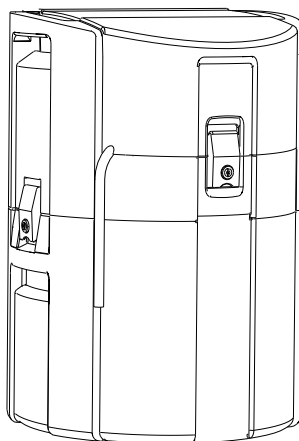


Brief Operating Instructions

Liquiport 2010 CSP44

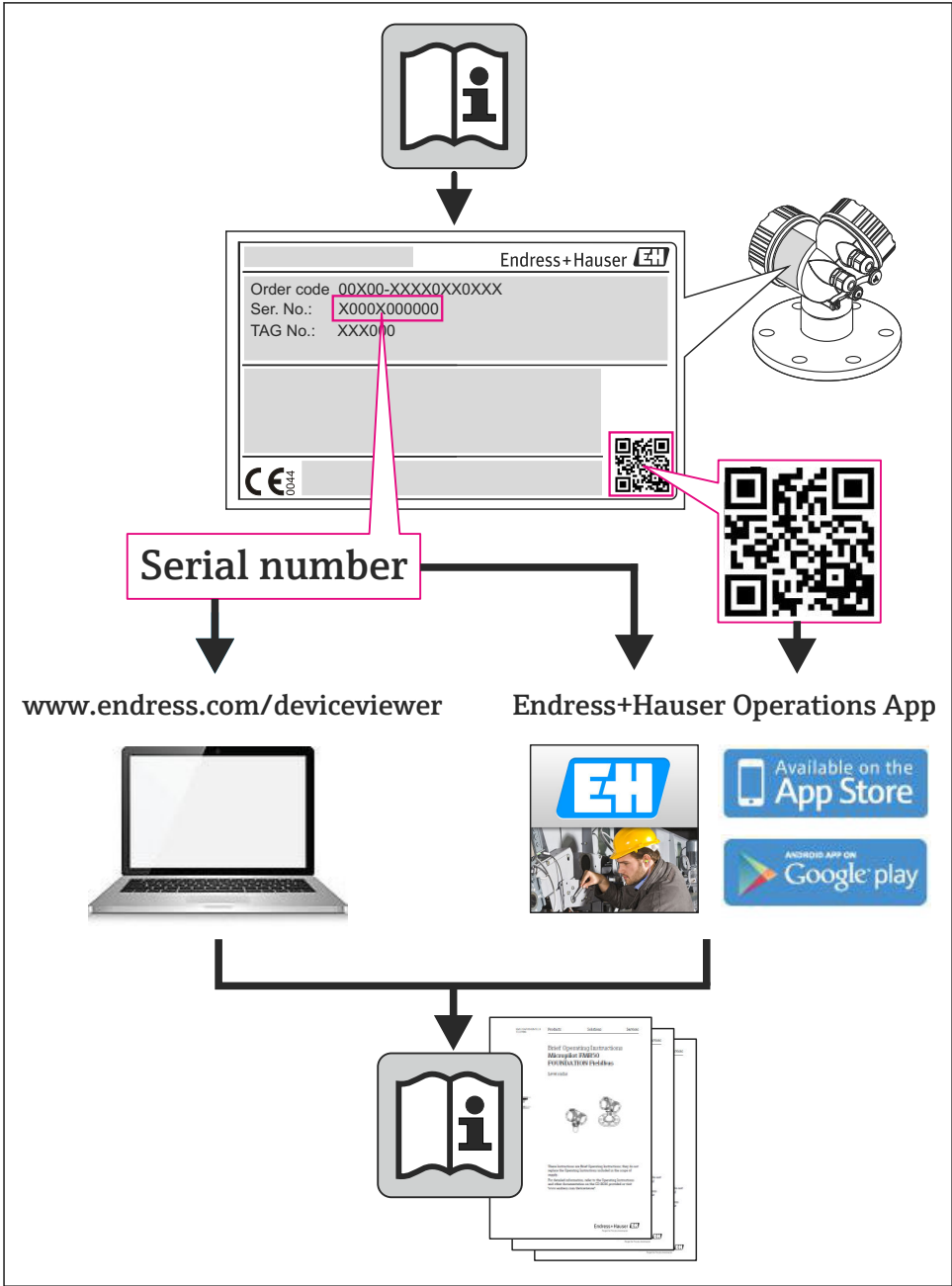
Automatic sampler for liquid media



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







A0023555

Table of contents








1	Document information	4
1.1	Warnings	4
1.2	Symbols	4
1.3	Symbols at the device	4
1.4	Documentation	5
2	Basic safety instructions	6
2.1	Requirements for the personnel	6
2.2	Designated use	6
2.3	Occupational safety	6
2.4	Operational safety	7
2.5	Product safety	7
3	Incoming acceptance and product identification	8
3.1	Incoming acceptance	8
3.2	Product identification	8
3.3	Scope of delivery	9
3.4	Certificates and approvals	9
4	Installation	10
4.1	Installation conditions	10
4.2	Installation	14
4.3	Connecting the suction line	14
4.4	Post-installation check	14
5	Electrical connection	15
5.1	Connecting the sampler	15
5.2	Connecting modules and sensors	17
5.3	Terminal assignment for input/output signals	17
5.4	Signal cable connection (optional)	18
5.5	Ensuring the degree of protection	20
5.6	Post-connection check	21
6	Operation options	22
6.1	Overview	22
6.2	Access to the operating menu via the local display	23
6.3	Configuration options	24
7	Commissioning	28
7.1	Function check	28
7.2	Switching on	28
7.3	Basic setup	29
7.4	Sampling programs	30

