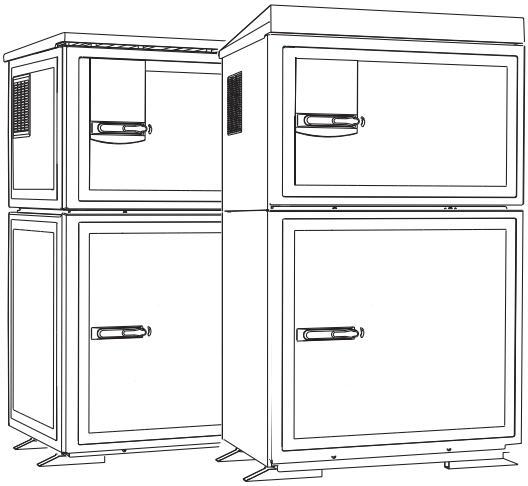
BA00488C/07/EN/15.13
71217975

Valid as of:
Softwareversion 01.04.00

Operating Instructions
Liquistation CSF33

Automatic sampler for liquid media
Maintenance & diagnostics



Endress+Hauser
People for Process Automation

About this manual

These instructions describe all the tasks you must perform for diagnostics, maintenance and repair.

A description of the following is provided here:
- General troubleshooting
- Overview of the diagnostic messages
- Description of the information of the "Diagnostics" menu
  - Diagnostics list
  - Logbooks
  - System information
  - Output status
  - Systemtest/Reset
  - Manual hold
  - Term information
  - Simulation
  - Sensor information
- Cleaning and maintenance
- Accessories and spare parts

This manual does not include the following:
- Setup/General settings
  --> Operating Instructions BA00479C "Commissioning"
- Display/Operation
  --> Operating Instructions BA00479C "Commissioning"
- Inputs
  --> Operating Instructions BA00487C "Operation&settings"
- Outputs
  --> Operating Instructions BA00487C "Operation&settings"
- Sampling programs
  --> Operating Instructions BA00487C "Operation&settings"
- Additional functions
  --> Operating Instructions BA00487C "Operation&settings"
- Data management
  --> Operating Instructions BA00487C "Operation&settings"
- Calibration
  --> Operating Instructions BA00489C "Calibration"
- Expert
  --> Internal Service Manual

Table of contents

1 Diagnostics and troubleshooting

The sampler continuously monitors its own functions.
The color of the display background changes to red if a diagnostics message for error category "F" occurs.
The LED beside the display flashes red if a diagnostics message for error category "M" occurs.

1.1 General troubleshooting

1.1.1 Troubleshooting

A diagnostic message appears on the display or via the fieldbus indicating that the measured values are not plausible, or you identify a fault.

1. See the Diagnostics menu for the details on the diagnostic message.
   ↳ Follow the instructions to rectify the problem.
2. If this does not help: Search for the diagnostic message under "Overview of diagnostic information" (→ 9) in this manual. Use the message number as a search criterion. Ignore the letters indicating the Namur error category.
   ↳ Follow the troubleshooting instructions provided in the last column of the error tables.
3. If the measured values are implausible, the onsite display is faulty or you encounter other problems, search for the faults under "Device-specific errors" (→ 5).
   ↳ Follow the recommended measures.
4. Contact the Service Department if you cannot rectify the error yourself. Only cite the error number.

1.1.2 Device-specific errors

Problem	Possible cause	Tests and/or remedial measures
The device cannot be switched on/display remains dark	No supply voltage	Check if voltage supplied
	Basic module defective	Replace basic module
Values appear on display but: – Display does not change and / or – Device cannot be operated	Module not wired correctly	Check modules and wiring
	Impermissible operating system condition	Switch off device and switch it on again
Control signals are not accepted or outputs do not switch	Incorrect program setting	Check program setting
	Incorrect wiring	Check wiring
	Electronics failure	Replace basic module
Sample not representative	Siphon in sampling hose	Check sampling hose
	Connection not air-tight/sampling hose taking in air	– Check tubes/connections – Check the sampling hose is routed correctly
	Bottles not being filled correctly	– Incorrect distribution selected in the controls – Calibrate the distribution arm
	Distribution arm does not move	– Incorrect distribution selected in the controls – Check distribution arm connection – Distributor defective, replace distributor or – Have repaired by E+H Service
	Incorrect bottle filled	– Incorrect distribution selected in the controls
	No sample cooling	– Check the setting for the sample compartment temperature in the controls – Cooling system defective --> Have repaired by E+H Service
	Wrong pump tube	Only use genuine pump tube
	Faulty sensory mechanism	Replace sensory mechanism (contact E+H Service)
No sampling	Connection leaking	Check tubes/connections for leaks
	Sampling hose taking in air	Check the sampling hose is routed correctly
	Air manager defective	Have repaired by E+H Service
	Vacuum pump defective	Have repaired by E+H Service
	Wrong pump tube	Only use genuine pump tube
	Faulty sensory mechanism	Replace sensory mechanism (contact E+H Service)

Problem	Possible cause	Tests and/or remedial measures
Current output, incorrect current value	Incorrect adjustment	Check with integrated current simulation, connect mA meter directly to current output.
	Load too large	
	Shunt / short to ground in current loop	
No current output signal	Basic module defective	Check with integrated current simulation, connect mA meter directly to current output.

