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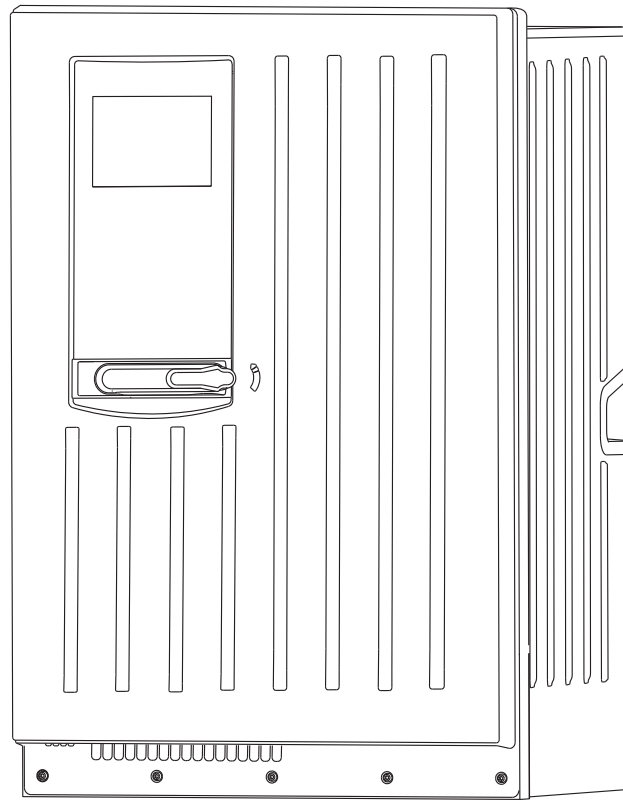
Operating Instructions
Liquiline System CAT860

Automatic sample conditioning system for supplying process measuring devices with filtered sample from sludge activation, secondary clarification or surface water



Endress+Hauser
People for Process Automation

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1 About this document

1.1 Document function

1.1.1 Document function

These Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

1.2 Warnings

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

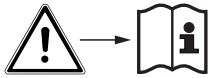
1.3 Symbols used

1.3.1 Symbols

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page

Symbol	Meaning
	Reference to graphic
	Result of a step

1.3.2 Symbols on the device

Symbol	Meaning
	Reference to device documentation

2 Basic safety instructions

2.1 Requirements for personnel

- 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 carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

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

2.2 Designated use

The Liquiline System CAT860 sample preparation system is designed to automatically supply process measuring devices with filtered sample from preclarification and sludge activation (see Technical data).

Use of the device for any purpose other than that described, poses a threat to the safety of people and of the entire measuring system and is therefore not permitted. The manufacturer is not liable for damage caused by improper or non-designated use.

2.3 Workplace safety

As the user, you are responsible for complying with the following safety conditions:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:

▶ If faults cannot be rectified:
products must be taken out of service and protected against unintentional operation.

2.5 Product safety

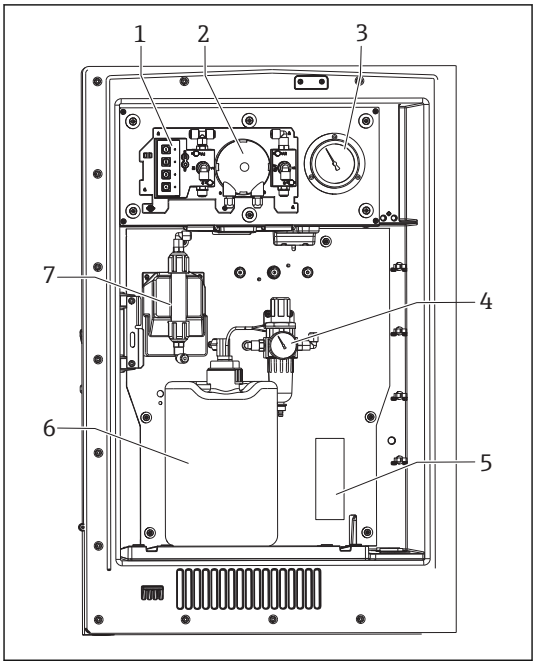
2.5.1 State of the art

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and European standards have been observed.

3 Product description

Operate the Liquiline System CAT860 only with a Liquiline System CA80 **single-channel** device.

- Liquiline System CAT860 sample preparation system
- Local operation with soft keys and status LEDs
- Filter unit with filter and holder in the configuration ordered
- Automatic cleaning function with compressed air (external compressed air supply necessary)
- Peristaltic pump for pumping the sample
- Diaphragm pump for the automatic backflush function with cleaning solution
- Housing heating (optional)
- Sample hose, filter to pump in the configuration ordered, optionally heated
- Sample hose, pump to analyzer in the configuration ordered, optionally heated
- Cleaner (must be ordered separately)



1 *Soft keys*
2 *Peristaltic pump*
3 *Pressure gauge*
4 *Pressure-reducing valve for compressed air*
5 *Housing heating (optional)*
6 *Cleaner*
7 *Diaphragm pump*

1

4 Incoming acceptance and product identification

4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
   ↳ Notify the supplier of any damage to the packaging.
   Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
   ↳ Notify the supplier of any damage to the delivery contents.
   Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
   ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
   ↳ The original packaging offers the best protection.
   Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

4.2 Product identification

4.2.1 Nameplate

The nameplate provides you with the following information on your device:
- Manufacturer identification
- Order code
- Serial number
- Power connection
- Degree of protection
- Ambient and process conditions

► Compare the data on the nameplate with your order.

4.2.2 Product identification

Product page

www.endress.com/cat860

Interpreting the order code

The order code and serial number of your product can be found in the following locations:
- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Open the product website.

2. At the top of the page, select the link **Services**.
   ↳ An additional sidebar opens up.
3. Select **Online Tools** followed by **Access device specific information**.
   ↳ An additional window opens.
4. Enter the order code from the nameplate into the search field. Then select **Show details**.
   ↳ Details of each feature (selected option) of the order code are displayed.

4.3 Scope of delivery

The scope of delivery comprises:
- 1 Liquiline System CAT860 in the version ordered
- 1 copy of the Operating Instructions (in the desired language on selection of the order option)
- 1 CD-ROM with Operating Instructions in all available languages
- Optional accessories

▶ If you have any queries:

Please contact your supplier or local sales center.

4.4 Certificates and approvals

4.4.1 CE mark

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EU directives. The manufacturer confirms successful testing of the product by affixing to it the CE mark.

5 Mounting

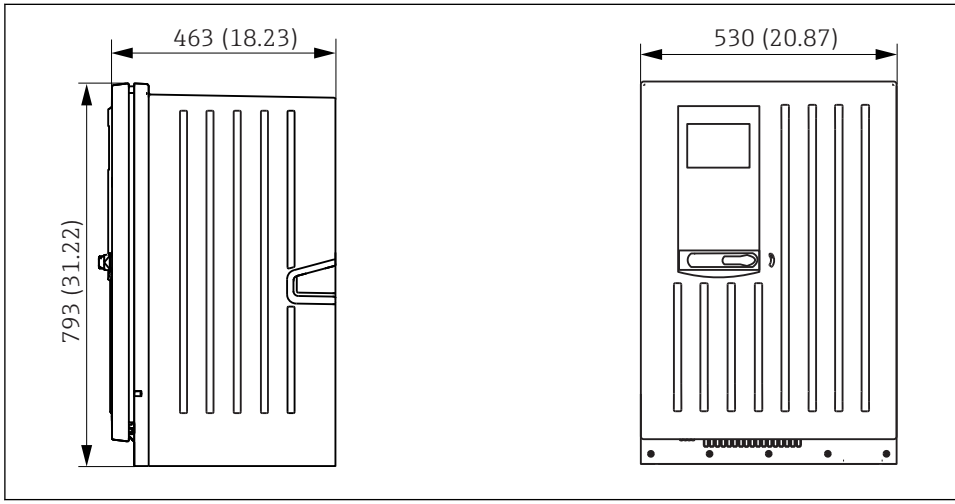
CAUTION

Incorrect transportation or installation can cause injury and damage the device

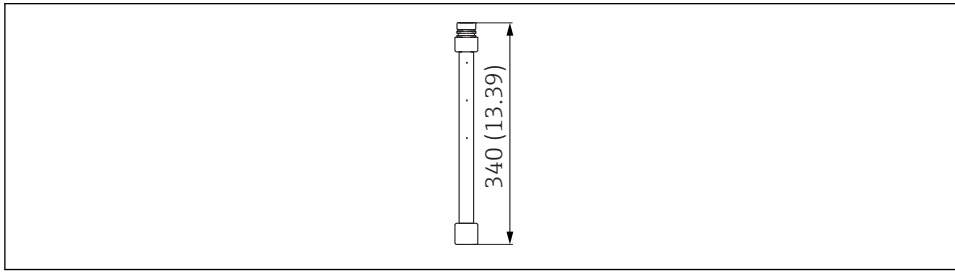
- Always use a lifting truck or a fork-lift to transport the sample preparation system. Two people are needed for the installation.
- Lift the device by the recessed grips.
- Check that the sample preparation system is fully hooked into the wall holder unit at the top and bottom and secure it to the upper wall holder unit using the securing screw.

