Oriental motor

NEW PRODUCTS

Hybrid Control System αSTEP

AR Series FR geared type

DC power input Frame size 90mm

Installation Manual

TB-66828-Δ0

Installation

■ Location for installation

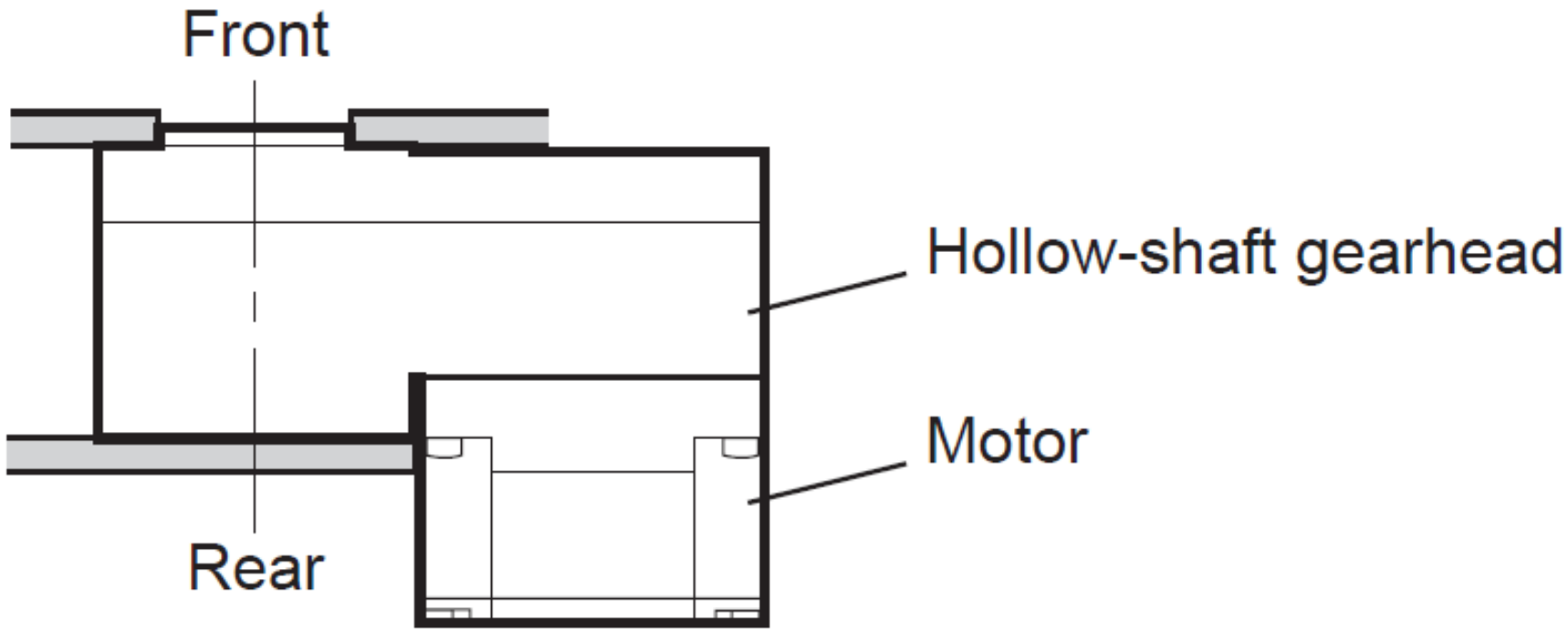
The motor is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions :

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature 0 to +50 °C (+32 to +122 °F) (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- 1,000 m (3,300 ft.) or lower above sea level

Installation

■ Installation direction

A hollow-shaft gearhead can be installed by using either its front or rear side as the mounting surface.



