EA01591C/07/EN/01.25-00
71697473
2025-02-28

Installation Instructions
Liquiline System CA80 analyzer

Process engineering

Endress+Hauser
People for Process Automation

Table of contents

1 Overview 3
2 Designated use 3
3 Personnel authorized to carry out conversion 4
4 Safety instructions 4
5 Scope of delivery 6
6 Overview of CA80 device types 15
7 Preparation 22
8 Replacing dispensers and dispenser holders 24
9 Replacing the Liquid Manager 27
10 Replacing the photometer module 27
11 Replacing the linear drive and light barriers module 28
12 Replacing the control module 35
13 Finishing work 41
14 Appendix: Hose connection diagrams 41
15 Additional documentation 55
16 Disposal 55

1 Overview

1.1 Spare parts kit

These installation instructions apply to the following spare parts kits:

Order code	Designation	Page
71420354	CA8x photometer module version 2	→ 🖹 6
71218490	CA8x linear drive	→ 🖹 7
71222105	CA8x dispenser holders 10 ml	→ 🖹 7
71222106	CA8x dispensers 10 ml	→ 🖹 8
71222107	CA8x dispensers 2.5 ml	→ 🖹 9
71222108	CA8x dispenser holders 2.5 ml	→ 🖹 8
71218491	CA8x light barrier, linear drives V1	→ 🖹 10
71465074	CA8x light barrier, linear drive V2	→ 🖹 9
71218492	CA8x Liquid Manager, complete	→ 🖹 10
71339718	CA8x 3 Reag: Liquid Manager, complete	→ 🖹 12
71299073	CA8x Liquid Manager without motor	→ 🖹 10
71339723	CA8x 3 Reag: Liquid Manager without motor	→ 🖹 12
71218493	CA8x stepping motor, Liquid Manager	→ 🖹 13
71218487	CA8x carrier plate cover	→ 🖹 13
71218504	CA8x control module version 1	→ 🖹 14
71503207	CA8x control module version 2	→ 🖹 14

2 Designated use

- The parts of the kits must only be used as spare parts for CA80xx analyzers. Any other use is not permitted!
- An overview with the structure of the main device types is provided in the "Overview of CA80 device types" section (→ 🖹 15).
- All replacement descriptions for the kits refer to the "CA80 single parameter" device type (CA80AL/AM/CR/FE/HA/NO/PH).
- The device types CA80COD, CA80TP, CA80SI and CA80TN each have different carrier plate structures. The respective replacement instructions must be applied accordingly.
- Only use original parts from Endress+Hauser.
- In the W@M Device Viewer, check if the spare part is suitable for the existing device.

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 chapters of this manual, as the procedure for electrical safety depends on the service kits used. The CA80 analyzer does not have a power switch for the power supply.
- ▶ All work must be carried out according to applicable safety standards.

⚠ CAUTION

Risk to health due to contact with the process medium!

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

⚠ 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

Note the instructions in the Operating Instructions for the analyzer.

4.1 Compatibility of the electrical assemblies

If one of the modules specified in the table 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 CER.

Electronics modules of version 1 are not compatible with version 2 electronics modules. This means that only modules of version 1 or modules of version 2 may be installed in one device. The table shows the compatibility of modules. **Affected in this manual:** Only the control module.

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

	Backplane V1	BASE-E	Interface V1	Control module V1	Backplane V2	BASE2-E	Interface V2	Control module V2
Backplane 1	N/A	☑	☑	☑	N/A	-	-	-
BASE-E	☑	N/A	☑	☑	-	N/A	-	-
Interface 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 V2	-	-	N/A	-	☑	☑	N/A	☑
Control module V2	-	-	-	N/A	☑	☑	☑	N/A

5 Scope of delivery

5.1 71420354 kit CA8x photometer module version V2

Pay attention to the labeling (1) on the photometer. For article number 71309400, at least SW version 1.06.08 is required. For article number 71685524, at least SW version 1.15.0 is required.

A0057828

The kit contains the following parts → 1, 6:

1 x	Photometer, complete	1 x	Kit instructions

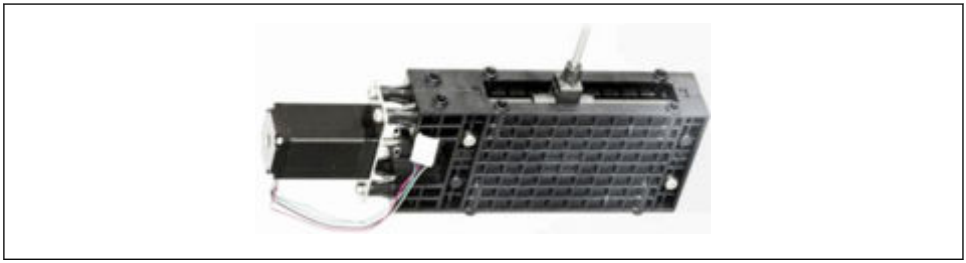
A0057608

1 Photometer module version V2

5.2 71218490 kit CA8x linear drive, complete

The kit contains the following parts → 2, 7:

1 x	Linear drive, complete	1 x	Kit instructions



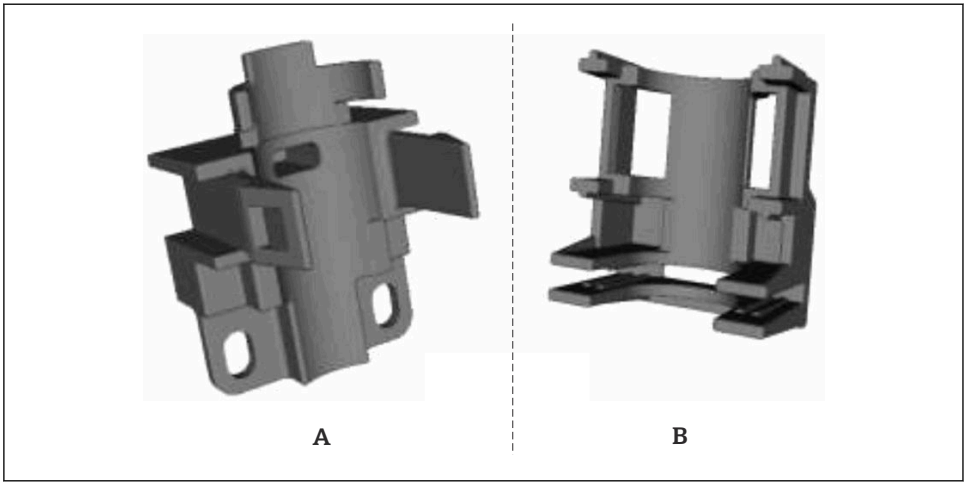
A0057609

2 Linear drive

5.3 71222105 kit CA8x dispenser holders 10 ml

The kit contains the following parts → 3, 7:

10 x	Long dispenser guide, for 10 ml	1 x	Kit instructions
10 x	Long base for dispenser guide		



A0057610

3 Holder for dispensers 10 ml

A Long base for dispenser guide
B Long dispenser guide

5.4 71222106 kit CA8x dispensers 10 ml

The kit contains the following parts → 🖼 4, 🖹 8:

20 x	Disposable dispenser 10 ml, cleaned	1 x	Kit instructions
20 x	Adapter (two-part) 10 ml		

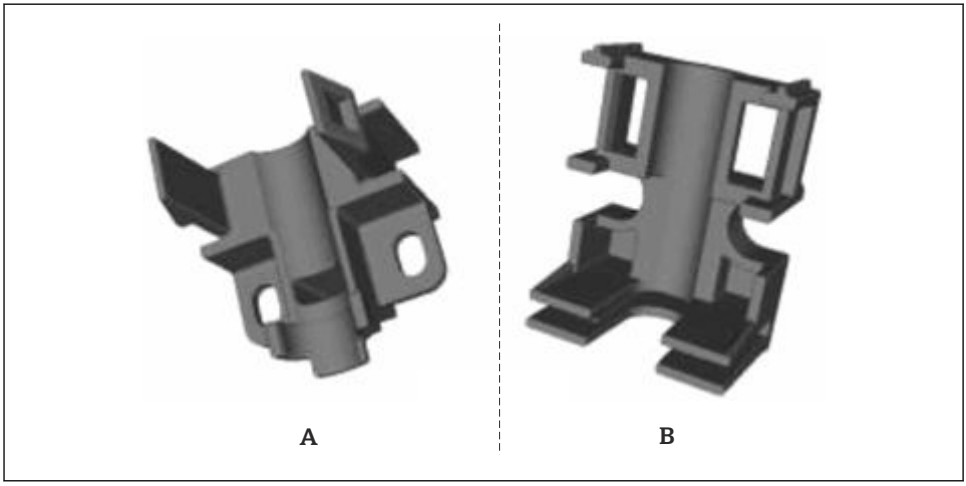
A0057611

🖼 *4 Dispenser 10 ml with adapter*

5.5 71222108 kit CA8x dispenser holders 2.5 ml

The kit contains the following parts → 🖼 5, 🖹 8:

10 x	Short dispenser guide, for 2.5 ml	1 x	Kit instructions
10 x	Short base for dispenser guide		



A0057612

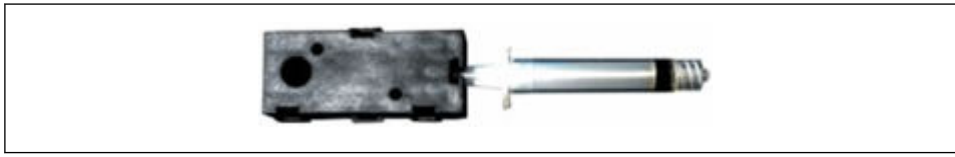
🖼 *5 Holder for dispensers 2.5 ml*

A Short base for dispenser guide
B Short dispenser guide

5.6 71222107 kit CA8x: Dispensers 2.5 ml

The kit contains the following parts → 6, 9:

20 x	Disposable dispenser 2.5 ml, cleaned	1 x	Kit instructions
20 x	Adapter (two-part) 2.5 ml		



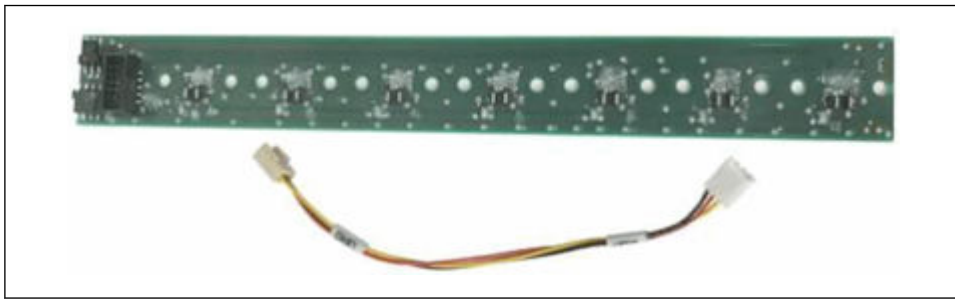
A0057613

6 *Dispenser 2.5 ml with adapter*

5.7 71465074 kit CA8x light barrier for linear drive V2

The kit contains the following parts → 7, 9:

1 x	Light barriers module FILB1 Vx.04.xx	1 x	Kit instructions
1 x	Connection cable		



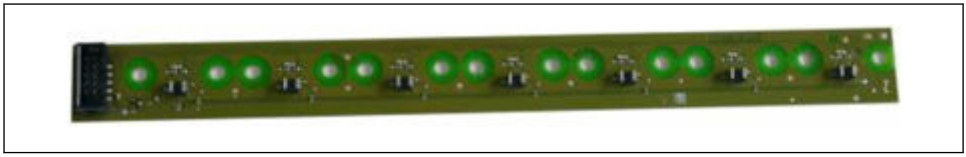
A0057617

7 *Light barriers module V2*

5.8 71218491 kit CA8x light barrier for linear drives V1

The kit contains the following parts → 8, 10:

1 x	Light barriers module FILB1 Vx.01.00	1 x	Kit instructions



A0057618

8 Light barriers module V1

5.9 Liquid Manager 1/2 reagents

5.9.1 71218492 kit CA8x Liquid Manager, complete with motor, for 1 or 2 reagents

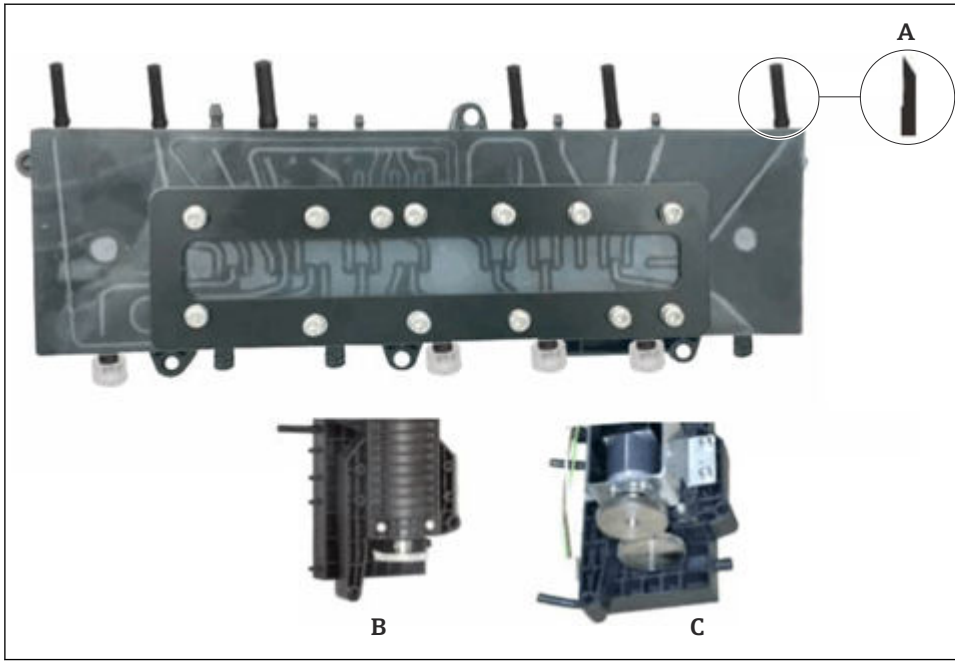
The kit contains the following parts → 9, 11:

1 x	Liquid Manager for 1 or 2 reagents (2R), with motor, including Luer sealing plugs and EPDM sealing caps	1 x	Kit instructions

5.9.2 71299073 kit CA8x Liquid Manager without motor, for 1 or 2 reagents

The kit contains the following parts → 9, 11:

1 x	Liquid Manager for 1 or 2 reagents (2R), without a motor, including Luer sealing plugs and EPDM sealing caps	1 x	Kit instructions



9 Liquid Manager for 1 or 2 reagents (2R)

A For CA80FE, CA80HA-B: Cap must be open, cut at an angle!
B Rear view, version without motor
C Rear view, version with motor

