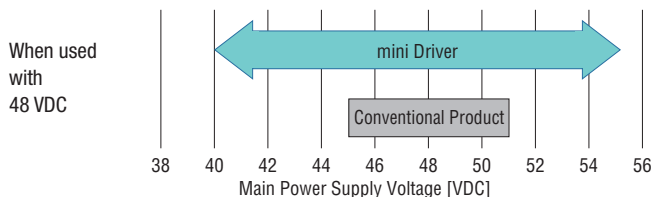
Compatible with Battery Power

Accepts a wide power supply voltage range for battery power operation. Supports 24 VDC and 48 VDC.

● Operable Voltage Range

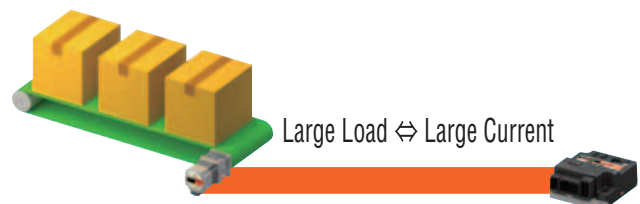


* For a motor with an electromagnetic brake, the range is 22.8 to 32 VDC



Energy Savings through Optimized Current Control

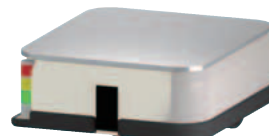
The servo emulation mode optimizes the current provided to the motor to match the load conditions.



When mounted inside the self-propelled devices

Reduce Power Consumption
Increase Battery Life

→ See use examples (Page 4)



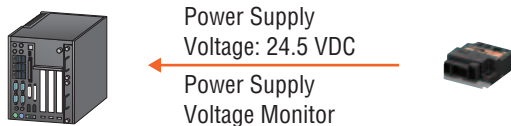
Power-Efficient Devices

What Are Modular Automation Products?

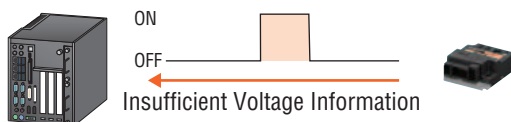
Modular Automation Products are a group of products that share the common features of being battery-powered, compact and lightweight. Optimized for use with self-propelled devices and mobile equipment, they contribute to the realization of flexible automation lines and mobile automation.

Visualization of Power Supply Voltage

It is possible to monitor the driver power supply voltage from the host controller.



If the driver power supply voltage drops below a pre-set threshold a signal is output.



When mounted inside the self-propelled devices

Avoid Stoppages Due to Insufficient Battery

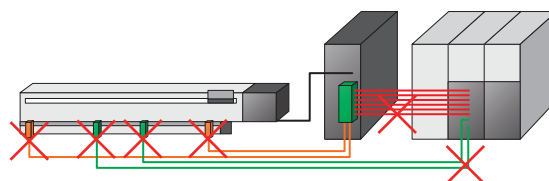
→ See use examples (Page 4)

No External Sensors Required

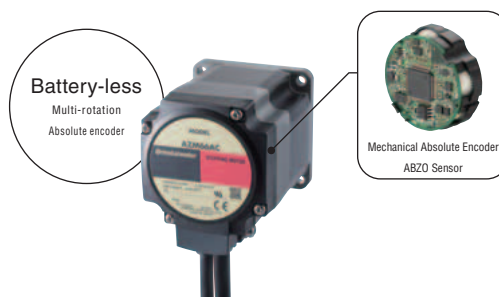
With the **AZ** Series, no external sensors and its related wiring is required.

Example of Wiring when Using External Sensors.

The **AZ** Series eliminates the need for these external sensors and wires shown in green and red.

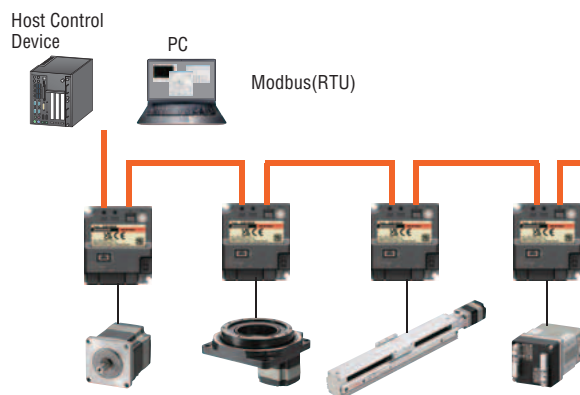


High positioning accuracy can be achieved by using the mechanical battery-free absolute sensor (ABZO Sensor).