1.2 Diagnostic information on the onsite display

Up-to-date diagnostic events are displayed along with their status category, diagnostic code and short text. Clicking on the Navigator lets you retrieve more information and tips on remedial measures.

1.3 Adjusting diagnostic information

1.3.1 Classification of diagnostics messages

More detailed information on the current diagnostics messages displayed is provided in the DIAG/Diagnostics list menu.

In accordance with Namur specification NE 107, the diagnostics messages are characterized by:
- Message number
- Error category (letter in front of the message number)
  - **F** = (Failure) a malfunction has been detected
    The cause of the malfunction is to be found in the sampling point/measuring point. Any controller connected should be set to manual mode.
  - **M** = (Maintenance required) Action should be taken as soon as possible
    The device still measures/takes a sample correctly. Immediate measures must not be taken. However, proper maintenance efforts would prevent a possible malfunction in the future.
  - **C** = (Function check) (No error)
    Maintenance work is being performed on the device. Wait until the work has been completed.
  - **S** = (Out of specification) The measuring point is being operated outside its specification
    Operation is still possible. However, you run the risk of increased wear, shorter operating life or lower accuracy levels. The cause of the problem is to be found outside the measuring point.
- Message text

If you contact the Service Department, please cite the message number only. Since you can individually change the assignment of an error to an error category, the Service Department cannot use this information.

1.3.2 Adjusting the device behavior

All the diagnostics messages are assigned to specific error categories at the factory. Since other settings might be preferred depending on the application, error categories and the effect errors have on the measuring point can be configured individually. Furthermore, every diagnostics message can be disabled.

Example

The controller returns diagnostics message 531 "Logbook full". You want to change this message so that an error is not indicated on the display for example.

1. Go to:
   - Menu/Setup/General settings/Extended setup/Diagnostics/Device behavior for device-specific diagnostics messages (as in this example)
   - Menu/Setup/Inputs/…/Extended setup/Diagnostics settings/Diag. behavior for diagnostics messages.
2. Select the diagnostics message and press the navigator button.
3. Decide:
   a. Should the message be deactivated?
   b. Do you want to change the error category?
   c. Should an error current be output?
   d. Do you want to trigger a cleaning program?
4. Deactivate the message, for example (Diagnostics message to "Off").

Configuration options

The list of diagnostic messages displayed depends on the path selected. There are device-specific messages.

Path: … /Extended setup/Diagnostics settings/Diag. behavior (optional)

Function	Options	Info
List of diagnostic messages		Select the message to be changed. Only then can you make the settings for this message.
Diag. code	Read only	
Diagnostic message	Options ▪ On ▪ Off **Factory setting** Depends on the message	You can deactivate or reactivate a diagnostic message here. Deactivating means: ▪ No error message in the measuring mode ▪ No error current at the current output
Error current	Options ▪ On ▪ Off **Factory setting** Depends on the message	Decide whether an error current should be output at the current output if the diagnostic message display is activated. If general device errors occur, the error current is output at all the current outputs. In the case of channel-specific errors, the error current is only output at the particular current output.

Path: ... /Extended setup/Diagnostics settings/Diag. behavior (optional)

Function	Options	Info
Status signal	Options ▪ Maintenance (M) ▪ Out of specification (S) ▪ Function check (C) ▪ Failure (F) **Factory setting** Depends on the message	The messages are divided into different error categories in accordance with NAMUR NE 107. Decide whether you want to change a status signal assignment for your application.
Diag. output	Options ▪ None **Factory setting** None	You can use this function to select a binary output to which the diagnostic message should be assigned.
Cleaning program(optional)	Options ▪ None ▪ Cleaning 1 ▪ Cleaning 2 ▪ Cleaning 3 ▪ Cleaning 4 **Factory setting** None	Decide whether the diagnostic message should trigger a cleaning program. You can define the cleaning programs under: Menu/Setup/Additional functions/Cleaning.
Detail information	Read only	Here you can find more information on the diagnostic message and instructions on how to resolve the problem.

1.4 Overview of diagnostic information

1.4.1 Device-specific, general diagnostic settings

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
202	Selftest active	F	On	Off	Wait for self-test to be finished
216	Hold active	C	On	Off	Output values and status of the channel are on hold
241	Device error	F	On	On	Internal device error 1. Update the software 2. Contact the Service Department 3. Replace the backplane (Service)
242	Software incomp.	F	On	On	
243	Device error	F	On	On	
261	Electr. module	F	On	On	Electronics module defective 1. Replace the module 2. Contact the Service Department
262	Module connect.	F	On	On	Electronics module not communicating 1. Check cable connection, replace if necessary 2. Check the power supply of the sampling control module 3. Contact the Service Department
263	Electr. module	F	On	On	Wrong kind of electronics module 1. Replace the module 2. Contact the Service Department
284	Firmware update	M	On	Off	Update completed successfully
285	Update error	F	On	On	Firmware update failed 1. Repeat update 2. SD card error --> use another card 3. Incorrect firmware --> repeat with suitable firmware 4. Contact the Service Department
302	Battery low	M	On	Off	Buffer battery of real time clock is low The date and time are lost if the power is interrupted. --> Contact the Service Department (battery replacement)
304	Module data	F	On	On	At least 1 module has incorrect configuration data 1. Check the system information 2. Contact the Service Department
305	Power consum.	F	On	On	Total power consumption too high 1. Check installation 2. Remove sensors/modules
306	Software error	F	On	On	Internal firmware error --> Contact the Service Department