5.1 Installation conditions

5.1.1 Dimensions



2 *Liquiline System CAT860, dimensions in mm (in)*

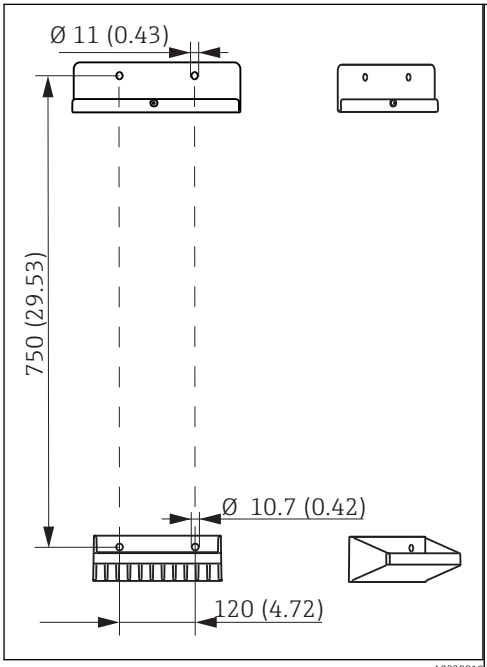


3 *Filter, dimensions in mm (in)*

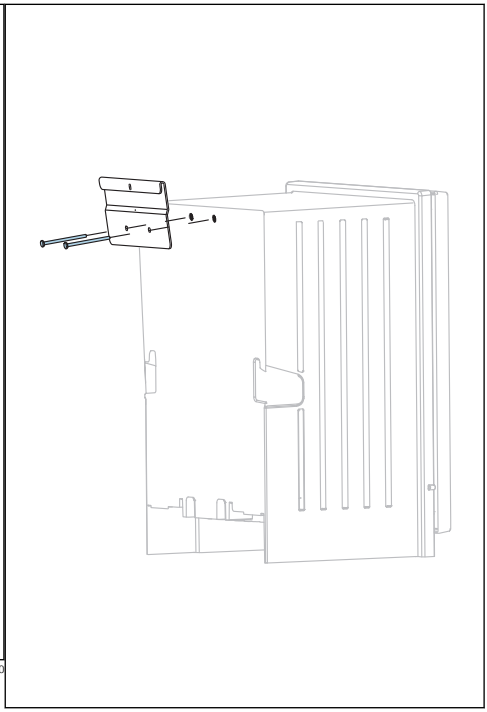
5.1.2 Holder

The mounting materials required to secure the device to the wall are not supplied.

- The mounting materials to secure the device to the wall (screws, wall plugs) must be provided by the customer onsite.

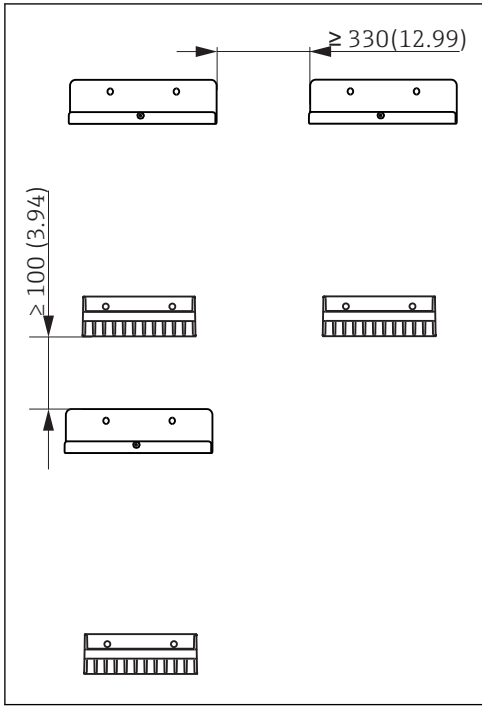


4 *Holder unit dimensions. Engineering unit mm (in)*

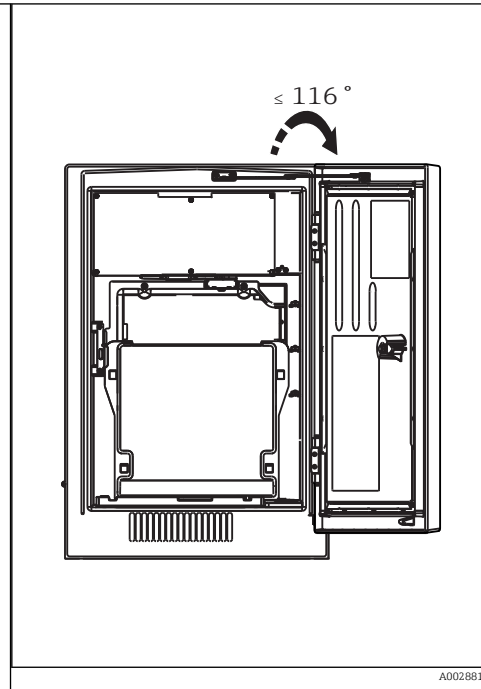


5 *Securing the holder unit on the housing*

5.1.3 Spacing required for mounting the wall holder units

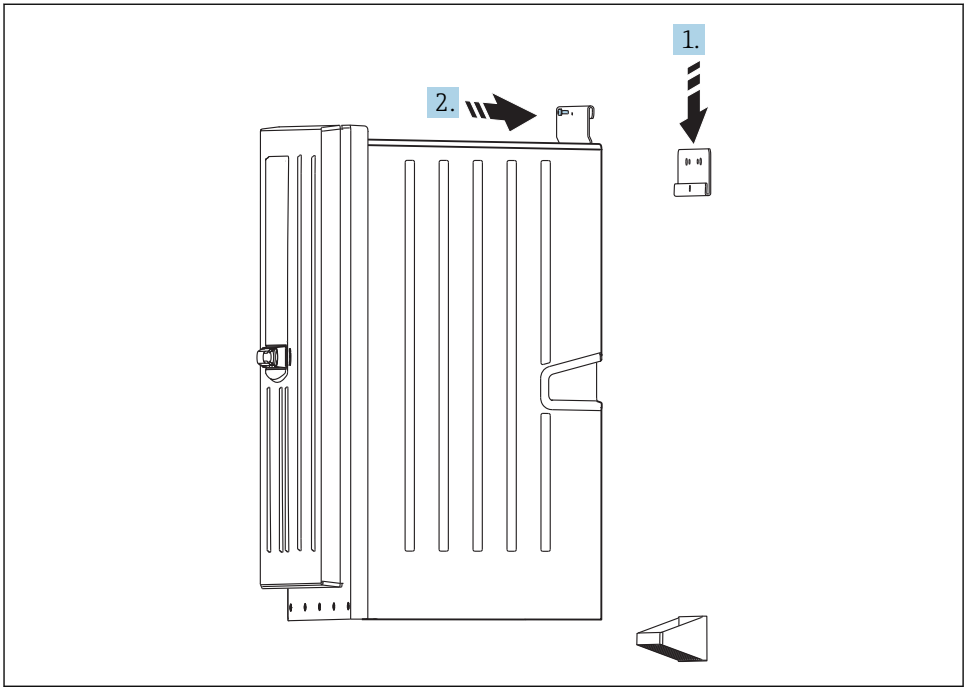


6 *Minimum spacing required for mounting. Engineering unit mm (in).*



7 *Maximum opening angle*

5.1.4 Hooking the sample preparation system into the wall holder unit



8 Hooking into the wall holder unit

1. Hook the analyzer into the wall holder unit.
2. Secure the two top parts of the wall holder unit with the screw supplied.