FA Network Compatible

Direct control over the network is possible. This contributes to centralized equipment management and simplified wiring.

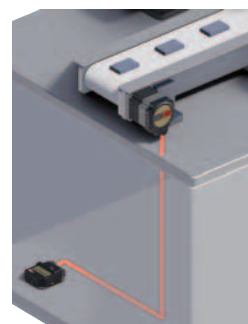


*By using **AZD-KR2D** in combination with a network converter (gateway), control by CC-Link, MECHATROLINK or EtherCAT can be supported.

Up to 10 m (32.8 ft) Connection Cable Extension

Connection cables can be selected to suit the installation environment, with lengths of 0.5 m (1.6 ft), 1 m (3.3 ft), 3 m (9.8 ft), 5 m (16.4 ft), 10 m (32.8 ft) available.

When the motor and driver are far apart, 3 m (9.8 ft), 5 m (16.4 ft) and 10 m (32.8 ft) cables are recommended.



When the motor and driver are close, 0.5 m (1.6 ft) and 1 m (3.3 ft) cables are recommended.



*Flexible connection cables in the same lengths are also available.

Example A: Incorporation into Self-propelled Devices

Equipment Problem Battery operation time must be maximized.

The equipment's overall power consumption can be reduced by lowering the equipment's overall mass, and by reducing the motor's running current when large amounts of torque aren't required.



With the *α*STEPAZ Series mini Driver...

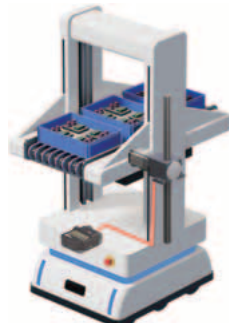
Light Design Reduces Load on Equipment

By reducing the overall equipment mass, the power consumption for the drive wheels can be reduced.



Energy Savings through Optimized Current Control

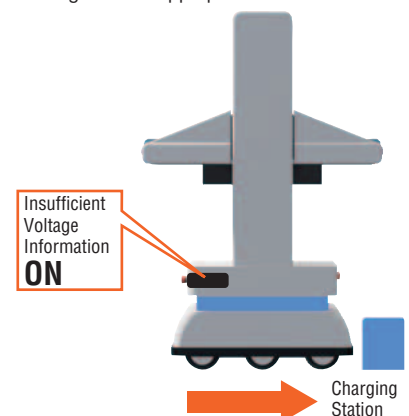
The current supplied to the motor is optimized to suit the load (also called servo emulation mode), thus reducing power consumption. This allows for a reduction in the number of times the battery must be charged.



When the load is light, the current supplied to the motor is automatically reduced.

Visualization of Power Supply Voltage

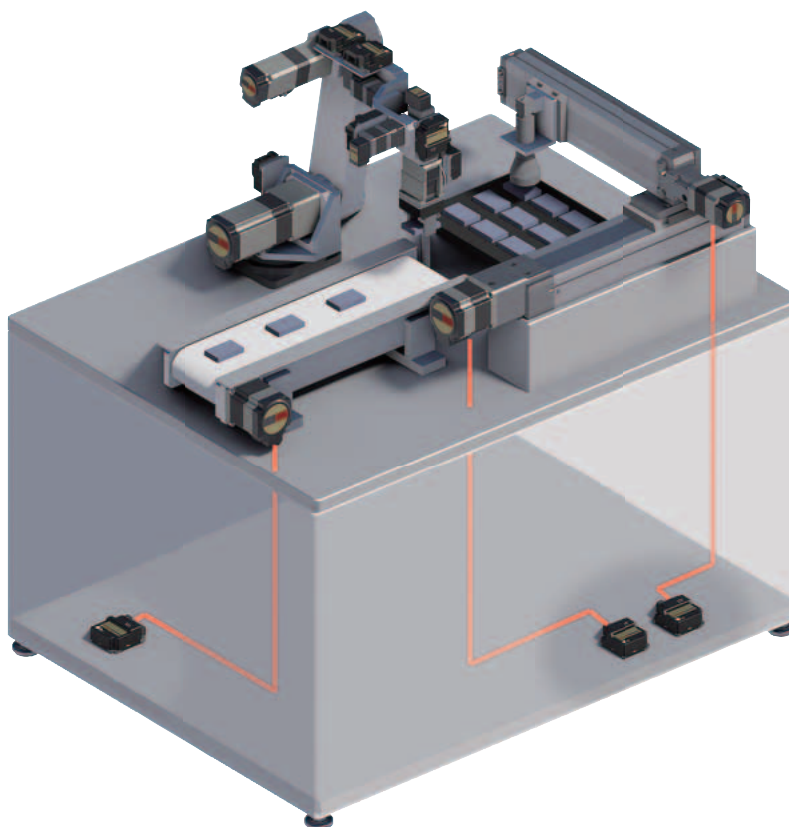
The power supply voltage can be monitored using the monitoring function, and the battery recharged at the appropriate time.



