EA01617C/07/EN/02.25-00
71714569
2025-07-20

Installation Instructions
Liquiline System CA8x analyzer

Conversion of electronics modules

Endress+Hauser
People for Process Automation

Table of contents

1 Overview

1.1 Spare parts kits

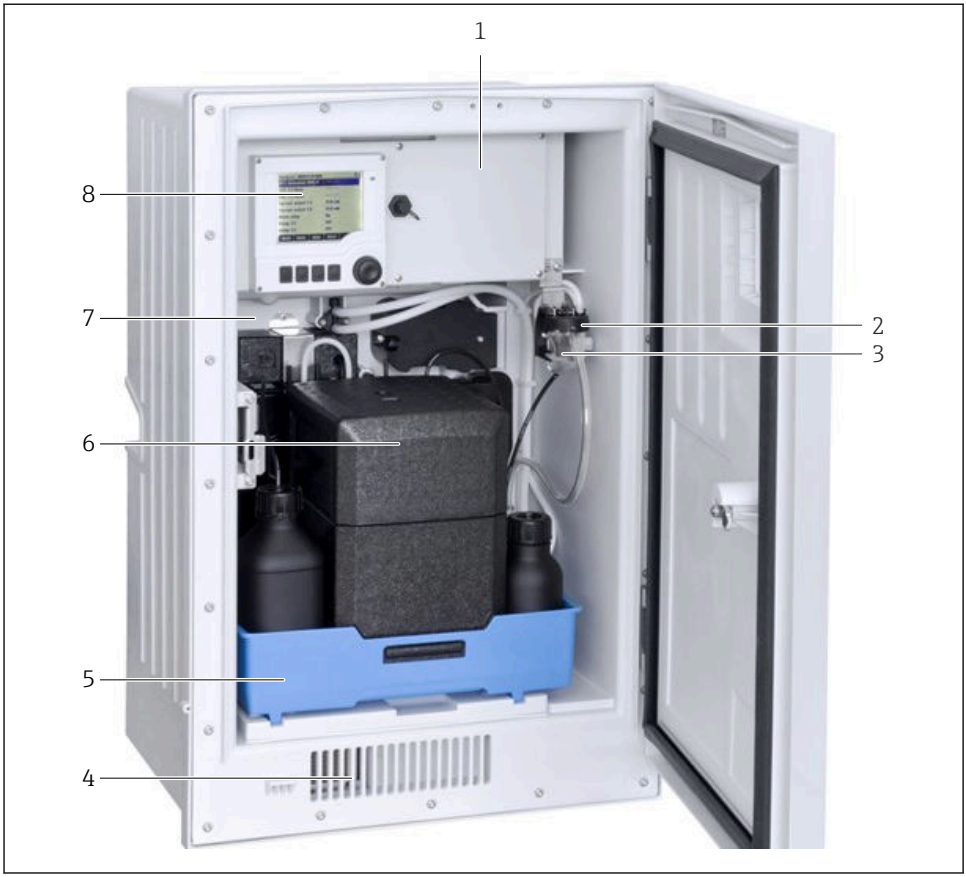
These installation instructions apply to the following spare parts kits:

Order code	Designation	Page
71510720	CA8x Conversion of electronics modules V2	→ 13
71510725	CA80COD/TP Conversion of electronics modules V2	→ 14
71510723	CA80SI/82HA Conversion of electronics modules V2	→ 15

1.2 Overview of CA8x device types

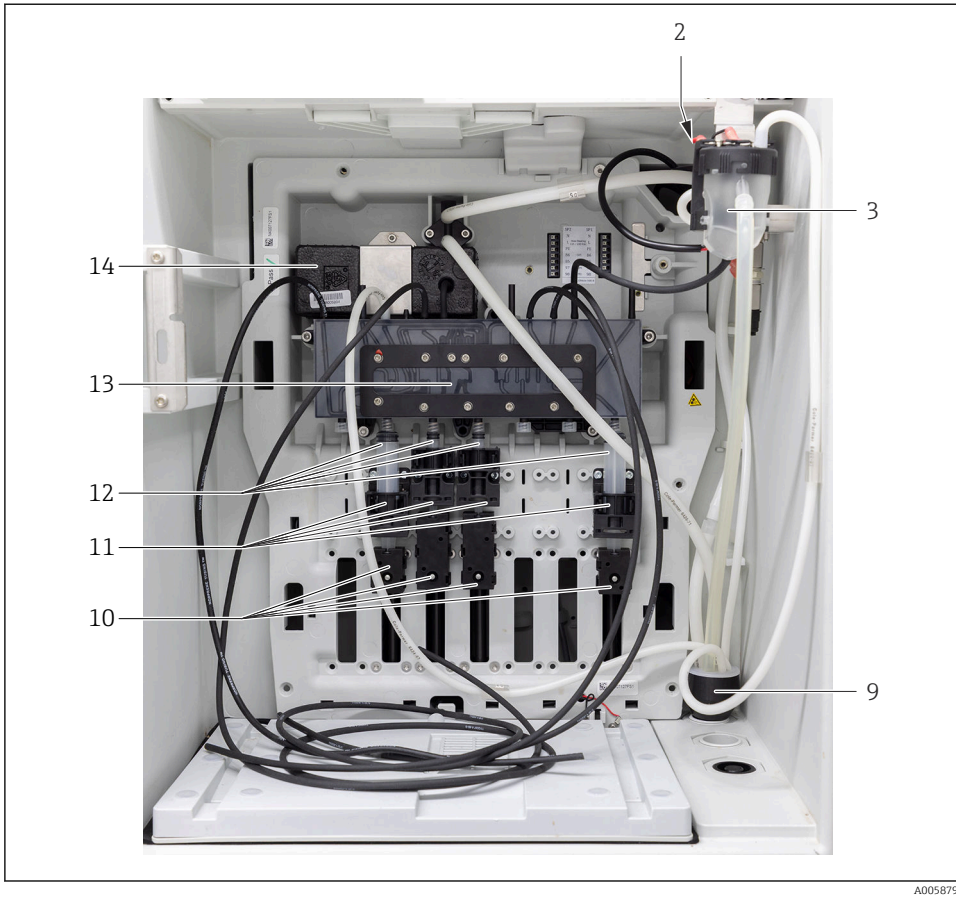
1.2.1 Overview of CA80 single parameters (CA80AL/AM/CR/FE/HA/NO/PH)