5.1.5 Installation site

Note the following when erecting the device:

1. Make sure that the wall has sufficient load-bearing capacity and is fully perpendicular.
2. Mount the device on a level surface (with additional base).
3. Protect the device against additional heating (e.g. from a heating system).
4. Protect the device against mechanical vibrations.
5. Protect the device against corrosive gases, e.g. hydrogen sulfide (H_2S).
6. Make sure that the liquid can discharge freely at the outlet without any siphoning effects.
7. Make sure air can circulate freely at the front of the housing.

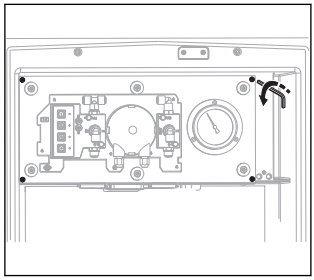
5.2 Manometer transportation lock

NOTICE

The manometer transportation lock is not open

Damage to the manometer or device

▶ Open the transportation lock of the manometer before commissioning.



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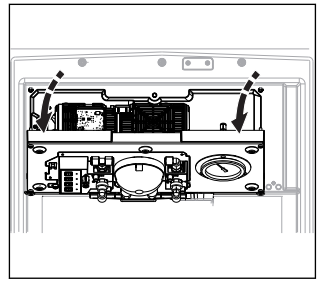
▶ Release the 4 screws with a 3 mm Allen key.



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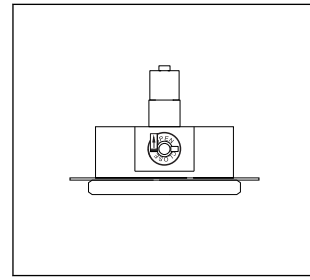
▶ Fold the cover forwards.



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▶ Open the transportation lock by moving the lock from "CLOSE" to "OPEN".

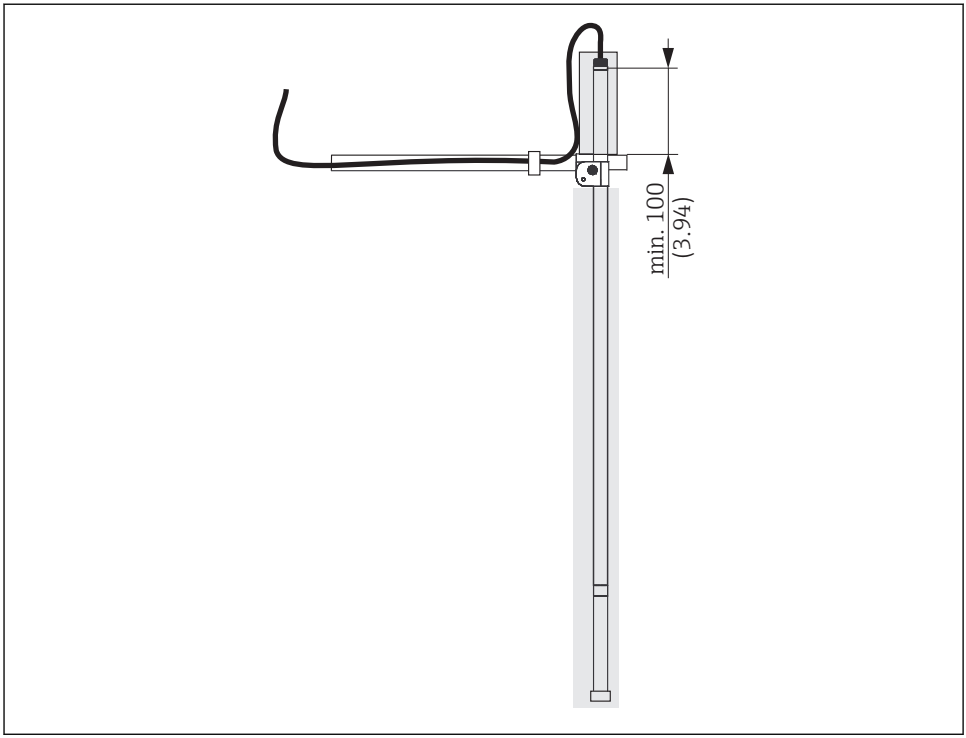
5.3 Mounting the filter in the process

Select the installation location so that a suitable distance from the fixed installations is maintained, and the filter cannot be damaged even when the medium is moving.

For fixed installation, select the retaining point so that the proper operation and maintenance of the assembly is guaranteed. The immersion tube must project at least 100 mm (3.94") above the retaining point (→ 9, 16).

The filter may only be installed with an assembly.

Use Endress+Hauser assemblies to install the filter

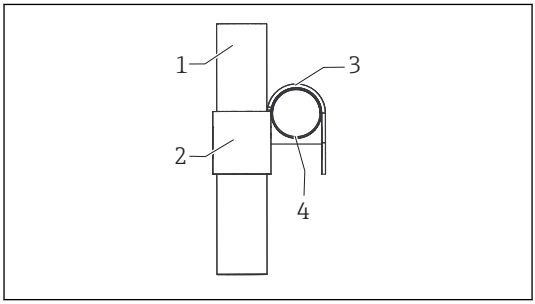


9 Retaining point (shown without splash protection cap)

5.3.1 Mounting as a fixed installation with immersion tube

The cross clamp is mounted in such a way that one closed side faces the center of the basin while the other closed side faces upwards.

Mount the immersion tube as follows:



1 *Immersion tube*
2 *Cross clamp, closed side facing center of basin*
3 *Cross clamp, closed side facing upwards*
4 *Holder transverse pipe*

10

1. Adjust the clamps on the cross clamp.
2. Slide the cross clamp over the immersion tube, making sure that the closed side of the cross clamp faces upwards.
3. Mount the multifunctional clamp ring (funnel-shaped side facing upwards) on the immersion tube above the cross clamp. The multifunctional clamp ring acts as an anti-slip lock.
4. Attach the cross clamp, along with the immersion tube, to the transverse pipe. Make sure that the closed side of the cross clamp faces the basin.
5. Align the assembly and the holder.
6. Tighten the clamp screws finger-tight (finger-tight corresponds to 13 Nm (9.6 lbf ft)).

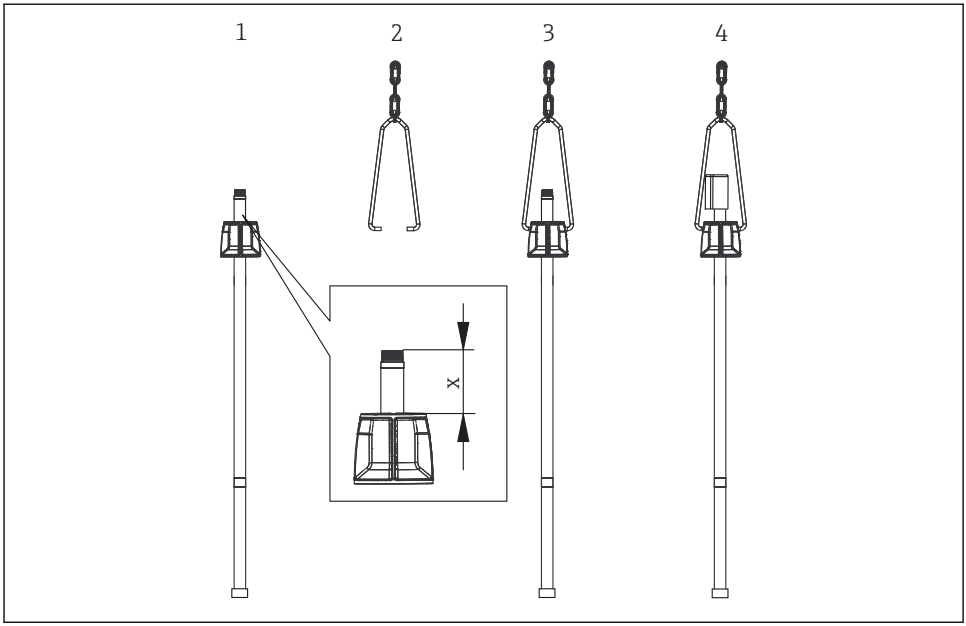
Mount the filter as follows:

1. Screw the immersion tube connection (straight, 90°) onto the immersion tube.
2. Where applicable, screw the quick release fastener onto the immersion tube connection (optional).
3. Remove the thread adapter nut from the hose. The thread adapter nut is not required when installing with an immersion tube.
4. Guide the "filter to pump" hose with the connection for sample preparation through the splash protection cap from below.
5. Guide the "filter to pump" hose with the connection for the filter through the immersion tube from above.
6. If a quick release fastener is used, slide the inner sleeve into the quick release fastener (→ 19).
7. Connect the 4 mm, blue PTFE sample hose to the filter (replacement hose PTFE, 4 mm, black).
8. Screw the filter onto the immersion tube connection or onto the quick release fastener if one is used.

