KA01742C/07/EN/01.25-00
71695969
2025-02-28

Brief Operating Instructions
Liquiline System CA82HA

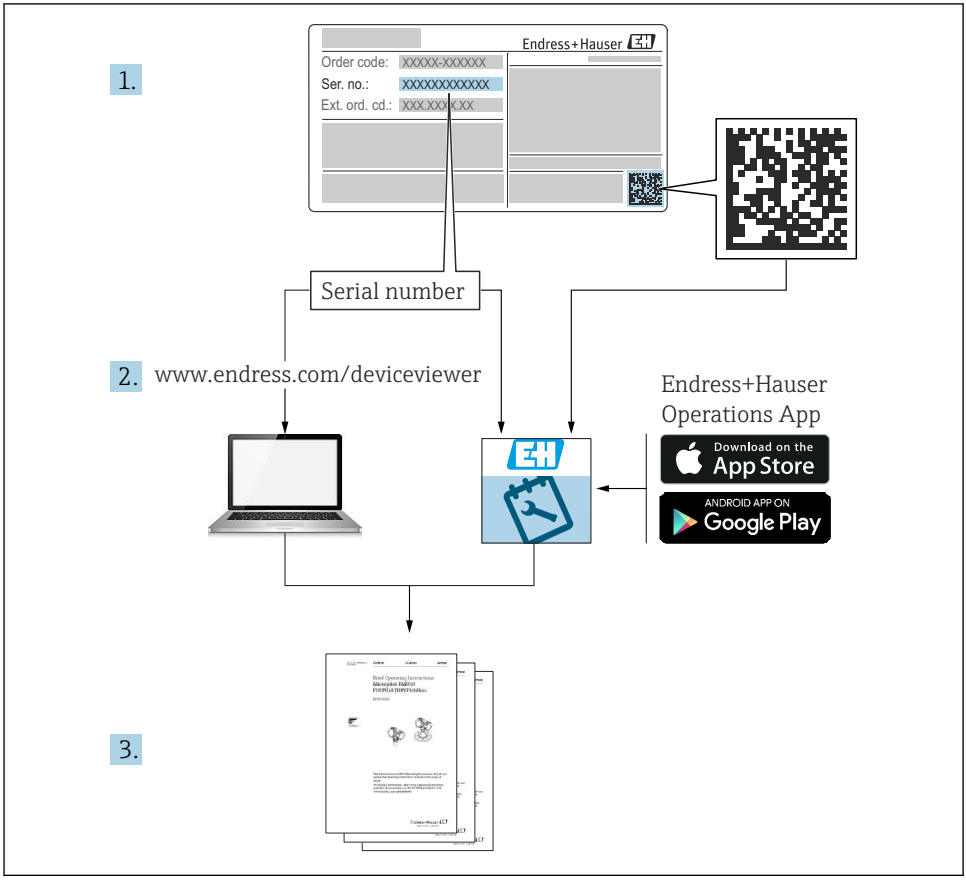
Colorimetric analyzer for total hardness

These instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

Detailed information on the device can be found in the Operating Instructions and in the other documentation available at:

- www.endress.com/device-viewer
- Smart phone/tablet: Endress+Hauser Operations App

Endress+Hauser
People for Process Automation


1.
Endress+Hauser
Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX.XXX-XXX
Serial number
2.
www.endress.com/deviceviewer
Endress+Hauser
Operations App
Download on the
App Store
ANDROID APP ON
Google Play
3.

A0040778

Table of contents

1 About this document ... 4
1.1 Warnings ... 4
1.2 Symbols ... 4
1.3 Symbols on the device ... 4
1.4 Documentation ... 5

2 Basic safety instructions ... 6
2.1 Requirements concerning personnel ... 6
2.2 Intended use ... 6
2.3 Reasonably foreseeable misuse ... 6
2.4 Workplace safety ... 6
2.5 Operational safety ... 7
2.6 Product security ... 7

3 Incoming acceptance and product identification ... 8
3.1 Incoming acceptance ... 8
3.2 Product identification ... 8
3.3 Scope of delivery ... 9

4 Mounting ... 10
4.1 Mounting requirements ... 10
4.2 Mounting the analyzer ... 14
4.3 Post-mounting check ... 16

5 Electrical connection ... 17
5.1 Connecting requirements ... 17
5.2 Connecting the analyzer ... 17
5.3 Ensuring the degree of protection ... 19
5.4 Post-connection check ... 20

6 Operation options ... 20
6.1 Structure and function of the operating menu ... 20

7 Commissioning ... 21
7.1 Preliminaries ... 21
7.2 Function check ... 23
7.3 Switching on the measuring instrument ... 23
7.4 Setting the operating language ... 23
7.5 Configuring the measuring instrument ... 23

1 About this document

1.1 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.