The figures below (→ 1, 4 and → 2, 5) show an overview of the CA80 for the colorimetric single parameter measurement:



1 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 tray*
6 *Insulation (optional, only for cooling)*
7 *Process module (carrier plate with Liquid Manager, photometer and control module)*
8 *Measuring and control unit (controller)*

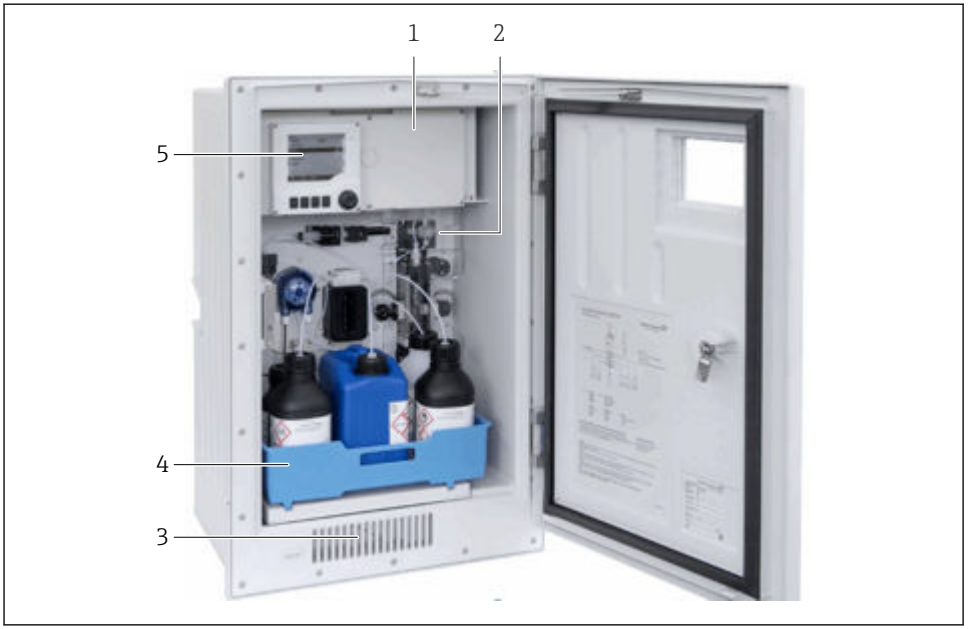


2 *Carrier plate for CA80 single parameters*

9 Drain pipe
10 Linear drives
11 Dispenser holders
12 Dosing dispensers
13 Liquid Manager
14 Photometer

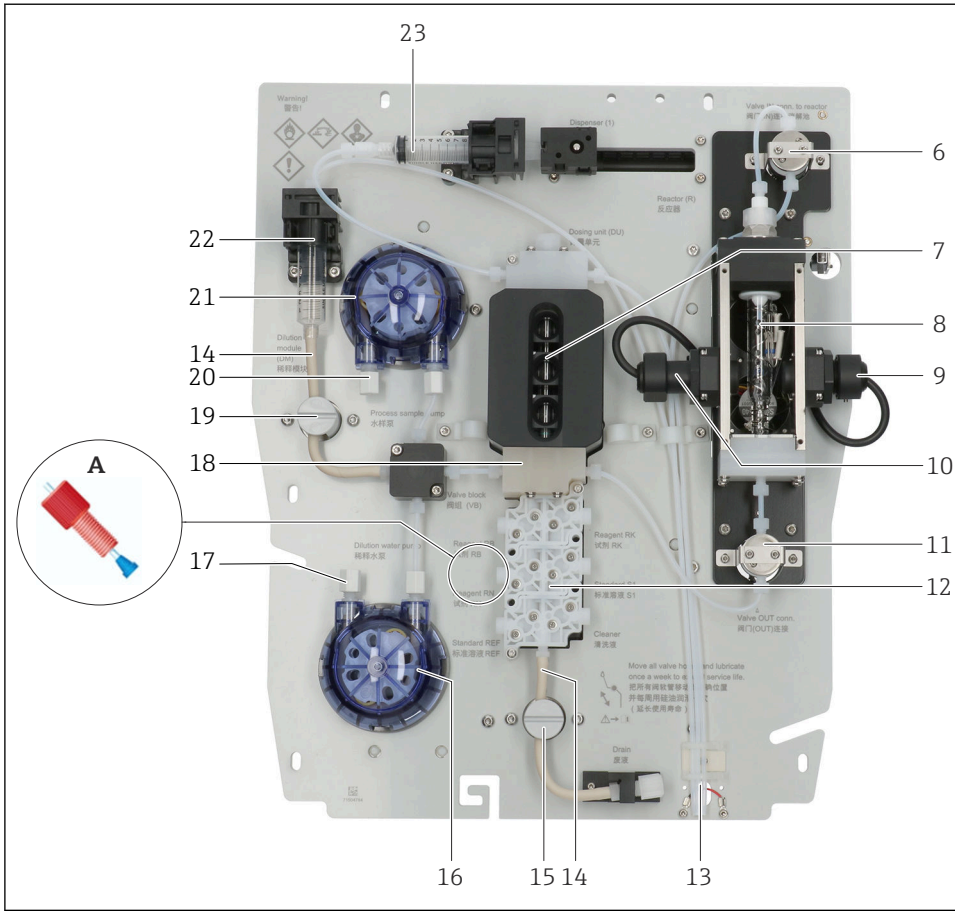
1.2.2 Overview of CA80 sum parameters (CA80COD/TP)

The figures below (→ 3, 6 and → 4, 7) show an overview of the CA80 for the colorimetric sum parameter measurement.



