

Stepping Motor and Driver Package *Astep* 

**AZ Series** Equipped with Battery-Free Absolute Sensor



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# Absolute with No Battery Required Advanced "Positioning" control in your hand.

Oriental Motor, a leading manufacturer of control motors.

The newly released **AZ** Series do not require a battery for positioning in the absolute method. Advanced positioning is available at affordable prices.



Sensor advanced technology with the newly developed < ABZO sensor> is now available at affordable prices.

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Closed Loop Stepping Motor Unit  $\alpha_{\text{STEP}}$ High reliability and energy saving are achieved.

High Reliability
 Energy Saving

**S** Two types of drivers, selectable for each system configuration.

Built-In Controller Type
 Pulse Input Type

Data setting software **MEXE02** makes operation easy.

Easy Setting and Easy Driving
 Monitoring Function

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**AZ Series** Equipped with Battery-Free Absolute Sensor



# Sensor advanced technology with the newly developed <ABZO sensor> is now at affordable prices.

Oriental Motor has developed a compact, low-cost mechanical driven type equipped with absolute sensor that does not require a battery (Patented). The products offered at affordable prices can achieve productivity improvement and cost reduction.



# **Newly Developed ABZO Sensor**

### Mechanical driven sensor

A mechanical driven sensor consisting of multiple gears recognizes the angle of each gear to detect positional information. Therefore, no battery is required.

### Multi-rotation absolute method

From the reference of home position, the absolute position for  $\pm$ 900 rotations (for 1800 rotations) of the motor shaft can be detected.

### How to set home position

Home position can be easily set by pressing the switch on the driver and the ABZO sensor saves the position of the point. You can also use the data setting software (**MEXEO2**) or external input signals to set home position.



# **No External Sensor Required**

This Series use the absolute method that does not require external sensors such as home postion sensor and limit sensor.

### Cost reduction

The sensor and wiring cost can be reduced, enabling lowering of the total system cost.

### Wire-saving

Wire saving allows the equipment to be easy for design.

### Equipment not affected by the malfunction of the sensor

Worry-free concerning sensor malfunction (in an environment where pieces of metal or oil mist are afloat), sensor failure, or sensor wire disconnection.

### Improvement of accuracy in the return to home position

It is possible to return to the home position regardless of the variation in the sensing of the home position sensor, improving the accuracy.

If there is no limit sensor attached, you can use the software limit of the driver to prevent the threshold from being exceeded.

# **Reduction in the Returning Time** ① High-speed Return to the Home

Returning to the home without using an external sensor, enabling return to the origin at high speed regardless of the specifications of the sensing of the sensor. This leads to reduction in the machine cycle time.



# **Reduction in Returning Time** ② No Need to Return to the Home

Even if the power is turned off during the positioning operation, the position information is retained. Moreover, with built-in positioning function, when recovering from an emergency stop of the production line or from a power outage, the positioning operation can be resumed without the return to home position.

- For the built-in positioning function type ABZO sensor ABZO sensor Comparison Compar

# **No Battery Required**

A mechanical driven sensor is used and requires no battery. The positional information is mechanically managed by the ABZO sensor. This retains the position information even if the power is turned off or the cable between the motor and the driver is removed.



### Less maintenance work

There is no need to replace the battery, thus reducing maintenance work and costs.

### Desired installation of the driver

There is no need to ensure space for battery replacement, as the driver can be installed in any location, and a more flexible layout design is available for the control panel and other devices.

### Trouble-free for in overseas transportation

An ordinary battery discharges itself, when it is transported over a long period of time for international or long-distance shipment. The ABZO sensor does not require a battery, and there is no time limit for position information retainment. In addition, there is no need to consider the regulations applied to battery export.

### The position retained even if the cable between the motor and driver is removed.

The position information is retained within the ABZO sensor.





The position information retained in the ABZO sensor. This requires resetting of the home position if the motor is replaced.



# Closed Loop Stepping Motor Unit *Xstep* High reliability and energy saving are achieved.

The **AZ** Series employs the  $\alpha$ *step* technology, achieving high reliability by using the unique control method and conserves energy with a highly efficient motor.

# **High Reliability**

This unit employs the unique control method, achieving high reliability with advantages for both the open loop control and closed loop control.

### Operation continues even at sudden load change or sudden acceleration.

Under normal conditions, this compact unit operates by open loop control synchronously with pulse commands and generates high torques, achieving excellent acceleration and responsiveness. When overloaded, the current control immediately changes to the closed loop control and corrects the position.

# In an abnormal condition, an alarm signal is output.

If overloaded, an alarm signal is output. A signal is also output when the positioning operation is finished. These features provide high reliability.

### • No tuning is required.

Under normal conditions, this unit operates by open loop control. This enables positioning without gain adjustment even when there is a change in the load in the belt mechanism, cum or chain drive, or other mechanical drives.

### • Stop position is retained.

At the time of positioning, this unit stops at its own holding power without hunching. This feature is best for a low-rigidity mechanism where no vibration must occur when stopping.

# **Energy Saving**

Highly-efficiency motor reduces heat generation, achieved energy saving.

### Less heat generation

Increase in efficiency has greatly reduced the heat generation of the motor.



•Motor housing temperature at operation under the same condition



 Energy conservation has reduced power consumption by 47% compared to the conventional level.





### Operating conditions

Rotation speed: 1000 r/min, Load factor: 50% Operating time: 24-hour operation (Operation: 70%, Stand-by: 25%, Stop: 5%); 365 days/year



# Two types of drivers, selectable for each system configuration.

Two types of drivers are provided for **AZ** Series. Either one can be selected according to your upper-level system.



Built-In Controller Type **GLEX** 



**Pulse Input Type** 

### GLEX What is FLEX?

FLEX is a general term of the products that support I/O control, Modbus (RTU) control, and FA network control via a network converter. FLEX enables easy connection and easy control, reducing the total lead time in building a system.

# Built-In Controller Type **GEED**

This type sets operation data in the driver, and selects and executes the operation data from the upper-level system. Connection with and control of the upper-level system are performed by ① I/O, ② Modbus (RTU)/RS-485, or ③ FA network.



### Operation data setting Parameter change Data setting software (MEXE02)



 Setting via RS-485 communication is also available.



CLINK and MECHANOLINK is the registered trademark of the CC-Link varither Association and MECHANOLINK memoers Association, respectively.
 EtherCAT.
 S the registered trademark licensed by Beckhoff Automation in Germany.

By using a network converter (sold separately), the CC-Link communication, MECHATROLINK communication, and EtherCAT communication can be supported. Operating data, parameter setting, and operation commands can be input for each communication. FLEX can be flexibly used on your network, reducing the design time.

# **Pulse Input Type**

This type executes operation by inputting pulses to the driver. The motor is controlled from the positioning unit (pulse oscillator) provided by the customer.

### Basic setting (Factory setting)

Driver



By using the data setting software (**MEXEO2**), the alarm history display and various monitors can be supported according to customer requests.



•Data setting software (MEXEO2) can be downloaded from the WEB site.



# Data setting software **MEXE02** makes operation easy.

By using the data setting software, **MEXEO2**, installed on your PC, you can set units, operate the equipment, and perform checking through various monitoring functions.



### Data setting software **MEXE02**

Data setting software can be downloaded from the WEB site.

# Easy Setting and Easy Driving

### Unit setting wizard

This function allows you to display/enter the travel distance, speed, or other details in your desired unit. You can easily make settings by following the on-screen instructions.



### Teaching/Remote operation

From the data setting software, you can easily set an original point or drive the motor. Use this function for teaching or trial operations.



# **Monitoring Function**

### I/O monitor

You can check the statuses of the I/O wiring to the driver on your PC. Use this function for I/O check after wiring or during operation.



### Waveform monitor

You can check the operational statuses (command speed, feedback speed, etc.) displayed in an oscilloscope like image. Use this function when starting up the device or making adjustments.



### Alarm monitor

If an error occurs, you can check the error details and measures to be taken. You can quickly take action by following the displayed measures.

Alarm Co	ndition	10 Exc	easive postion	deviation				
					Als	m Reset		
Allerin hie	itory							
	Code	Nami measage	Sub-code	Driver Temperature	Motor temperature	Inverter voltage	Direct-I/O Input	NE
#1	10	essive postion devia					0000	
172	00	Alam not present	00	Ū	0	0.0	0000	
#3	00	Alams not present	00	0	0	00	0000	
<b>C4</b>	00	Alem not present	00	Û	0	0.0	0000	
#5	00	Alarm nict present.	00	0	0	0.0	0000	
45	00	Alarm not present	00	0	0	0.0	0000	
π7	00	Aami not present	00	Q.	0	0.0	0000	
#8	00	Alams not present	00	0	0	0.0	0000	
49	00	Alarm not present	00	Ú.	÷.	0.0	0000	
#10	00	Alam not present	00	D.	0	0.0	0000	
Direct	I/O Input		N	ETHIO Output	Cause Polyten the meter was in a	a state of current ON	the decision behaves	
				NET-OUTS NET-OUTS NET-OUTID NET-OUTID	the command position an parameter for overflow ro "The load is large, or the Measure	d actual position avoa tation alarm during cu acceleration (declinera	eded the value set in mere on: Bon is too rapid	ita -
				NET-OUT13 NET-OUT14 NET-OUT15	"Reduce the load or make "Increase operation curre "Check the operation dat	e the acceleration/de nt. If it remains lower a	celeration longer.	1 1

The software allows you to perform remote operation or teaching while monitoring the operational statuses since multi-monitoring is supported.

# Lineup

### Driver and Motor Types

Drive	т Туре	Motor Type	Frame Size	Electromagnetic Brake Type	Power Supply Input
Built-In Controller Type	Pulse Input Type	Standard Type	42 mm 60 mm	•	
AC Power-Supply Input	AC Power-Supply Input	<b>TS</b> Geared Type <b>PS</b> Geared Type <b>HPG</b> Geared Type Harmonic Geared Type	42 mm≉ 60 mm	_	Single-Phase 100-120 VAC Single-Phase 200-240 VAC Three-Phase 200-240 VAC 24 VDC/48 VDC

\*40 mm for the **HPG** geared type

### Types and Features of Standard and Geared Motors

	Туре	Features	Permissible Torque and Maximum Instantaneous Torque [N·m]	Backlash [arcmin]	Basic Resolution [°/Step]	Output Shaft Rotation Speed [r/min]
	Standard Type	Basic model of <b>AZ</b> Series	Maximum Holding Torque 2		0.36	()4500
Low Bá	TS Geared Type (Spur gear mechanism)	A Wide Variety of Low Gear Ratios, High-Speed Operations Gear Ratio Types 3.6, 7.2, 10, 20, 30	Permissible Torque Maximum Instantaneous Torque 6 10	10	0.012	833
acklash	PS Geared Type (Planetary gear mechanism)	High Permissible Torque/Maximum Instantaneous Torque A Wide Variety of Gear Ratios for Selecting the Desired Step Angle Center Shaft Gear Ratio Types 5, 7.2, 10, 25, 36, 50	Permissible Torque Maximum Instantaneous Torque 8 20	7	0.0072	600
Non-Ba	HPG Geared Type (Harmonic planetary®)	High positioning accuracy High Permissible Torque/Maximum Instantaneous Torque Center Shaft Gear Ratio Types 5, 9, 15	Permissible Torque Maximum Instantaneous Torque 9 19	3	0.024	900
acklash	Harmonic Geared Type (Harmonic drive®)	High positioning accuracy High Permissible Torque/Maximum Instantaneous Torque High Reduction Ratio, High Resolution Center Shaft Gear Ratio Types 50, 100	Permissible Torque Maximum Instantaneous Torque 10 36	0	0.0036	70

Note The values shown above must be used as reference. These values vary depending on the motor frame size and gear ratio.

We offer motors pre-assembled with gears, as variations of stepping motors.

Select an appropriate type from the various geared motors according to the torque, accuracy (backlash) and price.



# **Features of Geared Motors**

### **TS** Geared Type



This type adopts a simple spur gear mechanism. High-accuracy processing of the parts allows reduction of the backlash and **TS** Geared is also offered at an affordable price range.



### **PS** Geared Type



### It consists of the sun gear at the center, the planetary gears and the internal gears. High torque can be achieved with the planetary gear mechanism.

Since torque is dispersed and transmitted via multiple gears, the torque can be set higher compared with the spur gear mechanism. And since it adopts high-accuracy gears, the backlash is smaller compared with the spur gear mechanism.



### **HPG** Geared Type (Harmonic planetary®)



This type adopts harmonic planetary gears. A thin elastic gear is used as an internal gear. The elastic deformation of the internal gear is used and low backlash can be determined without the adjustment mechanism. Two types of gearshafts are available : shaft output type and flange output type. For the flange output type, the table and arm can be attached directly to the rotating part, saving space in the direction of the motor length. Since, coupling and other mechanism parts become unnecessary, costs on design and parts has been reduced.

### Harmonic Geared Type (Harmonic drive®)



This type adopts harmonic gears. It consists of only 3 basic parts (wave generator, flex spline and circular spline) to which the mechanics of elasticity of metals has been applied. Since there are many meshing teeth. It able to generate a larger torque and lower backlash.

Wave Generator



Harmonic planetary®, harmonic drive® and 🚛 히 SYSTEMSHD® are registered trademarks or trademarks of Harmonic Drive Systems Inc.

### 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.

\*1 Not supplied.



System Configuration Example

			Sold Separately	
AZ Series	+	Motor Mounting Brackets	Flexible Couplings	General-Purpose Cables (1 m)
AZ66MCD-3		PAL2P-5	MCV251010	CC16D010B-1

The system configuration shown above is an example. Other combinations are available.

### Pulse Input, Standard Type with Electromagnetic Brake

An example of a single-axis system configuration with the **EMP400** Series controller is shown below.

\*1 Not supplied.
\*2 Only with products supplied with a connection cable.



System Configuration Example

				Sold Separately		
AZ Series		Controllor Motor General-Purpose Ca				Connector - Terminal Block
	+	GUITEI	Mounting Brackets	Flexible Couplings	(1 m)	Conversion Unit (1 m)
AZ66MC-3		EMP401-1	PAL2P-5	MCV251010	CC16D010B-1	CC50T10E
ALCOMC-3	J	EMIF401-1	FALZF-3	MC ¥ 251010	CCTODUTUB-T	CCSOTTOE

The system configuration shown above is an example. Other combinations are available.

AC Power-Supply Input

### Product Number Code

	Stan	dard	І Тур	е							
A	Ζ	6	6	A	С	D	-	1			
(	D	2	3	4	5	6		10			
	Gear	red T	vpe								
A	Ζ	6	6	A	С	D	-	HP	15	F٠	• 1
(	D	2	3	(4)	(5)	6		$\overline{7}$	(8)	0	(10)

1	Series Name	AZ: AZ Series
2	Motor Frame Size	<b>4</b> : 42 mm (40 mm for the <b>HPG</b> Geared Type) <b>6</b> : 60 mm
3	Motor Case Length	
4	Configuration	A: Single Shaft M: Electromagnetic Brake Type
5	Power Supply Input	A: Single-Phase 100-120 VAC C: Single-Phase/Three-Phase 200-240 VAC
6	Driver Type	D: Built-In Controller Type Blank: Pulse Input Type
7	Gear Type	TS: TS Geared Type PS: PS Geared Type HP: HPG Geared Type HS: Harmonic Geared Type
8	Gear Ratio	
9	Output Shaft Type*	Blank: Shaft Output F: Flange Output
10	Connection Cable	Number: Included Connection Cable Length <b>1</b> : 1 m <b>2</b> : 2 m <b>3</b> : 3 m None: Connection cable not included

\*HPG geared type only.

