EA01817C/07/EN/01.26-00
71779678
2026-04-30

Installation Instructions
Liquiline System CA80TN analyzer

Reactor components

Endress+Hauser
People for Process Automation

Table of contents

1 Spare parts kits

These installation instructions apply to the following spare parts kits:

Order code	Designation	Page
71516281	CA80TN Reactor O-rings	→ 7
71516286	CA80TN Reactor glasses	→ 16

2 Intended use

- The parts of the kits must only be used as spare parts for CA80TN analyzers. Any other use is not permitted!
- Only use original parts from Endress+Hauser.
- In the Device Viewer, check if the spare part is suitable for the device in question.

3 Personnel authorized to carry out modifications

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to perform the stated tasks.
- The electrical connection may only be established by an electrical technician.
- The technical personnel must have read and understood these Installation Instructions and must follow the instructions they contain.
- Measuring point faults may be repaired only by authorized and specially trained personnel.
- In the case of Ex-certified devices, the technical staff must also be trained in explosion protection.

Repairs not described in the Operating Instructions provided must only be carried out directly at the manufacturer's site or by the service organization.

4 Safety instructions

⚠ WARNING

Risk of death due to electric shock!

- Perform work on the device with the utmost caution, especially when the device remains fully or partially powered on during maintenance tasks.
- The analyzer has no power switch. If necessary, use the system-side circuit breaker.
- Follow the instructions in the relevant chapters of this manual, as the procedure for electrical safety depends on the service kits used.
- All work must be carried out according to applicable safety standards.
- Follow the instructions in the Operating Instructions for the device.

⚠ CAUTION

Risk to health due to contact with reagents (chemicals) or process solutions!

- Wear chemical-resistant protective gloves, protective goggles and protective clothing,
- Immediately rinse splashes with plenty of water and a 1% sodium bicarbonate solution ($NaHCO_3$, baking soda).
- In case of eye contact, rinse the affected area with plenty of water and then seek medical advice. Show the relevant safety data sheet to the physician.
- Note the nationally applicable workplace safety regulations for the work area when handling toxic or corrosive chemicals.

⚠ CAUTION

Electronic assemblies are sensitive to electrostatic discharges (ESD)!

- Before removing an assembly from the antistatic packaging, it must be discharged, e.g. at a protective ground. Continuous grounding, e.g. with an ESD wristband, is recommended.

Potential impact on the process

Before decommissioning an active device, the potential impact on the overall process must be taken into account! This applies in particular when using the switching contacts, the analog signal outputs or the communication interface of the associated measuring instrument to control process variables. Coordinate service tasks with the operator!

Contact Endress+Hauser Service if you have questions: www.addresses.endress.com

5 Scope of delivery

The scope of delivery is stored in the Spare Parts Finder (SFT) as a components sheet. The QR code below enables access to the scope of delivery including an overview of devices with the item numbers of the maintenance parts. The order code, product root or serial number of the device must be entered for this purpose.

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https://sft-p.cdn.endress.com/

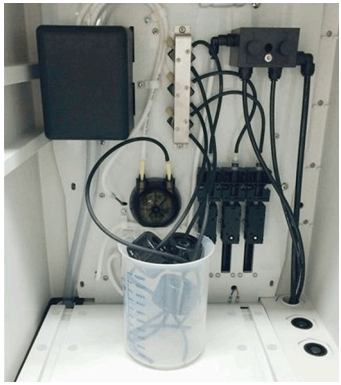
6 Replacing components

The following are required, in addition to standard tools, to replace components:

- Compressed air spray
- Distilled water
- Lint-free cleaning cloths

6.1 Preparation

1. Select **Mode → Manual mode** and confirm by pressing the navigator button.
2. Wait until the analyzer has finished the measurement and **Manual** is displayed as the **Current mode**.
3. Stop the sample feed.
4. Remove the covers of the reagent bottles and the hoses and place them in a plastic vessel.



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1 *Beaker for covers with hoses*

5. Remove the bottle tray together with the bottles from the analyzer.
6. Place the hoses in an empty beaker and select **Menu → Operation → Maintenance → Decommissioning → Empty hoses**.