1.2 Symbols

- Additional information, tips
- Permitted
- Recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- Result of an individual step

1.3 Symbols on the device

- Reference to device documentation
- Caution: Hazardous voltage
- Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.4 Documentation

The following manuals complement these Brief Operating Instructions and are available on the product pages on the Internet:

- Operating Instructions for Liquiline System CA82HA
  - Device description
  - Commissioning
  - Operation
  - Software description (excluding sensor menus; these are described in a separate manual - see below)
  - Device-specific diagnostics and troubleshooting
  - Maintenance
  - Repair and spare parts
  - Accessories
  - Technical data
- Technical Information for Liquiline System CA82HA, TI01816C
- Operating Instructions for Memosens, BA01245C
  - Software description for Memosens inputs
  - Calibration of Memosens sensors
  - Sensor-specific diagnostics and troubleshooting
- Guidelines for communication via fieldbus and web server
  - PROFIBUS, SD01188C
  - Modbus, SD01189C
  - Web server, SD01190C
  - EtherNet/IP, SD01293C

2 Basic safety instructions

2.1 Requirements concerning 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 Intended use

Liquiline System CA82HA is a wet-chemical analyzer for almost continuous determination of the concentration of water hardness in ultrapure water and boiler feedwater.

The analyzer is designed for use in the following applications:
- Ultrapure water
- Boiler feedwater
- Steam and condensate analysis
- Reverse osmosis
- Desalination systems

2.3 Reasonably foreseeable misuse

- ▶ All product variants may be damaged if set up or operated outdoors and are therefore not permitted.
- ▶ Use of the device for any purpose other than that intended 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 harm caused by unintended use.

2.4 Workplace safety

The operator is responsible for ensuring compliance with the following safety regulations:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

2.5 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.

Procedure for damaged products:

1. Do not operate damaged products, and protect them against unintentional operation.
2. Label damaged products as defective.

During operation:

- If errors cannot be rectified,
  take products out of service and protect them against unintentional operation.

⚠ CAUTION

Activities while the analyzer is in operation

Risk of injury and infection from medium!

- Before you release any hoses, make sure that no actions, such as the pumping of sample, are currently running or are due to start shortly.
- Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
- Wipe up any spilt reagent with a disposable tissue and rinse with clear water. Then dry the cleaned areas with a cloth.

⚠ CAUTION

Risk of injury from door stop mechanism

- Always open the door fully to ensure the door stop engages properly.

2.6 Product security

2.6.1 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 international standards have been observed.

2.6.2 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions . The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3 Incoming acceptance and product identification

3.1 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.

NOTICE

Incorrect transportation can damage the analyzer

► Always use a lifting truck or a fork-lift to transport the analyzer.

3.2 Product identification

3.2.1 Nameplate

Nameplates can be found:
- On the inside of the door on the bottom right or on the front in the lower right-hand corner
- On the packaging (adhesive label, portrait format)

The following information on the device can be found on the nameplate:
- Manufacturer identification
- Order code
- Extended order code
- Serial number
- Firmware version
- Ambient and process conditions
- Input and output values
- Measuring range
- Activation codes
- Safety information and warnings
- Certificate information
- Approvals as per order version

► Compare the information on the nameplate with the order.

3.2.2 Identifying the product

Product page

www.endress.com/ca82ha

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. Go to www.endress.com.
2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.
4. Click the product overview.
   ↳ A new window opens. Here you fill information pertaining to your device, including the product documentation.

3.2.3 Manufacturer address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
70839 Gerlingen
Germany

3.3 Scope of delivery

Scope of delivery
- 1 analyzer in the version ordered with optional hardware
- 1 x Brief Operating Instructions (hard copy)
- **Accessories enclosed:**
  - Wall bracket
  - Magnetic stir bar (for installation in cuvette)
  - 10 ml dispenser with hose (for draining cuvette and sample channel)
  - SD card (optional)
  - Supply hose
  - Sample outlet hose (for sample overflow)
  - Outlet hose (for overflow at cuvette)

	1-channel	2-channel	4-channel	6-channel
Filters and pressure relief valves	1 filter, 1 pressure relief valve with angle bracket	2 filters, 2 pressure relief valves with angle brackets	Panel with 4 pre-installed filters and 4 pre-installed pressure relief valves	Panel with 6 pre-installed filters and 6 pre-installed pressure relief valves
Sample channel switching	in analyzer	in analyzer	pre-installed on panel	pre-installed on panel

- If you have any queries:
  Please contact your supplier or local sales center.

4 Mounting

CAUTION

Incorrect transportation can cause injury and damage the device

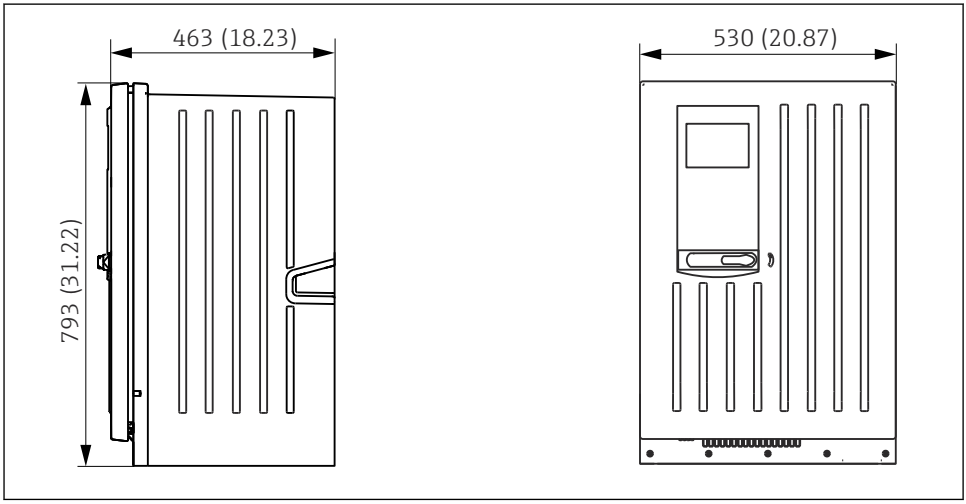
- Always use a lifting truck or a fork-lift to transport the analyzer. Two people are needed for the installation.
- Lift the device by the recessed grips.