Screw the tubes together finger-tight (no gaps). The threads are lubricated and provided with an O-ring.

5.3.2 Mounting on a chain retainer

Prerequisite:
- The immersion tube is fitted with a filter.
- The transverse pipe is fitted with a chain.



11 *Mounting the chain retainer*

1 Mount the multifunctional clamping ring.
2 Guide the bracket into the chain.
3 Hook the bracket into the multifunctional clamping ring.
4 Fit the splash protection cap.
x 60 to 80 mm (2.35 to 3.15")

1. Immersion tube made of PVC:
   If necessary, insert the stainless steel pipe supplied with the CYA112 assembly as a weight into the PVC immersion tube.
2. Mount the weight on the filter cap.
3. Screw the multifunctional clamp ring onto the immersion tube.
4. Guide the bracket into the bottom chain link.
5. Hook the bracket into the multifunctional clamp ring.
6. Guide the "filter to pump" hose through the splash protection cap from below (do not bend).
7. Fit the Teflon hose onto the filter connection.
8. Secure the chain on the holder with the triangular carabiner.

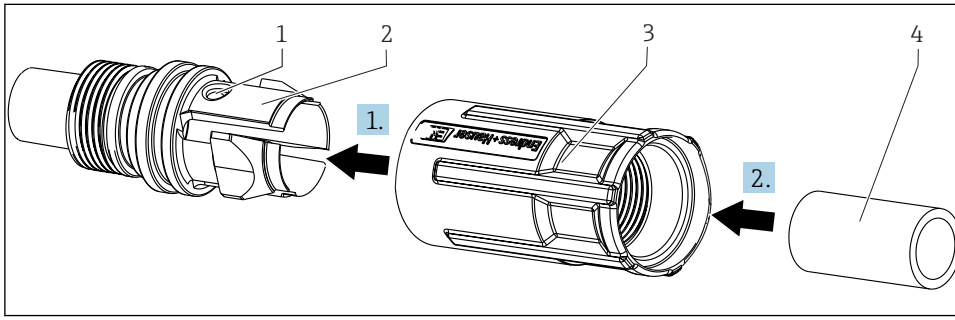
5.3.3 Mounting with a float

Mounting the filter

1. Screw the thread adapter nut onto the plastic insert of the float.
2. Connect the 4 mm, blue PTFE sample hose to the filter.
3. Screw the filter adapter into the plastic insert of the float.
4. Guide the metal bracket through the bottom link in the chain.
5. Secure the metal bracket at the bores provided for this purpose.
6. Fix the "filter to pump" hose to the transverse pipe of the CYH112 holder using hook and loop Velcro fasteners.

Make sure that the filter is vertical and medium flows over it fully.

5.3.4 Quick release fastener



12 *Quick release fastener*

1 Bore hole - makes it easier to screw the adapter on tightly
2 Adapter
3 Thread adapter nut
4 Inner sleeve

Installing the quick release fastener

1. Screw the adapter (item 2) into the immersion tube connection bracket.
2. Insert the Allen key or a similar tool through the bores (item 1) to secure the adapter.
3. Slide the thread adapter nut (item 3) over the adapter until the thread adapter nut engages with a click.
4. Guide the inner sleeve (item 4) through the thread adapter nut into the adapter as far as it will go.
5. First guide the hose for "filter to pump" through the immersion tube and then through the quick release fastener.

6. Connect the sample hose (PTFE, 4 mm, blue) to the filter.
7. Screw the filter into the quick release fastener as far as it will go. In doing so, turn the thread adapter nut, not the filter.

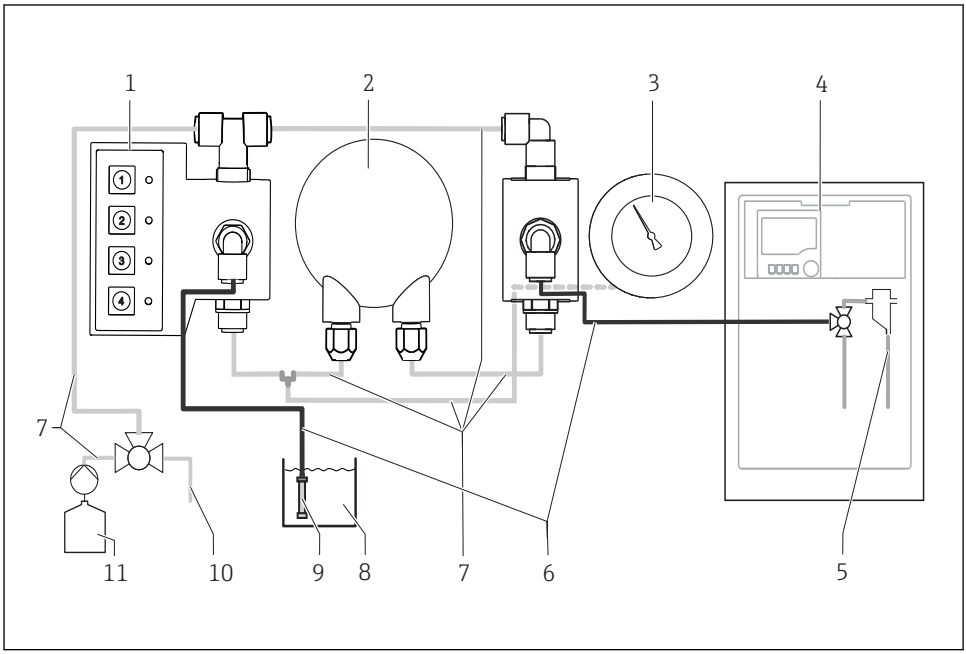
5.4 Connecting external compressed air

⚠ CAUTION

Incorrect connection can cause injuries and damage the device

- ▶ Connect a pressure-reducing valve upstream if the air pressure is likely to rise to above 4 bar (58 psi) (even short pressure surges).

5.4.1 Hose connection diagram



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1 *Control unit*
2 *Pump*
3 *Pressure gauge*
4 *Liquiline System CA80*
5 *Sample*
6 *PTFE hose, black/blue CAC800*
7 *PTFE hose, white, OD 6mm, ID 4mm*
8 *Medium*
9 *Filter (ceramic)*
10 *Compressed air*
11 *Cleaner*

Prerequisites:
- Compressed air with 2.0 to 4.0 bar (29 to 58 psi)
- The compressed air must be filtered (40 µm) and free from water and oil
- No continuous air consumption
- Minimum nominal diameter for compressed air lines: 4mm (0.16 ")

1. Connect the compressed air line to the connection provided on the bottom of the housing.
2. Run the valve's purge air connection at an air pressure of 2.0 to 4.0 bar (29 to 58 psi).
3. Set the pressure at the pressure-reducing valve.

5.5 Connecting the CAT860 sample preparation system to the CA80 analyzer

NOTICE

Solenoid valve and liquid detector incorrectly mounted at analyzer

Damage to dispensers and Liquid Manager of analyzer

▶ When commissioning the CAT860 with the CA80 for the first time (1-channel version): mount the pre-assembled assembly with the sample collecting vessel, solenoid valve and liquid detector in the CA80 analyzer.

The solenoid valve and a liquid detector control the supply of sample from the CAT860 sample preparation system to the CA80 analyzer.

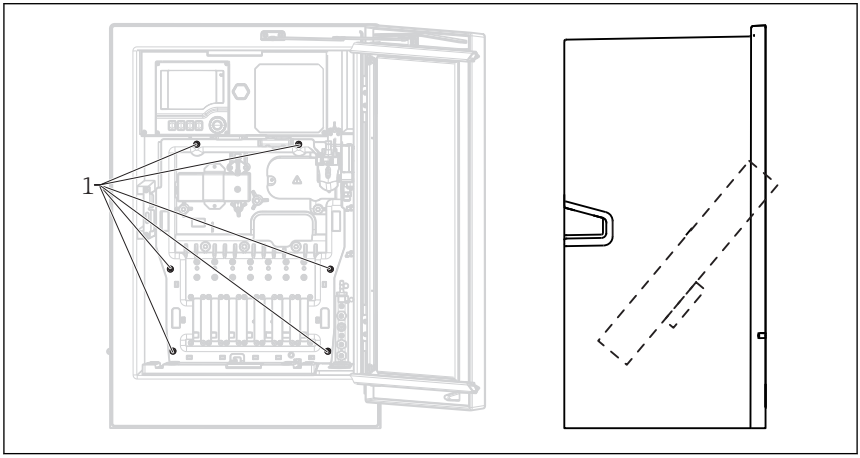
The pre-assembled assembly with a sample collecting vessel, solenoid valve and liquid detector, which is included in the delivery of the CAT860, must be mounted in the CA80 analyzer.