5.10 Liquid Manager 3 reagents

5.10.1 71339718 kit CA8x 3 reagents, Liquid Manager, complete, with motor

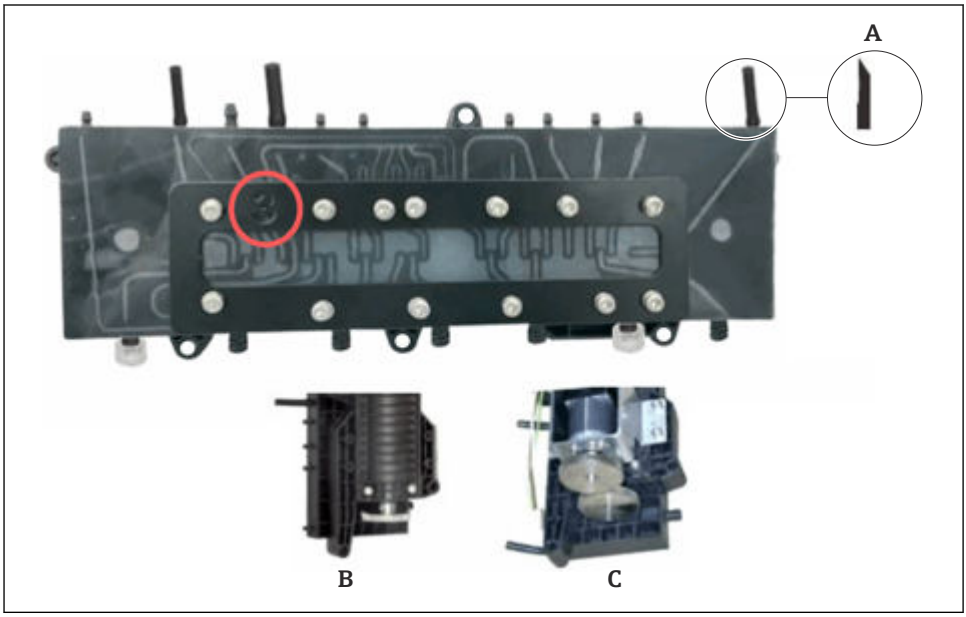
The kit contains the following parts → 10, 12:

1 x	Liquid Manager for 3 reagents (3R), with motor, including Luer sealing plugs and EPDM sealing caps	1 x	Kit instructions

5.10.2 71339723 kit CA8x 3 reagents Liquid Manager without motor

The kit contains the following parts → 10, 12:

1 x	Liquid Manager for 3 reagents (3R), without motor, including Luer sealing plugs and EPDM sealing caps	1 x	Kit instructions



A0057620

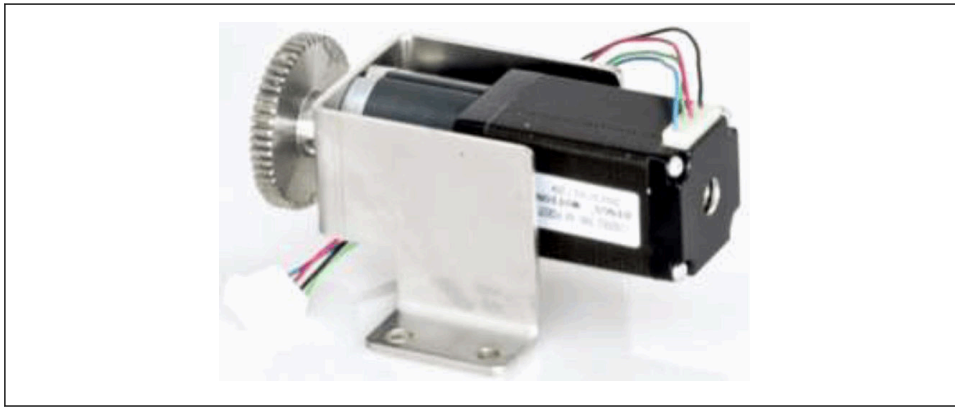
10 *Liquid Manager for 3 reagents (3R)*

A For CA80AL: Cap must be open, cut at an angle!
B Rear view, version without motor
C Rear view, version with motor

5.11 71218493 kit CA8x stepping motor for Liquid Manager

The kit contains the following parts → 🖼 11, 📄 13:

1 x	Stepping motor with gear drive	1 x	Cog
1 x	Motor holder	1 x	Kit instructions



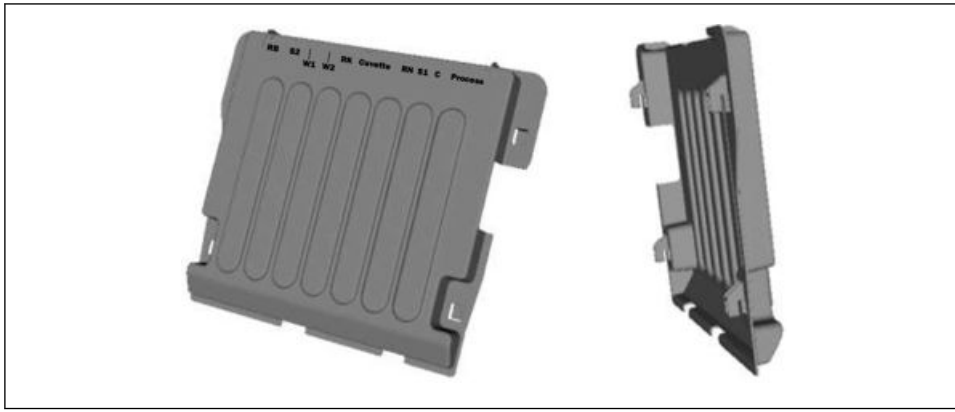
A0057621

🖼 11 *Stepping motor*

5.12 71218487 kit CA8x cover for carrier plate

The kit contains the following parts → 🖼 12, 📄 13:

1 x	Lasered carrier plate cover	1 x	Kit instructions



A0057622

🖼 12 *Carrier plate cover*

5.13 71218504 kit CA8x control module version 1

Accurate view of V1 → 🖼 34, 🖹 34 control module.

The kit contains the following parts → 🖼 13, 🖹 14:

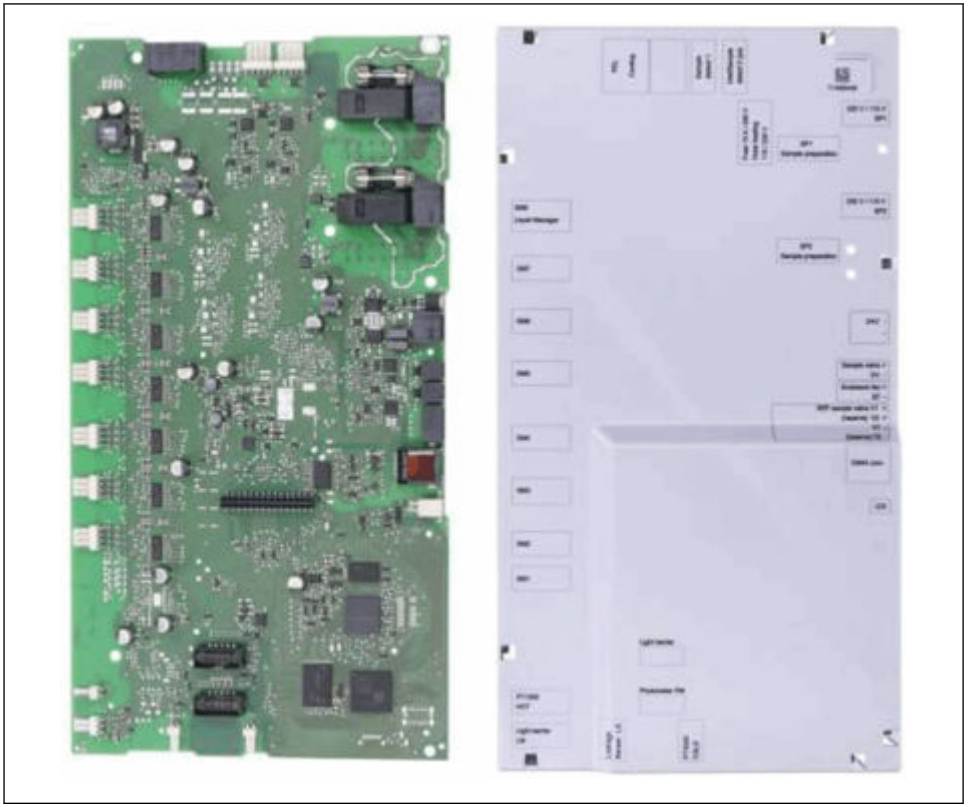
1 x	Control module version 1 (FXAB1)	1 x	Kit instructions

5.14 71503207 kit CA8x control module version 2

Accurate view of V2 → 🖼 36, 🖹 37 control module.

The kit contains the following parts → 🖼 13, 🖹 14:

1 x	Control module version 2 (FXAB2)	1 x	Kit instructions
1 x	Cover single parameters, labeled		

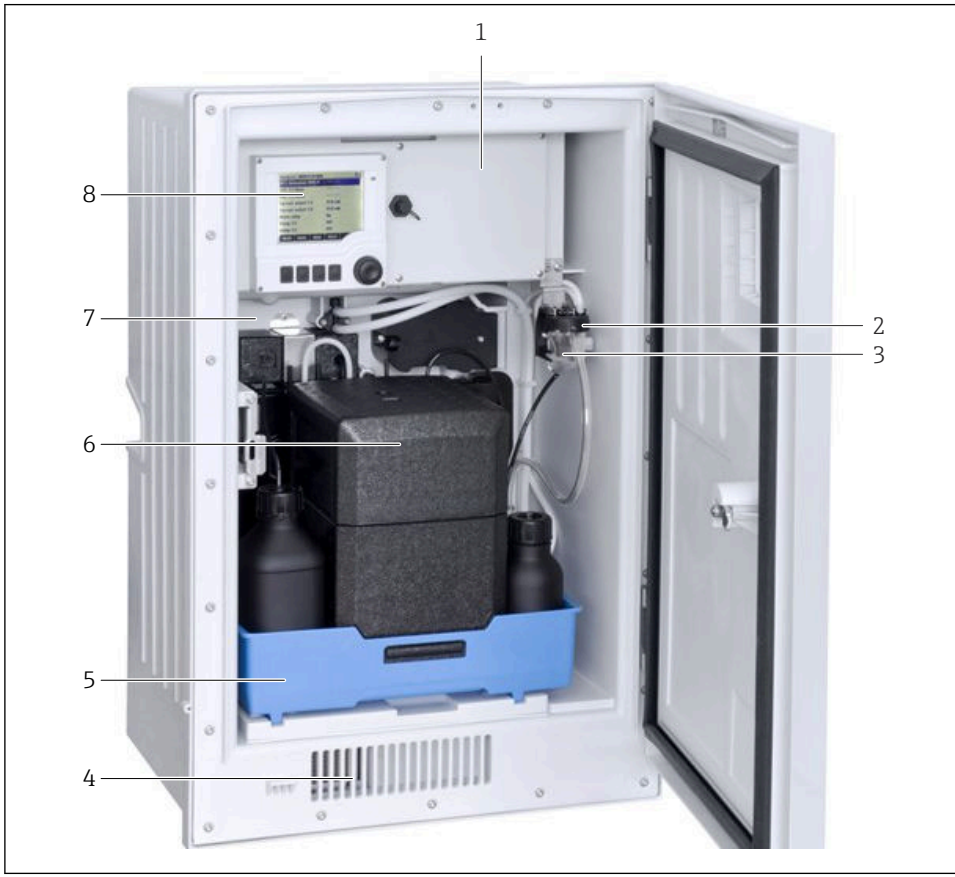


A0057623

🖼 13 *Control module and cover (V2 as an example)*

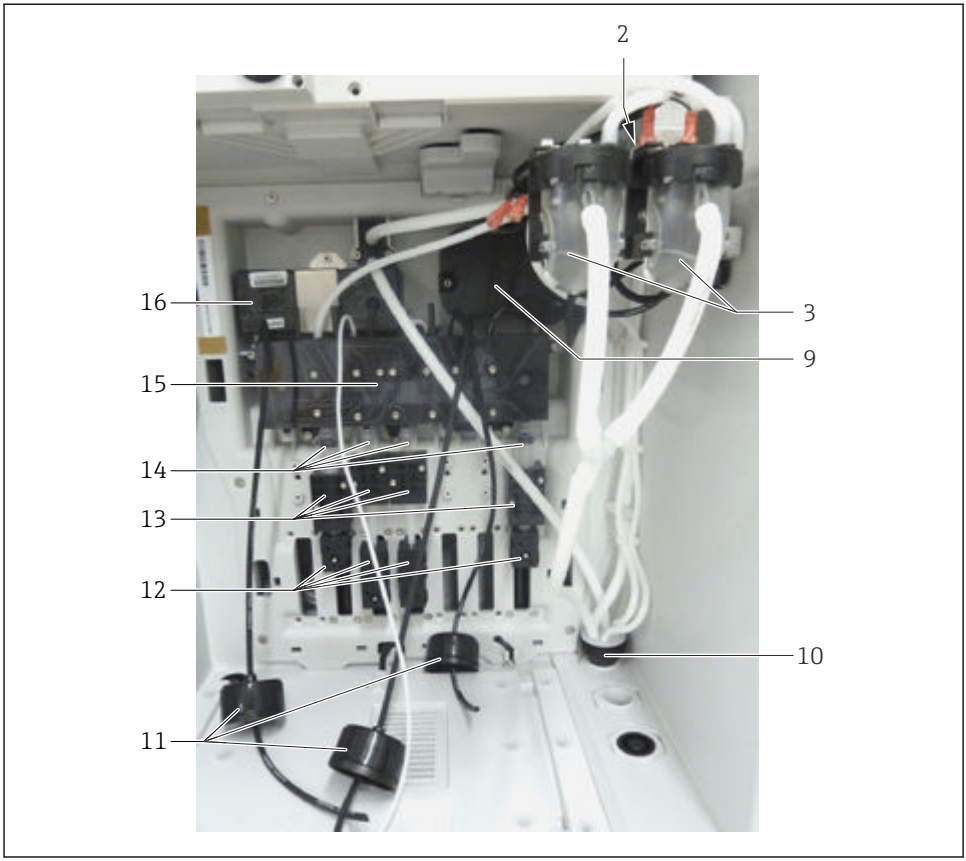
6 Overview of CA80 device types

6.1 Overview of CA80 single parameters (CA80AL/AM/CR/FE/HA/NO/PH)



14 *Overview of single parameters for CA80 assemblies*

1 *Electronics compartment cover*
2 *Solenoid valve (only for 2x sample collector)*
3 *Sample collector (depending on version ordered)*
4 *Ventilation/cooling*
5 *Bottle holder*
6 *Insulation (optional, only for cooling)*
7 *Process module (carrier plate with Liquid Manager, photometer and control module)*
8 *Measuring and control unit (controller)*