The software evaluates this as the bottles being removed. Therefore, they need to be reinserted at a later time.

7. Place the hoses in a beaker with distilled or treated water and select **Menu → Operation → Maintenance → Decommissioning → Rinse with water**. Wait until rinsing is finished.
8. Place the hoses back in an empty beaker and select **Menu → Operation → Maintenance → Decommissioning → Empty hoses**.

All the hoses are now flushed, clean and filled with air. It is now possible to work on the analyzer without risk.

9. **Disconnect the analyzer from the power supply using the circuit breaker provided on the system and secure the circuit breaker against unintentional recommissioning.**

⚠ WARNING

Risk of injury due to high voltage present during operation on the transmitter module and high-voltage circuit board.

- Only open the protective cover (see CAD/detail drawings in the spare parts finder) when the device is switched off!

6.2 Replacing the reactor O-rings

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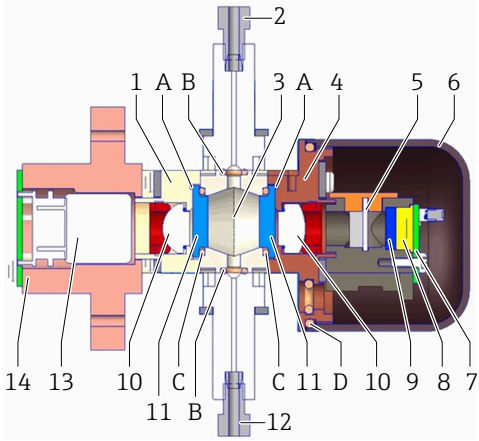
2 Link to Components Sheet, including scope of delivery and device overview



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3 Reactor sectional drawing

1 Lens holder
2 Reactor vent
3 Titanium cuvette
4 Lens holder
5 Beam splitter
6 Protective cup, receiver
7 Receiver module
8 Photodiodes
9 Optical filters (220 + 275 nm)
10 Lenses
11 Stepped sapphire window
12 Reactor inlet
13 Xenon strobe lamp
14 Transmitter module
A 2x FKM O-ring, ID 19 W 1 OD 21 mm (not wetted)
B 2x FFKM O-ring, ID 4.47 W 1.78 OD 8.03 mm
C 2x FFKM O-ring, ID 16 W 2 OD 20 mm
D 1x FKM O-ring, ID 48.90 W 2.62 OD 54.14 mm (not wetted)

We recommend you remove the entire carrier plate to facilitate work on the reactor.

Removing the carrier plate

1. Carry out preparatory work as per Section 6.1 → 5.
2. Disconnect the sample hose from the hose connector (refer to the hose connection diagram in the SFT, no. 13).
3. Pull the waste hoses out of the drain pipe.

4. Release the screws securing the carrier plate (see Components Sheet SF01646C, item d) and fold the carrier plate forward.
5. Disconnect the plug-in connectors of the cables from the electronics compartment to the control module, i.e. disconnect the following connectors: **EF** (Enclosure Fan), **CM44 com** (Communication), **24V** (Supply 1), **24V** (Supply 2) and **ground cable** for protective cover (green/yellow).

A dry and clean worktop in an oil-free and dust-free environment is required for the following work. A soft, lint-free surface must be provided.

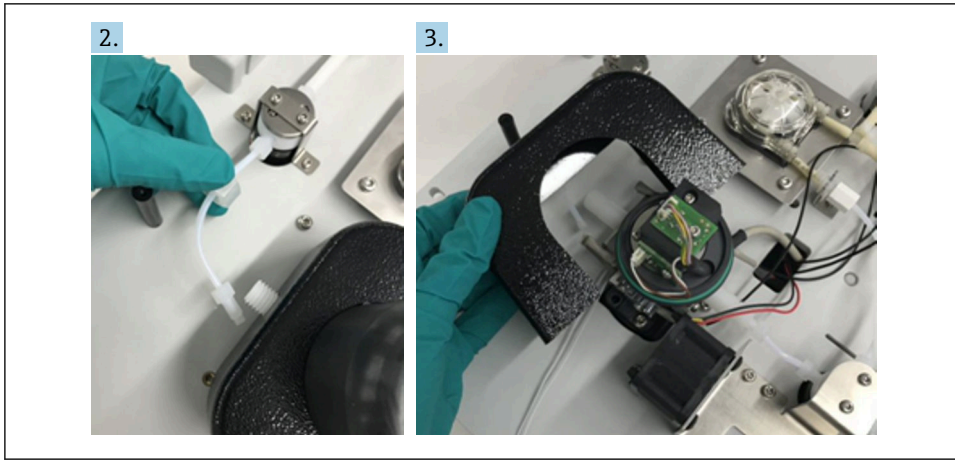
6. Remove the carrier plate from the device and place it on the worktop.