### Types

### Built-In Controller Type

$\diamondsuit$ Standard Type
Product Name
AZ46A_D-◇
AZ66A_D-◇
AZ69A_D-◇

### $\diamondsuit$ Standard Type with Electromagnetic Brake

Product Name
AZ46M_D-◇
AZ66M_D-◇
AZ69M_D-◇

### **♦ TS** Geared Type

Product Name
AZ46AD-TS3.6-🛇
AZ46A_D-TS7.2-🔿
AZ46A_D-TS10-🔷
AZ46A_D-TS20-◇
AZ46A_D-TS30-🔷
AZ66A_D-TS3.6-🛇
AZ66A_D-TS7.2-🔿
AZ66A_D-TS10-🛇
AZ66A_D-TS20-🔷
AZ66A_D-TS30-🔷

### ◇PS Geared Type

Product Name
AZ46AD-PS5-🛇
AZ46A_D-PS7.2-🛇
AZ46AD-PS10-🛇
AZ46A_D-PS25-◇
AZ46A_D-PS36-🔿
AZ46A_D-PS50-◇
AZ66A_D-PS5-◇
AZ66A_D-PS7.2-🛇
AZ66AD-PS10-0
AZ66A_D-PS25-◇
AZ66A_D-PS36-🔿
AZ66A_D-PS50-

### ♦ HPG Geared Type

 Product Name

 AZ46A
 D-HP5 

 AZ46A
 D-HP5F 

 AZ46A
 D-HP9 

 AZ66A
 D-HP5 

 AZ66A
 D-HP5 

 AZ66A
 D-HP5 

 AZ66A
 D-HP15

### ◇Harmonic Geared Type

	Product Name
AZ	46A_D-HS50-◇
AZ	46A_D-HS100-🔿
AZ	66A_D-HS50-◇

### AZ66AD-HS100-0

- Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name.
  - A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\diamond$  is located within the product name. If the connection cable is not included, the box - $\diamond$  does not appear in the product name.
- The following items are included in each product. -

Motor, Parallel Key<sup>\*1</sup>, Motor Installation Screws<sup>\*2</sup>, Driver, Cable for Motor<sup>\*3</sup>, Cable for Encoder<sup>\*3</sup>, Cable for Electromagnetic Brake (For electromagnetic brake type only)<sup>\*3</sup>, Connector Set for Driver, Operating Manual

- \*1 Only for products with a key slot on the output shaft.
- \*2 Only for **TS** Geared Type with Frame Size 60 mm
- \*3 Only with products supplied with a connection cable. In the following cases, purchase an accessory cable (sold separately):
- When using a flexible cable
- When using a cable longer than 3 m
- When buying products without an included cable

### Note

The motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the product).

Pulse Input Type	
Standard Type	♦ HPG Geared Type
	Draduct Nama
	AZ-40AIIFJ->
	AZ46A
	A746A
Actondard Turne with Electromognetic Proke	
Product Name	AZ66AHP15-☆
	AZ66AHP15F-
	$\diamondsuit$ Harmonic Geared Type
♦ TS Geared Type	Product Name
	AZ46AHS50-◇
	AZ46AHS100-◇
AZ46A - 155.0-> A746A - 157.2->	AZ66A-HS50-
A746A	AZ66A-HS100-
A746A	Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power
A746A	supply voltage is entered where the box $\square$ is located within the product name.
AZ66A	A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3
AZ66A	(3 m) is entered where the box $\diamond$ is located within the product name. If the connection cable is
AZ66A	not included, the box - $\langle \rangle$ does not appear in the product name.
AZ66ATS20-	The following items are included in each product.
AZ66A	Motor, Parallel Key*1, Motor Installation Screws*2, Driver, Cable for Motor*3, Cable for
	Encoder <sup>#3</sup> , Cable for Electromagnetic Brake (For electromagnetic brake type only) <sup>#3</sup> ,
OPS Geared Type	Connector Set for Driver, Operating Manual
Product Name	*1 Unly for products with a Key slot on the output shaft.
A746A	*2 Only for 15 dealed type with Frame Size of finite *3 Only with products supplied with a connection cable. In the following cases, purchase
A746A	an accessory cable (sold separately):
AZ46A	When using a flexible cable
AZ46A	When using a cable longer than 3 m
AZ46A	When buying products without an included cable
AZ46APS50-	
AZ66APS5-	Note
AZ66APS7.2-◇	Ine motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver When connected to the driver was an economy (connected to the driver).
AZ66APS10-◇	urrectly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the
AZ66A□-PS25-◇	nrighter the second of the included connection capie (in the connection capie is included with the
AZ66A <u></u> -PS36-◇	producy.
AZ66A	

# How to Read Specifications Table

Maximum Holding Torque	The maximum holding torque (holding force) of the motor when power (rated current) is being supplied but the motor shaft is at standstill. (With geared types, the permissible strength of the gear is given consideration for this value.)					
Permissible Torque	The maximum value of the torque that can be continuously applied on the output gear shaft.					
Maximum Instantaneous Torque	This is the maximum torque value that can be applied to the output gear shaft during acceleration/deceleration like when an inertial load is started and stopped.					
Holding Torque at Motor Standstill	While Power is ON       : Holding torque when the automatic current cutback function is active.         Electromagnetic Brake       : Static friction torque when the electromagnetic brake is activated at standstill. (Electromagnetic brake is power off activated type.)					

# Standard Type Frame Size 42 mm, 60 mm Standard Type with Electromagnetic Brake Frame Size 42 mm, 60 mm

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### Specifications

Broduct	lomo	Built-in Controlle	ſ	AZ46□□D-◇	AZ66□□D-◇	AZ69□□D-◇	
FIUUUGLIN	Idille	Pulse Input		AZ46□ <u></u> -◇	AZ66□ <u></u> -◇	AZ69□ <b>□</b> -◇	
Maximum Holding	g Torque		N∙m	0.3	1.2	2	
Holding Torque at	Power	r ON	N∙m	0.15	0.6	1	
Motor Standstill	Electr	omagnetic Brake	N∙m	0.15	0.6	1	
Rotor Inertial		J	kg∙m²	55×10 <sup>-7</sup> (71×10 <sup>-7</sup> )*1	370×10⁻ <sup>7</sup> (530×10⁻ <sup>7</sup> ) <b>*</b> 1	740×10⁻ <sup>7</sup> (900×10⁻ <sup>7</sup> )*1	
Resolution	Re	solution Setting: 10	00 P/R	0.36°/Pulse			
	Voltage and	Frequency		Single-phase 100-120 VAC,	, single-phase/three-phase 200-240 \	/AC -15~+6% 50/60 Hz	
Power Supply	Input	Single-Phase 100-	120 VAC	2.7	3.8	5.4	
Input	Current	Single-Phase 200-	240 VAC	1.7	2.3	3.3	
	Α	Three-Phase 200-	240 VAC	1.0	1.4	2.0	
Control Power So	urce			24 VDC ±5%*2 0.25 A (0.33 A)*1	24 VDC ±5%*2	0.25 A (0.5 A)*1	

Either A (single shaft) or M (electromagnetic brake type) indicating the configuration is entered where the box 
 is located within the product name

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box 🗔 is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\diamondsuit$  is located within the product name.

If the connection cable is not included, the box -  $\diamond$  does not appear in the product name.

For details of the standards, check the Oriental Motor website.

\*1 The parentheses () indicate the specifications for the electromagnetic brake type.

\*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using an accessory cable (sold separately).

### Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

(When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

# TS Geared Type Frame Size 42 mm

### Specifications

Built-in Controller		Built-in Controller	AZ46A_D-TS3.6-◇	AZ46A_D-TS7.2-🛇	AZ46A_D-TS10-🔷	AZ46A_D-TS20-🔷	AZ46A_D-TS30-🔿
Product Na	anne	Pulse Input	AZ46ATS3.6-◇	AZ46ATS7.2-🛇	AZ46A	AZ46A	AZ46A
Maximum Holding	g Torque	N·m	0.65	1.2	1.7	2	2.3
Rotor Inertial		J:kg·m <sup>2</sup>			55×10 <sup>-7</sup>		
Gear Ratio			3.6	7.2	10	20	30
Resolution	Reso	lution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torqu	ie	N·m	0.65	1.2	1.7	2	2.3
Maximum Instantaneous Torque N·m		0.85	1.6	2	3		
Holding Torque at	Motor Sta	ndstill N·m	0.54	1	1.5	1.9	2.2
Speed Range		r/min	0~833	0~416	0~300	0~150	0~100
Backlash arcmin			45 (0.75°)	25 (0	0.42°)	15 (0	).25°)
Voltage and Frequency			Sing	le-phase 100-120 VAC, sing	le-phase/three-phase 200-2	240 VAC -15~+6% 50/6	0 Hz
Power	Input	Single-Phase 100-120 VAC			2.7		
Supply Input	Current	Single-Phase 200-240 VAC	1.7				
	А	Three-Phase 200-240 VAC			1.0		
Control Power Source			24 VDC ±5% 0.25 A				

● Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box 🗌 is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box -  $\diamondsuit$  does not appear in the product name.

For details of the standards, check the Oriental Motor website.

### Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

AC Power-Supply Input

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DC Power-Supply Input

# TS Geared Type Frame Size 60 mm

### Specifications

# **91**° ( €

Duedue	+ Nama	Built-in Controller	AZ66A_D-TS3.6-◇	AZ66A_D-TS7.2-◇	AZ66A_D-TS10-◇	AZ66A_D-TS20-◇	AZ66A_D-TS30-◇	
Produc	t Name	Pulse Input	AZ66ATS3.6-◇	AZ66ATS7.2-◇	AZ66A	AZ66A	AZ66A	
Maximum Hol	ding Torque	N∙m	1.8	3	4	5	6	
Rotor Inertial		J: kg⋅m²			370×10 <sup>-7</sup>			
Gear Ratio			3.6	7.2	10	20	30	
Resolution	Res	olution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse	
Permissible To	orque	N∙m	1.8	3	4	5	6	
Maximum Inst	tantaneous To	orque <sup>*</sup> N∙m	*	4.5	6	8	10	
Holding Torqu	e at Motor St	andstill N·m	1.3	2.6	3.7	5	6	
Speed Range		r/min	0~833	0~416	0~300	0~150	0~100	
Backlash		arcmin	35 (0.59°)	15 (0	).25)	10 (0	).17°)	
Voltage and Frequency			Sing	le-phase 100-120 VAC, sing	le-phase/three-phase 200-2	240 VAC -15~+6% 50/6	0 Hz	
Power	Input	Single-Phase 100-120 VAC		3.8				
Supply Input	Current	Single-Phase 200-240 VAC		2.3				
	А	Three-Phase 200-240 VAC			1.4			
Control Power	Source				24 VDC +5% 0 25 A			

\* For the geared motor output torque, refer to the speed - torque characteristics.

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box - is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\bigcirc$  is located within the product name.

If the connection cable is not included, the box - does not appear in the product name.

For details of the standards, check the Oriental Motor website.



### Speed – Torque Characteristics (Reference values)

Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

# PS Geared Type Frame Size 42 mm

### Specifications

Draduat	Nomo	Built-in Controller	AZ46A_D-PS5-🛇	AZ46A_D-PS7.2-🛇	AZ46A_D-PS10-🛇	AZ46A_D-PS25-🛇	AZ46A_D-PS36-🛇	AZ46A_D-PS50-◇
Product	Name	Pulse Input	AZ46A - PS5- 🛇	AZ46APS7.2-◇	AZ46A	AZ46A-PS25-🛇	AZ46A-PS36-🛇	AZ46A
Maximum Holdi	ng Torque	N∙m	1	1.	5	2.5	3	
Rotor Inertial		J: kg∙m²			55×	10 <sup>-7</sup>		
Gear Ratio			5	7.2	10	25	36	50
Resolution	Reso	olution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque N·m		N∙m	1	1.5		2.5	2.5 3	
Maximum Instantaneous Torque N·m		rque N·m	1.5	2		6		
Holding Torque	at Motor Sta	andstill N·m	0.75	1	1.5	2.5	3	
Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash		arcmin	15 (0.25°)					
	Voltage and	Frequency		Single-phase 100-120	VAC, single-phase/thre	e-phase 200-240 VAC	-15~+6% 50/60 Hz	
Power	Input	Single-Phase 100-120 VAC			2	.7		
Supply Input	Current	Single-Phase 200-240 VAC	200-240 VAC 1.7					
	Α	Three-Phase 200-240 VAC			1.	.0		
Control Power S	Source				24 VDC ±	5% 0.25 A		

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🔷 is located within the product name. If the connection cable is not included, the box - control does not appear in the product name.

For details of the standards, check the Oriental Motor website.

### Speed – Torque Characteristics (Reference values)



### Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

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# PS Geared Type Frame Size 60 mm

### Specifications

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Droduct	Nomo	Built-in Controller	AZ66A_D-PS5-🛇	AZ66A_D-PS7.2-◇	AZ66A_D-PS10-0	AZ66A_D-PS25-◇	AZ66A_D-PS36-◇	AZ66A_D-PS50-🛇
Product	Name	Pulse Input	AZ66APS5-◇	AZ66APS7.2-◇	AZ66A-PS10-	AZ66A-PS25-◇	AZ66A-PS36-🛇	AZ66A - PS50-
Maximum Hold	ling Torque	N·m	3.5	4	5		8	
Rotor Inertial		J: kg⋅m²			370>	<10 <sup>-7</sup>		
Gear Ratio			5	7.2	10	25	36	50
Resolution	Res	olution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Tor	rque	N⋅m	3.5	4	5		8	
Maximum Instantaneous Torque* N·m		*	*	11	16 20		0	
Holding Torque	at Motor St	andstill N·m	3	4	5	8		
Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash		arcmin	7 (0.12°) 9 (0.15°)					
Voltage and Frequency			Single-phase 100-120 VAC, single-phase/three-phase 200-240 VAC $-15$ $\sim$ +6% 50/60 Hz					
Power	Input	Single-Phase 100-120 VAC	C 3.8					
Supply Input	Current	Single-Phase 200-240 VAC	C 2.3					
	А	Three-Phase 200-240 VAC			1	.4		
Control Power Source					24 VDC ±	5% 0.25 A		

\* For the geared motor output torque, refer to the speed - torque characteristics.

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box - does not appear in the product name.

For details of the standards, check the Oriental Motor website.



### Speed – Torque Characteristics (Reference values)

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

# HPG Geared Type Frame Size 40 mm, 60 mm

### Specifications

Droduot	Nomo	Built-in Controller	AZ46A_D-HP5∎-◇	AZ46A_D-HP9∎-◇	AZ66A□D-HP5∎-◇	AZ66A_D-HP15∎-◇		
Pulse Input		AZ46A <mark>□</mark> -HP5∎-◇	AZ46A <mark>_</mark> -HP9∎-◇	AZ66A <mark>_</mark> -HP5∎-◇	AZ66A□-HP15∎-◇			
Maximum Hold	ling Torque	N∙m	1.5	2.5	5.9	9		
Rotor Inertial		J: kg⋅m²	55×	10-7	370×10 <sup>-7</sup>			
Inertial*1		J: kg∙m²	5.8×10 <sup>-7</sup> (4.2×10 <sup>-7</sup> )	3.4×10 <sup>-7</sup> (2.9×10 <sup>-7</sup> )	92×10 <sup>-7</sup> (86×10 <sup>-7</sup> )	78×10 <sup>-7</sup> (77×10 <sup>-7</sup> )		
Gear Ratio			5	9	5	15		
Resolution	Res	olution Setting: 1000 P/R	0.072°/Pulse	0.04°/Pulse	0.072°/Pulse	0.024°/Pulse		
Permissible To	rque <sup>*</sup>	N∙m	*	2.5	5.9	9		
Maximum Instantaneous Torque* N·m		*	*	*	*			
Holding Torque at Motor Standstill N·m		ndstill N·m	0.75	1.35	3	9		
Speed Range		r/min	0~900	0~500	0~900	0~300		
Backlash		arcmin	3 (0.05°)					
	Voltage and	Frequency	Single-phase 100-120 VAC, single-phase/three-phase 200-240 VAC $-15$ $\sim$ +6 $\%$ 50/60 Hz					
Power Supply	Input	Single-Phase 100-120 VAC	2	.7	3	.8		
Input	Current	Single-Phase 200-240 VAC	1	.7	2.3			
A Three-Phase 200-240 VAC		1	.0	1.4				
Control Power	Source		24 VDC ±5% 0.25 A					
Runout of Outp	out Flange Su	rface <sup>*2</sup> mm	0.02					
Bunout of Outpu	it Flance Inner	r (Outer) Diameter*2 mm	0.03 0.04					

\* For the geared motor output torque, refer to the speed - torque characteristics.

■Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name.
For the flange output type, F is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\diamond$  is located within the product name. If the connection cable is not included, the box  $-\diamond$  does not appear in the product name.

For details of the standards, check the Oriental Motor website

\*1 The values for the moments of inertia within the gear that has been converted to motor shaft values. The parentheses () indicate the values for the flange output type.

\*2 Specifications for the flange output type.

### Speed – Torque Characteristics (Reference values)



The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

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# Harmonic Geared Type Frame Size 42 mm, 60 mm

### Specifications

Droduot	Nomo	Built-in Controller	AZ46A_D-HS50-🛇	AZ46A_D-HS100-◇	AZ66A_D-HS50-◇	AZ66A_D-HS100-◇		
Pulse Input		AZ46A <mark>_</mark> -HS50-🛇	AZ46A-HS100-	AZ66A <mark>_</mark> -HS50-◇	AZ66A-HS100-			
Maximum Hold	ling Torque	N∙m	3.5	5	7	10		
Rotor Inertial		J: kg∙m²	72×	10-7	405>	<10 <sup>-7</sup>		
Gear Ratio			50	100	50	100		
Resolution	Res	olution Setting: 1000 P/R	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse		
Permissible Tor	rque	N∙m	3.5	5	7	10		
Maximum Insta	antaneous Tor	rque N∙m	8.3	11	23	36		
Holding Torque	at Motor Sta	ndstill N·m	3.5	5	7	10		
Speed Range		r/min	0~70	0~35	0~70	0~35		
Lost Motion		oromin	1.5 or less	1.5 or less	0.7 or less	0.7 or less		
(Load torque)		dicitiiti	(±0.16 N⋅m)	(±0.20 N⋅m)	(±0.28 N⋅m)	(±0.39 N⋅m)		
Voltage and Frequency			Single-phase 100-120 VAC, single-phase/three-phase 200-240 VAC $-15{\sim}+6\%$ 50/60 Hz					
Power Supply	Input Single-Phase 100-120 VAC		2	.7	3	.8		
Input	Current	Single-Phase 200-240 VAC	1	.7	2	.3		
	Α	Three-Phase 200-240 VAC	1	.0	1	.4		
Control Power	Source		24 VDC + 5% 0.25 A					

**91**° ( €

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box - is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name

If the connection cable is not included, the box -  $\diamondsuit$  does not appear in the product name.

For details of the standards, check the Oriental Motor website.

Note

The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

### Speed – Torque Characteristics (Reference values)



The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

### Driver Specifications

Classification	Name		Name Built-In Controller Type		Built-In Controller Type	Pulse Input Type
I/O Function	Pulse Input ion Direct Input Direct Output		_	Maximum Input Pulse Frequency: Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative Logic Pulse Input (Initial value)		
			Input Points: 10 Points	Input Points: 6 Points		
			Output Points: 6 Points			
	RS-485	Network Input	16 Points	-		
	Communication	Network Output	16 Points	_		

### Built-In Controller Type RS-485 Communication Specifications

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 Based, Straight Cable
	Use twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m.
Communication Mode	Half duplex and Start-stop synchronization (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Baud Rate	Select from 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, or 230400 bps.
Connection Type	Up to 31 units can be connected to a single programmable controller (master unit).

### General Specifications

		Matar	Driver				
		MOLOI	Built-In Controller Type	Pulse Input Type			
Heat-resistant Class		130 (B) [Recognized as 105 (A) by UL.]	-	-			
Insulation Resistance		The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: • Case - Motor Windings • Case - Electromagnetic Brake Windings <sup>℁1</sup>	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: • Protective Earth Terminal - Power Supply Terminal • Encoder Connector - Power Supply Terminal • Power Input Terminal - Power Supply Terminal				
Dielectric Strength		No abnormality is found with the following application for 1 minute: • Case - Motor Windings 1.5 kVAC, 50 Hz or 60 Hz • Case - Electromagnetic Brake Windings <sup>*1</sup> 1.5 kVAC, 50 Hz or 60 Hz	No abnormality is found with the following application for 1 minute: • Protective Earth Terminal - Power Supply Terminal 1.5 kVAC, 50 Hz or 60 Hz • Encoder Connector - Power Supply Terminal 1.8 kVAC, 50 Hz or 60 Hz • I/O Signal Terminal - Power Supply Terminal 1.8 kVAC, 50 Hz or 60 Hz				
	Ambient Temperature	$0 \sim +40^{\circ}$ C (Non-freezing)	0∼+55°C (Non-freezing)*2				
(In operation)	Ambient Humidity	85% or less (Non-condensing)					
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.					
Degree of Protection		IP65 (excluding installation surfaces and connector locations)	IP10	IP20			
Stop Position Accuracy		<b>AZ46</b> : ±4 min (±0.067°)	<b>AZ66</b> , <b>AZ69</b> : ±3 min (±0.05°)				
Shaft Runout		0.05T.I.R. (mm)* <sup>3</sup>	-	-			
Concentricity of Installation Pilot to the Shaft		0.075T.I.R. (mm)* <sup>3</sup>	-				
Perpendicularity of Installation Surface to the Shaft		0.075T.I.R. (mm)* <sup>3</sup>	-				
Range of Multiple Rotation Power OFF	Detection at	±900 Rota	±900 Rotations (1,800 rotations)				
*1 Only for electromagnetic t	orake type			0 40 075 A			

\*2 When a heat sink equivalent to an aluminum plate size of at least 200×200 mm and 2 mm thickness is installed

\*3 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution, centered on the reference axis center.



Note Do not measure insulation resistance or perform a dielectric strength test while the motor and driver are connected.

Also, do not conduct these tests on the ABZO sensor section of the motor.

### Permissible Radial Load/Permissible Axial Load

				Permissible Radial Load						
Туре	Frame Size	Product Name	Gear Ratio	Distance from Shaft End mm					Permissible Axial Load	
				0	5	10	15	20		
	42 mm	AZ46		35	44	58	85	-	4.3 [6.0]*	
Standard Type	60 mm	AZ66	- [	00	100	120	100	270	8.9 [12.7] <b>*</b>	
	60 11111	AZ69		90	100	130	160	270	14 [17.6]*	
	42 mm	A746	3.6, 7.2, 10	20	30	40	50	-	15	
TE Coored Type	42 11111	AZ40	20, 30	40	50	60	70	-	15	
<b>15</b> Geareu Type	60 mm	AZ66	3.6, 7.2, 10	120	135	150	165	180	40	
			20, 30	170	185	200	215	230	40	
	42 mm	AZ46	5, <b>7.2</b> , 10	73	84	100	123	-	50	
			25, 36, 50	109	127	150	184	-		
PS Geared Type	60 mm	AZ66	5	200	220	250	280	320	100	
			<b>7.2</b> , 10	250	270	300	340	390		
			25, 36, 50	330	360	400	450	520		
	40 mm	A746	5	130	150	170	200	230	150	
	40 11111	AZ40	9	160	180	210	240	290	150	
<b>HFG</b> dealed type	60 mm	A766	5	210	230	250	280	310	300	
		ALOO	15	290	310	340	370	400	500	
Harmonic Coarod	42 mm	AZ46	50 100	180	220	270	360	510	220	
Harmonic Geared	60 mm	AZ66	50, 100	320	370	440	550	720	450	

The product names are described with text by which the product name can be identified.

 $\ensuremath{\boldsymbol{\star}}\xspace$  The value in the brackets [ ] indicate the value for the electromagnetic brake type.

### Permissible Moment Load

Ensure that the permissible moment load at the stage of installing on the flange surface does not exceed the permissible value in the table below.

Product Name	Gear Ratio	Permissible Moment Load (N·m)
A746	5	1.9
AL40	9	2.3
	5	5.2
ALOO	15	7

The permissible moment load can be calculated with the following formula.

# Example 1: If an external force F is applied at a distance L from the center of the output flange



Harmonic Geared Type

Product Name	Gear Ratio	Permissible Moment Load (N·m)	
AZ46	50 100	5.6	
AZ66	50, 100	11.6	

The permissible moment load can be calculated with the following formula.

# Example 1: If an external force F is applied at a distance L from the center of the output flange

Moment Load  $[N \cdot m] : M = F \times L$ 



### Example 2: If an external force F1 is applied at a distance L from the output flange installation surface

Moment Load [N·m] :  $M=F1 \times (L+coefficient a)$ 



Product Name	Coefficient a (m)
AZ46	0.006
AZ66	0.011

### Load Torque - Driver Input Current Characteristics

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-axis operation can be estimated. For the geared type, convert to torque and speed by the motor shaft. Motor shaft speed = Gear output shaft speed  $\times$  Gear ratio [r/min]

Motor shaft torque = <u>Gear Partice</u> [N·m]























AZ66 C Three-Phase 200-240 VAC



AZ69 C Three-Phase 200-240 VAC



### Dimension (Unit mm)

### Motor

### $\bigcirc$ Standard Type

### Frame Size 42 mm

### 2D & 3D CAD

2D & 2D CAD

Product Name Built-in Controller Pulse Input		Motor Product Name	Mass kg	2D CAD
Duint-in Controller	i uise input			
AZ46A_D-◇	AZ46A◇	AZM46AC	0.44	B1092
Encoder Cable ¢6	70 20±1 2 15±0.25 1	42 31=02 4×M3×4. 5 5 5 5 5 5 5 5 5 5 5 5 5	<u>5 Deep</u>	
JJ100-0070 (INIDIEX) /				

### Frame Size 60 mm

	1				TP & VP CAP	
Product Name		Motor Droduct Namo		Maaalka		
Built-in Controller	Pulse Input		L	IVIASS KY	20 GAD	
AZ66A_D-◇	AZ66A <u></u> -◇	AZM66AC	72	0.91	B1093	
AZ69A_D-🛇	AZ69A◇	AZM69AC	97.5	1.4	B1129	



### $\diamondsuit$ Standard Type with Electromagnetic Brake

Frame Size 42 mm

### 2D & 3D CAD



Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name. A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box is located within the product name. If the connection cable is not included, the box - does not appear in the product name.

### Frame Size 60 mm

### 2D & 3D CAD

Produc	t Name	Motor Draduat Nama		Mass kg	2D CAD
Built-in Controller	Pulse Input	WOLDT PTOUUCL Martie	L		
AZ66M_D-🛇	AZ66M <u></u> -◇	AZM66MC	118	1.3	B1155
AZ69M_D-🛇	AZ69M□-◇	AZM69MC	143.5	1.8	B1156



### **♦ TS** Geared Type

Frame Size 42 mm					2D & 3D CAD
Produc	t Name	Motor Product Name	Coor Datio	Mass kg	
Built-in Controller	Pulse Input		Gear Rallo		20 GAD
AZ46A_D-TS	AZ46ATS◇	AZM46AC-TS	3.6, 7.2, 10, 20, 30	0.59	B1157
	101 <u>20±1</u> 3.5 12	4×M4×8 Deep 42	-1		



### Frame Size 60 mm

Frame Size 60 mm 2D & 3D CA							
Product Name		Mater Draduat Nama	Coor Datia	Maaalka			
Built-in Controller	Pulse Input	Wotor Product Name	Gear Railo	IVIASS KY	ZD GAD		
AZ66AD-TS	AZ66A -TS	AZM66AC-TS	3.6, 7.2, 10, 20, 30	1.3	B1158		

Installation Screws: M4×60 P0.7 (4 pieces included) 115



Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box - is located within the product name. A number indicating the gear ratio is entered where the box  $\blacksquare$  is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🔷 is located within the product name. If the connection cable is not included, the box -  $\Diamond$  does not appear in the product name.

### $\Diamond \mathbf{PS}$ Geared Type

Frame Size 42 mm

2D & 3D CAD

Product Name		Motor Product Namo	Coor Potio		Magalika	
Built-in Controller	Pulse Input	WOLDI FIDUULLINAITIE	ueal hallu	L	IVId55 Ky	2D GAD
AZ46AD-PS	AZ46A□-PS□-◇	AZM46AC-PS	5, <b>7.2</b> , 10	98	0.64	B1159
			25, 36, 50	121.5	0.79	B1160



### Frame Size 60 mm

### 2D & 3D CAD

Product Name		Matar Draduat Nama	Coor Datio		Maaalka	20.040
Built-in Controller	Pulse Input	Wotor Product Name	Gear Rallo	L	wass ky	2D GAD
	AZ66A - PS -	AZM66AC-PS	5, <b>7.2</b> , 10	104	1.3	B1161
			25 36 50	124	16	B1162



# ♦ HPG Geared Type Frame Size 40 mm Shaft Output Type

### Frame Size 40 mm Shaft Output Type 2D & 3D CAD Product Name Motor Product Name Gear Ratio Mass kg 2D CAD Built-in Controller Pulse Input AZM46AC-HP 5,9 B1163 AZ46A D-HP 0.71 104.5 15 2.2 <u>4×¢3.4 Thru</u> <u>M3×6 Deep</u> 15 A 015(h7) Π 29.5 12 28.5 Encoder Cable $\phi 6$ ¢10**b40**-1 Motor Cable $\Phi 8$ ዝ 55100-0670 (Molex) 5557-06R-210 (Molex) Parallel Key (Included) 15

• Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name. A number indicating the gear ratio is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. **1** (1 m), **2** (2 m) or **3** (3 m) is entered where the box  $\bigcirc$  is located within the product name. If the connection cable is not included, the box  $-\bigcirc$  does not appear in the product name.



Frame Size 60 mm Shaft Output Type

Product Name

Pulse Input

58+

<u>25-0.2</u>

25

AZ66A - HP

Motor Cable  $\varphi 8$ 

5557-06R-210 (Molex)

132

28.5

Built-in Controller

12

00

Encoder Cable  $\Phi 6$ 

55100-0670 (Molex)

AZ66A D-HP

 Product Name
 Motor Product Name
 Gear Ratio
 Mass kg
 2D CAD

 Built-in Controller
 Pulse Input
 AZ46A
 -HP
 F AZ46A
 -HP
 F 5, 9
 0.66
 B1164

Motor Product Name

AZM66AC-HP

b16\_

556

18

5-0.03

Parallel Key (Included)





The colored section for the flange output type indicates the rotating part.

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name. A number indicating the gear ratio is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\bigcirc$  is located within the product name. If the connection cable is not included, the box - $\bigcirc$  does not appear in the product name.

2



2D & 3D CAD

2D CAD

B1165

Mass kg

1.9

Gear Ratio

5,15

<u>4×∳5.5 Thru</u>

M4×8 Deep

### ◇Harmonic Geared Type Frame Size 42 mm

2D & 3D CAD

Product Name		Motor Droduot Namo	Coor Potio	Maaa ka	20 040			
Built-in Controller	Pulse Input		ueal hallu	IVIASS KY	2D GAD			
AZ46A D-HS	AZ46A HS	AZM46AC-HS	50, 100	0.65	B1167			



\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

### 2D & 3D CAD Frame Size 60 mm Product Name Motor Product Name Gear Ratio Mass kg 2D CAD Built-in Controller Pulse Input AZ66A D-HS AZM66AC-HS 50, 100 1.4 B1168 112 4×M5×10 Deep . 1.5 20 6×M4×6 Deep b25.5 -0.018(h7) $\Phi 54 - 0.030(h7)$ rotating part) 12 28.5 Encoder Cable $\phi 6$ b15\_ Motor Cable $\phi 8$ neter c S 00 Maximun φ33.5 Parallel Key (Included) 20-0.21 55100-0670 (Molex) 5557-06R-210 (Molex) 2.1

\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

• Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. **1** (1 m), **2** (2 m) or **3** (3 m) is entered where the box  $\bigcirc$  is located within the product name. If the connection cable is not included, the box - $\bigcirc$  does not appear in the product name.

