

# Orientalmotor

ORIENTAL MOTOR U.S.A. Corp.  
570 Alaska Avenue  
Torrance, CA 90503  
1-800-GO-VEXTA (468-3982)

## Item # AZM46AK-HP9, 1.65 in. (40 mm) AZ Series Harmonic Planetary Gear Stepper Motor with Mechanical Absolute Encoder (Gear Ratio: 9:1) (DC Input)



### $\alpha$ STEP Hybrid Step-Servo

The  $\alpha$ STEP AZ Series stepper motor offers closed loop control, substantially reduces heat generation from the motor and by incorporating the newly developed Mechanical Absolute Encoder, absolute-type positioning is available, without battery back up or external sensors to buy.

- Requires  $\alpha$ STEP AZ Series Driver

\*Connection Cables required (sold separately)



Web Price

**\$845.00**

[Specifications](#) | [Dimensions](#) | [Speed-Torque](#) | [Rotation](#) | [System](#) | [Product Number](#)

### Specifications

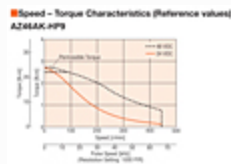
**Lead Time<sup>1</sup>** Available quantity to ship: 5 pieces by 5/5/26.

**Frame Size** 1.57 in

**Motor Length** 4.11 in.

**Driver Voltage Input Power** DC

#### Speed-Torque Characteristics



Speed - Torque Characteristics

**Holding Torque** 354 oz-in

**Holding Torque at Motor Standstill** 191 oz-in

**Type** Mechanical Absolute Encoder



<b>Shaft/Gear Type</b>	Harmonic Planetary Gear
<b>Gear Ratio (X:1)</b>	9 :1
<b>Backlash</b>	3 arc min (0.05°)
<b>Shaft</b>	Single
<b>Electromagnetic Brake</b>	Not Equipped
<b>Connection Type</b>	Cable
<b>Resolution (Resolution Setting: 1000 P/R)</b>	0.04 °/Pulse
<b>Permissible Speed Range (r/min)</b>	0 ~ 444
<b>Rotor Inertia</b>	0.30 oz-in <sup>2</sup>
<b>Stop Position Accuracy</b>	±4 arc minutes (±0.067°)
<b>Shaft Runout</b>	0.05 mm (0.002 in.) T.I.R.
<b>Concentricity</b>	0.075 mm (0.003 in.) T.I.R.
<b>Permissible Overhung Load</b>	0 in. from Shaft End = 40 lb 0.2 in. from Shaft End = 45 lb 0.39 in. from Shaft End = 51 lb 0.59 in. from Shaft End = 60 lb 0.79 in. from Shaft End = 72 lb
<b>Perpendicularity</b>	0.075 mm (0.003 in.) T.I.R.
<b>Permissible Thrust Load</b>	114 lb
<b>RoHS Compliant</b>	These products do not contain substances that exceed the regulation values in the RoHS Directive.
<b>Safety Standards</b>	CE
<b>California Proposition 65</b>	<b>⚠ CA WARNING</b> Cancer risk from exposure to Nickel. See <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> Risk of reproductive harm from exposure to Di-n-hexyl phthalate (DnHP). See <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> Risk of cancer and reproductive harm from exposure to Di(2-ethylhexyl phthalate (DEHP). See <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> See "?" or copy/paste <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> in your browser.
<b>CE Marking</b>	EMC Directives
<b>Insulation Class</b>	Class B [130°C (266°F)]

<b>Insulation Resistance</b>	100 M $\Omega$ or more when 500 VDC megger is applied between the following places: Case - Motor and sensor windings
<b>Dielectric Strength</b>	Sufficient to withstand the following for 1 minute: Case - Motor and sensor windings 1.5 kVAC 50 Hz or 60 Hz
<b>Ambient Temperature</b>	0 ~ 40°C (32 ~ 104°F) (non-freezing)
<b>Ambient Humidity</b>	85% or less (Non-condensing)
<b>Operating Atmosphere</b>	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.
<b>Degree of Protection</b>	IP66 (excluding the mounting surface and connector)