Preparing the reactor

1. Remove the transparent protective cover from the reactor.
2. Open the hose gland at the top of the reactor and remove the hose. Then release the hexagonal nut on the hose gland (→ 4, 9, left).

Make sure that the hose is not kinked when disassembling and reassembling!

3. Pull off the air hood (→ 4, 9, right).



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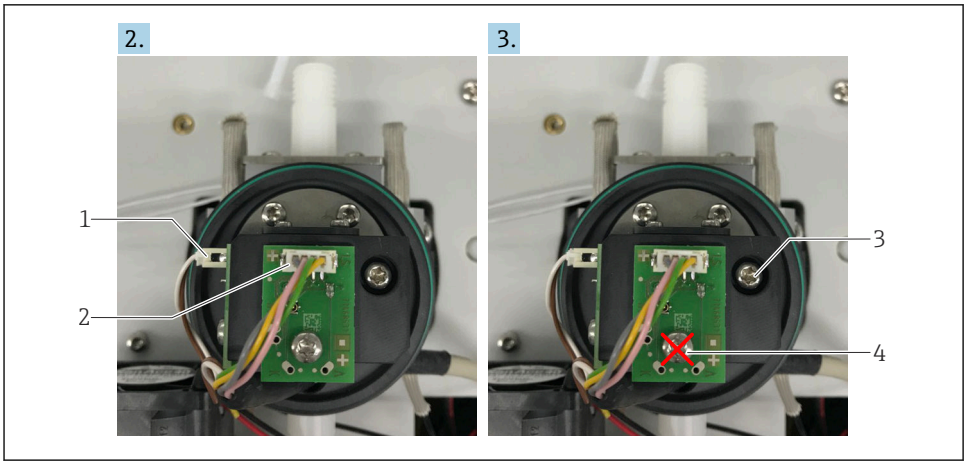
4 *Preparing for reactor removal*

Replacing the receiver O-rings

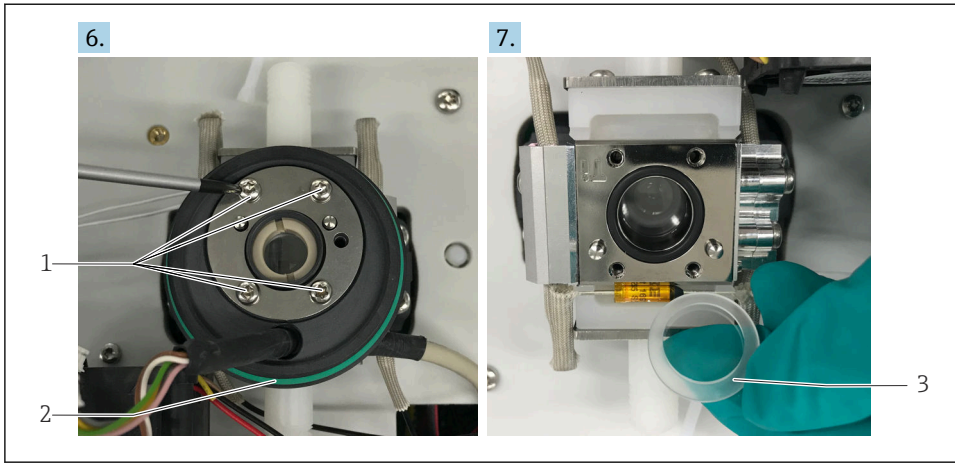
1. Unscrew and remove the black protective beaker of the receiver unit.
2. Remove the plugs of the connecting cables (→ 5, 10, items 1 and 2) at the receiver module.