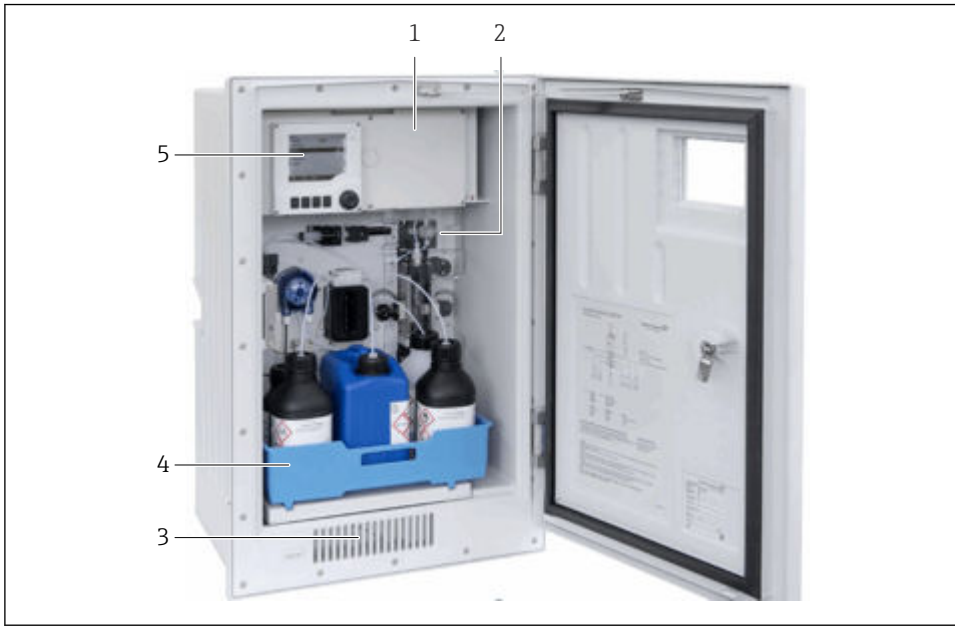


15 Single parameters for CA80 carrier plate

9 Cover of connections for sample preparation and hose heaters
10 Drain pipe
11 Cover of reagent container with hoses
12 Linear drives
13 Dispenser holders
14 Dosing dispensers
15 Liquid Manager
16 Photometer

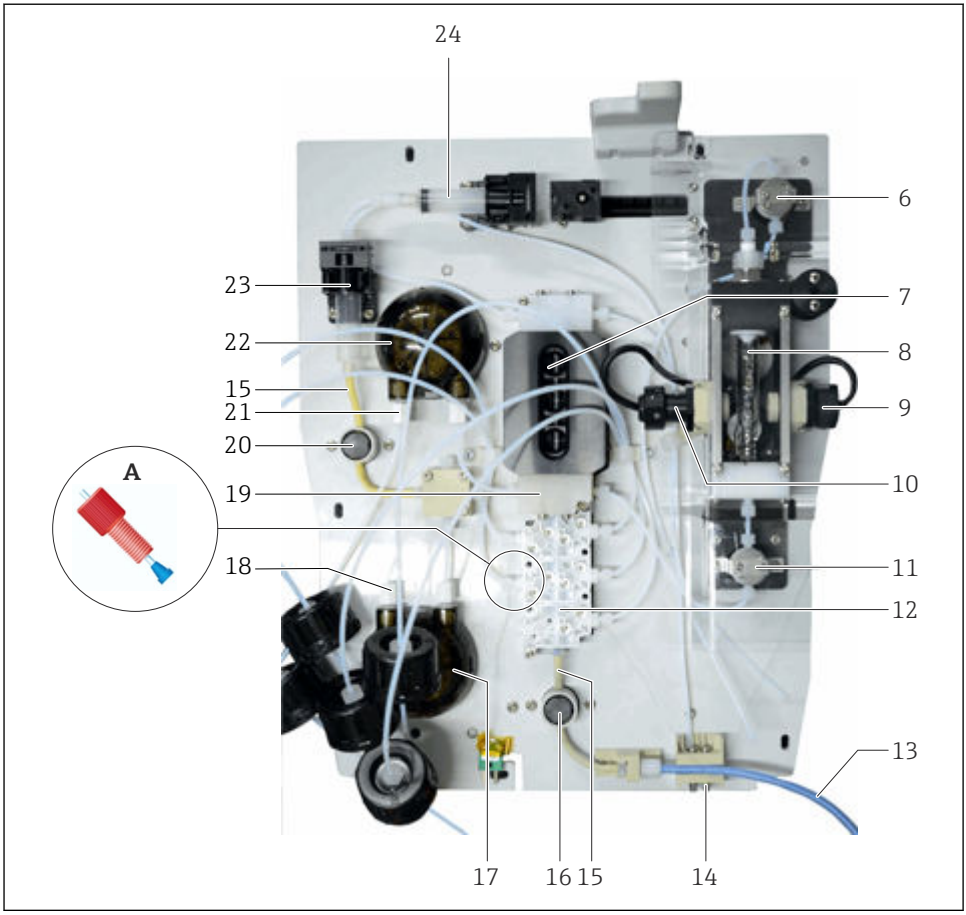
6.2 Overview of CA80 sum parameters (CA80COD, CA80TP)

The figures below (→ 16, 17 and → 17, 18) show an overview of the CA80 for the colorimetric sum parameter measurement.



16 CA80COD overview

1 *Electronics compartment*
2 *Carrier plate → 17, 18*
3 *Cooling (option for CA80TP)*
4 *Bottle tray for reagents and standard*
5 *Measuring and control unit (controller)*



17 *CA80COD carrier plate, assembly overview*

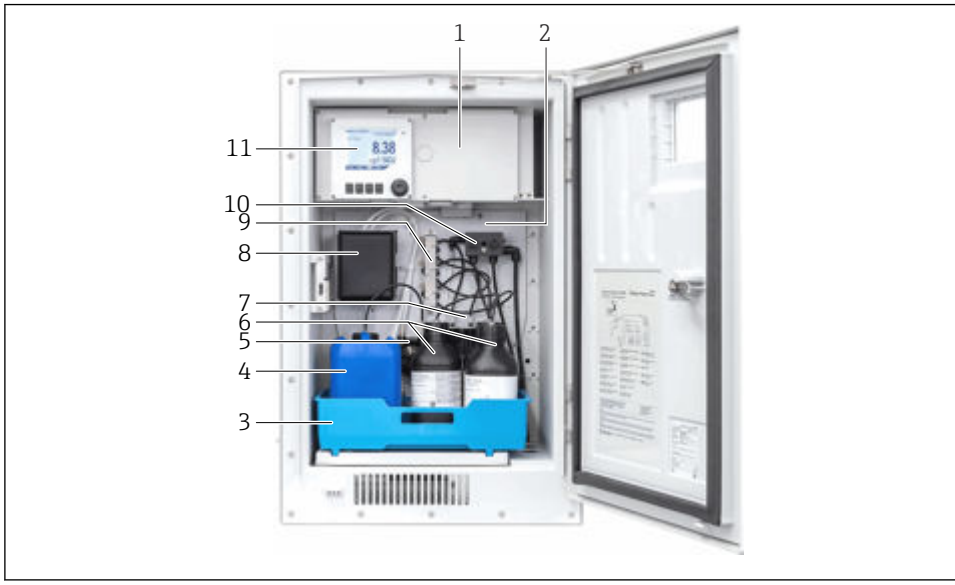
A Handling the glands with the cone: Note the installation direction of the cone!
6 Reactor valve at top
7 Dosing unit with dosing tubes
8 Reactor with reactor cuvette
9 Photometer (receiver module)
10 Photometer (transmitter module)
11 Reactor valve at bottom
12 Valve block
13 Waste hose
14 Leak sensor
15 Pharmed® hose for pinch valve
16 Waste valve
17 Dilution pump (only with high measuring range)
18 Dilution water intake
19 Valve block with dosing unit

20 Dilution water valve
21 Sample intake
22 Sample pump
23 Dilution module (only with high measuring range)
24 Dosing dispenser

6.3 Overview of CA80SI (silicate)

The figures below (→ 18, 19 and → 19, 20) show an overview of the CA80SI for photometric silicate measurement; a two-channel device is shown.

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

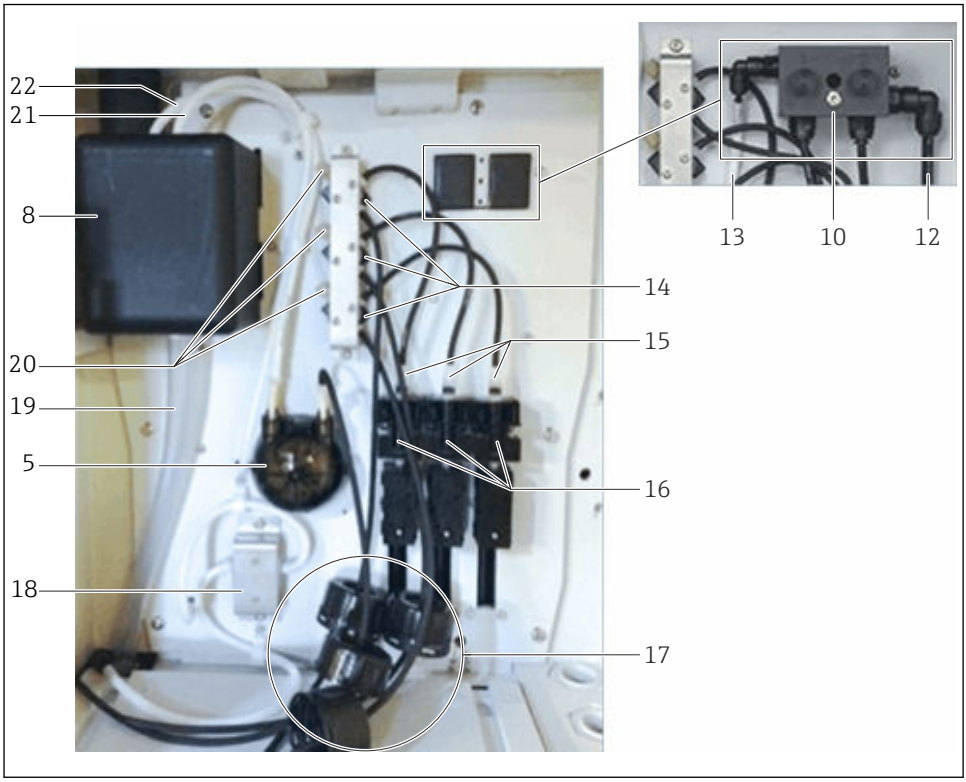


18 *CA80SI assembly overview*

1 Electronics compartment cover
2 Carrier plate → 19, 20
3 Bottle tray
4 Bottle for standard solution
5 Peristaltic pump for standard solution
6 Reagent bottles
7 Dosing dispensers for reagents
8 Cover, behind cuvette with photometer and agitator
9 Valve block for reagent dosing
10 Sample switch (only one-/two-channel devices)
11 Measuring and control device

Figure 19 shows the carrier plate from the front.

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



19 *Front of CA80SI carrier plate*

12 *Drain hose sample switch OD 8 mm*
13 *Sample hose for one/two-channel devices to heater*
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 *Sample hose (from heater)*
22 *Hose standard solution*

6.4 Overview of CA80TN (total nitrogen)

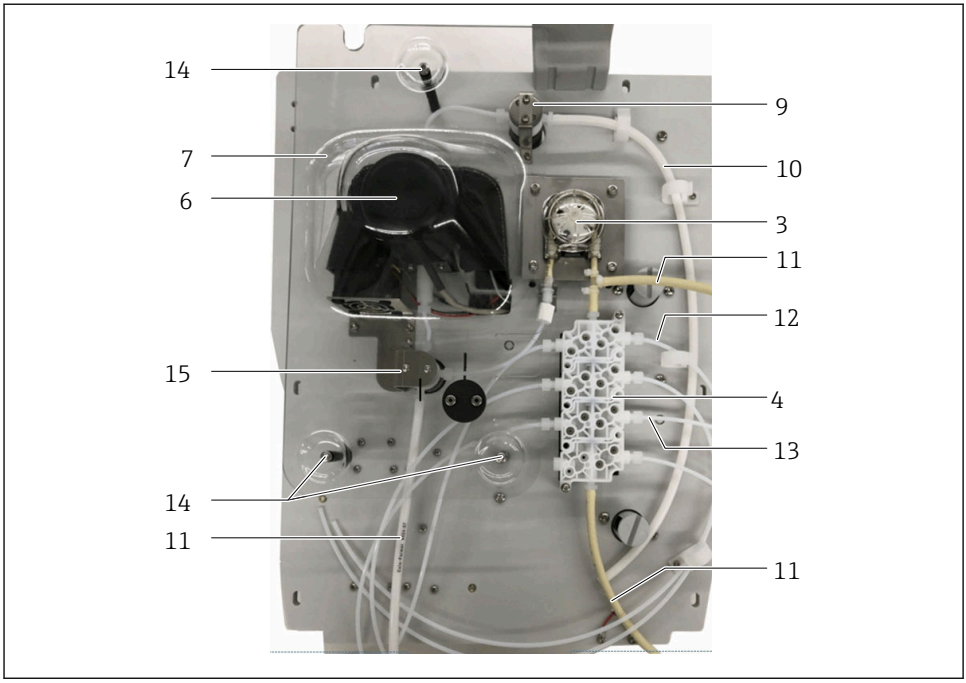
The figures below (→ 20, 21 and → 21, 22) show an overview of the CA80TN for the photometric measurement of the total nitrogen.

A0057730

20 *CA80TN assembly overview*

1 *Electronics compartment cover*
2 *Carrier plate → 21, 22*
3 *Peristaltic pump*
4 *Valve block for reagent dosing*
5 *Bottle tray for reagents, sample + standard*
6 *Reactor (behind protective cover)*
7 *Protective cover*
8 *Measuring and control device*

Figure 21 shows the carrier plate from the front.



21 *Front of CA80TN carrier plate*

9 Vent valve
10 Ventilation hose
11 Drain hoses
12 Sample hose
13 Dilution water hose
14 Screws of protective cover
15 Reactor valve

7 Preparation

The spare part installation differs depending on the spare part and parameters. Therefore, refer to and differentiate between Sections 4.1–4.3.

7.1 Work without removing the chemical containers = replacing modules/components in the electronics compartment

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

7.2 Work with removal of chemical containers = replacing components on or behind the carrier plate for CA80AL/AM/CR/FE/HA/NO/PH

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 from the sample preparation system.
4. Select "Menu/Operation/Maintenance/Decommissioning/Sample collector/Empty sample collector". Wait until the sample submission container is empty.
5. Remove all the hoses from the reagent bottles. Wipe the ends of the hoses with a clean paper towel and place the hoses in an empty beaker. Select "Rinse with water". The system is cleaned with air.

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

6. Then place the hoses in a beaker containing distilled water or treated water.
7. Also disconnect the black sample hose "P" from the sample submission container and place it in the beaker.
8. Select "Menu/Operation/Maintenance/Decommissioning/Rinse with water". Wait until rinsing is finished.
9. Place the hoses back into an empty beaker and flush again with air by selecting "Rinse with water".

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

10. **Disconnect the analyzer from the power supply!**
11. Secure the circuit breaker against unintentional recommissioning.

7.3 Work with the removal of chemical containers = replacing components on or behind the carrier plate for CA80COD/TP/SI/TN

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 hoses for reagents, the sample and, if necessary, the dilution water from their sampling points. Wipe the ends of the hoses with a clean paper towel.

5. Place the hoses in an empty beaker and select "Menu/Operation/Maintenance/Empty hoses".

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

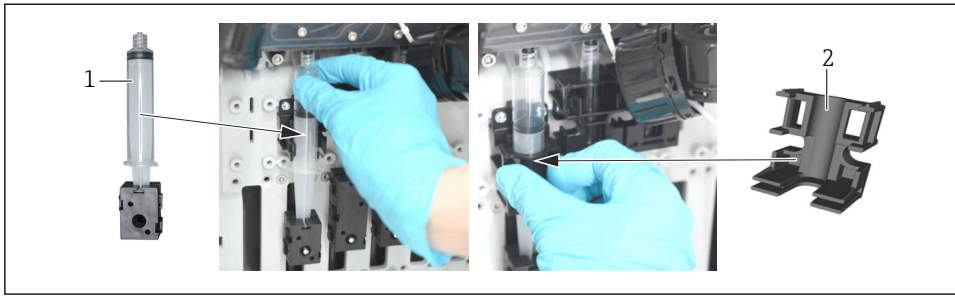
6. Place the hoses in a beaker with distilled or treated water and select "Menu/Operation/Maintenance/Decommissioning/Rinse with water". Wait until rinsing is finished.
7. Place the hoses back in an empty beaker and select "Menu/Operation/Maintenance/Empty hoses".