## Dimensions

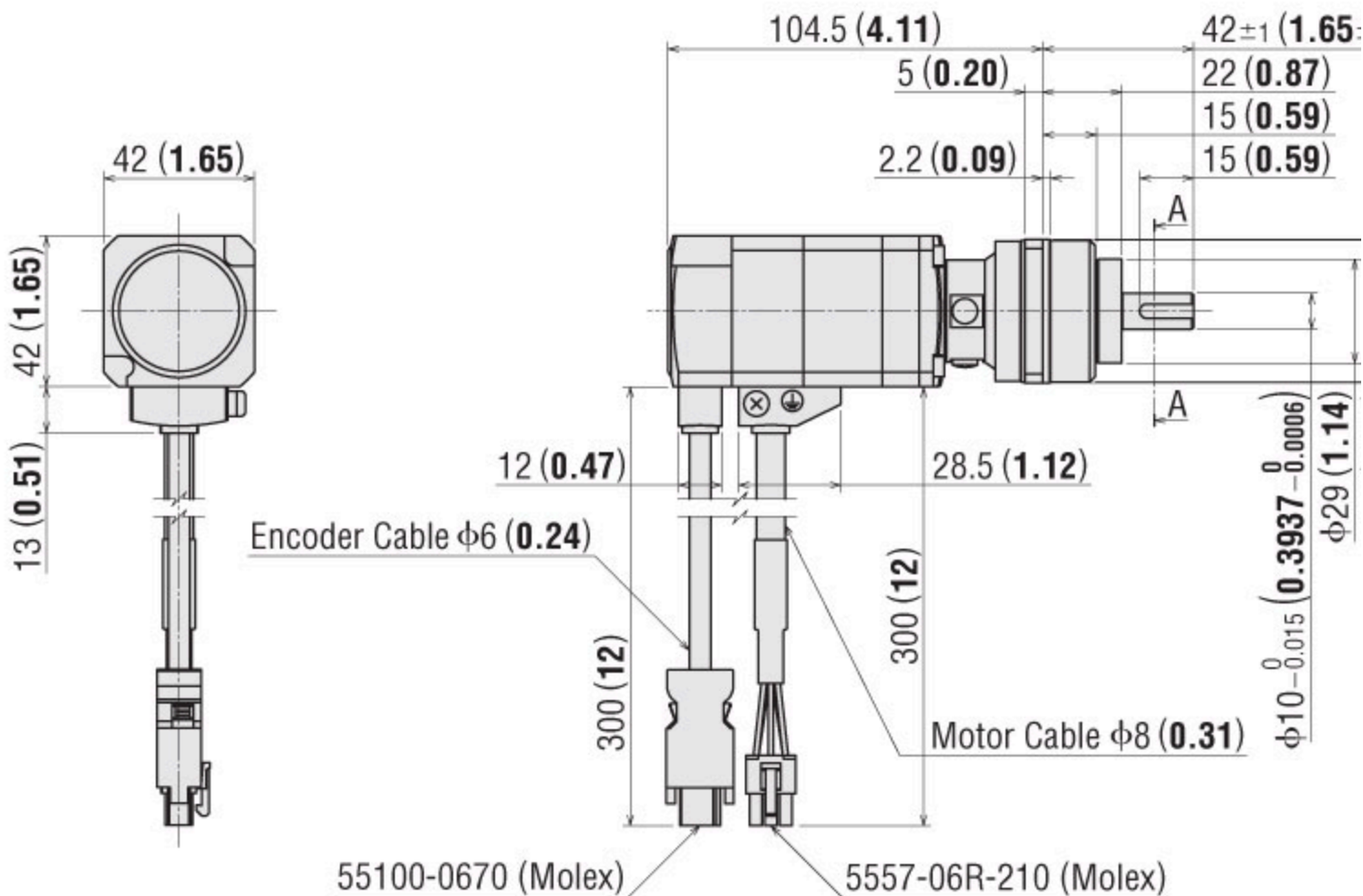
## ■ Dimensions Unit = mm (in.)

### ● Motors

#### ◇ HPG Geared Type

Frame Size 40 mm (1.57 in.)

Product Name		Motor Product Name	Gear Ratio	Mass kg (lb.)
Built-In Controller	Pulse Input			
<b>AZ46AKD-HP</b> ■-◇	<b>AZ46AK-HP</b> ■-◇	AZM46AK-HP ■	5, 9	0.71 (1.56)



$$\frac{15_{-0.18}^0}{(0.591_{-0.007}^0)}$$

$$1.6 (0.06)$$

Speed-Torque

-

## Load Torque - Driver Input Current Characteristic

This is the relationship between the load torque and driver input current at each speed when the motor is actually operated. From these characteristics, the power supply capacity required for use in multi-operation can be estimated. For the geared type, convert to torque and speed by the motor shaft.