1 Document information


1.1 Warnings

Structure of information	Meaning
 Causes (/consequences) 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.
 Causes (/consequences) 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.
 Causes (/consequences) 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.
 Cause/situation Consequences of non-compliance (if applicable) ► Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step

1.3 Symbols at the device

Symbol	Meaning
	Reference to device documentation

1.4 Documentation

The following manuals which are available on the product pages on the internet complement these Operating Instructions:

- Operating Instructions for Liquiport CSP44, BA00465C
 - 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
- 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
- Special Documentation: Sampler application manual SD01068C
- Documentation on other devices in the Liquiline platform:
 - Liquiline CM44xR (DIN rail device)
 - Liquiline System CA80 (analyzer)
 - Liquiline System CAT8x0 (sample preparation)
 - Liquistation CSFxx (sampler)
 - Liquiport CSP44 (sampler)

2 Basic safety instructions

2.1 Requirements for the 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.
- Measuring point faults may be repaired only by authorized and specially trained personnel.



Repairs not described in the Operating Instructions provided may only be carried out directly by the manufacturer or by the service organization.

2.2 Designated use

Liquiport 2010 CSP44 is a portable sampler for liquid media in non-hazardous areas. The samples are taken discontinuously using a peristaltic pump and are then distributed into sampling containers.

The sampler is designed for use in the following applications:

- Communal and industrial wastewater treatment plants
- Laboratories and water management offices
- Monitoring of liquid media in industrial processes

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 Occupational safety

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations

Electromagnetic compatibility

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

2.4 Operational safety

1. Before commissioning the entire measuring point, verify that all connections are correct. Ensure that electrical cables and hose connections are undamaged.
2. Do not operate damaged products, and safeguard them to ensure that they are not operated inadvertently. Label the damaged product as defective.
3. If faults cannot be rectified:
Take the products out of operation and safeguard them to ensure that they are not operated inadvertently.

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.

Devices connected to the sampler must comply with the applicable 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.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify your supplier of any damage to the packaging.
Keep the damaged packaging until the matter has been settled.
2. Verify that the contents are undamaged.
 - ↳ Notify your supplier of any damage to the delivery contents.
Keep the damaged products until the matter has been settled.
3. Check the delivery for completeness.
 - ↳ Check it against the delivery papers and 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.
The permitted ambient conditions must be observed (see "Technical data").

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

3.2 Product identification

Nameplates can be found:

- On the inside of the door
- On the packaging (adhesive label, portrait format)
- On the inside of the device cover

3.2.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
 - Order code
 - Extended order code
 - Serial number
 - Firmware version
 - Ambient and process conditions
 - Input and output values
 - Activation codes
 - Safety information and warnings
- Compare the data on the nameplate with your order.

3.3 Scope of delivery

The scope of delivery comprises:

- 1 Liquiport 2010 CSP44 with:
 - The ordered bottle configuration
 - Optional hardware
- 1 print version of Brief Operating Instructions in the language ordered
- Optional accessories

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

3.4 Certificates and approvals

3.4.1 C€ mark

Declaration of Conformity

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

MCERTS

The device has been assessed by Sira Certification Service and complies with "MCERTS Performance Standards for Water Monitoring Equipment Part 1, Version 2.1 dated November 2009"; certificate no.: Sira MC100176/02.

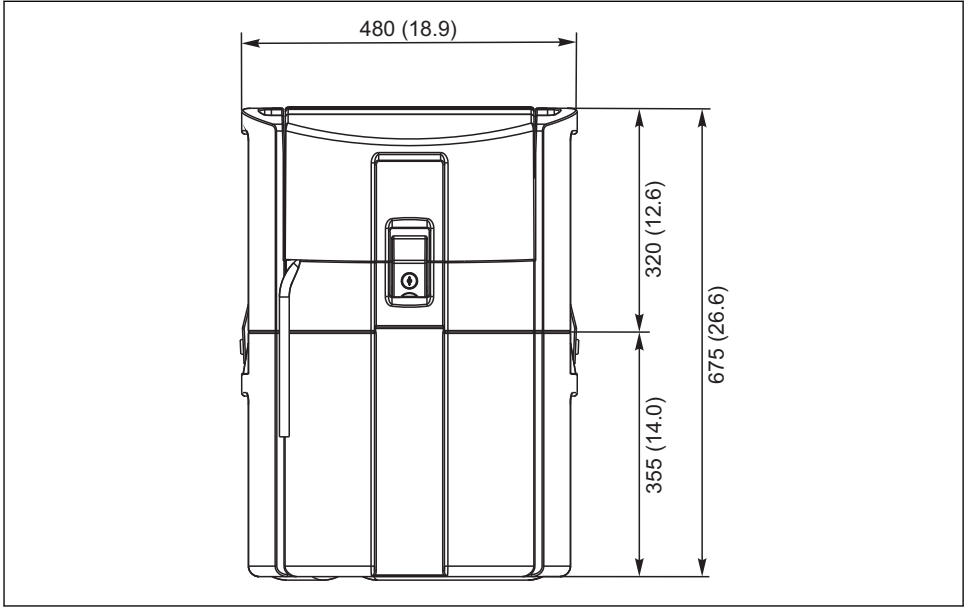
cCSAus General purpose

The product meets the requirements in accordance with "Class 8721 05, laboratory equipment, electrical; Class 8721 85, laboratory equipment, electrical, certified to US standards" for indoor use. Certificate no.: 2318018