3 *Assembly overview of CA80COD sum parameters*

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



4 *Carrier plate CA80 sum parameters (remove safety cover!)*

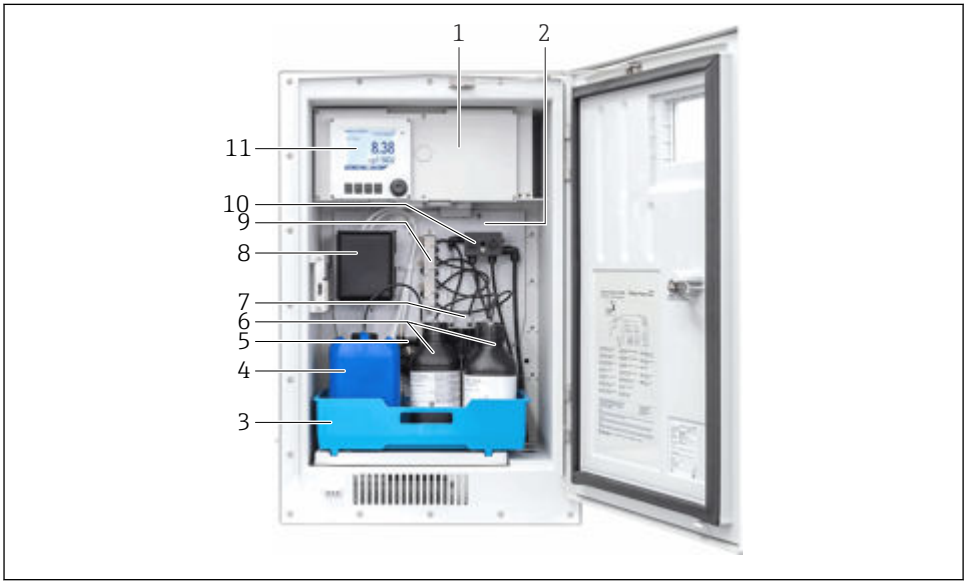
A Handling the glands with the cone: Note the installation direction of the cone!
6 Reactor valve at top
7 Dosing unit with dosing tubes
8 Reactor with reactor cuvette
9 Photometer (receiver module)
10 Photometer (transmitter module)
11 Reactor valve at bottom
12 Valve block
13 Leak sensor
14 Pharmed®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

20 Sample inlet
21 Sample pump
22 Dilution module (only with high measuring range)
23 Dosing dispenser

1.2.3 Overview of CA80SI/82HA

The figures below (→ 5, 8 and → 6, 9) show an overview of the CA80SI/82HA for photometric silicate measurement or to measure 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.



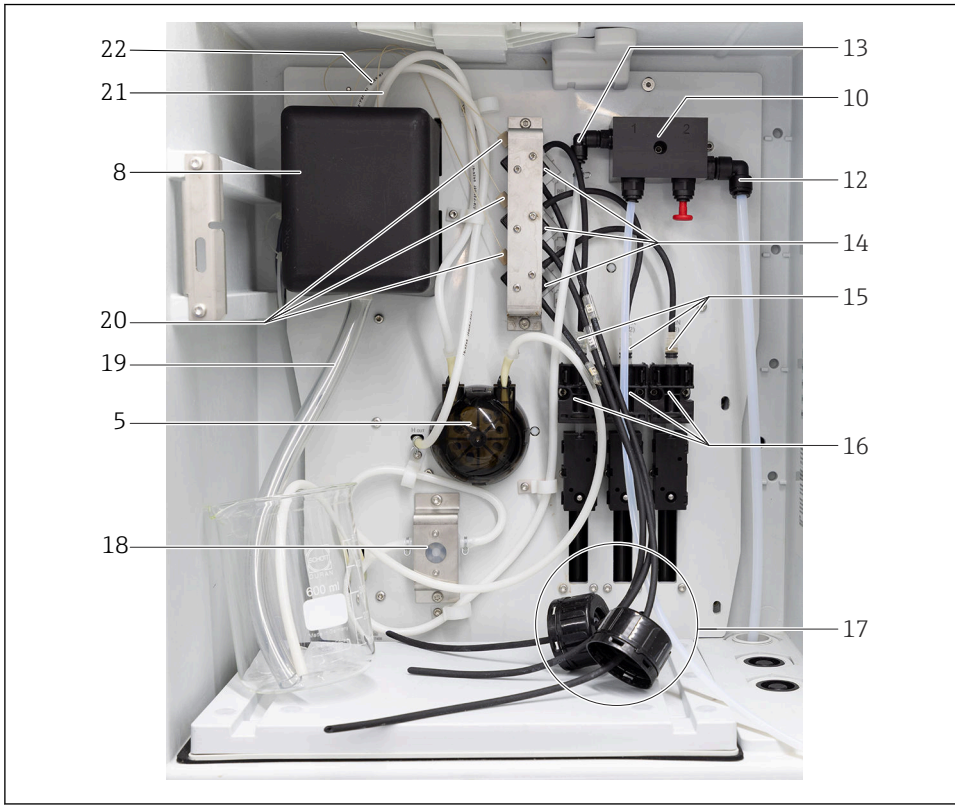
A0057631

5 *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 unit (controller)

The figure below shows the carrier plate from the front.

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



6 *CA80SI/82HA carrier plate*

12 Drain hose sample switch OD 8 mm
13 Sample hose for 1-channel/2-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

2 Intended use

- The parts of the kits must only be used as spare parts for CA8x 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

Risk of electric 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 CA8x 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 medium.

⚠ 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 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).

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.

The conversion kit is used if a version 1 module is no longer available for a required repair or if a version 2 module must be installed. In these cases, the entire analyzer must be converted to version 2.

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

When installing a version 2 backplane, firmware version 01.08.00 is ensured.