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

8. **Disconnect the analyzer from the power supply!**
9. Secure the circuit breaker against unintentional recommissioning.

8 Replacing dispensers and dispenser holders

1. Carry out the preparatory work according to Section 7.2 or 7.3 (depending on the type of analyzer).
2. Remove the bottle tray.
3. Open "Menu/Operation/Maintenance/Dispenser replacement".
4. Open "Dispenser selection" (not necessary for CA80COD and CA80TP since only one dispenser is present).
5. Select the dispensers that should be replaced (not necessary for CA80COD and CA80TP since only one dispenser is present).
6. Confirm selection by pressing "OK" (not necessary for CA80COD and CA80TP since only one dispenser is present).
7. Select "Draw up dispenser" to move the dispenser to the lower position.
8. Open the dispenser holder. Only the top part of the dispenser holder is attached.
9. Turn the dispenser counterclockwise to remove it from the Liquid Manager.
10. Pull the dispenser adapter with the dispenser from the dispenser drive.



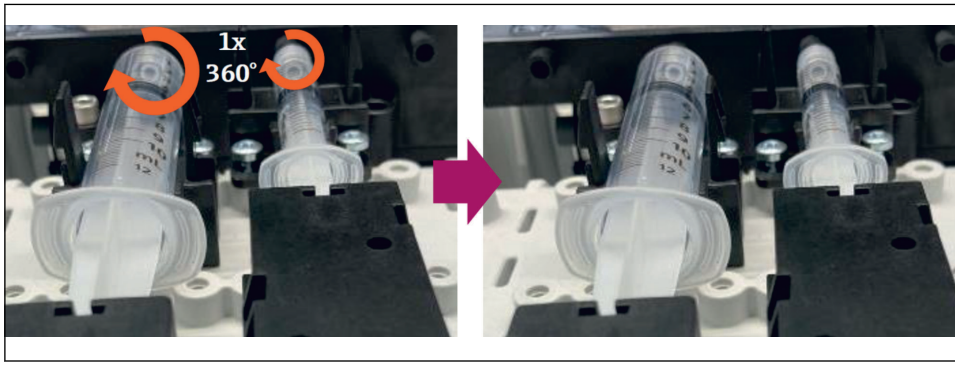
A0057732

22 *Replacing the dispensers*

1 Dispenser with adapter
2 The top of the dispenser holder for snap-on mounting

Replace the old dispenser with a new dispenser:

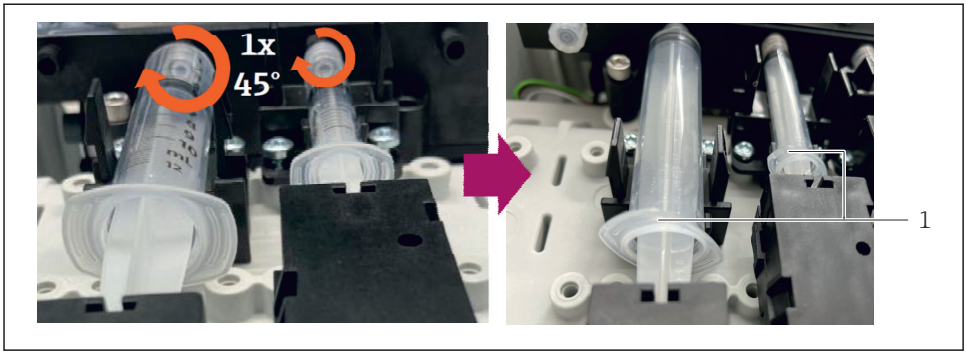
11. Secure new dispensers to the Liquid Manager; to do so, fasten the dispensers on the thread by hand. The figures below show all the dispenser sizes (large and small).
12. First, make a complete turn (360°) by hand.



A0057899

23 *Turning the dispensers 360°*

13. Then also turn the dispensers by 45°. The dispensers are now in the correct end position. Please refer to the installation instructions below!



24 *Turning the dispensers by 45°*

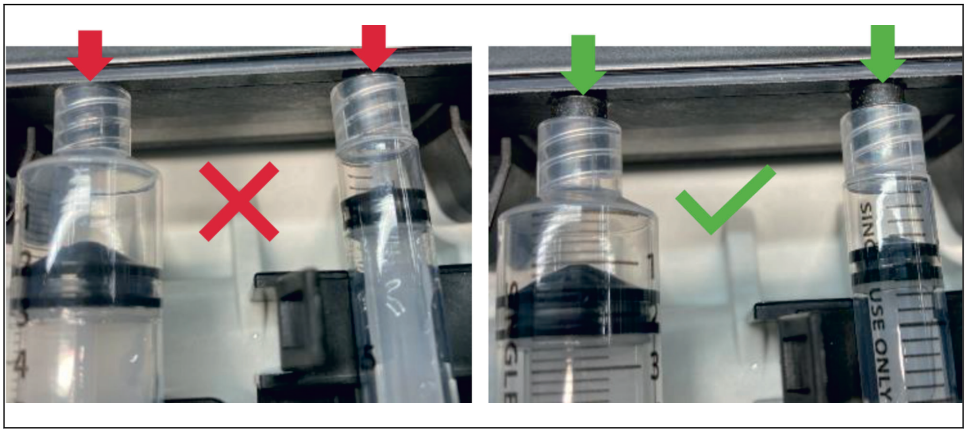
1 End position

14. Push the dispenser adapter into the dispenser drive.
15. Close the dispenser holder.

The end of the dispenser must be parallel to the Liquid Manager, otherwise the dispenser holder (see → 22, 25, right) cannot be closed.

The dispensers (small and large) must not be tightened as far as they will go.

There must be a gap between the Liquid Manager and the dispenser (see the figure below, right side)!



25 *Correct positioning*

9 Replacing the Liquid Manager

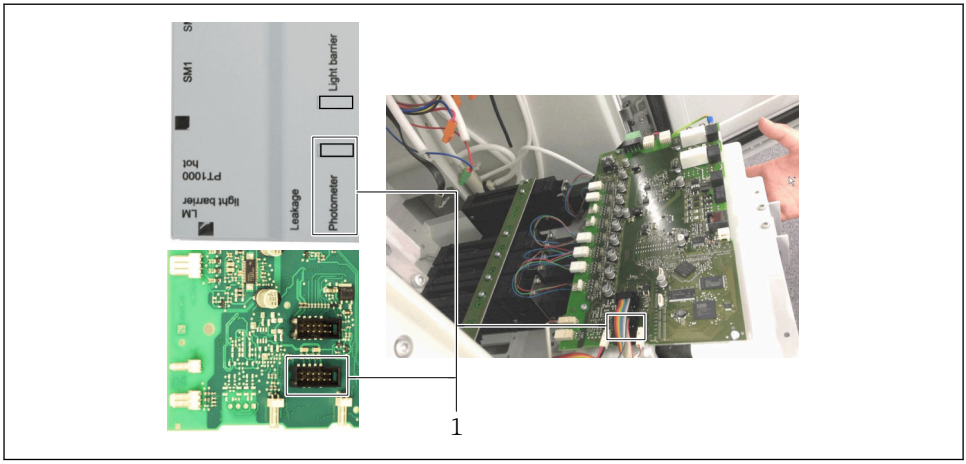
1. Carry out the preparatory work according to Section 7.2.
2. Remove the bottle tray.
3. Disconnect all the hoses.
4. Remove all the dispensers.
5. Undo the mounting screws (4 screws with 4 mm hex head).
6. Disconnect the two connectors from the carrier plate. The connectors are guided from the rear through the carrier plate such that it is not necessary to fold the carrier plate forward.
7. Remove the Liquid Manager.
8. Adapt the number of protective caps and Luer plugs to the new Liquid Manager (for the required connections, see the removed Liquid Manager or hose connection diagrams).
9. **Only for Liquid Manager without motor:** Undo the four Torx T20 screws on the stepping motor mounting bracket on the old Liquid Manager. Then mount the motor on the new Liquid Manager.
10. Install the new Liquid Manager in the reverse order.

10 Replacing the photometer module

1. Carry out the preparatory work according to Section 7.2.
2. Disconnect the sample preparation from CA80 (release all the hoses and cables).
3. Disconnect the hoses on the Liquid Manager.
4. Remove all the dispensers.

Remove the Liquid Manager:

1. Remove the mounting screws (4 Allen screws, 4 mm).
2. Disconnect the two connectors on the carrier plate. The connectors are guided from the rear through the carrier plate such that the carrier plate does not need to be folded forward.
3. Remove the screws of the photometer module holding bracket (5 Allen screws, 3 mm).
4. Remove the screws of the carrier plate (6 Allen screws, 3 mm).
5. Fold the carrier plate forward (→ 26, 28).
6. Release the connectors of the photometer cable (left on control module, see → 26, 28 and also the control module cover labeling).
7. Replace the photometer module and complete the device again in the reverse order.



26 Carrier plate with control module

1 Photometer connectors

11 Replacing the linear drive and light barriers module

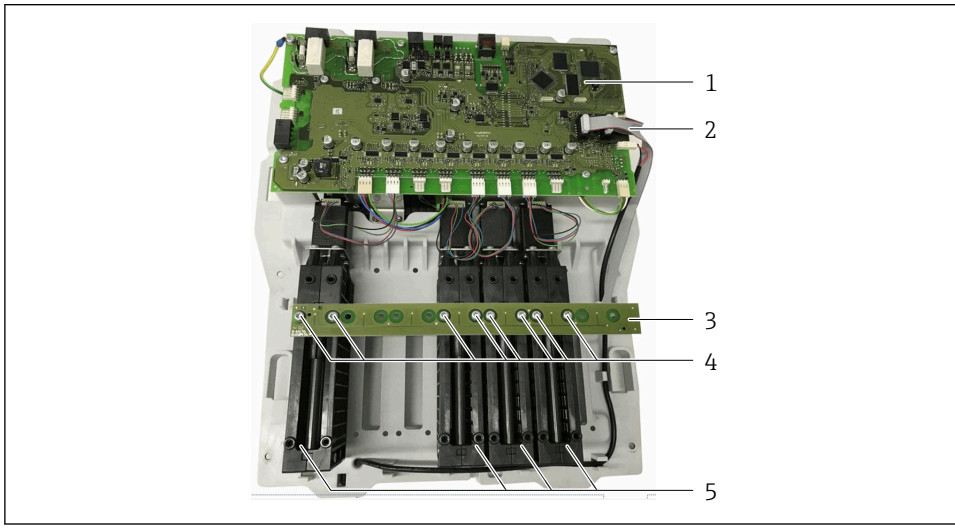
11.1 Versions of light barriers module

- Previous version: Light barrier V1 with module FILB1 V01.00, replacement kit = 71218491.
- Current version: Light barrier V2 with module FILB1 Vx.04.00, replacement kit = 71465074.
- Compatibility: Both light barriers modules are compatible in principle, but the different connections must be taken into account.
- **Instructions for replacement:**
  - Preparatory work, see Section 11.2 → 28.
  - For replacing the linear drive or light barriers module version V2, see Section 11.3 → 29.
  - For replacing light barriers module version V1, see Section 11.4 → 28.
  - For modifying light barriers module version V1 to the new V2 version, see Section 11.5 → 33.

11.2 Preparatory work for replacing the light barriers module or linear drives

1. Carry out the preparatory work according to Section 7.2.
2. Disconnect the sample preparation from CA80 (hoses and cables).
3. Remove all the hoses and remove all the dispensers.
4. Remove the screws of the carrier plate (6 Allen screws, 3 mm).

5. Fold out the carrier plate (→ 21, 22).
6. Remove all cables that connect the control module to the CA80 (cable harness for the electronics compartment).
7. Remove the carrier plate.
8. Use a desk or a worktop as a work surface. Place the carrier plate together with the carrier plate cover on this work surface.
9. Remove the light barrier from the linear drives. To do so, undo the screws (Torx T20, → 27, 29).
10. Remove the ribbon cable from the light barriers module (not required if only one linear drive is replaced).



27 *Overview of light barriers and linear drives*

1 *Control module (cover removed)*
2 *Ribbon cable for light barrier*
3 *Light barrier (in the figure: Type V1)*
4 *Torx T20 mounting screws*
5 *Linear drives*

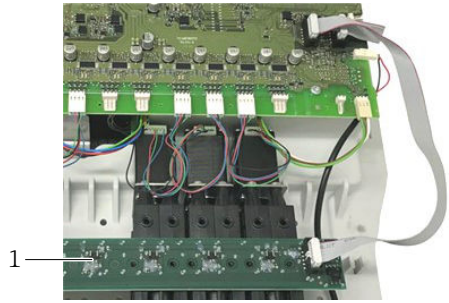
11.3 Replacing light barrier module version V2 or a linear drive

► Carry out the preparatory work according to Section 11.2.

Replace the light barrier (→ 28, 30):

1. Use spare parts kit 71465074.

2. Replace the light barrier. Insert the ribbon cable into the new light barrier (→ 🖼 26, 🖹 28). Turn the light barrier and then secure it.



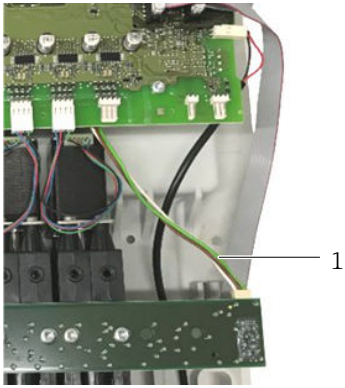
A0057735

🖼 28 *Connecting the ribbon cable*

1 Light barrier (version V2)

The next work step can be skipped for CA80SI. This additional cable is not required for CA80SI.

3. Plug the cable into the Liquid Manager at the top of the new light barrier (→ 🖼 29, 🖹 30).

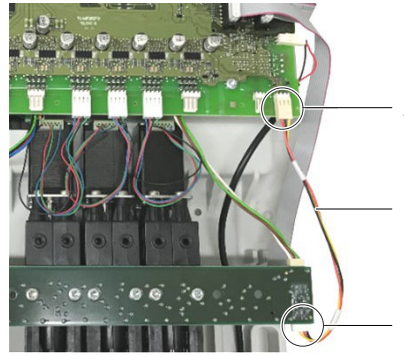


A0057736

🖼 29 *Light barrier connector at top*

1 Cable to the Liquid Manager, connection to light barrier V2

4. Insert the additional cable (1) from the service kit in the control module at plug connector LM (2) and insert the bottom of the light barrier (3) → 🖼 30, 🖹 31.



A0057738

30 Light barrier connector, bottom

1 Light barrier cable ↔ control module
2 LM connector, see also Figure 28
3 Light barrier

Replacing a linear drive (→ 27, 29):

1. Use spare parts kit 71218490.
2. Disconnect the connector of the defective linear drive from the control module (for plug connectors, see also → 36, 37 to → 39, 40).
3. Undo the screws of the defective linear drive (4 Torx T20 screws).
4. Install the new linear drive and connect the electrical connection.
5. Mount the light barrier again and connect the electrical connection.