4 Installation

4.1 Installation conditions

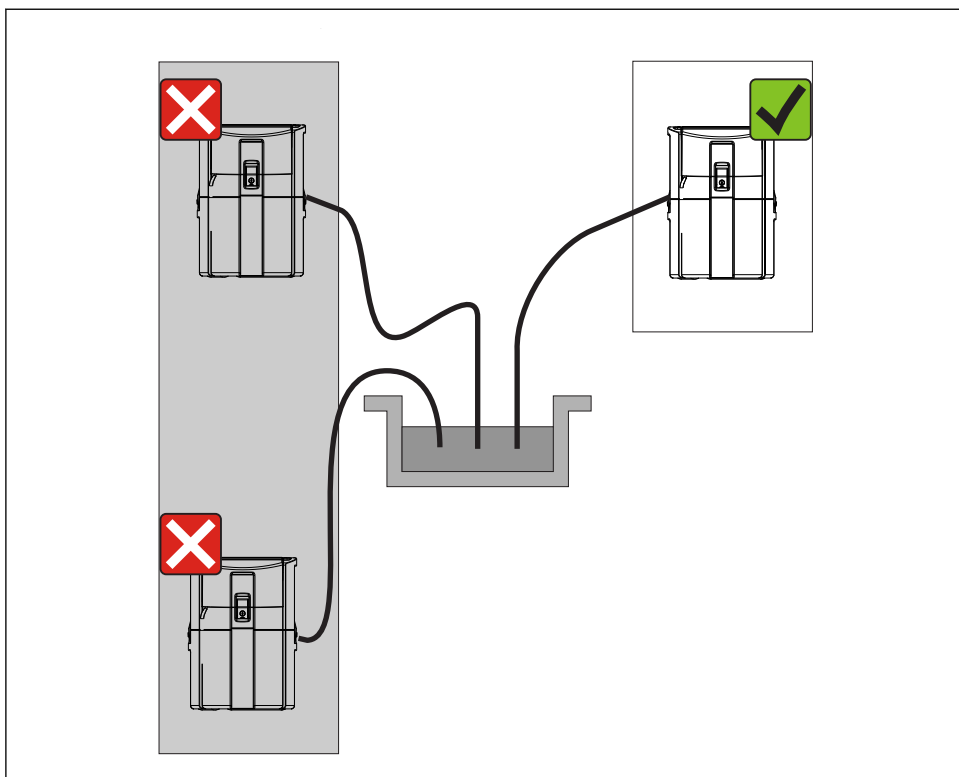
4.1.1 Dimensions



A0013473


 1 CSP44 standard version, dimensions in mm (in)

4.1.2 Installation site



A0013474

 2 Installation site, example

 The suction line must be routed with a downward slope to the sampling point. Avoid siphon formation!

Note the following when erecting the device:

- Erect the device on a level surface.
- Protect the device against additional heating (e.g. from a heating system).
- Protect the device against mechanical vibrations.
- Protect the device against strong magnetic fields.

4.1.3 Connection for suctioning samples

- Maximum suction height: 8 m (26 ft)
- Maximum hose length: 30 m (98 ft)
- Diameter of hose connection: 10 mm (3/8") internal diameter
- Intake speed:
 - > 0.5 m/s (> 1.6 ft/s) as per EN 25667, ISO 5667
 - > 0.6 m/s (> 1.9 ft/s) as per Ö 5893, US EPA

Note the following when erecting the device:

- Always route the suction line so that it slopes upwards from the sampling point to the sampler.
- The sampler must be located above the sampling point.
- Avoid siphoning effects in the suction line.

Requirements for the sampling point:

- Do not connect the suction line to pressurized systems.
- Use the suction filter to impede coarse and abrasive solids and solids which can cause clogging.
- Immerse the suction line in the direction of flow.
- Take the sample at a representative point (turbulent flow, not directly at the bottom of the channel).

Useful sampling accessories

- Suction filter:
 - Impedes coarser solids and solids which can cause clogging.
- Immersion assembly:
 - The adjustable immersion assembly fixes the suction line at the sampling point.

4.1.4 Connection to sample intake on version with pump

- Maximum suction height: 8 m (26 ft)
- Maximum hose length: 30 m (98 ft)
- Diameter of hose connection: 10 mm (3/8") internal diameter
- Intake speed:
 - > 0.5 m/s (> 1.6 ft/s) as per EN 25667, ISO 5667
 - > 0.6 m/s (> 1.9 ft/s) as per Ö 5893, US EPA

Note the following when erecting the device:

- Always route the suction line so that it slopes upwards from the sampling point to the sampler.
- The sampler must be located above the sampling point.
- Avoid siphoning effects in the suction line.

Requirements for the sampling point:

- Do not connect the suction line to pressurized systems.
- Use the suction filter to impede coarse and abrasive solids and solids which can cause clogging.
- Immerse the suction line in the direction of flow.
- Take the sample at a representative point (turbulent flow, not directly at the bottom of the channel).

Useful sampling accessories

- Suction filter:
Impedes coarser solids and solids which can cause clogging.
- Immersion assembly:
The adjustable immersion assembly fixes the suction line at the sampling point.

4.2 Installation

4.3 Connecting the suction line

1. When installing the device, take the installation conditions into account.
2. Open the device cover at the front fastening clasp.
3. Route the suction line from the sampling point to the device.
4. Screw the suction line onto the device's hose connection.

4.4 Post-installation check

1. Verify that the suction line is securely connected to the device.
2. Visually check that the suction line is installed correctly from the sampling point to the device.
3. Verify that the rotating arm is correctly engaged.
4. Allow the sampler to rest for a minimum of 12 hours following installation and before switch-on. Otherwise you may cause damage to the climate control module.

