

Installation Instructions

Liquiline System CA80SI/82HA analyzer

Photometer








Table of contents

| | | |
|---|--|----|
| 1 | Overview | 3 |
| 2 | Intended use | 8 |
| 3 | Personnel authorized to carry out conversion | 8 |
| 4 | Safety instructions | 8 |
| 5 | Scope of delivery | 11 |
| 6 | Replacing components | 13 |
| 7 | Additional documentation | 25 |
| 8 | Disposal | 25 |







1 Overview

1.1 Spare parts kits

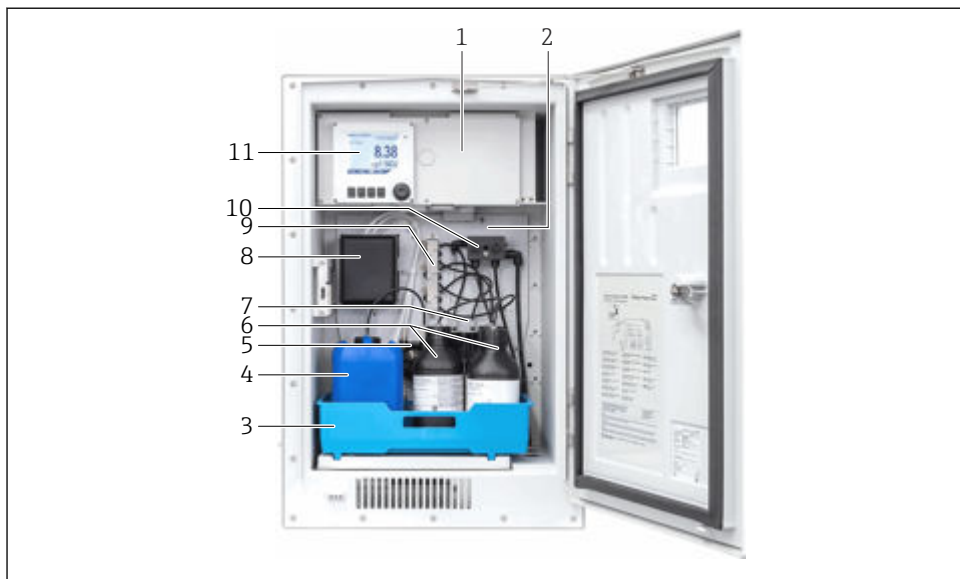
These installation instructions apply to the following spare parts kits:

| Order code | Designation | Page |
|------------|-------------------------------------|--|
| 71408712 | CA80SI photometer (without cuvette) | →  11 |
| 71699149 | CA82HA photometer (without cuvette) | →  11 |
| 71408711 | CA80SI/82HA photometer cuvette | →  12 |
| 71408683 | CA80SI capillaries incl. holder | →  12 |
| 71695965 | CA82HA capillaries incl. holder | →  13 |

1.2 Overview of CA80SI/82HA

The figures below (→  1,  4, →  2,  5 and →  3,  6) show an overview of the CA80SI/82HA for photometric silicate measurement or measurement of water hardness in the low validity range. A 2-channel device is shown.

For 2-channel devices, the sample switch is integrated into the device. Filters and pressure limiters are mounted externally.



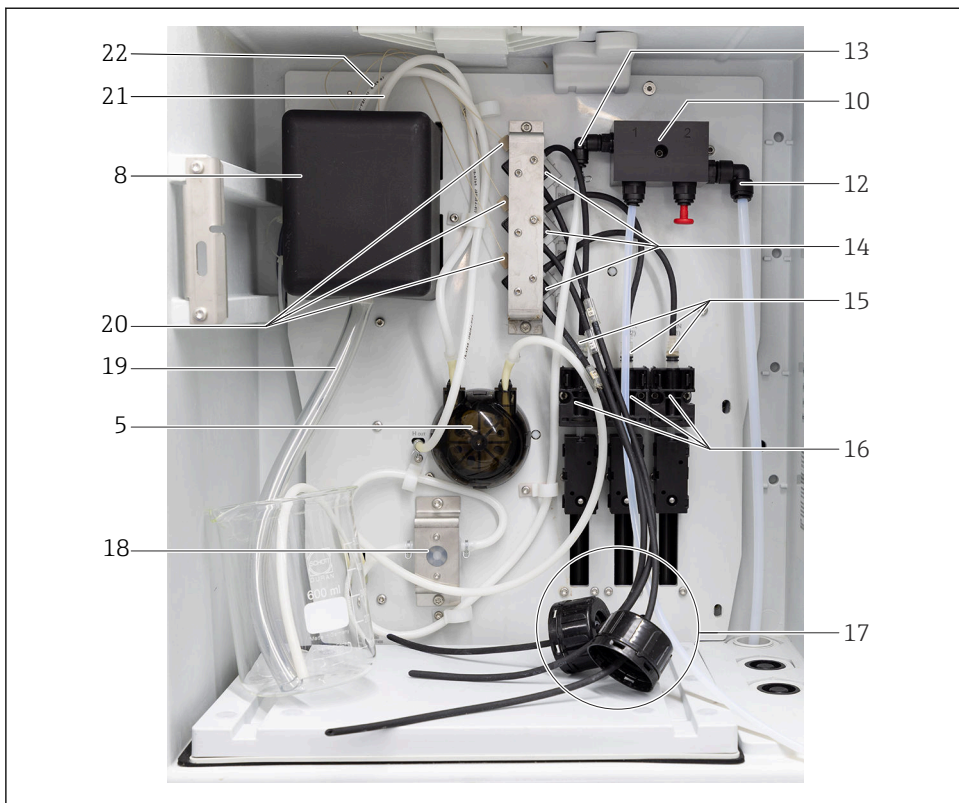
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1 CA80SI/82HA assembly overview