4.1 Mounting requirements

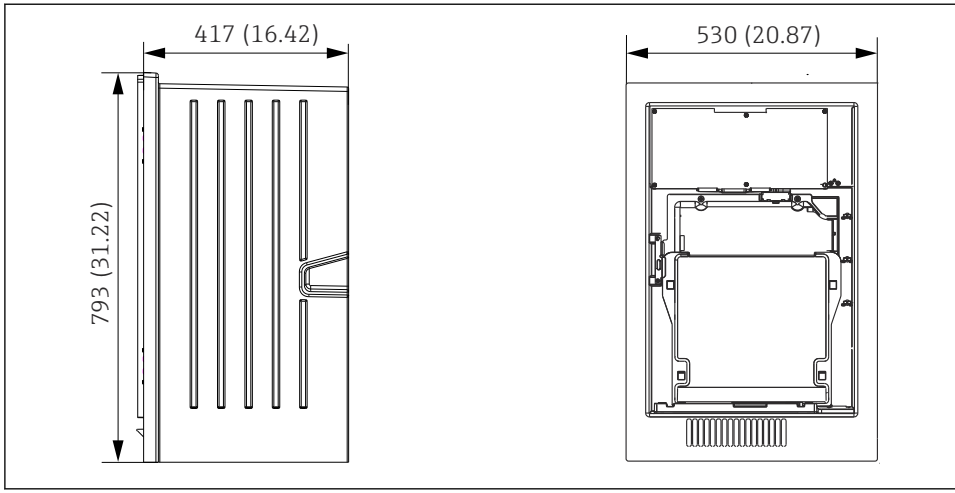
The device can be installed in the following ways:

- Mounted on a wall
- Mounted on a base

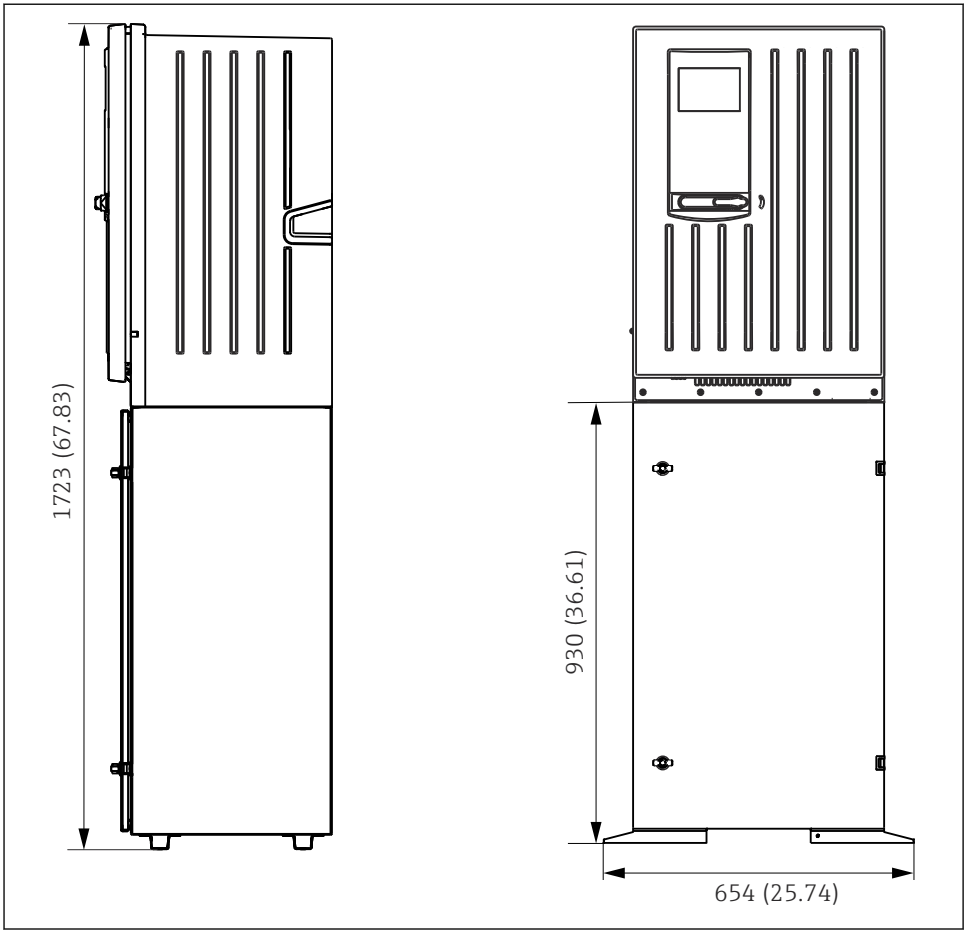
4.1.1 Dimensions



1 *Enclosed installation. Unit of measurement mm (in)*



2 Open installation. Unit of measurement mm (in)



3 With base. Unit of measurement mm (in)

4.1.2 Mounting location

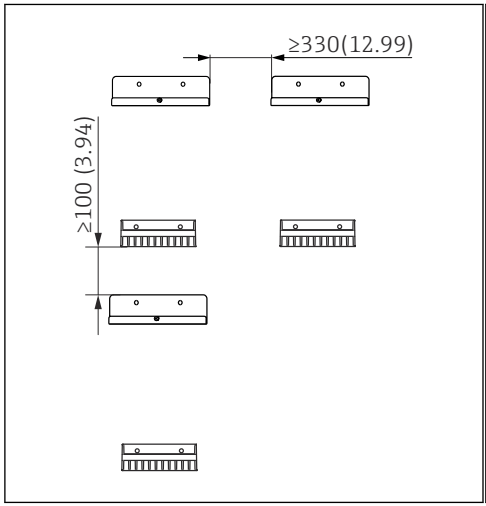
Note the following when erecting the device:

- If mounting on a wall, make sure that the wall has sufficient load-bearing capacity and is fully perpendicular.
- If mounting on a base, set up the device on a level surface. Installing on a base is only permitted indoors.
- Protect the device against additional heating (e.g. from heaters).
- Protect the device against mechanical vibrations.
- Protect the device against corrosive gases, e.g. hydrogen sulfide (H_2S) and chlorine gases.
- Make sure to pay attention to the maximum height difference and the maximum distance from the sampling point.

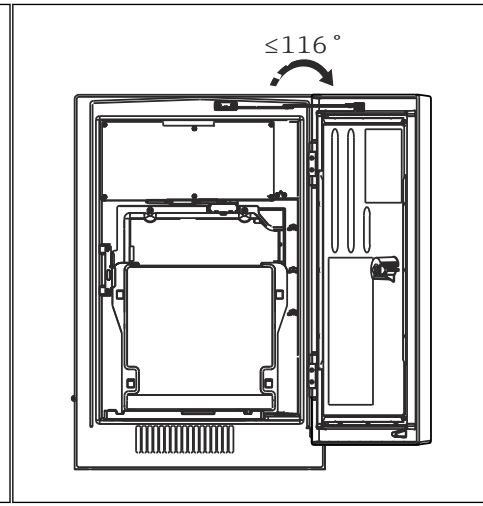
- Ensure that sample outlet hose "D" and outlet hose "W" can drain freely, without any siphoning effects.
- Make sure air can circulate freely at the front of the housing.
- Open analyzers (i.e. analyzers that are supplied without a door) may only be set up in closed areas or in a protective cabinet or similar facility.