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
310	Temp. sensor	F	On	On	Temperature sensor PT1 in climate control module for sample compartment measurement is defective. ▪ Not possible to regulate temperature of sample compartment ▪ A sampling program will not be canceled -> Contact the Service Department
311	Temp. sensor	F	On	On	Temperature sensor PT2 in sample compartment is defective. ▪ Sample temperature measurement not possible ▪ A sampling program will not be canceled -> Replace sensor
312	Temp. sensor	F	On	On	Temperature sensor PT3 for ambient temperature measurement is defective. ▪ Winter operation regulation not possible ▪ Sampling and distribution arm blocked to protect against freezing -> Disable winter operation under Setup/Inputs/Temperature S:3/Winter operation -> Replace sensor
313	Safety sensor	M	On	On	Safety switch LF2 for sample sensor active ▪ Contact electrodes for sample detection are fouled ▪ The sample continues to be taken -> Clean sample detection sensor LF1 in the dosing glass -> Contact the Service Department
314	No sample flow	F	On	On	Negative pressure cannot be created in the peristaltic pump. -> Check pump tube for leaks -> Immerse suction line in medium
315	Refrigeration	F	On	On	▪ Sample compartment target temperature not reached ▪ Refrigeration regulation not possible -> Check the sample compartment door -> Carry out a module test under Diagnostics/Systemtest/Climate control module/Test cooling -> Contact the Service Department

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
316	Heating	F	On	On	▪ Sample compartment target temperature not reached ▪ Heating regulation not possible -> Check the sample compartment door -> Carry out a module test under Diagnostics/Systemtest/Climate control module/Test heating -> Contact the Service Department
317	Liquidsensor	M	On	On	▪ Sensor LF1 for sample detection fouled. ▪ Five sampling processes still possible. -> Clean sensor LF1 in the dosing glass
318	Liquidsensor	F	On	On	▪ Sensor LF1 for sample detection defective. ▪ No sampling possible. -> Contact the Service Department
319	Safety sensor	M	On	On	▪ Safety switch LF2 fouled. ▪ Five sampling processes still possible. -> Clean sensor LF2 in the dosing glass
320	Safety sensor	F	On	On	▪ Safety switch LF2 defective. ▪ No sampling possible. -> Contact the Service Department
321	Liquid sensor	F	On	On	Capacitance sensor misaligned or defective. ▪ Medium detection in dosing chamber not possible ▪ No sampling possible -> Clean sensor -> Contact the Service Department
322	Read sub-program	F	On	On	Selected subprogram cannot be read from the program memory -> Create a new subprogram
323	Write sub-prg.	F	On	On	Subprogram created cannot be saved -> Hardware error -> Contact the Service Department
324	Delete sub-prg.	F	On	On	Selected subprogram cannot be deleted from the program memory -> Reset the software
325	Readsub-prg.list	F	On	On	Subprogram list cannot be read from the program memory -> Reset the software
326	Membrane pump	F	On	On	▪ Vacuum pump defective ▪ Motor cable broken -> Contact the Service Department

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
327	Air-Manager	F	On	On	▪ Air manager for compressed air distribution defective ▪ Photoelectric barrier defective ▪ Cable defective -> Contact the Service Department
328	Distribution arm	F	On	On	Distribution arm zero point not found during reference run -> Carry out a distribution arm test under Diagnostics/Systemtest/Distribution arm -> Contact the Service Department
329	Pump failure	F	On	On	Pump motor is drawing excess current -> Contact the Service Department
330	Membrane pump	F	On	On	Vacuum pump control defective -> Contact the Service Department
331	Peristaltic pump	F	On	On	▪ Peristaltic pump defective ▪ Motor cable broken -> Contact the Service Department
332	Peristaltic pump	F	On	On	Control of peristaltic pump defective --> Contact the Service Department
333	Pressure sensor	F	On	On	Medium detection not possible No sampling possible. ▪ Suction line not drained before sampling ▪ Pressure sensor defective -> Check the suction line, purge it using the pump test under Diagnostics/Systemtest/Pump test if necessary -> Contact the Service Department
334	Cooling system	F	On	On	Climate control module defective -> Replace the climate control module -> Contact the Service Department
335	Fan	F	On	On	Ventilator defective. -> Replace the ventilator -> Contact the Service Department
337	Pump tubing	M	On	Off	Pump tube operating time reached shortly Display under Diagnostics/Runtime info/Tubing age -> Schedule replacement -> After replacement, reset the operating time under Diagnostics/Runtime info
338	Pump tubing	M	On	Off	Pump tube operating time reached Display under Diagnostics/Runtime info/Tubing age -> Change the pump tubing -> After replacement, reset the operating time under Diagnostics/Runtime info

