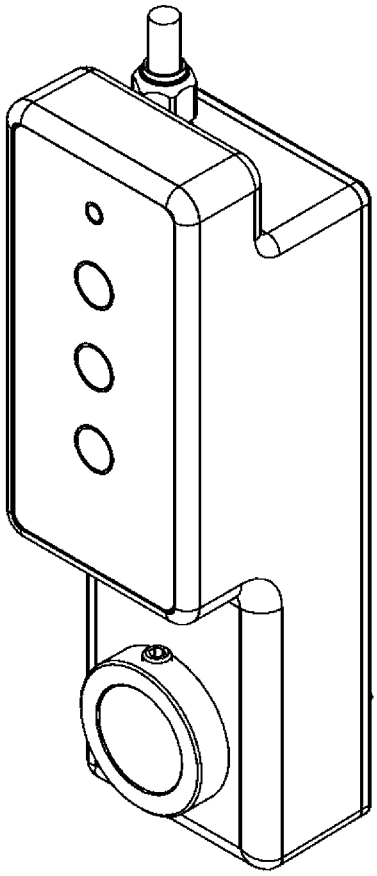
Wireless Positioning Units

EPU-200-W5-R60

- Adapter Plate (EOAP-200)(Option)
- Collar (EOCL-200)(Option)

Instruction Manual



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Couplings, Screws, Clampers

Introduction

Thank you very much for purchasing this **Wireless Positioning Unit (EPU-200-W5-R60)** from Nabeya Bi-tech Kaisha.

Read the "Wireless Positioning Unit (EPU-200-W5-R60) Simple Guide" or the "Wireless Positioning Unit (EPU-200-W5-R60) Instruction Manual" for this product carefully prior to use. Only use once the correct usage method of this product is understood.
The contents of **"1 Cautionary Notes Regarding Safety"** in particular, must be read and understood prior to use.
This manual should be stored in a manner that enables it to be viewed whenever a user may require it.

■About Applications of this Product

This product is designed for general industrial applications, such as feed screw drives.
Do not use in applications where incorrect operation or failure may lead to death or personal injury, or in applications where failure could cause serious social damage or adverse impact.

- **Contact us when considering use for special applications.**
- **Always install the fail-safe function if using for applications involving equipment that may cause serious accident or loss.**

■About Disposal

When disposing this product, follow the rules and regulations of each local government and dispose of it as industrial waste.

Due to product improvements, some of the specifications described in this document are subject to change without notice.

Contents

1 Cautionary Notes Regarding Safety

Take care to understand the following precautions before using the product in order to ensure safe operation.
Improper handling or use may cause an unexpected accident or shorten the life of the product.
We do not take any responsibility in the case of failure due to improper use, modification, of for not following the precautions.

In this manual, safety precautions are classified as either a "Warning" or "Caution".

■Description of Markers

The specific contents will be indicated in sentences near the Warning/Caution marker.

 Warning	This indicates a situation where improper handling could result in a dangerous situation that could cause death or serious injury.
 Caution	This indicates that incorrect handling may cause minor injury or damage to the product and surrounding equipment.

■Explanation of Figure Marker

The specific contents will be indicated in sentences near the figure marker.

Figure Marker	Description
	Indicates something is prohibited. Never perform any prohibited work.
	Indicates something is mandatory. Always perform any mandatory work as instructed.

1.1 Cautionary Notes Regarding Installation and Wiring

Warning

- Be sure to perform wiring after installation is complete. **Not doing so may result in an electric shock.**
- Do not allow conductive foreign matter, such as screws and metal pieces, or flammable foreign substances, such as oil, to enter the internals. **This may result in an electric shock, fire, or a fault.**
- Be sure to install the unit in such a way that fire or personal injury does not occur during an earthquake.
- Insulate the cable connections. **Not doing so may result in an electric shock.**
- If wiring in a location that is very dusty or may come in contact with water or oil, process in a manner that will make them resistant to water and dust. **Not doing so may result in an electric shock, fire, or a fault.**

Warning

- Do not perform wiring while hands are wet. **It may result in electric shock or failure.**
- Do not use this product underwater, corrosive atmosphere, flammable gas or harmful gas, or near combustible materials. **This may result in an electric shock, fire, or a fault.**
- Do not damage, apply excessive stress, place heavy objects on, pinch, or bend the cables repeatedly. **This may result in an electric shock, fire, or a fault.**
- Do not use in locations subject to severe vibration or impacts. **This may result in an electric shock, injury, fire, or a fault.**

Caution

- Perform wiring correctly and securely. **Not doing so may result in an electric shock, fire, or a fault.**
- Install according to the specified mounting method and mounting direction. **Not doing so may result in injury or a fault.**
- Consider each of the specifications, such as the main unit weight and rated output, when installing and install in an appropriate environment. **Not doing so may result in injury or a fault.**
- Install the unit where the ambient temperature is -5˚C to 55˚C (non-freezing) and the ambient humidity is 20%RH to 85%RH (non-condensing). **Not doing so may result in a fire or a fault.**
- Take measures regarding peripheral devices that are affected by noise as noise may be generated by the PWM switching control. Also consider the installation environment as the unit itself may be affected by external noise.
- Adjust the alignment between the output shaft and the partner device accurately. **Not doing so may result in a fault.**
- Check and adjust each setting before operation to avoid unexpected operation. **Not doing so may result in injury or a fault.**

Caution

- Do not apply any voltage other than the specified voltage. **This may result in a fault.**
- Do not stack the units. **This may result in a fault.**
- Do not hold the cables or output shaft during transportation. **This may result in a fault.**
- Do not step on the unit or place heavy objects on it. **This may result in a fault.**
- Do not subject the unit to strong impacts such as those caused by dropping or falling from something. **This may result in a fault.**
- Do not use outdoors or under exposure to direct sunlight. **This may result in a fire or a fault.**
- Do not use in places where static electricity is generated. **This may result in a fire or a fault.**
- Do not subject the output shaft to strong impacts. **This may result in a fault.**
- Do not subject the output shaft to loads in excess of the allowable load. **This may result in a fault.**
- Do not connect directly to AC power. **This may result in a fire or a fault.**

1.2 Cautionary Notes Regarding Operation and Maintenance

Warning

- Wiring, maintenance and inspection should be performed by a specialized technician. **Not doing so may result in an electric shock, injury, or a fault.**
- If an error occurs, stop operation immediately and install an external emergency stop circuit so that the power can be shut off. **Not doing so may result in an electric shock, injury, fire, or a fault.**