It is only possible to operate a CA80 analyzer with the CAT860 sample preparation system if the following conditions are met:
- 1-channel version of the CA80
- CA80 without a valve for a second analyzer

Removing the carrier board in the analyzer

1. Remove the cover hooked onto the analyzer.

2. Release the 6 screws on the carrier board using a Torx screwdriver (T25).



1 Screws on carrier board

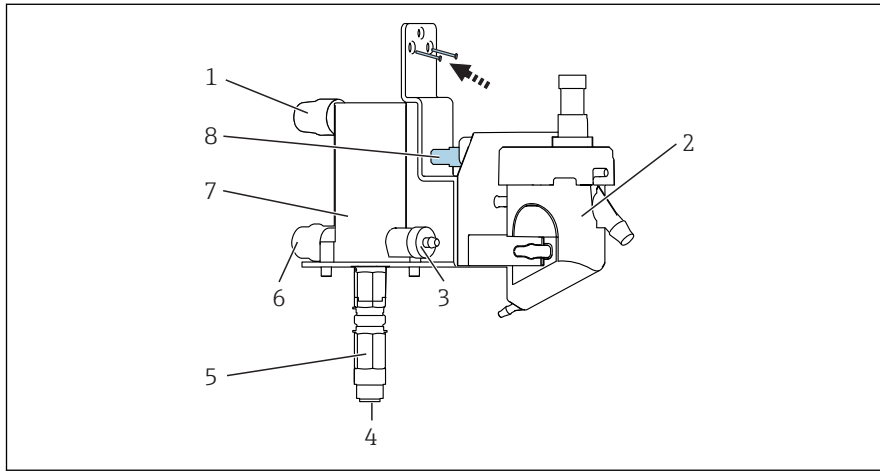
3. Remove the hoses D5, D6 and D7 which lead to the drain.
4. Fold the carrier board forwards and hook it onto the locking plate for convenience of handling.
5. Remove the entire sample collecting unit along with hoses D1, D2 and P from the analyzer: release the 2 screws on the fixing bracket.
6. Remove the connection tongue for the cable of the level measurement unit (8) from the sample collecting vessel.

Mounting the assembly with the sample collecting vessel, solenoid valve and liquid detector in the analyzer

The pre-assembled assembly with a sample collecting vessel, solenoid valve and liquid detector is included in the delivery of the CAT860 but must be mounted in the CA80 analyzer.

▶ Secure the assembly with the 2 screws on the fixing bracket in the analyzer.

↳



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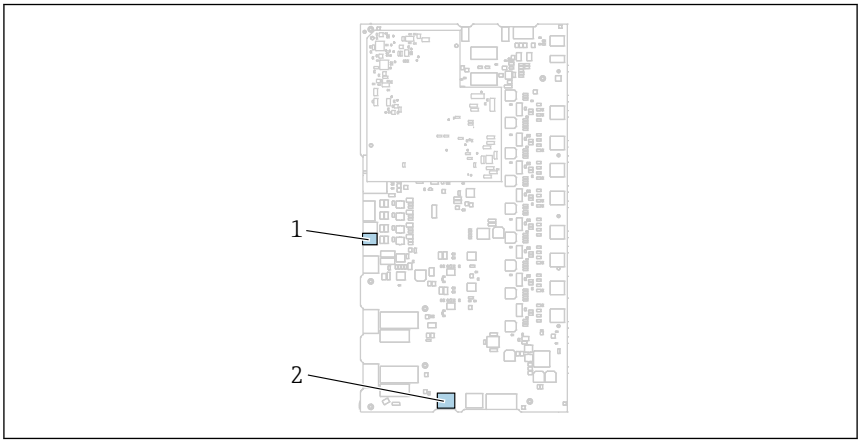
1 *Connecting cable for electrical connection to the control module in the analyzer*
2 *Sample collecting vessel*
3 *Connection for the sample hose to the sample collecting vessel (NO: normally open = open in currentless state)*
4 *Sample inlet from sample preparation system*
5 *Liquid detector*
6 *Connection from the hose to the outlet (NC: normally closed = closed in currentless state)*
7 *Solenoid valve*
8 *Connection tongue for cable of level measurement unit*

Electrical connection

1. Connect the hoses leading away from the solenoid valve: "**NC**" (normally closed = closed in currentless state) to the outlet. "**NO**" (normally open = open in currentless state) is connected to the sample collecting vessel (pre-assembled).
2. Guide the cable of the solenoid valve along the back of the analyzer's carrier board (use the cable holders supplied) and connect the connector to the "Sample valve" slot on the control module. There is no need to remove the module cover.

3. Connect the cable of the liquid detector to the "Inlet/Sample detect 2" slot on the control module.



13 CA80 analyzer: connections on the FXAB1 control module

1 Connection for solenoid valve cable ("Sample valve" slot)
2 Connection for liquid detector cable ("Inlet/Sample detect 2" slot)

4. Fold up the carrier board again and secure it.
5. Connect the connection tongue for the cable of the level measurement unit to the sample collecting vessel.
6. Reconnect hoses D1, D2, D5, D6, D7 and P as per the hose connection diagram for the CA80 analyzer.

5.6 Post-installation check

1. After installation, check the sample preparation system and hoses for damage.
2. After mounting, check all the connections to ensure they are secure and leak-tight.
3. Ensure that the hoses cannot be removed without force.
4. Check whether the compressed air is connected correctly.

6 Electrical connection

WARNING

Device is live!

Incorrect connection may result in injury or death!

- The electrical connection may be performed only by an electrical technician.
- The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- **Prior** to commencing connection work, ensure that no voltage is present on any cable.

NOTICE

The device does not have a power switch

- The device starts as soon as it is supplied with power.
- The customer must provide a protected circuit breaker in the vicinity of the device.
- The circuit breaker must be a switch or power switch, and you must label it as the circuit breaker for the device.
- A fuse with a maximum rating of 6.0 A must be provided by the customer. Observe the local regulations for installation.
- The ground connection must be made before all other connections. Danger may arise if the protective ground is disconnected.

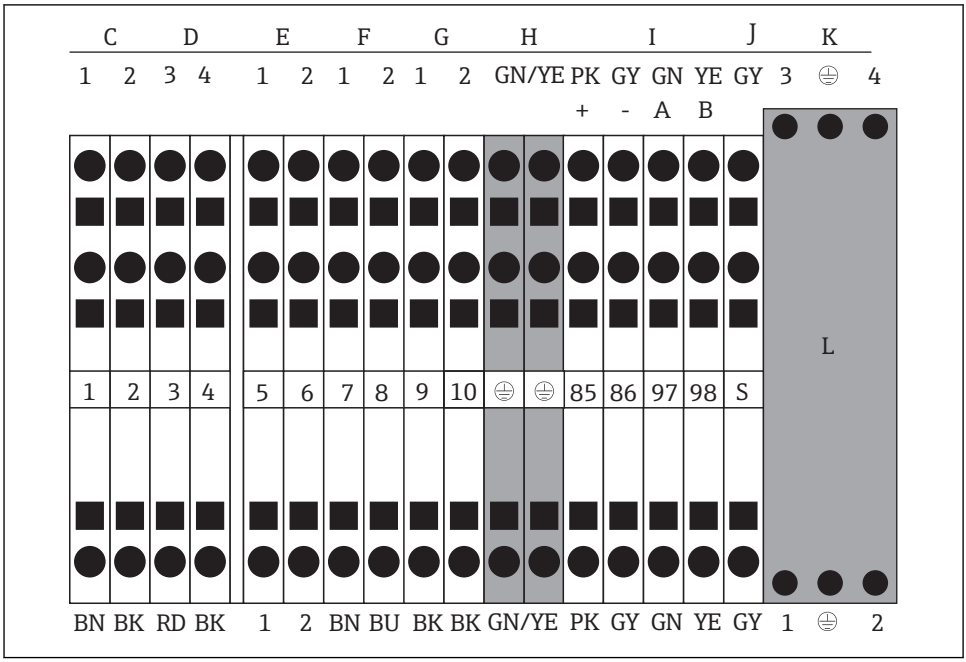
NOTICE

Torn off or buckled hoses can damage the device

- When folding down the carrier board make sure this does not damage any hoses.