Assembling and testing the linear drive:

1. Reinstall the carrier plate.

CAUTION

Pay attention to the leakage detector and the two temperature sensors of the cooling module at the bottom of the carrier plate!

▶ The components and cables must not be pinched or crushed.

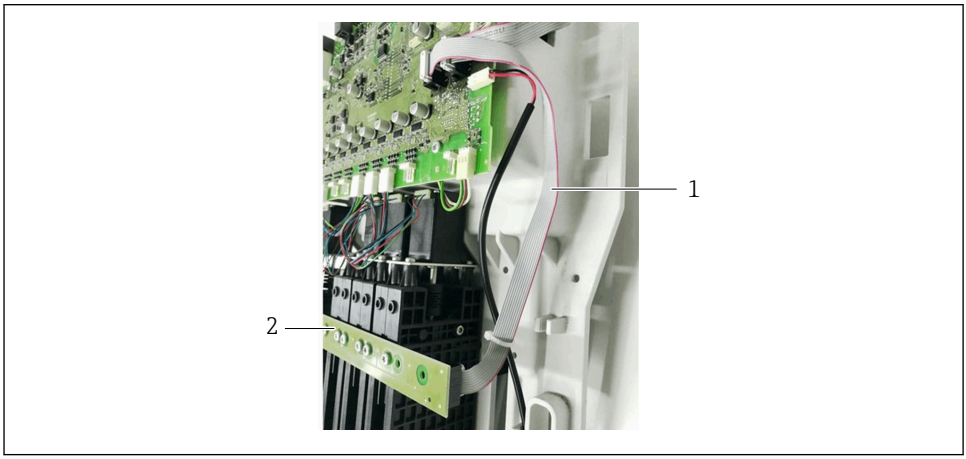
Check whether the new drive is working:

2. Open "Menu/Operation/Maintenance/Dispenser replacement/Dispenser selection".
3. Select the dispenser to be tested.
4. Confirm the selection by pressing "OK".
5. Select "Draw up dispenser" to move the dispenser to the lower position.
6. Check whether the dispenser is moving.

7. Check that the dispenser reaches the lower position.

11.4 Replacing light barriers module V1

1. Use spare parts kit 71218491.
2. Carry out the preparatory work according to Section 11.2.



31 Connecting the ribbon cable

1 Ribbon cable for light barrier
2 Light barrier version V1

3. Replace the light barrier.
4. Mount the new light barrier and connect the electrical connection.
5. Reinstall the carrier plate.

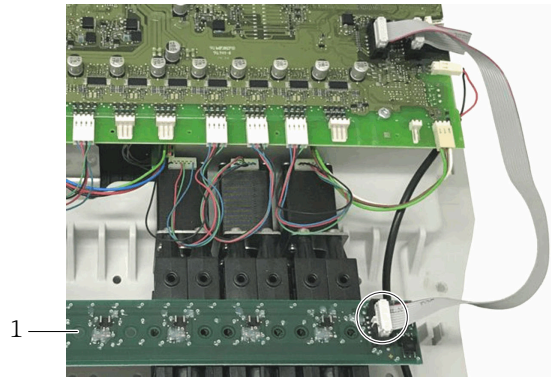
⚠ CAUTION

Pay attention to the leakage detector and the two temperature sensors of the cooling module at the bottom of the carrier plate!

► The components and cables must not be pinched or crushed.

11.5 Modifying from light barriers module version V1 to the new V2 version

1. Use spare parts kit 71465074.
2. Carry out the preparatory work according to Section 11.2.



A0057740

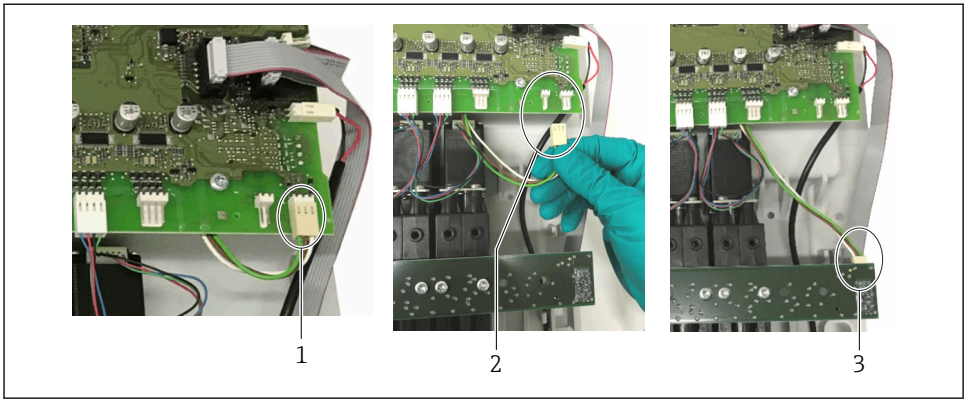
32 Connecting the ribbon cable

1 Light barrier (type V2)

3. Replace the light barrier with the V2 type.
4. Insert the ribbon cable into the new light barrier (→ 32, 33).
5. Turn the light barrier and secure it with the Torx T20 screws.

The next work step can be skipped for CA80SI. This additional cable is not required for CA80SI.

6. Disconnect the cable to the Liquid Manager from the control module (connector LM (2)) and insert it at the top of the new light barrier (3) → 33, 34.

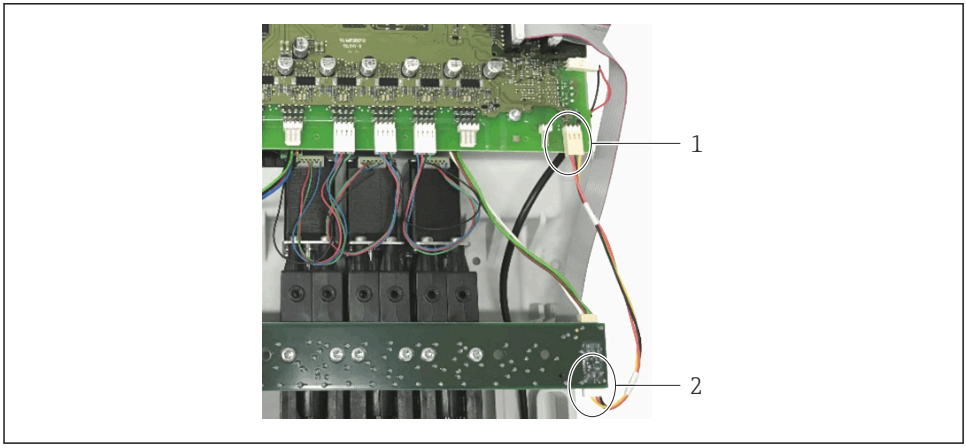


A0057741

33 *Light barrier connector at top*

1 *"LM light barrier" connector*

7. Insert the additional cable from the service kit at the control module in connector LM (1) and insert it below at the light barrier (2) → 34, 34.



A0057742

34 *Light barrier connector, bottom*

1 *"LM light barrier" connector*

8. Reinstall the carrier plate.

⚠ CAUTION

Pay attention to the leakage detector and the two temperature sensors of the cooling module at the bottom of the carrier plate!

► The components and cables must not be pinched or crushed.

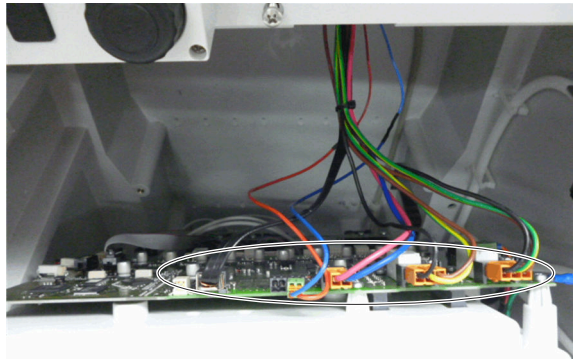
12 Replacing the control module

1. **Only replace control module version 1 with version 1, or version 2 with version 2 (see also Section 4.1 → 🖹 5).**
2. Perform the preparatory work as described in Section 7.2 and remove the bottle tray.
3. Disconnect the sample preparation from CA80 (hoses and cables).
4. Disconnect all the hoses from the Liquid Manager.
5. Remove the screws of the carrier plate (6 Allen screws, 3 mm).
6. Fold out the carrier plate (→ 🖹 26, 🖹 28).
7. Disconnect all the cables that connect the control module to the electronics compartment (→ 🖹 35, 🖹 36).
8. Remove the entire carrier plate.
9. Place the carrier plate on a suitable working surface (table or worktop).
10. Disconnect the remaining connectors from the control module (→ 🖹 36, 🖹 37).
11. Undo the mounting screws of the control module (7 Torx T20 screws) and replace the module.
12. Plug in the connectors again (→ 🖹 35, 🖹 36 to → 🖹 39, 🖹 40).
13. Reinstall the carrier plate.

⚠ CAUTION

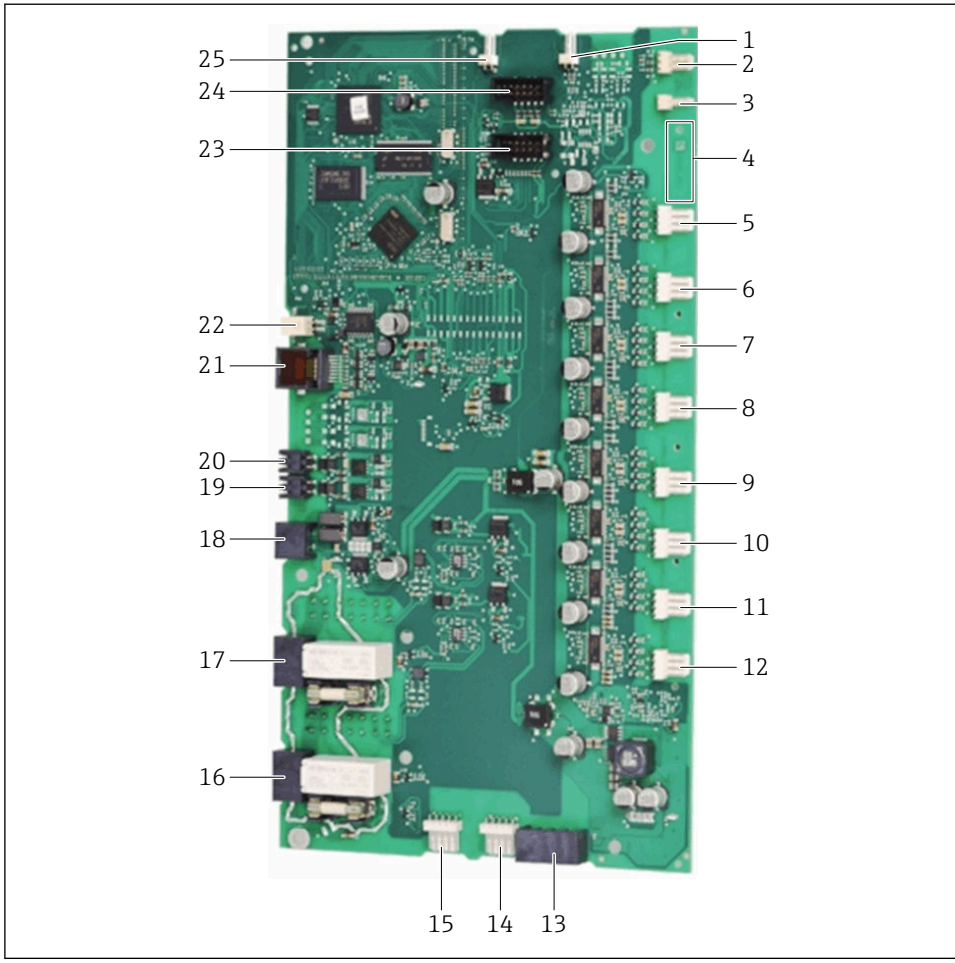
Pay attention to the leakage detector and the two temperature sensors of the cooling module at the bottom of the carrier plate!

► The components and cables must not be pinched or crushed.



A0057743

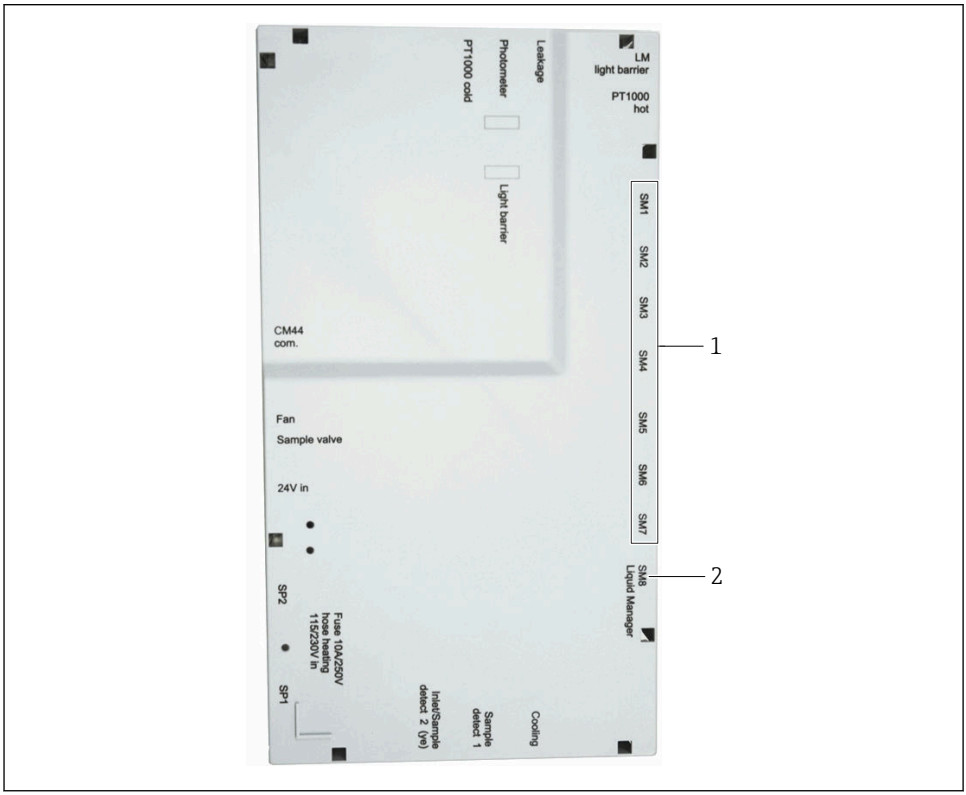
35 Connections for the control module to the electronics compartment