Warning

- Do not move, connect wiring, or inspect while the power is on. **It may result in electric shock or failure.**
- In case of a fault, shut off the power immediately at the power supply and do not reapply power. **Not doing so may result in a fire or a fault.**
- Do not touch the unit while the power is on or for a while after the power is turned off, as it may be hot. **This may result in burns.**
- Never touch the output shaft during operation. **This may result in injury.**
- Do not disassemble, repair or modify. **This may result in an electric shock, injury, fire, or a fault.**

Caution

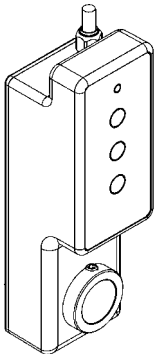
- Securely fix to the device so that it will not come loose during operation. **Not doing so may result in injury or a fault.**
- If a dangerous situation may occur while stopped or if the product fails, install an external holding brake. **Not doing so may result in injury or a fault.**
- If an error occurs, fix the cause and ensure safety before restarting operation. **Not doing so may result in a fault.**
- Turn off the power if not using the product for extended periods of time. **Not doing so may result in a fault.**

Caution

- Do not use a unit while damaged. **This may result in injury, fire, or a fault.**
- Do not make extreme adjustments or changes. **Such changes may cause unstable operation.**
- After power is restored in the event of a power outage, do not approach the equipment because operation may restart all of a sudden. **This may result in injury.**
- Do not turn the power on or off excessively frequently. **This may result in a fire or a fault.**
- Do not perform continuous operation for extended periods of time. **This may result in a fire or a fault.**

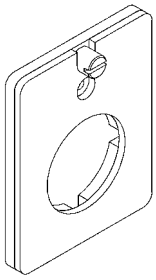
2 Overview

2.1 Product Overview



Wireless Positioning Unit (EPU-200-W5-R60)

- These units automate positioning mechanisms with a feed screw. By replacing the feed screw operating handle with this unit, equipment and device positioning mechanisms can be automated.



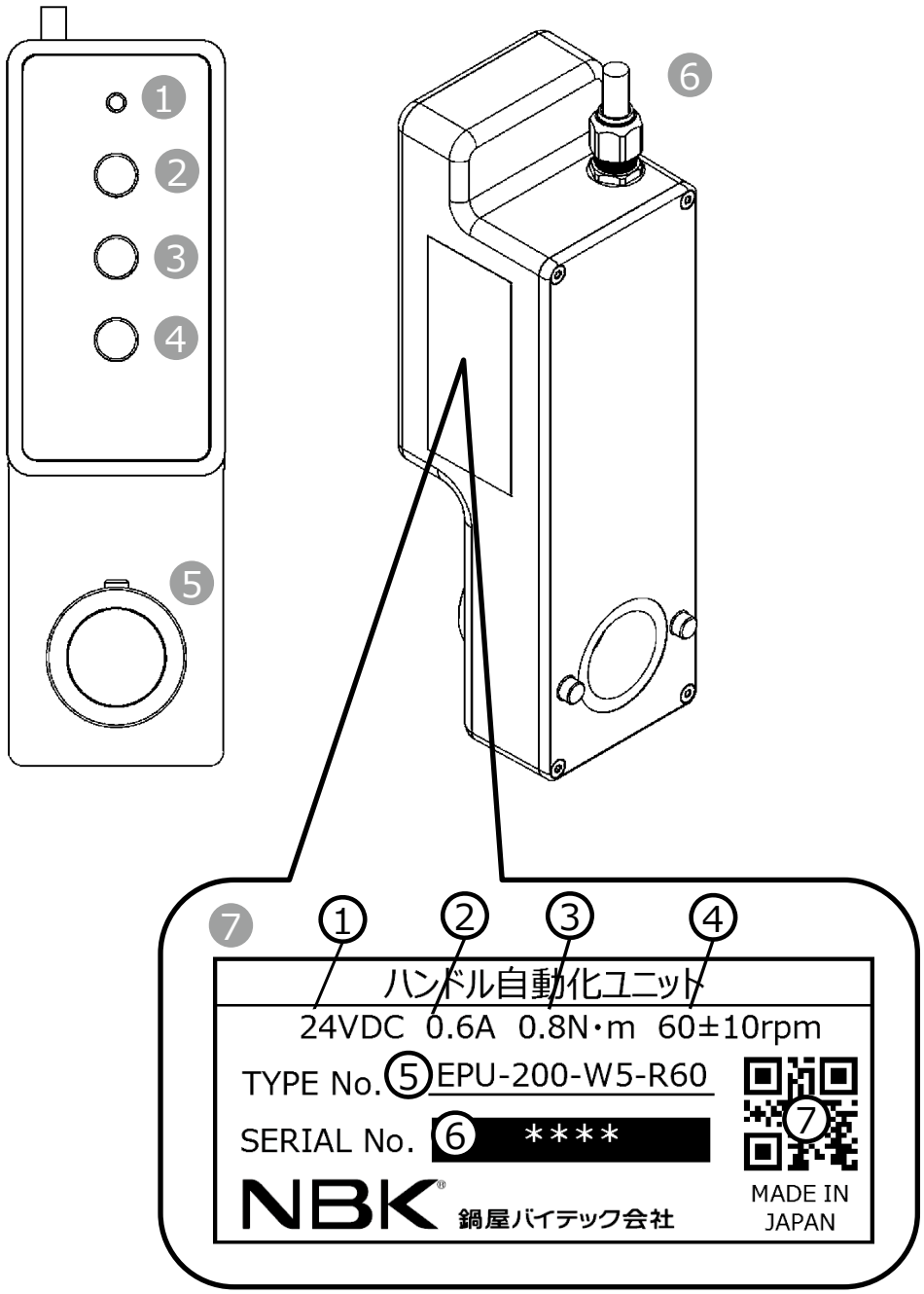
Adapter Plate (EOAP-200)(Option)

- If replacing the digital position indicator and handle attached to a machine with a Wireless Positioning Unit, use the positioning pin for the digital position indicator of the machine as-is to mount the Wireless Positioning Unit.

Collar (EOCL-200)(Option)

- The Wireless Positioning Unit bore diameter can be changed to match the rotation shaft.

