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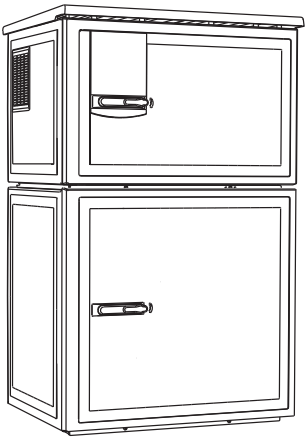
Valid as of:
Softwareversion 01.05.00

Brief Operating Instructions
Liquistation CSF34

Automatic sampler for liquid media



These are Brief Operating Instructions.
Please refer to the Operating Instructions and the Special Manuals on the CD-ROM provided for detailed information.

Endress+Hauser
People for Process Automation

Table of contents

1 Document information

1.1 Warnings

The structure, signal words and safety colors of the signs comply with the specifications of ANSI Z535.6 ("Product safety information in product manuals, instructions and other collateral materials").

Safety message structure	Meaning
⚠ DANGER **Cause (/consequences)** Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation **will** result in a fatal or serious injury.
⚠ WARNING **Cause (/consequences)** Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the situation **can** result in a fatal or serious injury.
⚠ CAUTION **Cause (/consequences)** Consequences if safety message is not heeded ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE **Cause/situation** Consequences if safety message is not heeded ▶ Action/note	This symbol alerts you to situations that can result in damage to property and equipment.

1.2 Symbols used

Additional information, tips

Permitted or recommended

Forbidden or not recommended

1.3 Documentation

As a supplement to these Brief Operating Instructions the following manuals are available on the CD-ROM:

- Operating Instructions Liquistation CSF34, BA00478C
  - Device description
  - Commissioning
  - Operation
  - Software description (apart from Memosens)
  - Device-specific diagnostics and troubleshooting
  - Maintenance
  - Repair and spare parts
  - Accessories
  - Technical data
- Operating Instructions Memosens, BA01245C
  - Software description for Memosens inputs
  - Calibration of Memosens sensors
  - Sensor-specific diagnostics and troubleshooting
- Operating Instructions for HART communication, BA00486C
  - Onsite settings and installation instructions for HART
  - Description of HART drivers
- Guidelines for communication via fieldbus and web server
  - HART, SD01187C
  - PROFIBUS, SD01188C
  - Modbus, SD01189C
  - Web server, SD01190C

The CD also contains:

- Technical Information Liquistation CSF34
- Special Documentation: Sampler application manual SD01068C
- Documentation for other devices in the Liquiline family:
  - Liquiline CM44x (field device)
  - Liquiline CM44xR (DIN rail device)
  - Liquiport CSP44
- Simulation software

2 Basic safety instructions

2.1 Requirements for personnel

- ▶ Installation, commissioning, operation and maintenance of the measuring system must only be carried out by specially trained technical personnel.
- ▶ The technical personnel must be authorized by the system operator to perform the specified tasks.
- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The technical personnel must have read and understood these Operating Instructions and must comply with them.
- ▶ Faults at the measuring point may only be rectified by authorized and specially trained personnel.

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

2.2 Designated use

The Liquistation CSF34 is a stationary sampler for liquid media. The samples are taken discontinuously using a vacuum or peristaltic pump, distributed to sampling containers and cooled.

The sampler is designed for use in the following applications:
- Municipal and industrial wastewater treatment plants
- Laboratories and Water Conservancy Boards
- Monitoring of liquid media in industrial processes

Any other use than the one described here compromises the safety of persons and the entire measuring system and is not permitted.
The manufacturer is not liable for damage caused by improper or non-designated use.

2.3 Occupational safety

As the user, you are responsible for complying with the following safety conditions:
- Installation instructions
- Local prevailing standards and regulations.

Electromagnetic compatibility
This device has been tested for electromagnetic compatibility in accordance with the applicable European standards for industrial applications.
The electromagnetic compatibility indicated only applies to a device that has been connected in accordance with the instructions in these Operating Instructions.

2.4 Operational safety

- ▶ Before commissioning the entire measuring point, ensure that all the connections are correct. Ensure that electric cables and hose connections are not damaged.
- ▶ Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- ▶ If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.

⚠ CAUTION

The cleaning system is not switched off during calibration or maintenance activities

Risk of injury due to medium or cleaning agent

- ▶ If a cleaning system is connected, switch it off before removing a sensor from the medium.
- ▶ If you are not switching off the cleaning system because you wish to test the cleaning function, wear protective clothing, goggles and gloves or take other appropriate measures.

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.
Relevant regulations and European standards have been observed.
Equipment connected to the sampler shall be in compliance with the relevant safety standards.

2.5.2 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.
Support in the performance of this task can be requested from Endress+Hauser.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Make sure the packaging is undamaged.
   ↳ Inform the supplier about any damage to the packaging.
   Keep the damaged packaging until the matter has been settled.
2. Make sure the contents are undamaged.
   ↳ Inform the supplier about damage to the contents.
   Keep the damaged products until the matter has been settled.
3. Check that the delivery is complete and nothing is missing.
   ↳ Compare the scope of delivery against the delivery papers and your order.
4. Pack the product in such a way as to protect it reliably against impact and moisture for storage and transportation.
   ↳ The original packaging offers the best protection.
   Keep to the approved ambient conditions (see "Technical data").

If you have any questions, contact your supplier or your local sales center.

NOTICE

The top of the sampler may be damaged or torn by incorrect transportation

▶ Always use a lifting truck or a fork-lift to transport the sampler. Never lift the sampler by the top. Lift it in the middle between the upper and lower sections.

3.2 Product identification

3.2.1 Nameplate

Nameplates can be found:
- On the inside of the upper door
- On the packaging (adhesive label, portrait format)

The nameplate provides you with the following information on your device:
- Manufacturer ID
- Order code
- Extended order code
- Serial number
- Firmware version
- Input and output variables
- Environment
- Activation codes
- Safety notices and warnings

Compare the data on the nameplate with your order.

3.2.2 Identifying the product

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

To find out the version of your device, enter theorder code indicated on the nameplate in the search screen at the following address: www.products.endress.com/order-ident

3.3 Scope of delivery

The scope of delivery comprises:
- 1 Liquistation CSF34 with:
  - The ordered bottle configuration
  - Optional hardware
- Accessories kit
  - Connection fitting for suction line with various angles (straight, 90 °), Allen key (for version with vacuum pump only)
- 1 Brief Operating Instructions
  (In the preferred language if the "Default operating language" order option is selected. Otherwise, the Brief Operating Instructions are supplied in English.)
- 1 CD-ROM with Operating Instructions in all the languages available, an application manual and the simulation software
- Optional accessories

If you have any questions, please contact your supplier or your local sales center.

3.4 Certificates and approvals

Declaration of conformity
The product meets the requirements of the harmonized European standards.
It thus complies with the legal requirements of the EC directives.
The manufacturer confirms successful testing of the product by affixing to it the CE mark.

Approvals for power supply

The power supply is approved by:
- CSA ("C" and "US")
- UL (UL 60950-1) ("C" and "US")
- UL (UL 508)

4 Installation

4.1 Installation conditions

4.1.1 Dimensions

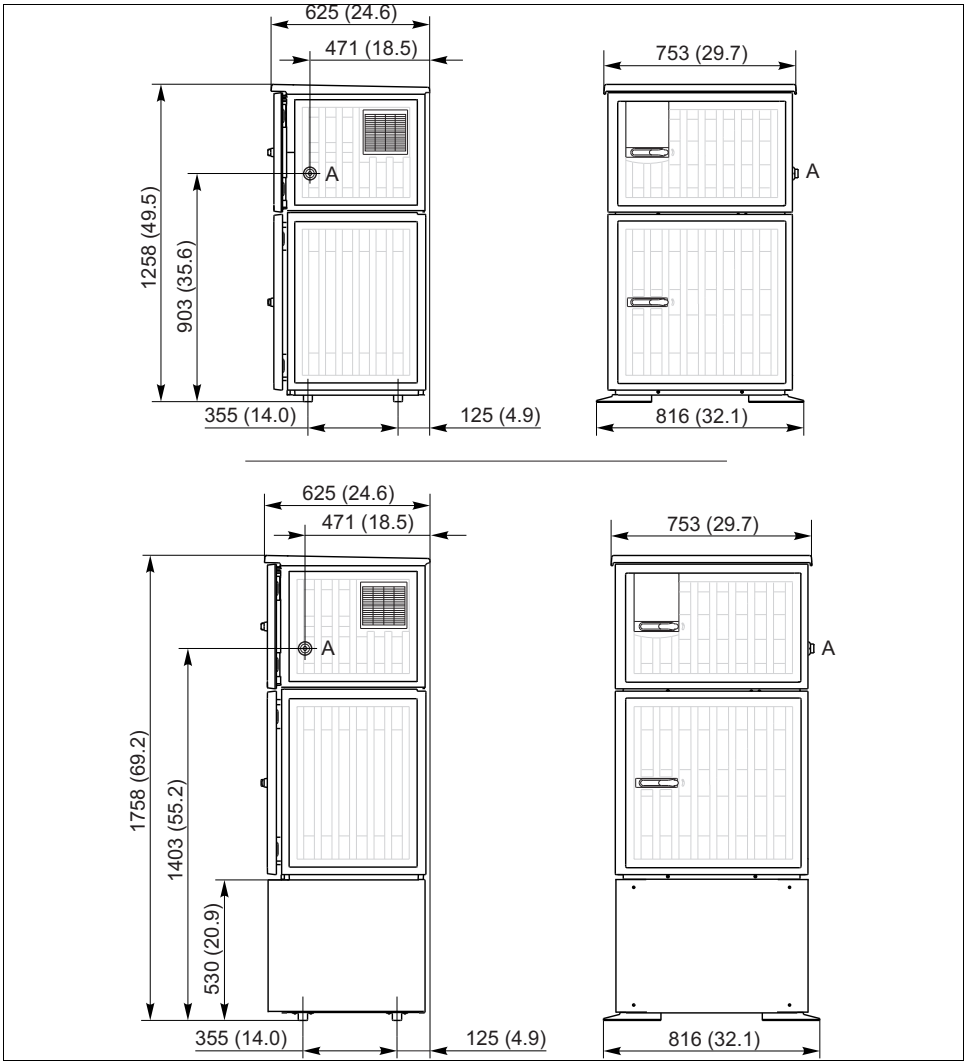


Fig. 1: Dimensions of plastic version of Liquistation CSF34 without/with stand. Engineering unit mm (in).