3. Release the fixing screw (→ 5, 10, item 3) of the receiver module. Do **NOT** release the fixing screw (→ 5, 10, item 4) of the circuit board!



5 *Removing the receiver module*

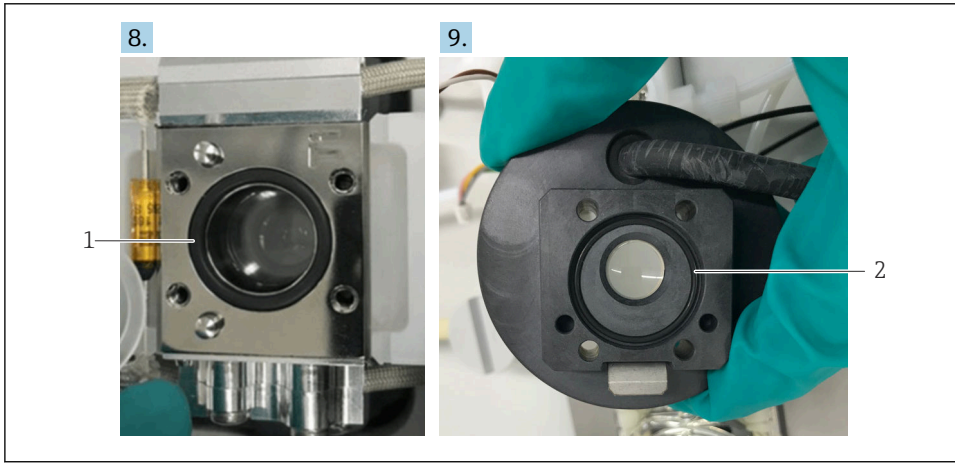
4. Remove the receiver module and keep it in a safe and clean place. Use the cover supplied to protect the opening in the module.
5. Replace the green FKM O-ring (O-ring ID 48.90 W 2.62 mm, → 6, 11, item 2).
6. Release the four screws on the round retaining plate (→ 6, 11, item 1) and remove it along with the lens holder (round and black) located underneath.
7. Remove the stepped sapphire window from the reactor (→ 6, 11, item 3) and store it safely on a lint-free cloth.



6 *Removing the lens holder and stepped window*

8. Remove and replace the O-ring (→ 7, 11, item 1) on the reactor.
9. Remove and replace the O-ring (→ 7, 11, item 2) on the lens.

Remove the O-rings by hand. If this is not possible, use a plastic O-ring picker. Do not scratch the sealing surfaces with hard tools!



7 *Replacing the O-rings for the stepped sapphire window*

10. Clean and reinstall the stepped sapphire window.

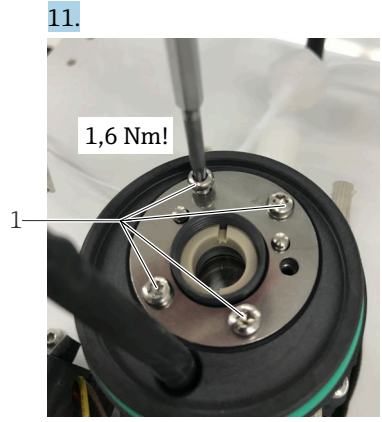
Clean as follows:

- Clean the window with deionized water,
- Then clean the window with the isopropyl wipe provided,
- Clean the window again with deionized water and a lint-free cloth,
- Use the compressed air spray to remove any dust from the sapphire window and reactor lens.

The sapphire window must be free of streaks and lint before reinstallation!

11. Mount the lens holder back on the reactor. Use the torque wrench (T10) with a torque of **1.6 Nm** (→ 8, 12)!

Failure to observe the torque specification may result in thread damage and leaks!