5 Electrical connection

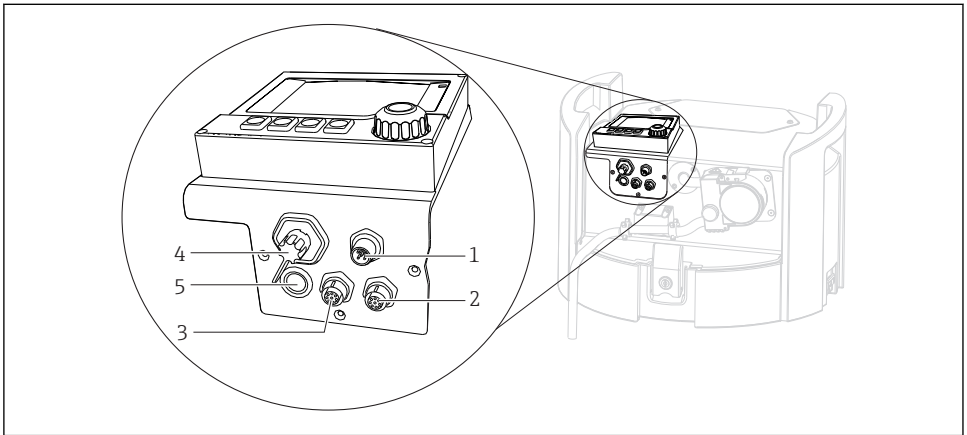
5.1 Connecting the sampler

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.





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3 *Electrical connections of the controller*


- 1 *Connection socket for charger*
- 2 *Socket for M12 sensor connector (optional)*
- 3 *Socket for M12 sensor connector (optional)*
- 4 *Connection socket for signal cable (optional)*
- 5 *Service interface*

5.1.1 Battery connection

The device is delivered with a built-in rechargeable battery. The battery is not yet connected. Charge the battery before initial commissioning. It takes approx. 5 hours to fully charge the battery. Please refer to the charger's operating manual for detailed information on the charger.

1. Unscrew the cover plate of the battery compartment, →  3,  15, item 2.
2. Remove the battery from the battery compartment.
3. Plug the connectors on the device into the color-coded terminals of the battery (red --> red; black --> black).


4. Plug the connectors on the device into the color-coded terminals of the battery (red --> red; black --> black).
5. Make sure the connections are secure.
6. Place the battery back into the battery compartment. The battery terminals must be toward the front.
7. After establishing the connection, screw the cover plate back onto the battery compartment.
8. Reverse the procedure to disconnect the battery from the device.

 Only replace batteries with the following battery type: Panasonic LC-R127R2PG1.

Connecting the charger when the batteries are installed

The mains plug of the charger must be easily accessible so that the charger can be easily disconnected from the power supply.

- Connect the battery charger to the connection socket (item 1). If the battery is not fully charged, it is recharged by the charger.

 Only use the chargers specified by the manufacturer.

Connecting the charger when the batteries are removed

If you are charging batteries that have been removed, you require the adapter cable (accessory no.: 71111882) to connect to the charger.

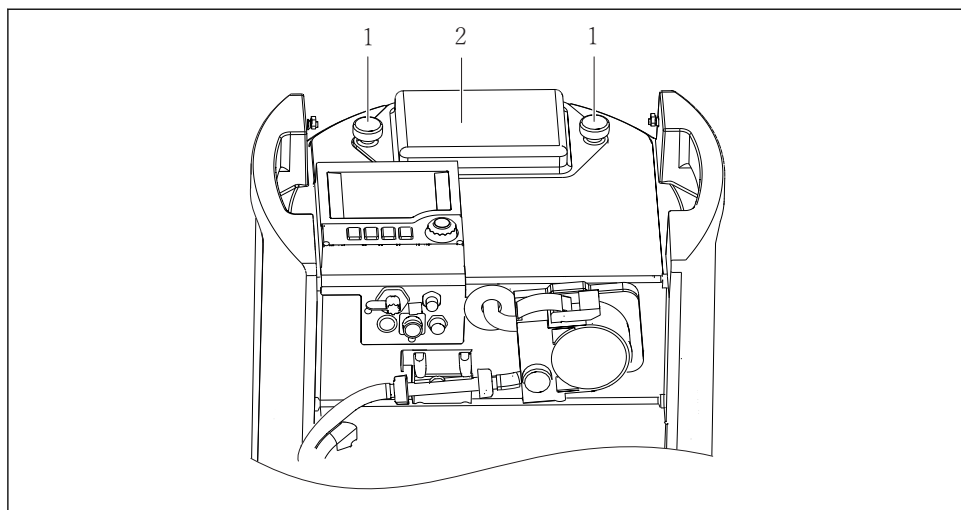
5.1.2 Removing the cover on the power unit

WARNING

Device is live

Incorrect connection may result in injury or death

- If a power unit or charger is connected, disconnect it from the power supply.



A0014207

- 1 Fixing screws
- 2 Battery compartment cover

1. Release the two securing screws (1).
2. Remove the cover of the battery compartment (2).
3. Remove the old batteries and release the plug-in connections.
4. Connect the new batteries (pay attention to the battery polarity).
5. Insert the new batteries and secure the battery compartment cover.