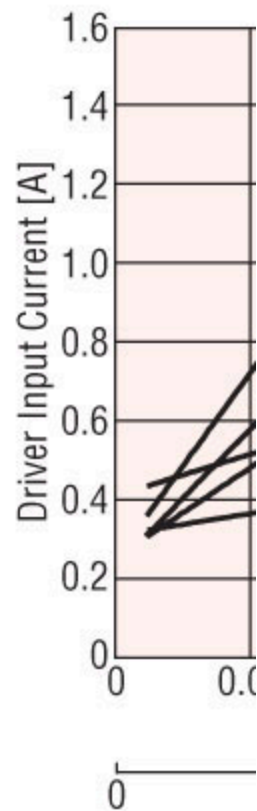
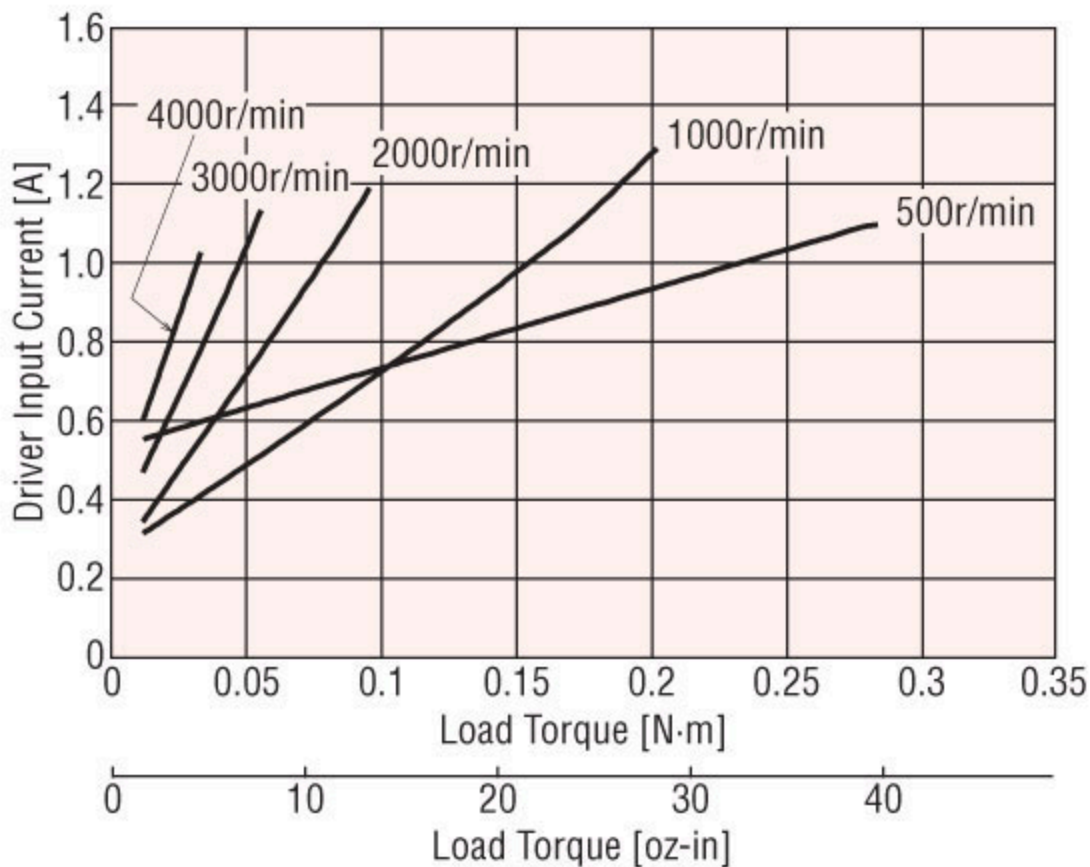
**Motor Shaft Speed = Gear Output Shaft Speed x Gear Ratio [r/min]**