- 1 Electronics compartment cover
- 2 Carrier plate
- 3 Bottle tray
- 4 Bottle for standard solution
- 5 Peristaltic pump for standard solution
- 6 Reagent bottles
- 7 Dosing dispensers for reagents
- 8 Cover with cuvette, photometer and stirrer behind
- 9 Valve block for reagent dosing
- 10 Sample switch (only 1-channel/2-channel devices)
- 11 Measuring and control device

The figure below shows the carrier plate from the front.

For 4/6-channel devices, the sample switch is outside of the analyzer.

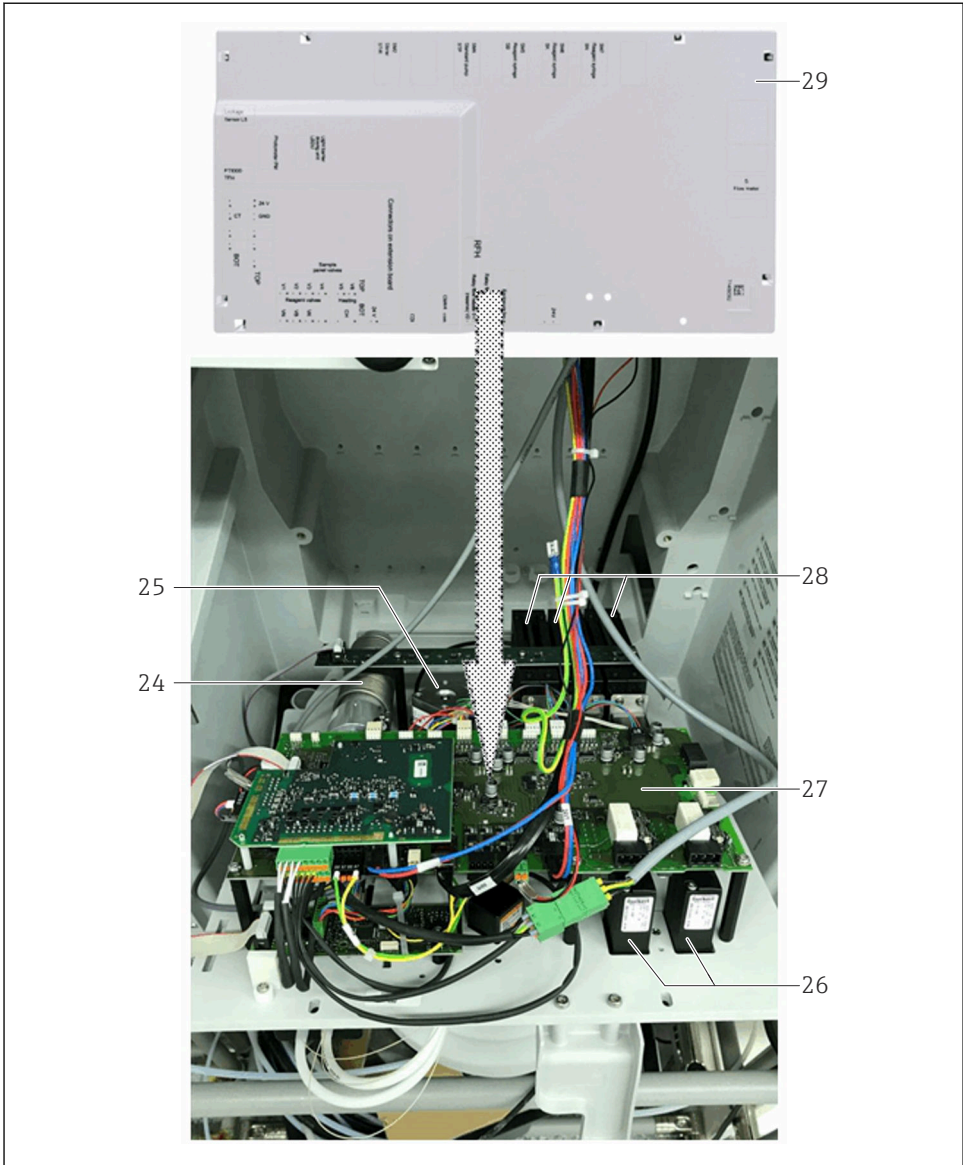


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2 Carrier plate CA80SI/82HA with photometer

- 12 Outflow hose for sample switch OD 8 mm
- 13 Sample hose to flow sensor
- 14 Valves for reagents
- 15 Dosing dispensers
- 16 Dispenser holders
- 17 Cover of reagent container with hoses
- 18 Flowmeter
- 19 Drain hose, cuvette ID 13 mm
- 20 Capillaries for reagents
- 21 Hose standard solution
- 22 Sample hose (from heater of CA80SI)

The figure below shows the carrier plate folded out and from the rear with a view of the control module.



3 Rear of CA80SI/82HA carrier plate, folded out

24 Sample heating

25 Motor for pump standard solution

26 Sample switch valve(s) (for 1-channel and 2-channel version, external from 4-channel version)

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2 Intended use

- The parts of the kits must only be used as spare parts for CA80SI/82HA 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 conversion

- 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

Danger of death from electrical shock!