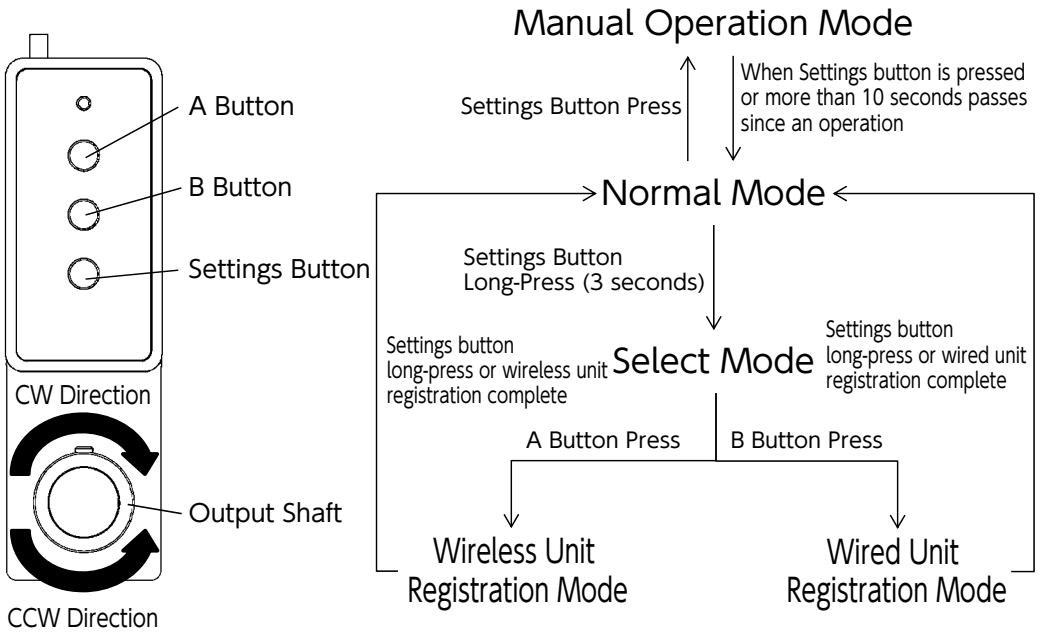
2.2 Part Names and Functions



<table>
<tr><th>No.</th><th>Name</th><th colspan="2">Function</th><th>Reference</th></tr>
<tr><td>1</td><td>Display LED</td><td colspan="2">Shows the current status of the unit.</td><td>> P.11</td></tr>
<tr><td>2</td><td>A Button</td><td colspan="2" rowspan="3">Enables switching between each mode or manually controlled output shaft rotation</td><td rowspan="3">> P.10</td></tr>
<tr><td>3</td><td>B Button</td></tr>
<tr><td>4</td><td>Settings Button</td></tr>
<tr><td>5</td><td>Output Shaft</td><td colspan="2">Drives the lead screw.</td><td>-</td></tr>
<tr><td>6</td><td>Power/Signal Cable</td><td colspan="2">Cable for making connections to 24 VDC power supply or for wired communication.</td><td>-</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Nameplate</td><td>(1) Rated Voltage</td><td>(5) Part No.</td><td rowspan="4">-</td></tr>
<tr><td>(2) Rated Current</td><td>(6) Serial No.</td></tr>
<tr><td>(3) Rated Torque</td><td>(7) QR Code</td></tr>
<tr><td>(4) Rated Rotational Frequency</td><td>-</td></tr>
</table>

2.3 Button Operation and Mode Transitions

Operating the buttons on the front of the unit enables the output shaft to be rotated or modes to be switched between.



2.4 About Each Mode

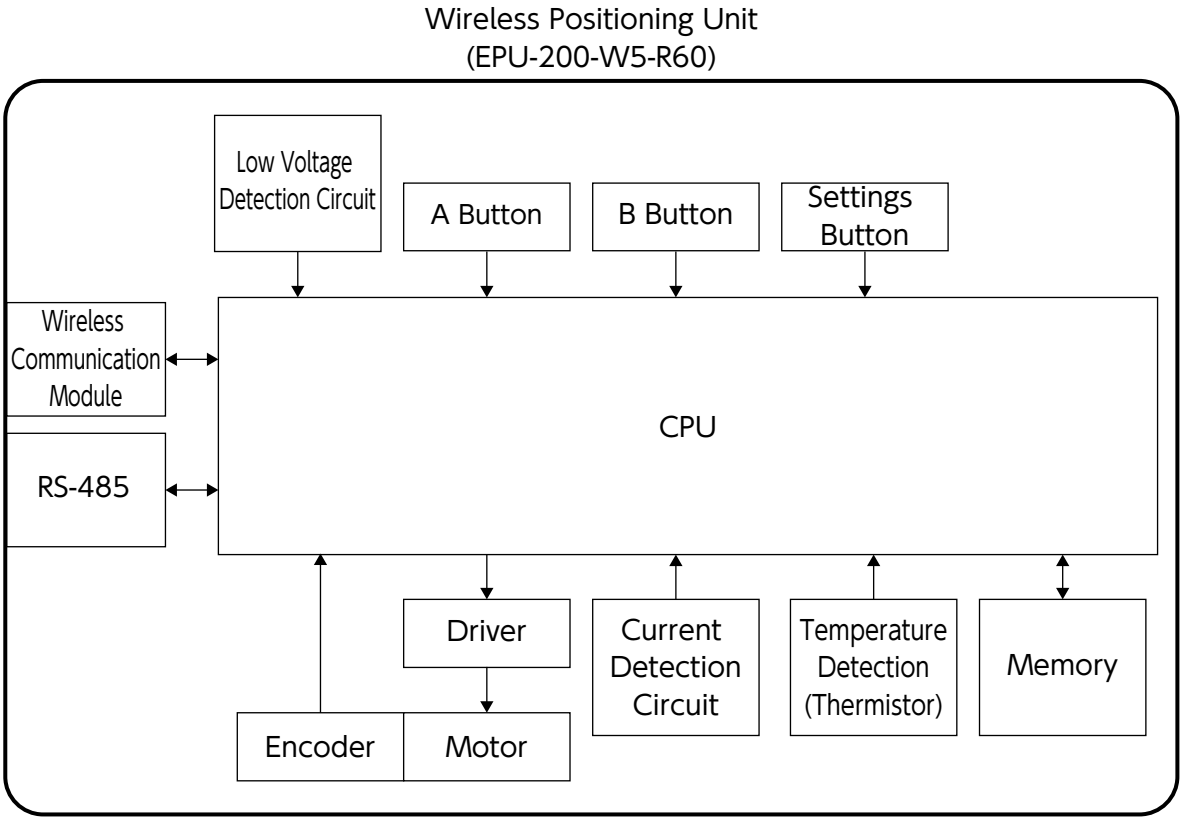
Mode Name	Description
Normal Mode	Standby state before setup execution.
Manual Operation Mode	Pressing the A button will cause the output shaft to rotate clockwise (CW direction). Pressing the B button will cause the output shaft to rotate counter-clockwise (CCW direction).
Select Mode	Select whether to perform unit registration wirelessly or by wire.
Wireless Unit Registration Mode	Puts the unit into wireless unit search standby state.
Wired Unit Registration Mode	Puts the unit into wired unit search standby state.