4.1.3 Spacing requirements when mounting

Spacing required for installing analyzer

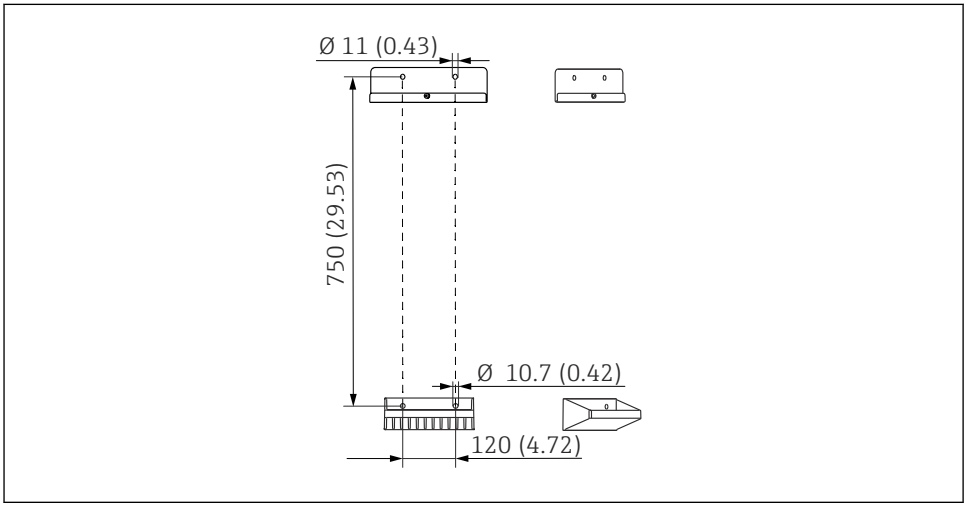


4 Minimum spacing required for installation. Unit of measurement mm (in)



5 Maximum opening angle

Spacing required for installing wall-mount version



6 *Dimensions of holder. Unit of measurement mm (in)*

4.2 Mounting the analyzer

4.2.1 Mounting the analyzer on a wall

⚠ CAUTION

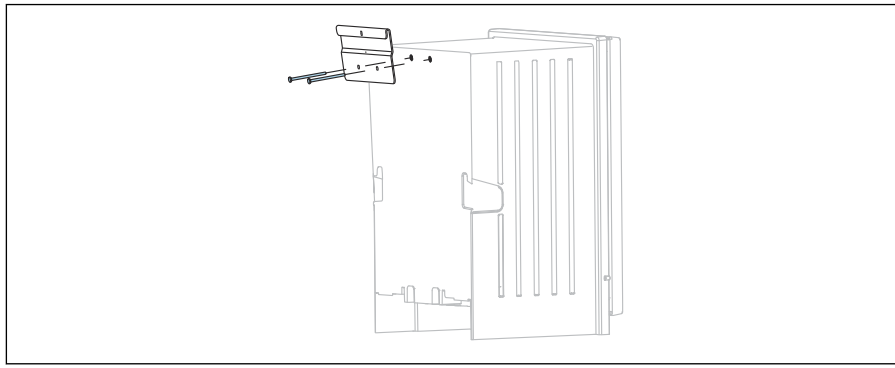
Incorrect installation can cause injury and damage the device

- If mounting on a wall, check that the analyzer is fully hooked into the wall holder unit at the top and bottom, and secure the analyzer to the upper wall holder unit using the securing screw.

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

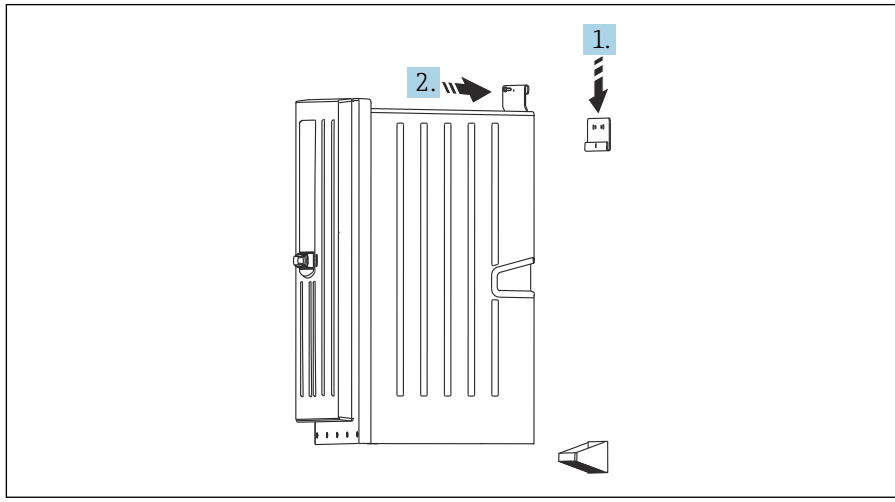
1. Provide the mounting materials to secure the device to the wall (screws, wall plugs) onsite.
2. Mount the wall holder unit (2 parts) on the wall.

3.



Secure the mount on the housing.

4.



A0036781

Hook the analyzer into the wall holder unit (1).

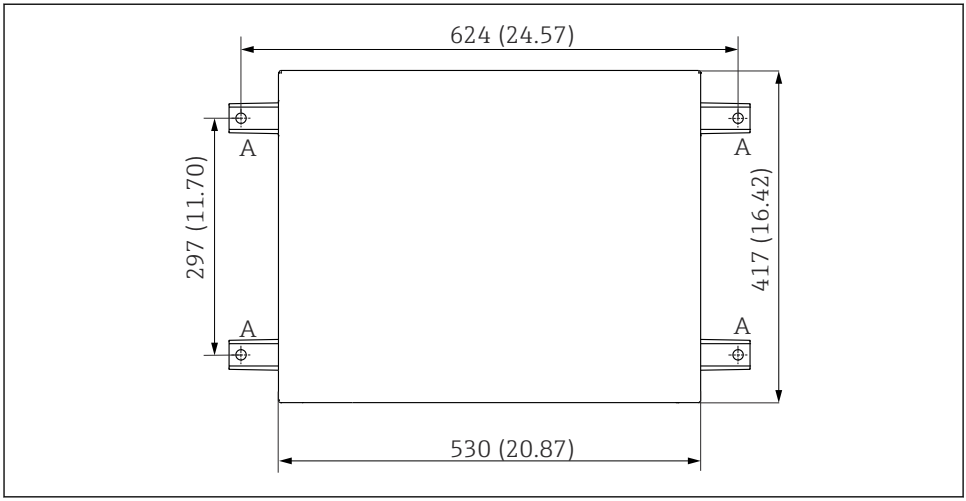
5. Fix the mount and wall holder unit in place with the screw supplied (2).

4.2.2 Installing version with analyzer stand

CAUTION

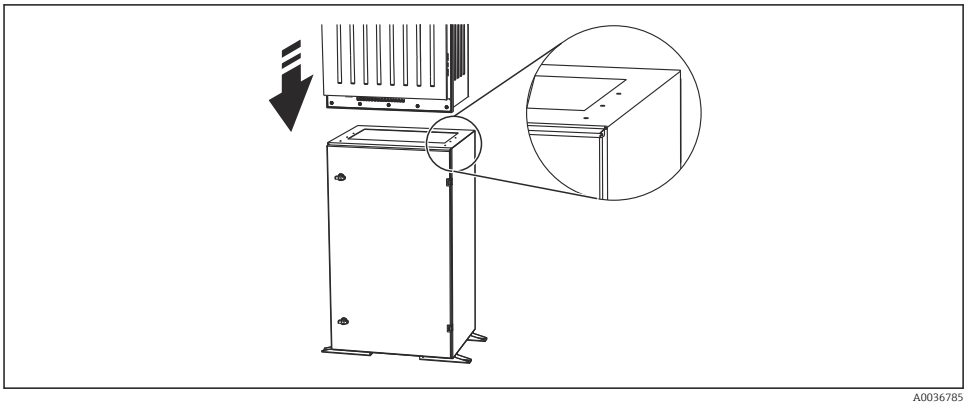
Incorrect installation can cause injury and damage the device

- If using the version with analyzer stand, make sure that the analyzer stand is secured to the floor.



