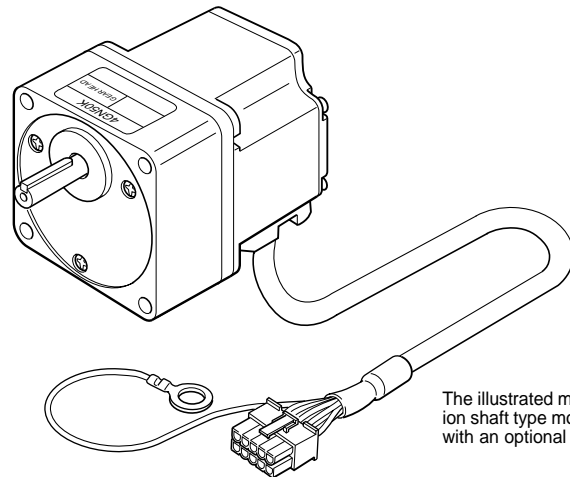
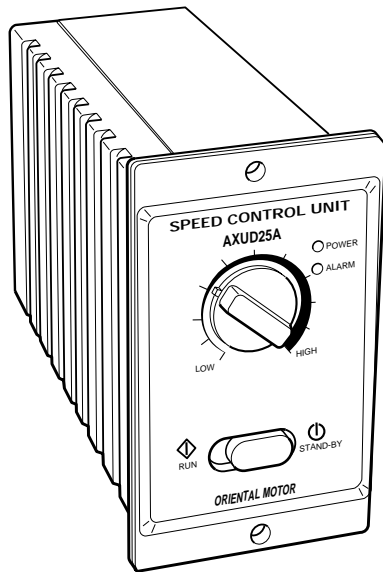




# AXU Series

## Instruction Manual



The illustrated motor is a pinion shaft type motor provided with an optional gearhead.

### Introduction

The **AXU** series is a speed control motor unit adopting a thin, high-torque brushless DC motor and a small-sized compact control unit. The **AXU** allows motor speed setting and Start/Stop operation to be controlled only by the control unit. This series is well suited for the speed control of transfer equipment and agitators which do not frequently change speed. The **AXU** is available in three types; (1) single-phase 100-115V, 50/60Hz, (2) single-phase 200-230V, 50/60Hz, and (3) three-phase 200-230V, 50/60Hz. The motor shaft is available in two types; a pinion shaft type where the gearhead (optional) can be directly coupled, and a round shaft type which is the optimum for the application requiring high speed rotation.

This product is designed to be incorporated in the general industrial machinery, and must not be used for other purposes. It should be noted in advance that ORIENTAL MOTOR CO., LTD. is not responsible for any damages caused by ignoring this warning.

- No part or whole of this Instruction Manual may be reproduced or copied without prior permission of ORIENTAL MOTOR CO., LTD.

When you have damaged or lost the Manual, please contact our local sales office located nearest to you to get a new one.

- This Manual is subject to change without prior notice due to product improvement, revision of the specifications improvement of the Manual itself.

- We are making efforts to ensure that the Manual carries correct information at all times. Should you find any ambiguous statement, description error or insufficient description, please contact our sales office located nearest to you. You will find the address of our sales office on page 8 of this Manual.

**VEXTA** is a trademark of ORIENTAL MOTOR CO., LTD. registered in Japan and other countries of the world.

The product names of other companies described in this Manual are given only for reference, and are not meant to force or recommend their use. ORIENTAL MOTOR CO., LTD. is not responsible for the performances of other manufacturers's products or their use.

This Manual describes the handling procedures and precautions to ensure safety.

- Read the Manual carefully to ensure operation safety of the equipment.
- After reading this Manual, keep it handy so that you can refer to it whenever required.

# Safety Precautions

This product is a high voltage device with high speed moving parts. Only qualified personnel should work the product. Precautions described below are intended to ensure the correct use of the product and to prevent the customer and other people from being injured. Please read the entire section.



## Warning

If this Warning is ignored, death or serious injury may be caused by fire or electric shock.



## Caution

If this Caution is ignored, injury or physical damage may be caused by electric shock or other accidents.

## NOTE

Notes are given at the related handling descriptions in the body of the text. They indicate the items which must be observed by the customer in order to ensure the proper use of the product.

## Warning

- Do not use the product in an explosive or flammable atmosphere. Otherwise, fire may occur.
- Only qualified installers should be assigned to the work of installation, connection, running, operation and inspection. This is intend to prevent fire, electric shock and injury.
- Before starting the work, turn off the control unit power. Otherwise, electric shock may occur.
- The motor and control unit for use only in equipment of protection class I. Otherwise, electric shock may occur.
- The motor and control unit must be properly grounded. Otherwise, electric shock may occur.
- Be sure to keep power input voltage of the control unit within the rated range.
- Electrical connections must be made in strict accordance with the connection example. Otherwise, fire and electric shock may occur.
- Do not rework or modify the motor cable and extension cable (sold separately). Do not remove the sheath of the cable and then ground or touch the shielded wire. This may cause electric shock or trigger the ground fault interrupt circuit.
- After connection, mount the covers of the power connection terminal and input/output signal connection terminal. Otherwise, fire or electric shock may occur.
- Do not bend or pull the electrical cable and motor cable. Do not force them into other parts . This is to prevent electric shock, short circuit and fire.
- Turn off the control unit power in the event of power interruption. When the power is restored, the motor may start up suddenly and cause injury of the operator and damage to the equipment.
- Do not use it in a vertical application. When the control unit protection function is activated, the motor will stop and movable portions may fall down to cause injury of the operator and damage of the equipment.
- For ten seconds after turning off power, do not touch the control unit terminal block. Otherwise, electric shock may be caused.
- Do not disassemble, modify the motor, gearhead and control unit. Otherwise, electric shock, injury of the operator and damage of the equipment may occur. When internal inspection and repair must be made, contact your local sales office.

