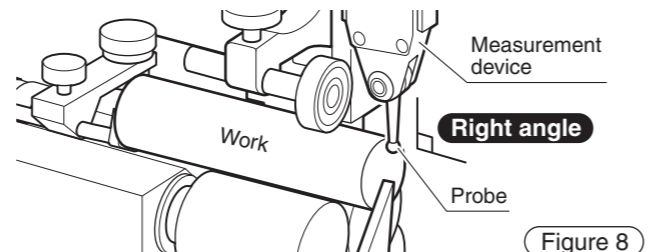
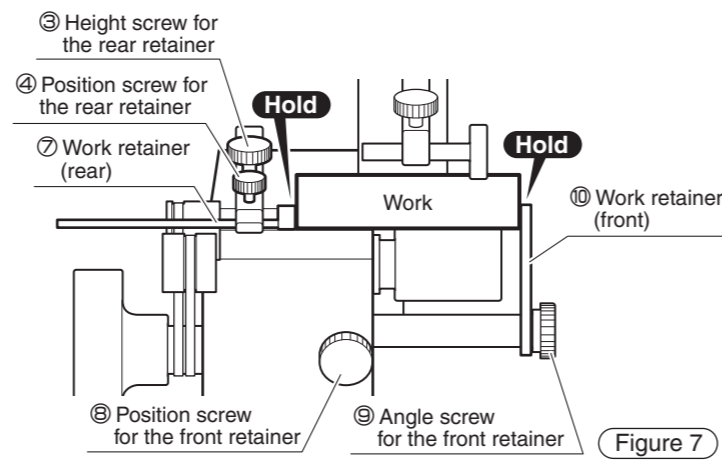


How to Use (Measuring Axial Circular Run-out)

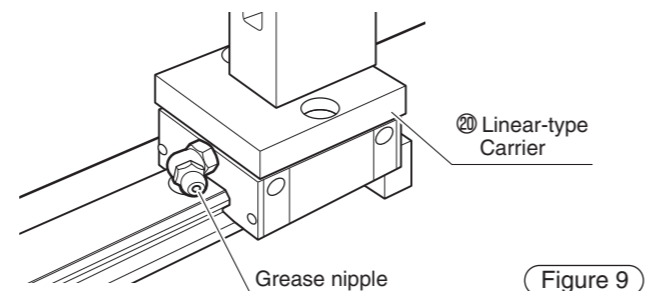
- ① Install a work on the rollers. To install the work, follow steps ① through ③ in "Eccentricity Measurement".
- ② Use the front and rear work retainers to anchor the position of a work.
This product has a structure that subtly moves works as the main rollers are turning. To prevent a work from moving, hold it with the front and rear work retainers.
- Loosen the position and angle screws for the front retainer. Adjust the position of the work retainer (front) so that it holds the front end of the work, and then tighten the screws (Figure 7).
 - Loosen the position screw for the rear retainer, adjust the position of the work retainer (rear) so that it holds the rear end of the work, and then tighten the screw (Figure 7).
- ※By changing the number of washers at the bottom of the height screw for the rear retainer you can tune the height of the work retainer (rear). Insert one or two washers as necessary.



- ③ Make contact with the probe on the work, and then turn the handle to conduct a measurement.
Make contact with the probe of the measuring device at a right angle to the end surface of the work. The measuring device measures run-out from the end of a work as it turns (Figure 8).
- ※In order to hold the measuring device in place when measuring the axial circular run-out, we recommended using a holder, such as a magnet-base, instead of the carrier.

Lubrication of the Linear-type Carrier

A linear-type carrier requires periodic lubrication to maintain smoothness of movement.
Use a grease gun to refill lubricating oil to the grease nipple of the carrier (Figure 9).



- Lubricant Applied: ISO VG32-150
- Recommended Frequency : Once every three months

Specifications

Model No.	Platform type	Type of roller	Carrier type	Weight
ROG-221S	Narrow Platform	Slitted roller	Basic type (no carrier)	3.6kg
ROG-221SS			With shaft carrier	4.0kg
ROG-221LS			Linear carrier	4.3kg
ROG-223S		Flat roller	Basic type (no carrier)	3.7kg
ROG-223SS			With shaft carrier	4.1kg
ROG-223LS			Linear carrier	4.4kg
ROG-351S	Wide Platform	Slitted roller	Basic type (no carrier)	4.6kg
ROG-351SS			With shaft carrier	5.0kg
ROG-351LS			Linear carrier	5.3kg
ROG-353S		Flat roller	Basic type (no carrier)	4.7kg
ROG-353SS			With shaft carrier	5.1kg
ROG-353LS			Linear carrier	5.4kg