Example B: Incorporation into Stationary Equipment

Equipment Problem Install the diver and control systems in separate locations to reduce overall equipment size.

Install the mini drivers in the empty enclosure space or install the mini drivers next to the work allowing for a smaller control cabinet design.



The α STEPAZ Series mini Driver Provides



Compact Design To Fit in Small Spaces

Volume is greatly reduced in comparison to a box-type DC driver.



AZD-KD

Size
Reduced
More Than
60%!



AZD-KR2D

No External Sensors Required

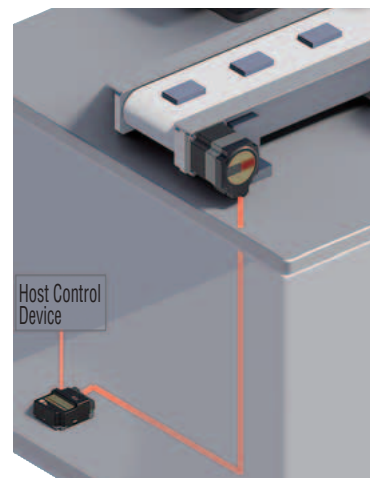
No external sensor or related wiring is necessary. Because there are no external sensors and wiring, the size and weight of the equipment can be reduced. In addition, the work time for wiring can be reduced.

FA Network Compatible

Common Network Protocols are available to support the upper controller, reduce the burden of programming and support quicker installation time.

Up to 10 m (32.8 ft) Connection Cable Extension

The length of the cable between the motor and driver can be selected to suit the installation environment. Extension of up to 10 m (32.8 ft) are available.



■Applicable Series

The **AZ** Series Mini Driver DC Power Input can be used in combination with the following motors and linear & rotary actuators.

●Motors

- **AZ** Series DC Power Input

●Electric Linear & Rotary Actuators

- Electric Linear Slides **EZS** Series DC Power Input / **EAS** Series DC Power Input **AZ** Series Equipped
- Electric Cylinders **EAC** Series DC Power Input **AZ** Series Equipped
- Compact Electric Cylinders **DR** Series / **DRS2** Series **AZ** Series Equipped
- Electric Grippers **EH** Series **AZ** Series Equipped
- Hollow Rotary Actuators **DGI** Series DC Power Input **AZ** Series Equipped
- Rack and Pinion System **L** Series DC Power Input **AZ** Series Equipped