The CAT860 sample preparation system can only be used if it is connected to a CA80 analyzer.

- Connect the pre-installed mains cable.

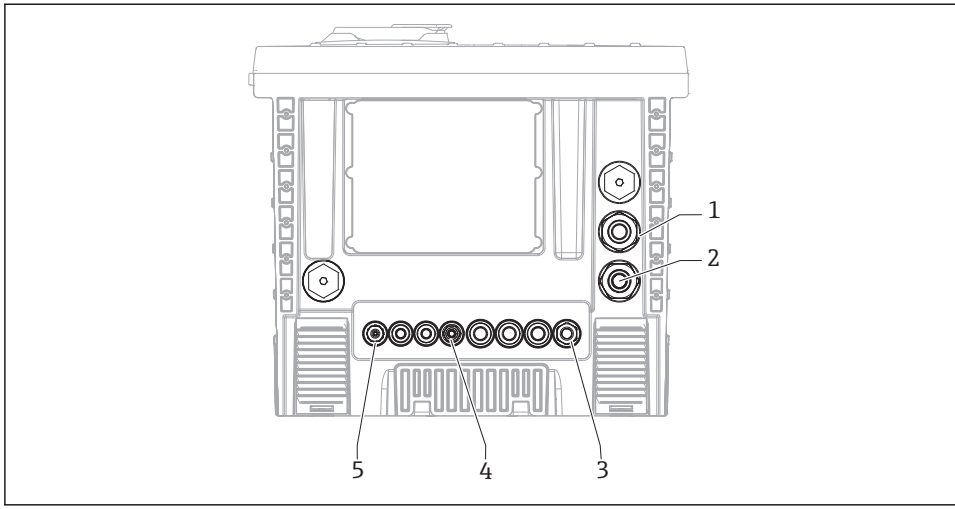


14

C	*Level monitoring*	*H*	*Grounding*
D	*Valve 3*	*I*	*Memosens*
E	*Housing heating (optional)*	*J*	*Shielding*
F	*Diaphragm pump*	*K*	*Supply voltage (115/230 VAC)*
G	*Hose heating (optional)*	*L*	*Line filter*

6.1 Connecting cables and hoses

To install heated hoses, a supply voltage of 200 to 240 V AC or 100 to 120 V AC is required. It is not possible to install heated hoses with the 24-volt version.



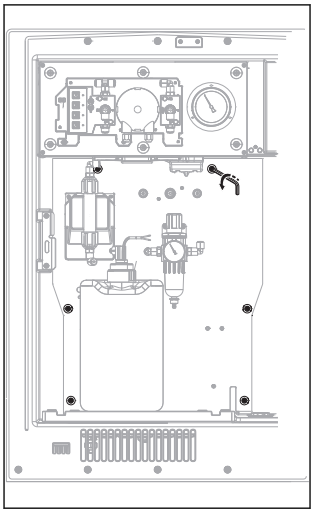
15 Underside of housing

1 Hose, "pump to analyzer"
2 Hose, "filter to pump"
3 Power cable
4 External compressed air line
5 Temperature sensor (optional

1. Release a suitable cable or hose gland on the underside of the housing and remove the dummy plug from the entry.
2. Making sure the gland is facing in the right direction, thread the gland onto the cable or hose end and pull the cable or the hose through the entry and into the housing. Ensure that the hose protrudes by approx. 2 cm beyond the bushing inside the housing.
3. Connect the cables according to the wiring diagram.
4. Lastly, tighten the cable gland or hose gland from the outside.

6.2 Terminal connection

- Power supply: e.g. NYY-J; 3-wire; max. 2.5 mm^2
- Analog, signal and transmission cables: e.g. LiYY 10 x 0.34 mm^2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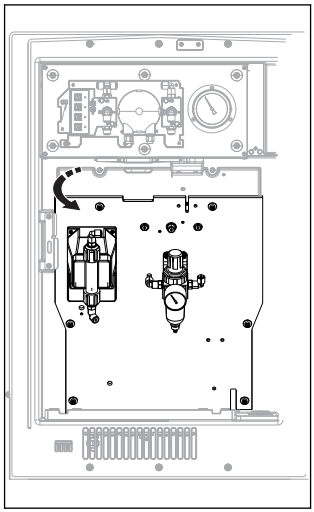
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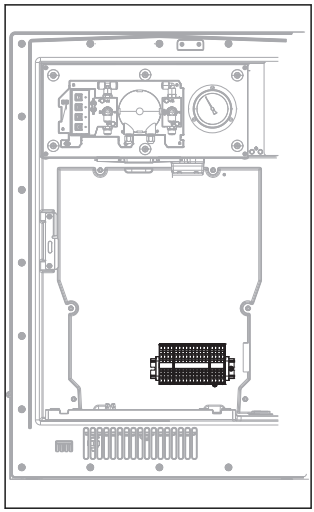
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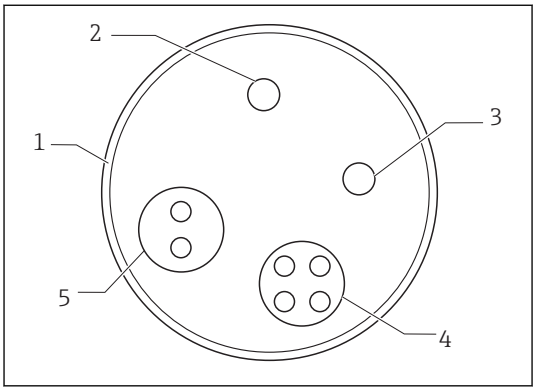
- Release the 6 screws with a 4 mm Allen key.
- Fold out the carrier board as far as the lock plate.
- The terminal block is located behind the carrier board.

6.3 Structure of the spiral hose



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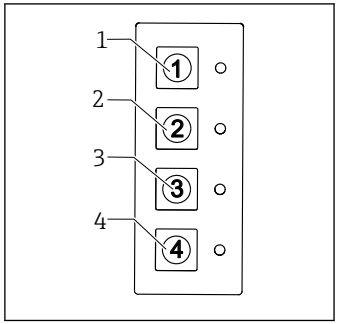
16

1 *Spiral hose, PVC*
2 *PTFE, blue*
3 *PTFE, black*
4 *Memosens*
5 *Hose heating*

7 Operation



1 On-site controller
2 Sample pump forwards
Sample pump backwards (press for longer)
3 Backflush filter with air
4 Backflush filter with cleaner

Key functions

Press once:	Function 1	= LED on
Press for longer:	Function 2	= LED flashes
Press twice:	Stop button	= LED off

8 Commissioning

8.1 Function check

WARNING

Risk of injury from medium leakage, incorrect supply voltage, no protective cover
Safety risks for staff and device malfunctions
- ▶ Check all the connections to ensure that the device has been properly connected.
- ▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.
- ▶ Ensure that the protective cover is mounted.

8.2 Venting the diaphragm pump

1. First vent the diaphragm pump.
2. Open the vent valve.
3. Use the enclosed disposable dispenser and the piece of flexible hose to completely fill the pipe from the canister to the diaphragm pump with cleaning solution.
4. Close the vent valve.

9 Operation

The sample preparation menu is configured via the display and operating elements of a Liquiline System CA80 analyzer. The status and the current process step of the Liquiline System CAT860 sample preparation system are also displayed here. For further information please refer to the relevant documentation.

To ensure optimum synchronization of the measuring point, all of the components (analyzer, sensors, sample preparation system) are controlled in automatic mode by the Liquiline System CA80 analyzer. If key 1 on the Liquiline System CAT860 is pressed, this results in a request to activate onsite mode. If this conflicts with a program cycle that has already begun, the system waits until the cycle is finished before the necessary activation is performed.

This process can take a few minutes, and sometimes even up to 30 minutes (e.g. if cleaning the sample preparation system). Status LED 1 flashes during this time.

10 Diagnostics and troubleshooting

The Liquiline System CAT860 sample preparation system with Memosens technology supports you with diagnostic messages when diagnosing and remedying faults in accordance with NAMUR NE 107. The relevant diagnostic message is output on the display of the Liquiline System analyzer.