**Motor Shaft Torque = Gear Output Shaft Torque / Gear Ratio [N·m (oz-in)]**

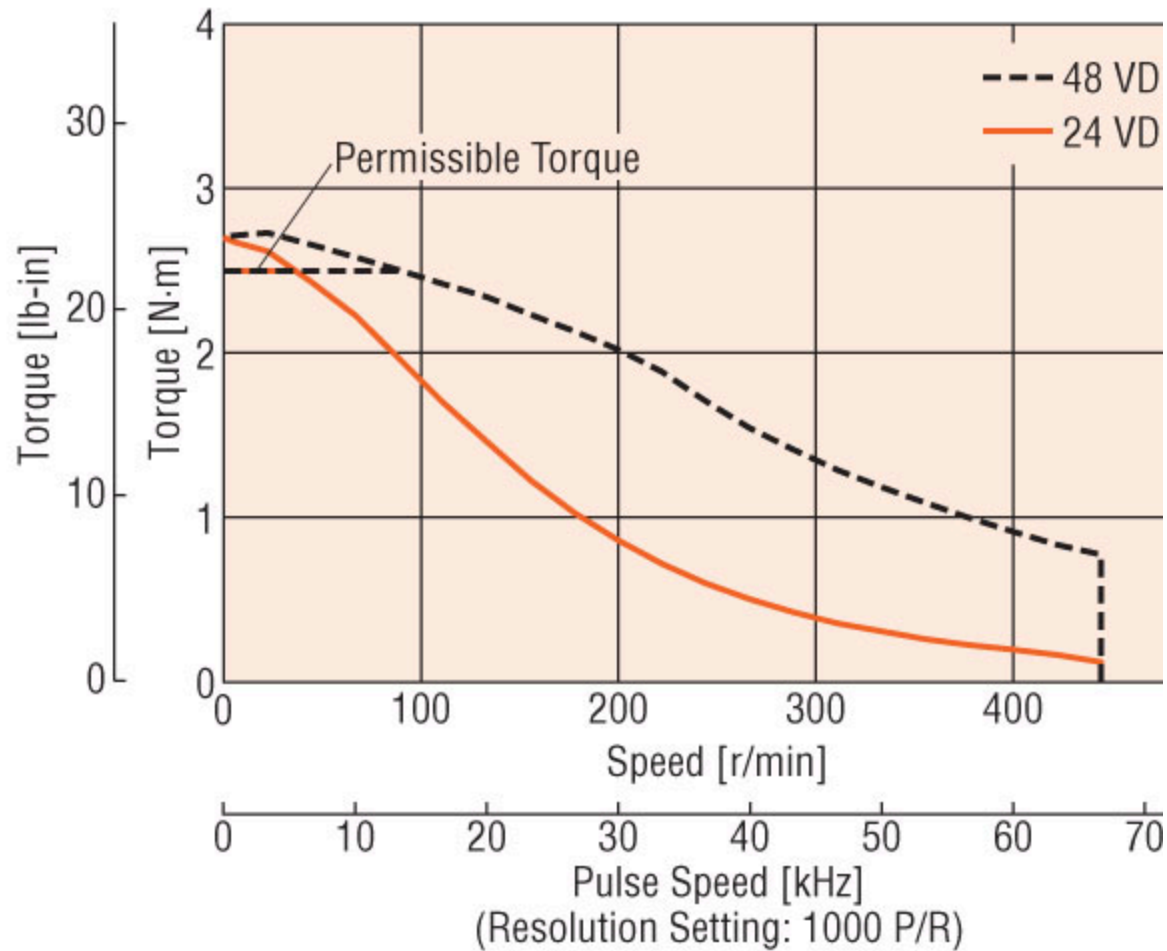
### AZ46□K

24 VDC

4



## Speed – Torque Characteristics (Ref AZ46AK-HP9)



## Rotation Direction

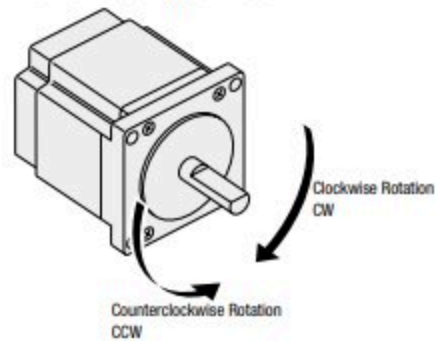
This indicates the rotation direction as viewed from the output shaft side of the motor (factory setting).

The rotation direction of the output gear shaft relative to the standard type motor output shaft varies depending on the gear type and gear ratio.