*For details, refer to the Dedicated Software (EPU-COM) Instruction Manual.

2.5 Display LED Light Patterns

Unit Status	Color	Pattern
Normal Mode	Green	Standby: Illuminated, Setup Execution: Blinking
Manual Operation Mode	White	Standby: Illuminated, Manual Operation Execution: Blinking
Select Mode	Blue and Yellow	Standby: Blinking interchangeably
Wireless Unit Registration Mode	Blue	Standby: Illuminated
Wired Unit Registration Mode	Yellow	Standby: Illuminated
Error	Red	Error: Illuminated, Fault: Blinking

2.6 Block Diagram



3 Specifications

■Operating Environment

Operating Environment	**Temperature**	-5˚C to 55˚C (non-freezing)
	Humidity	20%RH to 85%RH (non-condensing)

■Wireless Positioning Unit (EPU-200-W5-R60)

Power Source Voltage		24 VDC ± 10%
Current Consumption	**Standby**	40 mA
	Rated	0.6 A
	Maximum	1A
Rated Output		5 W
Rated Rotational Frequency		60 ±10 rpm
Rated Torque		0.8 N・m
Continually Usable Time		1 Minute or Less[*1]
Output Shaft Max. Allowable Load	**Radial Load**	19.6 N
	Thrust Load	19.6 N
Stop Accuracy		± 5˚
Input	**Wireless Communication**	2.4 GHz Band Wireless Communication
	Wired Communication	RS-485 (2-wire type)
Wireless Reach Distance (Reference Value)	**Indoors**	60 m
	Outdoors	1200 m
IP Protection Class		IP65
External Size (Power cable/excluding projection)		45 mm x 150 mm x 45 mm
Weight		304 g

*1: Let cool for 10 minutes or so after continuous use.

4 Installation and Connection

4.1 Installation

The following environmental conditions are required for installation. Install in an appropriate environment.

- **Install indoors.**
- **Install in a place that is not exposed to direct sunlight.**
- **Install where there is no continuous vibration.**
- **Install in an environment where heat is easily dissipated.**
- **Install in a place where inspection and cleaning are easy.**
- **Install the unit where the ambient temperature is -5˚C to 55˚C (non-freezing) and the ambient humidity is 20%RH to 85%RH (non-condensing).**
- **Be sure to install the unit in such a way that fire or personal injury does not occur during an earthquake.**
- **Do not install this product underwater, corrosive atmosphere, flammable gas or harmful gas, or near combustible materials.**
- **Take measures regarding peripheral devices that are affected by noise as noise may be generated by the PWM switching control. Also consider the installation environment as the unit itself may be affected by external noise.**

※ **Contact us individually if installing in a special environment.**

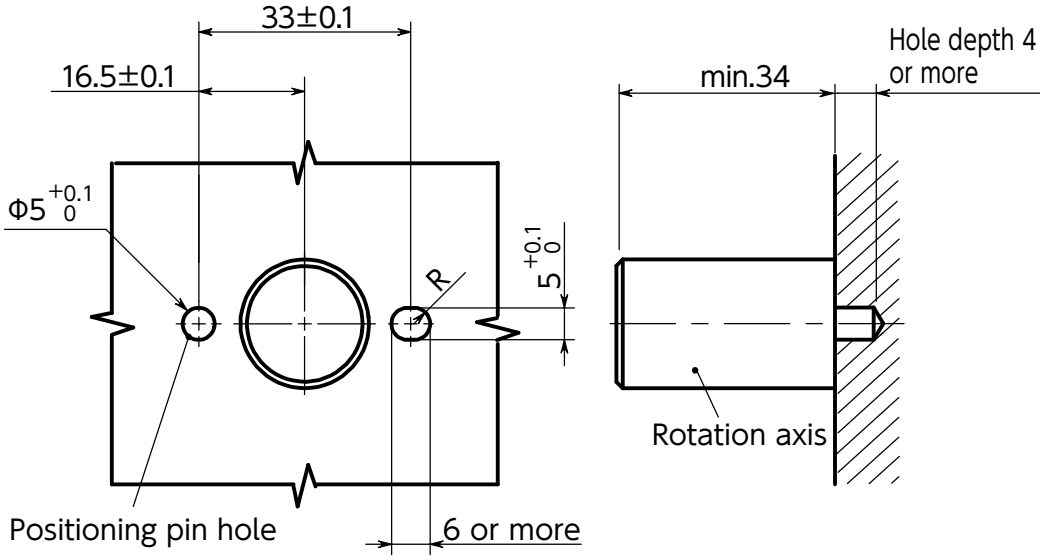
> P.27

Wireless communication distance using the internal antenna varies depending on the installation·connection conditions.
The communication distance may be shorter under the following conditions and should be considered when determining the installation location and connection method.

- **There is an obstacle in the transmission path. (Rebar, reinforced concrete, etc.)**
- **There is a height difference in the transmission path.**
- **The installed position is close to the ground.**
- **There is metal around.**
- **There is a lot of radio noise in the vicinity.**

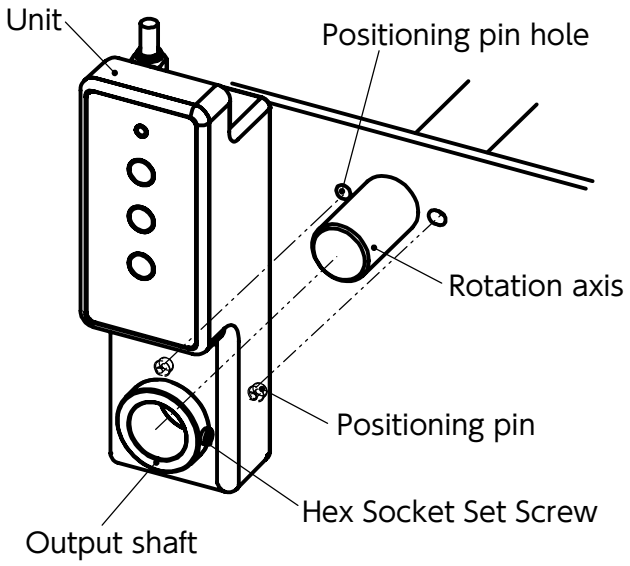
■Unit Installation

1. Drill a hole for the positioning pin on the mounting surface of the machine, then stick the rotation axis through the mounting surface as per the figure.