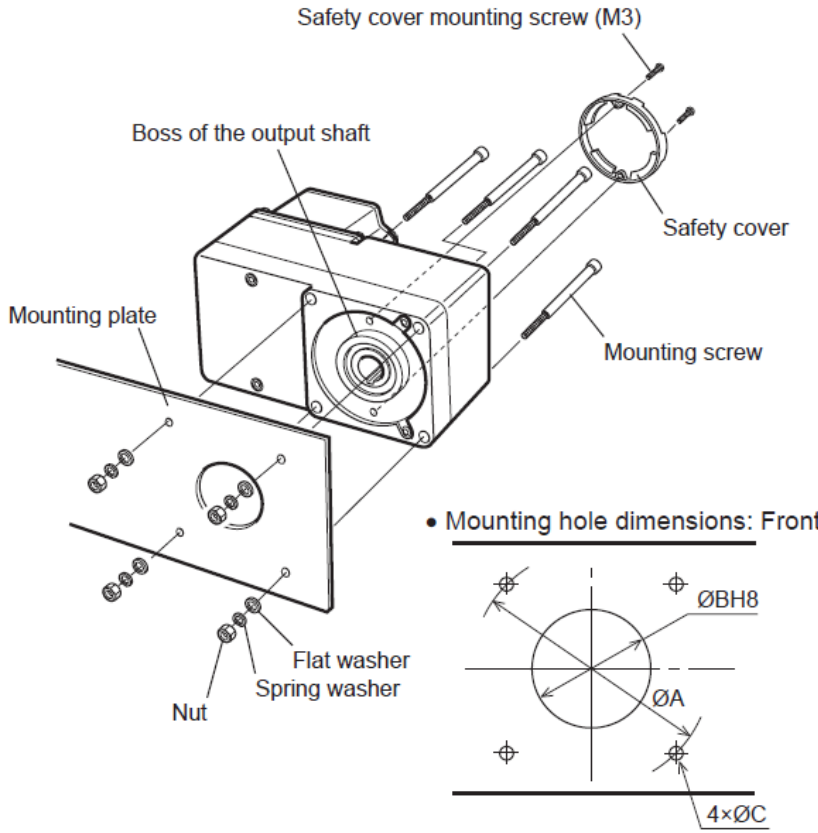
Installation

■ Installation method

- Affix the gearhead onto a smooth, machined metal surface using the supplied hexagonal socket head screw set.
- Drill mounting holes in the metal plate for installation of the gearhead.
- Using the supplied hexagonal socket head screw set and the four mounting holes provided in the gearhead's mounting surface, affix the gearhead in such a way that there is no gap along the equipment's mounting surface.
- Using the supplied safety cover mounting screw (M3-2 pcs.), install the supplied safety cover on the hollow output shaft opposite the shaft end on which the load shaft is installed.
- If use the hexagonal socket head screw (supplied), maximum applicable plate thickness is 12mm.(0.47in.)

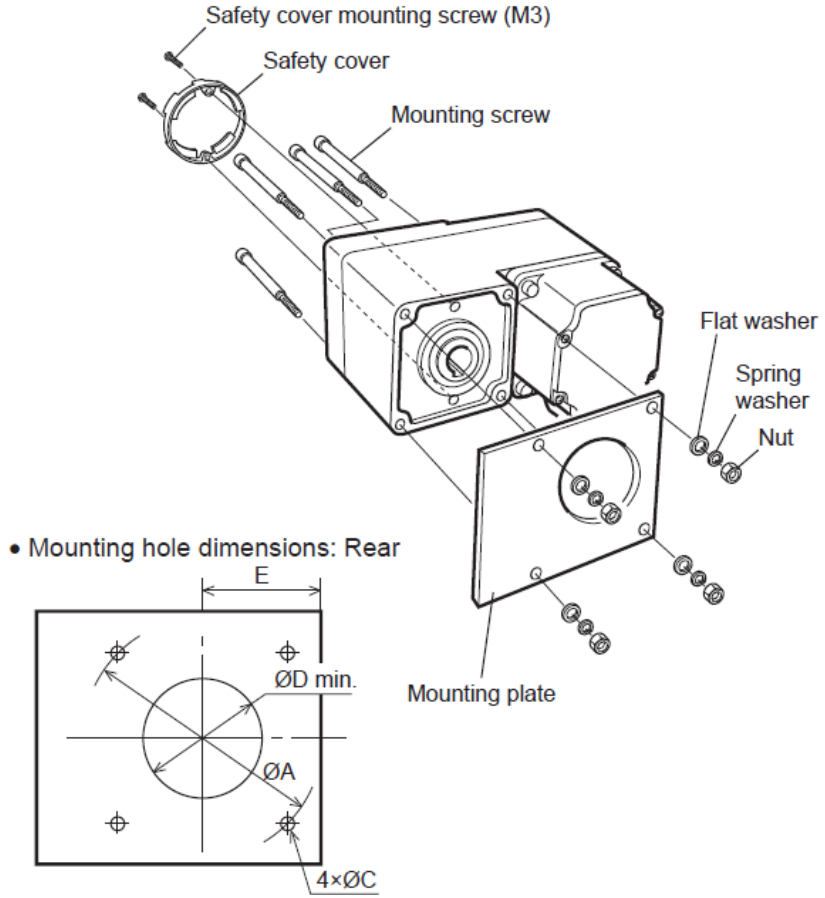
■ Using the front side as the mounting surface