### Driver ◇Built-In Controller Type

Driver Product Name: AZD-AD, AZD-CD Mass: 0.65 kg 2D CAD B1095 3D CAD



Connector (CN4) for the main power supply and regeneration

Connector: 05JFAT-SAXGDK-H5.0

Connector: DFMC1,5/12-ST-3,5

Connector for 24 VDC Power-Supply Input/Electromagnetic Brake Connection/Regeneration Unit Thermal Input/Power Cutoff Signal I/O

Connector: DFMC1,5/7-ST-3,5-LR

Connector wiring lever: J-FAT-0T

DC Power-Supply Input

### Cables for Motor (Included), Cables for Encoder (Included), Cables for Electromagnetic Brake (Included) Only with products supplied with a connection cable

3



### 

Cable for Electromagnetic Brake 3 m

Cable Type	Length L (m)
Cables for Encoder 1 m	1
Cables for Encoder 2 m	2
Cables for Encoder 3 m	3



80

**Driver Side** 

Motor Side

Motor Side

(14

23.9

♦ Cables for Electromagnetic Brake (Electromagnetic brake type only) Stick Terminal: Al0.5-10WH (Phoenix Contact) Length L (m) 5559-02P-210 Cable Type (Molex) Cable for Electromagnetic Brake 1 m 1 **F** ŧ₽₹ nillin - 14 Cable for Electromagnetic Brake 2 m 2 19) φ4.1

### Note

The motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the product).
# Connection and Operation (Built-in controller type)

# Names and Functions of Driver Parts



#### **1** Signal Monitor Indication

# ♦ LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

## 2 Unit Setting Switch

Indication	Function
ID	Set this when you use RS-485 communication. Set the unit number (factory default setting: 0).

# **3** Baud Rate Setting Switch

Indication	Function	
BAUD	Set this when you use RS-485 communication. Set the baud rate (factory default setting: 7).	

# **4** Function Switch

Indication	No.	Function	
SW1	1	Use in combination with the axis setting switch (ID) to set the axis number (Factory setting: OFF).	
	2	Set the RS-485 communication protocol (factory default setting: OFF).	

# ◇RS-485 Baud Rate Setting

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5	230400
6	Not used
7 Network Converters	
8~F	Not used

# **5** Terminating Resistor Setting Switch

Indication	No.	Function
TERM.	1	Set the terminating resistor (120 $\Omega$ ) for RS-485 communication (Factory setting: OFF).
	2	OFF: Terminating resistor not used ON: Terminating resistor used

Configure both No. 1 and No. 2 to the same setting.

#### 6 I/O Signals Connector (CN5)

Indication	Pin No.	Signal Name	Description	
	1	INO	START	This signal is used to start positioning operation.
	2	IN2	M1	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	IN6	STOP	Stops the motor.
	5	IN-COM [0-7]*1	INO~IN7 Input Common	
	6	IN8	FW-JOG	Starts the JOG operation.
	7	OUTO	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	OUT2	PLS-RDY	Not used.
	9	OUT4	MOVE	It will be output during motor operation.
	10	OUT-COM <sup>*1</sup>	Output Common	
	11	ASG +	A-Phase Pulse Output +	
CN5	12	BSG +	B-Phase Pulse Output +	
	13	IN1	MO	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
	14	IN3	M2	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
	15	IN5	FREE	Stops motor excitation.
	16	IN7	ALM-RST	Resets the alarms.
	17	IN-COM [8-9]*1	IN8, IN9 Input Common	
	18	IN9	RV-JOG	Starts the JOG operation.
	19	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	OUT3	READY	Outputs when the driver is ready for operation.
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	GND*1	Ground	
	23	ASG —	A-Phase Pulse Output –	
	24	BSG —	B-Phase Pulse Output –	

• You can set functions to assign by using parameters. Initial values are shown above. For details, refer to the Fuctions section.

 $\ensuremath{\ast} 1$  Initial settings cannot be changed.

# Connector for 24 VDC Power-Supply Input/Electromagnetic Brake/Regeneration Unit Thermal Input/Power Cutoff Signal Input/Power Cutoff Monitor Output Terminals (CN1)

Indication	I/0	Terminal Name	Description	
+24V	Innut	24 VDC Power Input Terminal +	The power supply for the driver control circuit. Always connect when using.	
0V	input	24 VDC Power Input Terminal –		
MB1	Output	Electromagnetic Brake Connection Terminal -	For an electromagnetic brake type mater, connect the electromagnetic brake cable line here	
MB2	Output	Electromagnetic Brake Connection Terminal +	ror an electromagnetic brake type motor, connect the electromagnetic brake cable line here.	
TH1	Innut	Regeneration Unit Thermal Input Terminal	Connect the accessory (sold separately) regeneration unit (RGB100).	
TH2	input	Regeneration Unit Thermal Input Terminal	When not connecting a regeneration unit, short these 2 terminals to each other.	
+HWT01		Power Cutoff Signal Input Terminal 1+		
-HWT01	Innut	Power Cutoff Signal Input Terminall 1–	Connect the switches and the programmable controller.	
+HWT02	input	Power Cutoff Signal Input Terminal 2+	without passing through the CPU to stop the motor	
-HWT02		Power Cutoff Signal Input Terminal 2–		
+EDM	Output	Power Cutoff Monitor Output Terminal +	Connects the programmable controller.	
-EDM	υιιραι	Power Cutoff Monitor Output Terminal –	If both the HWT01 input and HWT02 input are OFF, EDM output will be turned to ON.	

# Connection Diagram



- 1 Products are available with a 1 m, 2 m or 3 m cable for motor and driver and also without. If you need cables longer than 3 m or flexible cables, select appropriate cables from the accessories (sold separately). Keep the wiring distance between the motor and driver to 20 m or less.
- \*2 Not supplied.
- \*3 Connect to the controller when controlling by RS-485 communication.

#### $\bigcirc$ Connecting the Main Power Supply

The connection method varies depending on power supply specifications.



#### $\diamondsuit$ Connection of the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXEO2** is installed. Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cabla	Length: 3 m or less
Cable	Configuration: A-mini-B



AC Power-Supply Input

## $\bigcirc$ Connection to Programmable Controller

# • Connection Diagram for Connection with Current Sink Output Circuit

Controller	_	Driver
	INO	
-		4.7 kΩ 2.2 kΩ ↓ ≠
	IN1	
	IN2	
-		4.7 kΩ 2.2 kΩ ΣΔ=
	IN3	
	IN4	$4.7 \text{ k}\Omega \qquad 2.2 \text{ k}\Omega \qquad 4.7 \text{ k}\Omega$
-		4.7 kΩ 2.2 kΩ ΨΔ=ζ
	IN5	
$-\langle $		4.7 kΩ 2.2 kΩ ΨΔ=ζ
	IN6	
	INI7	4.7 KΩ2 2.2 KΩ2 ¥4.∓
	IN-COM[0-7]	4.7 kΩ 2.2 kΩ ΨΔ=
0 V V	IN8	
-		4.7 kΩ [2.2 kΩ ↓↓ = ↓
7	IN9	
	IN-COM[8-9]	$4.7 \text{ k}\Omega \qquad 2.2 \text{ k}\Omega \qquad          $
0 V ↓ 12~24 VDC △		
		_
	R0 OUT1	
	R0 OUT2	
>≠¥	R0 OUT3	Saturation voltage
Image: The second s	R0 OUTA	
>≠₹	R0 OUT5	
	OUT-COM	
0 V 🗸 🔒	ASG +	
	XASG	26C21 or Equivalent
	BSG +	
	X	
	GND	<u> </u>
0 V 🗸		↓ o v
	•	

#### Note

Use 24 VDC for the input signals.

● Use 12 ~ 24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R₀ to reduce the current to 10 mA or below. ● Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).

Do not run the signal lines in the same piping as power lines or bundle them with power lines.

If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

# ♦ Connection to Programmable Controller

Connection Diagram for Connection with Current Source Output Circuit



#### Note

Use 24 VDC for the input signals.

● Use 12 ~ 24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R₀ to reduce the current to 10 mA or less.

Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).

Do not run the signal lines in the same piping as power lines or bundle them with power lines.

If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

# Connection and Operation (Pulse input type)

# Names and Functions of Driver Parts



## **1** Signal Monitor Indication

# ♦ LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
READY	Green	READY Output	When READY output is ON

#### 2 Current Setting Switch

Indication	Function
CURRENT	Set the base current, which is the basis of the running current and the standstill current (Factory setting: F).

# **3** Command Filter Setting Switch

Indication	Function
FIL	Adjust the responsiveness of the motor (Factory setting: 1).

# **4** Function Switch

Indication	No.	Function				
SW1	1	Sets the resolution per one rotation of the motor output shaft (Factory setting: OFF [1000 p/r])				
	2	Sets the pulse input mode as either 1-pulse input mode or 2-pulse input mode. (Factory setting: OFF [2-Pulse Input Mode])				

## 5 I/O Signals Connector (CN5)

Indication	Pin No.	Signal Name		Description				
	1	CW+ [PLS+]*1	CW Pulse Input + [Pulse Input +]					
	2	CCW+ [DIR+]*1	CCW Pulse Input + [Rotation Direction Input +]					
	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.				
	4	IN6	STOP	Stops the motor.				
	5	IN-COM [4-7]*1	IN4~IN7 Input common					
	6	IN8	FW-JOG	Starts the JOG operation.				
	7	OUTO	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.				
	8	OUT2	PLS-RDY	Output when the pulse input preparation is completed.				
	9	OUT4	MOVE	Output during motor operation.				
	10	0UT-COM*1	Output Common					
	11	ASG +	A-Phase Pulse Output +					
CN5	12	BSG +	B-Phase Pulse Output +					
	13	CW- [PLS-]*1	CW Pulse Input – [Pulse Input –]					
	14	CCW- [DIR-]*1	CCW Pulse Input – [Rotation Direction Input –]					
	15	IN5	FREE	Stops motor excitation.				
	16	IN7	ALM-RST	Resets the alarms.				
	17	IN-COM [8-9]*1	IN8, IN9 Input Common					
	18	IN9	RV-JOG	Starts the JOG operation.				
	19	OUT1	IN-POS	Outputs when the motor operation is finished.				
	20	OUT3	READY	Outputs when the driver is ready for operation.				
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).				
	22	GND*1	Ground					
	23	ASG —	A-Phase Pulse Output –					
	24	BSG —	B-Phase Pulse Output –					

• You can set functions to assign by using parameters. Initial values are shown above. For details, refer to the Fuctions section.

\*1 Initial settings cannot be changed.

# 6 Connector for 24 VDC Power-Supply Input/Electromagnetic Brake/Regeneration Unit Thermal Input/Power Cutoff Signal Input/Power Cutoff Monitor Output Terminals (CN1)

Indication	I/0	Terminal Name	Description			
+24V	Input	24 VDC Power Input Terminal +	The newer supply for the driver central circuit Always connect when using			
0V	input	24 VDC Power Input Terminal –	The power supply for the driver control circuit. Always connect when using.			
MB1	Output	Electromagnetic Brake Connection Terminal –	For an alastronometic busine tractor account the electronometic busine achieves			
MB2	Uutput	Electromagnetic Brake Connection Terminal +	For all electromagnetic brake type motor, connect the electromagnetic brake cable line here.			
TH1	Innut	Regeneration Unit Thermal Input Terminal	Connect the accessory (sold separately) regeneration unit ( <b>RGB100</b> ).			
TH2	input	Regeneration Unit Thermal Input Terminal	n not connecting a regeneration unit, short these 2 terminals to each other.			
+HWT01		Power Cutoff Signal Input Terminal 1+				
-HWT01	Innut	Power Cutoff Signal Input Terminal 1-	Connect the switches and the programmable controllers.			
+HWT02	input	Power Cutoff Signal Input Terminal 2+	without passing through the CPII to stop the motor			
-HWT02		Power Cutoff Signal Input Terminal 2–				
+EDM	M Power Cutoff Monitor Output Terminal + Connect to the programmable controller.		Connect to the programmable controller.			
-EDM	υιίραι	Power Cutoff Monitor Output Terminal –	If both the HWT01 input and HWT02 input are OFF, EDM output will be turned to ON.			

AC Power-Supply Input

# Connection Diagram



Keep the wiring distance between the motor and driver to 20 m or less.

\*2 Not supplied.

## $\Diamond$ Connecting the Main Power Supply

The connection method varies depending on power supply specifications.



## $\diamondsuit$ Connecting the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXEO2** is installed. Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cablo	Length: 3 m or less
Cable	Configuration: A-mini-B

# Connection to Programmable Controller Connection Diagram for Connection with Current Sink Output Circuit





#### When the Pulse Input is Open Collector



#### Note

Use 24 VDC for the input signals.

- $\blacksquare$  Use 12  $\sim$  24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R<sub>0</sub> to reduce the current to 10 mA or less.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
- Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

# Note

●Use 5 ~ 24 VDC for the CW (PLS) and CCW (DIR) inputs. If voltage exceeding 5 VDC is applied, connect an external resistor R₁ and adjust so that the input current becomes 7 to 20 mA.

## ♦ Connection to Programmable Controller

# • Connection Diagram for Connection with Current Source Output Circuit

When the Pulse Input is the Line Driver



#### When the Pulse Input is Open Collector



# Note

Use 24 VDC for the input signals.

- $\blacksquare$  Use 12  $\sim$  24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R<sub>0</sub> to reduce the current to 10 mA or less.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
- Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

# Note

Use 5  $\sim$  24 VDC for the CW (PLS) and CCW (DIR) inputs.

If voltage exceeding 5 VDC is applied, connect an external resistor  $R_1$  and adjust so that the input current becomes 7 to 20 mA.

# Motor and Driver Combinations

The product names for motor and driver combinations are shown below.

#### Built-In Controller Type

Туре	Type Product Name Motor Product Name			
	AZ46A_D-◇	AZM46AC		
Standard Type	AZ66A_D-◇	AZM66AC		
	AZ69A_D-◇	AZM69AC		
Otors doub True a	AZ46M_D-◇	AZM46MC		
Standard Type	AZ66M_D-◇	AZM66MC		
Liectionagnetic brake type	AZ69M_D-◇	AZM69MC		
	AZ46AD-TS	AZM46AC-TS		
IS dealed type	AZ66AD-TS	AZM66AC-TS		
<b>BS</b> Coared Type	AZ46AD-PS	AZM46AC-PS	AZD-	
<b>PS</b> dealed Type	AZ66AD-PS	AZM66AC-PS		
	AZ46AD-HP	AZM46AC-HP		
	AZ46AD-HPEF-◇	AZM46AC-HP		
<b>HFG</b> dealed type	AZ66A_D-HP◇	AZM66AC-HP		
	AZ66A_D-HP_F-◇	AZM66AC-HP	]	
Hermonia Coared Type	AZ46AD-HSD-	AZM46AC-HS		
папнопіс веагей Туре	AZ66AD-HS	AZM66AC-HS	]	

# Pulse Input Type

Туре	Product Name	Motor Product Name	Driver Product Name
	AZ46A◇	AZM46AC	
Standard Type	AZ66A◇	AZM66AC	
	AZ69A◇	AZM69AC	
Chandend Ture	AZ46M◇	AZM46MC	
Standard Type	AZ66M◇	AZM66MC	
Licenomagnetic brake Type	AZ69M◇	AZM69MC	
TS Coored Tupo	AZ46ATS◇	AZM46AC-TS	
<b>IS</b> dealed Type	AZ66A	AZM66AC-TS	
BE Coored Type	AZ46A-PS-	AZM46AC-PS	AZD-
<b>FS</b> dealed Type	AZ66APS◇	AZM66AC-PS	
	AZ46AHP	AZM46AC-HP	
	AZ46AHP_F-◇	AZM46AC-HP <b></b> ■F	
<b>HFG</b> dealed type	AZ66A - HP -	AZM66AC-HP	
	AZ66A - HP F-	AZM66AC-HP	]
Harmonic Goard Typo	AZ46A -HS	AZM46AC-HS	]
папнопь осагси туре	AZ66A <b>□</b> -HS <b>□</b> -◇	AZM66AC-HS	]

Either A (single-phase 100-120 VAC) or C (single-phase 200-240 VAC) indicating the power supply voltage is entered where the box is located within the product name. A number indicating the gear ratio is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\Diamond$  is located within the product name.

If the connection cable is not included, the box "  $\diamond$  does not appear in the product name.

AC Power-Supply Input

# 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.

\*1 Not supplied.\*2 Only with products supplied with a connection cable.



System Configuration Example

		Sold Separately				
AZ Series	+	Motor Mounting Brackets	Flexible Couplings	General-Purpose Cables (1 m)		
AZ66MKD-3		PAL2P-5	MCV251010	CC16D010B-1		

The system configuration shown above is an example. Other combinations are available.