## Caution

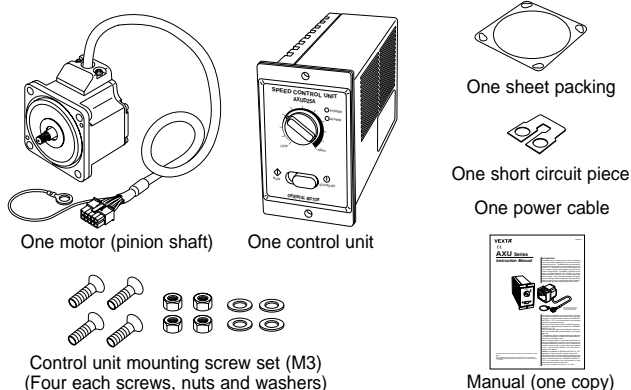
- Do not use the motor and control unit in excess of ratings. Otherwise, electric shock, injury of the operator and damage of the equipment may occur.
- Do not grip the motor output shaft or cable. Otherwise, injury may occur.
- Do not place combustibles around the motor and control unit. Otherwise, fire may occur.
- Do not put any object into the openings of the control unit. Otherwise, fire, electric shock or damage of the equipment may occur.
- The rotating part (output shaft) of the motor should be provided with a cover. Otherwise, injury of the operator may occur.
- Do not allow your finger to be caught between the motor and gearhead when the motor (pinion shaft) and gearhead are combined. This may cause injury.
- Do not allow your finger to be caught between the equipment and motor or gearhead when installing the motor or motor with gearhead on the equipment. This may cause injury.
- Use the motor and control unit in it's specified combination. This is to prevent fire, electric shock and damage of the equipment.
- Start test running after making sure that emergency stop can be used whenever required. Otherwise, injury of the operator may occur.
- Immediately when trouble has occurred, stop running and turn off the control unit power. Otherwise, fire, electric shock and injury of the operator may occur.
- During running and for some time after stopping the equipment, do not touch the motor and control unit with a bare hand. You may be burnt by high temperature on the surface of the motor.
- Immediately after the protection function has been activated, turn off the power. After removing the cause, turn on power again. If the motor operation is continued without removing the cause, the motor and control unit may operate incorrectly to cause injury of the operator and damage of the equipment.
- Use a insulated Phillips screwdriver for adjusting the slow start/slowdown time setting potentiometer of control unit. Otherwise, electric shock may occur.
- When testing the insulation resistance or dielectric strength, do not touch the terminal. Otherwise, electric shock may occur.
- When scrapping the motor and control unit, scrap them as industrial waste.

# Checking the products

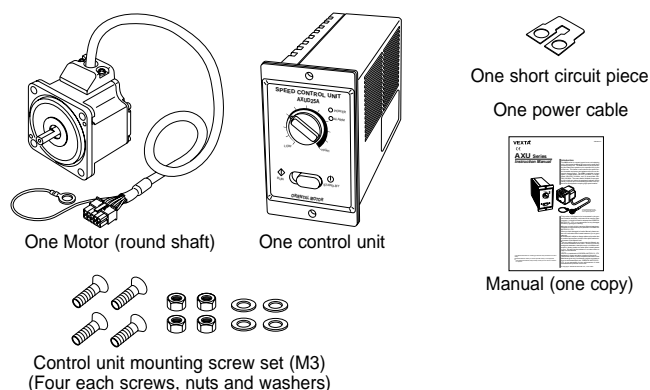
Open the package and make sure that the following items are supplied. If there is any shortage or damage, contact the sales office where you bought the product.

The unit name of the product you bought should be checked by reference to the name on the label of the package. Check the names of motor and driver by reference to the names on the name plate of each product. The Table below shows the combination of the motor and control unit according to unit names.

## Pinion shaft type



## Round shaft type



## Combinations of motors and control units

### ■ For single-phase 100V-115V

Unit name	Motor name	Control unit name
AXU210A-GN	AXUM210-GN	AXUD10A
AXU425A-GN	AXUM425-GN	AXUD25A
AXU540A-GN	AXUM540-GN	AXUD40A
AXU590A-GU	AXUM590-GU	AXUD90A

### ■ For single-phase 200V-230V

Unit name	Motor name	Control unit name
AXU210C-GN	AXUM210-GN	AXUD10C
AXU425C-GN	AXUM425-GN	AXUD25C
AXU540C-GN	AXUM540-GN	AXUD40C
AXU590C-GU	AXUM590-GU	AXUD90C

### ■ For three-phase 200V-230V

Unit name	Motor name	Control unit name
AXU210S-GN	AXUM210-GN	AXUD10S
AXU425S-GN	AXUM425-GN	AXUD25S
AXU540S-GN	AXUM540-GN	AXUD40S
AXU590S-GU	AXUM590-GU	AXUD90S