	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 + FXHC**2**	BASE**2**-E module	**71431302** BASE**2**-E base module
	FIDS1	Interface mod. V1	**71218507** CA8x Interface module (version 1)
	FIDS**2**	Interface mod. V**2**	**71465480** CA8x Interface module (version 2)
	FC4W2	Backplane V1	**71239304** CA8x Backplane CM44 (version 1)
	FC4W**3**	Backplane V**2**	**71401272** Kit CA8x backplane CM44 (version 2)
CA80AL/AM/ CR/FE/HA/NO/PH	FXAB1	Control module V1	**71218504** Kit CA8x FXAB1 control module
	FXAB**2**	Control module V**2**	**71503207** Kit CA8x control module version **2**
CA80COD/TP	FMAB1 (FXAB1 with AXIO1)	Control module V1	**71324197** Kit CA80COD/TP control module FMAB1
	FMAB2 (FXAB**2** with AXIO1)	Control module V**2**	**71503213** Kit CA80COD/TP control module Vers. **2**
CA80SI/82HA	FMAB1 (FXAB1 with AXIO1)	Control module V1	N/A
	FMAB2 (FXAB**2** with AXIO1)	Control module V**2**	**71503211** Kit CA80SI/82HA control module version **2**
CA80TN	FMAB2 (FXAB2 with AXIO1)	Control module V**2**	**71503214** Kit CA80TN control module version **2**

5 Overview and handling the spare parts kits

The spare parts kits in this manual are suitable for all the devices from the CA8x family. An overview of the main device types is provided in the “Overview of CA8x device types” section → 🖹 3.

All replacement descriptions for the kits refer to the “CA80 individual parameter” device type (CA80AL/AM/CR/FE/HA/NO/PH).

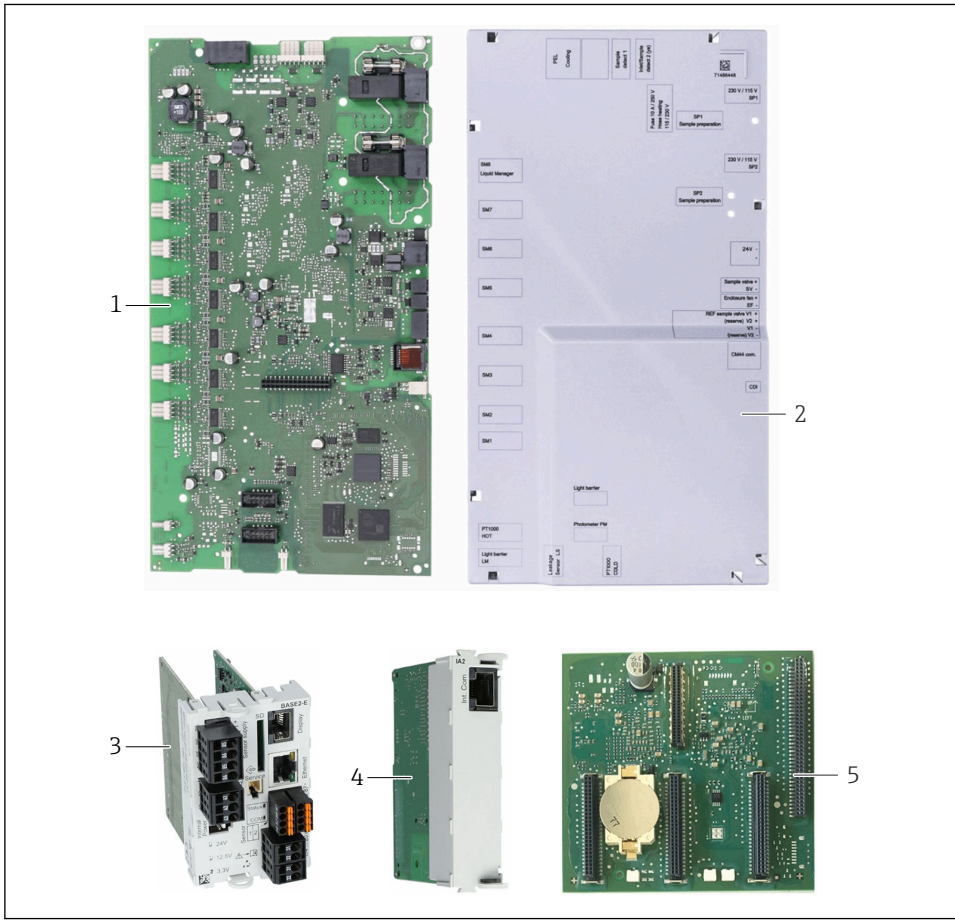
The CA80COD/TP/TN and CA80SI/82HA device types have a partial structural difference. However, the spare parts kits of this manual are not significantly affected. **Apply the individual replacement instructions accordingly.**

6 Scope of delivery

6.1 71510720 Kit CA8x conversion of electronics module V2

The kit contains the following parts → 7, 13:

1	1 x	Control module V2 (FXABs, single param.)	**4**	1 x	Interface module version 2 (FIDS2)
2	1 x	Cover single parameters for control module	**5**	1 x	Backplane version 2 (FC4W3)
3	1 x	BASE2-E base module		1 x	Kit instructions