36 *Connection overview for V1 control module (FXAB1)*

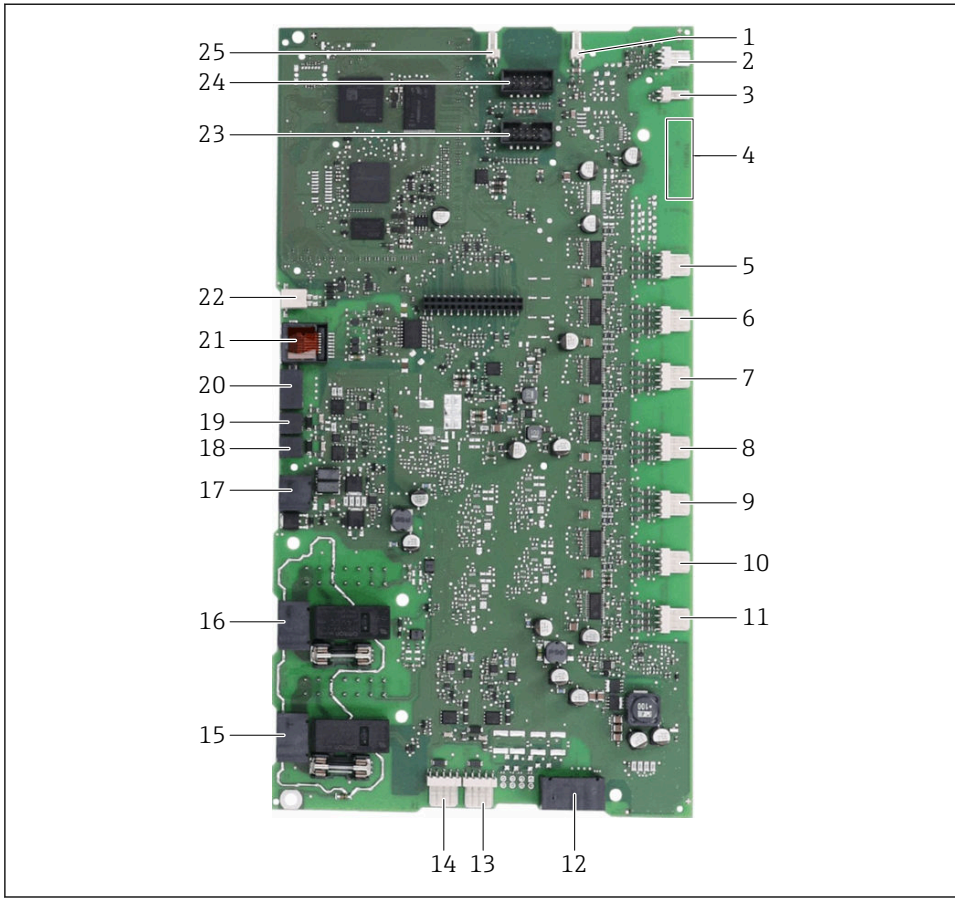
1 *Leak detector*
2 *LM light barrier*
3 *Pt1000 cooling module, hot*
4 *Identification/module name*
5 *Stepping motor 1 (dispenser drive)*
6 *Stepping motor 2 (dispenser drive)*
7 *Stepping motor 3 (dispenser drive)*
8 *Stepping motor 4 (dispenser drive)*
9 *Stepping motor 5 (dispenser drive)*
10 *Stepping motor 6 (dispenser drive)*
11 *Stepping motor 7 (dispenser drive)*
12 *Stepping motor 8 (Liquid Manager motor)*
13 *Peltier element*

14 *Sample 1 level*
15 *Sample 2 level*
16 *Hose heating PVB1*
17 *Hose heating PVB2*
18 *24 V power supply input*
19 *Sample collector valve*
20 *Housing fan*
21 *CM44 communication*
22 *CDI*
23 *Light barrier for linear drives*
24 *Photometer*
25 *Pt1000 cooling mode, cold*



37 *Cover of control module V1 (FXAB1) with labeling*

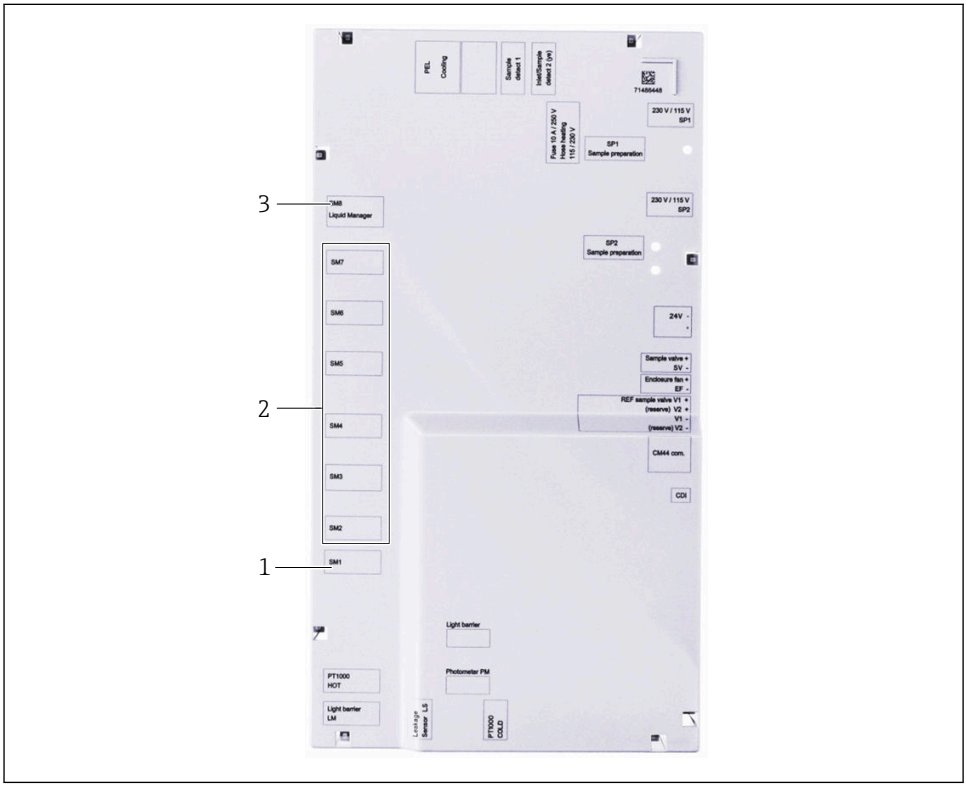
1 *SM1 to SM7 = linear drives for dispensers (SM = stepping motor)*
2 *SM8 = Liquid Manager motor*



38 *Connection overview for V2 control module (FXAB2)*

1 *Leak detector*
2 *Light barrier for Liquid Manager*
3 *Pt1000 cooling module, hot*
4 *Identification/module name*
5 *Stepping motor 2 (dispenser drive)*
6 *Stepping motor 3 (dispenser drive)*
7 *Stepping motor 4 (dispenser drive)*
8 *Stepping motor 5 (dispenser drive)*
9 *Stepping motor 6 (dispenser drive)*
10 *Stepping motor 7 (dispenser drive)*
11 *Stepping motor 8 (Liquid Manager motor)*
12 *Peltier element*
13 *Sample 1 level*
14 *Sample 2 level*
15 *Hose heating PVB1*

16 *Hose heating PVB2*
17 *24 V power supply input*
18 *Sample collector valve*
19 *Housing fan*
20 *Only for CA80AM-**S1/S2/S3*
21 *CM44 communication*
22 *CDI*
23 *Light barrier for linear drives*
24 *Photometer*
25 *Pt1000 cooling mode, cold*



A0057747

39 Cover of control module V2 (FXAB2) with labeling

1 *SM1 = not used (SM = stepping motor)*
2 *SM2 to SM7 = linear drives for dispensers*
3 *SM8 = Liquid Manager motor*

13 Finishing work

13.1 Finishing work after work without removing the chemical containers according to Section 6.1 → 15

1. Reestablish the power supply.
2. Select "Mode/Continue automatic mode".

13.2 Completion work after work with the removal of the chemical containers according to Section 6.1 or 6.3

1. Insert the bottle tray with reagents, standard and cleaner.
2. Reconnect all the hoses.
3. Switch the power supply to the analyzer back on.
4. Connect hoses to the reagent containers and fill the hoses as described below:
5. Select "Menu/Operation/Maintenance/Bottle change/Insert bottles/Bottle selection ".
6. Highlight all the bottles and confirm by pressing the "OK" soft key.
7. Select "Bottles inserted confirmation".
8. Activate the sample feed (depending on the type of sample preparation).
9. Select "Mode/Continue automatic mode" to start the normal measuring operation of the CA80.

14 Appendix: Hose connection diagrams

14.1 Key for hose connection diagrams

Hose types

	Norprene, black ID 1.6 mm
	C-Flex, white ID 1.6 mm
	C-Flex, white ID 3.2 mm
	C-Flex, white ID 6.4 mm

Components/functions

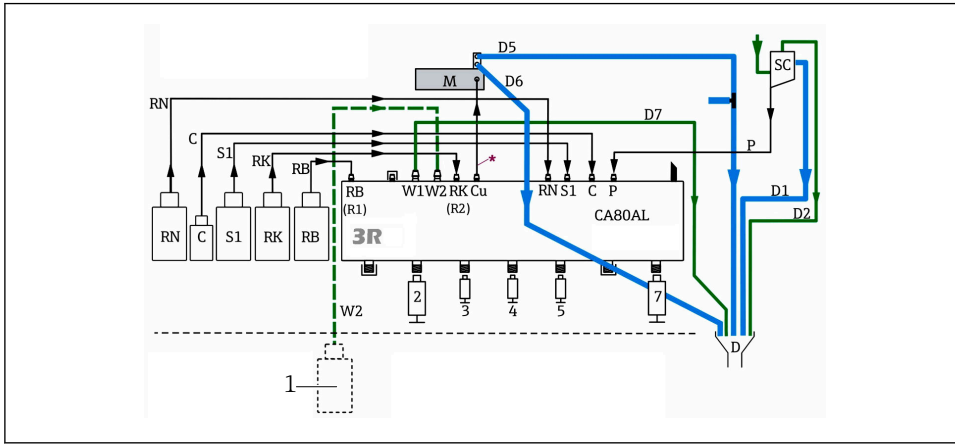
Cu	Cuvette
M	Measuring cell
P	Process

W1, D, Dx	Drain (waste)
SC	Sample collector
1–7	Dispenser
	Luer sealing plugs
 A0057830	Cap
	Sealing cap, open and angled (for CA80AL, CA80FE, CA80HA-B)
	T-section with open hose (vent for hose D5)
2R	Liquid Manager for 1 or 2 reagents
3R	Liquid Manager for 3 reagents

Liquids/chemicals

C	Cleaning solution
S (S1, S2)	Standard solution
R (RB, RK, RN)	Reagents

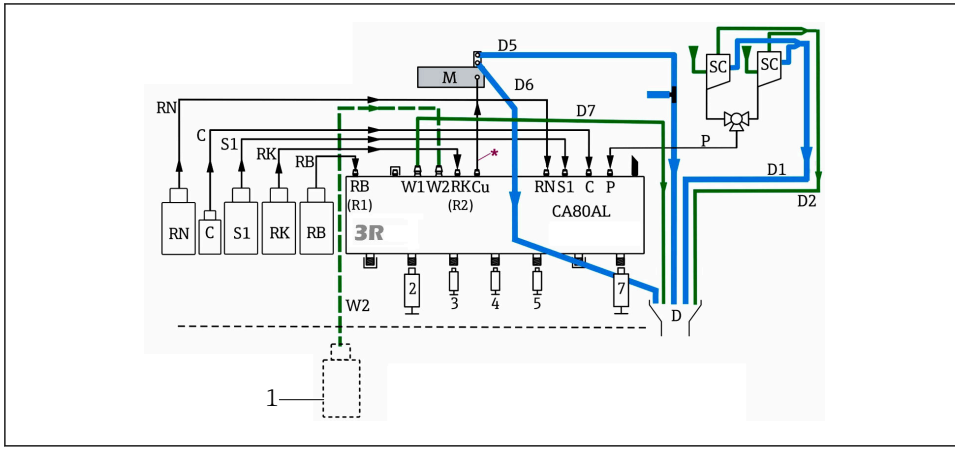
14.2 Hose system CA80AL, one-channel version



40 *CA80AL, 1 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

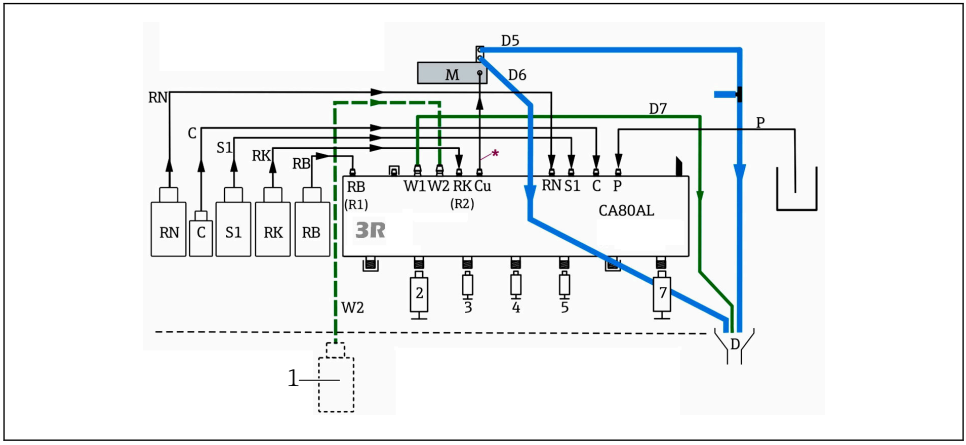
14.3 Hose system CA80AL, two-channel version



41 *CA80AL, 2 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

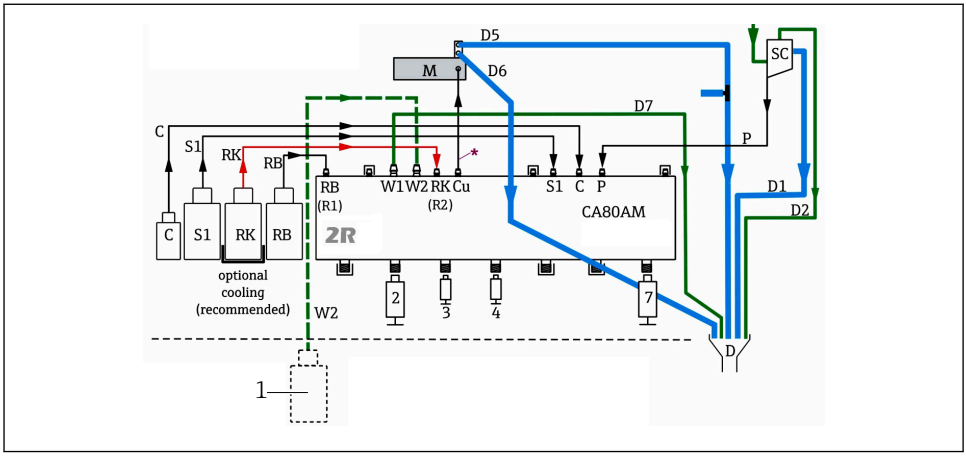
14.4 Hose system CA80AL, one-channel version, self-priming



42 *CA80AL, self-priming*

1 Dilution water (optional)
** Hose length 125 mm*

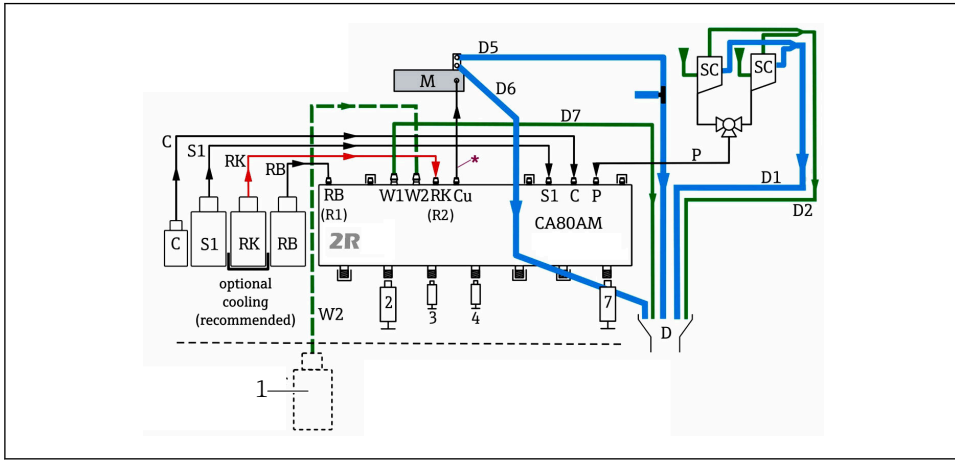
14.5 Hose system CA80AM, one-channel version



