

Instructions of modification (to Rotating contact)

This document describes how to modify Slip Ring (K9332JZ) and Brush (K9332JX) to Rotating contact (K9332SR) in Free Chlorine Analyzer or Residual Chlorine Analyzer.

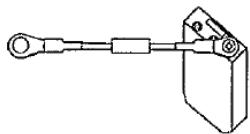
1. Modification Kit

1-1. List of modification kit

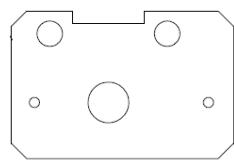
Use K9334SV: Modification kit for Rotating contact.

- ① K9332SR : Rotating contact
- ② K9334LW : Friction dust protection plate
- ③ K9332AP : Belt tension adjuster plate
- ④ K9332TM : Instructions of Modification to Rotating contact, Instruction of Replacement with Rotating contact. (This document)

① Rotating contact



② Friction dust protection plate



③ Belt tension adjuster plate

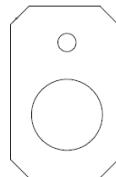


Figure1 Modification kit for Rotating contact

- ※ Don't lose the Belt tension adjuster. It is used to replace driven-shaft after the modification.
For further instruction, read section 3 of Instruction of Replacement with Rotating contact.

1-2. Precautions

【Caution 1】When you hold Rotating contact, pinch it with two fingers and never contact the center contact part as shown in Figure 2. Never drop it or gives a shock.

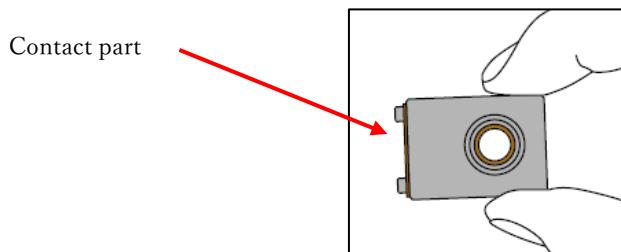


Figure 2 How to hold Rotating contact

【Caution 2】The storage limit for Rotating contact is 1 year after the purchase, considering degradation of the lubricant used inside. Store it in room temperature and keep it away from direct sunlight.