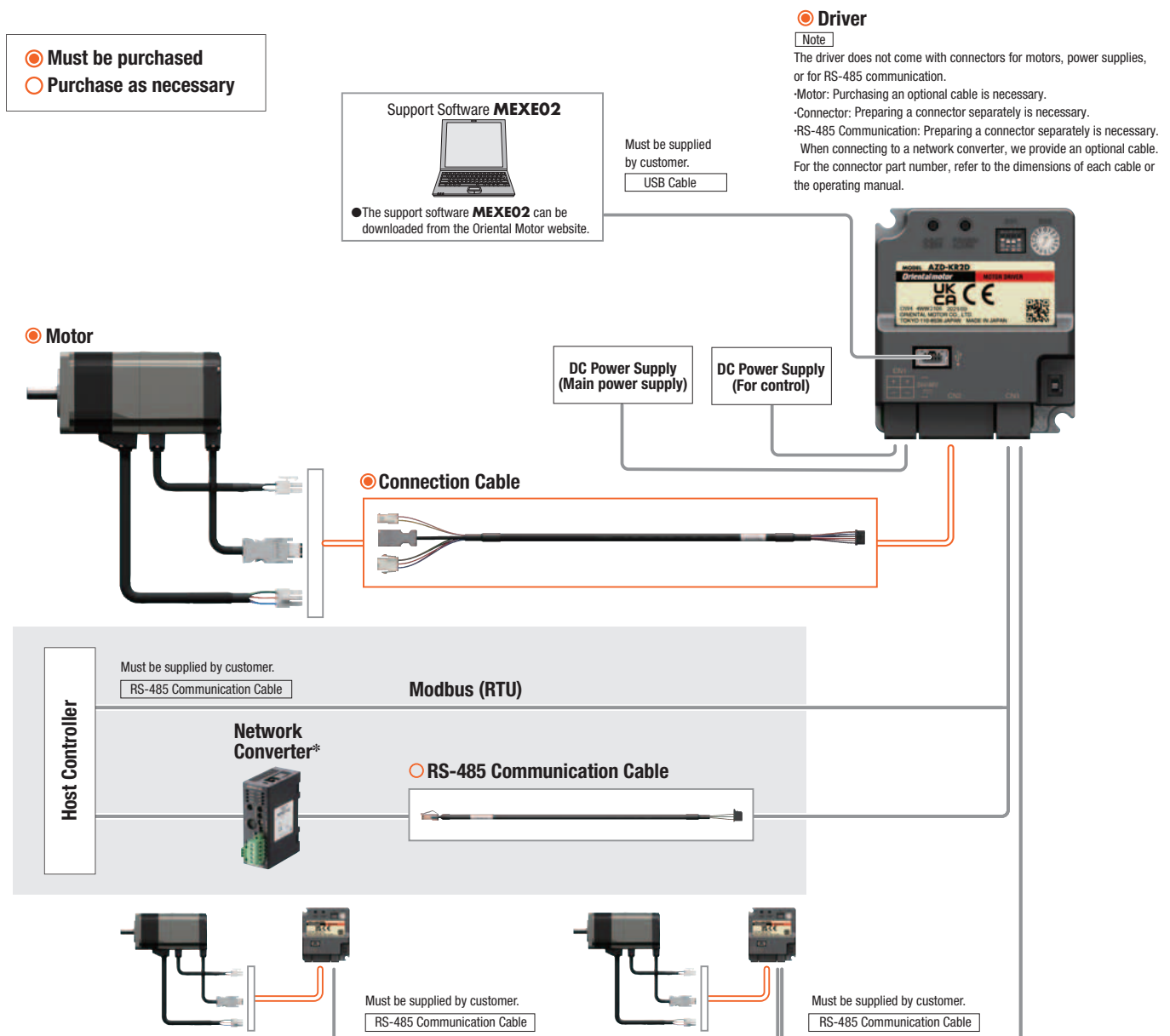
● For applicable motor and electric linear & rotary actuator combinations, please see the Oriental Motor website or refer to each brochure of product series.

■System Configuration

●Combination of AZ Series standard type electromagnetic brake motor and mini driver RS-485 communication type.

The system configuration shown below is an example of when using RS-485 communication.

Motors, drivers, and connection cables / flexible connection cables must be ordered separately.