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8 *Tightening torque for the lens holder*

Replacing the transmitter O-rings

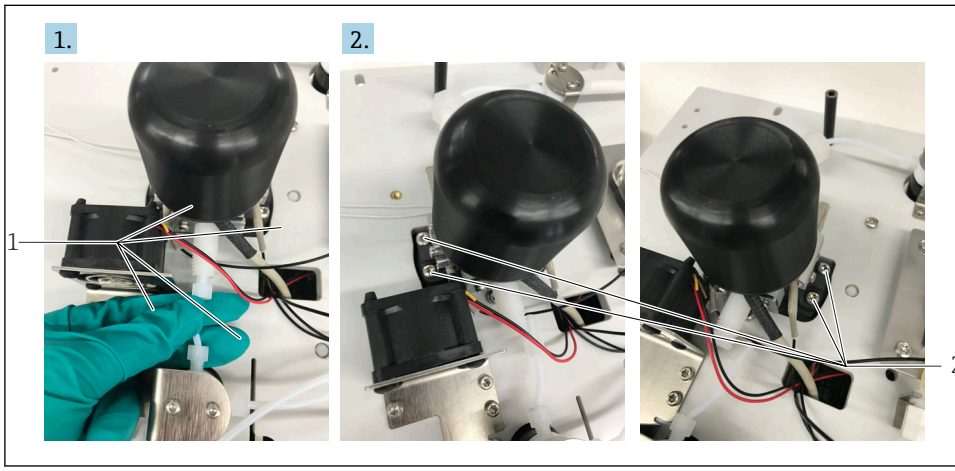
1. Open the hose gland at the bottom of the reactor and remove the hose (→ 9, 13, left).

Make sure that the hose is not kinked when disassembling and reassembling!

2. Unscrew the reactor (4 screws, → 9, 13, center and right).

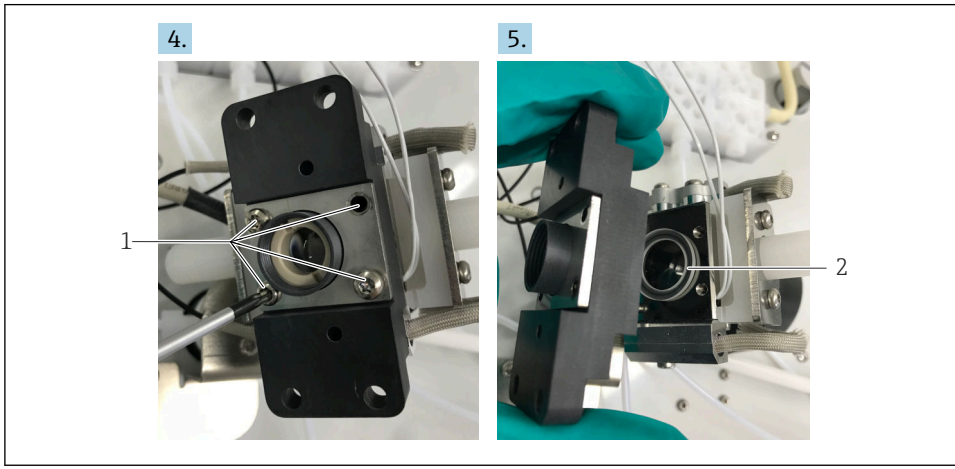
3. Pull the reactor forward until it detaches from the transmitter module.

The transmitter module with the xenon strobe lamp remains in the carrier plate. Protect the lamp temporarily with the cover provided!