Common Specifications

- Tolerance : Less 2 ~ 3.5μm
※ ref : φ20mm testing workpiece (our measured value)
- Operating temperature range : 0 ~ 40°C
- Storage temperature range : -10 ~ 50°C
- With storage case

Measuring conditions

- Out diameter of workpiece to be φ4 ~ 30mm
(Precision roller for measurements under φ4mm optional)
 - Length of workpiece to be 5 ~ 80mm
 - Reference part of the workpiece must have enough length to cramp to roller
- ※To prevent measurement error, tip end for workpiece to be measured on the main roller
※Softer material such as nonferrous metals(aluminum) and plastic will cause measurement errors depending on length and outside diameter for flexurally

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Precision Jig for Eccentricity Measurement

RUN-OUT GAUGE SYSTEM

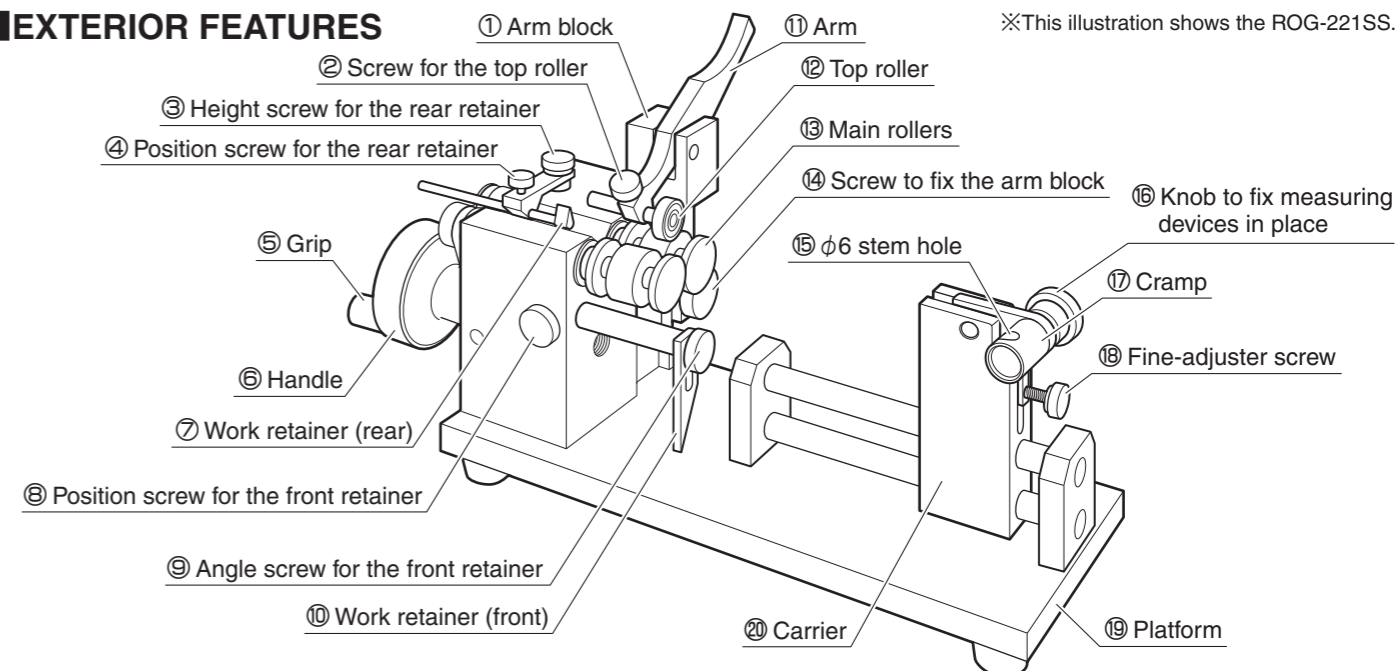
Thank you for your purchase of the Run-out Gauge System. This precision jig product comes with an indicator and other measuring devices. These can be used to measure eccentricity (the run-out inside and outside of the diameter when turning the work) or the axial circular run-out (squareness).

- For the safety of yourself and others, please read through this User Manual and follow its instructions carefully. Ensure that it is retained securely in a place where it can be readily accessed.
- When assigning or lending this product to a third party, make sure that it is accompanied by this manual.
- For questions regarding this product, contact us or the seller.