- ▶ Perform work on the device with the utmost caution, especially when the device remains fully or partially powered on during maintenance tasks.
- ▶ Follow the instructions in the relevant sections of this manual, as the procedure for electrical safety depends on the service kits used. The CA8x analyzer does not have a power switch for the power supply.
- ▶ All work must be carried out according to applicable safety standards.
- ▶ Note the instructions in the Operating Instructions for the analyzer.

CAUTION

Health hazard due to contact with the process medium!

- ▶ Wear protective gloves, protective goggles and protective clothing, particularly when working with reagents, chemicals or process medium.

⚠ CAUTION**Risk to health due to contact with chemicals!**

- ▶ When handling chemicals, note the warnings on the safety data sheets. Wear acid-proof protective gloves, a protective coat and protective goggles.
- ▶ Note the nationally applicable workplace safety regulations for the work area when handling toxic or corrosive chemicals. If necessary, consult a physician and show the safety data sheet or the information on the chemical container.

⚠ 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.

**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 used for controlling process variables. Coordinate any service tasks with the operator.



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

4.1 Compatibility of the electrical assemblies

If one of the modules specified in the table below needs to be replaced, care must be taken to use a module of the same version. A device's generation of modules can be determined in the Asset Central Viewer (ACV).

Version 1 electronics modules are not compatible with version 2 electronics modules. This means that only version 1 modules or version 2 modules may be installed in one device. The table shows the compatibility of modules.

Version 2 of the electronics modules is only supported by firmware 01.08.00 and later!

| | Backplane V1 | BASE-E | Interface module V1 | Control module V1 | Backplane V2 | BASE2-E | Interface module V2 | Control module V2 |
|---------------------|--------------|--------|---------------------|-------------------|--------------|---------|---------------------|-------------------|
| Backplane V1 | N/A | ☑ | ☑ | ☑ | N/A | - | - | - |
| BASE-E | ☑ | N/A | ☑ | ☑ | - | N/A | - | - |
| Interface module V1 | ☑ | ☑ | N/A | ☑ | - | - | N/A | - |
| Control module V1 | ☑ | ☑ | ☑ | N/A | - | - | - | N/A |
| Backplane V2 | N/A | - | - | - | N/A | ☑ | ☑ | ☑ |
| BASE2-E | - | N/A | - | - | ☑ | N/A | ☑ | ☑ |
| Interface module V2 | - | - | N/A | - | ☑ | ☑ | N/A | ☑ |
| Control module V2 | - | - | - | N/A | ☑ | ☑ | ☑ | N/A |

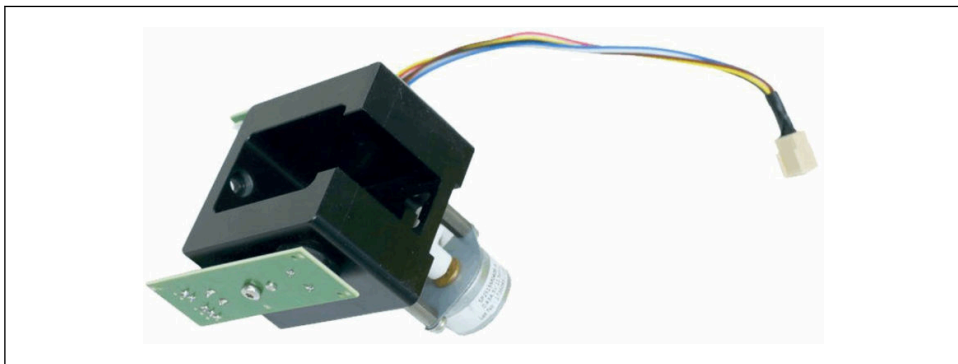
| CA80 | Name @ ACV | Module name | Spare parts kit |
|-------------|--------------------------|-------------------|---|
| all | FIDC1 + FXHC1 | BASE-E module | 71239305 CA8x BASE-E base module |
| | FIDC1 + FXHC2 | BASE2-E module | 71431302 BASE2-E base module |
| | FIDS1 | Interface mod. V1 | 71218507 CA8x Interface module (version 1) |
| | FIDS2 | Interface mod. V2 | 71465480 CA8x Interface module (version 2) |
| | FC4W2 | Backplane V1 | 71239304 CA8x Backplane CM44 (version 1) |
| | FC4W3 | Backplane V2 | 71401272 Kit CA8x backplane CM44 (version 2) |
| CA80SI/82HA | FMAB1 (FXAB1 with AXIO1) | Control module V1 | N/A |
| | FMAB2 (FXAB2 with AXIO1) | Control module V2 | 71503211 Kit CA80SI/82HA control module version 2 |

5 Scope of delivery

5.1 71408712 Kit CA80SI photometer (without cuvette)

The kit contains the following parts →  5,  11:

- | | | | |
|-----|---|-----|------------------|
| 1 x | Photometer, complete, with stirrer and photometer electronics | 1 x | Kit instructions |
|-----|---|-----|------------------|



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 5 CA80SI photometer (without cuvette)


5.2 71699149 Kit CA82HA photometer (without cuvette)

The kit contains the following parts →  6,  11:

- | | | | |
|-----|---|-----|------------------|
| 1 x | Photometer, complete, with stirrer and photometer electronics | 1 x | Kit instructions |
|-----|---|-----|------------------|