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
339	Liquidsensor	M	On	Off	Sensor conductivity 1 fouled -> Clean the sensor soon -> The sensitivity can be configured under Setup/General settings/Sampling/Conductive sensor
340	Liquidsensor	M	On	Off	Sensor conductivity 1 fouled -> Clean sensor -> The sensitivity can be configured under Setup/General settings/Sampling/Conductive sensor
343	Power supply	M	On	Off	Power supply failure
344	Program pause	C	On	Off	Sampling program paused
345	Time changeover	M	On	Off	Daylight saving time/winter time setting Normal time (winter time) active.
346	Time changeover	M	On	Off	Daylight saving time/winter time setting Daylight saving time active
347	Sample confirm.	F	On	On	Sampling command has not been processed -> Check the internal cable to 1IF -> Reset the software
348	Read program	F	On	On	Selected program cannot be read from the program memory --> Create new program
349	Write program	F	On	On	Program created cannot be saved Hardware error has occurred --> Contact the Service Department
351	Delete prog.	F	On	On	Selected program cannot be deleted from the program memory --> Reset the software
352	Read Prog.list	F	On	On	Program list cannot be read from the program memory --> Carry out a device reset under Diagnostics/Systemtest/Reset/Device reset
353	Overfill check	F	On	Off	Total capacity of bottle reached ▪ No further sampling to current bottle is triggered -> Adjust the sampling program under Program selection if desired
354	Bottle check	F	On	Off	No empty bottles available for current program ▪ No further sampling -> Check the program settings under Program selection
355	Start time over	M	On	Off	Start time entered is in the past ▪ Enter a new start time

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
356	Overfill check	F	On	Off	The total sample volume does not fit in the sample bottle -> Change the sample volume
357	Sampling faulted	M	On	Off	▪ Sample discarded ▪ There are too many sampling requests pending -> Adjust the sampling program under Program selection
358	Configuration	F	On	On	Program configuration does not match the current device configuration -> Adjust the configuration
359	Emptying error	F	On	On	▪ Error during emptying ▪ Emptying and sampling program canceled -> Inspect the connection to the FMSY1 module -> Inspect the 4R module, replace it if necessary -> Carry out a software restart under Setup/Diagnostics/Systemtest/Restart
366	Module connect.	F	On	On	No communication with the actuator module -> Check the internal connecting cable to the 1IF module
370	Intern. Voltage	F	On	On	Internal voltage outside the valid range --> Check supply voltage
373	Electr. temp.	M	On	Off	High electronics temperature --> Check ambient temperature and energy consumption
401	Reset to default	F	On	On	Factory reset is performed
406	Param. active	C	Off	Off	--> Wait for configuration to be finished
407	Diag. active	C	Off	Off	--> Wait for maintenance to be finished
412	Writing backup	F	On	Off	--> Wait for the write process to be finished
413	Reading backup	F	On	Off	--> Wait
502	No text catalog	F	On	On	--> Contact the Service Department
503	Language change	M	On	Off	Language change failed --> Contact the Service Department
530	Logbook at 80%	M	On	Off	1. Save the logbook to the SD card and then delete the logbook in the device 2. Set memory to ring memory 3. Deactivate logbook
531	Logbook full	M	On	Off	
532	License error	M	On	Off	--> Contact the Service Department
540	Parameter save	M	On	Off	Configuration saving has failed, --> repeat
541	Parameter load	M	On	Off	Configuration successfully loaded

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
542	Parameter load	M	On	Off	Configuration loading has failed, --> repeat
543	Parameter load	M	On	Off	Configuration loading aborted
544	Parameter reset	M	On	Off	Factory default successful
545	Parameter reset	M	On	Off	Setting of device configuration to factory setting has failed.
903	Minimum flow	F	On	On	Flow too low for time/flow-paced sampling -> Check medium flow -> Check flowmeter -> Check the configuration under Setup/Inputs/Current input S:x
910	Limit switch	S	On	Off	Limit switch activated
920	No sample	F	On	On	No sample flow during dosing process ▪ Suction line blocked or leaking ▪ No inflow of sample -> Check suction line and suction strainer -> Check sample flow
921	Pump bracket	F	On	On	The pump bracket is detected as open. ▪ Pump bracket open ▪ Reed contact defective -> Close the pump bracket -> Contact the Service Department
927	Winter operation	S	On	Off	▪ Winter operation active ▪ Outside temperature too low ▪ No sampling
928	No sample	F	On	On	Sample intake not possible ▪ Suction line is clogged ▪ Suction height too large -> Check suction line and suction strainer -> Ensure suitable suction height (<8m)
929	Input signal	F	On	On	▪ Check measuring inputs -> Sensors reversed -> Sensor not present
930	No sample	F	On	On	Sample flow interrupted during aspiration ▪ Suction line blocked or leaking ▪ No inflow of sample -> Check suction line and suction strainer -> Check sample flow
970	Input Overload	S	On	On	Current input overloaded The current input is switched off from 23 mA due to overload and reactivated automatically when a normal load is present.