Use the boss of the output shaft (h8) to align the center.



Installation

■ Using the rear side as the mounting surface



Note

When installing the gearhead using its rear face, be certain that dimension E does not exceed the specified value so that contact between the mounting plate and motor is prevented.

Tightening torque[unit：N･m(lb-in.)]

Screw	Tightening torque
M8	12 (106)

Mounting hole dimensions[unit：mm(in.)]

ΦA	ΦB H8	ΦC	ΦD	E
104 (4.09)	$50\ ^{-0.039}_{0}$ $(1.9685\ ^{-0.0015}_{0})$	8.5 (0.335)	35 (1.38)	44 (1.73)

Installation

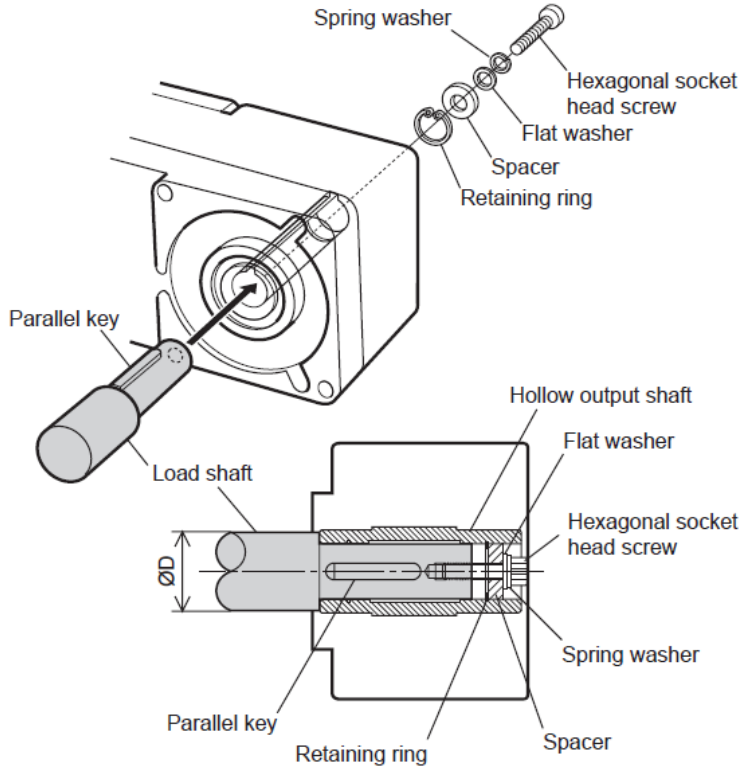
■ Installing the load shaft

- When installing the load shaft onto the hollow output shaft of the gearhead, align the centerlines of the hollow output shaft and load shaft.
- The hollow output shaft has a key groove. Machine a key groove in the load shaft and then affix the two shafts using the supplied parallel key.
- The recommended tolerance of the load shaft is “h7.”
- Use a stepped load shaft and affix it using an end plate* if large, frequent impacts are expected due to instantaneous stops or when the overhung load is large.
- There is a gap between the load shaft and the hollow output shaft due to parallel key and key groove. The misalignment can be prevented by affixing the load shaft using an end plate*.

*For details, refer to “Affixing method using end plate”.