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 6 CA82HA photometer (without cuvette)

5.3 71408711 Kit CA80SI/82HA photometer cuvette

The kit contains the following parts →  7,  12:

1 x Photometer cuvette

1 x Kit instructions



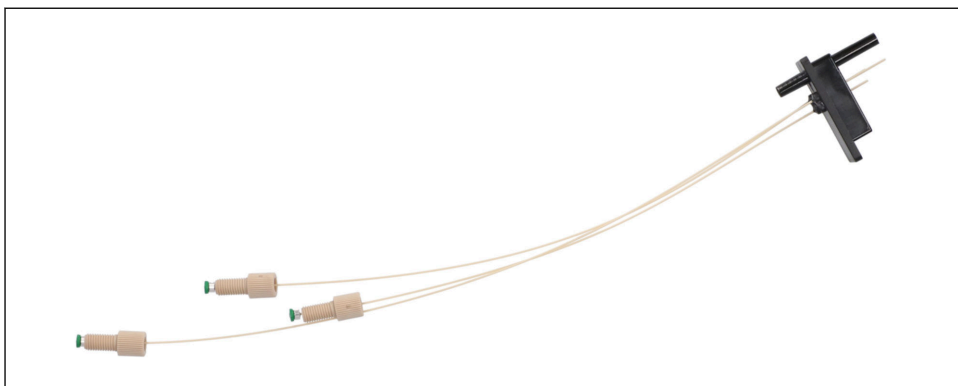
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 7 CA80SI/82HA photometer cuvette


5.4 71408683 Kit CA80SI capillaries incl. holder

The kit contains the following parts →  8,  12:

1 x Capillary holder incl. capillaries and $\frac{1}{4}$ " fittings for hoses OD $\frac{1}{32}$ " 1 x Kit instructions



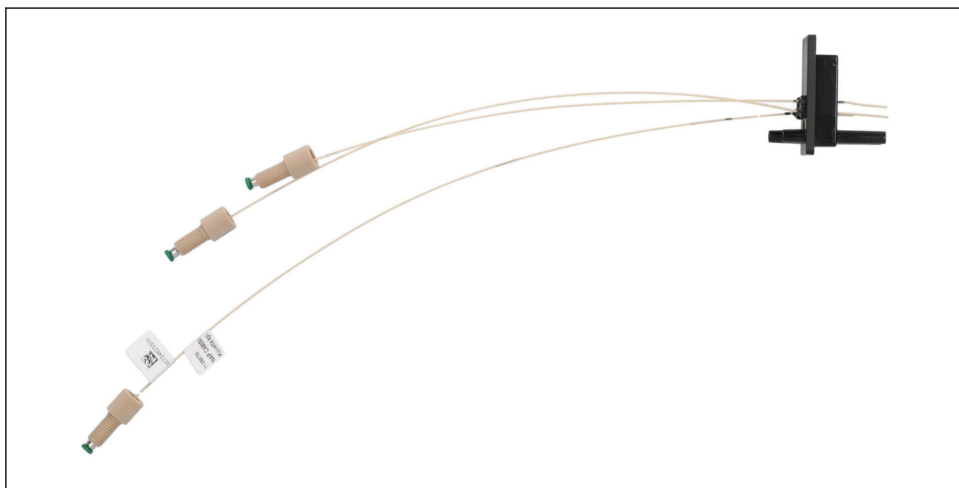
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 8 CA80SI capillaries incl. holder


5.5 71695965 Kit CA82HA capillaries incl. holder

The kit contains the following parts →  9,  13:

- 1 x Capillary holder incl. capillaries and 1/4" fittings for hoses OD 1/32" 1 x Kit instructions



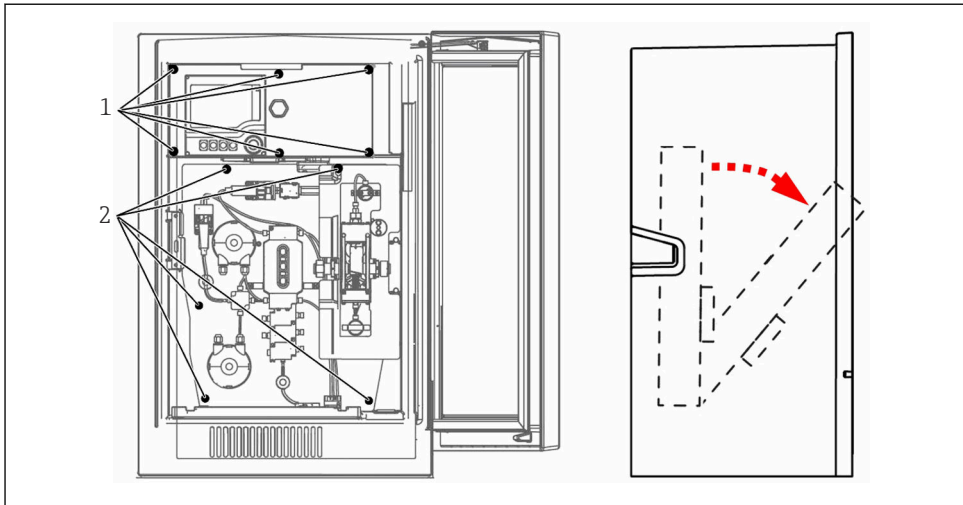
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-  9 CA82HA capillaries incl. holder

6 Replacing components

6.1 Access for service work

The figure below shows the opening of the connection compartment cover and the folding forward of the carrier plate.