No.	Message	Factory settings			Tests or remedial measures
		Cat.	Diag. on/off	Error current	
971	Input low	S	On	On	Current input too low At 4 to 20 mA, the input current is less than the lower error current. --> Check the input for short-circuits.
972	Input > 20 mA	S	On	On	Current output range exceeded
973	Input < 4 mA	S	On	On	Current output range undershot
974	Diag. confirmed	C	Off	Off	User has acknowledged the message displayed in the measuring menu.
975	Device reset	C	Off	Off	Device reset

1.5 Pending diagnostic messages

The Diagnostics menu contains all the information on the device status.
Furthermore, various service functions are available.

The following messages are directly displayed every time you enter the menu:
- "Most important message"
  Diagnostics message recorded with the highest criticality level
- "Past message"
  Diagnostic message whose cause is no longer present.

All the other functions in the Diagnostics menu are described in the following chapters.

Diagnostics messages associated with sampling are deleted under the following conditions:
- Diagnostics messages caused by sampling are deleted automatically with the next successful sampling.
- Diagnostics messages caused by the level of medium in the bottle are deleted the next time the bottle is changed.

If diagnostics message "M313 Liquidsensor" appears five times in succession when running a program, the active program is aborted for reasons of safety. This behavior on the part of the device cannot be modified by deactivating the diagnostics message under Menu/Setup/General settings/Diagnostics.

1.6 Diagnostics list

All the current diagnostics messages are listed here.
A time stamp is available for each message. Furthermore, the system also displays the configuration and description of the message as saved in "Menu/Setup/General settings/Diagnostics/Device behavior".
For this purpose, select the appropriate message and press the navigator.

1.7 Logbooks

1.7.1 Available logbooks

Types of logbooks
- Logbooks physically available (all apart from the overall logbook)
- Database view of all logbooks (=overall logbook)

Logbook	Visible in	Max. entries	Can be disabled [1]	Logbook can be deleted	Entries can be deleted	Can be exported
Program logbook	Program logbook	5000	Yes	No	Yes	Yes
Overall logbook	All events	1000	Yes	No	Yes	No
Diagnostics logbook	Diagnostic events	250	(Yes)	No	Yes	Yes
Calibration logbook	Calibration events	75	(Yes)	No	Yes	Yes
Operation logbook	Configuration events	250	(Yes)	No	Yes	Yes
Version logbook	All events	50	No	No	No	Yes
Hardware version logbook	All events	125	No	No	No	Yes
Data logbook	Data logbooks	150,000	Yes	Yes	Yes	Yes
Debugging logbook	Only accessible with the special activation code (Service)	1000	Yes	No	Yes	Yes

1) Data in brackets means this depends on the overall logbook

1.7.2 Logbooks menu

Diagnostics/Logbooks

Function	Options	Info
▶ Program logbook		Chronological list of the programming events.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▶ Show summary of current program	Read only	The bottle statistics for the sampler are displayed. The statistics are displayed for each individual bottle when the program is started. Further information is provided in the "Bottle statistics" section.

Diagnostics/Logbooks

Function	Options	Info
▶ Summary of inputs	Read only	The counters configured for the analog and binary input are displayed. Max. 8 lines
▷ Delete all entries	Action	You can delete all the program logbook entries here.
▶ All events		Chronological list of all the logbook entries, with information on the type of event.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▶ Calibration events		Chronological list of the calibration events.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▷ Delete all entries	Action	You can delete all the calibration logbook entries here.
▶ Configuration events		Chronological list of the configuration events.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▷ Delete all entries	Action	You can delete all the operation logbook entries here.
▶ Diagnostic events		Chronological list of the diagnostics events.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▷ Delete all entries	Action	You can delete all the diagnostics logbook entries here.

You can view your data logbook entries graphically on the display ("Show plot").
You can also adapt the display to suit your individual requirements:
- If you press the navigator button in the graphic display, you are given additional options such as the zoom function and x/y movement of the graph.
- Furthermore, you can also define a cursor. If you select this option, you can move along the graph with the navigator and view the logbook entry (date stamp/measured value) in text form for every point in the graph.

Diagnostics/Logbooks

Function	Options	Info
▶ Data logbooks		Chronological list of the data logbook entries.
▶ Show	Events are displayed	Select a particular event to display more detailed information.
▶ Show plot	Graphic display of the logbook entries	The entries are displayed according to your settings in the General settings/Logbooks menu.
▶ Go to date	User input ▪ Go to date ▪ Time	Use this function to go directly to a specific time in the list. In this way, you avoid having to scroll through all the information. The complete list is always visible, however.
▷ Delete all entries	Action	You can delete all the data logbook entries here.
▶ Save logbooks		
File format	Options ▪ CSV ▪ FDM	Save the logbook in the preferred file format. You can then open the file you saved (.csv) on the PC and process it in MS-Excel for example.[1)]. You can import the FDM files into Fieldcare and archive them so they are tamper-proof.
▷ Program logbook ▷ All data logbooks ▷ Data logbook 1...n ▷ All event logbooks ▷ Calibration logbook ▷ Diagnostic logbook ▷ Configuration logbook ▷ HW version logbook ▷ Version logbook	The action commences as soon as the option is selected	Use this function to save the logbook to an SD card. ▶ Insert the SD card into the device card reader and select the logbook to be saved.
The file name is made up of the "Logbook ident" (Menu/Setup/General settings/Logbooks), an abbreviation for the particular logbook and a time stamp.		