7 Foundation plan. Unit of measurement mm (in)

A Fasteners (4 x M10)



8 Securing the base

1. Screw the base to the ground.
2. With 2 people, lift the analyzer and fit it on the base. Use the recessed grips.
3. Secure the base to the analyzer using the 6 screws supplied.

4.3 Post-mounting check

After mounting, check all the connections to ensure they are secure.

5 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.

- Before establishing the electrical connection, verify that the pre-installed power cable meets the local national electrical safety specifications.

5.1 Connecting requirements

5.2 Connecting the analyzer

NOTICE

The device does not have a power switch

- You must install the device near (distance < 3 m (10 ft)) an easily accessible and fused plug socket so that it can be disconnected from the power supply.

- Comply with the instructions for protective grounding when installing the analyzer.

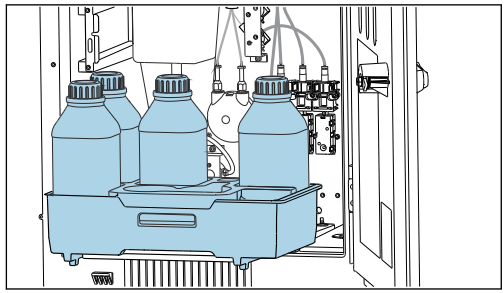
5.2.1 Routing the cable in the connection compartment

The analyzer is supplied with a pre-installed power cable.

- For cabinet versions, the cable length is approx. 4.3 m (14.1 ft) from the housing floor.
- For cabinet versions with CSA approval (CA8xXX-CA), the cable length from the base of the housing is 2.3 m (7.55 ft).
- For analyzer stands, the cable length is approx. 3.5 m (11.5 ft) from the foundation.

Connection of analog inputs and outputs, Memosens sensors or digital fieldbuses

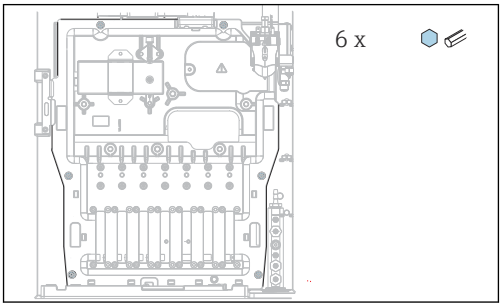
1.



Remove the bottle tray: Lift up the recessed grip slightly and pull it towards the front.

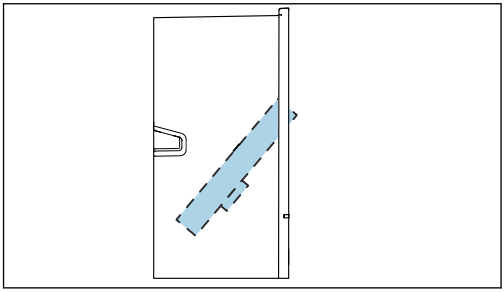
2. Remove all liquid-bearing sample lines.

3.



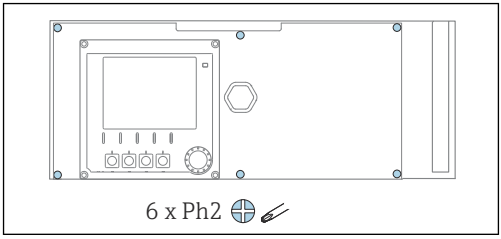
Release the 6 screws on the carrier plate using a Torx screwdriver (T25).

4.



Fold out the carrier plate towards the front and remove.

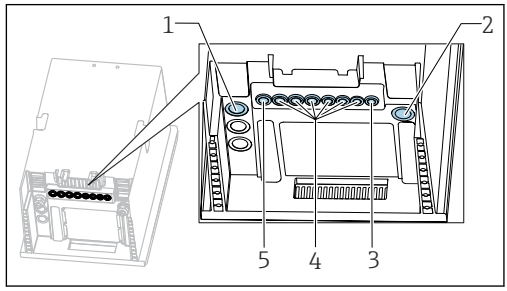
5.



Release the 6 screws on the electronics compartment cover using a Phillips-head screwdriver and fold out the cover towards the front.

6. **Only for order versions with G or NPT glands:**
Replace the pre-installed M-thread cable glands with the G or NPT cable glands that are enclosed. This does not affect the M32 hose glands.

7.



1 Sample outlet hose "D" and either sample inlet hose SP1 and SP2 (1-/2-channel version) or SPx (4-/6-channel version)
2 Outlet hose "W"
3 4-/6-channel version: Cable connection for panel
4 Connections for sensors, signal lines
5 Power cable (factory-connected)

Guide the cables through the cable glands on the bottom of the device.