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

An example of a single-axis system configuration with the **EMP400** Series controller is shown below.

\*1 Not supplied.\*2 Only with products supplied with a connection cable.



The Features section that describes the operating methods for these products is available. For details, please contact the nearest Oriental Motor sales office, or download from the Oriental Motor website. http://www.orientalmotor.com.sg/



		Sold Separately						
AZ Series	Controllor	Motor	Elovible Couplings	General-Purpose Cables	Connector - Terminal Block			
+	Gontroller	Mounting Brackets	i lexible couplings	(1 m)	Conversion Unit (1 m)			
AZ66MK-3	EMP401-1	PAL2P-5	MCV251010	CC16D010B-1	CC50T10E			

The system configuration shown above is an example. Other combinations are available.

DC Power-Supply Input

AC Power-Supply Input

# Product Number Code

Star	ndarc	і Тур К		K	D	_	1			
1	2	3	4	5	6		10			
Gea	red 1	Гуре								
AZ	6	6	A	Κ	D	-	HP	15	F·	• 1
$\bigcirc$	$\bigcirc$	3	(4)	(5)	6		$\overline{\mathcal{O}}$	8	9	10

1	Series Name	AZ: AZ Series					
2	Motor Frame Size	<b>4</b> : 42 mm (40 mm for the <b>HPG</b> Geared Type) <b>6</b> : 60 mm					
3	Motor Case Length						
4	Configuration	A: Single Shaft M: Electromagnetic Brake Type					
5	Power Supply Input	<b>K</b> : 24/48 VDC					
6	Driver Type	D: Built-In Controller Type Blank: Pulse Input Type					
7	Gear Type	TS: TS Geared Type PS: PS Geared Type HP: HPG Geared Type HS: Harmonic Geared Type					
8	Gear Ratio	<u>.</u>					
9	Output Shaft Type*	Blank: Shaft Output <b>F</b> : Flange Output					
10	Connection Cable	Number: Included Connection Cable Length <b>1</b> : 1m <b>2</b> : 2m <b>3</b> : 3m None: Connection cable not included					

\*HPG geared type only

# Types

Built-In Controller Type

 $\Diamond$ Standard Type

Product Name

AZ46AKD-\(\circ) AZ66AKD-\(\circ)

AZ69AKD-

## $\bigcirc$ Standard Type with Electromagnetic Brake

Product Name
AZ46MKD-🔷
AZ66MKD-🔷
AZ69MKD-🔿

#### **♦ TS** Geared Type

Product Name
AZ46AKD-TS3.6-🔿
AZ46AKD-TS7.2-🛇
AZ46AKD-TS10-🔷
AZ46AKD-TS20-🔷
AZ46AKD-TS30-🛇
AZ66AKD-TS3.6-🛇
AZ66AKD-TS7.2-🔿
AZ66AKD-TS10-🔷
AZ66AKD-TS20-🛇
AZ66AKD-TS30-🔷

#### $\diamondsuit \textbf{PS}$ Geared Type

Product Name
AZ46AKD-PS5-🔷
AZ46AKD-PS7.2-🔿
AZ46AKD-PS10-🔷
AZ46AKD-PS25-🛇
AZ46AKD-PS36-🔿
AZ46AKD-PS50-🔿
AZ66AKD-PS5-🛇
AZ66AKD-PS7.2-🔿
AZ66AKD-PS10-🔿
AZ66AKD-PS25-🛇
AZ66AKD-PS36-🔿
AZ66AKD-PS50-🔷

#### $\bigcirc$ HPG Geared Type

Product Name
AZ46AKD-HP5-🛇
AZ46AKD-HP5F-🛇
AZ46AKD-HP9-🔷
AZ46AKD-HP9F-🔷
AZ66AKD-HP5-🛇
AZ66AKD-HP5F-🔿
AZ66AKD-HP15-🔷
AZ66AKD-HP15F-🛇

♦ Harmonic Geared Type

Product Name
AZ46AKD-HS50-🔷
AZ46AKD-HS100-🛇
AZ66AKD-HS50-🔷
AZ66AKD-HS100-

- The following items are included in each product. -

Motor, Parallel Key\*1, Motor Installation Screws\*2, Driver, Cable for Motor\*3, Cable for Encoder\*3, Cable for Electromagnetic Brake (For electromagnetic brake type only)\*3, Connector Set for Driver, Operating Manual

- $\ensuremath{\,{\star}} 1$  Only for products with a key slot on the output shaft.
- \*2~ Only for TS Geared Type with Frame Size 60 mm
- \*3 Only with products supplied with a connection cable. In the following cases, purchase an accessory cable (sold separately):
- When using a flexible cable
- When using a cable longer than 3 m
- When buying products without an included cable

#### Note

The motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the product).

Pulse Input Type	
Standard Type	♦ HPG Geared Type
Product Name	Product Name
	AZ46AK-HP5F-
AZ69AK-	AZ46AK-HP9-
	AZ46AK-HP9F-
	AZ66AK-HP5-
	AZ66AK-HP5F-
	AZ66AK-HP15-
	AZ66AK-HP15F-🛇
	$\Diamond$ Harmonic Geared Type
	Product Name
	AZ46AK-HS50-
Product Name	AZ46AK-HS100-
AZ46AK-TS3.6-\>	AZ66AK-HS50-
	AZ66AK-HS100-
AZ40AK-1510->	A number indicating the length of desired connection cable, if included, 1 (1 m), 2 (2 m) or 3
AZ40AR-1520->	(3 m) is entered where the box $\diamondsuit$ is located within the product name. If the connection cable is
AZ40AR-1550->	not included, the box - $\diamondsuit$ does not appear in the product name.
AZ66AK-153.0->	The following items are included in each product.
AZ66AK-TS10-	Motor Parallel Kev <sup>*1</sup> Motor Installation Screws <sup>*2</sup> Driver Cable for Motor <sup>*3</sup> Cable for
Δ766ΔΚ-Τ520-	Encoder*3, Cable for Electromagnetic Brake (For electromagnetic brake type only)*3,
AZ66AK-TS30-	Connector Set for Driver, Operating Manual
	*1 Only for products with a key slot on the output shaft.
	*2 Only for <b>TS</b> Geared Type with Frame Size 60 mm
	*3 Only with products supplied with a connection cable. In the following cases, purchase
	an accessory cable (sold separately):
	When using a flexible cable     When using a scale langer than 2 m
	When buying products without an included cable
	• When buying products without an included cable
AZ40AR-F325->	Note
AZ40AR-F350-~	The motor cable from the motor and the electromagnetic brake cable cannot be connected
Δ766ΔΚ-Ρ\$5-	directly to the driver. When connecting to the driver, use an accessory (separately sold)
AZ66AK-PS7.2-	connection cable or the included connection cable (if the connection cable is included with the
AZ66AK-PS10-	product).
AZ66AK-PS25-	
AZ66AK-PS36-	
AZ66AK-PS50-	
¥	

# How to Read Specifications Table

Maximum Holding Torque	: The maximum holding torque (holding force) of the motor when power (rated current) is being supplied but the motor shaft is at standstill. (With geared types, the permissible strength of the gear is given consideration for this value.)						
Permissible Torque	The maximum value of the torque that can be continuously applied on the output gear shaft.						
Maximum Instantaneous Torque	: This is the maximum torque value that can be applied to the output gear shaft during acceleration/deceleration like when an inertial load is started and stopped.						
Holding Torque at Motor Standstill	While Power is ON       : Holding torque when the automatic current cutback function is active.         Electromagnetic Brake       : Static friction torque when the electromagnetic brake is activated at standstill. (Electromagnetic brake is power off activated type.)						

AC Power-Supply Input

# Standard Type Frame Size 42 mm, 60 mm Standard Type with Electromagnetic Brake Frame Size 42 mm, 60 mm

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# Specifications

Built-in Controller	AZ46□KD-◇	AZ66□KD-◇	AZ69□KD-◇
Pulse Input	AZ46□K-◇	AZ66□K-◇	AZ69□K-◇
N∙m	0.3	1	2
Power ON N·m	0.15	0.5	1
Electromagnetic Brake N·m	0.15	0.5	1
J: kg⋅m²	55×10 <sup>-7</sup> (71×10 <sup>-7</sup> )*1	370×10 <sup>-7</sup> (530×10 <sup>-7</sup> )*1	740×10 <sup>-7</sup> (900×10 <sup>-7</sup> )*1
Resolution Setting: 1000 P/R		0.36°/Pulse	
Voltage	24	VDC ±5% <sup>*2</sup> /48 VDC ±5%	*3
Input Current A	1.72 (1.8) <sup>*1</sup>	3.55 (3.8)*1	3.45 (3.7) <sup>*1</sup>
	Built-in Controller           Pulse Input           Power ON         N·m           Electromagnetic Brake         N·m           J: kg·m <sup>2</sup> Resolution Setting: 1000 P/R           Voltage           Input Current	Built-in Controller         AZ46□KD-◇           Pulse Input         AZ46□K-◇           N·m         0.3           Power ON         N·m         0.15           Electromagnetic Brake         N·m         0.15           J: kg·m²         55×10 <sup>-7</sup> (71×10 <sup>-7</sup> )*1           Resolution Setting: 1000 P/R         24           Input Current         A         1.72 (1.8)*1	Built-in Controller         AZ46□KD-◇         AZ66□KD-◇           Pulse Input         AZ46□K-◇         AZ66□K-◇           N·m         0.3         1           Power ON         N·m         0.15         0.5           Electromagnetic Brake         N·m         0.15         0.5           J: kg·m²         55×10 <sup>-7</sup> (71×10 <sup>-7</sup> )*1         370×10 <sup>-7</sup> (530×10 <sup>-7</sup> )*1           Resolution Setting: 1000 P/R         0.36°/Pulse           Voltage         24 VDC ±5%*2/48 VDC ±5%           Input Current         A         1.72 (1.8)*1         3.55 (3.8)*1

Either A (single shaft) or M (electromagnetic brake type) indicating the configuration is entered where the box is located within the product name. A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box is located within the product name. If the connection cable is not included, the box - does not appear in the product name.

\*1 The parentheses () indicate the specifications for the electromagnetic brake type.

\*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using an accessory cable (sold separately).

\*3 When the motor is operated from 48 VDC input, use an inertial load 10 times of the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding AZ46)



# Speed – Torque Characteristics (Reference values)

Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

# TS Geared Type Frame Size 42 mm

# Specifications

Droduct Namo	Built-in Controller	AZ46AKD-TS3.6-🛇	AZ46AKD-TS7.2-🛇	AZ46AKD-TS10-🔷	AZ46AKD-TS20-🔷	AZ46AKD-TS30-🔷		
FIOUUCI Name	Pulse Input	AZ46AK-TS3.6-🛇	AZ46AK-TS7.2-🛇	AZ46AK-TS10-🔷	AZ46AK-TS20-🛇	AZ46AK-TS30-🔷		
Maximum Holding Torque	N∙m	0.65	1.2	1.7	2	2.3		
Rotor Inertial	J:kg∙m <sup>2</sup>			55×10 <sup>-7</sup>				
Gear Ratio		3.6	7.2	10	20	30		
Resolution Res	olution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse		
Permissible Torque	N∙m	0.65	1.2	1.7	2	2.3		
Maximum Instantaneous Torque* N·m		0.85	1.6	2	*	3		
Holding Torque at Motor St	andstill N·m	0.54	1	1.5	1.8	2.3		
Speed Range	r/min	0~833	0~416	0~300	0~150	0~100		
Backlash	arcmin	45 (0.75°) 25 (0.42°) 15 (0.25°)				).25°)		
Device Construction	Voltage		24 VDC ±5%/48 VDC ±5%					
	Input Current A	1.72						

\* For the geared motor output torque, refer to the speed – torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box - does not appear in the product name.

# Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

# TS Geared Type Frame Size 60 mm

# Specifications

Draduat Nama	Built-in Controller	AZ66AKD-TS3.6-◇	AZ66AKD-TS7.2-🔿	AZ66AKD-TS10-🔷	AZ66AKD-TS20-🔷	AZ66AKD-TS30-🔷
Product Name	Pulse Input	AZ66AK-TS3.6-🛇	AZ66AK-TS7.2-🛇	AZ66AK-TS10-🔷	AZ66AK-TS20-🔷	AZ66AK-TS30-🛇
Maximum Holding Torque	N⋅m	1.8	3	4	5	6
Rotor Inertial	J: kg · m²			370×10 <sup>-7</sup>		
Gear Ratio		3.6	7.2	10	20	30
Resolution Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N⋅m	1.8	3	4	5	6
Maximum Instantaneous Torque* N·m		*	*	*	8	10
Holding Torque at Motor S	andstill N·m	1.1	2.2	3	5	6
Speed Range	r/min	0~833	0~416	0~300	0~150	0~100
Backlash	arcmin	35 (0.59°) 15 (0.25°) 10 (0.17°)				).17°)
Davier Curali Janut	Voltage		2	4 VDC ±5%/48 VDC ±5%*	:1	
	Input Current A			3.55		

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\* For the geared motor output torque, refer to the speed - torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box - does not appear in the product name.

\*1 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

# Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

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# PS Geared Type Frame Size 42 mm

# Specifications

Droduct Namo	Built-in Controller	AZ46AKD-PS5-🛇	AZ46AKD-P\$7.2-🛇	AZ46AKD-PS10-🛇	AZ46AKD-PS25-🛇	AZ46AKD-PS36-🛇	AZ46AKD-PS50-🛇	
FIUUUGENAIIIC	Pulse Input	AZ46AK-PS5-🛇	AZ46AK-PS7.2-🛇	AZ46AK-PS10-🛇	AZ46AK-PS25-🛇	AZ46AK-PS36-🛇	AZ46AK-PS50-🛇	
Maximum Holding Torque	N∙m	1	1.	.5	2.5	3	3	
Rotor Inertial	J: kg · m <sup>2</sup>			55×	10 <sup>-7</sup>			
Gear Ratio		5	7.2	10	25	36	50	
Resolution Re	solution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse	
Permissible Torque	N∙m	1	1.	.5	2.5	3	3	
Maximum Instantaneous	Torque <sup>*</sup> N∙m	*	2		6	*	6	
Holding Torque at Motor S	Standstill N·m	0.75	1	1.5	2.5	3	}	
Speed Range	r/min	0~600	0~416	0~300	0~120	0~83	0~60	
Backlash	arcmin		15 (0.25°)					
Power Supply Input	Voltage		24 VDC $\pm$ 5%/48 VDC $\pm$ 5%					
	Input Current A		1.72					

\* For the geared motor output torque, refer to the speed – torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box - does not appear in the product name.

Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

# PS Geared Type Frame Size 60 mm

# Specifications

Droduct Namo	Built-in Controller		AZ66AKD-PS5-🛇	AZ66AKD-PS7.2-🛇	AZ66AKD-PS10-🛇	AZ66AKD-PS25-🛇	AZ66AKD-PS36-🛇	AZ66AKD-PS50-🛇
Product Marine	Pulse Input		AZ66AK-PS5-🛇	AZ66AK-PS7.2-🛇	AZ66AK-PS10-🛇	AZ66AK-PS25-🛇	AZ66AK-PS36-🛇	AZ66AK-PS50-🛇
Maximum Holding Torq	le	N∙m	3.5	4	5		8	
Rotor Inertial	J: kg	∙m²			370>	<10 <sup>-7</sup>		
Gear Ratio			5	7.2	10	25	36	50
Resolution I	Resolution Setting: 1000	P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N∙m	3.5	4	5	8		
Maximum Instantaneou	s Torque <sup>*</sup>	N∙m	*	*	*	*	*	20
Holding Torque at Motor	<sup>r</sup> Standstill	N∙m	2.5	3.6	5	7.6	8	3
Speed Range	r/	/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash	arc	min	7 (0.12°) 9 (0.15°)					
Power Supply Input	Voltage			24 VDC ±5%/48 VDC ±5%*1				
	Input Current	Α		3.55				

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\* For the geared motor output torque, refer to the speed – torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box - $\diamondsuit$  does not appear in the product name.