SAFETY NOTICE

In this Manual, ⚠ denotes an item which can result in expansion damage, ⚡ denotes a prohibition, and Ⓢ denotes a mandatory item that must be observed.

EXTERIOR FEATURES



- ① Arm block Supports the arm and the top roller.
- ② Screw for the top roller Allows you to fix the vertical position of the top roller.
- ③ Height screw Allows you to adjust the height of the work retainer (rear) with the number of washers.
- ④ Position screw Allows you to fix the horizontal position of the work retainer (rear).
- ⑤ Grip Makes it easier to rotate the handle. However it can cause the body of the device to shake, resulting in measurement errors. Attach if necessary.
- ⑥ Handle Allows you to rotate the main roller.
- ⑦ Work retainer (rear) Fixes a work to a set position when measuring the axial circular run-out (squareness).
- ⑧ Position screw Allows you to fix the horizontal position of the work retainer (front).
- ⑨ Angle screw Allows you to fix the angle of the work retainer (front).
- ⑩ Work retainer (front) Holds a work to prevent it from moving during the measurement of axial circular run-out (squareness).
- ⑪ Arm Allows you to move the top roller vertically to pinch a work.
- ⑫ Top roller The upper roller that pinches the work.
- ⑬ Main rollers The lower rollers that pinch the work. A flat-type and slit-type are available.
- ⑭ Screw to fix the arm block Fixes the position of the arm block.
- ⑮ φ6 stem hole A φ6mm hole into which the stem of the measuring device is inserted.
- ⑯ Knob to fix measuring devices in place Anchors the device inserted in the φ6 stem hole.
- ⑰ Cramp Allows you to mount an indicator or other measuring device.
- ⑱ Fine-adjuster screw Vertically adjusts the angle of the measuring device to allow its probe to come in contact with a work horizontally.
- ⑲ Platform A base made of steel. Long-type platforms, or platforms without a carrier, have enough space to mount a magnet-base. This can then be used for measurement.
- ⑳ Carrier A moving part that holds measuring devices. There are three types of carriers: shaft-type, linear-type, and carrier-free-type.

How to Maintain / Store after Use

- Ⓢ Wipe away any dirt from the main rollers, the top rollers, and the carrier. Apply them with a rustproof treatment.
The rollers and carrier are prone to rusting. Since rust on the rollers, in particular, impacts on the overall accuracy it is important to apply them with an adequate amount of rustproof treatment.
- Ⓢ Put the product into the supplied container case and store it in a dry, cool, and dark place.
Avoid moisture and direct sunlight. Keep anyone other than the product's administrator away from the storage place.

Safety Precautions

It is important to observe all of the following instructions.

In order to forestall damages to users, other persons, and property, the instructions below must be strictly adhered to at all times in the manner that they are described.

The following set of indications classifies the degree of damage that can arise from improper use of the product or a lack of compliance with the instructions.

Caution This mark means that ignoring the instruction can cause injury or physical damage.

Items to be observed are marked by the following symbols:

Denotes a "prohibition": You MUST NOT do it. Denotes a "requirement": You MUST do it.

Caution

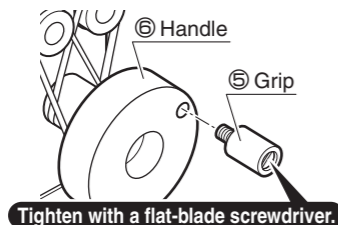
- Read through this User Manual and follow the instructions.**
 - Any use of this product in a manner that is not described in this manual may cause an accident.
- Use this product only for the precision measurement of eccentricity or axial circular run-out.**
 - Any use of this product for purposes not described in this manual may cause damage, abrasion of the product, or unexpected accidents.
- Use this product only in environments that are:**
 - Dry and free from contact with water.
 - Not exposed to direct sunlight.
 - Stable and vibration-free.
 - Flat, without any unevenness in the surface.
 - Not accessible by children or individuals other than the user.
 - Use of this product in an environment other than those described above can cause inaccuracy, damage to the product, accidents, or injury.
- Treat this device with care.**
 - Shocks, including those suffered from falling or loading heavy materials, can result in inaccuracy or damage to the product, and therefore should be avoided.
- Observe the conditions required for measuring a work.**
 - Ignoring any of the condition may damage or deform the roller.
- Do not disassemble or modify this product.**
 - Doing so can cause inaccuracy or damage to the product.
 - Keep in mind that if you detach any of the components, such as the main roller, the product's accuracy assurance will become void.
- After using, rustproof this product and store it in a dry place free from contact with direct sunlight.**
 - The main roller, the top roller and the carrier are likely to gather rust. It is therefore very important to rustproof this product after use.