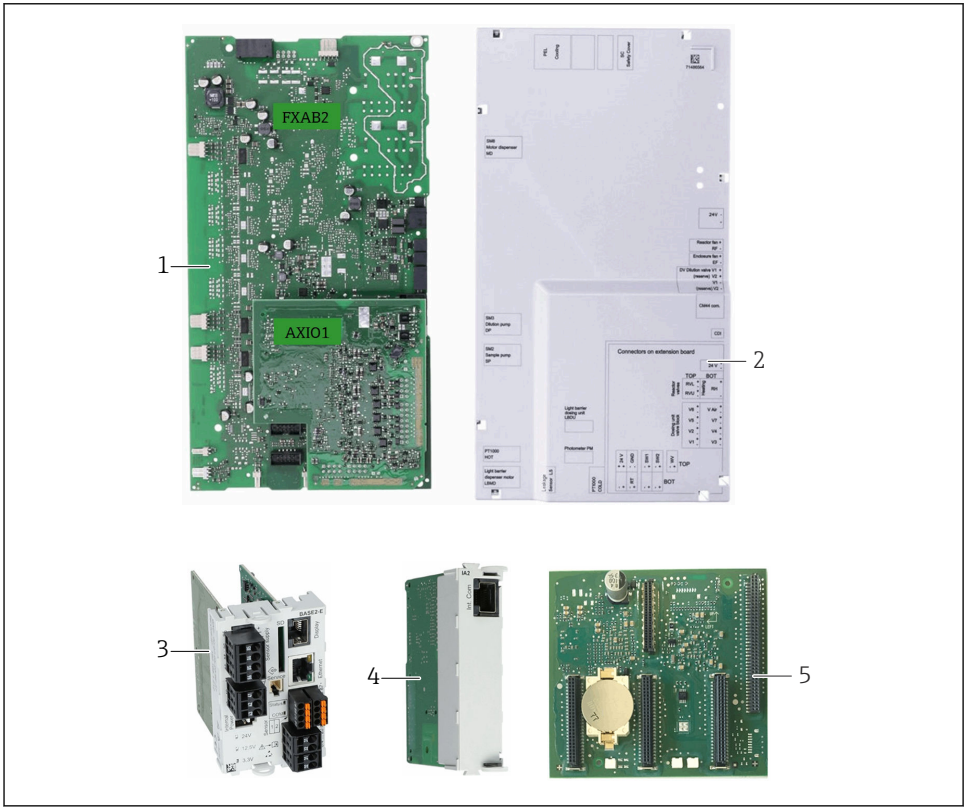
A0058547

7 *CA8x Conversion of electronics modules V2*

6.2 71510725 Kit CA80COD/TP Conversion of electronics modules V2

The kit contains the following parts → 8, 14:

1	1 x	Control module version 2 for CA80COD/TP (module FMAB2 = FXAB2 + AXIO1)	**4**	1 x	Interface module version 2 (FIDS2)
2	1 x	COD/TP cover for control module	**5**	1 x	Backplane version 2 (FC4W3)
3	1 x	BASE2-E base module		1 x	Kit instructions

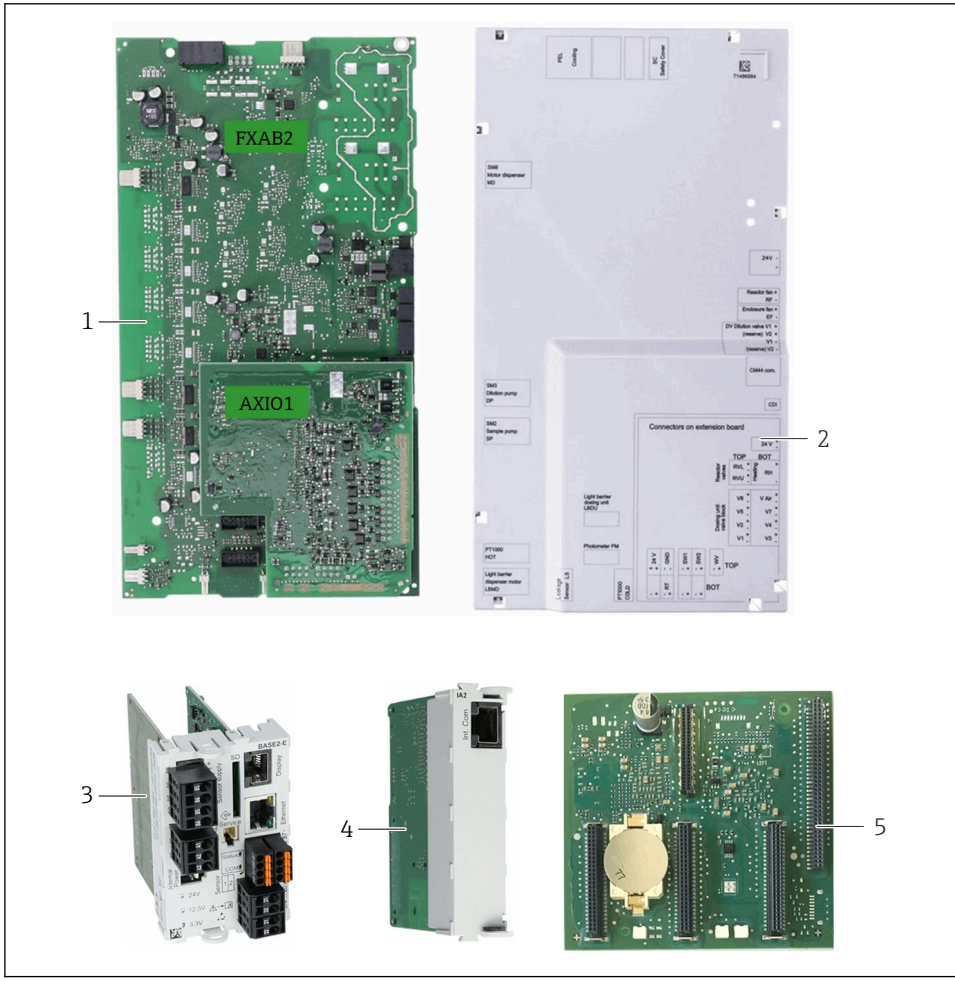


8 *CA80COD/TP Conversion of electronics modules V2*

6.3 71510723 Kit CA80SI/82HA Conversion of electronics modules V2

The kit contains the following parts → 9, 15:

1	1 x	Control module version 2 for CA80SI/82HA (module FMAB2 = FXAB2 + AXIO1)	**4**	1 x	Interface module version 2 (FIDS2)
2	1 x	SI/HA cover for control module	**5**	1 x	Backplane version 2 (FC4W3)
3	1 x	BASE2-E base module		1 x	Kit instructions



A0058550

9 *CA80SI/82HA Conversion of electronics modules V2*

7 Replacing components

7.1 Preparation

The spare part installation differs depending on the spare part and parameters. Therefore, refer to and differentiate between Sections 7.1.2 → 16 to 7.1.3 → 17.

7.1.1 Saving data and configurations

Once the backplane has been replaced, the device must be reconfigured. The configuration can be saved on an SD card with the assistance of menu guidance. Please use the SD card recommended by E+H (industrial flash memory 1 GB), order option “T4” in the CA8x product structure or accessories order number 71110815. The slot for the SD card (1) is located on the BASE(2)-E module .