Product Number

AZD - K R 2 D

① ② ③ ④ ⑤













































①	Driver Type	AZD : AZ Series Driver
②	Power Supply Input	K : 24 VDC/48 VDC
③	Driver Figure	R : Compact
④	Reference Number	
⑤	Type	D : RS-485 Communication Type

Product Line








Product Name	List Price
AZD-KR2D	\$391.00



List of Combinations

Product	Type	Product Name
Motor	Standard Type	AZM14AK, AZM15AK AZM24AK, AZM26AK AZM46  K , AZM48A  K AZM66  K , AZM69  K
	TS Geared Type	AZM46  K-TS  AZM66  K-TS 
	FC Geared Type	AZM46  K-FC  A AZM66  K-FC  A
	PS Geared Type	AZM24AK-PS  AZM46  K-PS  AZM66  K-PS 
	HPG Geared Type	AZM46  K-HP  AZM66  K-HP 
	Harmonic Geared Type	AZM24AK-HS  AZM46  K-HS  AZM66  K-HS 
+		
Product	Type	Product Name
Driver	RS-485 Communication Type	AZD-KR2D
+		
Product	Type	Product Name
Connection Cable / Flexible Connection Cable	For AZM14, AZM15, AZM24, AZM26	Connection Cable CCM    Z2AAF
		Flexible Connection Cable CCM    Z2AAR
	For AZM46, AZM48, AZM66, AZM69	Connection Cable For Motor / Encoder: CCM    Z2ABF For Motor / Encoder / Electromagnetic Brake: CCM    Z2ACF
		Flexible Connection Cable For Motor / Encoder: CCM    Z2ABR For Motor / Encoder / Electromagnetic Brake: CCM    Z2ACR

● A code or a number indicating either one of the followings is entered where the box is located within the product name.

- : Output Shaft Shape
- : Additional Function
- : Motor Cable Type
- : Gear Ratio
- : Cable Outlet Direction
- : Output Shaft Type
- : Cable Length

Driver Specifications



Driver Product Name		AZD-KR2D
Main Power Supply	Rated Voltage	· 24 VDC \pm 5% · 48 VDC \pm 5%
	Input Current*1	AZM14 : 0.4A, AZM15 : 0.5A, AZM24 : 1.4A, AZM26 : 1.4A AZM46 : 1.6A, AZM48 : 2.1A, AZM66 : 3.7A, AZM69 : 3.5A DGM60 : 1.4A, DGM85 : 1.6A, DGM130 : 3.7A, DGB85 : 1.6A, DGB130 : 3.7A DR20 : 0.4A, DR28 : 1.3A, DRSM42 : 1.5A, DRSM60 : 2.6A EH3 : 0.4A, EH4 : 1.4A, LM2 : 3.7A, LM4 : 3.7A
	Allowable Operating Voltage	24 VDC Input: 20 VDC to 32 VDC (22.8 VDC to 32 VDC)*2 48 VDC Input: 40 VDC to 55 VDC
Control Power Supply	Rated Voltage	· 24 VDC \pm 5% · 48 VDC \pm 5%
	Input Current	0.15 A (0.4 A)*3
	Allowable Operating Voltage	24 VDC Input: 20 VDC to 32 VDC (22.8 VDC to 32 VDC)*2 48 VDC Input: 40 VDC to 55 VDC

*1 The value of the input current depends on the motor used in combination.

*2 The values in parentheses () indicate the specifications when connected to the electromagnetic brake motor.

*3 The value in parentheses () indicates the specification when connected to the electromagnetic brake motor. **AZM46** is 0.23 A.

Driver Functions

Driver Product Name			AZD-KR2D	
Number of Positioning Data Sets			256 Points	
Remote I/O	Input		16 Points	
	Output		16 Points	
Setting Tool			Support Software MEXE02	
Coordinates Management Method			Battery-Free Absolute System	
Operation	Positioning Operation	Operation Method	Positioning Operation	<input type="radio"/>
			Positioning Push-Motion Operation*1	<input type="radio"/>
		Linked Operation	Independent Operation	<input type="radio"/>
			Sequential Operation	<input type="radio"/>
			Multi-Speed Operation (Continuous Sequential Operation)	<input type="radio"/>
	Sequence Control	Loop Operation (Repeating)	<input type="radio"/>	
		Event Jump Operation	<input type="radio"/>	
		Speed Control Operation (Continuous Operation)		<input type="radio"/>
	Return-To-Home Operation	Return-To-Home Operation*2	<input type="radio"/>	
		High-Speed Return-to-Home Operation	<input type="radio"/>	
JOG Operation			<input type="radio"/>	
Monitor and Information	Waveform Monitoring		<input type="radio"/>	
	Overload Detection		<input type="radio"/>	
	Overheat Detection (Motor and driver)		<input type="radio"/>	
	Position and Speed Information		<input type="radio"/>	
	Temperature Detection (Motor and Driver)		<input type="radio"/>	
	Motor Load Factor		<input type="radio"/>	
	Distance Traveled/Integrating Distance Traveled		<input type="radio"/>	
Alarm				

*1 The push-motion operation cannot be operated with the geared motors and the Rotary Actuators **DGII** Series.