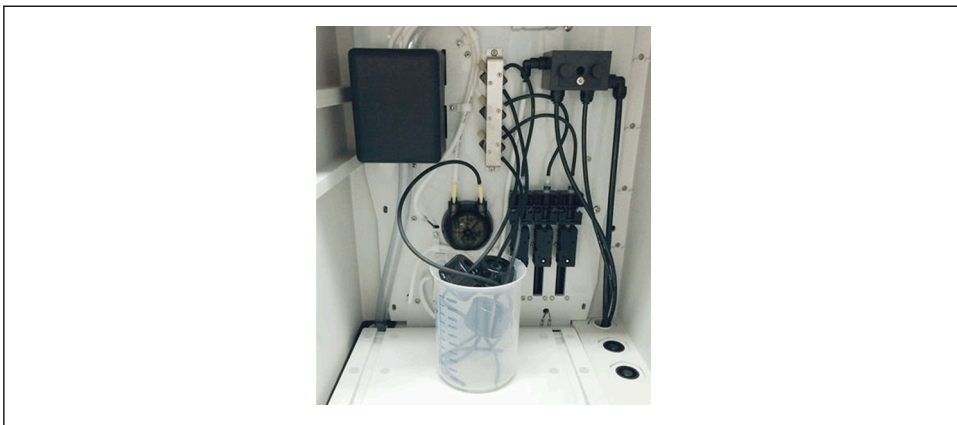
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10 Access for service work on the rear of the carrier plates

- 1 Screws for connection compartment cover
- 2 Screws for securing the carrier plates

6.2 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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11 *Beaker for covers with hoses*

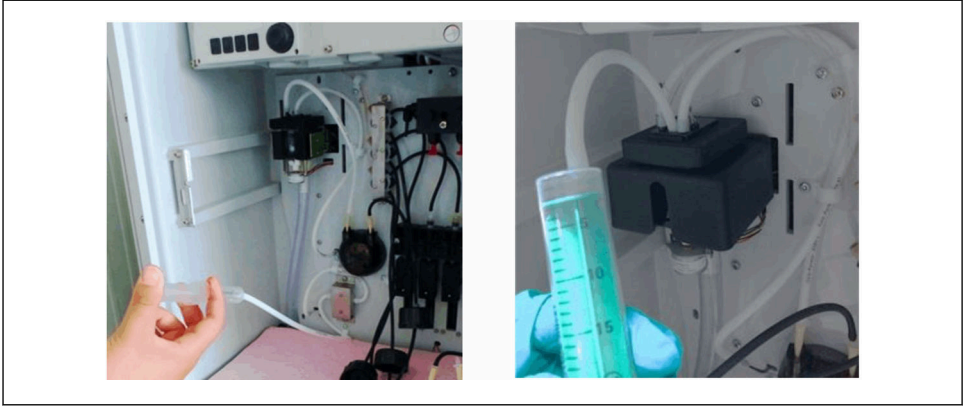
5. Remove the bottle tray together with the bottles from the analyzer.
6. Place the hoses in an empty beaker and select **Menu → Operation → Maintenance → Decommissioning → Empty hoses**.

i 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 flushing is finished.
8. Place the hoses back in an empty beaker and select **Menu → Operation → Maintenance → Decommissioning → Empty hoses**.

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

9. The analyzer cannot drain the SPx sample hose and the photometer cuvette independently. If required for draining, remove the hose from the flowmeter and drain it with a dispenser.



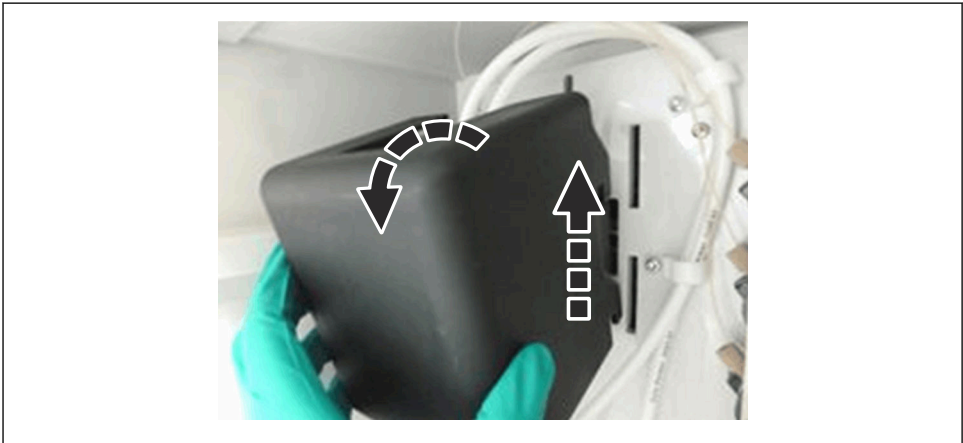
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12 *Draining the SPx sample hose and photometer*

10. **Disconnect the analyzer from the power supply and secure the circuit breaker against unintentional recommissioning.**