A Suction line connection

4.1.2 Mounting location

For version with pump

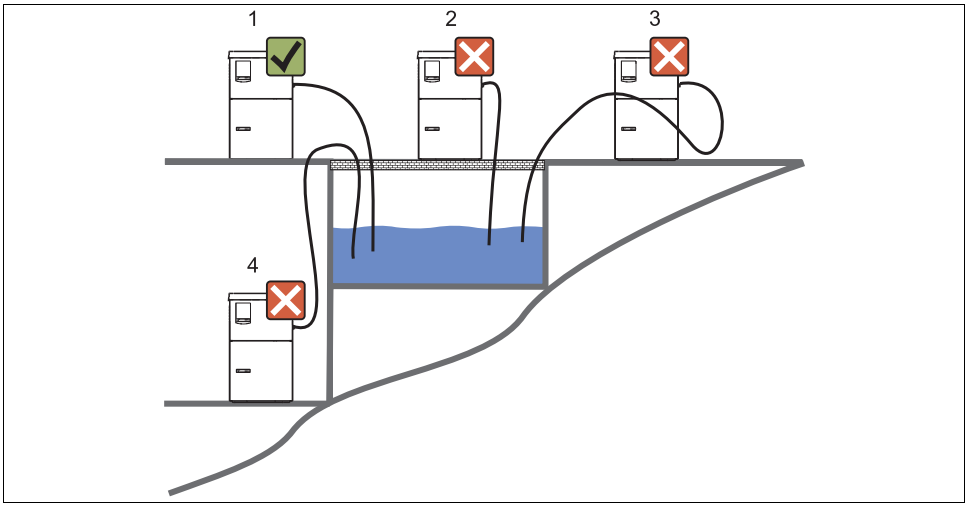


Fig. 2: Mounting conditions for Liquistation CSF34 for open channels

1. **Correct**
   The suction line must be routed with a downward slope to the sampling point.
2. **Incorrect**
   The sampler should never be mounted in a place where it is exposed to aggressive gases, e.g. hydrogen sulfide (H_2S).
3. **Incorrect**
   Avoid siphoning effects in the suction line
4. **Incorrect**
   The suction line should never be routed with an upward slope to the sampling point.

Note the following when mounting the sampler:
- The ventilation of the mounting location must be guaranteed.
- Mount the sampler on a level surface.
- Protect the sampler from additional heating (e.g. from heaters).
- Protect the sampler from mechanical vibrations.
- Protect the sampler from strong magnetic fields.
- Make sure air can circulate freely through the side panels of the housing. Do not mount the sampler directly against a wall. Allow at least 150 mm (5.9") between the wall and the sampler on the left and right-hand sides.
- Do not mount the sampler directly over the inlet channel of a municipal wastewater treatment plant.

4.1.3 Mechanical connection

Foundation plan

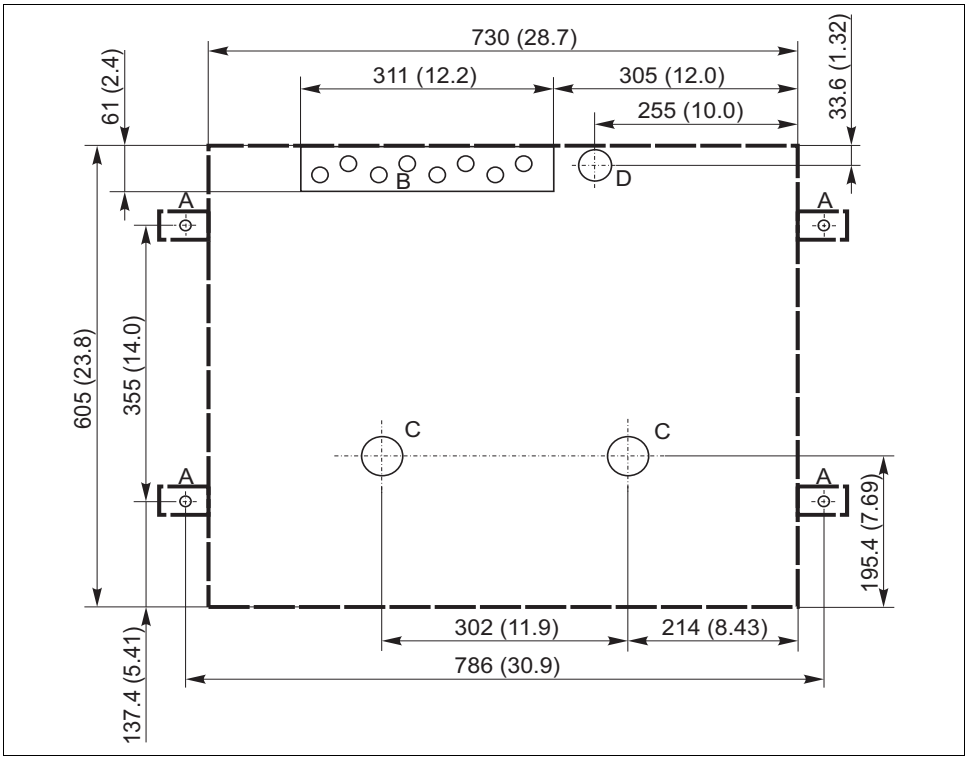


Fig. 3: Foundation plan. Engineering unit mm (in).

A Fasteners (4 x M10)
B Cable inlet
C Outlet for condensate and overflow > DN 50
D Sample supply from below > DN 80
- - - Dimensions of Liquistation

4.1.4 Connection for sampling for version with pump

- Maximum suction height:
  Vacuum pump: 8 m (26 ft)
  Peristaltic pump: standard 8 m (26 ft)
- Maximum hose length: 30 m (98 ft)
- Hose connection diameter:
  Vacuum pump: internal diameter of 10 mm (3/8"), 13 mm (1/2"), 16 mm (5/8") or 19 mm (3/4")
  Peristaltic pump: internal diameter of 10 mm (3/8")
- Intake speed:
  > 0.5 m/s (> 1.6 ft/s) for ≤ 13 mm (1/2") ID, in accordance with EN 25667, ISO 5667
  > 0.6 m/s (> 1.9 ft/s) for 10 mm (3/8") ID, in accordance with Ö 5893, US EPA

Note the following when mounting the sampler:
- Always route the suction line with an upward slope from the sampling point to the sampler
- The sampler should always be located above the sampling point
- Avoid siphoning effects in the suction line

The following conditions must be met at the sampling point:
- Do not connect the suction line to pressurized systems
- Use a suction strainer to catch bigger, abrasive solids that could clog the system
- Immerse the intake hose in the direction of flow
- Take the sample at a representative point (turbulent flow; not directly at the base of the channel)

Useful sampling accessories
- Suction strainer:
  Catches bigger, abrasive solids that could clog the system
- Immersion assembly:
  The adjustable immersion assembly fixes the suction line to the sampling point.

4.2 Erecting the sampler

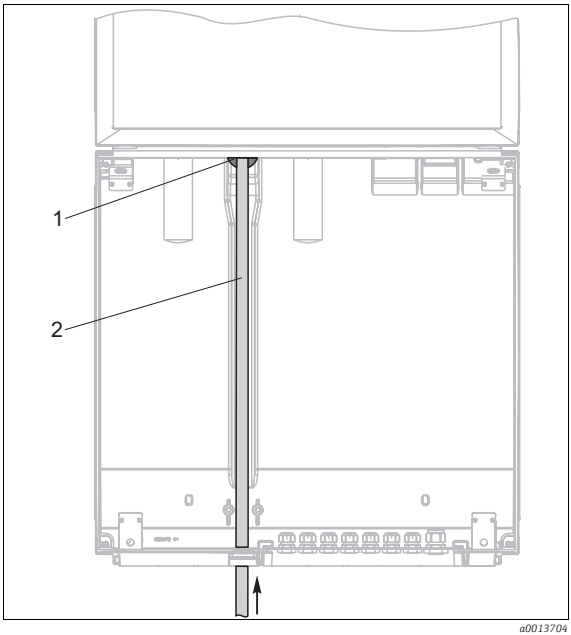
4.2.1 Connecting the suction line from the side for version with pump

1. Observe the installation conditions when mounting the sampler.
2. Route the suction line from the sampling point to the sampler.
3. Screw the suction line onto the suction line connection of the sampler.

4.2.2 Connecting the suction line from below for version with pump

If the suction line is connected from below, the suction line is routed upwards behind the rear panel of the sample compartment. First remove the rear panel of the dosing chamber and sample compartment as described in the "Wiring" section.

1. Remove the drain plug from the hose gland located at the back of the sampler base.
2. As illustrated, guide the suction line upwards and through the opening towards the front.



1 Gland for the suction line
2 Suction line

Fig. 4: Sample supply from below

Connecting the suction line in the version with the vacuum pump

1. Unscrew the thread adapter nut (item 3).
2. Unscrew the hose gland (item 4) from the side panel.
3. Fit the hose gland in the fixing clamp (item 2) as illustrated.
4. Screw the hose tight from above.
5. Attach the hose adapter supplied to the suction line and screw it onto the hose gland from below.
6. Insert the dummy plugs supplied.

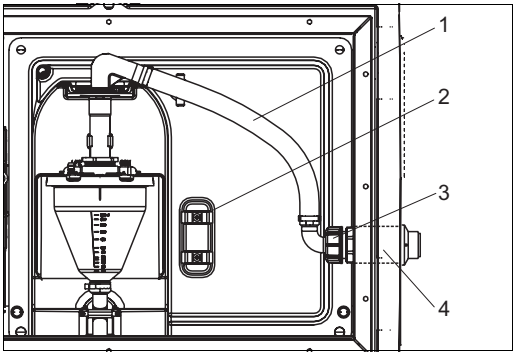


Fig. 5: Connecting the suction line from the side (as-delivered state)

1 Hose
2 Fixing clip for hose gland
3 Thread adapter nut
4 Hose gland

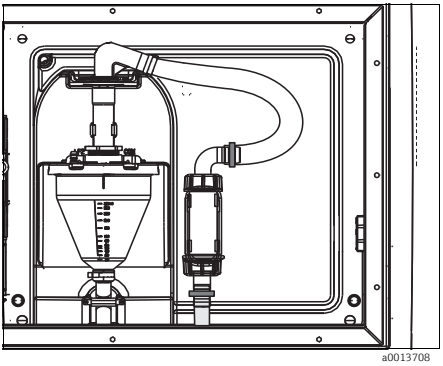


Fig. 6: Suction line connected from below

Connecting the suction line in the version with the peristaltic pump

1. Unscrew the thread adapter nut (item 3) and the hose gland (item 4) from the side panel.
2. Unscrew the small thread adapter nut (item 1) and remove the hose.
3. Connect the suction line from below as illustrated.
4. Insert the dummy plugs supplied.