*2 The return-to-home operation using direct I/O is not available.

RS-485 Communication Specifications

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 Based, Straight Cable Use a shielded twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m (164 ft.) or less.*
Communication Mode	Half duplex, asynchronous communication (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Transmission Rate	Select either from 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, or 230400 bps.
Connection Units	Up to 31 drivers can be connected to a single programmable controller (master device).

*If the motor cable or power supply cable generates an undesirable amount of noise depending on the wiring or configuration, shield the cable or install a ferrite core.

General Specifications

Degree of Protection		IP10
Operating Environment	Ambient Temperature	0 to +50°C (+32 to +122°F) (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 1000 m (3300 ft.) above sea level
	Atmosphere	No corrosive gases or dust. The product should not be exposed to water, oil or other liquids.
Storage Conditions	Ambient Temperature	−25 to +70°C (−13 to +158°F) (Non-freezing)
Transportation Conditions	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 3000 m (10000 ft.) above sea level
	Atmosphere	No corrosive gases or dust. The product should not be exposed to water, oil or other liquids.

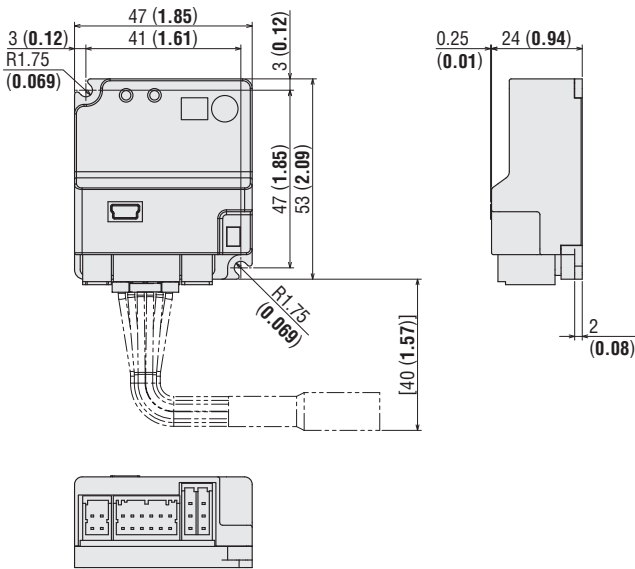
Note

- When measuring insulation resistance or performing dielectric strength test, disconnect the motor and driver.
Also, do not perform these tests on the ABZO Sensor (Absolute Sensor) part of the motor.

Dimensions Unit: mm (in.)

2D & 3D CAD

Type	Product Name	Mass g (oz.)	2D CAD
RS-485 Communication Type	AZD-KR2D	56 (1.98)	B1538



Applicable Connectors

Power Connector (CN1)

Connector Housing: 1-1827864-2 (TE Connectivity)

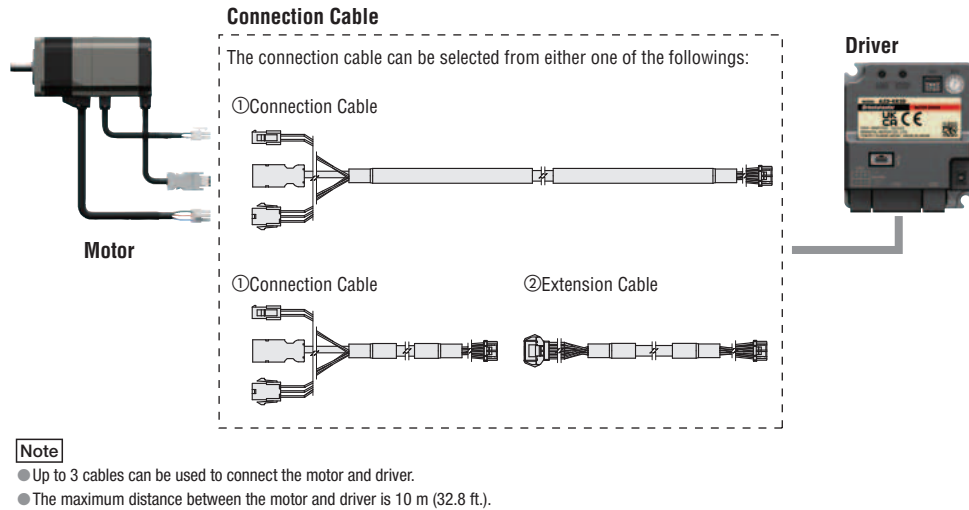
Contact: 1827589-2 (TE Connectivity)