1) CSV files use international number formats and separators. Therefore they must be imported into MS Excel as external data with the correct format settings. If you double-click the file to open it, the data are only displayed correctly if MS Excel is installed with the US country setting.

1.7.3 Program logbook

The following table shows an overview of the exported program logbook and explains the most important terms in the program logbook.

Entry	Example	Info
Timestamp	2010-05-05 12:40	Time stamp - the start time in the case of sampling
Event	BasicPrgStart	**Power on** --> Time the device was started **Power failure** --> Time the power failed (to the minute) **BasicPrgStart, StdPrgStart** --> Time the program was started **BasicSampling, StdSampling** --> Entry made during sampling **PrgPartStart, PrgPartStop** --> Time a subprogram is enabled and disabled **PrgStop** --> Time the program was ended
Name	Program1	In the case of **BasicPrgStart, StdPrgStart, BasicSampling** or **PrgStop** --> the name of the program appears In the case of **StdSampling, PrgPartStart** or **PrgPartStop** --> the name of the subprogram appears
Bottle configuration	12x+6x - PE/glass plate distribution	The selected bottle configuration is displayed
Left bottle volume	1000	The bottle volume is displayed --> "Right bottle volume" remains empty for bottle configurations with different volumes
Right bottle volume	3000	
Sampling mode	Time-paced CTCV	**Time-paced CTCV** --> in proportion to time **Flow-paced VTCV** --> in proportion to volume **Time/flow-paced CTVV** --> in proportion to flow **Single sample** --> single sample **Sample table** --> single sample --> the sampling mode is displayed
Sampling interval/unit	10 min	--> The interval and unit are displayed
Samples/bottle	4	**With bottle change** --> Number of samples per bottle
Bottles/sample	0	Multiple bottles
Sampling volume/unit	100 ml	Sample volume when sampling

Entry	Example	Info
Start mode	Immediate	Field only populated for **PrgPartStart, BasicPrgStart** and **StdPrgStart:** --> The program start setting is displayed - **Immediate** --> immediately - **Date/time** --> after date/time - **Volume** --> with a volume - **Event** --> when an event occurs - **Interval** --> after an interval - **Individual dates** --> individual timetable - **Multiple date** --> multiple dates
Start date	2010-05-05	Field only populated if **Start mode = Date/Time:** --> The start date is displayed
Stop mode	Program end	The program stop setting is displayed - **Program end** --> when the program ends - **Continuous** --> continuous operation - **Bottles full** --> when bottles are full - **Date/time** --> after date/time - **Event** --> when an event occurs
Stop date	2010-05-06	Field only populated if **Program end = Date/Time:** --> The time the program was stopped is displayed
Start flow sum/unit	100 m^3	Field only populated if **Start mode = Volume:** --> The starting volume is displayed
Bottle number	1	The field is only populated for **BasicSampling** or **StdSampling:** --> The bottle which was filled with the sample is displayed
Sample nbr	2	Number of samples transferred to the current bottle
Sampling result	Sampling Ok	**Sampling Ok** --> sampling ok **Sampling nOk** --> sampling failed --> For detailed diagnostics messages, see the diagnostics logbook
Running sample number	1	Running sample number in the current program
Flow sum since last sampling	1	For **flow-paced** and **time/flow-paced** sampling: --> Flow since the last sampling For all other types of sampling: --> Display: 0

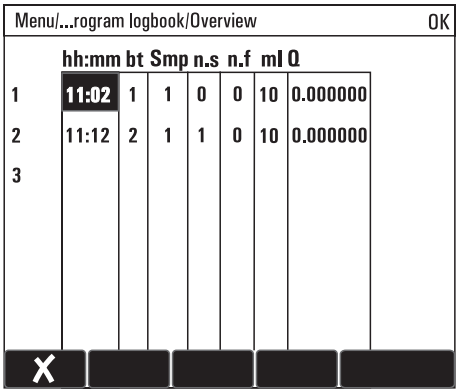
1.7.4 Bottle statistics

In "Menu/Diagnostics/Logbooks/Logbook program", select the "Show summary of current program" item to display the bottle statistics for the sampler. The statistics are displayed for each individual bottle when the program is started. This gives you detailed feedback on the last sampling operations.

The statistics are deleted when the following event occurs:
- Program is started

The statistics are selectively overwritten when the following event occurs:
- When the 1st bottle is reached in situations where "Continuous operation" is configured as the end of the program in the program settings.