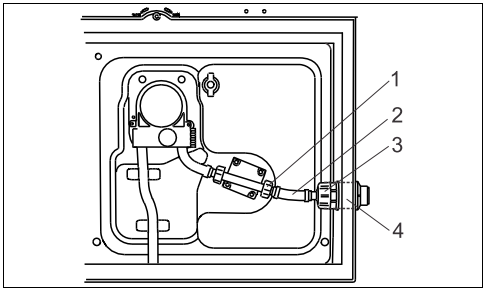


Fig. 7: Connecting the suction line from the side (as-delivered state)

1 Small thread adapter nut
2 Hose
3 Thread adapter nut
4 Hose gland

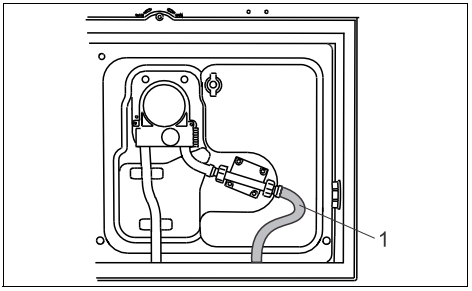


Fig. 8: Suction line connected from below

1 Suction line

4.3 Sampling with a flow assembly

The sample is taken directly from the flow assembly which is installed in the sampler stand.

The flow assembly is used when sampling in pressurized systems, e.g.:
- Containers located at a higher level
- Pressurized pipes
- Pumping with external pumps

The flow rate should be 1000 to 1500 l/h.

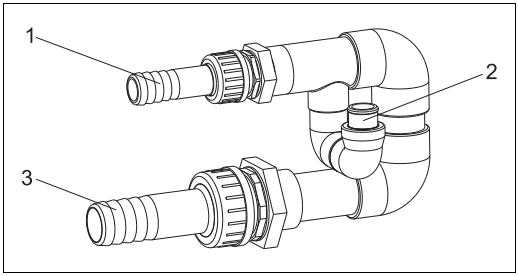


Fig. 9: Flow assembly

1 Flow assembly inlet: ¾"
2 Sample connection
3 Flow assembly outlet: 1¼"

The outlet of the flow assembly must be unpressurized (e.g. drain, open channel).

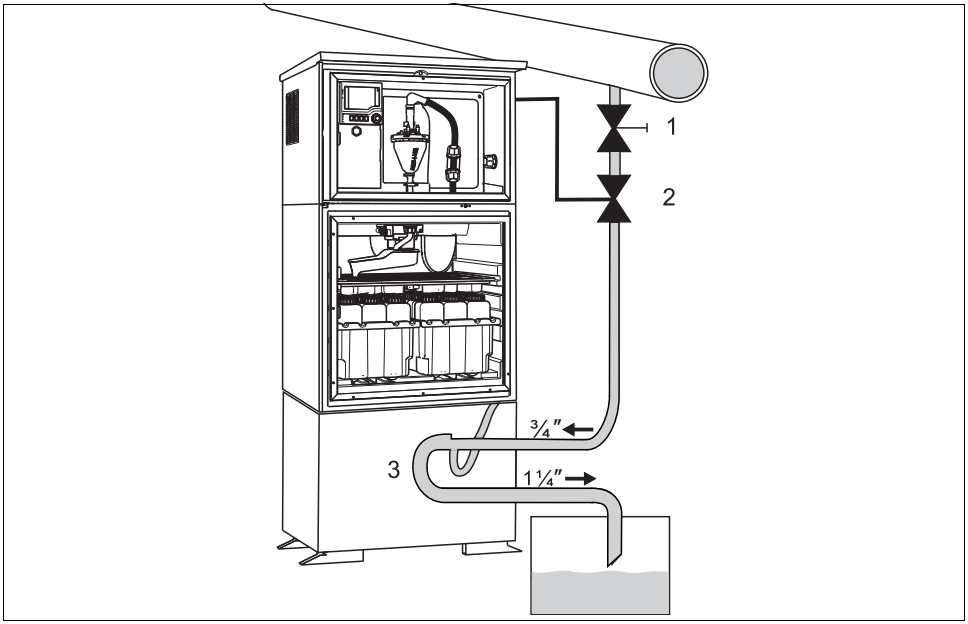


Fig. 10: Example: Sampling from pressure piping

1 Ball valve 1
2 Valve 2
3 Flow assembly

Use the ball valve 1 to set the flow rate to 1000 l/h-1500 l/h. When the sampling cycle begins, you can use one of the relay outputs to control and open valve 2. The medium flows through the pipe and the flow assembly into the outflow. When a settable delay time has elapsed, the sampler takes the sample directly from the flow assembly. Valve 2 is closed again once the sample has been taken.

The ball valve and the valve are not contained in the scope of delivery (can be ordered under TSP No. 71180379).

4.4 Post-installation check

- Make sure the suction line is securely fitted to the sampler.
- Perform a visual inspection to ensure the suction line is routed correctly from the sampling point to the sampler.
- Ensure that the distribution arm is correctly engaged.
- Allow the sampler to rest for a minimum of 12 hours following installation and before switching on. Otherwise the cooling module may be damaged.

5 Electrical connection

⚠ WARNING

Device is energized

Incorrect wiring can result in injury or fatality

- The electrical connection must only be carried out by a certified electrician.
- Technical personnel must have read and understood the instructions in this manual and must adhere to them.
- **Prior to** beginning any wiring work, make sure voltage is not applied to any of the cables.

5.1 Connecting the sampler

NOTICE

The device does not have a power switch

- The customer must provide a fuse with a maximum rating of 10 A at the installation location. Please observe local installation regulations.
- The circuit breaker must be a switch or a power-circuit breaker and must be labeled as the circuit breaker for the device.
- The protective ground connection must be established before any other connections are made. A disconnected protective ground can be a source of danger.
- An overload protection unit is required for the power supply cable.

5.1.1 Routing the cables

- Route the cables behind the rear panel of the sampler so that they are properly protected.
- Cable glands are available for the cable entries (up to 8, depending on the version).
- Plan a cable length of approx. 1.7 m (5.6 ft) from the foundation to the terminal connection.

5.1.2 Cable types

- Power supply: e.g. NYY-J; 3-wire; max. 2.5 mm^2
- Analog, signaling and transmission cables: e.g. LiYY 10 x 0.34 mm^2

The terminal connection is located under an additional protective cover in the upper rear section of the device. For this reason, the rear panel of the device must be removed to connect the power supply prior to commissioning.

5.1.3 Removing the rear panel of the dosing compartment

Open the dosing compartment door to remove the rear panel of the dosing compartment.

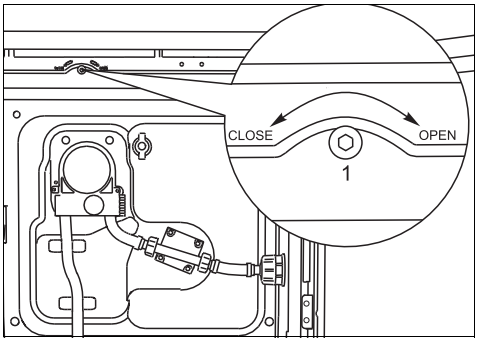


Fig. 11: Screw above the dosing compartment

1 To release the rear panel, turn clockwise with an Allen key (5 mm)

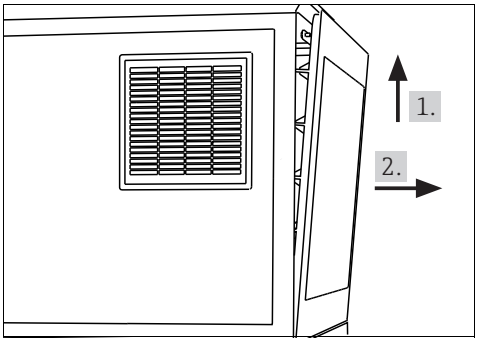


Fig. 12: Lift up the top rear panel and pull it back to remove it

5.1.4 Removing the rear panel of the sampling compartment

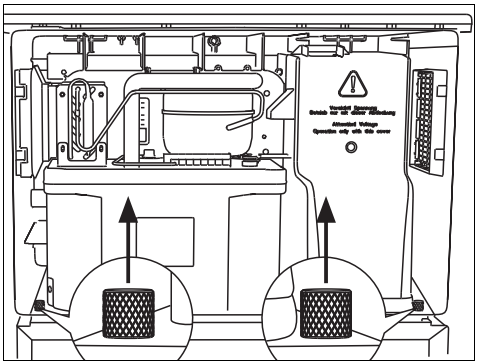


Fig. 13: Remove the bolts on the bottom left and right on the rear of the dosing compartment

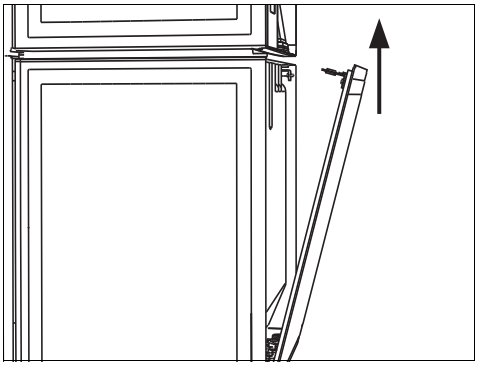


Fig. 14: Push up the lower rear panel to remove it

5.1.5 Removing the cover on the power unit

⚠ WARNING

Device is energized

Incorrect wiring can result in injury or fatality

- ▶ Make sure the device is disconnected from the power source before you remove the cover of the power unit.

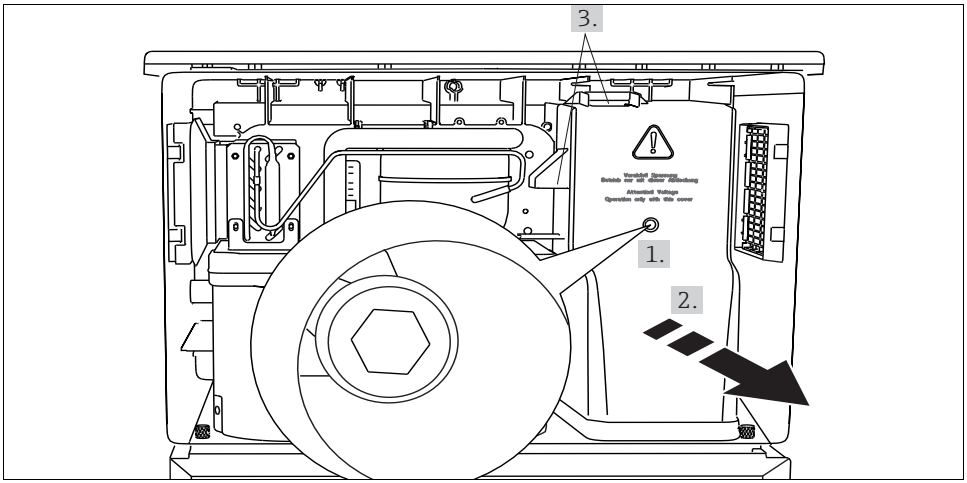


Fig. 15: Removing the cover on the power unit

1. Release the screw with an Allen key (5 mm).
2. Remove the cover of the power unit from the front.
3. When reassembling make sure that the seals are seated correctly.

5.1.6 Power supply terminal assignment

The power supply is connected via plug-in terminals. Connect the ground to one of the ground connections.
Rechargeable batteries are available as an option (for battery type see section Technical Data).
Fuses are available as an option (see section Technical Data).

Use rechargeable batteries only.