9 *Reactor removal*

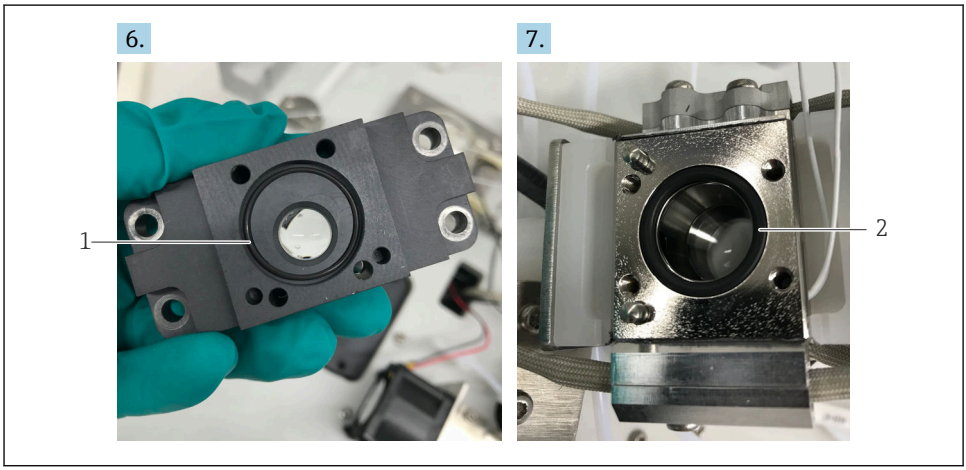
4. Release the four screws at the bottom of the reactor to remove the black lens holder (→ 10, 13, item 1).



10 *Remove the lens holder at the bottom*

5. Remove the stepped sapphire window from the reactor (→ 10, 13, item 2) and store it safely on a lint-free cloth.
6. Remove and replace the O-ring (→ 11, 14, item 1) on the lens.
7. Remove and replace the O-ring (→ 11, 14, item 2) on the reactor.

Remove the O-rings by hand. If this is not possible, use a plastic O-ring picker. Do not scratch the sealing surfaces with hard tools!



11 *Replacing the O-rings for the stepped sapphire window; illustration on left: lens holder; illustration on right: reactor side*

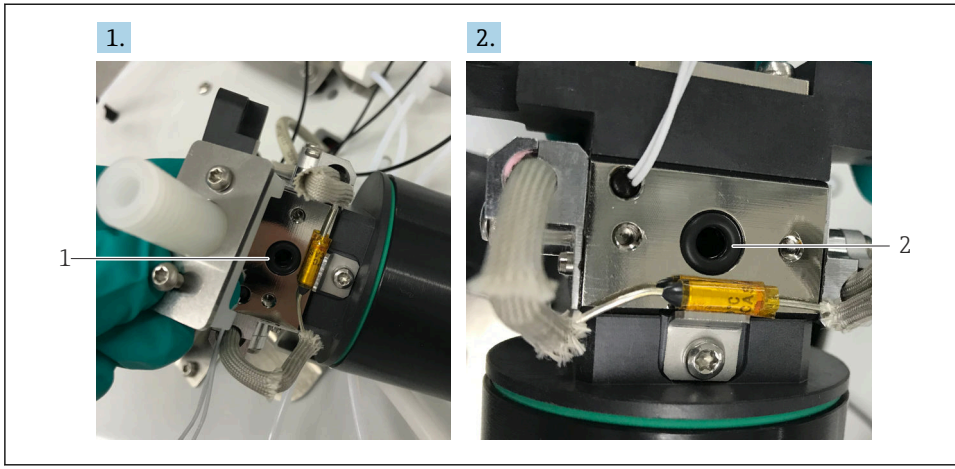
8. Clean and reinstall the stepped sapphire window as described in step 10 (refer to **Replacing the receiver O-rings**→ 9).
9. Mount the lens holder back on the reactor. Use the torque wrench (T10) with a torque of **1.6 Nm** (→ 8, 12)!

Failure to observe the torque specification may result in thread damage and leaks!

Replacing the O-rings at the reactor inlet and reactor vent

Carry out the following steps for both hose connections (the inlet and vent sides of the reactor).

1. Release the two screws to loosen the relevant retaining plate and remove the retaining plate along with the hose connection (example: → 12, 15).
2. Replace the O-ring in question (example: → 12, 15, items 1 and 2).
3. Screw both hose connections and retaining plates back onto the reactor.



12 Retaining plate with hose connection and O-ring (example: reactor vent)

Reinstallation of the reactor and final assembly of the device

1. Make sure that all temporary protective caps are removed.
2. Reassemble the reactor and screw it back onto the transmitter module.
3. Screw the black protective beaker back on the receiver module as far as it will go. The green O-ring should no longer be visible.
4. Push the air hood onto the hose connection at the top and secure with the plastic nut.
5. Reconnect the hoses to the reactor. Use the new hose glands and cones supplied.