6.3 Replacing the photometer

1. Carry out preparatory work as per Section 6.2 → 14.
2. Remove the cover of the photometer.



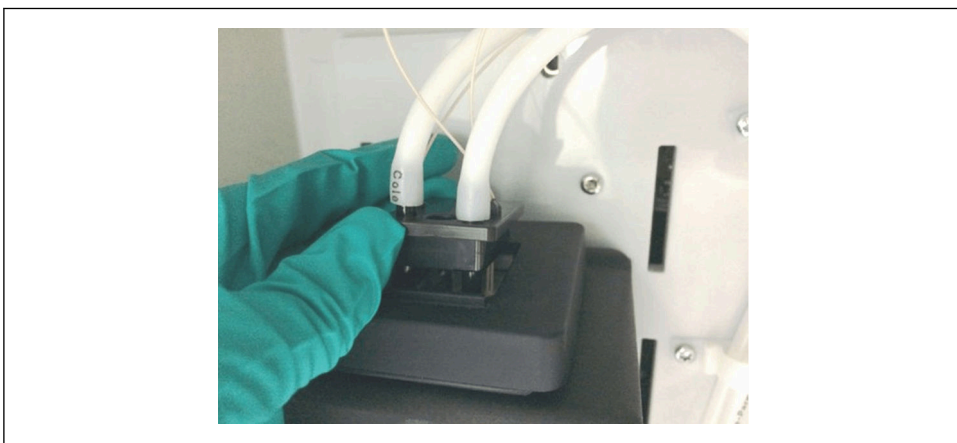
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3. Draw all liquid out of the cuvette through the hole in the cuvette. Use the syringe with the C-Flex tube for this purpose (accessory CA8x).



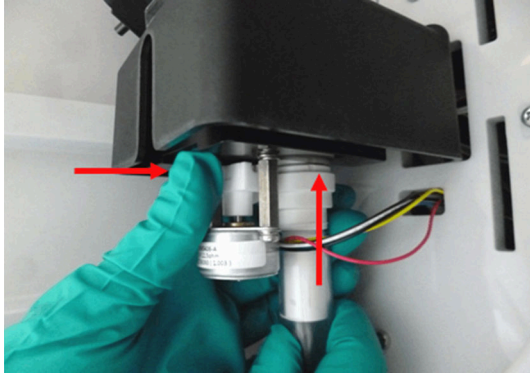
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4. Carefully lift the capillary holder with the capillaries and hoses and place it to the side. Leave the PEEK hose connectors screwed into the valves.



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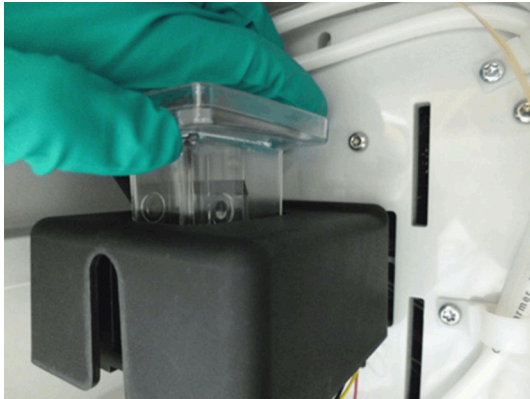
5. Push the outlet hose (W) upwards to release the push-in connector. At the same time, press the cuvette tab and push the cuvette upwards until it disengages.



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6. Remove the cuvette.

i Store the cuvette and magnetic stirrer → 🗑️ 14, 📄 20 for reuse. Do not touch the optical lenses - they must remain clean!





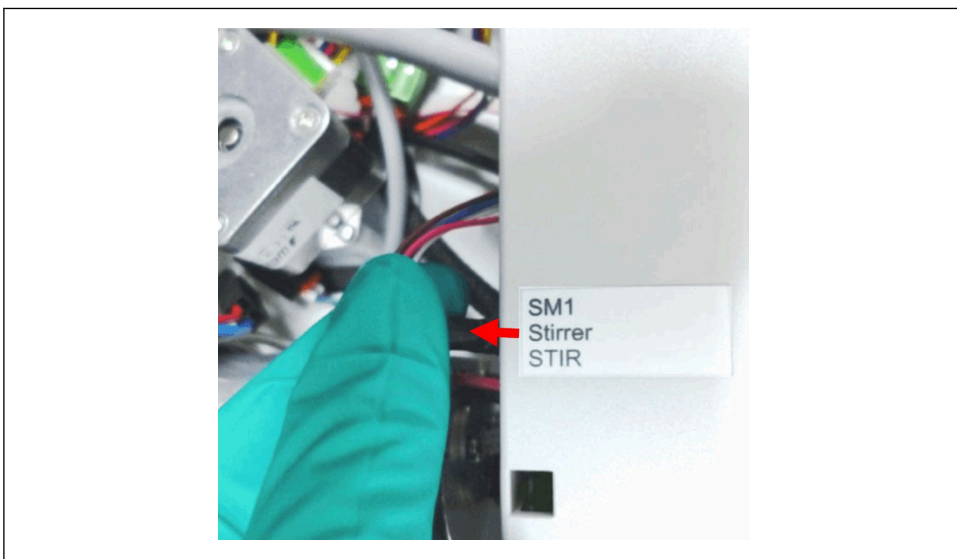
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7. Remove the photometer cover. Store the photometer cover for reuse.