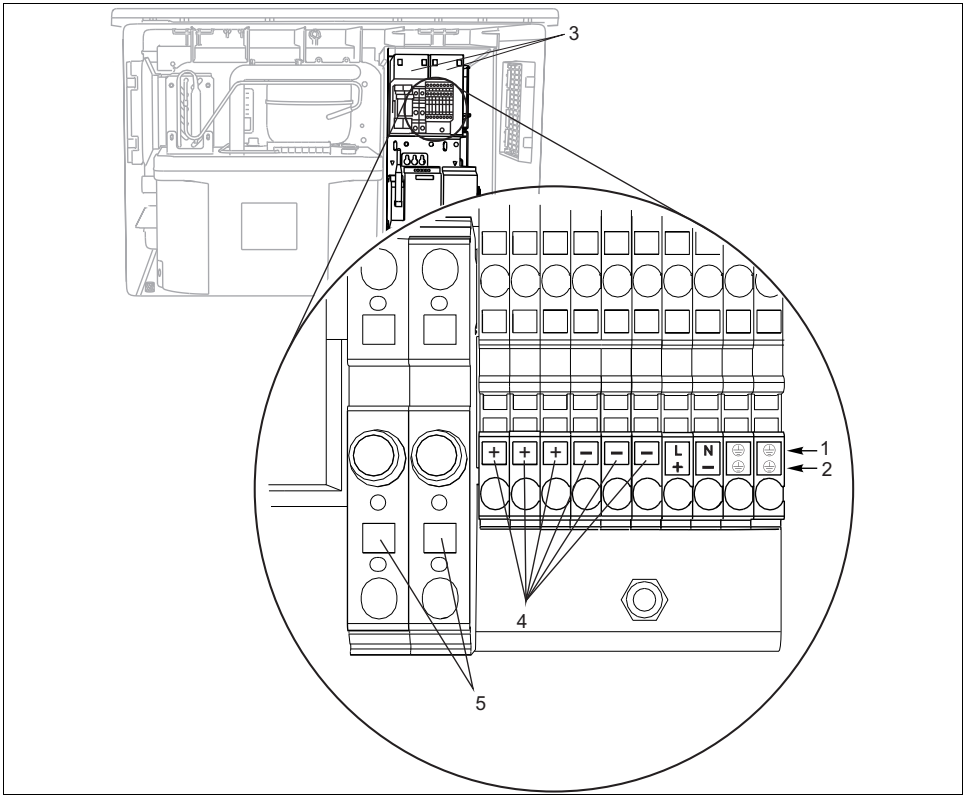


Fig. 16: Terminal assignment

1 Assignment: 100 to 120 V/200 to 240 V AC ±10 %
2 Not applicable
3 Rechargeable batteries (optional)
4 Internal 24 V voltage
5 Fuses

5.1.7 Cable terminals

Plug-in terminals for Memosens and PROFIBUS/RS485 connections

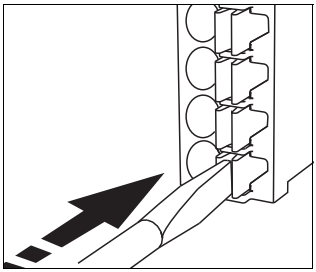


Fig. 17: Press the screwdriver against the clip (opens the terminal)

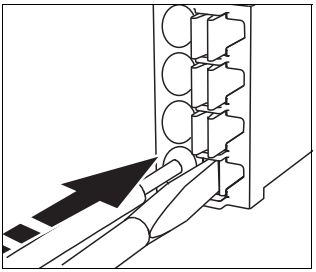


Fig. 18: Insert the cable until the limit stop

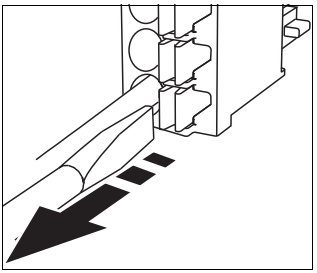


Fig. 19: Remove the screwdriver (closes the terminal)

After connection, make sure that every cable end is securely in place. Terminated cable ends, in particular, tend to come loose easily if they have not been correctly inserted as far as possible.

All other plug-in terminals

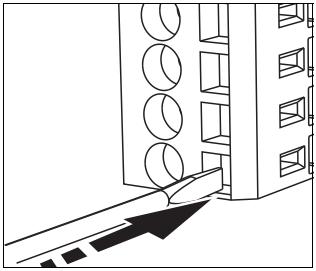


Fig. 20: Insert the screwdriver (opens the terminal)

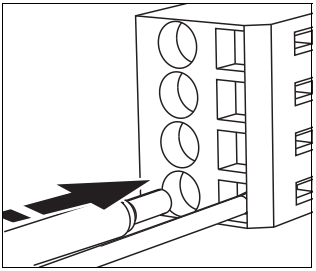


Fig. 21: Insert the cable until the limit stop

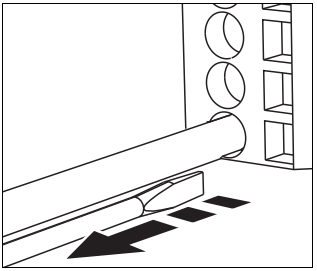


Fig. 22: Remove the screwdriver (closes the terminal)

Single-wire, multi-wire and fine-wire cables can be used for the connection, with and without ferrules. Only one wire is permitted per terminal.

5.2 Connection compartment in the controller housing

The controller housing has a separate connection compartment. Release the 6 housing screws to open the connection compartment:

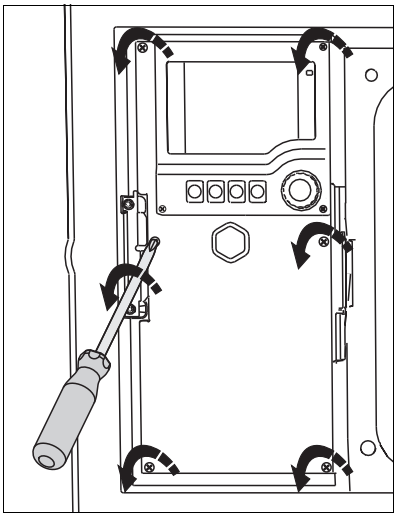


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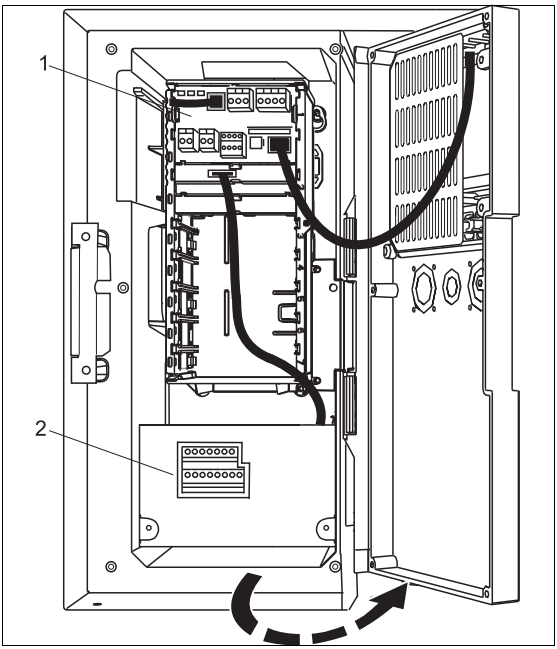
Fig. 23: Release 6 housing screws with a Phillips screwdriver to open the display cover



a0013238

Fig. 24: Controller with E basic module, opened

1 E basic module
2 Sampler controller

5.2.1 SYS basic module

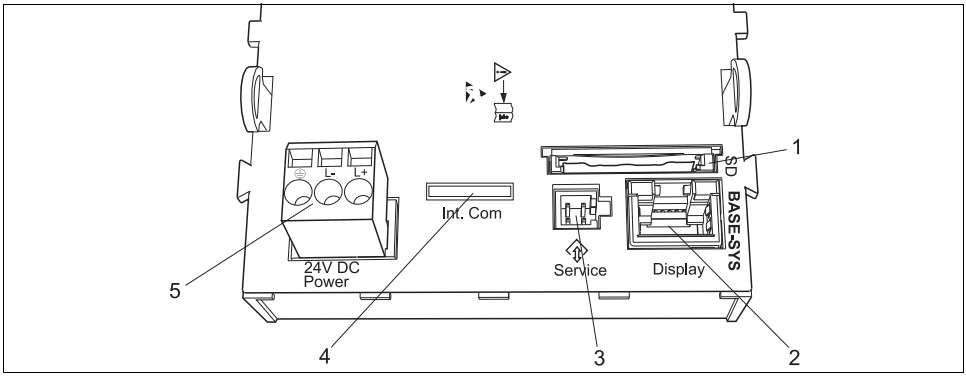


Fig. 25: SYS basic module

1 *SD card slot*
2 *Slot for the display cable* [1)]
3 *Service interface* [1)]
4 *Connection cable to sampler controller* [1)]
5 *Power connection* [1)]

5.2.2 E basic module

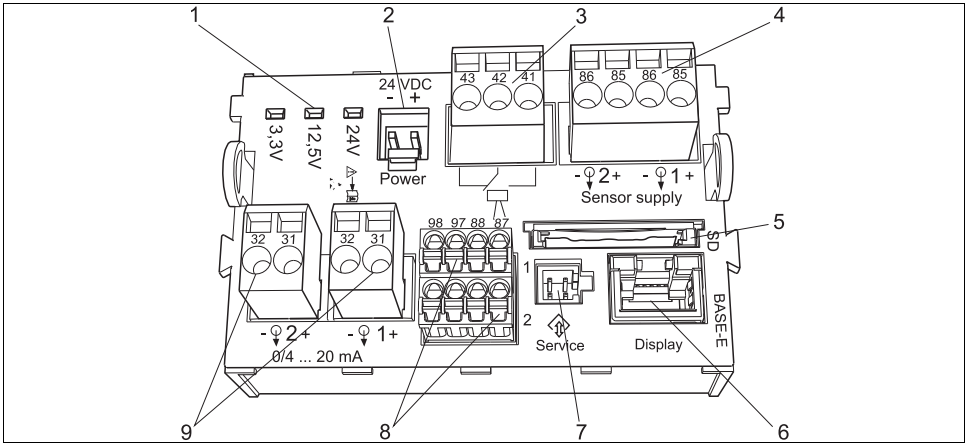
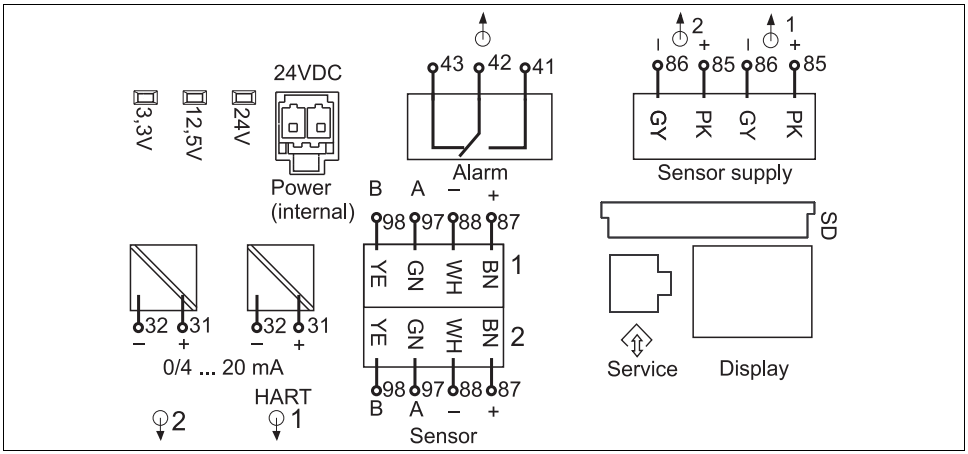


Fig. 26: E basic module

1 *Indicator LEDs*
2 *Voltage connection*[1)]
3 *Alarm relay connection*
4 *Power supply for digital fixed cable sensors with Memosens protocol*
5 *SD card slot*
6 *Slot for the display cable* [1)]
7 *Service interface* [1)]
8 *Connections for 2 Memosens sensors*
9 *Current outputs*

1) Internal device connection. Do not disconnect the connector!