## Combinations of motors and control units

### ■ For single-phase 100V-115V

Unit name	Motor name	Control unit name
AXU210A-A	AXUM210-A	AXUD10A
AXU425A-A	AXUM425-A	AXUD25A
AXU540A-A	AXUM540-A	AXUD40A
AXU590A-A	AXUM590-A	AXUD90A

### ■ For single-phase 200V-230V

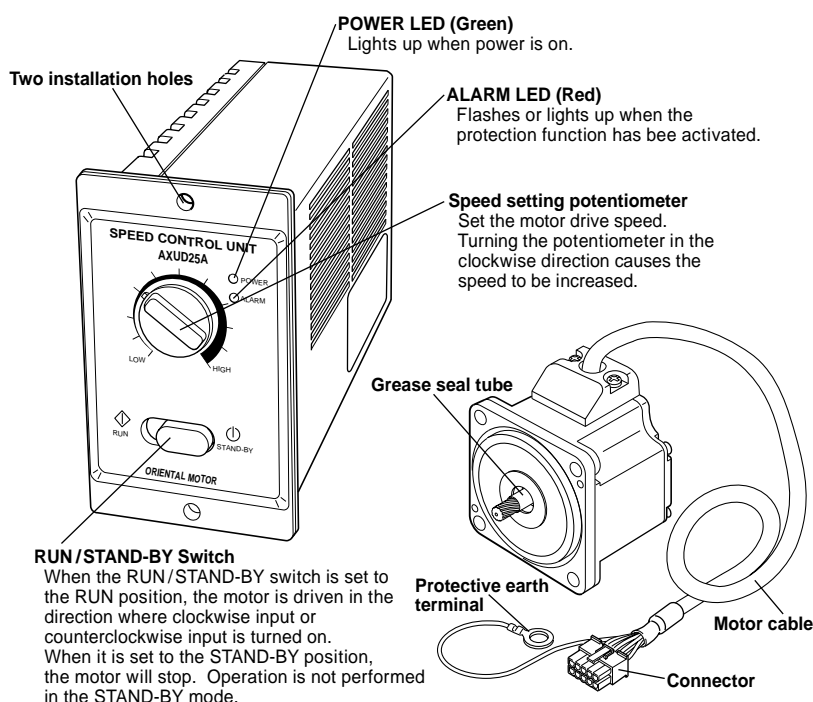
Unit name	Motor name	Control unit name
AXU210C-A	AXUM210-A	AXUD10C
AXU425C-A	AXUM425-A	AXUD25C
AXU540C-A	AXUM540-A	AXUD40C
AXU590C-A	AXUM590-A	AXUD90C

### ■ For three-phase 200V-230V

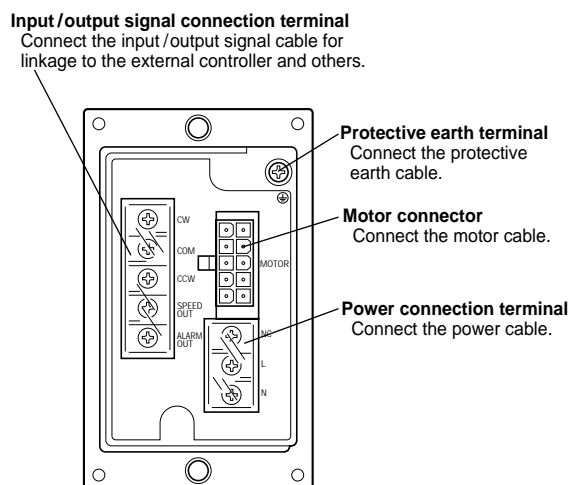
Unit name	Motor name	Control unit name
AXU210S-A	AXUM210-A	AXUD10S
AXU425S-A	AXUM425-A	AXUD25S
AXU540S-A	AXUM540-A	AXUD40S
AXU590S-A	AXUM590-A	AXUD90S

# Names and functions of individual components

## ■ Front of Control Unit

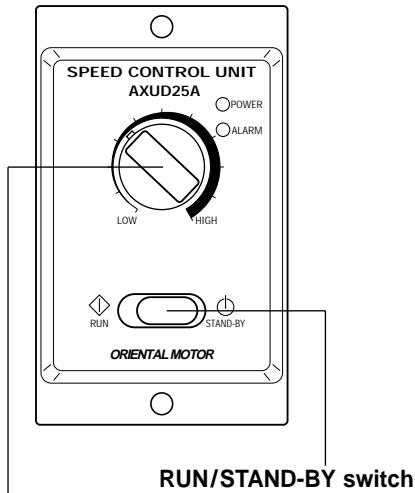


## ■ Back of Control Unit



\*Illustration shows a pinion shaft type of 25W.

# Running and Connection



## Speed setting potentiometer

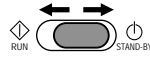
Turning the potentiometer in the clockwise direction causes the speed to be increased. The speed can be set in the range from 100 to 2000 r/min. It is set to 0 r/min at the time of shipment.

### NOTE

The RUN/STAND-BY switch is not a power ON/OFF switch. When you want to stop the motor for a long time, turn off the control unit power.

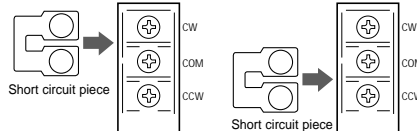
## Running by the RUN/STAND-BY switch (Use the short circuit piece.)

When the RUN/STAND-BY switch is set to the RUN position, and the motor is driven. When it is set to the STAND-BY position, the motor will stop. Operation is not performed in the STAND-BY mode.