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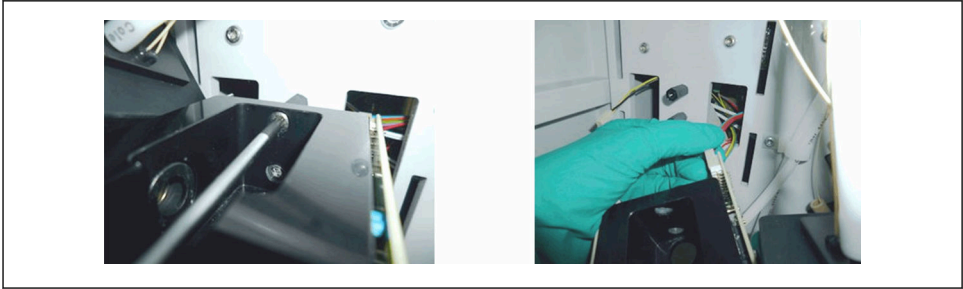
8. Loosen the screws of the carrier plate (6 x T25) and fold the carrier plate forward. Store the screws for reuse →  10,  14.
9. On the rear of the carrier plate, disconnect the magnetic stirrer plug from control module FXAB1.




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10. Fold back the carrier plate and loosen the screws on the photometer →  13,  20, left.

11. Disconnect the plugs on the photometer modules and remove the photometer
→  13,  20, right.

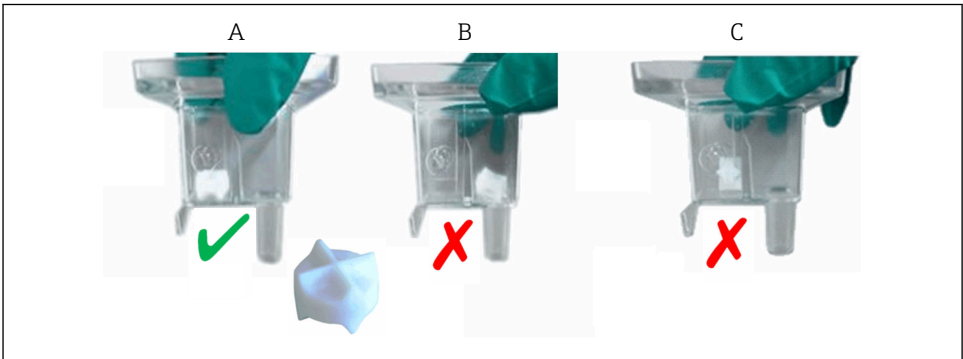


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-  13 *Removing the photometer*

12. Install the new photometer in reverse order.


-  Place the magnet (magnetic stir bar) flat in the front chamber.

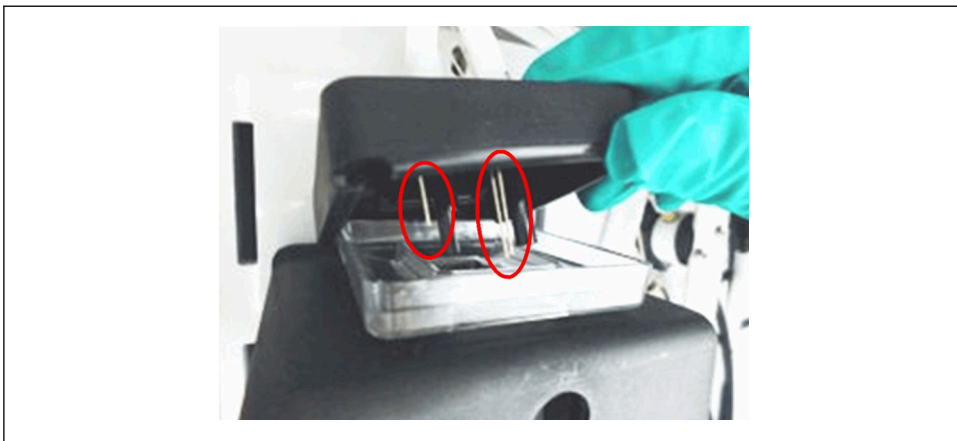


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-  14 *Magnetic stir bar for magnetic stirrer*

- A *Magnet (magnetic stir bar) inserted correctly*
B *Magnet (magnetic stir bar) inserted into the wrong chamber*
C *Magnet (magnetic stir bar) inserted in the wrong position*

-  Make sure that the capillaries are not kinked when fitting the cover.



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📷 15 *Capillaries*

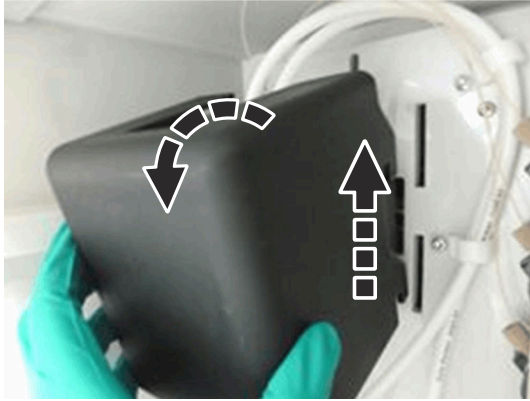
13. Put the analyzer back into operation → 📄 24.

6.4 Replacing the photometer cuvette

1. Carry out preparatory work as per Section 6.2 → 📄 14.
2. Perform steps 1 to 6 from the "Replacing the photometer" → 📄 16 section.
3. Insert new cuvette. Note figures → 📷 14, 📄 20 and → 📷 15, 📄 21!
4. Put the analyzer back into operation → 📄 24.