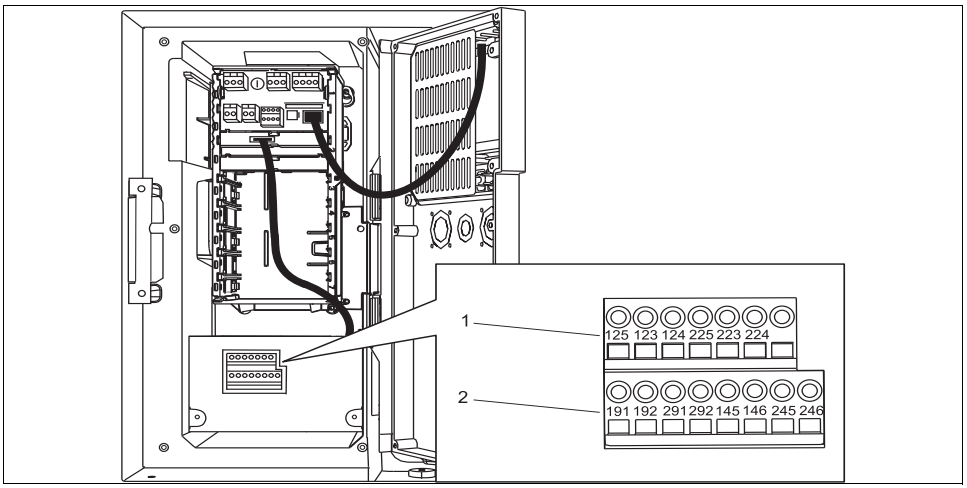
a0016537

Fig. 27: E basic module wiring diagram

5.2.3 Sampler controller

The connections for the sampler controller are in the controller housing, see section "Connection compartment in the controller housing".

Analog inputs and binary inputs/outputs



a0012988

Fig. 28: Position of the terminals

1 Analog inputs 1 and 2
2 Binary inputs/outputs

Analog inputs

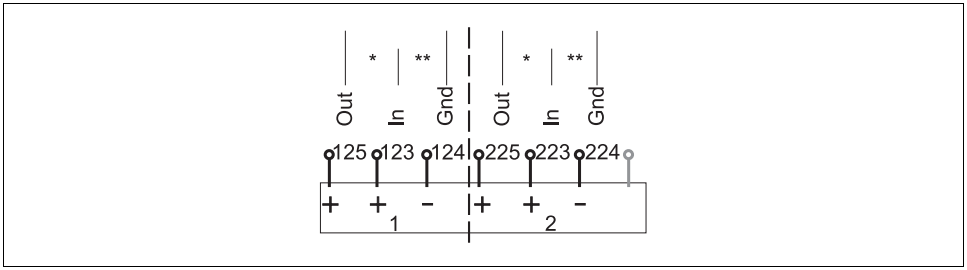


Fig. 29: Assignment of analog inputs 1 and 2

* *Analog input for passive devices (two-wire transmitter)*
Out + In terminals (125/123 or 225/223)
** *Analog input for active devices (four-wire transmitter)*
In + Gnd terminals (123/124 or 223/224)

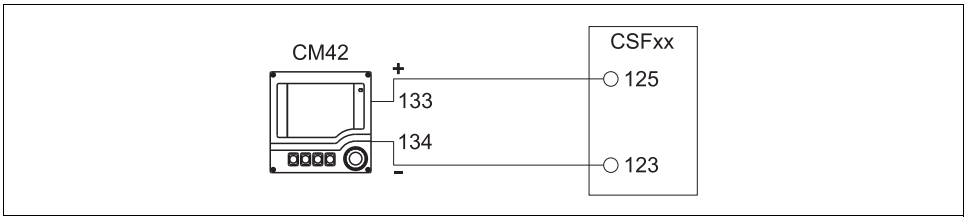


Fig. 30: With two-wire transmitter, e.g. Liquiline M CM42

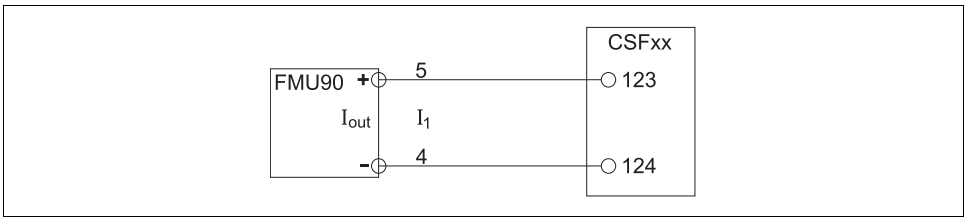


Fig. 31: With four-wire transmitter, e.g. Prosonic S FMU90

Binary inputs

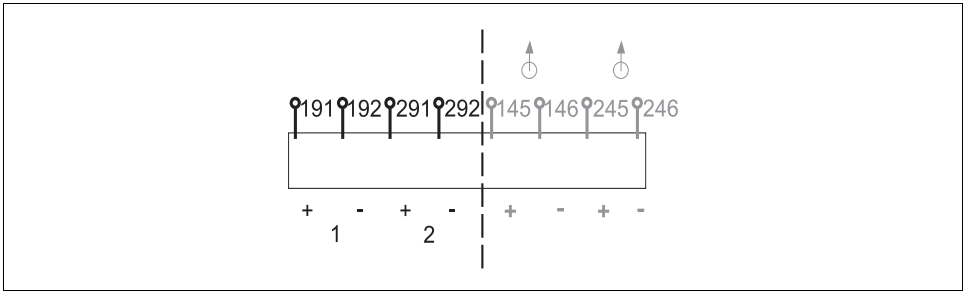


Fig. 32: Assignment of binary inputs 1 and 2

1 Binary input 1 (191/192)
2 Binary input 2 (291/292)

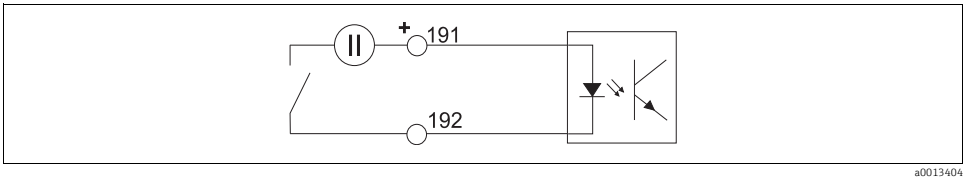


Fig. 33: Connection example binary input with external voltage source

When connecting to an internal voltage source, use the terminal connection on the rear of the dosing chamber. The connection is located on the lower terminal strip (on the far left, + and -), see the "Power supply terminal assignment" section.

Binary outputs

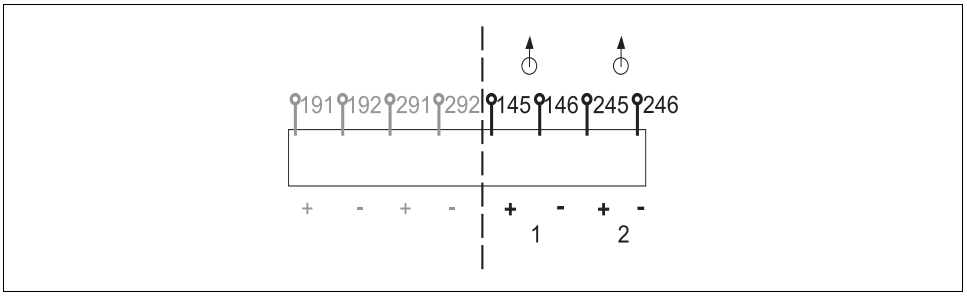
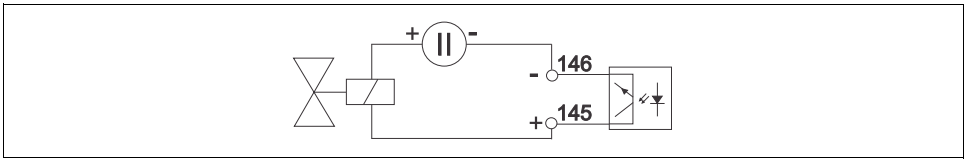


Fig. 34: Assignment of binary outputs 1 and 2

1 Binary output 1 (145/146)
2 Binary output 2 (245/246)

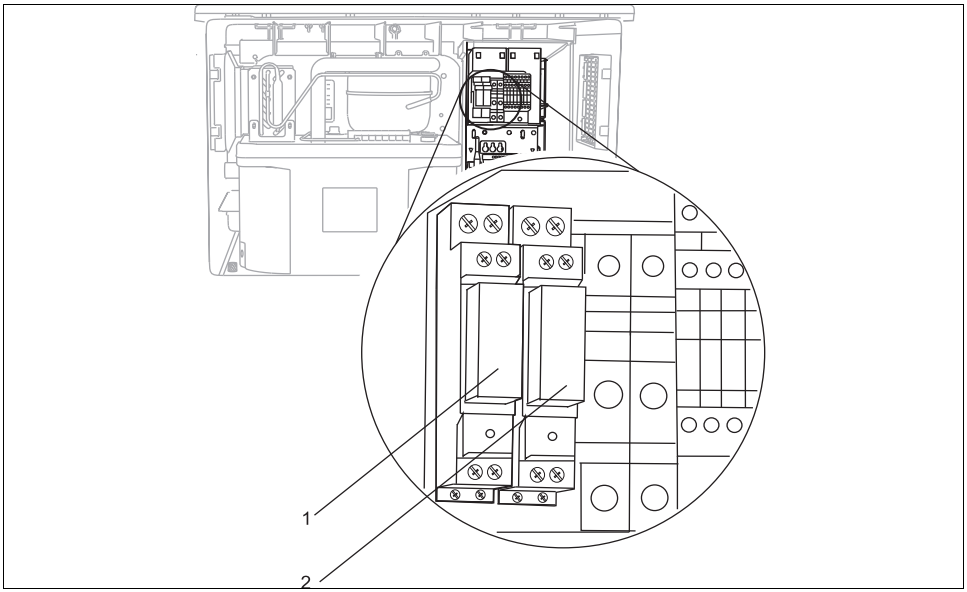


a0013407

Fig. 35: Connection example binary output with external voltage source

When connecting to an internal voltage source, use the terminal connection on the rear of the dosing chamber. The connection is located on the lower terminal strip (on the far left, + and -), see the "Power supply terminal assignment" section.