Drive direction depends on how the short circuit piece is connected.

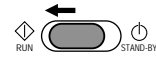
### • Clockwise direction • Counterclockwise direction



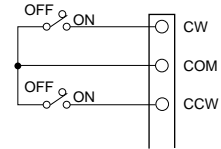
Connect the attached short circuit piece between the CW and COM or CCW and COM. Do not use the short circuit piece for other purposes.

## Running by external signals

Set the RUN/STAND-BY switch to the RUN position.

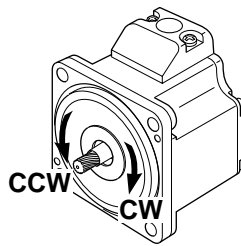
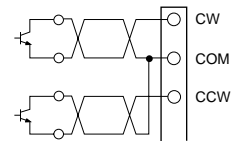


### ① Small-capacity switch and relay



Use a small-capacity contact type relay capable of opening and closing 12 VDC, 5mA.

### ② Transistor output type controller



### • Clockwise drive

When CW input is turned on (level L), the motor is driven in the clockwise direction. When CW input is turned off (level H), the motor is stopped.

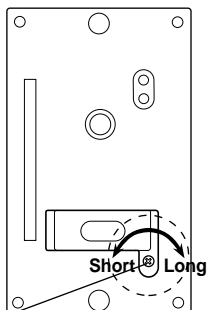
### • Counterclockwise drive

When CCW input is turned on (level L), the motor is driven in the counterclockwise direction. When CCW input is turned off (level H), the motor is stopped.

◆ When both the CW and CCW inputs are turned on (level L), the motor is stopped instantly. The motor cannot be reversed instantaneously.

## Setting the slow start/slowdown time

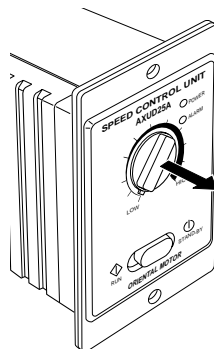
The motor starts slowly when it starts up, and stops slowly when it stops. This slow start and slowdown time can be set within the range from 0.5 to 10 sec. (2000 r/min without load).



### Slow start/slowdown time setting potentiometer

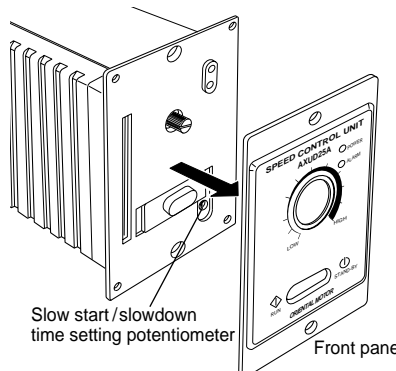
Time is increased by turning the switch in the clockwise direction. Use an insulated Phillips screwdriver for this operation. The shortest time is selected at the time of shipment.

## How to remove front panel



### Remove the control knob of the speed setting potentiometer.

Put a screwdriver (⊖) or the like between the front panel and the control knob. Then, pull the control knob toward you, and it will be removed. (Keep the knob completely at the LOW position.)

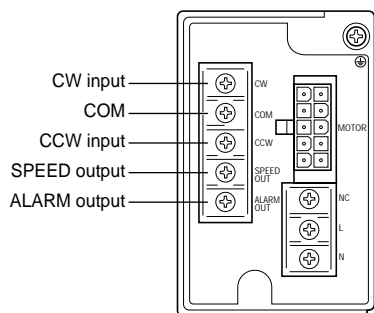


### Remove front panel.

Hold only the front panel, and pull it toward you. Then the front panel can be removed. In this case, the RUN/STAND-BY switch is also removed together. Care should be taken not to lose it.

Reverse the above steps if you want to install the front panel.

# Input/output signals

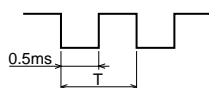


## Speed output

Concurrently with motor drive, the system outputs pulse signals (with a width of about 0.5 ms) at 30 pulses per rotation of the motor output shaft. You can measure the speed output frequency and calculate motor speed.

$$\text{Motor speed (r/min)} = \frac{\text{Speed output frequency (Hz)}}{30} \times 60$$

$$\frac{1}{T} = \text{speed output frequency}$$



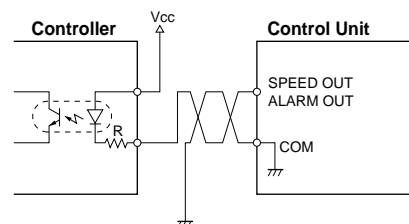
- ① When motor feedback signal failure has occurred due to motor cable disconnection or connector connection failure.
- ② When the motor is used in an elevating/lowering application or with a load in excess of the permissible load inertia, or when voltage applied to the control unit has exceeded the voltage setting (115VAC or 230VAC) by 20% or greater.
- ③ When voltage applied to the control unit is less than the voltage setting (100VAC or 200VAC) by 30% or greater.
- ④ When motor speed has reached an excess of 2800 r/min.

When electrical connection is made as shown in the example of connection, the ALARM output is on the level L if the control unit is normal (OFF), and is on the level H in the event of alarm.