Please check the following table.

Type	Gear Ratio	Rotation direction Relative to Motor Output Shaft
<b>TS</b> Geared	<b>3.6, 7.2, 10</b>	Same direction
	<b>20, 30</b>	Opposite direction
<b>SH</b> Geared Frame Size 28 mm (1.10 in.)	<b>7.2, 36</b>	Same direction
	<b>9, 10, 18</b>	Opposite direction
<b>SH</b> Geared Frame Size 42 mm (1.62 in.), 60 mm (2.36 in.)	<b>3.6, 7.2, 9, 10</b>	Same direction
	<b>18, 36</b>	Opposite direction
<b>PS</b> Geared	All gear ratios	Same direction
<b>PLE</b> Geared	All gear ratios	Opposite direction
<b>FC</b> Geared	All gear ratios	Same direction
Harmonic Geared	All gear ratios	Opposite direction

### Standard Type Motor

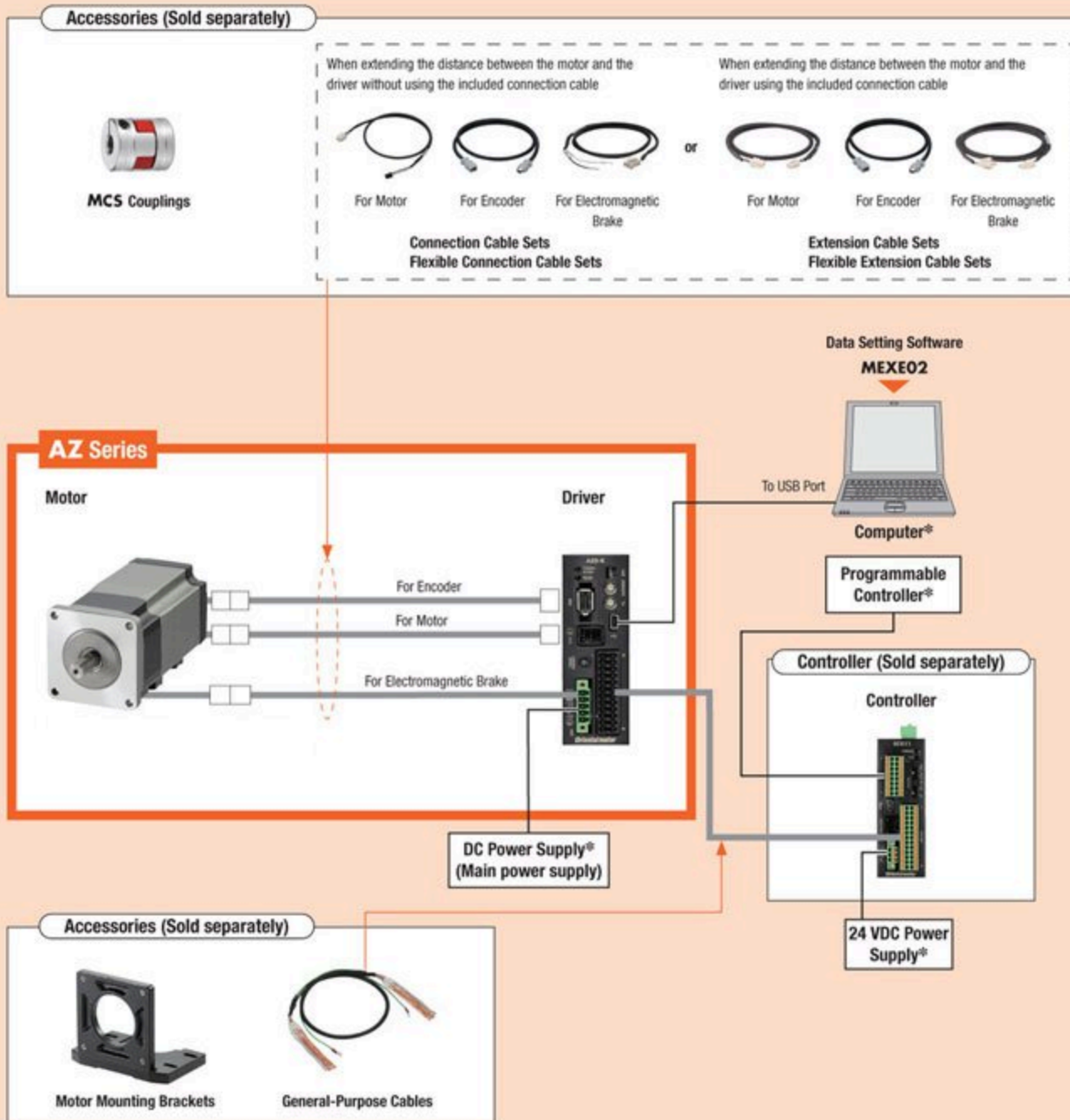


## System Configuration

### Pulse Input Type, Standard Type with Electromagnetic Brake

A single-axis system configuration with the **SCX11** Series controller is shown below.