Binary outputs with relay option



a0016343

Fig. 36: Relays

1 Binary output 1
2 Binary output 2

The left relay is activated with binary output 1, while the right relay is activated by binary output 2.

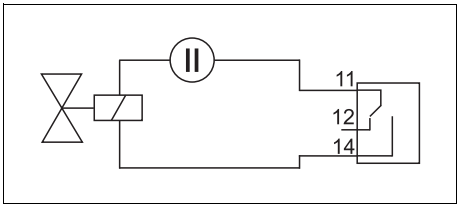


Fig. 37: Connection example for binary output with relay

5.2.4 Terminal assignment for input/output signals

The following signals can be configured for external sampler control:

Input signals
- 2 analog signals 0/4 to 20 mA
- 2 binary signals > 100 ms pulse width or edge
- Signals of digital sensors with Memosens protocol (optional)

Output signals
- 2 binary signals > 1 s pulse width or edge

The controller must be opened to allow the signal cable, sensor cable and optional relay to be connected.

5.3 Optional sensor inputs, current outputs and relays

⚠ WARNING

Module not covered

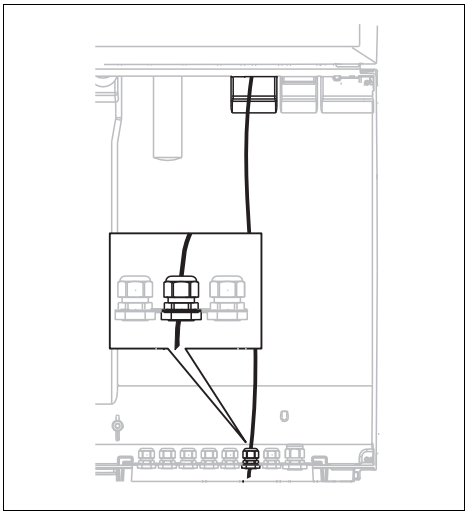
No shock protection. Danger of electric shock!

- If you are modifying or extending your hardware, always fill the slots from top to bottom. Do not leave any gaps.
- If not all the slots are occupied, always insert a dummy or end cover beneath the last module. This ensures the unit is shock-protected.
- Always ensure shock protection is guaranteed particularly in the case of relay modules (2R, 4R, AOR).

5.3.1 Connecting the sensors

Sensor connection

Before you connect a sensor to the controller, you must first route it via the back panel to the controller housing towards the front. See the "Removing the rear panel of the dosing compartment" and the "Removing the rear panel of the sampling compartment" sections.



a0016360

Fig. 38: Gland to the controller

If possible, only use terminated genuine cables.

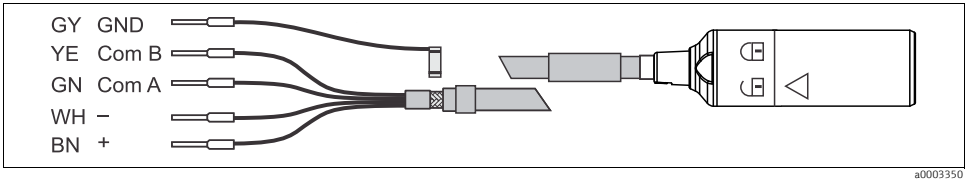


Fig. 39: Memosens data cable CYK10

Connecting the end sleeves of the sensor cable to the E basic module

The outer shield of the cable is grounded by means of the metal gland on the left of the E basic module.

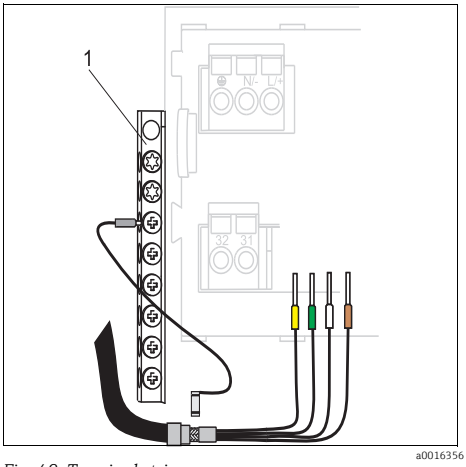
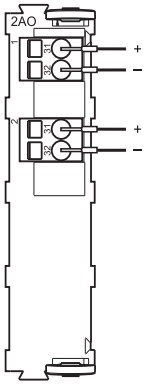
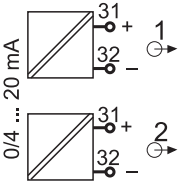
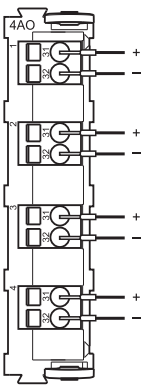
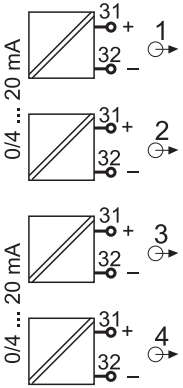


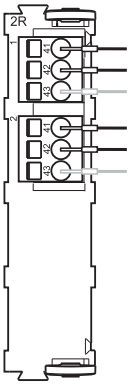
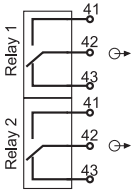
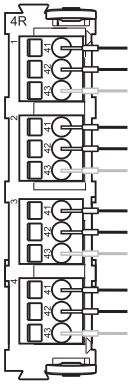
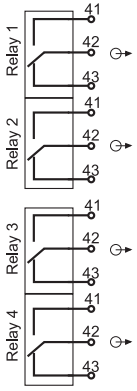
Fig. 40: Terminal strip

5.3.2 Optional modules

Current outputs

Module 2AO		Module 4AO	
			
a0016179	a0015759	a0016178	a0015760
Fig. 41: Module front	*Fig. 42: Wiring diagram*	*Fig. 43: Module front*	*Fig. 44: Wiring diagram*

Relays

Module 2R		Module 4R	
			
a0016181	a0015758	a0016182	a0015757
Fig. 45: Module front	*Fig. 46: Wiring diagram*	*Fig. 47: Module front*	*Fig. 48: Wiring diagram*

5.4 Connecting digital communication

5.4.1 Module 485

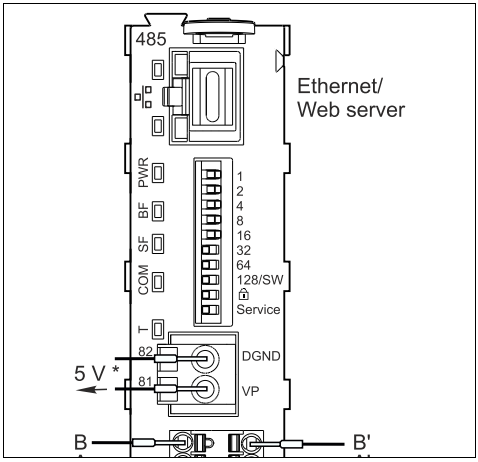


Fig. 49: Bus connections on module 485

* *Optional to supply power to an external terminating resistor for bus termination*

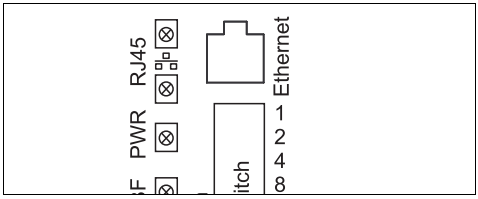


Fig. 50: Wiring diagram for module 485

LEDs on front of module

LED	Name	Color	Description
RJ45	LNK/ACT	GN	▪ Off = Connection is not active ▪ On = Connection is active ▪ Flashing = Data transmission
RJ45	10/100	YE	▪ Off = Transmission rate 10 MBit/s ▪ On = Transmission rate 100 MBit/s
PWR	Power	GN	Supply voltage is applied and module is initialized
BF	Bus failure	RD	Bus failure
SF	System failure	RD	System failure
COM	Communication	YE	Sending or receiving Modbus message
T	Bus termination	YE	▪ Off = No termination ▪ On = Termination is used

DIP switches on front of module

DIP	Factory setting	Assignment
1-128	ON	Bus address (--> "Commissioning/Communication")
🔓	OFF	Write protection: "ON" = configuration **not** possible via the bus, only via local operation
Service	OFF	Only for service, not to be used by the operator

5.4.2 Bus termination

There are two ways to terminate the bus:

1. **Internal terminating resistor** (via DIP switch on the module board)

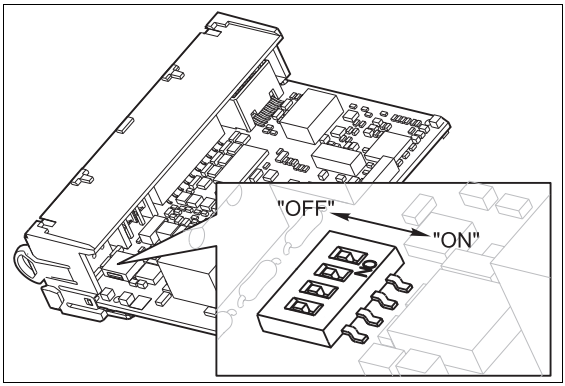
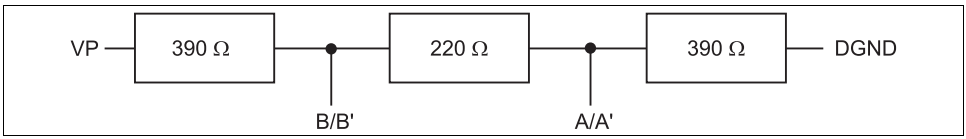


Fig. 51: DIP switches for internal terminating resistor

▶ Using a suitable tool, such as a tweezers, set all 4 DIP switches to the "ON" position.

↳ The internal terminating resistor is used.



a0016306

Fig. 52: Structure of the internal terminating resistor

2. **External terminating resistor**

Here, leave the DIP switches on the module board in the "OFF" position (factory setting).

- ▶ Connect the resistor to terminals 81 and 82 on the front of module 485 for 5-V power supply.
  - ↳ The external terminating resistor is used.

5.5 Hardware settings

Setting the bus address

1. Open the housing.
2. Set the desired bus address via the DIP switches of module 485.

For PROFIBUS DP, valid bus addresses are anything between 1 and 126, and anything between 1 and 247 for Modbus. If you configure an invalid address, software addressing is automatically enabled via the local configuration or via the fieldbus.