Make sure that the hoses do not bend when reassembling!

6. Mount the transparent safety cover for the reactor back on the carrier plate.
7. Place the carrier plate back into the device and fold it forward.
8. Reattach all plug-in connectors (see step 5 of **Removing the carrier plate**→ 8).
9. Fold up the carrier plate and secure it with 6 screws.
10. Reconnect the sample hose and waste hoses.
11. Put the analyzer back into operation → 16.
12. Perform any additional final tasks → 17.

6.3 Replacing the reactor glasses (stepped sapphire window)

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13 Link to Components Sheet, including scope of delivery and device overview

The entire reactor disassembly procedure and how to handle the stepped sapphire window are described in Section 6.2 → 🖹 7.

Be careful not to mix up the old and new stepped sapphire windows! Only ever handle the stepped sapphire window using nitrile gloves!

We recommend you replace the reactor O-rings when replacing the stepped sapphire windows. To do this, follow the instructions in Section 6.2 → 🖹 7 directly and use **Kit 71516281 CA80TN reactor O-rings**.

If the O-rings are not replaced, omit the following steps from Section 6.2 → 🖹 7:

- **Step 5** (see: **Replacing the receiver O-rings** → 🖹 9)
- **Steps 8 and 9** (see: **Replacing the receiver O-rings** → 🖹 9)
- **Steps 6 and 7** (see: **Replacing the transmitter O-rings** → 🖹 12)
- **Steps 1 to 2** (see: **Replacing the O-rings at the reactor inlet and reactor vent** → 🖹 12)

6.4 Recommissioning

1. Insert the bottle tray with reagents, standard and cleaner.
2. Switch the power supply to the analyzer back on.
3. Connect hoses to the reagent containers and fill as described below:
4. Select **Menu → Operation → Maintenance → Bottle replacement → Bottle insertion → Bottle selection**.
5. Highlight all the bottles and confirm by pressing the **OK** softkey.
6. Select the **Bottles inserted confirmation** entry.
7. Activate the sample feed.
8. Select **Mode → Continue automatic mode** to start the normal measuring operation.

9. Check all the new components for leaks.

Recalibration is not required if only the hose connectors have been replaced.

A two-point calibration may be necessary if additional maintenance work has been performed. In this case, follow the Operating Instructions or the relevant kit instructions.

6.5 Additional final tasks

Carrying out manual cleaning of the reactor (duration approx. 15 minutes)

- Select **Menu → Expert (password entry) → Operation → Manual operation → Cleaning** to start reactor cleaning.
  - ↳ Manual reactor cleaning is performed.

Performing reactor pressure test (duration 5-10 minutes)

1. Select **Menu → Expert (password entry) → Diagnostics → Device test → Analyzer → Reactor → Reactor pressure test** to start the reactor pressure test.
2. Close the enclosure door.
   - ↳ The reactor pressure test is carried out.

Re-evaluation of the photometer status (duration 6.5 hours)

- Select **Menu → Expert (password entry) → Diagnostics → Device test → Analyzer → Start photometer status re-evaluation** to start re-evaluation.
  - ↳ The photometer status is re-evaluated.

The photometer status must be between 70% and 100%.

Performing calibration

1. Select **Menu → Operation → Manual operation → Determine zero point and calibr. factor** to start the calibration.
   - ↳ The calibration is performed.
2. Check whether the nominal standard concentration displayed is correct, i.e. identical to the standard solution bottle specification in the analyzer.

6.6 Starting measuring mode

1. Before starting the measurement, make sure that the analyzer receives an adequate quantity of sample.
2. Select **Mode → Continue automatic mode** or **Mode → Start automatic mode** to resume or start normal measuring mode.

7 Additional documentation

Detailed information on the devices shown here can be found in the Operating Instructions for each device and in the other documentation, available at:

- Product page: https://www.endress.com/
- Spare parts finder: https://sft-p.cdn.endress.com/
- Device Viewer: www.endress.com/device-viewer
- Smartphone/tablet: Endress+Hauser Operations app

8 Disposal

If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

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