To save, open the housing as described in the “Opening the electronics compartment” → 19 section, insert the SD card, close the cover provisionally again and go to **Menu → Setup → General settings → Extended setup → Data management → Setup → Save setup → Save**.

1. Open the housing, see the “Conversion of backplane and plug-in modules” section → 19.
2. Insert the SD card.
3. Close the cover again on a provisional basis.
4. Save the configuration via **Menu → Setup → General settings → Extended Setup → Data management → Setup → Save setup → Save**.

7.1.2 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 collecting vessel is empty.
5. Remove all the hoses from the reagent bottles. Wipe the ends of the hoses with a clean paper towel.
6. Remove the bottle tray from the analyzer.
7. Place hoses in an empty beaker. Select the **Rinse with water** entry. 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.

8. Then place the hoses in a beaker containing distilled water or treated water.

9. Also disconnect the black sample hose “P” from the sample collecting vessel and place it in the beaker.
10. Select **Menu → Operation → Maintenance → Decommissioning → Rinse with water**. Wait until flushing is finished.
11. Place the hoses back into an empty beaker and flush again with air by selecting the **Rinse with water** entry.

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.

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

7.1.3 CA80COD/TP/SI and CA82HA

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. Remove the bottle tray 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 flushing is finished.
8. 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.

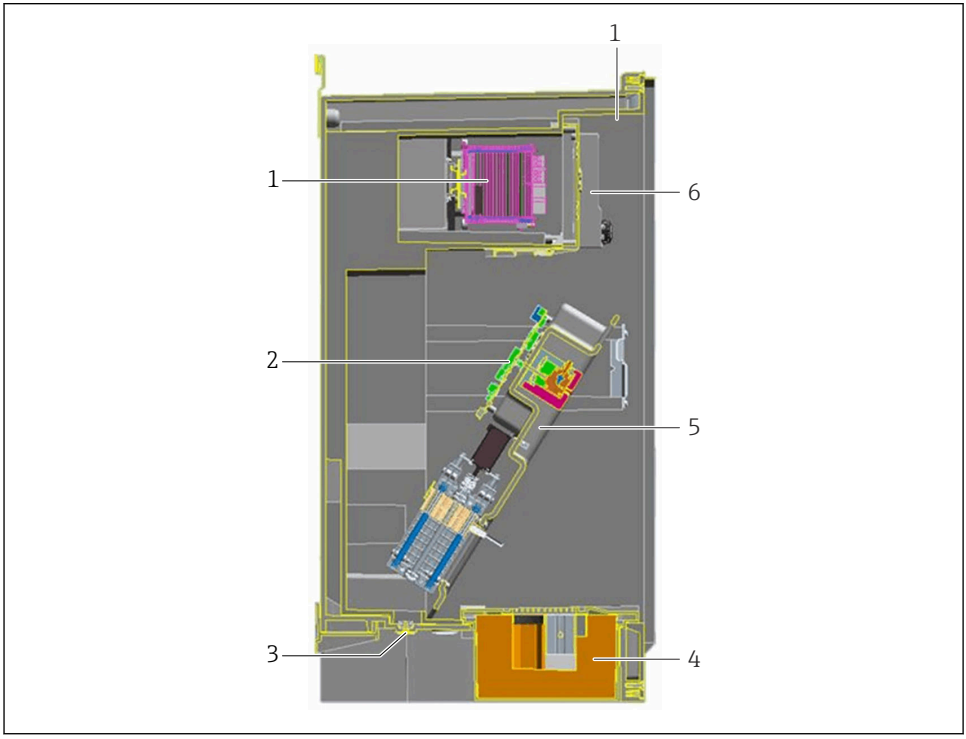
9. **Disconnect the analyzer from the power supply!** Secure the circuit breaker against unintentional recommissioning.

7.1.4 CA80TN

The CA80TN analyzer is fitted with version 2 modules from the start. Conversion or a conversion kit is therefore not necessary.

7.2 Conversion of the control module

1. Carry out preparatory work as per the “Preparatory work” section → 16.
2. Loosen the screws of the carrier plate (5 x T25) and fold the carrier plate forward. Keep the screws for reuse.



10 *Cut-away drawing of CA8x*

1 *Electronics compartment with installation frame for slide-in modules*
2 *Control module (without cover)*
3 *Cable entries*
4 *Cooling*
5 *Mounting frame (expanded)*
6 *Operating device with display*

3. Remove the attached cover of the control module.
4. Loosen the mounting screws of the control module. Keep the screws for reuse.
5. The old version 1 control module must be carefully lifted until the new version 2 control module can be pushed underneath.

6. Plug one plug connector after the other from the old module into the new module. This avoids confusion between identical connectors.
7. Tighten the new control module and fit the cover plate back on.
8. Fold up the carrier plate and secure it again (5 x T25).

7.3 Conversion of backplane and plug-in modules

The backplane can only be replaced by E+H specialists!

Once the backplane has been replaced, the device must be reconfigured. The configuration can be saved on an SD card with the assistance of menu guidance. Please use the SD card recommended by E+H (industrial flash memory 1 GB), order option “T4” in the CA8x product structure or accessories order number 71110815. The slot for the SD card is located on the BASE2-E module, see figure → 🖼 12, 🖹 20.

To save, open the housing as described in the “Opening the electronics compartment” → 🖹 19 section, insert the SD card, close the cover provisionally again and go to **Menu → Setup → General settings → Extended setup → Data management → Save setup → Save**.

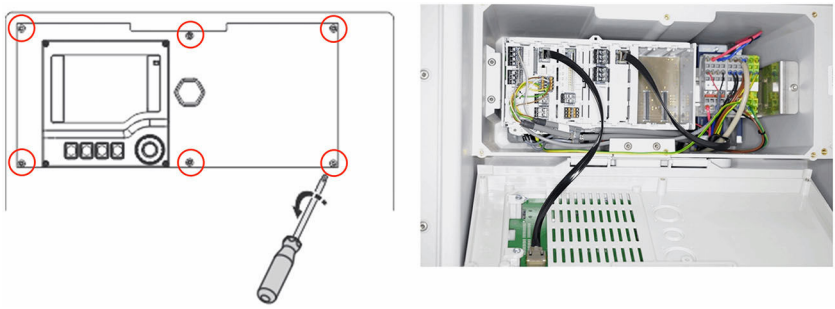
⚠ WARNING

Risk of material damage!