If a diagnostic message from error category "F" occurs, the status LED of the Liquiline System CAT820 changes to red and the background of the Liquiline System CA80 display changes to red. --> Additional information is provided in BA01240C

11 Maintenance

WARNING

Electrical voltage

Risk of serious or fatal injury

- Make sure the device is de-energized before you open it.

CAUTION

Risk of injury/infection from escaping medium or uncleaned filters

- Before each maintenance task, ensure that the automatic cleaning function is deactivated.
- Before each maintenance task, ensure that the suction line is unpressurized, empty and rinsed.
- Clean the filter immediately each time it is removed from the process. Only store cleaned filters.

11.1 Maintenance schedule

Interval	Maintenance work
Every week	Check the filter for damage and replace or clean: – If the filter is damaged, replace it – If the filter is undamaged, clean it
After every filter replacement	Check the filter for scratches and other damage and replace the filter if damaged
Every 2 months	Lubricate the Viton O-ring on the filter; replace it if necessary
Every 6 months	Replace the following components: ▪ Pump head ▪ O-rings ▪ Connector to peristaltic pump ▪ PTFE hoses

11.2 Maintenance tasks

⚠ CAUTION

Risk of injury from cleaning solutions

- ▶ Wear protective gloves, protective goggles and protective clothing.
- ▶ When disposing of unused cleaning solutions, observe local regulations.

11.2.1 Cleaning the housing

- ▶ Clean the front of the housing using commercially available cleaning agents only.

The front of the housing is resistant to the following in accordance with DIN 42 115:

- Ethanol (for a short time)
- Diluted acids (max. 2% HCl)
- Diluted bases (max. 3% NaOH)
- Soap-based household cleaning agents

11.2.2 Cleaning agent

NOTICE

Cleaning agents not permitted

Damage to the

- ▶ Never use concentrated mineral acids or alkaline solutions for cleaning.
- ▶ Never use organic cleaners such as acetone, benzyl alcohol, methanol, methylene chloride, xylene or concentrated glycerol cleaner.
- ▶ Never use high-pressure steam for cleaning.

The choice of cleaning agent depends on the degree and type of contamination. The most common types of contamination and the appropriate cleaning agents can be found in the following table.

Type of soiling	Cleaning agent
Greases and oils	CY820 alkaline cleaning solution
Limescale deposits, metal hydroxide buildup	CY820 acidic cleaning solution
Protein buildup	CY820 acidic cleaning solution
Fibers, suspended substances	CY820 alkaline cleaning solution
Light biological buildup	CY820 oxidizing cleaning solution
Antisoluble biological buildup	CY820 oxidizing cleaning solution, then CY820 acidic cleaning solution

11.2.3 Cleaning parts in contact with medium

For stable and safe sampling, the parts of the sample preparation system that come into contact with media must be cleaned regularly. The frequency and intensity of the cleaning process depend on the medium.

1. Remove light soiling with suitable cleaning solutions (see section "Cleaning agents").
2. High levels of contamination are removed using a soft brush and a suitable cleaning agent.
3. For very persistent dirt, soak the parts in a cleaning solution. Then clean the parts with a brush.

Cleaning the filter manually

A typical filter cleaning interval is 1 week for installations in the primary clarifier, for example.

Clean the filter as soon as possible after it is removed from the process.

1. Release the ceramic filter tube from the filter holder.
2. Rinse the ceramic filter tube thoroughly with water.
3. Use the transport packaging of the filter as the cleaning vessel.
4. First clean the ceramic filter tube for 1 to 2 days in a combination of alkaline (1.5 %) and oxidizing cleaner (1.0 %).
   ↳ For detailed information on the "Cleaner", see the Special Documentation for the CY820 cleaner.
5. Rinse the ceramic filter tube thoroughly with water.
6. Then clean the ceramic filter tube in an acid cleaning solution (1.5 %) for 2 days.
7. Rinse the ceramic filter tube thoroughly with water.

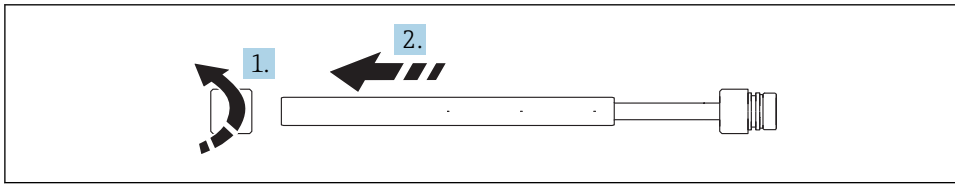
11.2.4 Cleaning the sample collector and hoses between the solenoid valve and sample collector

The automatic cleaning function of the Liquiline System CAT860 comprises the filter and almost all hoses. The collecting vessel and the hose between the solenoid valve and collecting vessel do not fall within the scope of the automatic cleaning function. This excludes the possibility of the measurement result being affected by the cleaning solution. Therefore, the collecting vessel and the hose between the solenoid valve and collecting vessel must be cleaned manually on a regular basis. The cleaning interval in a typical application is 1 week.

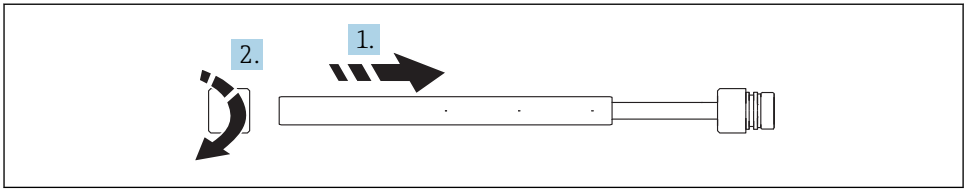
11.3 Replacing the pump hose and pump head

1. Open the cover of the sample preparation system.
2. Press key 1 to go to the on-site mode.
   ↳ The status LED beside key 1 first starts flashing and is then lit continuously once the on-site mode has been enabled. This may take some time → 30.
3. Remove the filter from the medium.
4. Press key 2.
   ↳ The status LED beside key 2 comes on and the peristaltic pump rotates forward. The medium in the hoses is now replaced by intake air.
5. Wait until all the hoses have been completely emptied.
6. Press key 2 again.
   ↳ The pump stops and the status LED goes off.
7. Open the bayonet lock of the peristaltic pump.
8. Replace the hose and, if necessary, replace the pump head.
9. Close the bayonet lock of the peristaltic pump.
10. Make sure all the hoses and connectors are seated correctly.
11. Press key 1 to return to the automatic mode.
    ↳ The settings are accepted, the status LED beside operating key 1 goes out.
12. Close the cover of the sample preparation system.

11.4 Replacing the filter



17 *Removing the filter cartridge*



18 *Installing the new filter cartridge*

The filter unit can stay on the assembly when replacing. Only the ceramic is replaced.

Lubricate the O-rings regularly.

12 Repairs

⚠ CAUTION

Danger resulting from improper repair

- Following all repair and maintenance work, suitable measures must be taken to ensure that the sample preparation system is leak-tight. Once the work is complete, the sample preparation system must once again meet the specifications in the technical data. Replace all other damaged components immediately.

12.1 Spare parts

Contact your Endress+Hauser Service Department if you have any questions about the spare parts.