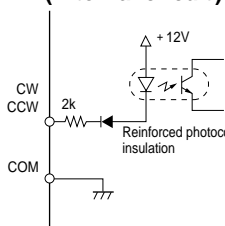
When alarm output is on (level H), turn off the control unit power after the motor has stopped. If the motor cable is free of any trouble, check the operating conditions (load torque, running pattern and power supply voltage). After removing the cause for activating the protection function, turn on power again and reset the alarm.

## NOTE

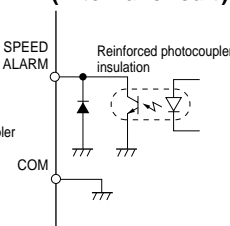
Signal output is open collector output. Use the power source of 26.4 VDC or less to connect the limit resistance (R) so that output current does not exceed 10mA.



## Input circuit (Internal circuit)



## Output circuit (Internal circuit)



The direction of rotation is the direction where the motor output shaft is driven when viewed from the motor output shaft side. The direction of gear output shaft rotation may be the reverse of the motor drive direction, depending on the speed reduction ratio of the gearhead.

## NOTE

- When you want to extend the input/output signal cable, the length must not exceed 2m(6.6ft). The cable should be as short as possible in order to minimize noise.
- The input/output signal cable should be connected to run perpendicular to the power cable and motor cable, not in parallel with the power cable and motor cable.

If you want to indicate or monitor the motor output shaft speed and determine the speed of the gearhead output shaft, use an optional digital speed indicator **SDM496**.

## ALARM output

In the following cases, the protection function of the control unit is enabled to turn on the ALARM output (level H) and to stop the motor. In this case, the LED flashes or lights up to allow the protection function to be checked.

\* It is normal that the LED lamp will turn on in a moment of the connection with power supply.

## LED lamp flashing

The LED lamp flashes when a load in excess of the rated torque is applied to the motor for about 5 seconds or more, or when the motor is instantly stopped or when the direction of rotation is switched repeatedly in a short period of time.

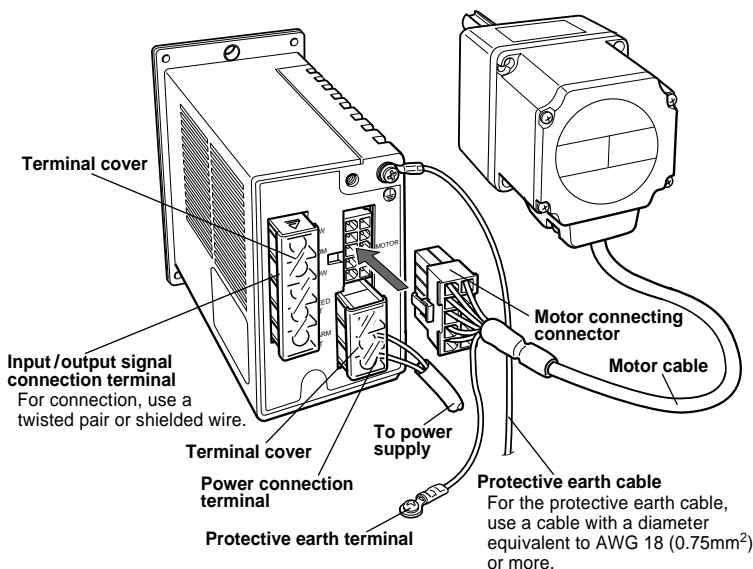
## LED lamp ON

This LED lamp turns on in the following cases:

# Connection

## Control unit

## Motor



## Motor connection

Insert the motor cable connector into the motor connector of the control unit.

Insert it until a click sound is audible, and connect it firmly.

To expand connection between the motor and controller, use the optional extension cable. Connection can be extended to a maximum of 10.5m (34.4ft).

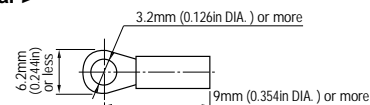
## Power connection

Connect the power cable to the power connection terminal of the control unit.

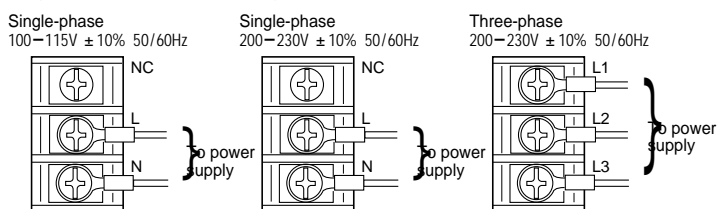
For the power cable, use the attached power cable or a cable with a diameter equivalent to AWG 22 (0.34mm<sup>2</sup>) or more.

For connection, use the insulated round crimp terminal.

## < Applicable crimp terminal >



## ● Single-phase 100 to 115V ● Single-phase 200 to 230V ● Three-phase 200 to 230V



# Cautions for Use

■ Do not use a solid state relay (SSR) to turn on or off power.  
The motor control unit may be damaged if it is used.

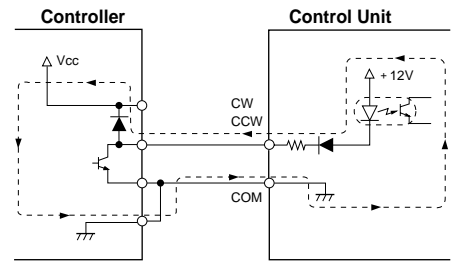
■ When you want to use the controller with a built-in clamp diode, pay attention to the sequence of turning on or off the power.