For all versions

8. Route the cables on the rear panel of the device so that they are properly protected. Use cable clips.
9. Guide the cable to the electronics compartment.

After connecting:

1. Secure the electronics compartment cover with the 6 screws.
2. Fold up the carrier plate and use the 6 screws to secure it after connecting.
3. Tighten the cable glands on the bottom of the device to secure the cables.
4. Place the bottle tray back into the housing.

5.3 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions, and which are necessary for the required intended use, may be established on the device delivered.

▶ Exercise care when carrying out the work.

Individual types of protection permitted for this product (impermeability (IP), electrical safety, EMC interference immunity, explosion protection) can no longer be guaranteed if, for example:
- Covers are left off
- Different power units to the ones supplied are used
- Cable glands are not sufficiently tightened (must be tightened with 2 Nm (1.5 lbf ft) for the permitted level of IP protection)
- Unsuitable cable diameters are used for the cable glands
- Modules are not fully secured

- The display is not fully secured (risk of moisture entering due to inadequate sealing)
- Cables/cable ends are loose or insufficiently tightened
- Conductive cable strands are left in the device

5.4 Post-connection check

⚠ WARNING

Connection errors

The safety of people and of the measuring point is at risk! The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

▶ Put the device into operation only if you can answer **yes** to **all** the following questions.

Device condition and specifications

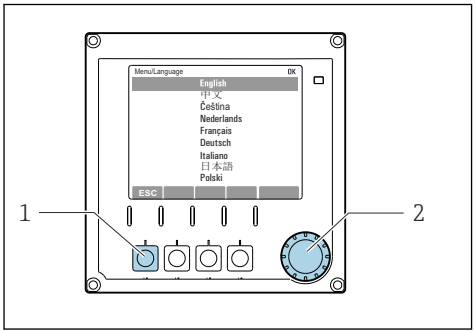
▶ Are the device and all the cables free from damage on the outside?

Electrical connection

▶ Are the mounted cables strain relieved?
▶ Are the cables routed without loops and cross-overs?
▶ Are the signal cables correctly connected as per the wiring diagram?
▶ Are all plug-in terminals securely engaged?
▶ Are all the connection wires securely positioned in the cable terminals?

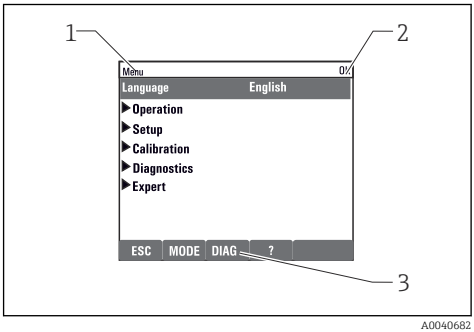
6 Operation options

6.1 Structure and function of the operating menu



9 Display (example)

1 *Soft key (press function)*
2 *Navigator (jog/shuttle and press/hold function)*



10 Display (example)

1 *Menu path and/or device designation*
2 *Status indicator*
3 *Assignment of soft keys, ESC: Go back, MODE: Fast access to frequently used functions, DIAG: Link to Diagnostics menu ?: Help, if available*

7 Commissioning

Activities while the analyzer is in operation

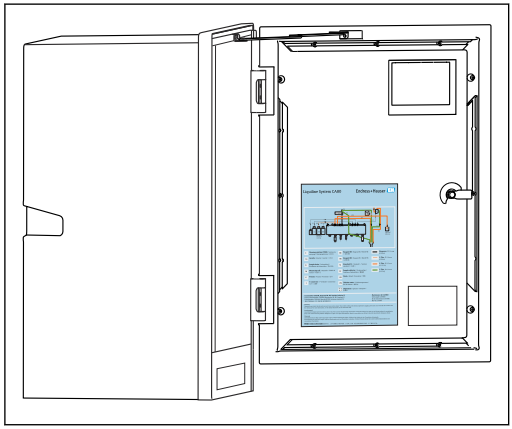
Risk of injury and infection from medium!

- ▶ Before you release any hoses, make sure that no actions, such as the pumping of sample, are currently running or are due to start shortly.
- ▶ Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
- ▶ Wipe up any spilt reagent with a disposable tissue and rinse with clear water. Then dry the cleaned areas with a cloth.