\* N

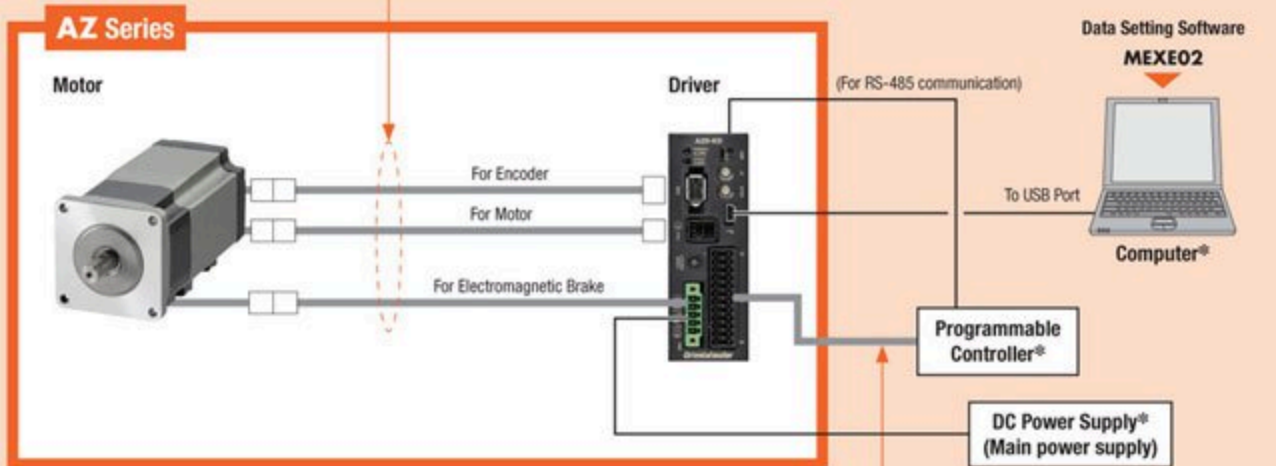
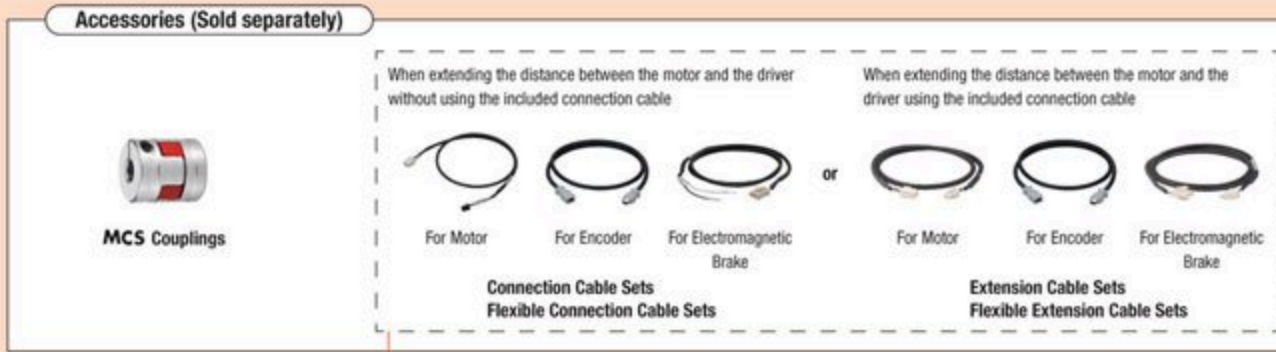


## System Configuration

### Built-in Controller Type, Standard Type with Electromagnetic Brake

An example of a configuration using I/O control or RS-485 communication is shown below.