**Power ON:** Controller ON → Control unit ON

**Power OFF:** Control unit OFF → Controller OFF

If the control unit power is turned on first when connected as shown on the right, or the controller power is turned off with the control unit power turned on, current will be applied, as indicated by arrow mark of the diagram, and this may cause the motor to be driven. When the power is turned on or off simultaneously, the motor may be driven temporarily due to differences in power capacity.

The controller power must be turned on first, and control unit power must be turned off first.



# Installation

## Installation site

The motor (gearhead) and control unit are designed and manufactured to be incorporated into the equipment. Install them in a site which ensures effective ventilation and easy inspection and meets the following conditions:

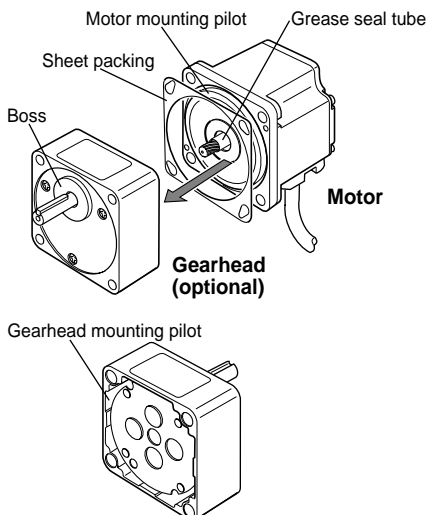
- ◆ Indoors
- ◆ Ambient temperature  
Motor: 0°C ~ +50°C (32°F ~ 122°F)  
Control unit: 0°C ~ +40°C (32°F ~ 104°F)  
(freezing not allowed)
- ◆ Ambient humidity: 85% or less  
(dew condensation not allowed)
- ◆ Not in the explosive or hazardous atmosphere
- ◆ Not exposed to sunlight
- ◆ Not exposed to dust or conductive particles
- ◆ Not splashed with water, oil or other liquid
- ◆ Not subjected to continuous vibration or excessive shock
- ◆ No radiation, magnetic field or vacuum atmosphere in the vicinity
- ◆ Overvoltage category III, Pollution degree 2, Class I (For EN Standard)  
When the machinery to which the control unit is mounted requires pollution degree 3 specifications, install the control unit in a cabinet that complies with IP54.

## Installation of motor (gearhead)

Install the motor (gearhead) on a metallic plate having an excellent resistance to vibration and providing high heat conduction. Keep the motor case temperature at 90°C (194°F) or less.

### Pinion shaft type

**1**  
Install the attached sheet packing on the motor installation surface, and mount the gearhead. **GN** type is the only pinion shaft type of the gearhead that can be mounted.

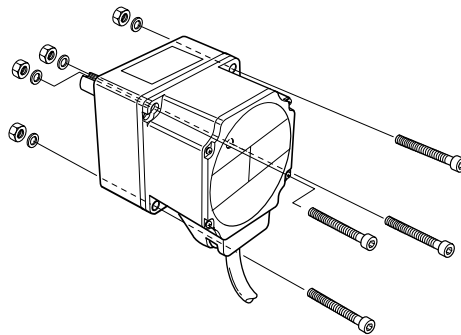


### NOTE

- Without removing the grease seal tube (white) on 10W and 25W types attached to the pinion shaft, mount it on the gearhead. If this tube is removed, gearhead grease will flow into the motor, and this may cause the motor to be damaged.
- When the motor and gearhead are assembled, use each mounting pilot as a guide, and turn the gearhead slowly to the right and left, taking care to prevent the threaded portion of the motor from heavily hitting the side plate of the gearhead or the gear. Then assemble them in position.

### 2

Using the four installation holes, lock the motor with four installation screws of the gearhead so that there is no gap with the metallic plate.



### NOTE

The boss located on the gearhead installation surface should be inserted into the countersunk or drilled-through mounting pilot hole.

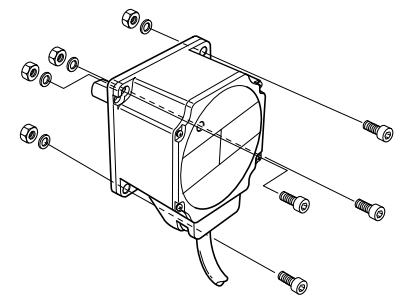
### Tightening torque

Unit name	Bolt designation	Tightening torque
AXU210□-GN	M4	1.8N·m (15.9lb-in)
AXU425□-GN	M5	3.8N·m (33.6lb-in)
AXU540□-GN	M6	6.4N·m (56.6lb-in)
AXU590□-GU (5GU □ KB)	M6	6.4N·m (56.6lb-in)
AXU590□-GU (5GU □ KBH)	M8	15.5N·m (137.1lb-in)

"A", "C" or "S" showing voltage specifications is put in "□" of the unit product name.  
The gear ratio appears at the position in the gearhead model number indicated by the box (□).

### Round shaft type

Using the four installation holes, mount the motor with four screws and nuts (not included) so that there is no gap with the metallic plate.



### NOTE

- The mounting pilot on the motor installation hole should be inserted into the countersunk or drilled-through mounting pilot hole.
- The round shaft should be mounted on the metallic plate of the following dimensions so that the motor case temperature will be 90°C (194°F) or less.