5.2 Connecting modules and sensors

5.3 Terminal assignment for input/output signals

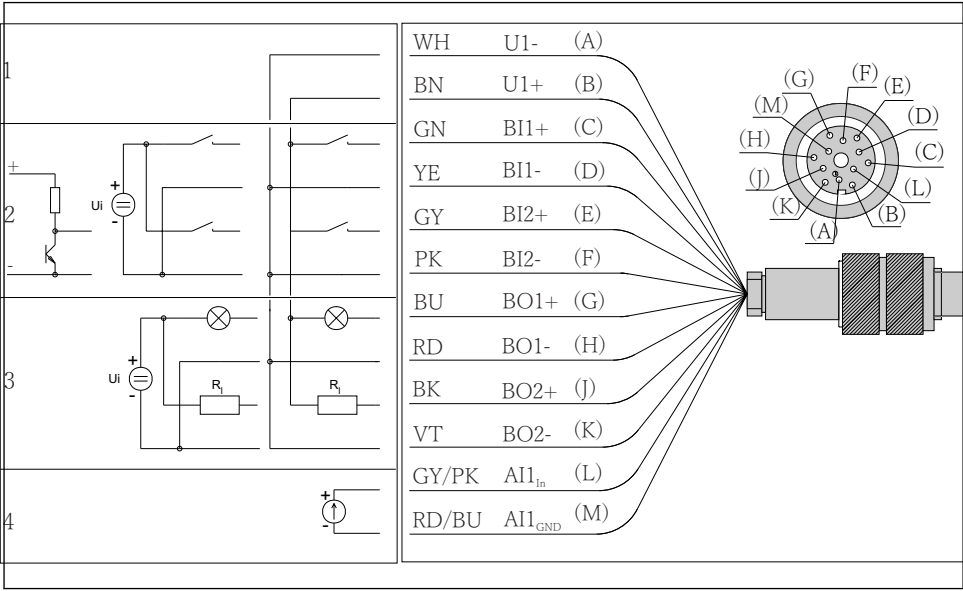
Input signals

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

Output signals

- 2 binary signals > 1 s pulse width or edge (optional)
- 2 current outputs 0/4 to 20 mA (optional)

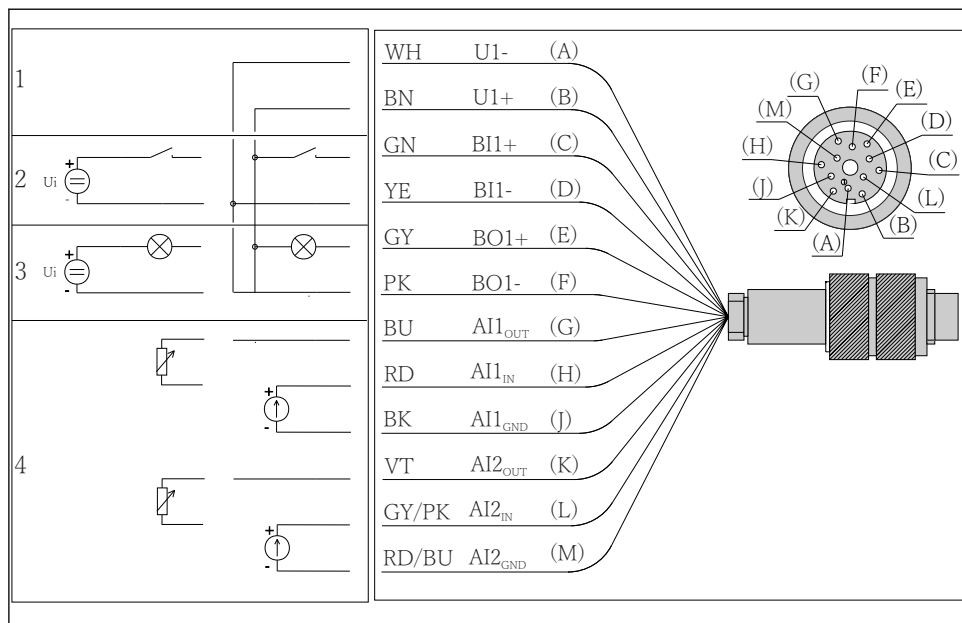
5.4 Signal cable connection (optional)



A0014162

4 Pin assignment and wiring diagram of signal cable (version K3)

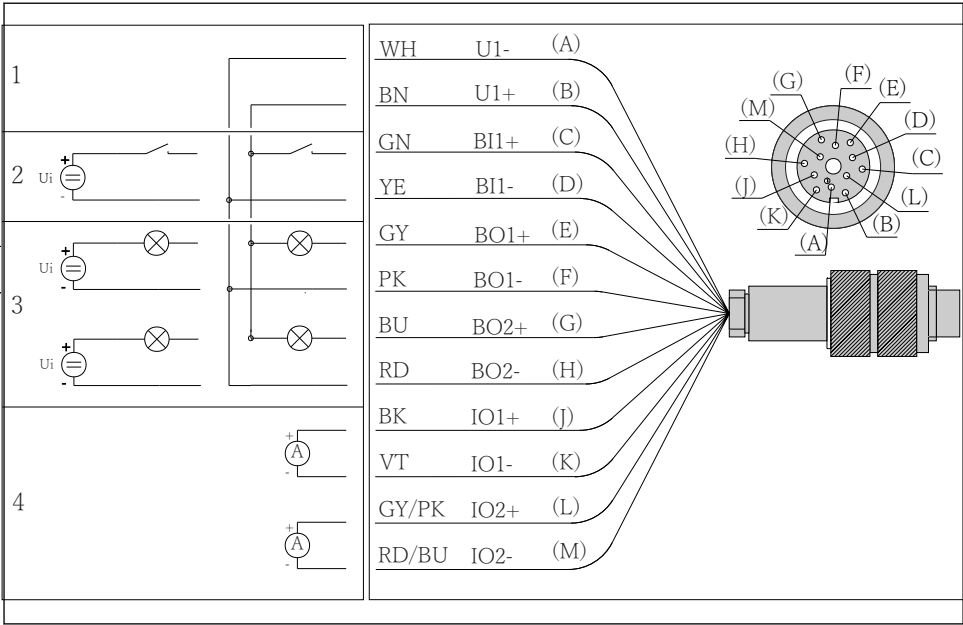
- 1 Auxiliary voltage U: 24 V max. 30 mA load capacity
- 2 Binary inputs BI: > 20 ms, only extra-low voltage U_i ≤ 30 V DC
- 3 Binary outputs BO: only extra-low voltage U_i ≤ 30 V DC, max. current when using ext. auxiliary voltage (max. 200 mA)
- 4 Analog input AI: 0 to 20 mA, 4 to 20 mA