- A version 1 backplane must be replaced by a version 1 backplane and a version 2 backplane must be replaced by a version 2 backplane. Otherwise, the backplane is not compatible with the remaining modules.
- Refer to the compatibility information → 🖹 11.

7.3.1 Opening the electronics compartment

1. Shut down the device.
2. Make sure the device is de-energized. It is not permitted to replace a live module!
3. Loosen the screws of the electronics compartment and fold out the hatch forward.



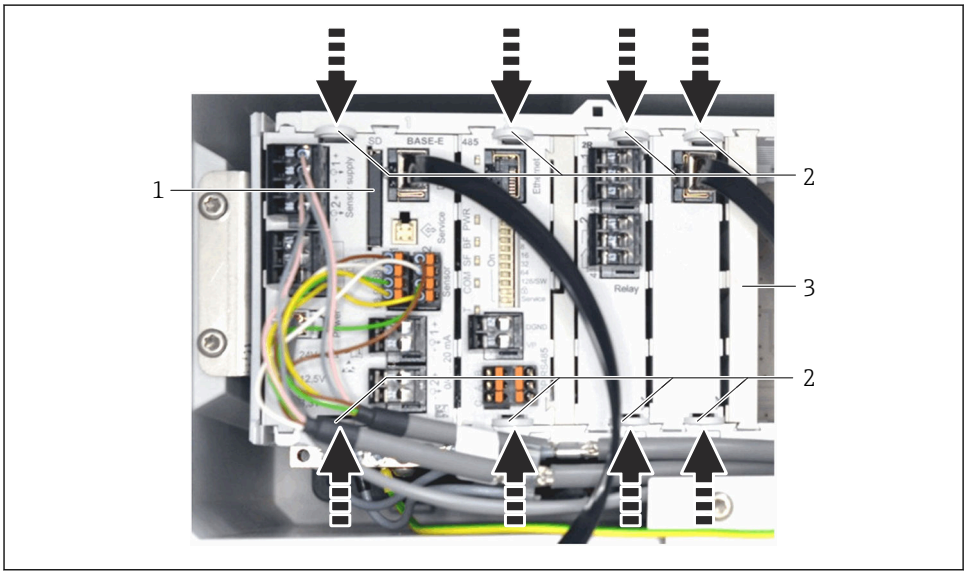
A0058554

🖼 11 *Electronics compartment with open cover*

7.3.2 Removing the plug-in modules

All terminal strips and connectors on the modules can be removed. No cables must be disconnected.

1. Remove all terminal strips and connectors from the modules.
2. If available, remove the end cover (3) and all the dummy covers.
3. Press the locking tabs of the modules (2) inwards together and pull out all the modules by the locking tabs → 12, 20.



A0058488

12 *SD card slot, locking mechanisms*

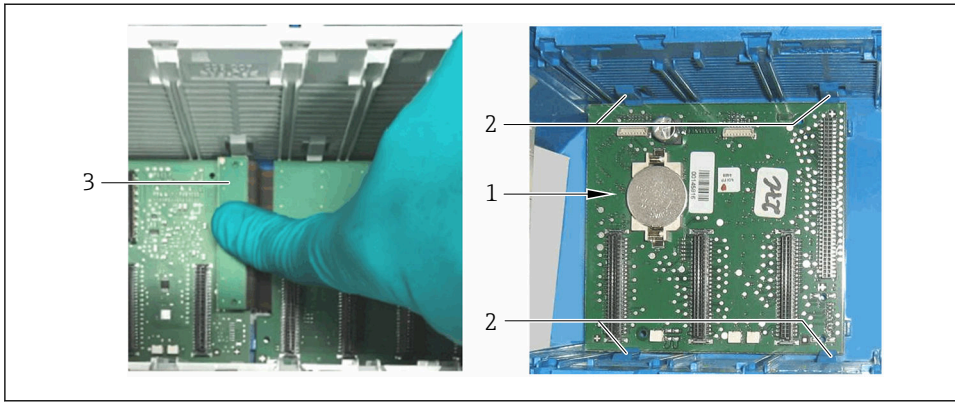
1 Slot for SD memory card
2 Locking tabs
3 End cover

4. Set the previous version 1 plug-in modules aside; they are no longer needed. This concerns the BASE-E base module, the version 1 interface module and the version 1 backplane. Other plug-in modules (if any) are reused.

7.3.3 Conversion of the backplane

The backplane (1) is not rotation-proof. For this reason, note the installation position → 14, 21!

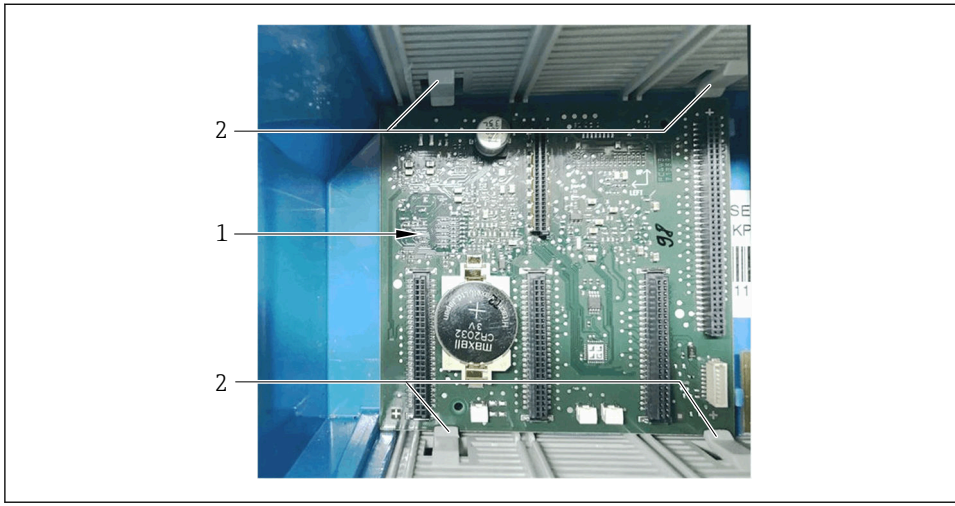
1. If present, disconnect the connector for the extension backplane, see (3) in the figure below.