About the Grip

Attaching the accessory grip onto the handle makes it easier to turn. However, doing so causes a shift in the rotation support and makes it impossible to rotate evenly. This also can cause the device body to vibrate, resulting in measurement errors.

We recommend rotating the handle manually while keeping an even distance from the axis of rotation. However, if you do wish to use the grip despite its restraints, please follow the instructions below to attach it to the handle:

- 1 Insert a grip into the hole in the handle.
- 2 Tighten the grip to affix it to the handle. Use a flat-blade screwdriver to tighten and fix the grip in place.



Setting of the Components before Use

Before using, assemble the components into their correct positions.

- 1 **Attach the work retainer (rear).** Insert the height screw for the rear retainer into the mounting hole on the body, and then tighten it. Adjust the height of the work retainer (rear) by changing the number (thickness) of the washers.
- 2 **Attach the work retainer (front).** Insert the work retainer (front) into the mounting hole on the body, and then fix it in place with the position screw for the front retainer. Do not allow the work retainer to make contact with the roller.
- 3 **Attach the top roller.** Insert the top roller into the mounting hole on the arm. Tighten the position screw for the top roller to fix it in place.
- 4 **Attach the arm block.** Insert the arm block into the groove on the body. Tighten the screw to fix the arm block in place.
- 5 **Attach a measurement device.** Mount an indicator or other measurement device. Loosen the knob to fix a measuring device onto the cramp and push it towards the cramp to align the $\phi 6$ stem hole with the stem of the measuring device. Insert the $\phi 6$ stem of the measuring device into the hole and tighten the knob to hold the device in place.

For devices without a carrier, use a holder such as a magnet-base to hold the measuring device in place.

Measuring Conditions

In order to measure a work, it must first satisfy the following conditions. Failure to comply with the conditions may damage or deform the work or the roller.

- 1 The work is a cylinder with an outside diameter of 4 to 30 mm,
- 2 The axis of the work is long enough to be pinched by the roller, and
- 3 The work is made of a material that is resistant to deformation.
 - Depending on its outside diameter and length, any work made of a soft material, such as nonferrous metal (i.e. aluminum) or plastic, is likely to bend and cause measurement errors.

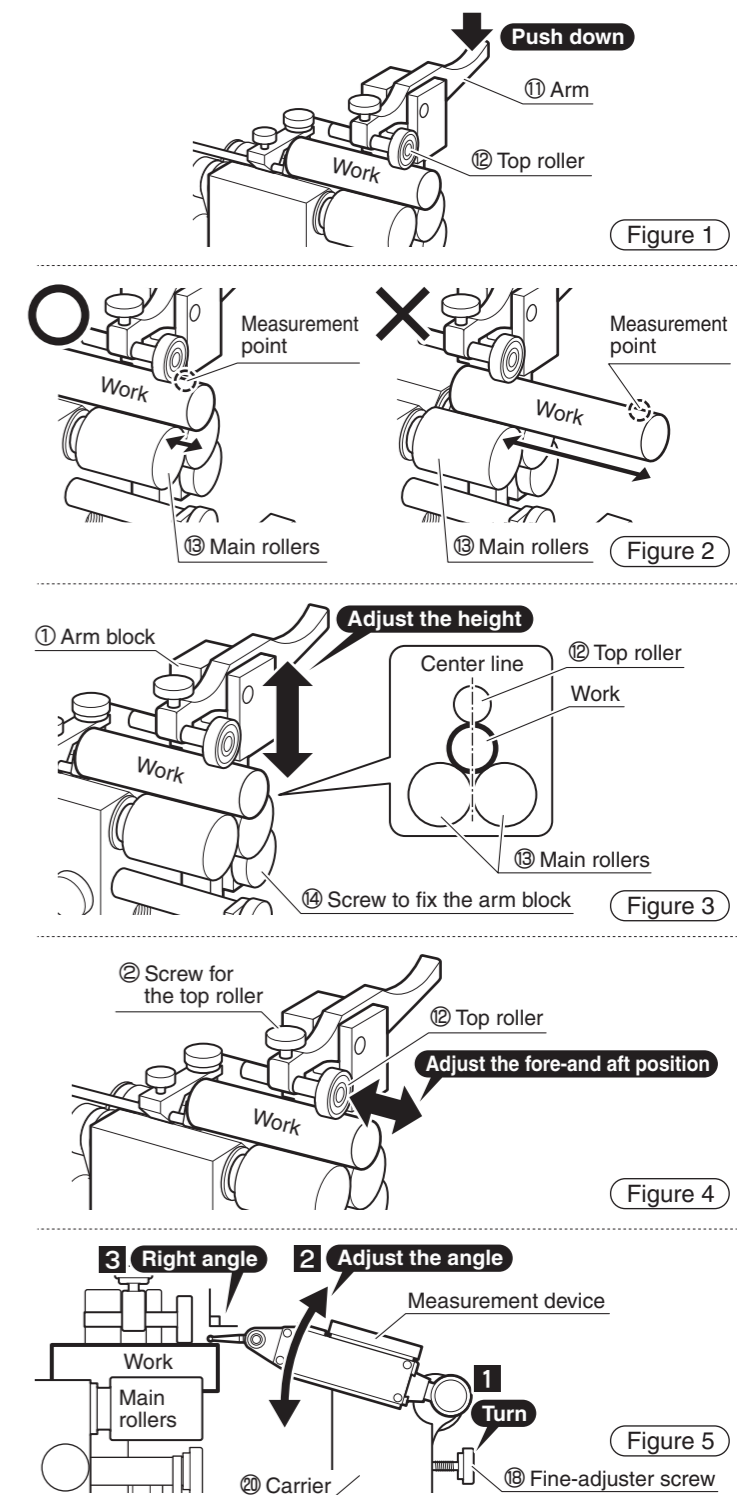
How to Use (Eccentricity Measurement)