2. Procedure

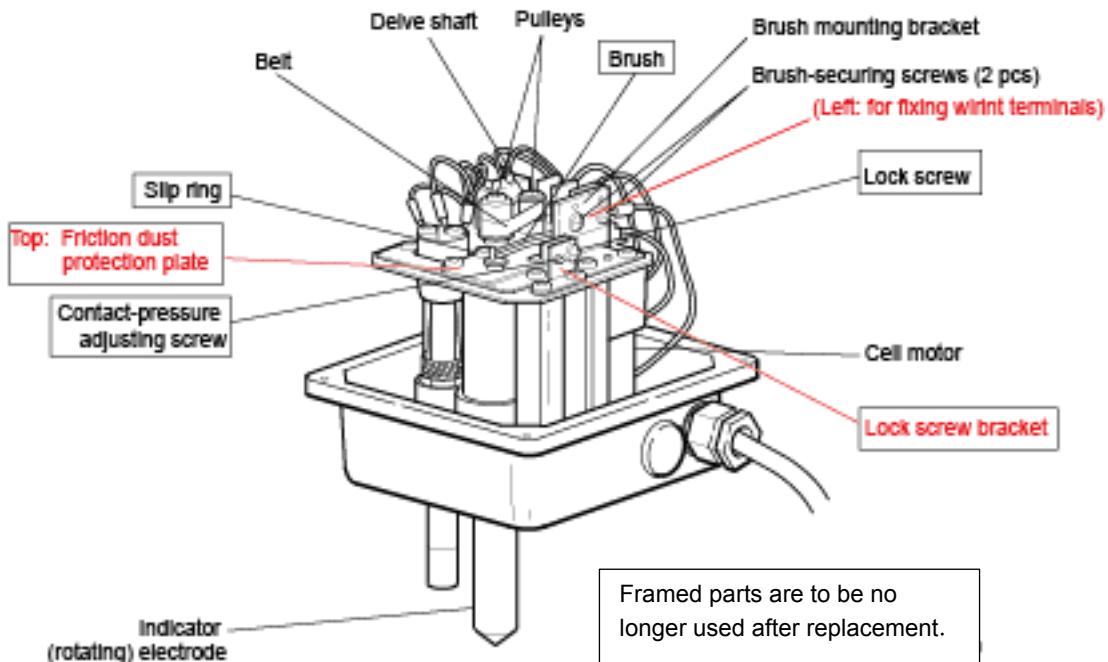


Figure 3 Electrode mechanism block before the modification

- ① Shut off the power supplied to the analyzer to stop the operation.
- ② Remove Brush.
Take out the two screws fixing the brush. (One of them is for wiring terminals.)
- ③ Remove Contact-pressure adjusting block.
First, remove the contact-pressure adjusting screws. Next, remove the lock screws. Unscrew the two screws fixing lock-screw bracket onto the motor plate. Fix the motor plate with the two screws.
- ④ Remove the two pulleys of the drive shaft (cell motor shaft) and driven shaft (indicator electrode-mounting shaft).
The driven shaft pulley can be removed by inserting a 2 mm nominal size of Allen wrench (accessory) into the hole in the shaft, which is used as a lock, and unscrewing the top of the driven shaft.
The drive shaft pulley can be removed by unscrewing two set screws using a 1.5 mm nominal size Allen wrench (accessory).
Remove the pulleys together with the drive belt.
- ⑤ Remove Slip ring and Friction dust protection plate.
Take out the slip ring from the driven shaft. Unscrew the two fixing screws and remove the friction dust protection plate.
- ⑥ Install a new Friction dust protection plate (K9334LW).
Confirm that the plate never contacts the driven shaft and fix it with screws.
- ⑦ Loosen the two screws and adjust the position of the brush mounting bracket by rotating in the direction of arrow so that the bracket does not touch the rotating contact. Adjust the position and fix it with screws. (Figure 4)

⑧ Install Rotating contact.

First, hold the rotating contact, with its metal top facing toward you as Figure 2 , while the cable being on your right side. Then put the driven shaft through the center hole.

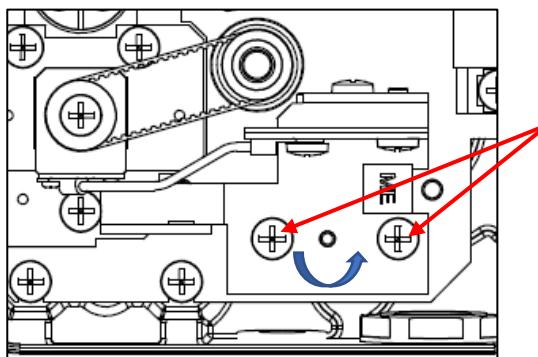
⑨ Put the pulley and the drive belt which were removed on ④ back in place.

⑩ Tighten the wiring terminals of the rotating contact.

Install it on the brush mounting bracket with a brush fixing screw which is taken out on ④. (Figure 4, left) Avoid the contact of the wiring and the drive belt. The terminals shall be parallel to the motor mounting plate. (Figure 5)

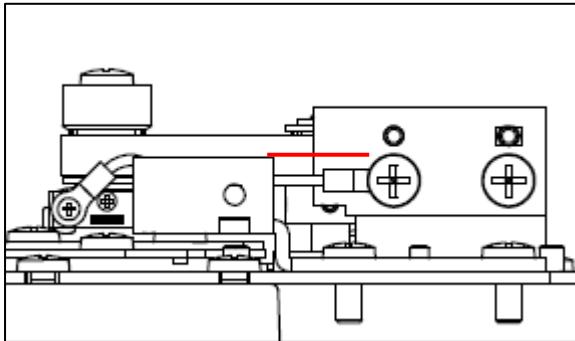
Confirm that the rotating contact does not touch the tip of brush mounting bracket. If it does, adjust the position of the brush mounting bracket as shown on ⑦.