\*1 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

# Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

# HPG Geared Type Frame Size 40 mm, 60 mm

# Specifications

Draduat Nama	Built-in Controller	AZ46AKD-HP5∎-◇	AZ46AKD-HP9∎-◇	AZ66AKD-HP5∎-◇	AZ66AKD-HP15∎-◇	
Product Name	Pulse Input	AZ46AK-HP5∎-◇	AZ46AK-HP9∎-◇	AZ66AK-HP5∎-◇	AZ66AK-HP15∎-◇	
Maximum Holding Torque	N∙m	1.5	2.5	5	9	
Rotor Inertial	J: kg · m <sup>2</sup>	55×	10 <sup>-7</sup>	370>	<10 <sup>-7</sup>	
Inertia <sup>*1</sup>	J: kg · m <sup>2</sup>	5.8×10 <sup>-7</sup> (4.2×10 <sup>-7</sup> )	3.4×10 <sup>-7</sup> (2.9×10 <sup>-7</sup> )	92×10 <sup>-7</sup> (86×10 <sup>-7</sup> )	78×10 <sup>-7</sup> (77×10 <sup>-7</sup> )	
Gear Ratio		5	9	5	15	
Resolution Res	solution Setting: 1000 P/R	0.072°/Pulse	0.04°/Pulse	0.072°/Pulse	0.024°/Pulse	
Permissible Torque*	N∙m	*	2.5	*	9	
Maximum Instantaneous Torque* N·m		*	*	*	*	
Holding Torque at Motor Standstill N·m		0.75	1.35	2.5	7.5	
Speed Range	r/min	0~800	0~444	0~600	0~200	
Backlash	arcmin		3 (0	.05°)		
Voltage		24 VDC ±5%/48 VDC ±5% <sup>*3</sup>				
Power Supply Input	Input Current A	1.	72	3.55		
Runout of Output Flange Su	ırface <sup>*2</sup> mm	nm 0.02				
Runout of Output Flange Inne	er (Outer) Diameter*2 mm	0.	03	0.	04	

\* For the geared motor output torque, refer to the speed - torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗘 is located within the product name.

If the connection cable is not included, the box - $\diamondsuit$  does not appear in the product name.

● For the flange output type, **F** is entered where the box **I** is located within the product name.

\*1 The values for the moments of inertia within the gear that has been converted to motor shaft values. The parentheses () indicate the values for the flange output type.

\*2 Specifications for the flange output type.

\*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding AZ46)

--- 48 VDC

400

60 70

--- 48 VDC 24 VDC

250

60

200

50

24 VDC

# Speed – Torque Characteristics (Reference values)







The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

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# Harmonic Geared Type Frame Size 42 mm, 60 mm

# Specifications

Draduat Nama	Built-in Controller	AZ46AKD-HS50-🔷	AZ46AKD-HS100-🔷	AZ66AKD-HS50-🔷	AZ66AKD-HS100-🔷	
Product Name	Pulse Input	AZ46AK-HS50-🛇	AZ46AK-HS100-🛇	AZ66AK-HS50-🛇	AZ66AK-HS100-🛇	
Maximum Holding Torq	ue N·m	3.5	5	7	10	
Rotor Inertial	J: kg · m <sup>2</sup>	72×	<10 <sup>-7</sup>	405>	<10 <sup>-7</sup>	
Gear Ratio		50	100	50	100	
Resolution	Resolution Setting: 1000 P/R	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	
Permissible Torque	N⋅m	3.5	5	7	10	
Maximum Instantaneou	ıs Torque <sup>*</sup> N∙m	8.3	11	*	36	
Holding Torque at Moto	r Standstill N·m	3.5	5	7	10	
Speed Range	r/min	0~70	0~35	0~60	0~30	
Lost Motion	oromin	1.55 or less	1.55 or less	0.75 or less	0.75 or less	
(Load torque)	alumin	(±0.16 N⋅m)	(±0.20 N⋅m)	(±0.28 N⋅m)	(±0.39 N⋅m)	
Dowor Cupply Input	Voltage	24 VDC ±5%/48 VDC ±5%*1				
rower supply input	Input Current A	1.	72	3.55		

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\* For the geared motor output torque, refer to the speed - torque characteristics.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🗇 is located within the product name.

If the connection cable is not included, the box  $-\diamondsuit$  does not appear in the product name.

\*1 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding AZ46)

The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

# Speed – Torque Characteristics (Reference values)



Note

The speed-torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

# Driver Specifications

Classification		Name	Built-In Controller Type	Pulse Input Type	
I/O Function	Pulse Input		_	Maximum Input Pulse Frequency: Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (Whe the pulse duty is 50%) Negative Logic Pulse Input (Initial value)	
	Direct Input		Input Points: 10 Points	Input Points: 6 Points	
	Direct Output		Output P	oints: 6 Points	
	RS-485	Network Input	16 Points	-	
	Communication	Network Output	16 Points	_	

# Built-In Controller Type RS-485 Communication Specifications

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 Based, Straight Cable
	Use twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m.
Communication Mode	Half duplex and Start-stop synchronization (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Baud Rate	Select from 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, or 230400 bps.
Connection Type	Up to 31 units can be connected to a single programmable controller (master unit).

# General Specifications

		Matar	Driver			
		MOLOT	Built-In Controller Type	Pulse Input Type		
Heat-resistant Class		130(B)	-			
Insulation Resistance		The measured value is 100 M $\Omega$ or more when a 500 VDC megger is applied between the following locations: • Case - Motor Windings • Case - Electromagnetic Brake Windings*1	The measured value is 100 $M\Omega$ or mm applied between the following locatio $\cdot$ Protective Earth Terminal - Power S	pre when a 500 VDC megger is ns: upply Terminal		
Dielectric Strength		No abnormality is found with the following application for 1 minute: • Case - Motor Windings 1.5 kVAC, 50 Hz or 60 Hz • Case - Electromagnetic Brake Windings <sup>*1</sup> 1.5 kVAC, 50 Hz or 60 Hz	or _			
Operating Environment (In operation)	Ambient Temperature	$0 \sim +40^{\circ}$ C (Non-freezing) $0 \sim +50^{\circ}$ C (Non-freezing)				
	Ambient Humidity	85% or less (Non-condensing)				
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.				
Degree of Protection		IP65 (excluding installation surfaces and connector locations)	IP	10		
Stop Position Accuracy		<b>AZ46</b> : ±4 min (±0.067°)	<b>AZ66</b> , <b>AZ69</b> : ±3 min (±0.05°)			
Shaft Runout		0.05T.I.R. (mm)*2	-	_		
Concentricity of Installation Pilot to the Shaft		0.075T.I.R. (mm) <sup>*2</sup>	-			
Perpendicularity of Installation Surface to the Shaft		0.075T.I.R. (mm)*2	-			
Range of Multiple Rotation Power OFF	Inspection at	±900 Rotations)				
*1 Only for electromagnetic	brake type.			(◯ (\$\phi 0.075 A)		

\*2 T. I. R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution centered on the reference axis center.

Note

Do not measure insulation resistance or perform a dielectric strength test while the motor and driver are connected.

Also, do not conduct these tests on the ABZO sensor section of the motor.



/ 0.05

А

L 0.075 A

AC Power-Supply Input

# Permissible Radial Load/Permissible Axial Load

	Frame Size			Permissible Radial Load						
Туре		Product Name	Gear Ratio	Distance from Shaft End mm					Permissible Axial Load	
				0	5	10	15	20		
	42 mm	AZ46		35	44	58	85	-	4.3 [6.0] <b>*</b>	
Standard Type	60 mm	AZ66	-	00 100	100	100 100	100	270	8.9 [12.7] <b>*</b>	
	00 11111	AZ69		90	100	130	100	270	14 [17.6] <b>*</b>	
	40 mm	A746	3.6, 7.2, 10	20	30	40	50	_	16	
TS Coored Type	42 11111	A240	20, 30	40	50	60	70	-	10	
<b>15</b> Geared Type	60 mm	AZ66	3.6, 7.2, 10	120	135	150	165	180	- 40	
			<b>20</b> , <b>30</b>	170	185	200	215	230		
	42 mm	AZ46	5, <b>7.2</b> , 10	73	84	100	123	-	- 50	
			25, 36, 50	109	127	150	184	-		
PS Geared Type	60 mm	AZ66	5	200	220	250	280	320		
			<b>7.2</b> , 10	250	270	300	340	390	100	
			25, 36, 50	330	360	400	450	520		
	40 mm	A746	5	130	150	170	200	230	150	
	40 11111	AZ40	9	160	180	210	240	290	100	
<b>HFG</b> Geared Type	60 mm	A766	5	210	230	250	280	310	300	
		A200	15	290	310	340	370	400	500	
Hormonia Coarod Tuno	42 mm	AZ46	50 100	180	220	270	360	510	220	
Harmonic Geared Type	60 mm	AZ66	50,100	320	370	440	550	720	450	

The product names are described with text by which the product name can be identified.

st The brackets [ ] indicate the value for the electromagnetic brake type

# Permissible Moment Load

When installing on the flange surface, ensure that the permissible moment load does not exceed the permissible value in the table below.

HPGGeared Type Flange Output Type						
Product Name	Gear Ratio	Permissible Moment Load (N·m)				
	5	1.9				
A240	9	2.3				
	5	5.2				
A200	15	7				

The permissible moment load can be calculated with the following formula.

Example 1: If an external force F is applied at a distance L from the center of the output flange

Moment Load  $[N \cdot m] : M = F \times L$ 



Harmonic Geared Type

Product Name	Gear Ratio	Permissible Moment Load (N·m)
AZ46	50 100	5.6
AZ66	50, 100	11.6

The permissible moment load can be calculated with the following formula.

Example 1: If an external force  $\mathsf{F}$  is applied at a distance  $\mathsf{L}$  from the

center of the output flange

Moment Load [N·m] : M=F  $\times$  L



Example 2: If an external force F is applied at a distance L from the output flange installation surface





Product Name	Coefficient a (m)
AZ46	0.006
AZ66	0.011

# Load Torque - Driver Input Current Characteristics

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-axis operation can be estimated. For the geared type, convert to torque and speed by the motor shaft.

Motor shaft speed = Gear output shaft speed  $\times$  Gear ratio [r/min]

Motor shaft torque = Gear Output shaft torque
[N·m]
Gear Ratio













AC Power-Supply Input

# Dimension (Unit mm)

## Motor

# $\bigcirc$ Standard Type

# Frame Size 42 mm

# 2D & 3D CAD

Product Name		Motor Product Name	Maaalka	2D CAD	
Built-in Controller	Built-in Controller Pulse Input		IVId55 Ky		
AZ46AKD-🔷	AZ46AK-🛇	AZM46AK	0.44	B1092	
Encoder Cable $\phi 6$	70 20±1 2 15±0.25 ((14)12000-27 90 00 00 90 00 00	42 31-02 4×M3×4 0 1 1 29.5 1 1 1 1 1 1 1 1 1 1 1 1 1	<u>1.5 Deep</u>		
55100-06/0 (Molex) /	> 555/-068-210 (Molex)				

#### Frame Size 60 mm

#### 2D & 3D CAD

Product Name		Motor Droduct Name		Mass ko	20 CAD	
Built-in Controller Pulse Input		WOLOF Product Name	L	IVIASS KY	ZD GAD	
AZ66AKD-🛇	AZ66AK-🛇	AZM66AK	72	0.91	B1093	
AZ69AKD-🔿	AZ69AK-🔿	AZM69AK	97.5	1.4	B1129	



# $\diamondsuit Standard$ Type with Electromagnetic Brake Frame Size 42 mm

2D & 3D CAD Product Name Motor Product Name 2D CAD Mass kg Built-in Controller Pulse Input AZM46MK B1154 AZ46MKD-🛇 AZ46MK-🔿 0.61 101 20±1 42 4×M3×4.5 Deep 31±0.2 1.2 15±0.25 12 28.5 29.5 Encoder Cable  $\phi 6$ Í 8 S 80 Motor Cable  $\phi 8$ Electromagnetic Brake Cable  $\phi 6$ ŀ Ж 55100-0670 (Molex) 5557-06R-210 (Molex) 5557-02R-210 (Molex)

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box  $\diamond$  is located within the product name. If the connection cable is not included, the box - $\diamond$  does not appear in the product name.

#### Frame Size 60 mm

#### 2D & 3D CAD

Produc	t Name	Motor Droduot Namo		Magalika	
Built-in Controller	Pulse Input	MOLOI FIOUUCI NAITIE	L	IVIASS KY	2D GAD
AZ66MKD-🔷	AZ66MK-🛇	AZM66MK	118	1.3	B1155
AZ69MKD-🔷	AZ69MK-🛇	AZM69MK	143.5	1.8	B1156



# $\Diamond \mathbf{TS}$ Geared Type

Frame Size 42 mm							
Produc	t Name	Motor Droduct Nomo	Coor Potio	Maaalka	20.040		
Built-in Controller	Pulse Input		deal hallo	IVId55 Ky	ZD GAD		
AZ46AKD-TS	AZ46AK-TS	AZM46AK-TS	3.6.7.2.10.20.30	0.59	B1157		



# Frame Size 60 mm

2D & 3D CAD

Product Name		Motor Product Namo	Goar Patio	Magalia	20.040
Built-in Controller	Pulse Input		deal hallo	iviass ky	2D GAD
AZ66AKD-TS	AZ66AK-TS	AZM66AK-TS	3.6, 7.2, 10, 20, 30	1.3	B1158

Installation Screws: M4×60 P0.7 (4 pieces included)

115
32±1



 $\blacksquare$  A number indicating the gear ratio is entered where the box  $\blacksquare$  is located within the product name.

A number indicating the length of desired connection cable, if included. **1** (1 m), **2** (2 m) or **3** (3 m) is entered where the box  $\bigcirc$  is located within the product name. If the connection cable is not included, the box - $\bigcirc$  does not appear in the product name.

# $\Diamond \mathbf{PS}$ Geared Type

Frame Size 42 mm

2D & 3D CAD

Product Name		Motor Draduat Nama	Coor Datio		Maaalka	
Built-in Controller	Pulse Input	Wotor Product Name	Gear Ralio	L	IVId55 Ky	2D GAD
	AZ46AK-PS	AZM46AK-PS	5, <b>7.2</b> , 10	98	0.64	B1159
			25, 36, 50	121.5	0.79	B1160



#### Frame Size 60 mm

2D & 3D CAD

Product Name		Mator Droduct Namo	Coor Datio		Magalia	
Built-in Controller	Pulse Input	Wotor Product Name	Gear Rallo	L	IVIASS KY	ZD GAD
	AZ66AK-PSI	AZM66AK-PS	5, <b>7.2</b> , 10	104	1.3	B1161
			25, 36, 50	124	1.6	B1162



# ◇HPG Geared Type



A number indicating the gear ratio is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. **1** (1 m), **2** (2 m) or **3** (3 m) is entered where the box  $\bigcirc$  is located within the product name. If the connection cable is not included, the box  $-\bigcirc$  does not appear in the product name.

# 64

# Frame Size 40 mm Flange Output Type

Frame Size 40 mm	Flange Output Type	)			2D & 3D CAD
Produc	t Name	Motor Product Namo	Coor Potio	Maaalka	
Built-in Controller	Pulse Input	Motor Product Name	Gear Ralio	IVIASS KY	ZD GAD
AZ46AKD-HP	AZ46AK-HP <b>_</b> F-🛇	AZM46AK-HP	5.9	0.66	B1164



#### Frame Size 60 mm Shaft Output Type 2D & 3D CAD Product Name Motor Product Name Gear Ratio Mass kg Built-in Controller Pulse Input AZM66AK-HP 5,15 AZ66AKD-HP AZ66AK-HP 1.9





The colored section for the flange output type indicates the rotating part.

A number indicating the gear ratio is entered where the box is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🔷 is located within the product name. If the connection cable is not included, the box -  $\Diamond$  does not appear in the product name.