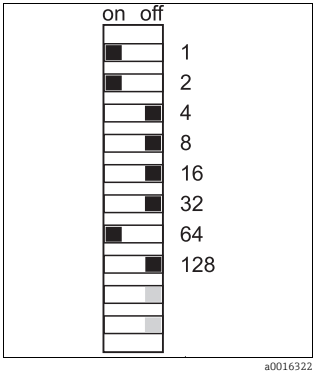


Fig. 53: Valid PROFIBUS address 67

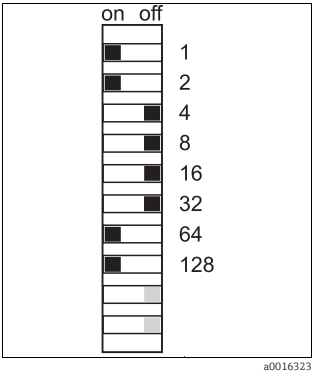


Fig. 54: Valid Modbus address 195

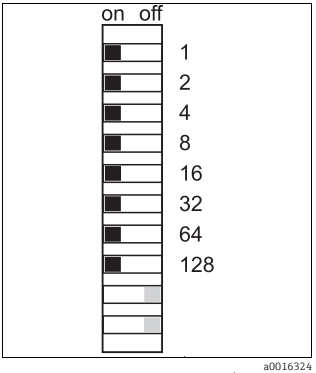


Fig. 55: Invalid address 255 [1)]

1) Order configuration, software addressing is enabled, software address configured at the factory: PROFIBUS 126, Modbus 247

Address configuration via software: --> BA00478C

5.6 Guaranteeing the degree of protection

Only the mechanical and electrical connections that are described in this manual, and are necessary for the required, designated application, may be established on the device supplied.

▶ Please play close attention when performing the work as degrees of protection individually confirmed for this product (ingress protection (IP), electrical safety, EMC interference immunity) can no longer be guaranteed as a result of things such as:
- Leaving off covers
- Not tightening cable glands sufficiently (must be tightened with 2 Nm for the confirmed level of IP protection)
- Loose or insufficiently tightened cables/cable ends
- Conductive cable strands left in the device

5.7 Post-connection check

⚠ WARNING

Wiring errors

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

▶ Only put the transmitter into operation if you can answer **yes** to **all** of the following questions.

Device state and specifications

1. Are the sampler, suction line and cables free from damage on the outside?

Electrical connection

2. Are the mounted cables strain relieved?
3. Are the cables run without loops and cross-overs?
4. Are the signal lines correctly connected in accordance with the wiring diagram?
5. Have all the other connections been established correctly?
6. Have you connected unused connection wires to the protective ground connection?
7. Are all the connection wires securely positioned in the cable terminals?
8. Are all the cable entries installed, tightened and sealed?
9. Does the supply voltage match the voltage indicated on the nameplate?

Connection for sampling

10. Is the suction line connected along with the suction strainer?
11. Is the suction line routed at a gradient without any loops?
12. Are all the sample connections leak-tight?
13. Are sample bottles in the sampling compartment?

6 Operation options

6.1 Overview

6.1.1 Display and operating elements

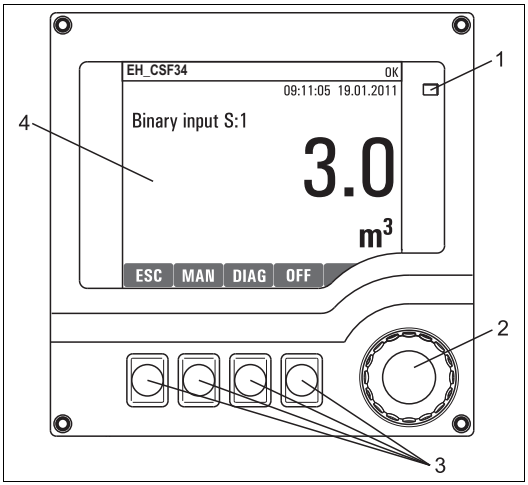


Fig. 56: Overview of operation

1 *LED*
2 *Navigator (jog/shuttle and press/hold function)*
3 *Soft keys (function depends on the menu)*
4 *Display (red background in the event of an error)*

6.1.2 Display

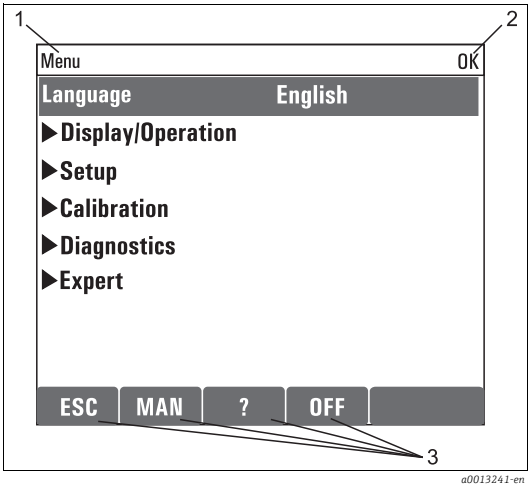


Fig. 57: Display (example)

1 *Menu path and/or device designation*
2 *Status display*
3 *Assignment of the soft keys, e.g.*
ESC: escape or abortion of a sampling process
MAN: manual sample
?: help, if available
OFF: switches the device to standby or aborts a program

6.2 Access to the operating menu via the local display

6.2.1 Operation concept

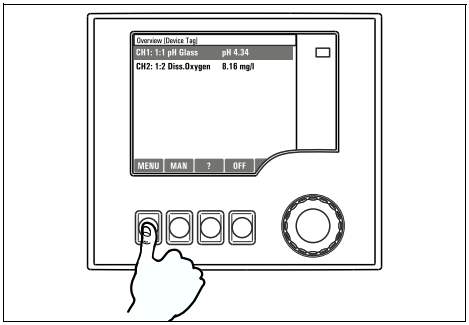


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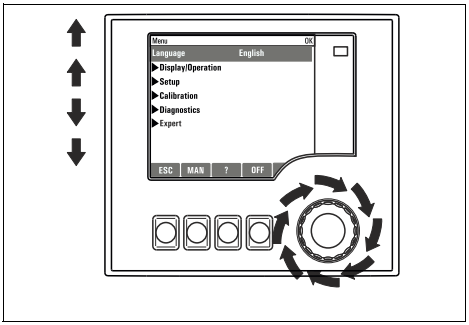
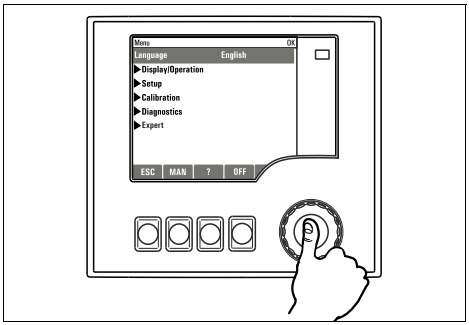
Fig. 58: Pressing the soft key: selecting the menu directly



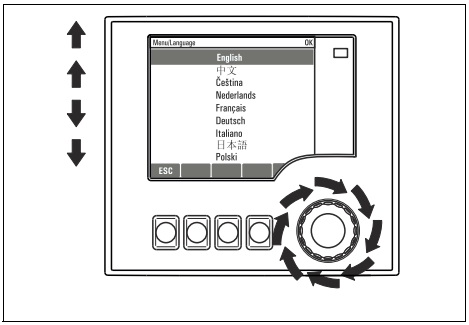
a0013354-en

Fig. 59: Turning the navigator: moving the cursor in the menu



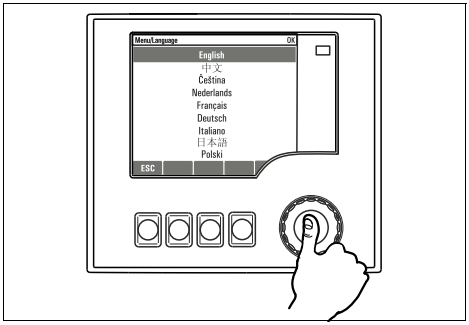
a0013355-en

Fig. 60: Pressing the navigator: launching a function



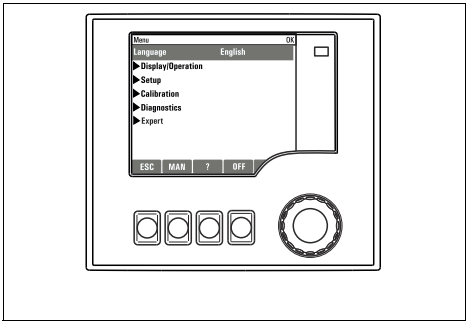
a0013356-en

Fig. 61: Turning the navigator: selecting a value (e.g. from a list)



a0013357-en

Fig. 62: Pressing the navigator: accepting the new value



a0013358-en

Fig. 63: Result: new setting is accepted

6.2.2 Locking or unlocking operating keys

Locking operating keys

1. Press the navigator for longer than 2 s.
   ↳ A context menu for locking the operating keys is displayed.

You have the choice of locking the keys with or without password protection. "With password" means that you can only unlock the keys again by entering the correct password. You can set this password here: Menu/Setup/General settings/Extended setup/Data management/Change lock password.

2. Choose whether you want to lock without or without a password.
   ↳ The keys are locked. No more entries can be made. The 🔒 symbol appears in the soft key bar.

The password is 0000 when the device is delivered from the factory. **Make sure to note down any new password** as otherwise you will not be able to unlock the keypad yourself.

Unlocking operating keys

1. Press the navigator for longer than 2 s.
   ↳ A context menu for unlocking the operating keys is displayed.
2. Select "Key unlock".
   ↳ The keys are unlocked immediately if you did not choose to lock with a password. Otherwise you are asked to enter your password.
3. Only if keypad is password-protected: enter the right password.
   ↳ The keys are unlocked. It is possible to access the entire onsite operation again. The 🔓 symbol is no longer displayed on the screen.