Note: Install the drive shaft pulley so that the tip of the shaft can project out 0.3 to 0.7 mm.

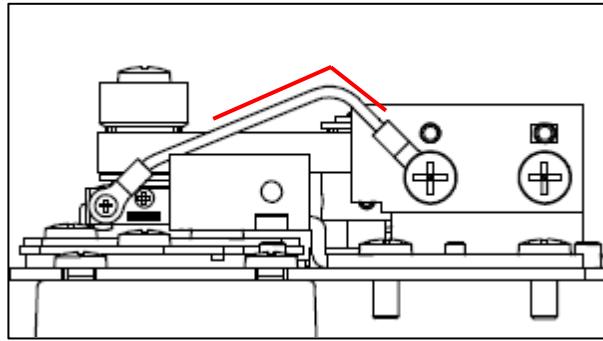


First loosen the two screws. Then adjust the position of the bracket by rotating it in the direction of the arrow without the contact with the rotating contact.

Figure 4 How to adjust the position of the brush mounting bracket



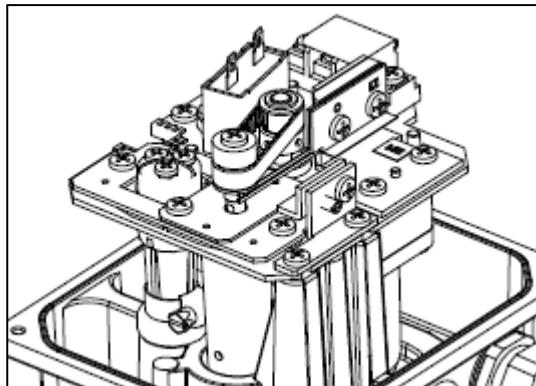
OK: The wiring terminals are parallel to the motor mounting plate.



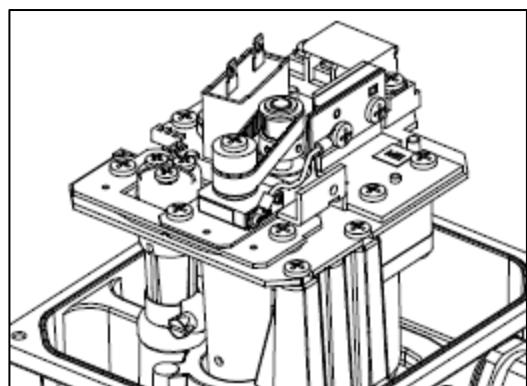
NG: The wiring is bent.

Figure 5 How to install wiring terminals of the rotating contact

⑪ Supply the power to the analyzer. Check that the drive shaft/drive belt/driven shaft rotates smoothly and has no abnormal noise like vibration or intermittent sound.



Before the rotating contact is replaced



After the rotating contact is replaced

Figure 6 Before and after the replacement of the rotating contact

3. Inspection and Maintenance

Realizing the low maintenance as distinct advantage over conventional slip-ring type, the rotating contact no longer requires the regular maintenance. Never touch the rotating contact unless replacement is performed. One year is recommended as a replacement cycle.

Read the following pages on how to replace the rotating contact after the modification.

Instructions of replacement (Rotating contact and Driven shaft)

This document describes how to replace Rotating contact (K9332SR) built in Free Available Chlorine Analyzer or Residual Chlorine Analyzer and applies to modified model from the conventional one with slip ring/brush assy.

1. Inspection and Maintenance

1-1. Rotating contact

The rotating contacts incorporate continuous sliding structure with ring and brush to pass the measuring signal. It becomes worn out over long period of continuous use. Lubricant used for the part also needs to be concerned about its quality degradation after the long period of use. Therefore, standard replacement interval is one year.

1-2. Precautions

When you hold the rotating contact, pinch it with two fingers and never touch the center contact part as shown in Figure 1. Never drop it or gives a shock.