A0058555

13 Backplane module version 1

2. Press the four locking mechanisms (2) in the side walls outwards and remove the backplane → 13, 21.
3. Insert the new version 2 backplane from the conversion kit. It must lock into place in the locking mechanisms (2).
4. If present, reconnect the connector of the extension backplane.



A0058489

14 Backplane module version 2

7.3.4 Upgrading plug-in modules from version 1 to version 2

All terminal strips and connectors on the modules can be removed. No cables must be disconnected.

1. Plug in the plug-in modules again. For the base module and interface module, use the new modules from the conversion kit (BASE**2**-E and interface module version 2).
2. Reinstall the dummy covers and end cover.
3. Re-connect all of the connectors.
4. Close the electronics compartment hatch.
5. Carry out the finishing work as per the → 🖹 22 section.

7.3.5 Finishing work

Preparatory steps

1. Insert the bottle tray with reagents, standard and cleaner.
2. Connect the hoses to the reagent containers.
3. Connect the hoses for the sample and dilution water to the extent that they have been removed or are available.
4. Re-establish the power supply.

7.3.6 Data recovery

Once the device has been restarted, the following data must be re-entered manually (see figure → 🖼 15, 🖹 23):

- Serial number (Ser. no.)
- Type code (entered in the “Function Codes”, always 037xxx for CA8x)
- Order code
- Extended order code (order code ext.)
- Upgrade codes (function codes)

If the device is restarted after replacing the backplane, the required input fields are displayed automatically.

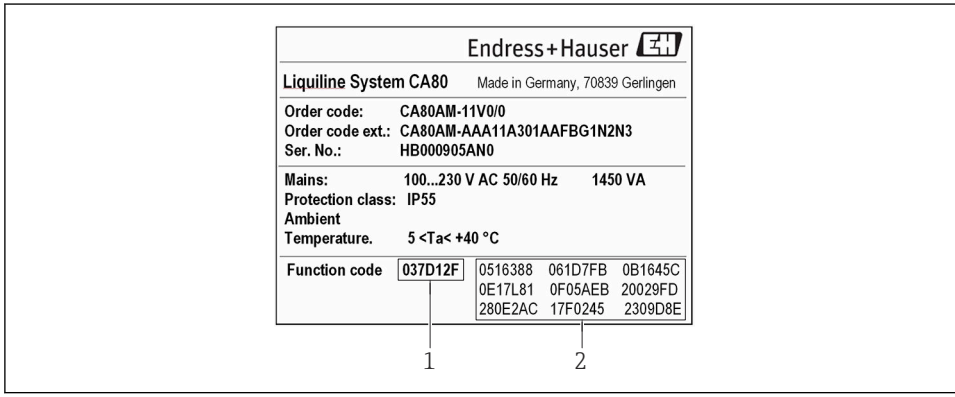
1. Read the requested information from the nameplate → 🖼 15, 🖹 23 and enter it in the appropriate field.
2. After it has been entered completely and correctly, there is a prompt to restart the device. Press the **OK** button.
3. Enter upgrade codes. The value is entered under **Menu → Setup → General settings → Extended setup → Data management → Upgrade code → Enter upgrade code**. Not all the functionalities of the analyzer are activated without entering the upgrade codes.

4. Enter and note all the 7-digit activation codes that are not in bold on the nameplate.
   ↳ A confirmation of whether the activation code was entered and a prompt to restart appears.

Do not restart the system until all the activation codes that are not in bold on the nameplate are entered!

Upgrade codes for extensions installed subsequently, whose codes are not listed on the nameplate, must be found in the past delivery documents.

5. Check whether all the functions are enabled in the relevant menus.



A0058490

15 *Nameplate entries*

1 *Type code*
2 *Upgrade codes*

The type code for analyzers always starts with 037.... It does not necessarily need to be at the first position! For more recent devices, the type code is in bold.

Digits 1 to 3: Indicates the upgrade code
Digits 4 to 7: Customized according to device ser. no.
037 yyyy = type code = family code for CA80
05X yyyy = function code for operating language
06X yyyy = function code for additional Memosens input of BASE2 module
08X yyyy = function code for additional analog output of BASE2 module
0B0 yyyy = function code for deactivating the communication protocols. Do not enter a value if communication is already active (see **0BX** yyyy).
0BX yyyy = function code for digital communication
0DX yyyy = function code for E+H or OEM identification

0FX yyyy = function code for cooling module
20X yyyy = function code for sample collector sensor
23X yyyy = function code for measuring range
26X yyyy = function code for CA80 parameters
28X yyyy = function code for configuring channels
2CX yyyy = function code for internal dilution function
2DX yyyy = function code for Heartbeat Technology
32X yyyy = function code for mathematical functions
35X yyyy = function code for web server on BASE2

6. If the configuration was saved to an SD card, it can be restored with this backup file (via **Menu → Setup → General settings → Extended setup → Data management → Load setup**). Otherwise, the device must be fully reconfigured by hand.

Repeated calibration of additionally connected Memosens sensors is not required. The calibration data is saved in the Memosens sensors and is automatically read into the device again.

7.4 Recommissioning

1. Select **Menu → Operation → Maintenance → Bottle replacement → Bottle insertion → Bottle selection**.
2. Highlight all the bottles and confirm by pressing the **OK** soft key.
3. Select the **Bottles inserted confirmation** and press the navigator button to confirm.
4. Activate the sample feed (depending on the type of sample preparation).
5. Select **Mode → Continue automatic mode** to start the normal measuring operation of the CA8x.
6. 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**.

8 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

9 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