Unit name	Heat radiation plate dimensions	Thickness
AXU210□-A	135 mm × 135 mm (5.31in × 5.31in)	5mm (0.197in)
AXU425□-A	165 mm × 165 mm (6.50in × 6.50in)	
AXU540□-A	200 mm × 200 mm (7.87in × 7.87in)	
AXU590□-A	200 mm × 200 mm (7.87in × 7.87in)	

"A", "C" or "S" showing voltage specifications is put in "□" of the unit product name.

### Tightening torque

Unit name	Bolt designation	Tightening torque
AXU210□-A	M4	1.8N·m (15.9lb-in)
AXU425□-A	M6	6.4N·m (56.6lb-in)
AXU540□-A	M8	15.5N·m (137.1lb-in)
AXU590□-A	M8	15.5N·m (137.1lb-in)

"A", "C" or "S" showing voltage specifications is put in "□" of the unit product name.

# Load installation

When mounting a load on the motor and gearhead, make sure that the centerline is aligned between the motor output shaft or gearhead output shaft and load shaft.

The **2GN** type gearhead output shaft and round shaft type motor output shaft are provided with milling. Use a double-point screw to fix it firmly to the milled portion, thereby preventing load from rotating on the shaft.

The **4GN**, **5GN**, **5GU** type gearhead output shaft is provided with key-grooves. A key groove should also be provided on the load side to be mounted. Mount it firmly by the key of the gearhead.

◆ Direct coupling connection  
Make sure of a straight centerline between the motor (gearhead) output shaft and load shaft.

◆ Belt connection  
Make sure that the motor (gearhead) output shaft and load shaft will be parallel to each other. Ensure that the line connecting the centers of both pulleys is at a right angle to the shaft.

◆ Gear connection  
Make sure that the motor (gearhead) output shaft and gear shaft will be parallel to each other. Ensure that the gear teeth mesh properly.

## NOTE

- When mounting the coupling or pulley to the motor output shaft or gear output shaft, take care not to damage the output shaft or bearing.
- When connecting the motor (gearhead) with the load, pay attention to centering, belt tension and pulley parallelism. The coupling and pulley locking screws must be tightened firmly.
- Do not modify or machine the motor (gearhead) output shaft. You may damage the bearing, motor or gearhead.

## Overhang load and thrust load

Ensure that overhung load applied to the motor shaft does not exceed the tolerance shown in the Table below.

Avoid thrust load wherever possible. If it has to be applied, it should not exceed half the motor weight. Should it exceed the tolerance, the motor (gearhead) bearing and output shaft may be subjected to fatigue damage due to repeated load.

Unit/gearhead name	Overhang load	
	Distance from the shaft end 10mm (0.4in)	20mm (0.8in)
AXU210 □ -A	70N (16lb)	100N (22lb)
AXU425 □ -A	120N (27lb)	140N (31lb)
2GN3K ~ 2GN18K	50N (11lb)	80N (18lb)
2GN25K ~ 2GN180K	120N (27lb)	180N (40lb)
4GN3K ~ 4GN18K	100N (22lb)	150N (34lb)
4GN25K ~ 4GN180K	200N (45lb)	300N (67lb)
5GN3K ~ 5GN18K	250N (56lb)	350N (78lb)
5GN25K ~ 5GN180K	300N (67lb)	450N (101lb)
5GU3KB ~ 5GU9KB	400N (90lb)	500N (112lb)
5GU12.5KB ~ 5GU18KB	450N (101lb)	600N (135lb)
5GU25KB ~ 5GU180KB	500N (112lb)	700N (157lb)
5GU50KBH ~ 5GU180KBH	400N (90lb)	600N (135lb)

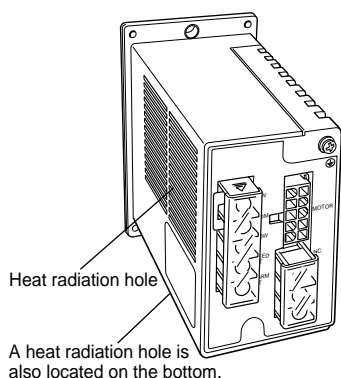
"A", "C" or "S" showing voltage specifications is put in "□" of the unit product name.

# Installation of control unit

## Direction of installation

The control unit is designed based on the assumption of heat radiation due to air convection.

When you want to install the control unit inside the housing, install it to ensure that one of two heat radiation holes of the control unit faces downward.



## NOTE

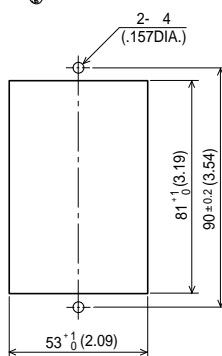
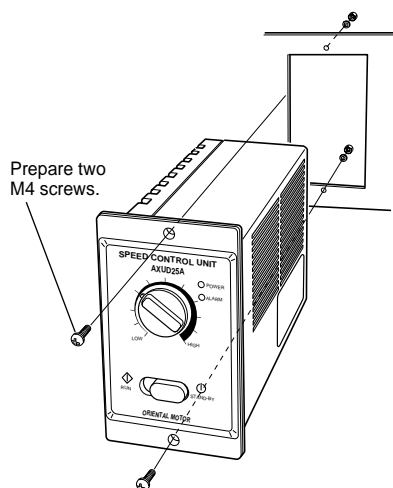
- Install the control unit 25mm (1in) or more away from the housing and other equipment inside the housing in the horizontal direction, and 50mm (2in) or more away in the vertical direction.
- Around the control unit, do not install the equipment which generates a great deal of heat or noise.
- If the ambient temperature of the control unit exceeds 40°C (104°F), review the ventilation conditions or forcibly cool control unit with a fan.