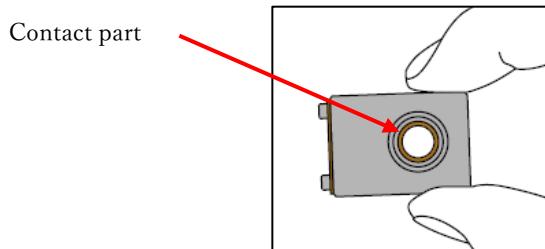


Figure 1 How to hold Rotating contact

【Storage limit and method】

The storage limit for Rotating contact is one year after the purchase, considering degradation of the lubricant used inside. Store it in room temperature and keep it away from direct sunlight.

1-3. Inspection and Maintenance

The rotating contact no longer requires the regular maintenance. Never contact the rotating contact unless the replacement is performed. One year is recommended as a replacement cycle.

2. How to replace Rotating contact

Prepare Rotating contact (K9332SR).

- ① Shut off the power supplied to the analyzer to stop the operation.
- ② Remove the two pulleys of the drive shaft (cell motor shaft) and driven shaft (indicator electrode-mounting shaft).

The driven shaft pulley can be removed by inserting a 2 mm nominal size of Allen wrench (accessory) into the hole in the shaft, which is used as a lock, and unscrewing the top of the driven shaft. The drive shaft pulley can be removed by unscrewing two set screws using a 1.5 mm nominal size of Allen wrench

(accessory). Remove the pulleys together with the drive belt.

- ③ Unscrew the screws on the brush mounting bracket and remove the wiring terminals of the rotating contact. Remove it from the driven shaft.
- ④ Hold a new rotating contact, with its metal top facing toward you as Figure 1, while the cable being on your right side. Then put the driven shaft through the center hole.
- ⑤ Put the pulley and the drive belt back in place.
- ⑥ Tighten the wiring terminals of the rotating contact.
Don't let the wiring touch the drive belt.

Note: Install the drive shaft pulley so that the tip of the shaft can project out 0.3 to 0.7 mm.

3. How to replace Driven shaft

When the driven shaft becomes defunct, whole assembly of the driven shaft needs to be replaced.

Yokogawa service provides the replacement, however, if customers perform on their own, follow the next instructions. Step ① to ⑦ explain how to disassemble, and after ⑧ how to assemble is described.

Prepare Belt tension adjuster plate (K9332AP).

※ Use the belt tension adjuster plate, because the hole for the hook of driven shaft is covered with rotating contact, after the modification to rotating contact.

- ① Shut off the power supplied to the analyzer and place the electrode mechanism block in the maintenance position then remove the cover from the electrode part.
- ② Remove indicator electrode and counter electrode.
To remove the indicator electrode, insert the supplied Allen wrench into the socket of the driven shaft, to stop it from rotating.
Disconnect the three wires connected to the counter electrode, next loosen and remove the clamp holding the electrode in its holder.
- ③ Remove the drive belt. Remove the drive belt with pulleys all together installed onto the drive shaft.
- ④ Remove the rotating contact out of the driven shaft.
- ⑤ Remove the friction dust protection plate installed to prevent drive belt shavings to enter the electrode holder in the driven shaft assembly by loosening the two screws.
- ⑥ Remove the plate holding the driven shaft which is held with two screws.
- ⑦ Remove the defunct driven shaft out of the motor assembly mounting plate. The place where the electrode holder base is inserted contains an O-ring. This O-ring and the counter electrode fixing clamp can be reused.

Note: Even if the O-ring (Y9115XB) is not damaged, we recommend its replacement every 3 years,

Follow the procedures of assembly as described below. When reassembling, observe the following cautions.

- Clean any dirt off parts before reassembling.