2D CAD

B1165

DC Power-Supply Input

#### ◇Harmonic Geared Type Frame Size 42 mm

Frame Size 42 mm					2D & 3D CAD
Product	Name	Motor Product Namo	Coar Patio	Maes ka	20 CAD
Built-in Controller	Pulse Input	NIOLOI FIOUUGLINAIIIC	ucai natio	Wiass Ky	20 GAD
AZ46AKD-HS	AZ46AK-HS	AZM46AK-HS	50, 100	0.65	B1167
	100 05				



\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

# Frame Size 60 mm



\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

A number indicating the gear ratio is entered where the box 🗐 is located within the product name.

A number indicating the length of desired connection cable, if included. 1 (1 m), 2 (2 m) or 3 (3 m) is entered where the box 🔷 is located within the product name. If the connection cable is not included, the box -  $\Diamond$  does not appear in the product name.

# Driver Built-In Controller Type Driver Product Name: AZD-KD Mass: 0.15 kg ZD CAD B1094 3D CAD



◇ Pulse Input Type
Driver Product Name: AZD-K
Mass: 0.15 kg
2D CAD B1096 3D CAD



Cables for Motor (Included), Cables for Encoder (Included), Cables for Electromagnetic Brake (Included)
 Only with products supplied with a connection cable
 Cables for Motor

Cable Type	Length L (m)
Cables for Motor 1 m	1
Cables for Motor 2 m	2
Cables for Motor 3 m	3

#### $\diamondsuit$ Cables for Encoder

Cable Type	Length L (m)
Cables for Encoder 1 m	1
Cables for Encoder 2 m	2
Cables for Encoder 3 m	3





Motor Side

Driver Side

# $\bigcirc$ Cables for Electromagnetic Brake (Electromagnetic brake type only)

Cable for Electromagnetic Brake 1 m 1 Cable for Electromagnetic Brake 2 m 2	
Cable for Electromagnetic Brake 2 m 2	
Cable for Electromagnetic Brake 3 m 3	1



The motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the product).

#### Connector: MC1,5/5-STF-3,5 (Phoenix Contact) I/O Signal Connector (CN4) Connector: DFMC1,5/12-ST-3,5 (Phoenix Contact)

Main Power Supply/Electromagnetic Brake Connector (CN1)

Included



I/O Signal Connector (CN4) Connector: DFMC1,5/12-ST-3,5 (Phoenix Contact)





# Connection and Operation (Built-in controller type)

Names and Functions of Driver Parts



# **1** Signal Monitor Indication

#### ◇LED Indicators

Indication	Color	Function	Lighting Condition
POWER	Green	Power supply indication	When power is applied
ALARM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

# 2 Function Switch

Indication	No.	Function
	1	Use in combination with the axis setting switch (ID) to set the axis number (Factory setting: OFF).
01/11	2	Set the RS-485 communication protocol (factory default setting: OFF).
2001	3	Set the terminating resistor (120 $\Omega$ ) for RS-485 communication (Factory setting: OFF).
	4	OFF: Terminating resistor not used ON: Terminating resistor used
A Configura b	th No.	2 and No. 4 to the same patting

 $\ensuremath{\boldsymbol{\star}}\xspace$  Configure both No. 3 and No. 4 to the same setting.

# **3** Unit Setting Switch

Indication	Function
ID	Set this when you use RS-485 communication. Set the unit number (factory default setting: 0).

# 4 Baud Rate Setting Switch

Indication	Function
BAUD	Set this when you use RS-485 communication. Set the baud rate (factory default setting: 7).

# ◇RS-485 Baud Rate Setting

No.	Baud Rate (bps)				
0	9600				
1	19200				
2	38400				
3	57600				
4	115200				
5	230400				
6	Not used				
7	Network Converters				
8~F	Not used				

Indication	Pin No.	Signal Name	Description		
	1	INO	START	This signal is used to start positioning operation.	
	2	IN2	M1	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.	
CN4	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.	
	4	IN6	STOP	Stops the motor.	
	5	IN-COM [0-7]*1	INO~IN7 Input Common		
	6	IN8	FW-JOG	Starts the JOG operation.	
	7	OUTO	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.	
	8	OUT2	PLS-RDY	Not used.	
	9	OUT4	MOVE	Output during motor operation.	
	10	0UT-COM*1	Output Common		
	11	ASG +	A-Phase Pulse Output +		
	12	BSG +	B-Phase Pulse Output +		
	13	IN1	MO	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.	
	14	IN3	M2	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.	
	15	IN5	FREE	Stops motor excitation.	
	16	IN7	ALM-RST	Resets the alarms.	
	17	IN-COM [8-9]*1	IN8, IN9 Input Common		
	18	IN9	RV-JOG	Starts the JOG operation.	
	19	OUT1	IN-POS	Outputs when the motor operation is finished.	
	20	OUT3	READY	Outputs when the driver is ready for operation.	
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).	
	22	GND*1	Ground		
	23	ASG -	A-Phase Pulse Output -		
	24	BSG -	B-Phase Pulse Output -		

You can set functions to assign by using parameters. Initial values are shown above. For details, refer to the Fuctions section.

\*1 Initial settings cannot be changed.

Included with product.Available as accessories (sold separately).



\*1 Products are available with a 1 m, 2 m or 3 m cable for motor and driver and also without. If you need cables longer than 3 m or flexible cables, select appropriate cables from the accessories (sold separately). Keep the wiring distance between the motor and driver to 20 m or less.

\*2 Not supplied.

\*3 Connect to the controller when controlling by RS-485 communication.

#### $\Diamond$ Connection of the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXEO2** is installed. Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)		
Cabla	Length: 3 m or less		
Cable	Configuration: A-mini-B		

# ♦ Connection to Programmable Controller

Connection Diagram for Connection with Current Sink Output Circuit

Controller				Driver	
		INO			
-			4.7 kΩ	2.2 kΩ	⋬⋣⋾
			47k0	122k0	
			4.7 K32	2.2 K12	
			4.7 kΩ	] 2.2 kΩ	<u></u> <u> </u>
-			4.7 kΩ	2.2 kΩ	<b>∀</b> ★≠1
				¥	
$-\langle -\rangle$		Ĭ	4.7 kΩ	2.2 kΩ	<b>▼</b> 本≠<
			4710		
		IN6	4.7 K12	U 2.2 K12	₩44=
-			4.7 kΩ	2.2 kΩ	▼本=€
				*	
	IN-C	ом[0-7]	4.7 kΩ	2.2 kΩ	⋬⋣≠⋠
0 V 🗸		IN8			
-		Ç	4.7 kΩ	[ 2.2 kΩ	<b>▼</b> 本≠
				• П	
	IN-C	OM[8-9]	4.7 kΩ	2.2 kΩ	¥4≠√
<sup>0 V ↓</sup> 12~24 VDC△		Ĭ			
	R0 10 mA or loss	0.1170		_	
	R0				
		ľ		,)≠¥	
	Ro	01172			
				∖≠ע	
					Output Saturation
					Voltage Maximum 3 VDC
→≠⊈	R0	OUT4			
		Ĭ		>≠⊈	
┯┯━┘	Bo	OUTE		]	
		оит-сом			
0 V 🗸		ASG +	- <b>• • K</b>  -'		
	γγ	ASG -			
		BSG +		26C31 c	r Equivalent
	X X	BSG -			
p-+		GND			
0 V 🗸		Y		νον	
	l				

#### Note

Use 24 VDC for the input signals.

● Use 12 ~ 24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R₀ to reduce the current to 10 mA or less. ● Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).

Do not run the signal lines in the same piping as power lines or bundle them with power lines.

If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

## $\bigcirc$ Connection to Programmable Controller

Connection Diagram for Connection with Current Source Output Circuit



#### Note

Use 24 VDC for the input signals.

Use 12 ~ 24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor Ro to reduce the current to 10 mA or less.

Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).

Do not run the signal lines in the same piping as power lines or bundle them with power lines.

If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.
## Connection and Operation (Pulse input type)

#### Names and Functions of Driver Parts



### **1** Signal Monitor Indication

## ♦ LED Indicators

Indication	Color	Function	Lighting Condition
POWER	Green	Power supply indication	When power is applied
ALARM	Red	Alarm indication	When a protective function is activated (blinking)
READY	Green	READY Output	When READY Output is ON

### 2 Function Switch

Indication	No.	Function
	1	Sets the resolution per one rotation of the motor output shaft. (Factory setting: OFF [1000 p/r])
SW1	2	Sets the pulse input mode as either 1-pulse input mode or 2-pulse input mode. (Factory setting: OFF [2-Pulse Input Mode])
	3, 4	Not used.

#### **3** Current Setting Switch

Indication	Function
CURRENT	Set the base current, which is the basis of the running current and the standstill current (Factory setting: F).

### 4 Command Filter Setting Switch

Indication	Function
FIL	Adjust the responsiveness of the motor. (Factory setting: 1)

## 5 I/O Signal Connector (CN4)

•		. ,		
Indication	Pin No.	Signal Name		Description
	1	CW+ [PLS+]*1	CW Pulse Input + [Pulse Input +]	
	2	CCW+ [DIR+]*1	CCW Pulse Input + [Rotation Direction Input +]	
	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	IN6	STOP	Stop the motor.
	5	IN-COM [4-7]*1	IN4~IN7 Input Common	
	6	IN8	FW-JOG	Starts the JOG operation.
	7	OUTO	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	OUT2	PLS-RDY	Outputs when the pulse input preparation is completed.
	9	OUT4	MOVE	Output during motor operation
	10	0UT-COM*1	Output Common	
	11	ASG +	A-Phase Pulse Output +	
CN4	12	BSG +	B-Phase Pulse Output +	
	13	CW- [PLS-]*1	CW Pulse Input – [Pulse Input –]	
	14	CCW- [DIR-]*1	CCW Pulse Input – [Rotation Direction Input –]	
	15	IN5	FREE	Stops motor excitation.
	16	IN7	ALM-RST	Resets the alarms.
	17	IN-COM [8-9]*1	IN8, IN9 Input Common	
	18	IN9	RV-JOG	Starts the JOG operation.
	19	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	OUT3	READY	Outputs when the driver is ready for operation.
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	GND*1	Ground	
	23	ASG —	A-Phase Pulse Output –	
	24	BSG —	B-Phase Pulse Output -	

•You can set functions to assign by using parameters. Initial values are shown above. For details, refer to the Fuctions section.

\*1 Initial settings cannot be changed.

DC Power-Supply Input

AC Power-Supply Input

Included with product. Available as accessories (sold separately).



If you need cables longer than 3 m or flexible cables, select appropriate cables from the accessories (sold separately). Keep the wiring distance between the motor and driver to 20 m or less.

\*2 Not supplied.

#### $\bigcirc$ Connection of the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXEO2** is installed. Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cabla	Length: 3 m or less
Capie	Configuration: A-mini-B

## Connection to Programmable Controller Connection Diagram for Connection with Current Sink Output Circuit





When the Pulse Input is Open Collector

Controller		Driver
5~24 VDC A	CW(PLS)+ R1 / CW(PLS)- CCW(DIR)+ R1 / CCW(DIR)-	$100 \Omega \qquad 2.2 k\Omega$ $100 \Omega \qquad 4 = 0 \qquad 4 = 0$ $100 \Omega \qquad 2.2 k\Omega$ $100 \Omega \qquad 2.2 k\Omega$ $100 \Omega \qquad 4 = 0 \qquad 4 = 0$

Note

Use 24 VDC for the input signals

O Use 12  $\sim$  24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor Ro to reduce the current to 10 mA or less.

- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
- Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

#### Note

● Use 5 ~ 24 VDC for the CW (PLS) and CCW (DIR) inputs. If voltage exceeding 5 VDC is applied, connect an external resistor R1 and adjust so that the input current becomes 7 to 20 mA.

### ♦ Connection to Programmable Controller

### • Connection Diagram for Connection with Current Source Output Circuit

When the Pulse Input is the Line Driver



When the Pulse Input is Open Collector



Note

Use 24 VDC for the input signals.

- Use 12  $\sim$  24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R<sub>0</sub> to reduce the current to 10 mA or less.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
- Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

Note

● Use 5 ~ 24 VDC for the CW (PLS) and CCW (DIR) inputs. If voltage exceeding 5 VDC is applied, connect an external resistor R1 and adjust so that the input current becomes 7 to 20 mA.

## Motor and Driver Combinations

The product names for motor and driver combinations are shown below.

### Built-In Controller Type

Туре	Product Name	Motor Product Name	Driver Product Name
	AZ46AKD- $\Diamond$	AZM46AK	
Standard Type	AZ66AKD-🔷	AZM66AK	
	AZ69AKD-🔷	AZM69AK	]
	AZ46MKD-🔷	AZM46MK	
Standard Type	АZ66МКD-🔷	AZM66MK	]
Electromagnetic brake Type	АZ69МКD-🔷	AZM69MK	
TE Coored Turne	AZ46AKD-TS	AZM46AK-TS	1
<b>IS</b> Geared Type	AZ66AKD-TS	AZM66AK-TS	
DS Coored Turns	AZ46AKD-PS	AZM46AK-PS	AZD-KD
<b>FS</b> Geared Type	AZ66AKD-PS	AZM66AK-PS	· · ·
	AZ46AKD-HP	AZM46AK-HP	
	AZ46AKD-HP <b></b> F-	AZM46AK-HP	
nro deared type	AZ66AKD-HPI	AZM66AK-HP	
	AZ66AKD-HP <b></b> F-	AZM66AK-HP	
	AZ46AKD-HSI- AZM46AK-HS	]	
namonic deared type	AZ66AKD-HS	AZM66AK-HS	]

## Pulse Input Type

Туре	Product Name	Motor Product Name	Driver Product Name
	AZ46AK-🛇	AZM46AK	
Standard Type	AZ66AK-🛇	AZM66AK	
	АZ69АК-🛇	AZM69AK	
	AZ46MK-🛇	AZM46MK	
Standard Type	AZ66MK-🛇	AZM66MK	
Electromagnetic brake type	AZ69MK-🛇	AZM69MK	
TE Grand Trac	AZ46AK-TS	AZM46AK-TS	
<b>IS</b> Geared Type	AZ66AK-TS	AZM66AK-TS	
DC Georged Trans	AZ46AK-PS	AZM46AK-PS	AZD-K
<b>PS</b> Geared Type	AZ66AK-PS	AZM66AK-PS	
	AZ46AK-HPI	AZM46AK-HP	
	AZ46AK-HP <b>I</b> F-🛇	AZM46AK-HP	
<b>HFG</b> Geared Type	AZ66AK-HPII-🛇	AZM66AK-HP	-
	AZ66AK-HP <b>I</b> F-🛇	AZM66AK-HP	
Hermonia Coored Type	AZ46AK-HS	AZM46AK-HS	
паннопис цеагей Туре	AZ66AK-HS∎-◇	AZM66AK-HS	

 $\blacksquare$  A number indicating the gear ratio is entered where the box  $\blacksquare$  is located within the product name.

A number indicating the length of desired connection cable, if included. **1** (1 m), **2** (2 m) or **3** (3 m) is entered where the box  $\Diamond$  is located within the product name.

## Accessories (Sold separately) Connection Cable Sets, Flexible Connection Cable Sets Extension Cable Sets, Flexible Extension Cable Sets

The AZ Series is available with a cable (1 m, 2 m or 3 m) for motor and driver and also without a cable.

If the distance between the motor and driver is extended to 3 m or longer, a connection cable set or extension cable set must be used. The maximum length of the cable extension is 20 m (using included connection cable).

For the standard motor, cables come as a set of motor and encoder cables. For the electromagnetic brake type motor, cables come as a set of motor, encoder and electromagnetic brake cables.

Use a flexible connection cable set or flexible extension cable set if the cable will be bent repeatedly.



The motor cable from the motor and the electromagnetic brake cable cannot be connected directly to the driver. When connecting to the driver, use an accessory (separately sold) connection cable or the included connection cable (if the connection cable is included with the product).