*Make one of the two positioning pin holes into a slot as per the figure. If machining a slot is difficult, drill out a Φ6 or larger round hole.

2. Pass the rotation axis over the unit output shaft ad insert the positioning pins into the holes drilled in 1. then secure with the hex socket set screws supplied.
(Recommended tightening torque: 2.8 N·m)



■If installing the unit using the adapter plate (optional)

An adapter plate is used when replacing digital position indicators with sizes as per Fig. 1 or Fig. 2. When shipped, the position of the adapter plate positioning pin is matched for sizes of Fig. 2. Rotate the positioning pin anti-clockwise with a flathead screwdriver and remove it when replacing digital position indicators with sizes as per Fig. 1, then change its position. (Recommended tightening torque: 0.3 N·m)

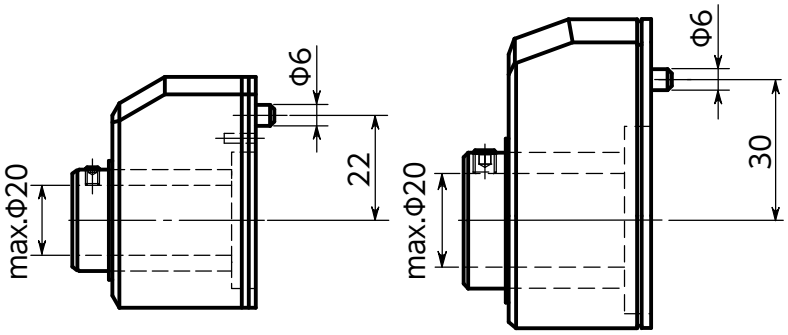
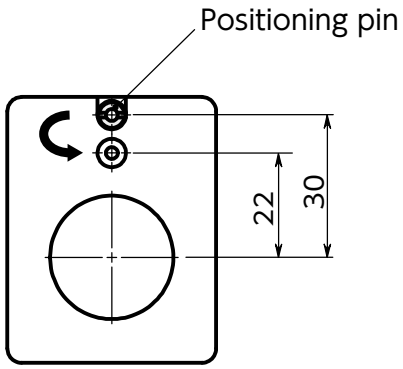
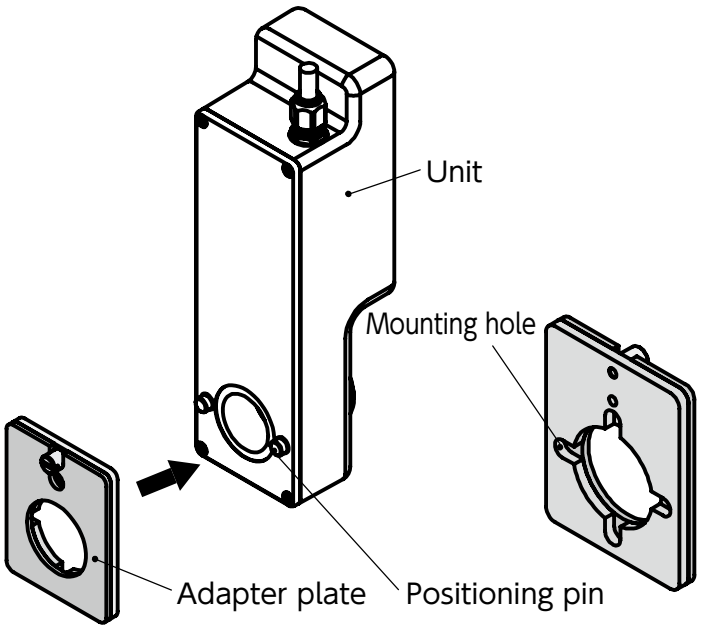


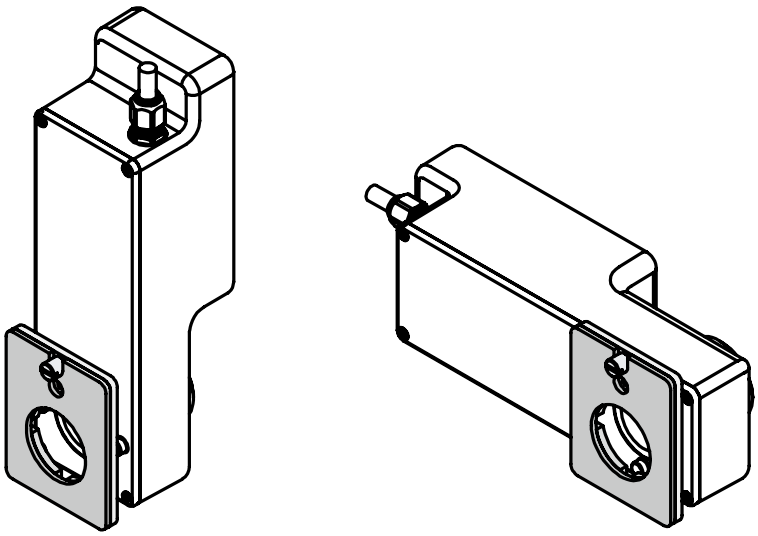
Diagram 1　　Diagram 2



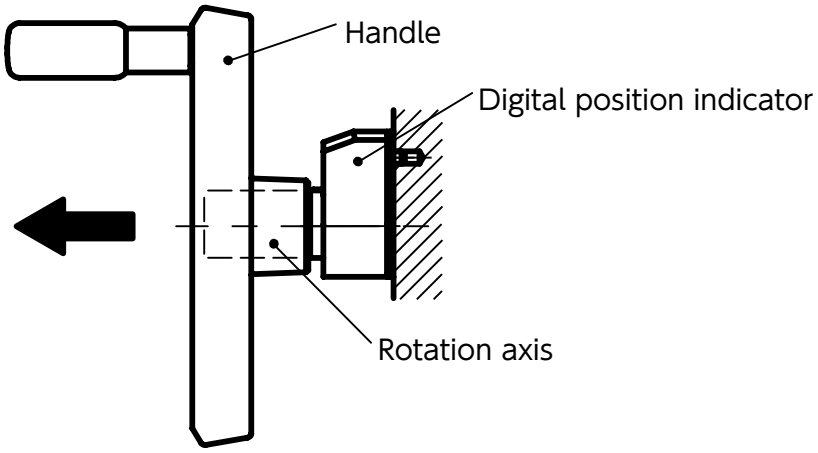
1. **Mount by aligning the unit's positioning pins with the adapter plate mounting holes.**