6.3 Configuration options

6.3.1 Display only

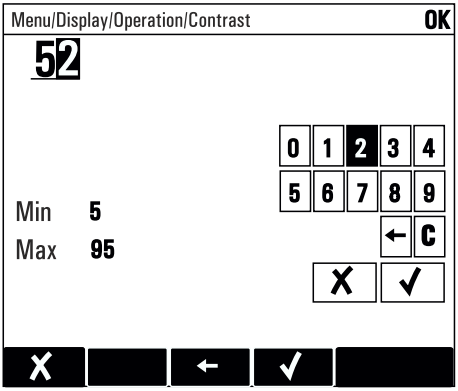
- You can only read the values but cannot change them.
- Typical read-only values are: sensor data and system information
- Example: Menu/Setup/Inputs/../Sensor type

6.3.2 Picklists

- You receive a list of options.
- You select one of the options.
- Example: Menu/Setup/General settings/Temperature unit

6.3.3 Numerical values

- You are changing a variable.
- The maximum and minimum values for this variable are shown on the display.
- Set a value within this range.
- Example: Menu/Display/Operation/Contrast



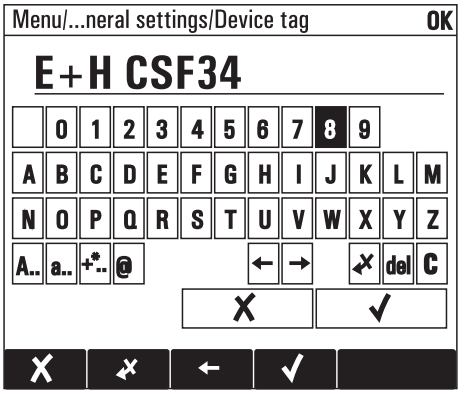
6.3.4 Actions

- You trigger an action with the appropriate function.
- You know that the item in question is an action if it is preceded by the following symbol: ▷
- Examples of typical actions include:
  - Starting a sampling program
  - Starting manual sampling
  - Saving or loading configurations
- Example: Menu/Manual sampling/Start sampling

6.3.5 Customized text

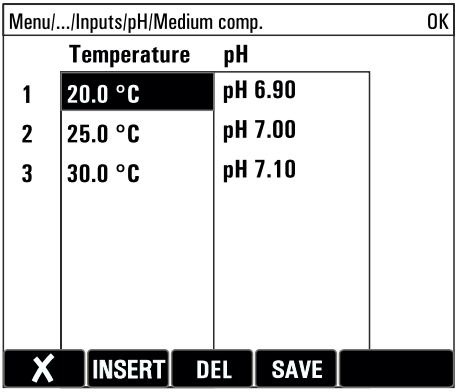
- You are assigning an individual designation.
- Enter a text. You can use the characters in the editor for this purpose (upper-case and lower-case letters, numbers and special characters).
- Using the soft keys, you can:
  - Cancel your entries without saving the data (✗)
  - Delete the character in front of the cursor (✗)
  - Move the cursor back one position (←)
  - Finish your entries and save (✓).

- Example: Menu/Setup/General settings/Device tag



6.3.6 Tables

- Tables are needed to map mathematical functions.
- You edit a table by navigating through rows and columns with the navigator and changing the values of the cells.
- You only edit the numerical values. The controller automatically takes care of the engineering units.
- You can add rows to the table (soft key "INSERT") or delete them (soft key "DEL").
- Afterwards, you save the table (soft key "SAVE").
- You can also cancel your entries any time via the soft key ✗.
- Example: Menu/Setup/Inputs/pH/Medium comp.



7 Commissioning

7.1 Function check

⚠ WARNING

Incorrect connection, incorrect supply voltage

Safety risks for staff and incorrect operation of the device

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

7.2 Switching on the unit

7.2.1 First steps

Setting the language, configuring the display

1. Switch on the supply voltage.
   - ↳ Wait for the initialization to complete.
2. Press the soft key for "MENU". First select your language in the top menu item.
3. Go to the "Display/Operation" menu and configure your desired display settings (Contrast, Backlight and Screen rotation).
   - ↳ You have now changed the display to suit your requirements and can operate the device in the preferred language.
4. Go to the "Setup/Basic setup" menu and run a quick setup, see "Basic setup" section.

7.2.2 Startup screen

You can find the following menu items and soft keys on the initial screen:

- Select sampling program
- Edit program %0V[1)]
- Start program %0V[2)]
- MENU
- MAN
- MEAS
- OFF

1) "%0V" here stands for text that depends on the context. This text is generated automatically by the software and inserted in place of %0V. In the simplest situations, the generated text could be the name of the measuring channel, for example.

7.3 Basic setup

Making basic settings

1. Go to the "Setup/Basic setup" menu.

Make the following settings:

2. Device tag: Give your device any name of your choice (max. 32 characters).
3. Set date: Correct the set date if necessary.
4. Set time: Correct the set time if necessary.
5. Number of bottles: Correct the set number of bottles if necessary.
6. Bottle volume: Correct the set bottle volume if necessary.

For quick commissioning, you can ignore the additional settings for outputs, relays etc. You can make these settings later in the specific menus.

7. Return to the overview by pressing and holding the soft key for "ESC" for at least one second.
   ↳ Your sampler now works with your general settings.

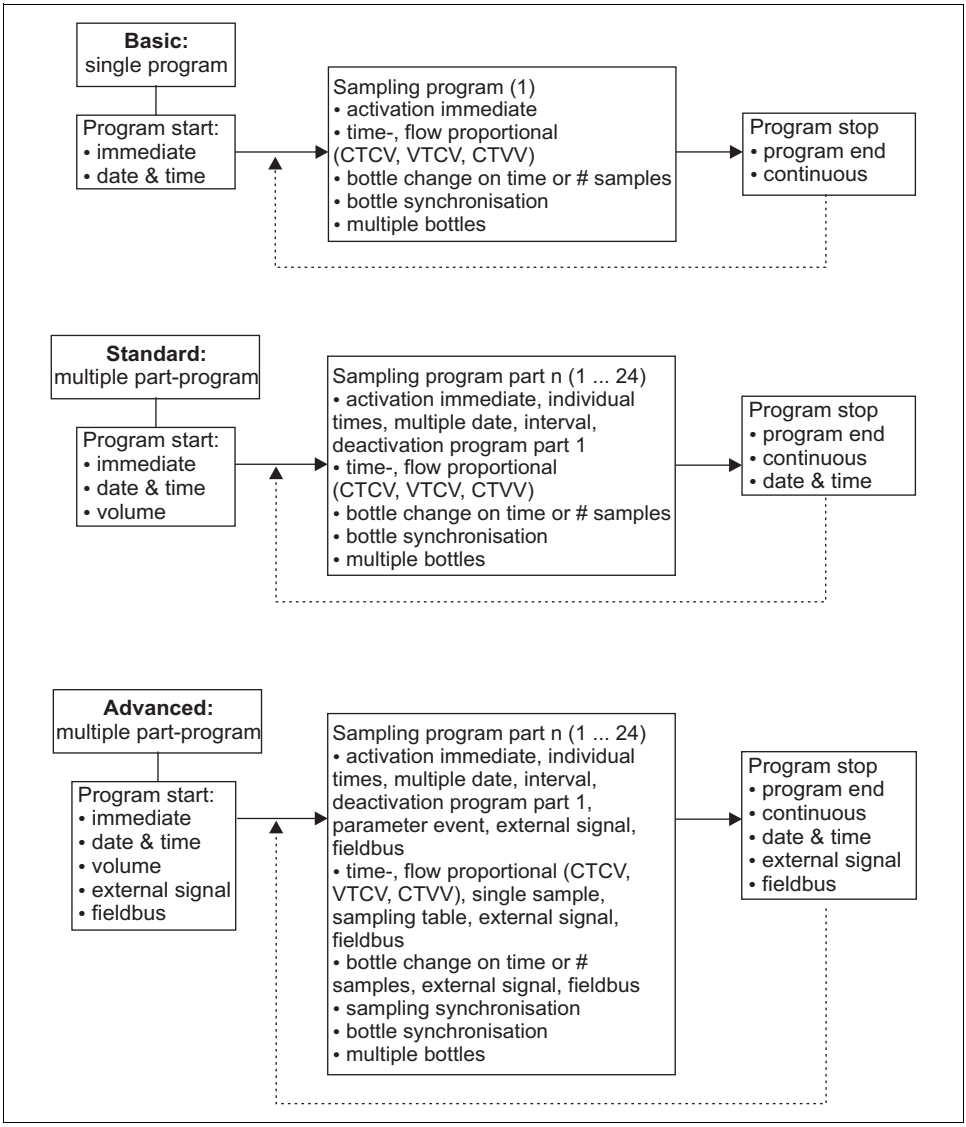
If you want to configure your most important input and output parameters already in the "Basic setup", proceed as follows:

▶ Configure the current outputs, relays, limit contactors, device diagnostics and cleaning cycles with the following submenus.

7.4 Sampling programs

7.4.1 Differences between the types of program

The following chart provides an overview of the differences between the Basic, Standard and Advanced program types:



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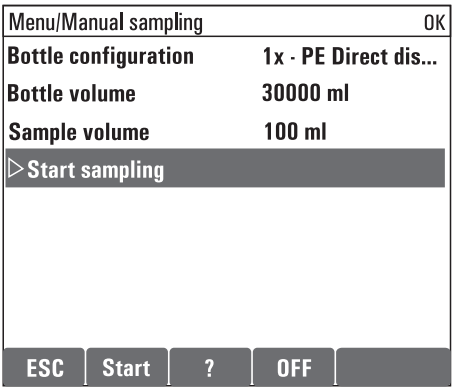
7.4.2 Manual sampling

- Manual sampling is triggered by the "MAN" soft key. This pauses any program currently running.
- The current bottle configuration and the current sample volume are displayed. The distributor position and sample volume can be changed.
- Select "Start sampling".
- A new screen is displayed indicating the progress of the sampling process.
- After manual sampling a running program can be displayed and resumed by pressing the "ESC" soft key.
- Example:

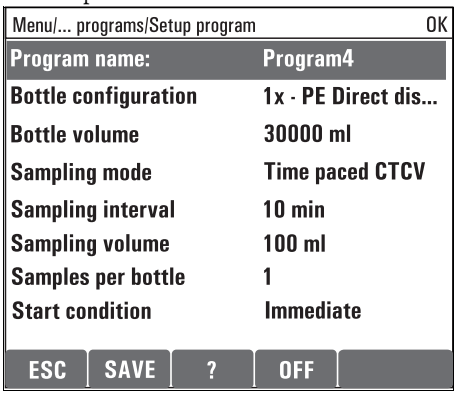


- The sample volume for "Manual sampling" is not taken into account in the calculated bottle volumes.

7.4.3 Programming for automatic sampling

Create a sampling program in the general overview under "Select sampling program/New/Basic" or in the menu "Menu/Setup/Sampling programs/Setup program/New/Basic":

- Enter the "Program name".
- The screen displays the settings from the "Basic setup" for the bottle configuration and the bottle volume.
- Sampling mode = "Time paced CTCV" is preset.
- Enter the "Sampling interval".
- Enter the "Sampling volume" per sample. (For device versions with a vacuum pump, configure under "Menu/Setup/General settings/Sampling".)
- Select the "Bottle change mode" after number of samples or time for average samples.
  - With the option "bottle change after time", you can enter the bottle change time and the bottle synchronization (None, 1. bottle change time, 1. time of change + bottle number). The description for this can be found in the "Bottle synchronization" section.
- For "Multiple bottles" enter the number of bottles the sample should be transferred to.
- "Start condition": immediately or time-delayed.
- "Stop condition": when the program ends or continuous operation.
- Pressing the "SAVE" soft key saves the program and ends data entry.
- Example:



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