The statistics are displayed as follows:



Column	Display	Info
1	**hh:mm**	The time the first sample was transferred to the bottle is displayed.
2	**bt**	The bottle number is displayed.
3	**Smp**	Displays how often sampling was triggered per bottle.
4	**n.s.**	Indicates the number of times a sample was not taken even though sampling was triggered. This can occur if the maximum permissible fill volume for the bottle has been reached but the system is still supposed to transfer samples to the bottle. The "Overfill sensor" message is displayed while the program is active.
5	**n.f.**	The value indicates how often sampling was canceled since the system was unable to take in any medium, or enough medium, into the dosing chamber to cover the conductivity 1 probe.
6	**ml**	The sampling volume collected per bottle is displayed.
7	**Q**	The total flow for every bottle is displayed (if connected).

1.8 Device info

1.8.1 System information

Diagnostics/System information

Function	Options	Info
Device tag	Read only	Individual device tag, --> "General settings"
Order code	Read only	You can order identical hardware with this code. This code changes on account of changes to the hardware and you can enter the new code you received from the manufacturer here[1].
To find out what device version you have, enterthe order code in the search screen at the following address: www.products.endress.com/order-ident		
Orig. order code ext.	Read only	Complete order code for the original device, resulting from the product structure.
Current order code ext.	Customized text	Current code, taking into account changes to the hardware. You must enter this code yourself.
Serial number	Read only	The serial number allows you to access device data and documentation on the Internet: www.products.endress.com/device-viewer
Software version	Read only	Current version
Sw version FMSY1	Read only	Current version
FMSY1-proj. version	Read only	Current version
ENP version	Read only	Version of the electronic nameplate
▶ SD card	Read only ▪ Total ▪ Free memory	Total memory and space available
▶ System modules		
Depends on the electronics module available, e.g.: Base	Read only ▪ Description ▪ Serial number ▪ Order code ▪ Hardware version ▪ Software version	This information is provided for every electronics module available. Specify the serial numbers and order codes when servicing, for example.
▶ Save system information		
▷ Save to SD card	File name assigned automatically (includes a time stamp)	The information is saved on the SD card in a "sysinfo" subfolder. The csv file can be read and edited in MS Excel for example. This file can be used when servicing the device.

1) Provided you give the manufacturer all the information about changes to the hardware.

1.9 Simulation

You can simulate values at inputs and outputs for testing purposes:
- Current values at current outputs
- Measured values at inputs
- Connecting a binary output

Only current values are simulated. It is not possible to use the simulation function to calculate the totalized value for the flow or rainfall.

The inputs and outputs must be activated in the Setup menu prior to simulation.

Diagnostics/Simulation

Function	Options	Info
▶ Current output x:y		Simulation of an output current This menu appears once for each current output.
Simulation	Options ▪ On ▪ Off **Factory setting** Off	If you simulate the value at the current output, this is indicated on the display by a simulation icon in front of the current value.
Current	2.4 to 23.0 mA **Factory setting** 4 mA	Set the desired simulation value.
Simulation	Options ▪ On ▪ Off **Factory setting** Off	If you simulate the relay state, this is indicated on the display by a simulation icon in front of the relay display.
State	Options ▪ Low ▪ High **Factory setting** Low	Set the desired state. The relay switches in accordance with your setting when you switch on the simulation. The display shows "On" (="Low") or "Off" (="High") for the simulated relay state.
▶ Meas. inputs		Simulation of a measured value This menu appears once for each measuring input.
▶ Channel : parameter		
Sim. main value	Options ▪ On ▪ Off **Factory setting** Off	If you simulate the measured value, this is indicated on the display by a simulation icon in front of the measured value.
Sim. temperature	Options ▪ On ▪ Off **Factory setting** Off	If you simulate the temperature measured value, this is indicated on the display by a simulation icon in front of the temperature.

Diagnostics/Simulation

Function	Options	Info
Temperature	-50.0 to +250.0 °C (-58.0 to 482.0 °F) **Factory setting** 20.0 °C (68.0 °F)	Set the desired simulation value.

1.10 Reset measuring instrument

Diagnostics/Systemtest/Reset

Function	Options	Info
Power supply	Read only	The current supply voltage is displayed.
▶ Cooling system(only for version with sample compartment temperature regulation)		
▶ Check cooling		
Power supply	Read only	The current supply voltage is displayed. With AC power supply: 24 V ±0.5 V With DC power supply: 22 to 28 V
Overcurrent	Read only	No: no error Yes: the fan in the climate control module is defective -> Contact the Service Department
Sample compartment	Read only	The **current** temperature of the sample compartment is displayed.
Sample compartment	Read only	When you start the cooling test, the temperature at the start time is displayed
Cooling test offor Cooling test on -> progress of test is displayed		
▷ Start Test	Action	Start the cooling test.
▷ Stop test	Action	End the cooling test.
▶ Check heating		
Power supply	Read only	The current supply voltage is displayed. With AC power supply: 24 V ±0.5 V With DC power supply: 22 to 28 V
Overcurrent	Read only	No: no error Yes: the heating is defective -> Contact the Service Department
Overcurrent	Read only	No: no error Yes: the fan is defective -> Contact the Service Department
Sample compartment	Read only	The **current** temperature of the sample compartment is displayed.