43 *CA80AM, 1 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

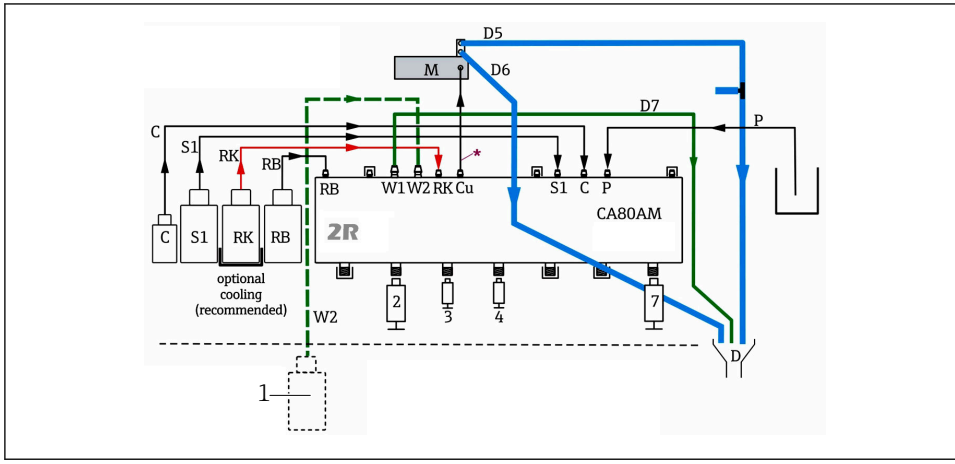
14.6 Hose system CA80AM, two-channel version



44 *CA80AM, 2 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

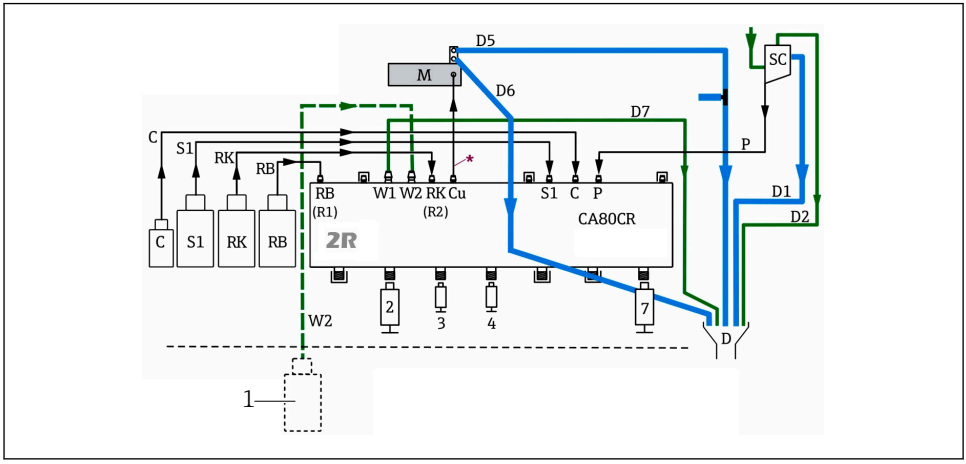
14.7 Hose system CA80AM, self-priming



45 *CA80AM, self-priming*

1 Dilution water (optional)
** Hose length 45 mm*

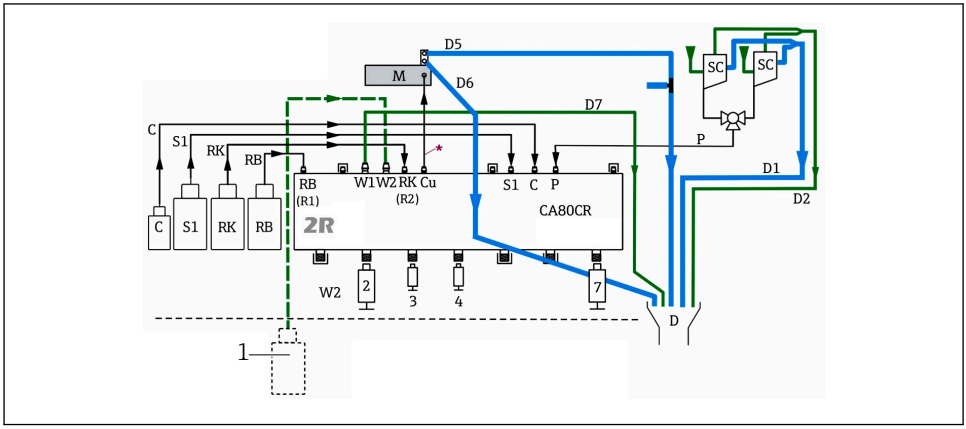
14.8 Hose system CA80CR, one-channel version



46 *CA80CR, 1 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

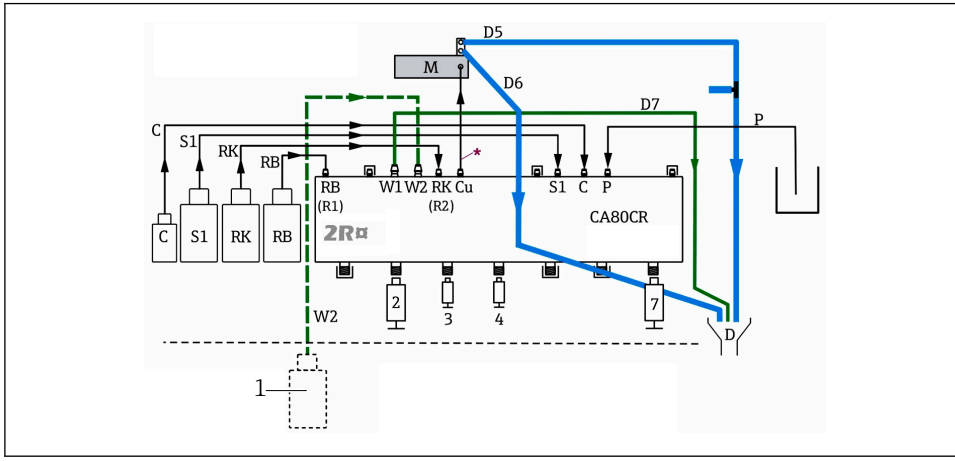
14.9 Hose system CA80CR, two-channel version



47 *CA80CR, 2 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

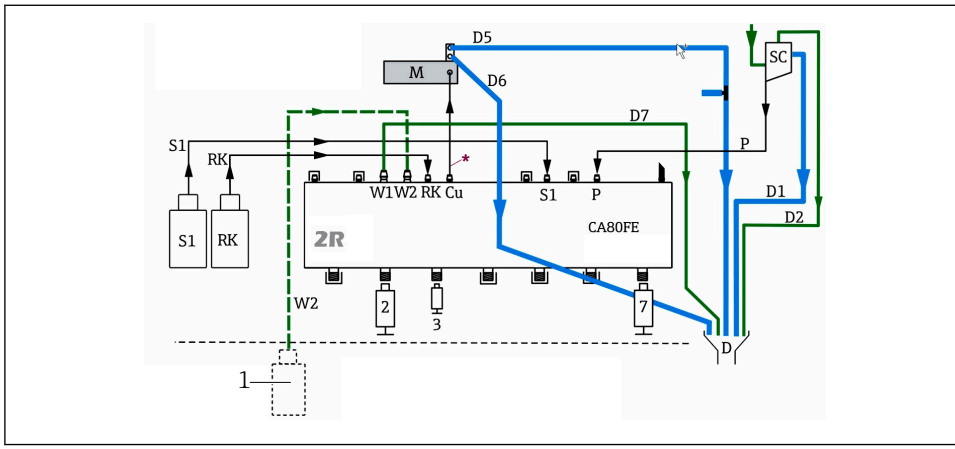
14.10 Hose system CA80CR, self-priming



48 *CA80CR, self-priming*

1 Dilution water (optional)
** Hose length 45 mm*

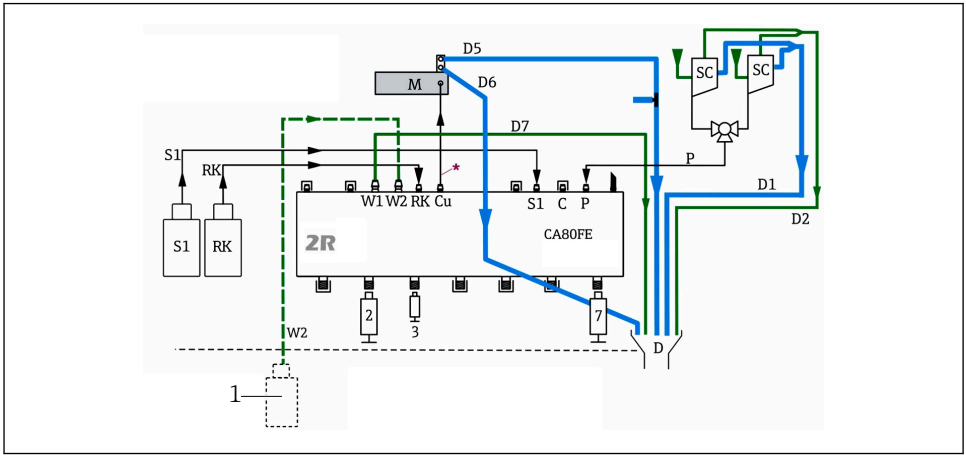
14.11 Hose system CA80FE, one-channel version



49 *CA80FE, 1 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

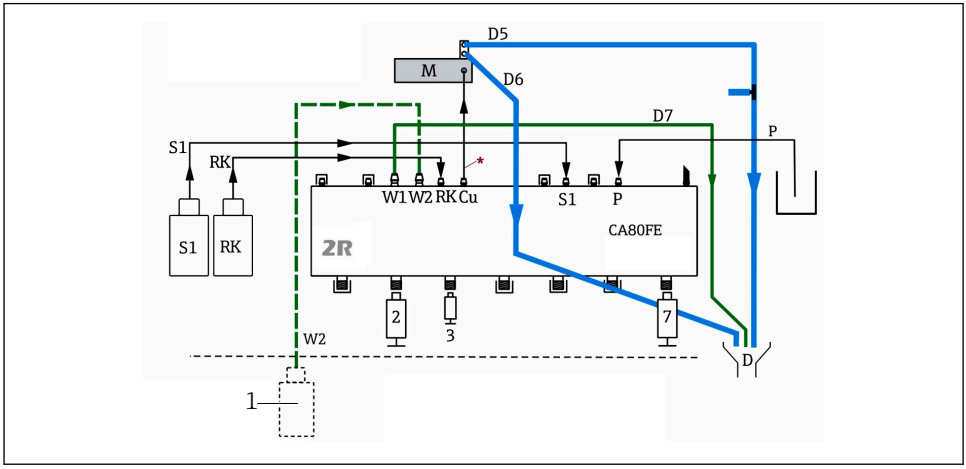
14.12 Hose system CA80FE, two-channel version



50 *CA80FE, 2 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

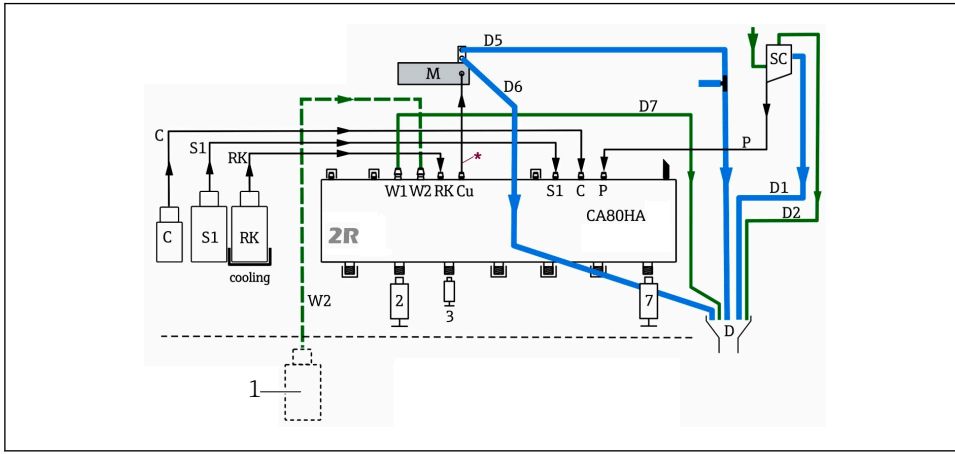
14.13 Hose system CA80FE, self-priming



51 *CA80FE, self-priming*

1 Dilution water (optional)
** Hose length 125 mm*

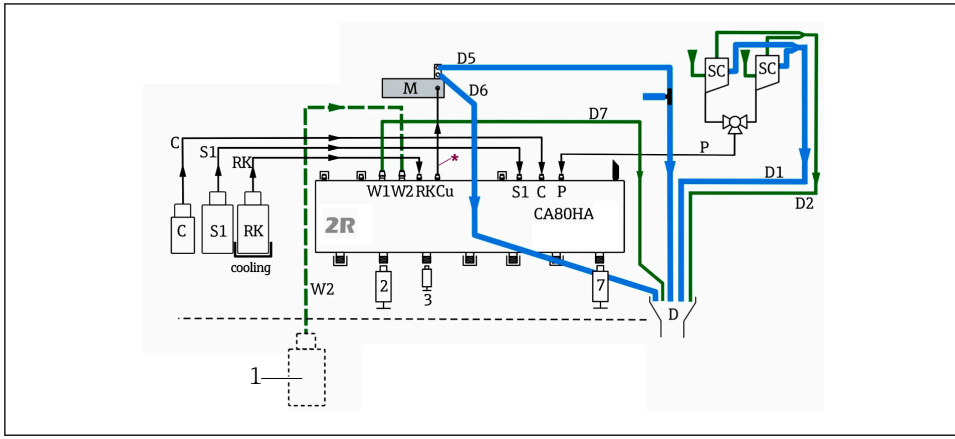
14.14 Hose system CA80HA, one-channel version



52 *CA80HA, 1 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

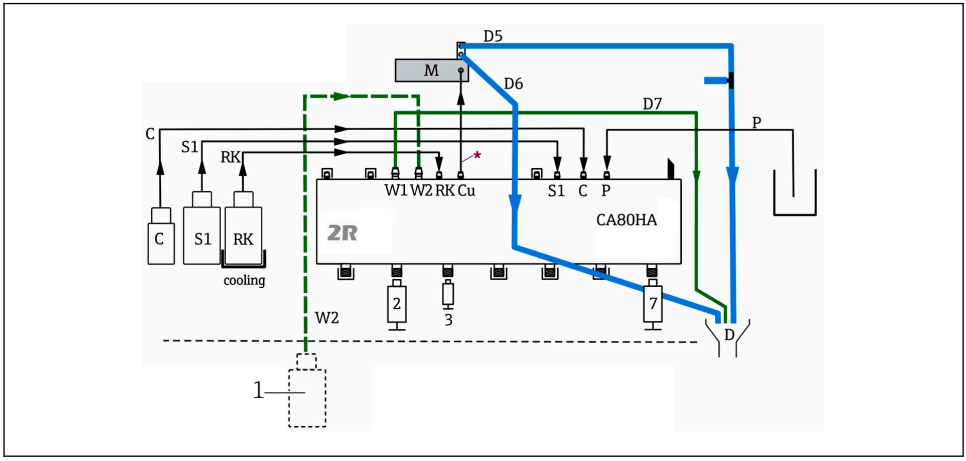
14.15 Hose system CA80HA, two-channel version