A0014197

5 Pin assignment and wiring diagram of signal cable (version K4)

- 1 Auxiliary voltage U: 24 V max. 30 mA load capacity
- 2 Binary input BI: > 20 ms, only extra-low voltage U_i ≤ 30 V DC
- 3 Binary output BO: only extra-low voltage U_i ≤ 30 V DC, max. current when using ext. auxiliary voltage (max. 200 mA)
- 4 Analog inputs AI: 0 to 20 mA, 4 to 20 mA



A0014198

6 Pin assignment and wiring diagram of signal cable (version K5)

- 1 Auxiliary voltage U: 24 V max. 30 mA load capacity
- 2 Binary input BI: > 20 ms, only extra-low voltage $U_i \leq 30$ V DC
- 3 Binary output BO: only extra-low voltage $U_i \leq 30$ V DC, max. current when using ext. auxiliary voltage (max. 200 mA)
- 4 Analog inputs AI: 0 to 20 mA, 4 to 20 mA

5.5 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions and which are necessary for the required, designated use, may be carried out 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) 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 for the confirmed level of IP protection).
- Modules are not fully secured.
- The display is not fully secured (risk of moisture entering due to inadequate sealing).
- Loose or insufficiently tightened cables/cable ends.
- Conductive cable strands are left in the device.

5.6 Post-connection check

WARNING

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.

- ▶ Operate the device only if you can answer **yes** to **all** of the following questions.

Instrument status and specifications

- ▶ Is there any external damage to the device and cables?

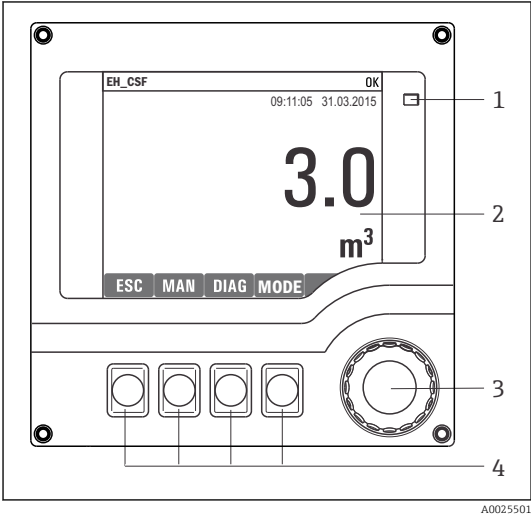
Electrical connection

- ▶ Are the mounted cables strain-relieved?
- ▶ Have the cables been routed without loops and cross-overs?
- ▶ Have the signal lines been connected correctly in accordance with 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 Overview

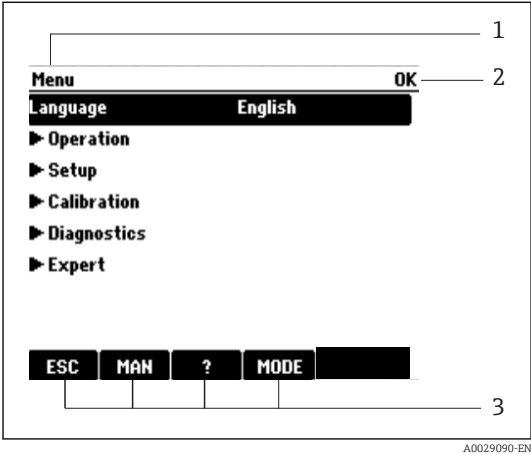
6.1.1 Display and operating elements



- 1 LED
- 2 Display (with red display background in alarm condition)
- 3 Navigator (jog/shuttle and press/hold function)
- 4 Soft keys (function depends on menu)

7 Overview of operation

6.1.2 Display

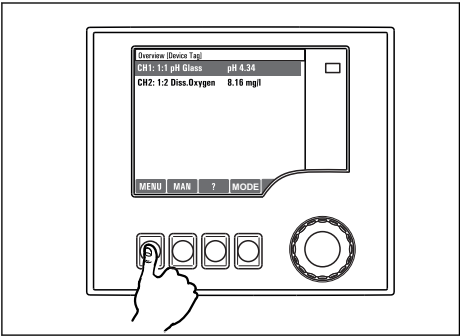


- 1 Menu path and/or device designation
- 2 Status display
- 3 Assignment of soft keys, e.g.:
ESC: escape or abortion of a sampling process
MAN: manual sample
?: Help, if available
MODE: switch the device to standby or cancel the program

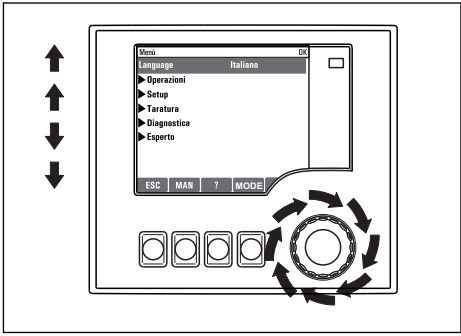
8 Display (example)

6.2 Access to the operating menu via the local display

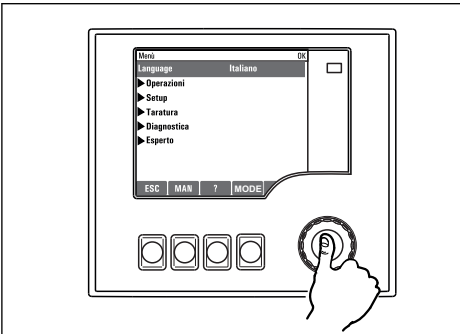
6.2.1 Operating concept



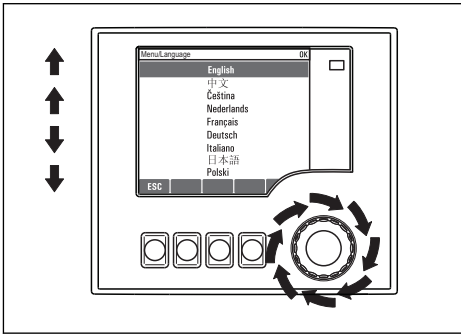
Pressing the soft key: selecting the menu directly