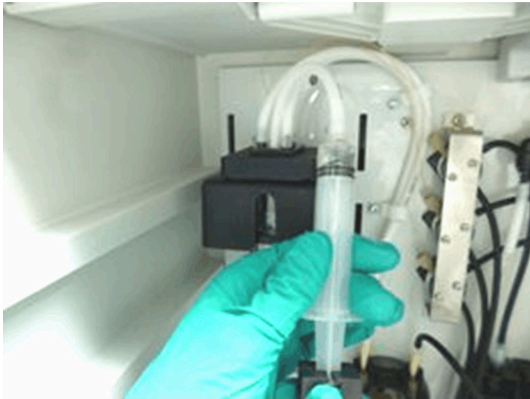
6.5 Replacing the capillaries

1. Carry out preparatory work as per Section 6.2 → 📄 14.
2. Remove the cover of the photometer.



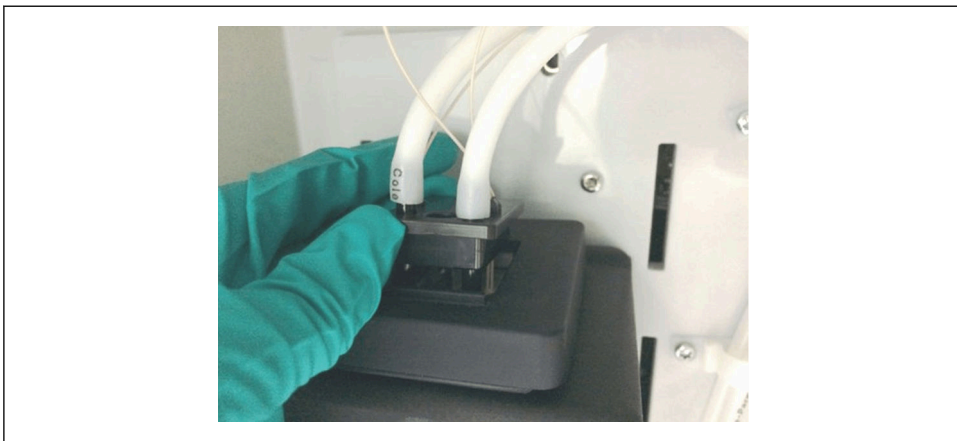
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3. Draw all liquid out of the cuvette through the hole in the cuvette. Use the syringe with the C-Flex tube for this purpose (accessory CA8x).





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4. Detach the capillary holder with the capillaries and hoses from the cuvette.





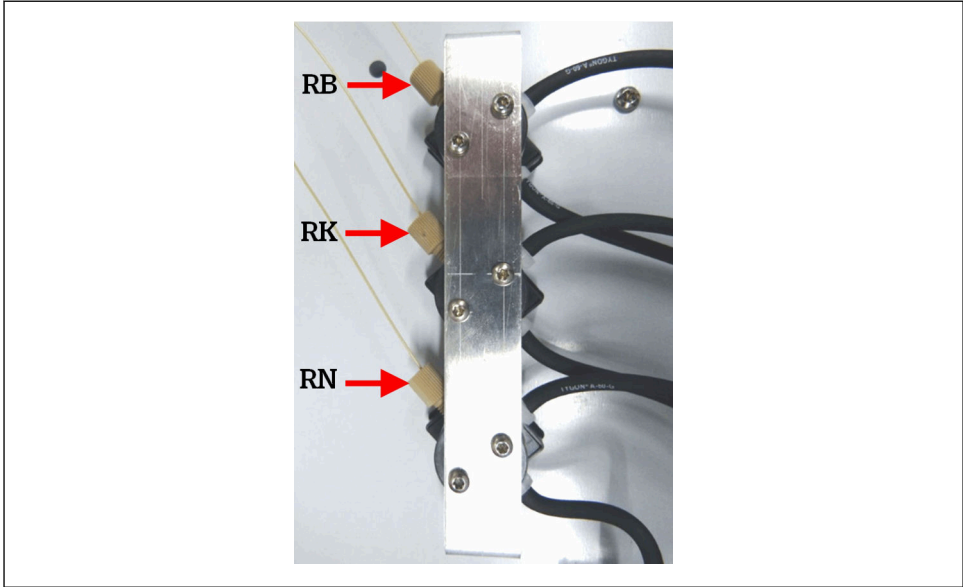
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i The following steps must be carried out one at a time and in sequence to avoid mixing up the hoses.


5. Remove one of the C-Flex tubes from the old capillary holder and immediately connect it to the corresponding hose connection on the new capillary holder.
6. Repeat this step with the other C-Flex tube.
7. Unscrew one of the capillary screw connectors from its valve and immediately screw the corresponding male connector of the new capillary holder onto this valve (see →  16,  24).
8. Repeat this step with the other two capillary male connectors.

i **Alternative:**



If the hoses S1, SX and RB/RK/RN are labeled, all hoses and male connectors can be removed →  16,  24. Then reconnect them in accordance with the hose connection diagram.




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 16 Valves for reagents with capillary male connectors

 Tighten the capillary male connectors by hand only.

9. Check the hoses and male connectors against the hose connection diagram →  4,  7.
10. Place the new capillary holder on the cuvette.

 Make sure that the capillaries are not kinked when fitting the cover →  15,  21.

11. Reattach the photometer cover.
12. Put the analyzer back into operation →  24.

6.6 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. It is recommended to perform one single-point calibration at the end of the service work. To do so, select **Menu** → **Calibration** → **Analyzer** → **Determine calibration factor**.
10. Check all the new components for leaks.

7 Additional documentation

Detailed information on the devices can be found in the Operating Instructions for the analyzer and in the other documentation, available at:

- 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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