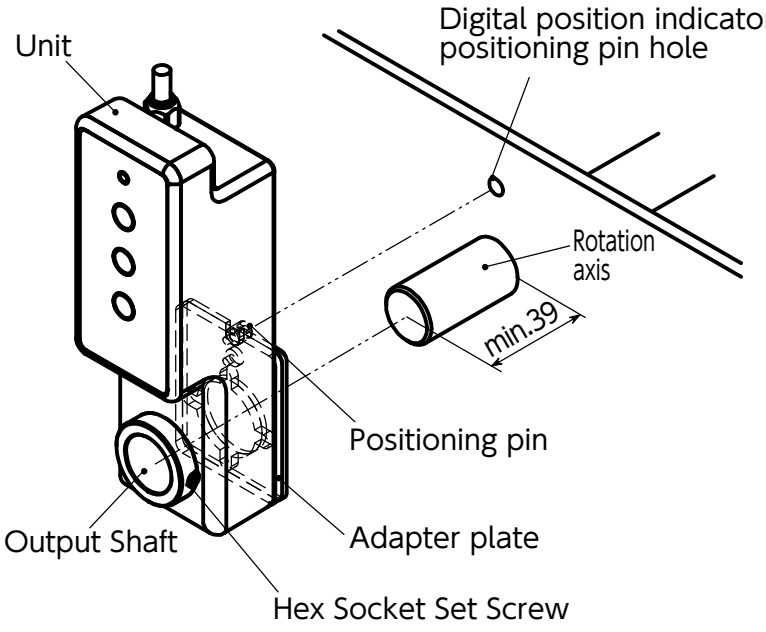
Can be mounted in each 90° orientation.
Mount in a position that does not interfere with machinery.



2. Remove the digital position indicator and handle from the rotation axis.

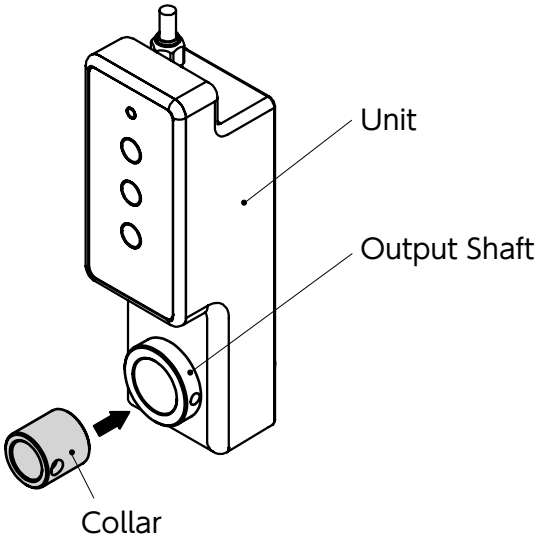


3. With the unit mounted to the adapter plate, pass the rotation axis over the output shaft and secure with the hex socket set screws supplied with the unit. (Recommended tightening torque: 2.8 N·m)

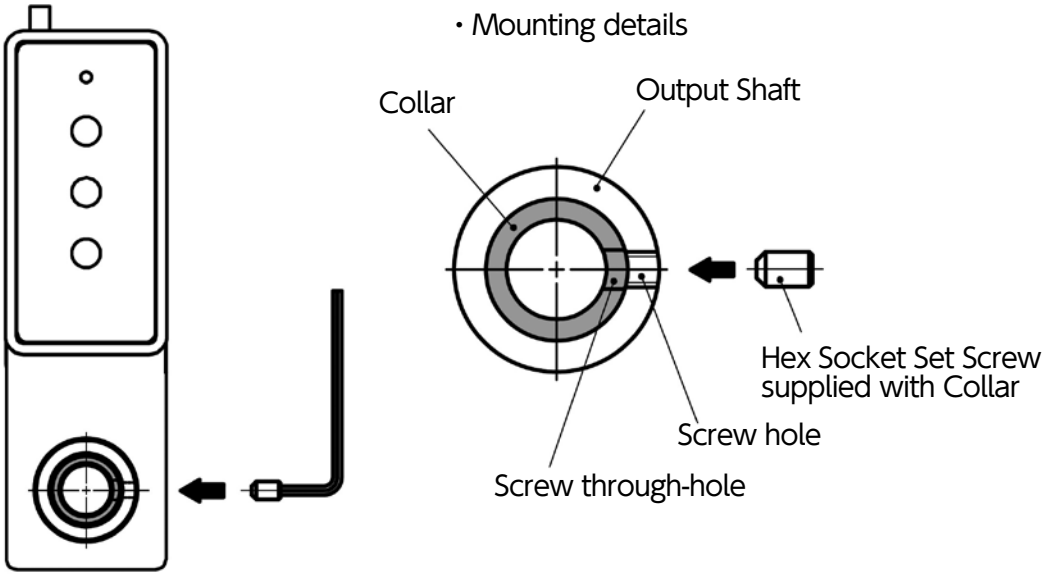


■If installing the unit using a collar (optional)

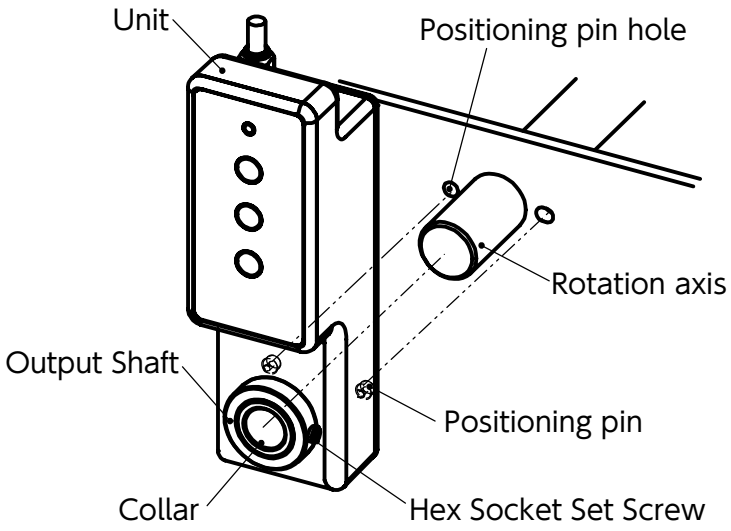
1. Insert the collar onto the unit's output shaft.



2. Align the unit's output shaft screw holes with the collar's screw through-holes, then mount using the hex socket set screws supplied with the collar.