RS-485 Communication Connector (CN3)

Connector Housing: 1-1827579-1 (TE Connectivity)

Contact: 1827588-2 (TE Connectivity)

Connection Cables



① Connection Cables / Flexible Connection Cables

These cables are used to connect the motor and the driver. Use the flexible connection cable in applications where the cable is bent and flexed repeatedly.

Product Line

For **AZM14, AZM15, AZM24, AZM26**

◇ Connection Cables

• For Motor / Encoder

Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2AAF	\$35.00
1 (3.3)	CCM010Z2AAF	\$35.00
3 (9.8)	CCM030Z2AAF	\$58.00
5 (16.4)	CCM050Z2AAF	\$101.00
10 (32.8)	CCM100Z2AAF	\$162.00



◇ Flexible Connection Cables

• For Motor / Encoder

Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2AAR	\$78.00
1 (3.3)	CCM010Z2AAR	\$78.00
3 (9.8)	CCM030Z2AAR	\$102.00
5 (16.4)	CCM050Z2AAR	\$130.00
10 (32.8)	CCM100Z2AAR	\$217.00



For **AZM46, AZM48, AZM66, AZM69**

◇ Connection Cables

• For Motor / Encoder

Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2ABF	\$35.00
1 (3.3)	CCM010Z2ABF	\$35.00
3 (9.8)	CCM030Z2ABF	\$58.00
5 (16.4)	CCM050Z2ABF	\$101.00
10 (32.8)	CCM100Z2ABF	\$162.00



• For Motor / Encoder / Electromagnetic Brake

Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2ACF	\$48.00
1 (3.3)	CCM010Z2ACF	\$48.00
3 (9.8)	CCM030Z2ACF	\$76.00
5 (16.4)	CCM050Z2ACF	\$124.00
10 (32.8)	CCM100Z2ACF	\$197.00



◇ Flexible Connection Cables

• For Motor / Encoder

Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2ABR	\$78.00
1 (3.3)	CCM010Z2ABR	\$78.00
3 (9.8)	CCM030Z2ABR	\$102.00
5 (16.4)	CCM050Z2ABR	\$130.00
10 (32.8)	CCM100Z2ABR	\$217.00



• For Motor / Encoder / Electromagnetic Brake

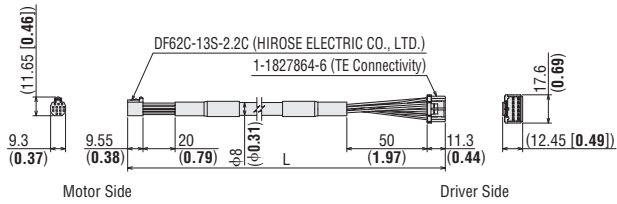
Length L [m (ft.)]	Product Name	List Price
0.5 (1.6)	CCM005Z2ACR	\$105.00
1 (3.3)	CCM010Z2ACR	\$105.00
3 (9.8)	CCM030Z2ACR	\$139.00
5 (16.4)	CCM050Z2ACR	\$176.00
10 (32.8)	CCM100Z2ACR	\$286.00



● Dimensions Unit: mm (in.)