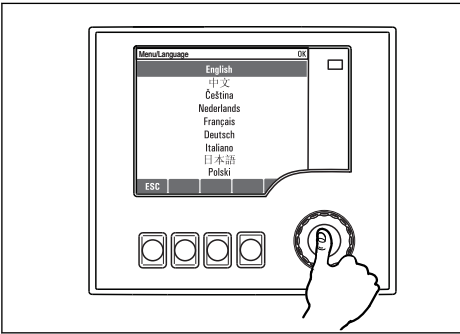
Turning the navigator: moving the cursor in the menu



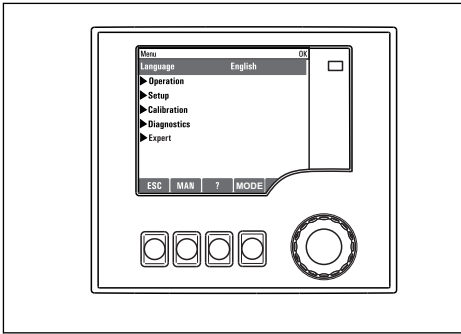
Pressing the navigator: launching a function



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



Pressing the navigator: accepting the new value




↪ New setting is accepted

6.2.2 Locking or unlocking operating keys

Locking operating keys

- ▶ 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. This password is set here: **MenuSetupGeneral settingsExtended setupData managementChange lock password**

- ▶ Choose whether you want to lock without or without a password.
 - ↳ The keys are locked. No more entries can be made. In the soft key bar, you will see the  symbol.



The password is 0000 when the device is delivered from the factory. **Make sure to note down any changes to the 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 visible on the display.



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

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. In a few cases, these also appear in the form of multiple choice boxes.
- Usually you just select one option; in rare instances you select one or more 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/Operation/Display/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:
 - Start a sampling program
 - Start manual sampling
 - Saving or loading configurations
- Example: **Menu/Manual sampling/Start sampling**

6.3.5 Free 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**

Menu/...neral settings/Device tag
OK

E+H CSP4

	0	1	2	3	4	5	6	7	8	9		
A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A..	a..	+..	@					←	→	✕	del	C
								✕		✓		

✕
✕
←
✓

6.3.6 Tables

- Tables are needed to map mathematical functions or to enter irregular interval samples.
- 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 lines to the table (**INSERT**) or delete lines from the table (**DEL**).
- Afterwards, you save the table (**SAVE**).
- You can also cancel your entries any time using the **X** soft key.
- Example: **Menu/Setup/Inputs/pH/Medium comp.**

	Temperature	pH
1	20.0 °C	pH 6.90
2	25.0 °C	pH 7.00
3	30.0 °C	pH 7.10

7 Commissioning

7.1 Function check

WARNING

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.

7.2 Switching on

7.2.1 Setting the operating language

Configure language

If you have not already done so, close the housing cover and screw the device closed.

1. Connect the rechargeable battery (see "Electrical connection" section).
 - ↳ Wait for initialization.
2. Press the soft key **MENU**. Set your language in the top menu item.
 - ↳ The device can now be operated in your chosen language.

7.2.2 Start screen

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

- **Select sampling program**
- **Edit program %OV¹⁾**
- **Start program %OV¹⁾**
- **MENU**
- **MAN**
- **MEAS**
- **MODE**

1) "%OV" here stands for text that depends on the context. This text is generated automatically by the software and inserted in place of %OV.

7.3 Basic setup

Making basic settings

1. **Device tag:** Give your device any name of your choice (max. 32 characters).
2. **Set date:** Correct the set date if necessary.
3. **Set time:** Correct the set time if necessary.
4. **Number of bottles:** Correct the set number of bottles if necessary.
5. **Bottle volume:** Correct the set bottle volume if necessary.
 - ↳ For quick commissioning, you can ignore the additional settings for outputs etc. You can make these settings later in the specific menus.
6. Return to the overview by pressing and holding the soft key for **ESC** for at least one second.
 - ↳ Your sampler now works with your basic settings.