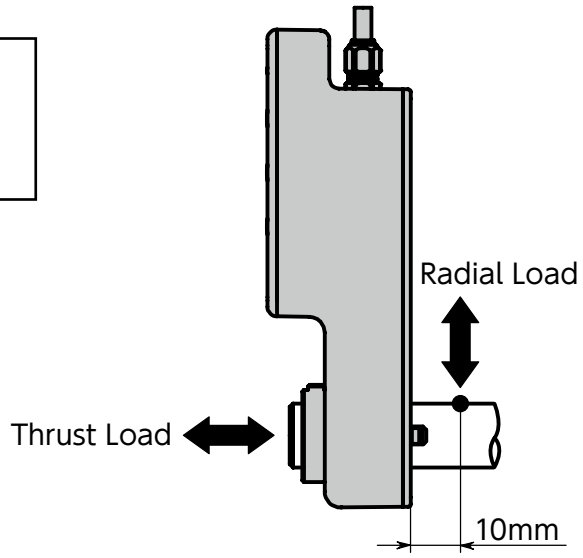
3. With the collar mounted, pass the rotation axis over the unit's output shaft and secure with a hex socket set screw. (Recommended tightening torque: 2.8 N·m)



■Max. Allowable Load

Make adjustments such that no excessive load is applied to the output shaft.

Allowable Load:
Radial Load: 19.6 N
Thrust Load: 19.6 N



Caution

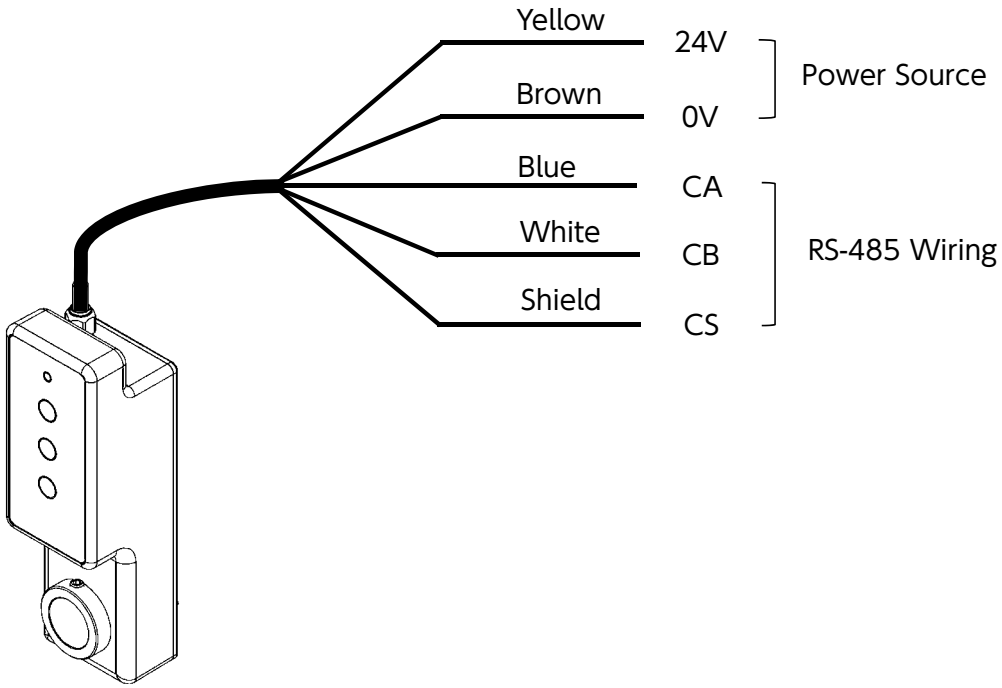
- Do not hold the cables or output shaft during transportation. **This may result in a fault.**
- Do not subject the output shaft to strong impacts. **This may result in a fault.**
- Adjust the alignment between the output shaft and the partner device accurately. **Not doing so may result in a fault.**
- Do not apply excessive radial or thrust loads to the output shaft as this may damage the bearing.

4.2 Connection

■Unit Connection

Power/Signal Cable Specifications:

Sheath	**Material**	Oil Resistant PVC
	Outside Diameter	5.4 mm
Conductor	**Material**	Tin plated mild copper stranded wire
	No. of Cores	2P
	Sectional Area	AWG25
Minimum Bending Radius		32.4 mm
Cable End		Cut Off
Cable Length		1 m



Connect the power supply.
A power supply with an appropriate current capacity should be prepared by the customer.

Operating current per unit:

Power Source Voltage: 24 VDC±10% **Rated Current:** 0.6 A **Maximum Current:** 1 A

Do not connect directly to AC power. **This may result in a fire or a fault.**

*For details about wiring for wired communication [Transceivers for Wireless Positioning Units (EPC-200-CC) Instruction Manual] serves as a reference.

5 Maintenance

Perform maintenance periodically in order to ensure safe use.
If any abnormality is found, stop using the unit immediately and take measures to eliminate the root cause of the abnormality.

5.1 Requests for Inspections

- **The technicians must turn on and off the power themselves.**
- **Do not touch the unit during operation or immediately after operation stops as the unit is hot.**
- **Be sure to carry out inspections regularly to prevent accidents.**
- **The standard lifetime of the unit is 300 hours of actual operation. Although this varies depending on the environmental conditions and operating conditions, if an error occurs after the standard life time has already elapsed, replace then unit immediately.**

5.2 Inspection Items

- **Is the power supply voltage within the specified values?**
- **Is the operating environment within the specified values?**
- **Is there any abnormal noise or abnormal vibration?**
- **Is there any dust, debris, or foreign matter in the surrounding area?**
- **Are there any loose or misaligned fasteners or joints?**
- **Are any of the cables damaged or stressed?**
- **Are the terminals damaged?**