## AC Power Supply Input

## **Connection Cable Sets, Flexible Connection Cable Sets**

## Product Line

Connection Cable Sets
For Standard Type Motor



Product Name	Length L (m)
CC010VZF	1
CC020VZF	2
CC030VZF	3
CC050VZF	5
CC070VZF	7
CC100VZF	10
CC150VZF	15
CC200VZF	20

Flexible Connection Cable Sets
For Standard Type Motor



2
3
5
7
10
15
20

◇For Electromagnetic Brake Type Motor



Cables for Motor

Cables for Encoder

Cable for Electromagnetic Brake

Product Name	Length L (m)
CC010VZFB	1
CC020VZFB	2
CC030VZFB	3
CC050VZFB	5
CC070VZFB	7
CC100VZFB	10
CC150VZFB	15
CC200VZFB	20

 $\bigcirc$ For Electromagnetic Brake Type Motor



Cable for

Cables for Motor

Cables for Encoder Electromagnetic Brake

Product Name	Length L (m)
CC010VZRB	1
CC020VZRB	2
CC030VZRB	3
CC050VZRB	5
CC070VZRB	7
CC100VZRB	10
CC150VZRB	15
CC200VZRB	20

## **Extension Cable Sets, Flexible Extension Cable Sets**

## Product Line

Extension Cable Sets ◇For Standard Type Motor



Product Name	Length L (m)
CC010VZFT	1
CC020VZFT	2
CC030VZFT	3
CC050VZFT	5
CC070VZFT	7
CC100VZFT	10
CC150VZFT	15

Flexible Extension Cable Sets ◇For Standard Type Motor



Product Name	Length L (m)
CC010VZRT	1
CC020VZRT	2
CC030VZRT	3
CC050VZRT	5
CC070VZRT	7
CC100VZRT	10
CC150VZRT	15

## Dimension (Unit mm)

## Connection Cable

#### 



### 







◇For Electromagnetic Brake Type Motor



Cables for Motor



Cables for Encoder



Cable for Electromagnetic Brake

Product Name	Length L (m)
CC010VZFBT	1
CC020VZFBT	2
CC030VZFBT	3
CC050VZFBT	5
CC070VZFBT	7
CC100VZFBT	10
CC150VZFBT	15

#### $\bigcirc$ For Electromagnetic Brake Type Motor







Cables for Motor

Cables for Encoder

Product Name	Length L (m)
CC010VZRBT	1
CC020VZRBT	2
CC030VZRBT	3
CC050VZRBT	5
CC070VZRBT	7
CC100VZRBT	10
CC150VZRBT	15



Electromagnetic Brake

## Extension Cable



### 



### ◇Cable for Electromagnetic Brake



DC Power-Supply Input

AC Power-Supply Input

## **Connection Cable Sets, Flexible Connection Cable Sets**

## Product Line

## Connection Cable Sets

◇For Standard Type Motor

		$\sum$
Cables for Motor	Cables	for Encoder
Product Name	Length L (m)	
CC010VZF2	1	
CC020VZF2	2	
CC0201/7E2	0	

CCU3UVZF2	3
CC050VZF2	5
CC070VZF2	7
CC100VZF2	10
CC150VZF2	15
CC200VZF2	20

Flexible Connection Cable Sets ◇For Standard Type Motor



Product Name	Length L (m)
CC010VZR2	1
CC020VZR2	2
CC030VZR2	3
CC050VZR2	5
CC070VZR2	7
CC100VZR2	10
CC150VZR2	15
CC200VZR2	20

◇For Electromagnetic Brake Type Motor





Cable for

Electromagnetic Brake

Cables for Motor

Cables for Encoder

Product Name	Length L (m)
CC010VZFB2	1
CC020VZFB2	2
CC030VZFB2	3
CC050VZFB2	5
CC070VZFB2	7
CC100VZFB2	10
CC150VZFB2	15
CC200VZFB2	20

◇For Electromagnetic Brake Type Motor





Cables fo

or Motor	Cables for Encoder

Cable for
Electromagnetic Brake

Product Name	Length L (m)
CC010VZRB2	1
CC020VZRB2	2
CC030VZRB2	3
CC050VZRB2	5
CC070VZRB2	7
CC100VZRB2	10
CC150VZRB2	15
CC200VZRB2	20

## **Extension Cable Sets, Flexible Extension Cable Sets**



Extension Cable Sets ◇For Standard Type Motor



 $\bigcirc$  For Electromagnetic Brake Type Motor





Cable for

Product Name	Length L (m)
CC010VZFBT	1
CC020VZFBT	2
CC030VZFBT	3
CC050VZFBT	5
CC070VZFBT	7
CC100VZFBT	10
CC150VZFBT	15

Electromagnetic Brake

Cables for Motor	Cables	for Encoder
Product Name	Length L (m)	
CC010VZFBT	1	
CC020VZFBT	2	
CC030VZFBT	3	
CC050VZFBT	5	
CC070VZFBT	7	
CC100VZFBT	10	

## Flexible Extension Cable Sets

◇For Standard Type Motor

$\bigcirc$		
Cables for Motor	Cables	for Encoder
Product Name	Length L (m)	
CC010VZRT	1	
CC020VZRT	2	
CC030VZRT	3	-
CC050VZRT	5	
CC070VZRT	7	-
CC100VZRT	10	
CC150VZRT	15	

## Dimension (Unit mm)

## Connection Cable



## 



## ◇Cable for Electromagnetic Brake



## Notes on Use of Flexible Cable

(1)Do not allow the cable to bend at the cable connector.



## ◇For Electromagnetic Brake Type Motor

Cables for Encoder



Cable for Electromagnetic Brake

Cables for Motor

Product Name	Length L (m)
CC010VZRBT	1
CC020VZRBT	2
CC030VZRBT	3
CC050VZRBT	5
CC070VZRBT	7
CC100VZRBT	10
CC150VZRBT	15

## Extension Cable



◇Cables for Encoder



## ◇Cable for Electromagnetic Brake



②For the bending radius, use at 6 times min. of the cable diameter.



(3)The cable from the motor and the accessory cable are not bending types. If the motor cable is to be bent, bend it at the flexible cable.

#### • Flexible Connection Cable

• Flexible Extension Cable





Flexible Extension Cable (Bending)

## Data Setting Software MEXE02

In addition to operating data and various parameter settings with a computer, you can perform teaching and monitor I/O and operating speed waveform with Data Setting Software.

Data Setting Software can be downloaded from the Oriental Motor website.

Oriental Motor can also provide a CD-ROM.

Visit our website, or contact the nearest Oriental Motor sales office.

## Computer and Driver Connection

Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less Configuration: A-mini-B

Operating Environment

#### Operating System (OS)

The 32 bit (x86) editions and 64 bit (x64) editions are supported.

- Microsoft Windows XP Service Pack 3\*
- Microsoft Windows Vista Service Pack 2
- Microsoft Windows 7 Service Pack 1
- Microsoft Windows 8
- Microsoft Windows 8.1

\*For the 64-bit (x64) version, Service Pack 2 is used.

#### Computer

Recommended CPU*1	Intel Core processor 2 GHz or faster (OS must be supported)
Display	Video adapter and monitor with a minimum resolution of XGA (1024 $\times$ 768)
Recommended Memory <sup>*1</sup>	32 bit (x86) edition: 1 GB or more 64 bit (x64) edition: 2 GB or more
Hard Disk <sup>*2</sup>	Free disk space of at least 60 MB
USB Port	One USB2.0 port
Disk Device	CD-ROM drive (for installation)

\*1 The system requirements for the OS must be met.

\*2 MEXEO2 requires Microsoft.NET Framework 4 Client Profile. If it is not installed, it will be installed automatically. An additional 1.5 GB of free space may be required for 64-bit (x64) edition OS and 600 MB for 32-bit (x86) edition OS.

Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries.

Intel and Core are registered trademarks or trademarks of Intel Corporation in the United States and other countries

For the latest information of operating environment, refer to the Oriental Motor website. Note

Depending on your system environment, the required memory and hard disk may vary.

## **General-Purpose Cables**

General-purpose multi-core cables provide convenient connection between a driver and programmable controller.



## Product Line

Product Name	Length L (m)
CC16D005B-1	0.5
CC16D010B-1	1.0
CC16D015B-1	1.5
CC16D020B-1	2.0

The core number for the above products is 16. Products with a core number of 6, 10 and 12 are also available.

## Dimension (Unit mm)



## **RS-485 Communication** Cables

This cable is used to link drivers in multi-axis operations with the built-in controller type. It also connects the network converter to the driver.



## Product Line

Product Name	Applicable Drivers	Length L (m)
CC001-RS4	DC Power-Supply Input Driver	0.1
CC002-RS4	AC Power-Supply Input Driver DC Power-Supply Input Driver	0.25

## Dimension (Unit mm)



# **MCV** Couplings

This one-piece coupling is made with anti-vibration rubber molded between aluminum alloy hubs.



## **Product Line** Product Name

Tioudot Numo	
MCV15	
MCV25	
A number indicating	+1

 $\blacksquare$  A number indicating the coupling inner diameter is entered where the box  $\square$  is located within the product name

## Product Number Code

MCV 25 10 12

(1)(2)(3)

- 1 MCV Coupling
- ② Outer Diameter of Coupling
- Inner Diameter d1 (Smaller inner diameter) (**06A** represents  $\phi$ 6.35 mm.) 3

(4)

④ Inner Diameter d2 (Larger inner diameter)

For inner diameter d1, the smaller of the motor shaft diameter or the driven shaft diameter is entered. For inner diameter d2, the larger of the motor shaft diameter or the driven shaft diameter is entered.



## Coupling Selection Table

Applicable Product		Moto		Motor Shaft Driven Shaft Diameter mm								
Туре	Frame Size	Product Name	Coupling Type	Dian	neter	04	05	06	06A	80	10	12
				m	m	φ4	φ5	ф6	ф6.35	φ8	φ10	φ12
-	42 mm	AZ46	MCV15	06	ф6							
Standard Type	60 mm	AZ66 AZ69	MCV25	10	φ10							

The product names of the applicable ones are described with text by which the product name can be identified.

## **MCS** Couplings

This three-piece coupling adopts an aluminum alloy hub and a resin spider.



## Product Line Product Name

	M	CS:	30			
	M	CS4	40			
	M	CS:	55			
_					_	

A number indicating the coupling inner diameter is entered where the box [] is located within the product name.

## Product Number Code MCS 30 10 12

(1)	(2)	(3)	(4)

1 MCS Coupling	
----------------	--

2 Inner Diameter of Coupling (3)

For inner diameter d1, the smaller of the motor shaft diameter or the driven shaft diameter is entered.



Inner Diameter d1 (Smaller inner diameter) (F04 represents \$\phi6.35 mm.)

4 Inner Diameter d2 (Larger inner diameter) For inner diameter d2, the larger of the motor shaft diameter or the driven shaft diameter is entered.

## Coupling Selection Table

App	licable Pro	duct		Motor Shaft		Shaft					Driv	en Sh	aft Dia	meter i	nm				
Tumo	Frame	Draduat Nama	Gear Ratio	Coupling Type	Diam	ieter	05	06	F04	80	10	12	14	15	16	18	20	22	24
Type	Size	Product Marrie			m	m	φ5	φ6	ф6.35	φ8	φ10	φ12	φ14	φ15	φ16	φ18	φ20	φ22	φ24
	40	A746 TE	3.6, 7.2	MCS20	04														
TE Count Ture	42 mm	AL40-15	10, 20, 30	MCS30	00	φυ													
S Geared Type			3.6, 7.2	MCS30	10	140													
	60 mm	A200-15	10, 20, 30	MCS40	MCS40	φ10													
	40		5	MCS20	10	140													
DC Convert Trees	42 mm	AZ40-P5_	7.2, 10, 25, 36, 50	MCS30	10	φ10													
PS Geared Type	00		5, 7 <b>.</b> 2	MCS40	10	140													
	60 mm	A200-P5	10, 25, 36, 50	MCS55	12	φ12													
HPG Geared	40 mm	AZ46-HP	5, 9	MCS30	10	φ10													
Туре	60 mm	AZ66-HP	5, 15	MCS55	16	φ16													
Harmonic Geared	42 mm	AZ46-HS	50, 100	MCS40	10	φ10													
Туре	60 mm	AZ66-HS	50,100	MCS55	15	φ15													

The product names of the applicable ones are described with text by which the product name can be identified.

 $\blacksquare$  A number indicating the gear ratio is entered where the box  $\square$  is located within the product name.

DC Power-Supply Input

## **Motor Mounting Brackets**

Mounting brackets are convenient for installation and securing a stepping motor and geared type stepping motor. The mounting bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.



## Product Line

#### For Standard Type

Material: Aluminum alloy

Surface treatment: Painting

Product Name	Motor Frame Size	Applicable Product
PAFOP PALOP	42 mm	AZ46
PAL2P-5	60 mm	AZ66 AZ69

These installation brackets can be perfectly fitted to the pilot of the stepping motors. (Excluding PALOP)

The motor installation screws are included.

#### For **TS** Geared Type

Material: Aluminum allov Surface treatment: Painting

Product Name	Motor Frame Size	Product
SOLOB	42 mm	AZ46
SOL2M4	60 mm	AZ66

## Motor Installation Direction

Since the cable comes out perpendicular with the motor, install the cable in a way that it faces upward or sideward. For PLA60G and PLA60H, the cable can be installed in the downward direction.

## For PS Geared Type

Material: SS400

Surface treatment: Electroless nickel plating

	60 mm	Product
FLAUUU	00 11111	ALOU

The motor installation screws are included.

#### For Harmonic Geared Type

Material: SS400 . . . . . . . . . .

	60 mm	۸766			
Product Name	Motor Frame Size	Applicable Product			
Surface treatment. Electroless nickel platin					

The motor installation screws are included.



Cable Facing Up

**Cable Facing Sideways** 

## Installation Methods of the Motor

1 PAL2P-5, SOL2M4



(1)Use the screws to secure the motor to the installation bracket. ②Install the motor from the direction shown by the arrow (B).



(1)Use the screws to secure the motor to the installation bracket. (2)Install the motor from the direction shown by the arrow (B).

**3 PAFOP** 



(1)Use the screws to secure the motor to the installation bracket.

② Install the motor from the direction shown by the arrow (A, B).

### 4 PLA60G, PLA60H



(1)Use the screws to secure the motor to the installation bracket. (2)Install the motor from the direction shown by the arrow (B).



### PAFOP

Mass: 30 g 2D CAD B140 3D CAD



Installation Screws: M3 Length 7 mm
 4 pieces included

#### PALOP

SOLOB

Mass: 85 g

2D CAD B267 3D CAD

¢

4.4

7.4

ച

72

20

56

44

88

20

14

 $4 \times \varphi 4.5$  Thru

20

40

<del>1</del>36

62

Mass: 35 g 2D CAD B139 3D CAD



Installation Screws: M3 Length 10 mm 4 pieces included

 $4 \times \phi 3.5$  Thru

29

20

42

31±0.3

60

3

37.



#### Mass: 110 g 2D CAD B143







Installation Screws: M4 Length 12 mm 4 pieces included

## SOL2M4

Mass: 135 g



22

L Hite

50

+++--

### PLA60G





## **Network Converters**

The network converter converts host communication protocol to Oriental Motor's original RS-485 communication protocol. You can use a network converter to control Oriental Motor's RS-485compatible products within the host communication environment.

## Product Line

Network Type	Product Name
CC-Link-Compatible	NETC01-CC
MECHATROLINK-II-Compatible	NETC01-M2
MECHATROLINK-III-Compatible	NETC01-M3
Compatible with EtherCAT	NETC01-ECT









NETCO1-CC

NETC01-M2 NETC01-M3

NETCO1-ECT



## Controller

# Stored-Program Type Controllers **EMP400 Series**

In addition to enhanced pulse oscillation functions that only a motor manufacturer can provide, this series adopts storedprogram type controllers that include I/O control functions and sequence functions that make programming sequential operations possible.

For Single Axis



For Dual Axis



Control Module (Sold separately)

## Product Line

Product Name	Number of Axis	Connector
EMP401-1	Cingle Avie	-
EMP401-2	Single Axis	Included
EMP402-1	Dual Avia	-
EMP402-2	Dual Axis	Included

Control Module OP300

## **Connector - Terminal Block Conversion Unit**

The EMP Series half-pitch connector can be connected with the terminal block.

 $\bullet$  Includes a signal name plate for easy, one-glance identification of signal names

DIN-rail Installable

## Product Line

Product Name	Pin No.	Cable Length m
CC50T10E	50	1

For the dimensions, check the Oriental Motor website or contact the Oriental Motor sales office. http://www.orientalmotor.com.sg/







# **Oriental motor**

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