■ Stepped load shaft

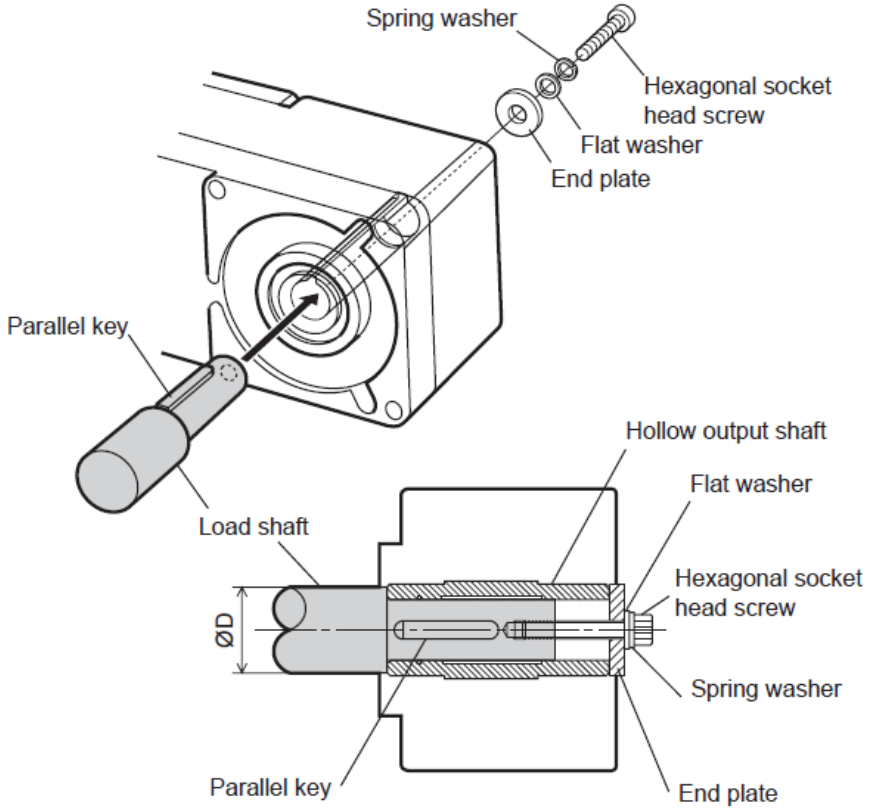
- Affixing method using retaining ring
  Install each hexagonal socket head screw over a retaining ring, spacer, flat washer and spring washer and securely affix the ring.



Installation

・Affixing method using end plate

Affix the load shaft by tightening the hexagonal socket head screw over an end plate, flat washer and spring washer.

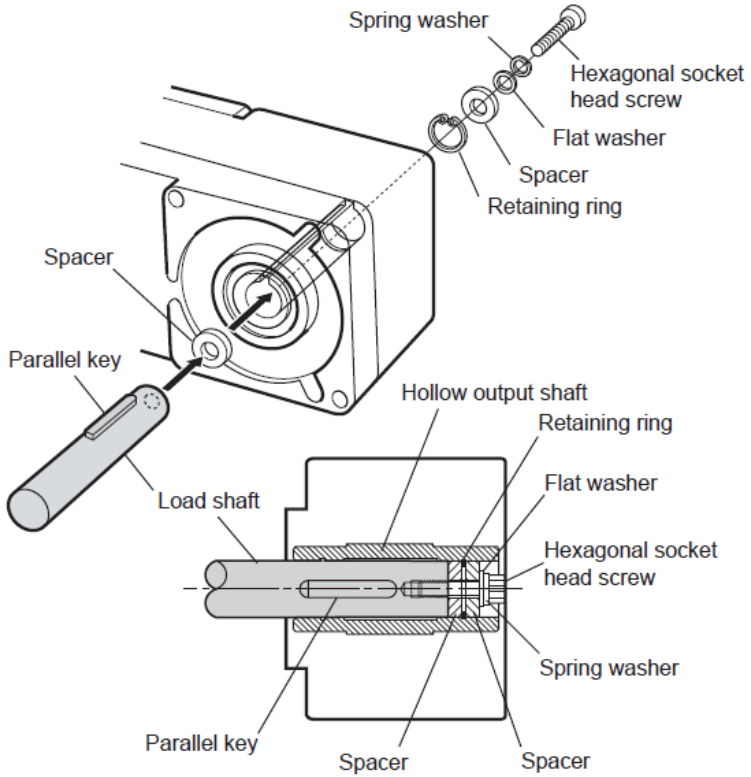


Note The supplied safety cover cannot be installed because it interferes against the hexagonal socket head screws. The customer must provide other protective measure for the rotating part.