The main rollers and top roller are designed to deliver a high level of accuracy. However, their construction also causes them to rust easily. For this reason, you may not fail to wear gloves when handling them.

- 1 **Install the body.** Install the body of the device onto a vibration-free, flat, and stable surface. This is necessary to achieve stable measurement results.
- 2 **Set a work on the main rollers.** Install a work between the two main rollers. Push down on the arm to elevate the top roller. Place the work while the roller is elevated (Figure 1).
 - The nearer to the roller the measurement point is, the higher accuracy this device produces. Adjust the work's position so that the measurement point is not too far from the rollers (Figure 2).
 - The slit-type rollers allow the flange (step) to be relieved. Align the work's flange with the groove of the rollers and set it.
- 3 **Set up the top roller.** Loosen the screw in order to fix the position of the arm block and adjust its height. Adjust the vertical position of the top roller so that the point of contact between the top roller and the work is aligned with the center line of the work. Tighten the screw to fix the arm block back into place (Figure 3).
- 4 **Adjust the fore-and-aft position of the top roller.** Loosen the position screw for the top roller and adjust the top roller's position. Tighten the screw to fix it at a position where it can make stable contact with a work (Figure 4).
- 5 **Move the carrier back and forth in order to make contact with the probe of the measuring device affixed to the work.** Have the contact with the probe set so that the direction of measurement is at a right angle to the work. Turn the fine-adjuster screw to fine-adjust the angle of the measuring device so that the probe is at a right angle (Figure 5).

- Move the carrier slowly. If you move it too fast, the measuring device or the probe might hit a work, causing inaccuracy.
- Use the carrier to position the probe before measurement. Note that it is impossible to move the carrier while turning the roller.

- 6 **Undertake measurement by turning the handle.** Turning the handle turns the main rollers, causing the work to turn. The measuring device measures the run-out of a work during rotation.
 - Measuring eccentricity at a point other than at the end of a work:** The carrier of this product is designed to measure run-out at the end of a work. If you would like to measure at a different point, refer to "Using Your Magnet-Base", described below.



How to Use (Using Your Magnet-Base)

For a no-carrier-type or wide-platform-type, it is possible to mount a retainer, such as a magnet-base, onto the base for measurement.

- **Measuring a central part of a work:** It is possible to measure at any point other than at the end of a work. Put the probe so that it is making contact with a work at a right angle (the direction of measurement is right angle) (Figure 6).
- **Mounting more than one measuring device to conduct concurrent measurements of multiple points:** In addition to the supplied carrier, you can mount a magnet-base onto the space available on the wide-platform. This enables you to conduct concurrent measurements of multiple points.