53 *CA80HA, 2 x sample collector*

1 Dilution water (optional)
** Hose length 125 mm*

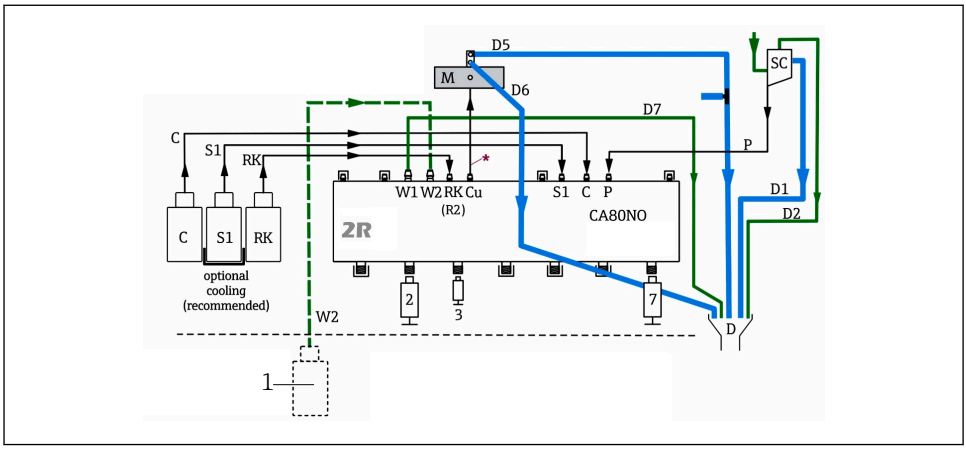
14.16 Hose system CA80HA, self-priming



54 *CA80HA, self-priming*

1 Dilution water (optional)
** Hose length 125 mm*

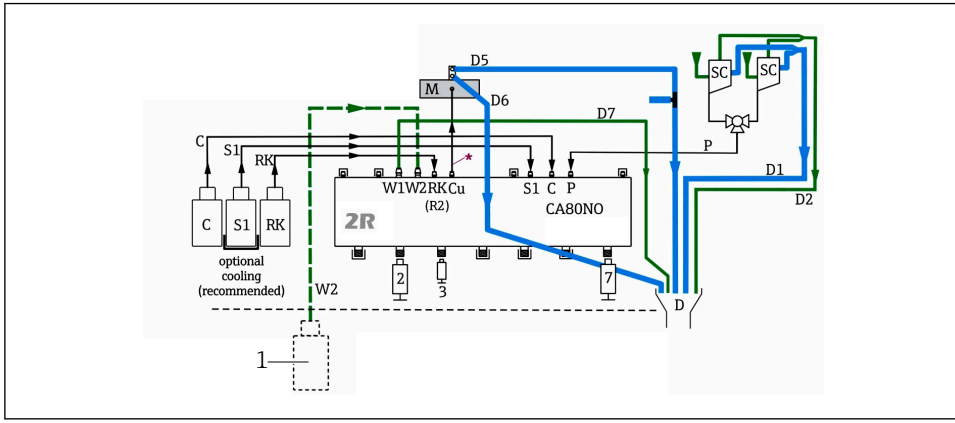
14.17 Hose system CA80NO, one-channel version



55 *CA80NO, 1 x sample collector*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

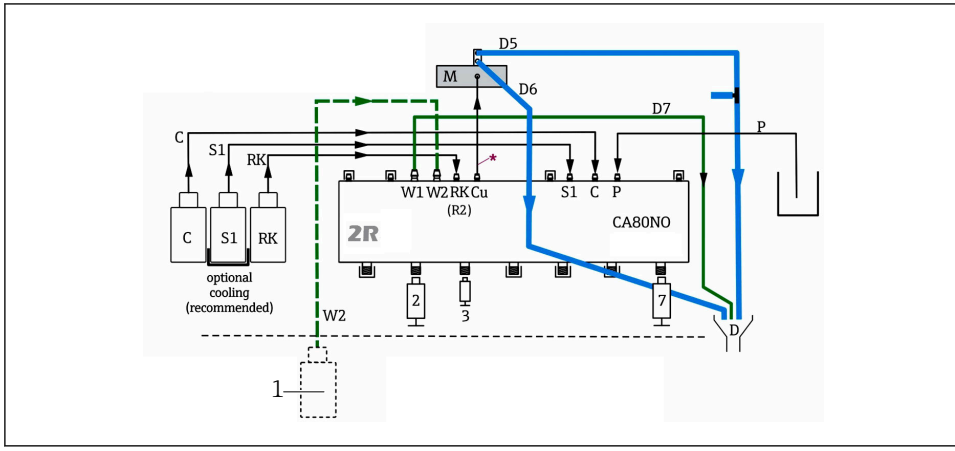
14.18 Hose system CA80NO, two-channel version



56 *CA80NO, 2 x sample collector*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

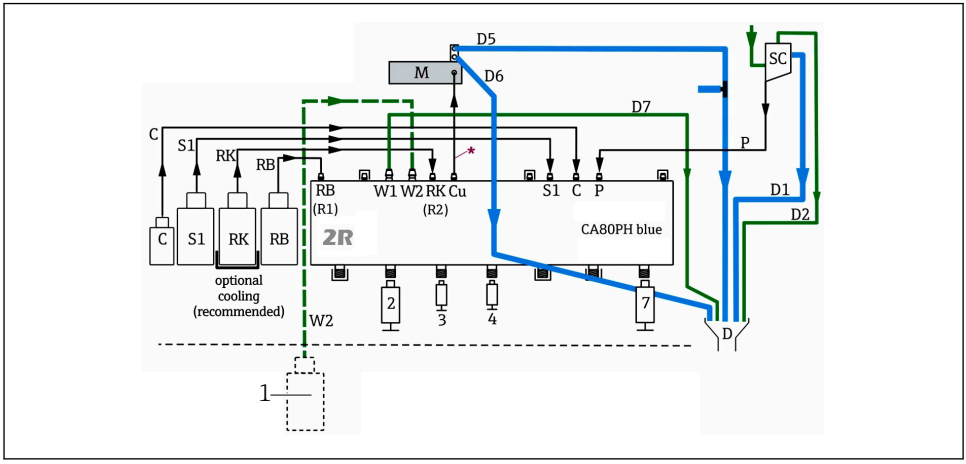
14.19 Hose system CA80NO, self-priming



57 *CA80NO, self-priming*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

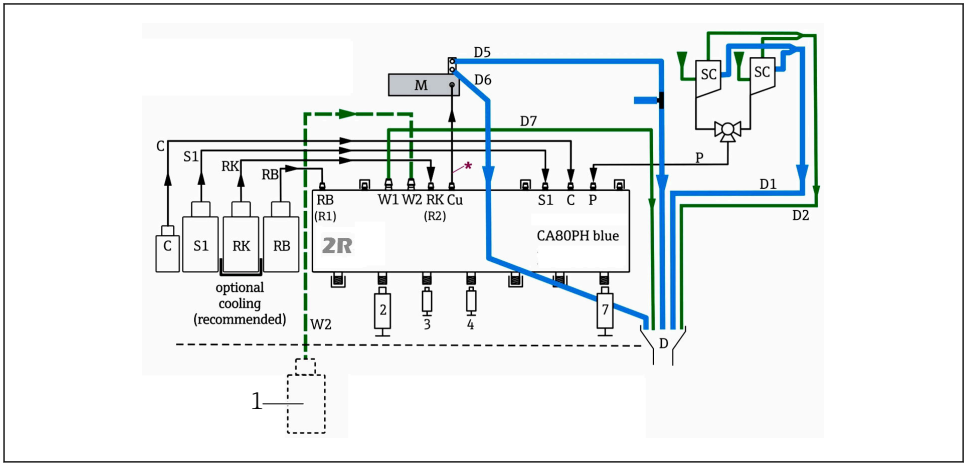
14.20 Hose system CA80PH blue, one-channel version



58 *CA80PH blue, 1 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

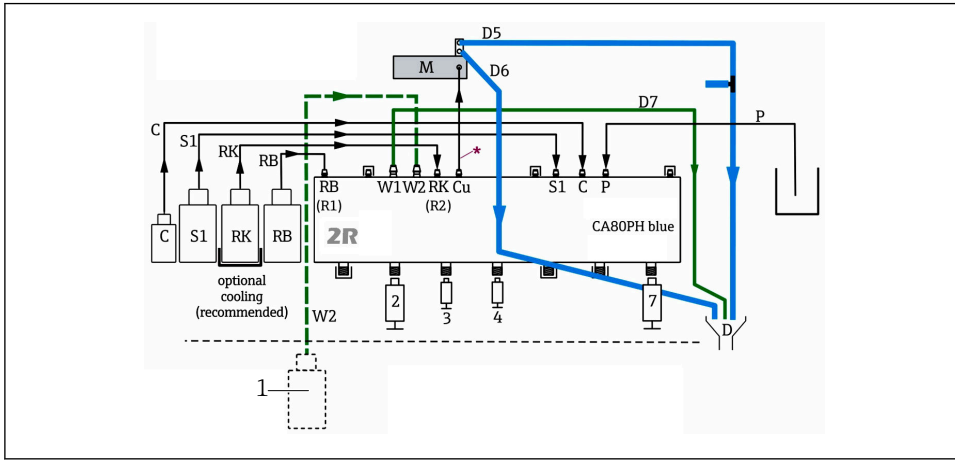
14.21 Hose system CA80PH blue, two-channel version



59 *CA80PH blue, 2 x sample collector*

1 Dilution water (optional)
** Hose length 45 mm*

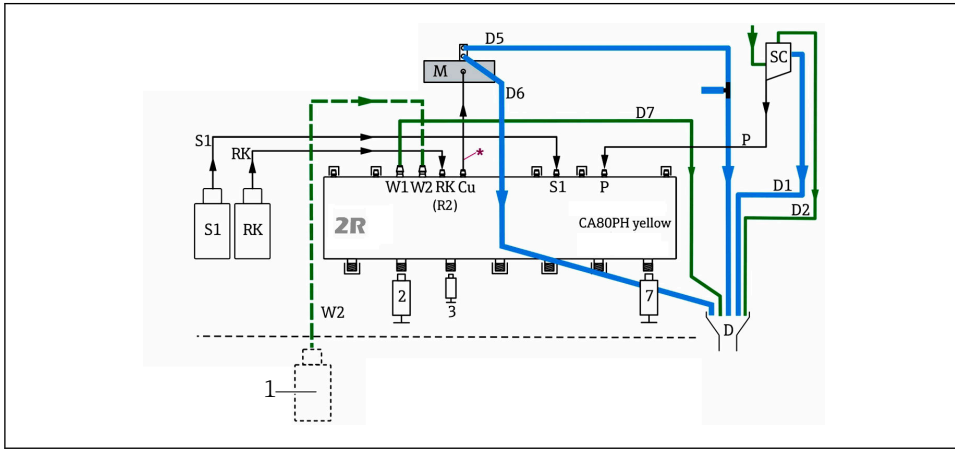
14.22 Hose system CA80PH blue, self-priming



60 *CA80PH blue, self-priming*

1 Dilution water (optional)
** Hose length 45 mm*

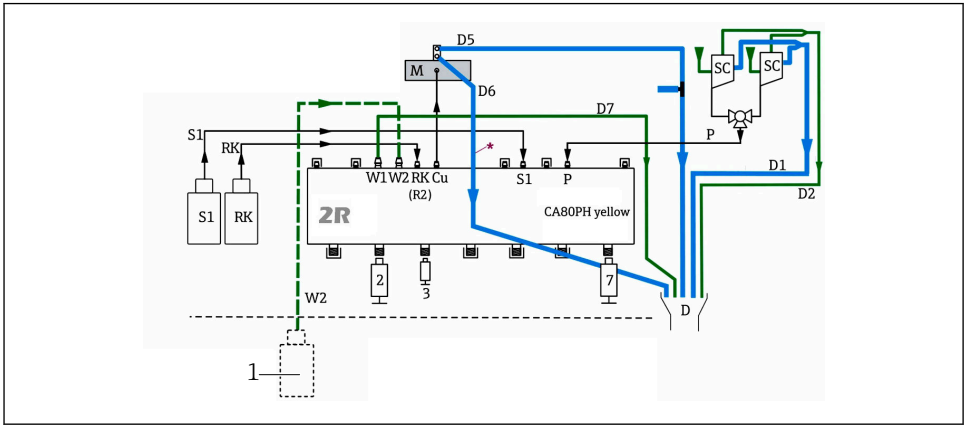
14.23 Hose connection diagram for CA80PH yellow, one-channel version



61 *CA80PH yellow, 1 x sample collector*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

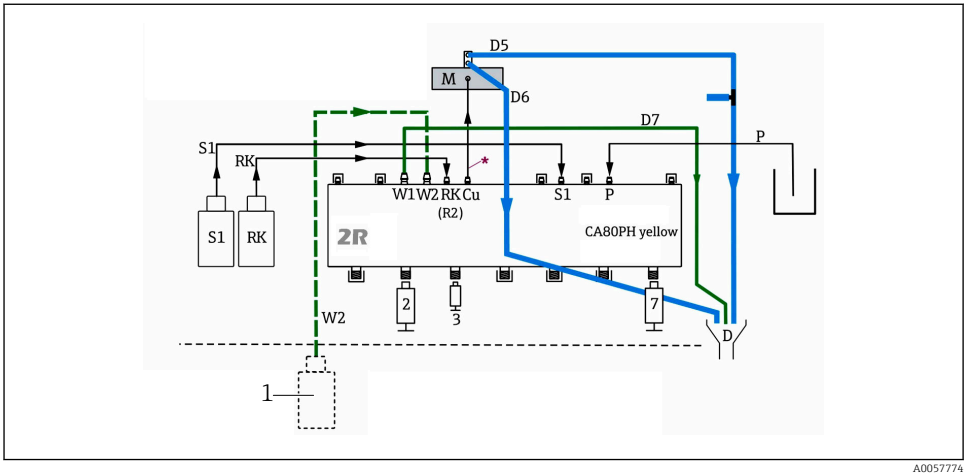
14.24 Hose system CA80PH yellow, two-channel version



62 *CA80PH yellow, 2 x sample collector*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

14.25 Hose system CA80PH yellow, self-priming



63 *CA80PH yellow, self-priming*

1 Dilution water (optional)
** Hose length up to SW 01.06.08: 45 mm, hose length from SW 01.07.01: 125 mm*

15 Additional documentation

Detailed information on the device can be found in the Operating Instructions for the transmitter and in the other documentation available via:
- www.endress.com/device-viewer
- Smartphone/tablet: Endress+Hauser Operations app

16 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.

www.addresses.endress.com

Endress+Hauser

People for Process Automation