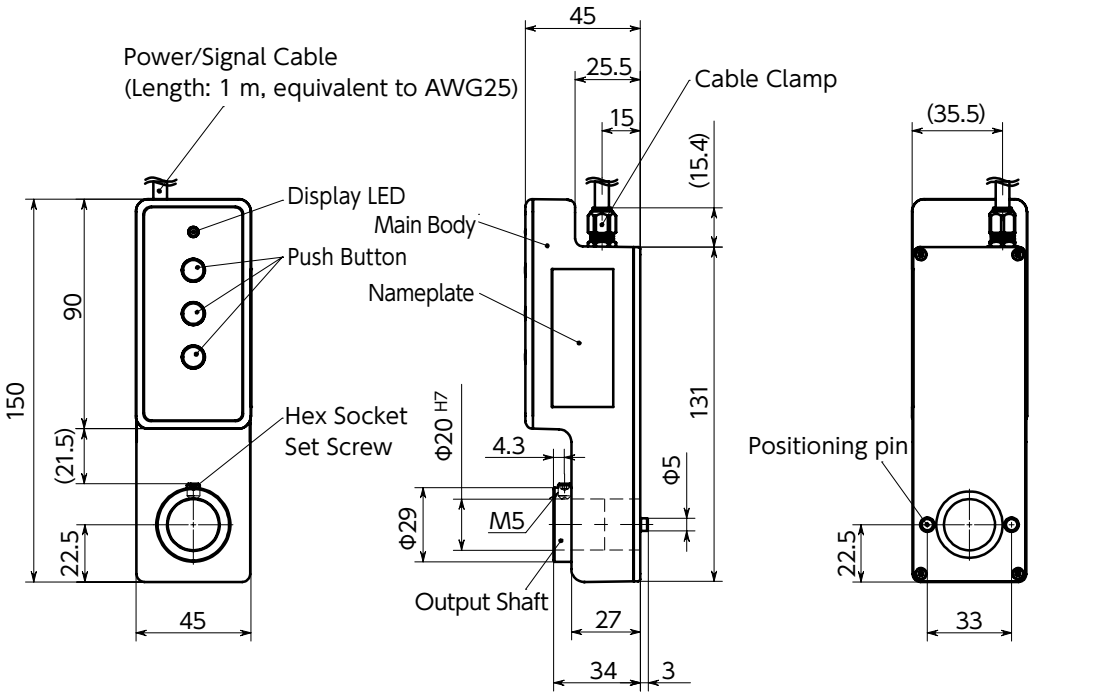
6 Troubleshooting

Symptom	Verification	Countermeasure	Explanation Page
Display LED is not turning ON	Is the power supply voltage correct?	Make sure the voltage level is within 24 V ± 10%	> P.23
	Are the power/signal cables are connected correctly?	Wire correctly	> P.22
Wired communication Isn't working	Are the power/signal cables are connected correctly?	Wire correctly	> P.22
I cannot mound to the equipment	Is the mounting part machined correctly?	Machine the mounting part to the recommended dimensions	> P.15
The feed screw can't be driven	Is the load too large?	Adjust the feed screw drive torque down to be within the rated torque range	-

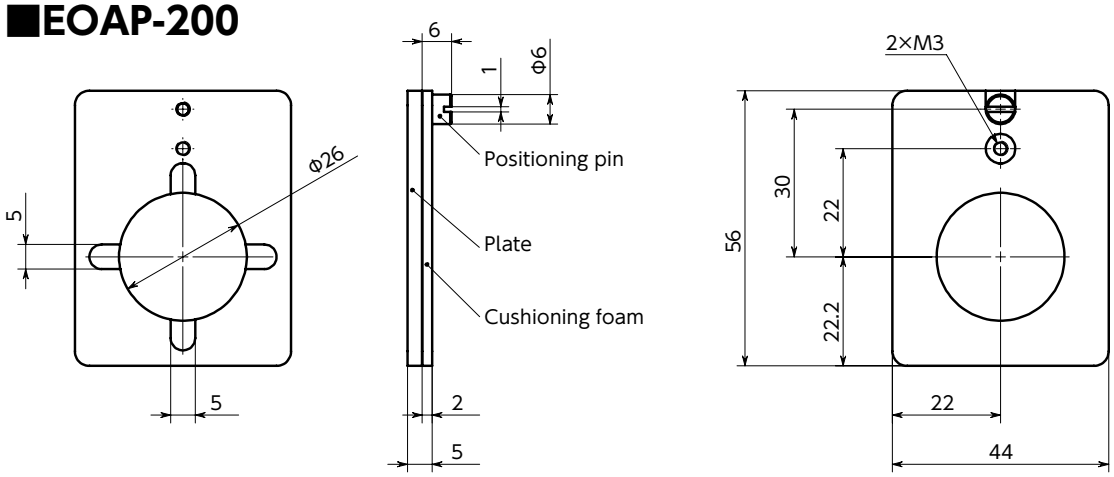
7 Dimension Figure

■EPU-200-W5-R60

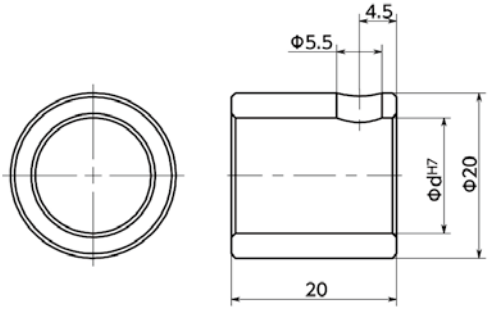
Unit: mm



■EOAP-200



■EOCL-200



Part Number	d
EOCL-200-6	6
EOCL-200-8	8
EOCL-200-10	10
EOCL-200-12	12
EOCL-200-14	14
EOCL-200-15	15
EOCL-200-16	16

8 Warranty

Warranty period: 300 hours of operation or one year, whichever is shorter.

Warranty contents: If a failure occurs during the warranty period under normal operating conditions as per this instruction manual, repair or replacement will be performed free of charge.

However, there may be a charge in the following cases even within the warranty period.

(1) If the unit is used incorrectly, has been repaired improperly, or modified.
(2) If the problem is caused by dropping the unit after purchase or due to damage during transportation.
(3) When the cause is a result of using the product outside of the specification range.
(4) Fire, earthquake, lightning, storm and flood damage, salt damage, abnormal voltages, or natural disasters.
(5) When the cause is intrusion of water, oil, metal chips, or other foreign matter.

The warranty covers only the product itself. Damage resulting from failure of the product will not be compensated.

■Contact

Customer Service Business Hours: 8:00 to 17:00 on weekdays, Eastern Standard Time
Phone: +1 (484) 685-7500
Fax: +1 (484) 685-7600
https://www.nbk1560.com/en-US/
e-mail: info.us@nbk1560.com
307 East Church Road, Suite 7, King of Prussia, PA 19406, USA

9 Notes About Electromagnetic Radiation

Contains FCC ID : MCQ-S2CTH / IC : 1846A-S2CTH

The wireless module built into the Wireless Positioning Unit (EPU-200-W5-R60) uses frequencies in the 2.4 GHz band.
For this reason, read the following precautions regarding electromagnetic radiation carefully as use correctly.

We shall not be liable for any improper use, faults caused during use, malfunctions, and damages caused by use of this machine by our customers or third parties, unless legal liability is determined.

■Notes About Electromagnetic Radiation

- This device complies with part 15 of FCC Rules and Industry Canada’ s licence-exempt RSSs. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
- This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
- Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Revision History

Date	Identification Number	Revision Contents
February 2020	UM-EPU200-SU-01E	Initial Release

NBK®

Couplings, Screws, Clampers

Initial Release February 2020
UM-EPU200-SU-01E