Detailed information on the spare parts kits is available from the "Spare Part Finding Tool" on the internet at: www.products.endress.com/spareparts_consumables

Item No.	Description and contents	Order number Spare parts kit
201	CAT820/860 kit: solenoid valve (1 pc) Kit instructions: CAT820 / 860, electronics compartment	71218548
202	CAT820/860 kit: control module 100-240 V Kit instructions: CAT820 / 860, electronics compartment	71222174
204	CAT820/860 kit: key electronics Kit instructions: CAT820 / 860, electronics compartment	71222179
205	Kit CAT820/860: ceramic filter pipe 0.1 µm Kit instructions: CAT8xx filter	71222181
206	Kit CAT820/860: 10 x conn. Peristaltic pump Kit instructions: CA8x / CAT8xx hose connection	71241442

Item No.	Description and contents	Order number Spare parts kit
208	CAT820/860 kit: pump head (10 x) Kit instructions: CAT820 / 860, electronics compartment	71222201
209	CAT8xx kit: filter O-ring set (20 x) Kit instructions: CAT8xx filter	71222206
210	CAT820/860 kit: pump hoses (10 pc) Kit instructions: CAT820 / 860, maintenance	71222209
211	Kit CAT860: 10 x hose conn. T Kit instructions: CA8x / CAT8xx hose connection	71222212
213	Kit CAT8xx: 10 x hose conn. 90° Kit instructions: CA8x / CAT8xx hose connection	71222214
214	Kit CAT8xx: 10 x hose conn. G1/4" Kit instructions: CA8x / CAT8xx hose connection	71222216
217	CAT820/860 kit: peristaltic pump, complete Kit instructions: CAT820 / 860, electronics compartment	71218549
225	CAT860 kit: CPU module Kit instructions: CAT820 / 860, electronics compartment	71218557
226	CAT860 kit: canister for cleaner 5 l Kit instructions: CAT860 sample preparation inlet	71218561
227	CAT860 kit: impact/expanding rivets (30 pcs) Kit instructions: CAT860 sample preparation inlet	71222223
228	Kit CAT860: complete vacuum pump Kit instructions: CAT860 sample preparation inlet	71218563
229	CAT860 kit: complete heating module Kit instructions: CAT860 sample preparation inlet	71218567
230	CAT860 kit: complete manometer Kit instructions: CAT860 sample preparation inlet	71218568
231	CAT860 kit: door excl. window, insulated Kit instructions: CAT860 sample preparation inlet	71229927
235	CAT860 kit: complete pressure-reducing valve Kit instructions: CAT860 sample preparation inlet	71222224
244	Kit CAT820/860: ceramic filter, complete Kit instructions: CAT8xx filter	71241492
247	CAT820/860 kit: T-sensor (1 pc.) Kit instructions: CAT820 / 860, electronics compartment	71247278
249	CAT820/860 kit: ceramic filter, PVC holder Kit instructions: CAT8xx filter	71222217
251	CAT8xx kit: compressor 230 V	71249987

12.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

- Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

12.3 Disposal

The device contains electronic components. and must therefore be disposed of in accordance with regulations on the disposal of electronic waste.

- Observe the local regulations.

Always dispose of batteries in accordance with local regulations on battery disposal.

13 Accessories

The following are the most important accessories available at the time this documentation was issued.

- For accessories not listed here, please contact your Service or Sales Center.

Quick release fastener, filter, G1
Order No. 71254159

Post
Order No. 71221053

Post mount clamp
- For securing the sample preparation to horizontal and vertical posts and pipes
- Order No. 71214646

Kit CAT820/860: ceramic filter, complete
Order No. 71241492

Kit CAT820/860: compressor 230 V
Order No. 71249987

The order numbers for accessories for the Flexdip CYA112 assembly can be found in TI00432C.

14 Technical data

14.1 Temperature inputs

14.1.1 Type of input

Pt1000

14.1.2 Accuracy

± 2.5 K

14.2 Power supply

14.2.1 Electrical connection

See the "Electrical connection" section

14.2.2 Supply voltage

- 100 to 120 V AC / 200 to 240 V AC
- 50 or 60 Hz

NOTICE

The device does not have a power switch

- ▶ The customer must provide a protected circuit breaker in the vicinity of the device.
- ▶ The circuit breaker must be a switch or power switch, and you must label it as the circuit breaker for the device.

To install heated hoses, a supply voltage of 200 to 240 V AC or 100 to 120 V AC is required. It is not possible to install heated hoses with the 24-volt version.

14.2.3 Cable entries

Depending on order version:
- 2 x M32 cable gland (assigned internally)
- 1 x M20 cable gland (1 x assigned internally)
- 1 x M12 (temperature sensor, optional)

Permitted cable diameter:
M20 x 1.5 mm: 7 to 13 mm (0.28 to 0.51")

14.2.4 Power consumption of

300 VA (with housing heating)

14.2.5 Fuse

5x20 mm, 250 V, 3.15 A slow-blow (T3.15A)

14.3 Performance characteristics

14.3.1 Sampling method

Control unit, Liquiline System CA80 analyzer

14.3.2 Filtrate quantity

Version with Memosens technology:
- 5.5 to 16.5 ml/min
- Factory setting: 8.25 ml/min

All the values have been determined with new filters.

14.3.3 Suction height of peristaltic pump

Max. 5 m (16 ft)

14.3.4 Hose length, filter to pump

Max. 5 m (16 ft)

14.3.5 Hose length, pump to analyzer

Max. 30 m (98 ft)

14.4 Environment

14.4.1 Ambient temperature range

Unheated
+5 to +50 °C (41 to 122 °F)

Heated
-20 to +50 °C (-4 to +122 °F)

14.4.2 Storage temperature

-20 to +60 °C (-4 to 140 °F)

14.4.3 Humidity

10 to 95 %, non-condensating

14.4.4 Degree of protection

IP55

14.4.5 Electromagnetic compatibility

Interference emission and interference immunity as per EN 61326-1:2006, class A for industrial sectors

14.4.6 Electrical safety

IEC 61010-1, Class I equipment
Low voltage: overvoltage category II
Environment < 2000 m (< 6562 ft) above MSL

14.4.7 Pollution degree

The product is suitable for pollution degree 2.

14.5 Process

14.5.1 Sample temperature

4 to 40 °C (39 to 104 °F)

14.5.2 Consistency of the sample

TS < 8 g/l

14.5.3 pH value of the sample

pH 4 to 14

14.5.4 Salt content of the sample

NaCl concentration < 10,000 mg/l (ppm)

14.5.5 Process pressure

Unpressurized

14.5.6 Compressed air

2 to 4 bar (29 to 58 psi)

14.5.7 Compatible compressors

Configurable compressor (required pressure: 4 bar)

Recommended specifications:

Suction capacity	> 95 l/min
Filling capacity	> 50 l/min
Vessel volume	> 5 l

14.6 Mechanical construction

14.6.1 Dimensions

--> "Installation" section

14.6.2 Weight

33 kg (73 lbs)

14.6.3 Materials

Housing material	
Housing exterior cover	Plastic ASA+PC
Housing inner lining	Plastic PP

Parts in contact with medium	
Filter (ceramic) End caps	Al_2O_3, coated PVC
Hose, sample preparation	PTFE
Couplings, peristaltic pump Nut + sleeve	PP
Hose, peristaltic pump	PHARMED
Coupling, solenoid valve and T-section	POM
Solenoid valve on sample collecting vessel	PVDF
Seal, solenoid valves	EPDM
Seal, valve sample collecting vessel	FKM
Solenoid valve for backflushing	PEEK
Hose from solenoid valve to sample collecting vessel	NORPRENE

Parts in contact with medium	
Cleaning solution canister	PE
Conductivity detection before valve ▪ Double nipple ▪ Sleeve	 ▪ PP ▪ Stainless steel 1.4571 (AISI 316Ti)

14.6.4 Hoses and cables

If a 2400 mm immersion tube is used, use a 5 m hose between the filter and the pump.

Hose, filter to pump	
Permitted hose lengths	▪ 3 m (9.8 ft) ▪ 5 m (16.4 ft)
Spiral hose	▪ PVC material ▪ OD 21.6 mm (0.85") ▪ ID 16 mm (0.63")
Sample hose 1 / 2	▪ PTFE material ▪ OD 4 mm (0.16") ▪ ID 2 mm (0.08") ▪ Color: blue/black
Heated version	Hose heating: 115V/230V (connection inside sample preparation system) Heating capacity 17 Watt per meter, self-limiting

Hose, pump to analyzer	
Permitted hose lengths	▪ 2 m (6.6 ft) ▪ 5 m (16.4 ft) ▪ 10 m (32.8 ft) ▪ 15 m (49.2 ft) ▪ 20 m (65.6 ft) ▪ 30 m (98.4 ft)
Spiral hose	▪ PVC material ▪ OD 24.6 mm (0.97") ▪ ID 19 mm (0.75")
Memosens cable	
Sample hose 1 / 2	▪ PTFE material ▪ OD 4 mm (0.16") ▪ ID 2 mm (0.08") ▪ Color: blue/black
Heated version	Hose heating: 115V/230V (connection to CA80 or CA71; in the case of CA71, connection kit for CA71 heated hose version required) Heating capacity 17 Watt per meter, self-limiting

Compressed air hoses	
Outer diameter	6 mm
Permitted hose lengths	▪ 5 m (16.4 ft)(included in the delivery) ▪ 10 m (32.8 ft) ▪ 15 m (49.2 ft) ▪ 20 m (65.6 ft) ▪ 30 m (98.4 ft) ▪ 50 m (164.0 ft)

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