- Adjust drive belt tension to 4 N (0.4 kg f).
 - Make sure that indicator electrode does not touch its base.
- ⑧ Assemble new driven shaft assembly on motor mounting plate. First install the clamp and O-ring in the electrode holder in the driven shaft assembly. Next, mount the driven shaft assembly on the motor mounting plate, taking care not to allow the O-ring to protrude from the hole in the base.
- ⑨ Mount plate that holds driven shaft assembly in place.
Confirm that four pins on plate surround electrode holder. As a temporary measure, loosely tighten the two screws in the lengthwise direction.
- ⑩ Place the friction dust protection plate dust.
With the two bumps on the plate facing down, pass the plate under the driven shaft and index the two bumps with the two holes in the plate mounted in step ⑨. As temporary measure, loosely tighten the two screws that hold it in place.
- ⑪ Mount the rotating contact on the driven shaft.
Note: The driven shaft and rotating contact need to be in contact and make a good electrical connection, so make sure that they are clean. However, lubricant adhered to the rotating contact does not affect the performance.
- ⑫ With the drive belt mounted, attach pulleys to the drive shaft and driven shaft.
Note: Install the drive shaft pulley so that the tip of the shaft can project out 0.3 to 0.7 mm from end of the shaft, or the drive belt becomes horizontal.
- ⑬ While adjusting the drive belt tension, further tighten the screws that were tightened temporarily in steps ⑨ and ⑩.
Set the spring balance and the belt tension adjuster plate (K9332AP) as Figure 2 shows.
Hang the hook of a spring balance (1.00 kg) on the hold in the driven shaft. Make sure that all the temporarily tighten four screws are loose.
Draw the drive belt horizontally in the direction of the line that connects between the drive shaft and the driven shaft, by a force of 4 N (spring balance reading of 0.4 kgf). With this tension kept, tighten the screws completely.
Fasten the screws to set the friction dust protection plate.
- ⑭ Mount the indicator electrode on the driven shaft, and check that indicator electrode is not touching the base.
Note: If the indicator electrode is touching the base, or if the hole in the center of the base and the center of the indicator electrode are not aligned, loose the four screws on the motor mounting base and adjust.
- ⑮ Confirm that the rotating contact does not touch the tip of brush mounting bracket. If it does, re-adjust the position of the brush mounting bracket as Figure 3.
- ⑯ Remount counter electrode, reconnect wiring and fix clamp.
- This completes the replacement procedure. Supply power to the analyzer. Check that the drive shaft/drive belt/driven shaft rotates smoothly and does not have abnormal noise like vibration or intermittent sound.

Spring balance

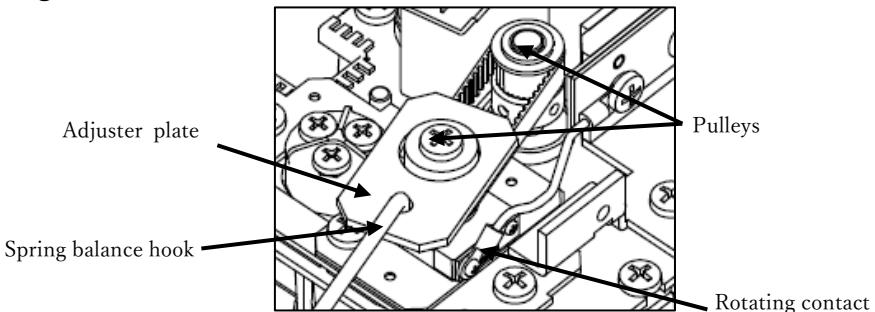
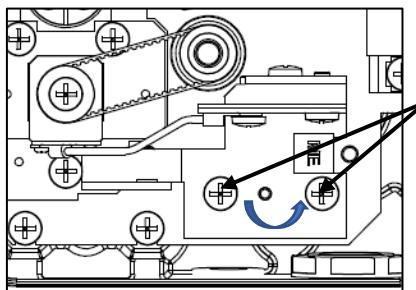


Figure 2 Setup of belt tension adjustment



First loosen the two screws. Then adjust the position of the bracket by winding it in the direction of the arrow, so that it never contacts the rotating contact.

Figure 3 How to adjust the position of the brush mounting bracket

4. Troubleshooting

If the measured value shows abnormality or the measured value fluctuates greatly, the electrical continuity of the electrode mechanism may be incomplete due to defects of the rotating contact. Analyze the cause of the problem including the rotating contact. For other abnormal phenomena and causes, refer to the instruction manual and take measures.