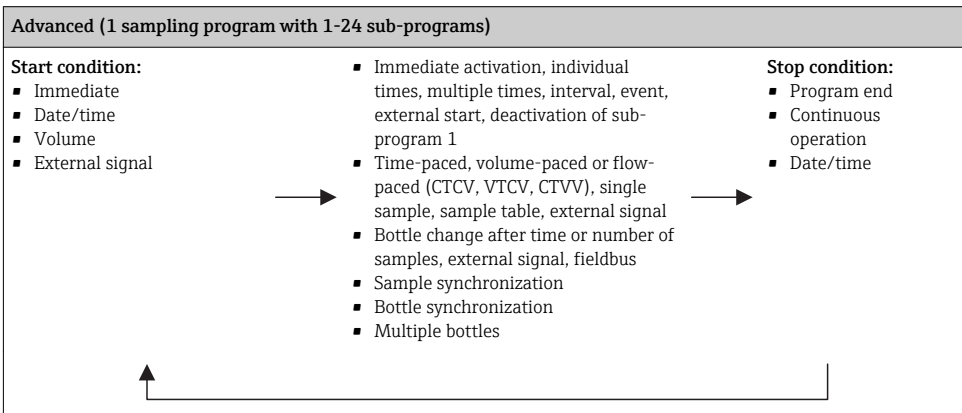
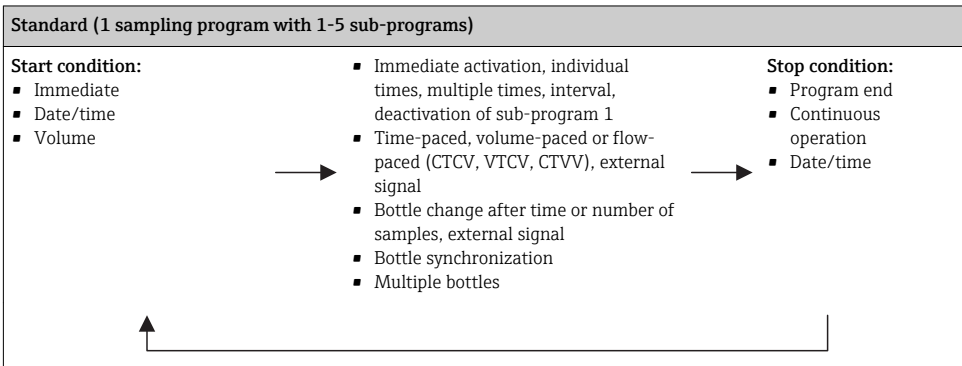
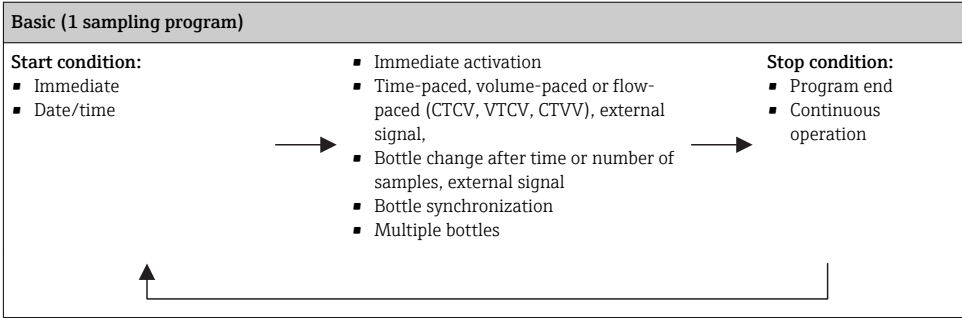
If you wish to configure your most important input and output parameters in the **Basic setup** :

- Configure the current inputs, limit contactors, cleaning cycles and device diagnostics with the following submenus.

7.4 Sampling programs

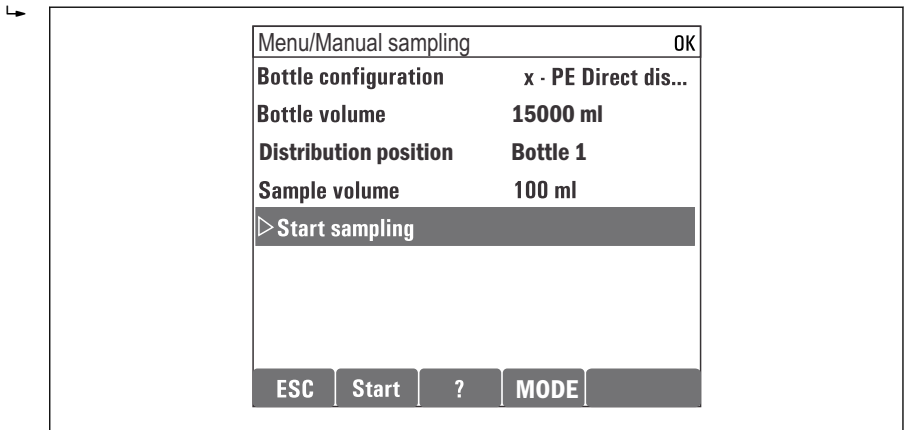
7.4.1 Difference between program types

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



7.4.2 Manual sampling

1. 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. You can select the distributor position. In peristaltic systems, you can also change the sample volume.
2. Select **Start sampling**
 - ↳ A new screen is displayed indicating the progress of the sampling process.
3. After manual sampling, a running program can be displayed and continued with the **ESC** **ESC**



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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 simple sampling program in the general overview under **Select sampling program/New/Basic** or in the menu **Menu/Setup/Sampling programs/Setup program/New/Basic**

1. Enter the "Program name".
2. The settings from the **Basic setup** for bottle configuration and bottle volume are displayed.
3. **Sampling mode=Time paced CTCV** is preset.
4. Enter the **Sampling interval**
5. Enter the **Sampling volume** per sample. (For version with vacuum pump, configure under **Menu/Setup/General settings/Sampling .**)

6. Select the **Bottle change mode** after number of samples or time for average samples.

 With the option "Bottle change after a time", you can enter the change time and bottle synchronization (None, 1st bottle change time, 1st time of change + bottle number). The description for this can be found in the "Bottle synchronization" section.

 With the option "Bottle change after a time", you can choose the bottle synchronization before the start condition (None, 1st bottle change time, 1st time of change + bottle number). The description for this can be found in the "Bottle synchronization" section.

1. For **Multiple bottles** enter the number of bottles the sample should be distributed over.
2. **Start condition:** immediately or after date/time
3. **Stop condition:** after program end or continuous operation.
4. Pressing the **SAVE** saves the program and ends data entry.

↳ Example:

Menu/... programs/Setup program		OK
Program name:	Program4	
Bottle configuration	2x · PE Direct dis...	
Bottle volume	15000 ml	
Sampling mode	Time paced CTCV	
Sampling interval	10 min	
Sampling volume	100 ml	
Samples per bottle	144	
Start condition	Immediate	
ESC	SAVE	? MODE

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The program can be started.



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