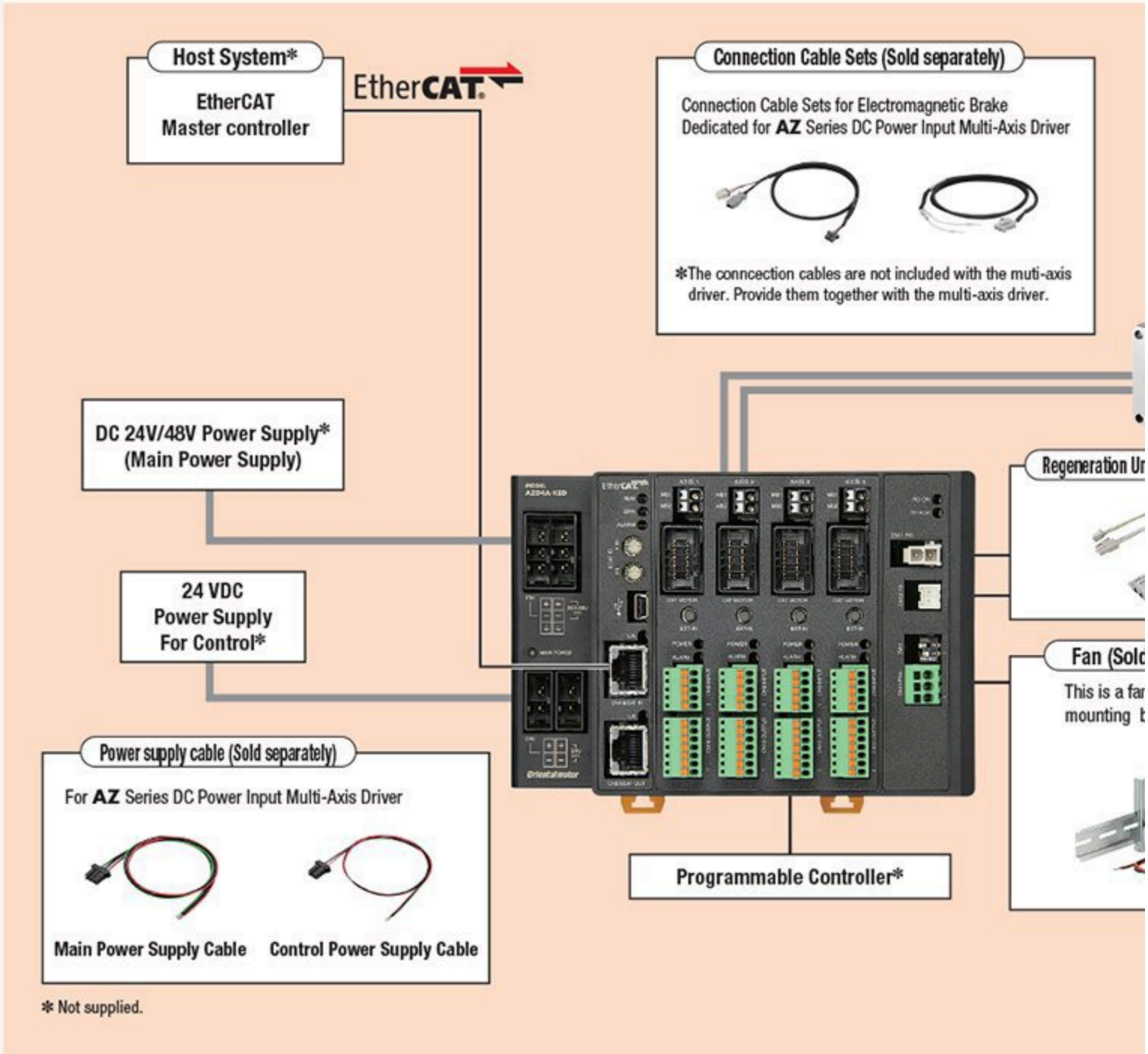
\* N



# System Configuration

## EtherCAT Drive Profile Support

The following is a system configuration example combining with the AZ Series DC power supply input stage electromagnetic brake.