## Installation method

Install the control unit on the metallic plate having an excellent resistance to vibration.

### ① When mounting the unit by drilling a rectangular hole

Use the control unit mounting hole and mount the unit with two M4 flat countersunk head screws and nuts.



Panel machining drawing [mm (in)]

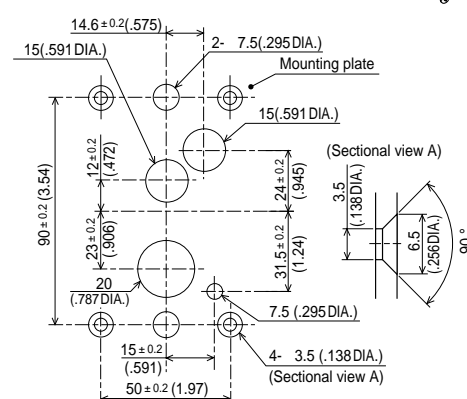
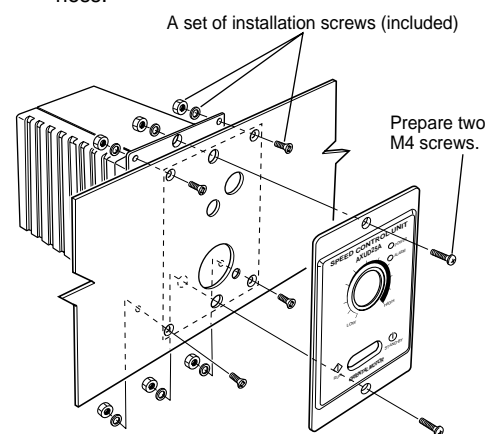
## NOTE

Use a tightening torque of 0.7N·m (99.4 oz·in) or less for the screws. Tightening them at a torque above 0.7N·m (99.4 oz·in) could damage the control unit.

### ② When using the included set of the installation screws to mount the install unit

Remove the front panel according to the steps shown in "How to remove front panel" on page 4 (lower position), and mount the control unit.

Use a plate 2mm (0.08in) or less in thickness.



Panel machining drawing [mm (in)]

# Trouble diagnosis and countermeasures

The motor and control unit may not operate correctly during motor operation due to speed setting error or electrical connection error. If the motor cannot be driven correctly, take the appropriate measures according to the following Table. If correct motor operation cannot be regained despite such measures, contact our sales office.

Trouble	Possible cause	Measures
The motor fails to rotate.	<ul style="list-style-type: none"> <li>●The RUN/STAND-BY switch is set to the STAND-BY position.</li> <li>●Both CW and CCW inputs are turned on.</li> <li>●The speed setting potentiometer is not adjusted.</li> <li>●The protection function has been activated. (ALARM LED lamp flashes or lights up.)</li> </ul>	<ul style="list-style-type: none"> <li>●Set the RUN/STAND-BY switch to the RUN position. Turn on either CW or CCW input.</li> <li>●Turn off either CW or CCW input.</li> <li>●Turn the speed setting potentiometer slightly in the clockwise direction.</li> <li>●Check for the cause of the protection function activation and take the appropriate measures.</li> </ul>
The motor turns in the direction opposite to the specified one.	<ul style="list-style-type: none"> <li>●The CW input and CCW input are incorrect or electrical connection is wrong.</li> <li>●The motor rotates in the opposite direction, depending on gearhead speed reduction ratio.</li> </ul>	<ul style="list-style-type: none"> <li>●Supply correct input signals. When CW input is at level L, the motor shaft rotates in the CW direction. When CCW input is at level L, it rotates in the CCW direction.</li> <li>●Reverse the CW and CCW input operations. [Rotating opposite of motor direction]  <b>GN type :</b>                      1/25, 1/30, 1/36  <b>GU type :</b>                      1/12.5, 1/15, 1/18, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180</li> </ul>
Motor operation is not stable. There is much vibration.	<ul style="list-style-type: none"> <li>●The centerline is not aligned between the motor (gearhead) output shaft and load shaft.</li> <li>●The motor and gearhead are not assembled correctly.</li> </ul>	<ul style="list-style-type: none"> <li>●Check the connection between the motor (gearhead) output shaft and load shaft.</li> <li>●Check how the motor and gear head are assembled. Also check pinion shaft type.</li> </ul>

## Safety standards and CE marking

Motors and control units have been designed and inspected according to the following standards.

Subject	Standards	Certification Body	Standards File No.	CE Marking
Motor	UL1004	Conformed to UL, CSA, EN Standards (UL, CSA, EN certified are scheduled)		Low Voltage Directive
	CSA C22.2 No.100			
	EN60950			
	EN60034-1			
Control unit	EN60034-5			
	UL508C			
	CSA C22.2 No.14			
	EN60950			
	EN50178			

**NOTE**

- The EMC measurements required under standard EN50178 are not performed separately for motors and control units. Perform the EMC test when they are incorporated into the final product.
- The overvoltage protection test required under standard EN50178 is not performed. Perform the test when incorporated into the final product.

**●Installation Conditions**

Overvoltage category III, Pollution degree 2, Class I ( For EN Standard )  
 When the machinery to which the control unit is mounted requires pollution degree 3 specifications, install the control unit in a cabinet that complies with IP54.

- Please contact your nearest ORIENTAL MOTOR office for further information.

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