Installation

■ Non-stepped load shaft

Install each hexagonal socket head screw over a retaining ring, spacer, flat washer and spring washer and securely affix the ring. Also insert a spacer on the load shaft side.



Recommended load shaft installation dimensions[unit：mm(in.)]

Inner diameter of hollow shaft (H8)	Recommended tolerance of load shaft (h7)
$\Phi 20\ ^{-0.033}_{0}$ $(\Phi 0.7874\ ^{-0.0013}_{0})$	$\Phi 20\ ^{0}_{-0.021}$ $(\Phi 0.7874\ ^{0}_{-0.0008})$

Nominal diameter of retaining ring	Applicable screw	Spacer thickness	Outer diameter of stepped shaft (ØD)
Φ20 (Φ0.79)	M6	5 (0.20)	30 (1.18)

Note

- When installing the load shaft onto the hollow output shaft, be careful not to damage the hollow output shaft or the bearing.
- Apply grease (molybdenum disulfide grease, etc.) on the surface of the load shaft and inner walls of the hollow output shaft to prevent seizure.
- Do not modify or machine the hollow output shaft. Doing so may damage the bearing and cause the gearhead to break.
- If the motor receives an overhung load, it is recommended that the load be affixed using one of the installation methods explained under “Stepped load shaft.”

Technical Reference

■ Selection Points

・Please refer to "Technical Reference" of the general catalog.

・When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

■ Service Life of a Gearhead

・Defines the rated life as the life of a FR gearhead under the following operating conditions.

・Please refer to "Technical Reference" of the General Catalog for estimating lifetime.

Conditions

Torque	: Permissible torque
Load Type	: Uniform Load
Input Speed	: Reference input speed
Radial Load	: Permissible radial load
Axial Load	: Permissible axial load

Series	Gearhead Type	Reference Input Speed [r/min]	Rated Life [h]
AR Series	FR Geared Type	1500	10000

Notes

■ Notes for when the electromagnetic brake is used

Note

Note the following points when a electromagnetic brake type is used.

・About electromagnetic brake
Do not use the electromagnetic brake as a means to decelerate and stop the motor.
Please refer to "Precautions for use " of the operating manual "AR Series Motor" and user manual "AR Series Pulse input type" and "AR Series Built-in Controller Type “.

・When combined with a driver “ARD-K”.
Note the following points when the power supply drop voltage is expected by using such as batteries for the power supply.
The driver outputs "Undervoltage warning*1" for the power supply voltage drop and turns off the motor excitation. However, the electromagnetic brake keeps releasing when the power supply of electromagnetic brake*2 is supplied from the same power supply. Please turn off the power supply of electromagnetic brake when the motor excitation is turned off.

*1. "Undervoltage warning" is 18V (factory setting) regardless of ARD-K or ARD-KD. Please refer to user manual "AR Series"

*2. When the combination driver is ARD-K, the electromagnetic brake is required to control by switching the ON/OFF status of the power supply for electromagnetic brake. Please refer to "Connection" of the operating manual "AR Series DC power input Pulse input type Driver" and user manual "AR Series Pulse input type" and "AR Series Built-in Controller Type“.
When the combination driver is ARD-KD, the driver controls the power supply of electromagnetic brake.

Notes

■ Handling method of product

- Please refer to operating manual "AR Series Motor“ for handling method of a motor and the disclaimer other than the contents of this technical data.
- Please refer to motor specification, attached sheet, "Introduction“, "Safety precautions“, “Precautions for use”, ” Connection”, “Inspection and maintenance” and “Regulations and standards” when a product is used.
- Combinable drivers are “ARD-K” and “ARD-KD”. Please refer to operating manual " AR Series DC power input Pulse input type" and "AR Series DC power input Built-in controller type” for handling method of a driver and the disclaimer.