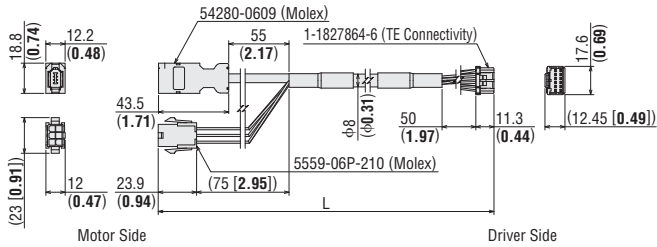
For **AZM14, AZM15, AZM24, AZM26**

● For Motor / Encoder

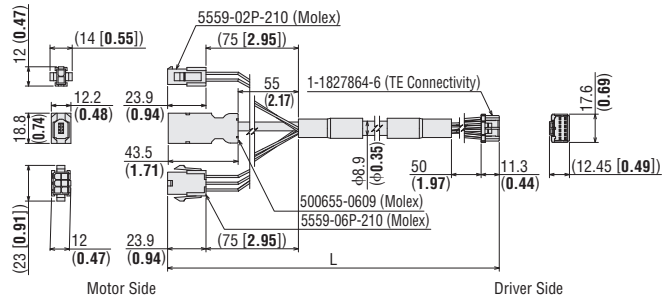


For **AZM46, AZM48, AZM66, AZM69**

● For Motor / Encoder



● For Motor / Encoder / Electromagnetic Brake



② Extension Cables / Flexible Extension Cables Driver Side

These are cables to provide an extension between the connection cable and the driver. When extending the connection, keep the overall cable length at 10 m (32.8 ft.) or less.

Use the flexible extension cable in applications where the cable is bent and flexed repeatedly.

● Product Line

◇ Extension Cables

Length L [m (ft.)]	Product Name	List Price
1 (3.3)	CCM010Z2ADFT	\$66.00
3 (9.8)	CCM030Z2ADFT	\$84.00
5 (16.4)	CCM050Z2ADFT	\$101.00

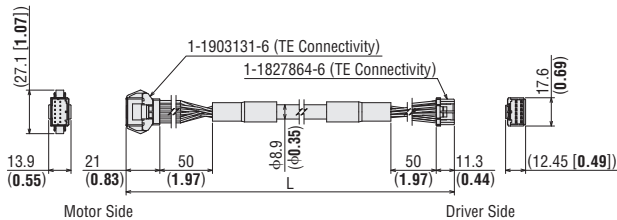


◇ Flexible Extension Cables

Length L [m (ft.)]	Product Name	List Price
1 (3.3)	CCM010Z2ADRT	\$78.00
3 (9.8)	CCM030Z2ADRT	\$102.00
5 (16.4)	CCM050Z2ADRT	\$130.00



● Dimensions Unit: mm (in.)



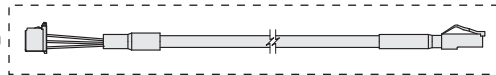
■ RS-485 Communication Cables

These cables are used to connect the driver to a network converter or a robot controller **MRC01**.

Driver



RS-485 Communication Cable*1



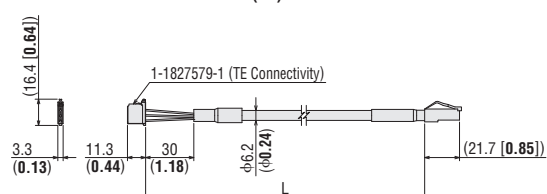
Network Converter*2

● Product Line

Product Name	Length L [m (ft.)]	List Price
CC02FLT6	2 (6.6)	\$52.00
CC05FLT6	5 (16.4)	\$75.00



● Dimensions Unit: mm (in.)



*1 This cable cannot be used to connect the drivers together.

*2 This cable cannot be combined with the network converter **NETC02-CC**.

■ Products Suitable for Mobile Automation

This is a product line having a common concept of battery-drive, compact, and lightweight. Ideal for installing in transportation devices such as autonomous mobile robots and automated guided vehicles, these products contribute to creating an automation line possible to change as desired and achieving the mobile automation, which are further expected in the future.

Brushless Motors BLV Series R Type

These are DC power input brushless motors that further downsizing and weight reduction are achieved.

Low-speed operation from 1 r/min can be performed. Operation by battery-drive is also available.

- Output Power: 100 W (1/8 HP), 200 W (1/4 HP)
- Speed Control Range: 1 to 4000 r/min
- Modbus (RTU) and CANopen Communications Compatible



Specifications are subject to change without notice. This catalog was published in January, 2022.

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