## Product Number Code

### ● Motor

#### ◇ Standard Type

**AZM 6 6 A 0 K F**

① ② ③ ④ ⑤ ⑥ ⑦

#### ◇ PS, HPG, Harmonic Geared Type

**AZM 6 6 A K - HP 15 F**

① ② ③ ④ ⑥ ⑧ ⑨ ⑩

### ● TS Geared Type

**AZM 6 6 A K - TS 7.2 U**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

### ● FC Geared Type

**AZM 6 6 A K - FC 7.2 U A**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

### ● Connection Cable Set / Flexible Connection Cable Set

**CC 050 V Z □ F B 2**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

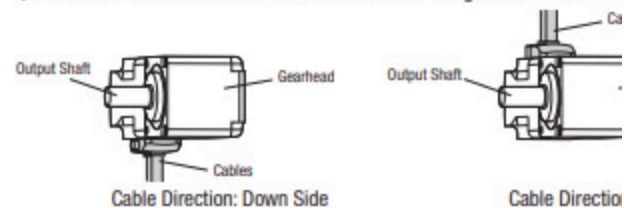
①	Motor Type	<b>AZM: AZ Series Motor</b>
②	Motor Frame Size	<b>1:</b> 20 mm (0.79 in.) <b>2:</b> 28 mm (1.10 in.) (Harmonic (1.18 in.)) <b>4:</b> 42 mm (1.65 in.) ( <b>HPG</b> Gear) <b>6:</b> 60 mm (2.36 in.)
	Motor Case Length	
	Output Shaft Configuration	<b>A:</b> Single Shaft <b>M:</b> Electrom
	Motor Specifications*	<b>O:</b> Straight <b>I:</b> Keyed
⑤	Motor Specifications*	
⑥	Gear Type	<b>K:</b> DC Power Supply Input Spe
⑦	Motor Cable Configuration	<b>F:</b> Horizontal Outlet Direction
⑧	Geared Type	<b>PS: PS</b> Geared Type <b>HP: HPG</b> Geared Type <b>HS:</b> Harmonic Geared Type
	Gear Ratio	
	Output Shaft Type	<b>HPG</b> Geared Type Blank: Shaft Output <b>F:</b> Flange

\*For standard type, if there is no number indicating additional functionality, flat face specification.

①	Motor Type	<b>AZM: AZ Series Motor</b>
②	Motor Frame Size	<b>4:</b> 42 mm (1.65 in.) <b>6:</b> 60 r
③	Motor Case Length	
④	Output Shaft Type	<b>A:</b> Single <b>M:</b> Type with Elec
⑤	Motor Type	<b>K:</b> DC Input Specification
⑥	Geared Type	<b>TS: TS</b> Geared Type
⑦	Gear Ratio	
⑧	Cable Outlet Direction	<b>U:</b> Upper Side <b>L:</b> Left Side

①	Motor Type	<b>AZM: AZ Series Motor</b>
②	Motor Frame Size	<b>4:</b> 42 mm (1.65 in.) <b>6:</b> 60 r
③	Motor Case Length	
④	Output Shaft Type	<b>A:</b> Single <b>M:</b> Type with Elec
⑤	Motor Type	<b>K:</b> DC Input Specification
⑥	Geared Type	<b>FC: FC</b> Geared Type
⑦	Gear Ratio	
⑧	Cable Outlet Direction*	<b>D:</b> Down Side <b>U:</b> Upper Sid
⑨	Identification Symbol	<b>A:</b> Solid Shaft

\*The cable The cable direction is when viewed from the gearhead side with t



①		<b>CC:</b> Cable
②	Length	<b>010:</b> 1 m (3.3 ft.) <b>020:</b> 2 m (6.6 f <b>050:</b> 5 m (16.4 ft.) <b>070:</b> 7 m (23 <b>150:</b> 15 m (49.2 ft.) <b>200:</b> 20 m (E
	Reference Number	
	Applicable Product	<b>Z: AZ Series</b>
	Reference Number	Blank: Frame Size 42 mm (1.65 in.) [

⑤		40 mm (1.57 in.)], 60 mm (2.3 <b>2:</b> Frame Size 20 mm (0.79 in.), 28 r Geared Type is 30 mm (1.18 in.)]
⑥	Cable Type	<b>F:</b> Connection Cable Set <b>R:</b> Flexible Connection Cable Set
⑦	Description	Blank: Without Electromagnetic Brak <b>B:</b> Electromagnetic Brake Type
⑧	Cable Specifications	<b>2:</b> DC Power Supply Input

<sup>1</sup> Quoted Ship Date for orders placed before 12:00 pm PST. Quantities may affect Shipping Date.

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