7.1 Preliminaries

7.1.1 Commissioning steps

7.1.2 Hose connection diagram

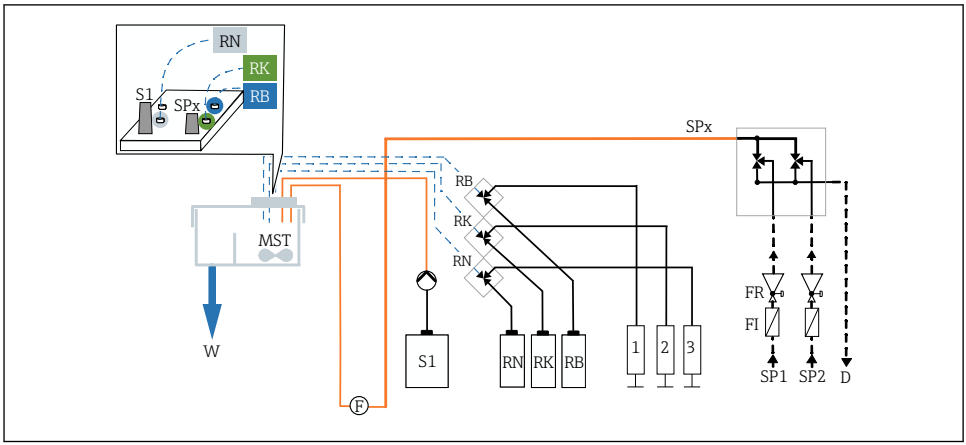


A0041298

11 Hose connection diagram

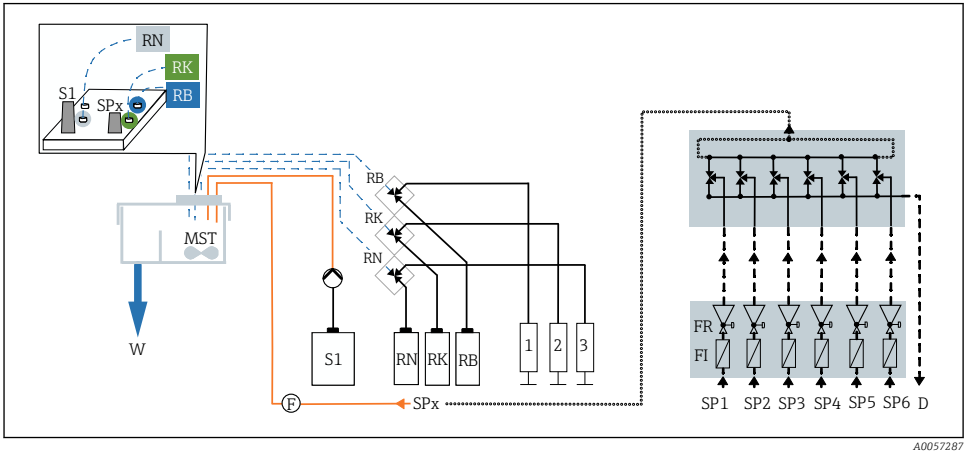
The diagrams below reflect the status at the time of issue of this documentation. The hose connection diagram that applies for your device version is provided on the inside of the door of the analyzer.

- ▶ Only connect the hoses as specified in this diagram.



12 *Hose connection diagram for 1-/2-channel version*

D	*Sample outlet*	*RB..N*	*Reagents RB, RK, RN*
F	*Flow sensor*	*S1*	*Standard 1*
FR	*Pressure relief valve*	*SP1..6*	*Sample inlets*
FI	*Filter*	*W*	*Drain*
MST	*Magnetic stirrer*	*1, 2, 3*	*Dispensers*



13 *Hose connection diagram for 4-/6-channel version*

D	*Sample outlet*	*RB..N*	*Reagents RB, RK, RN*
F	*Flow sensor*	*S1*	*Standard 1*
FR	*Pressure relief valve*	*SP1..6*	*Sample inlets*
FI	*Filter*	*W*	*Drain*
MST	*Magnetic stirrer*	*1, 2, 3*	*Dispensers*

7.2 Function check

Incorrect connection, incorrect supply voltage

Safety risks for staff and device malfunctions!

- ▶ Check that all connections have been established correctly in accordance with the wiring diagram.
- ▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.

Connection errors

The safety of people and of the measuring point is under threat. The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

- ▶ Put the device into operation only if you can answer **yes** to **all** the following questions.

Check the device conditions and specifications.

- ▶ Are the hoses free from damage on the outside?

Visual inspection of the liquid-bearing lines

- ▶ Have the bottles with reagents, and standard been inserted and connected?
- ▶ Is the magnetic stir bar lying flat in the bypass?

7.3 Switching on the measuring instrument

1. Connect the power supply.
2. Wait for the initialization to finish.

7.4 Setting the operating language

Configuring the language

1. Press the soft key: **MENU**.
2. Set your language in the top menu item.
   ↳ The device can now be operated in your chosen language.

7.5 Configuring the measuring instrument

7.5.1 Basic setup analyzer

Making basic settings

1. Switch to the menu **Setup/Basic setup analyzer**.
   ↳ Make the following settings.

- Device tag
  Give your device any name of your choice (max. 32 characters).
- Set date
  Correct the set date if necessary.
- Set time
  Correct the set time if necessary.

2. Insert the bottles and activate the bottles used in the menu: **Bottle insertion**/**Bottle selection**.
3. Check the concentration of the calibration standard used: **Calibration**/**Settings**/**Nominal concentration**.
4. Optionally, also change the measuring interval: **Measurement**/**Measuring interval**.
   ↳ All the other settings can be left in the default factory settings for the time being.
5. Return to the measuring mode: press and hold the soft key for **ESC** for at least one second.
   ↳ Your analyzer now works with your general settings. Optionally connected sensors use the factory settings of the specific sensor type and the individual calibration settings that were last saved.

If you want to already configure additional input and output parameters in the **Basic setup analyzer**:

▶ Configure the current outputs, relays, limit switches and device diagnostics with the following submenus.

www.addresses.endress.com

Endress+Hauser

People for Process Automation