Diagnostics/Systemtest/Reset

Function	Options	Info
Sample compartment	Read only	When you start the heating test, the temperature at the start time is displayed
Heating test offor Heating test on -> progress of test is displayed		
▷ Start Test	Action	Start the heating test.
▷ Stop test	Action	End the heating test.
▶ Manual sampling		
Bottle configuration	Read only	
Bottle volume	Read only	
Distributor position	Options ▪ Front ▪ Bottle 1 ... ▪ Back	Select which bottle should be filled with the sample.
Sample volume	50 to 2000 ml **Factory setting** 100 ml	You can change the sample volume in the version with the peristaltic pump.
Sample volume	**Factory setting** 200 ml	The sample volume is preset at the factory in the version with the vacuum pump.
▷ Start sampling	Action	
▶ Peristaltic pump(only for version with peristaltic pump)		
▷ Pump purge	Action	
Pump purge, to stop press ESC	Read only	
Current pump run time	Read only	
Power supply	Read only	The current supply voltage is displayed. With AC power supply: 24 V ±0.5 V With DC power supply: 22 to 28 V
Motor current	Read only	The current consumption of the pump is displayed.
Vacuum	Read only	The vacuum is an indicator of the suction height. -> 100 mbar is equivalent to a suction height of approx. 1 m.
Medium detected	Read only	Yes: the medium was detected No: no medium was detected
▷ Pump suction	Action	
Pump suction, to stop press ESC	Read only	
Current pump run time	Read only	

Diagnostics/Systemtest/Reset

Function	Options	Info
Power supply	Read only	The current supply voltage is displayed. With AC power supply: 24 V ±0.5 V With DC power supply: 22 to 28 V
Motor current	Read only	The current consumption of the pump is displayed.
Vacuum	Read only	The vacuum is an indicator of the suction height. -> 100 mbar is equivalent to a suction height of approx. 1 m.
Medium detected	Read only	Yes: the medium was detected No: no medium was detected
▷ Vacuum pump (only for version with vacuum pump)	Action	
Bottle configuration	Read only	
Bottle volume	Read only	
Distributor position	Options ▪ Front ▪ Bottle 1 ... ▪ Back	Select which bottle should be filled with the sample.
Sample volume	**Factory setting** 200 ml	The sample volume is preset at the factory.
▷ Start sampling	Action	Perform sampling manually.
Progress	Read only	The progress of the sampling operation is displayed.
Power supply	Read only	The current supply voltage is displayed. With AC power supply: 24 V ±0.5 V With DC power supply: 22 to 28 V
Motor current	Read only	The current consumption of the pump is displayed.
Medium LF1	Read only	▪ Medium detection conductivity 1 switchoff ▪ Medium detection conductivity 2 disconnection from protective circuit -> Both "No" at the start -> If "Yes", clean conductivity 2
Medium LF2	Read only	
▷ Distribution arm	Action	Only for bottle configurations with more than one bottle.
Test distribution arm	Read only	When the menu item is activated, the distribution arm undergoes a test run. Afterwards, the system moves to each position in succession and the position is displayed. In the case of plate distribution, the arm moves left and right to ensure the bottles are numbered consecutively. Calibrate the distribution arm if the arm is not positioned precisely over the bottles.
Position	Read only	

Diagnostics/Systemtest/Reset

Function	Options	Info
▷ Device reset	Options ▪ OK ▪ ESC	Restart and keep all the settings
▷ Factory default	Options ▪ OK ▪ ESC	Restart with factory settings Settings that have not been saved are lost.
▶ Power supply	Read only ▪ Digital Supply 1: 1.2V ▪ Digital Supply 2: 3.3V ▪ Analog Supply: 12.5V ▪ Sensor Supply: 24V ▪ Temperature	Detailed list of power supply to instrument. The actual values can vary without a malfunction being present.

1.11 Term information

The following information is displayed:
- **Operating hours device:**
  Displays the total operating hours of the device in days, hours and minutes
- **Operating hours cooling** (only for the version with a climate control module):
  Displays the total operating hours of the compressor in days, hours and minutes
- **Overfill sensor** (for version with vacuum pump):
  Number of times a safety switchoff has been caused by conductivity 2
- **Dosing valve** (for version with vacuum pump):
  Number of times the dosing valve is actuated; -> corresponds to the number of samples taken
- **Vacuum pump** (for version with vacuum pump):
  Displays the pump operating time in hours and minutes
- **Sample totalizer** (for version with peristaltic pump):
  Number of all samples taken and sample errors
- **Pump tube life** (for version with peristaltic pump):
  Displays how old the tube is in days, hours and minutes
  This counter must be reset when a tube is replaced.

Set the specific counter reading to zero with "Reset".

1.12 Status of inputs/outputs

Path: Display/Operation/Measurement

The following measured values are listed (read only):
- Binary inputs
  Current function state: on or off
- Current inputs
  Actual current values of all the current inputs available
- Binary outputs
  Current function state: on or off
- Temperature sensors
  Current value is displayed: S:1 (cooling system)

1.13 Firmware history

Date	Version	Changes to software	Documentation: edition
04/2013	01.04.00	Extension ▪ Keylock with password protection ▪ Logbooks remain intact after a firmware update Improvement ▪ Export print (xml): Export file revised and supplemented with a stylesheet for better legibility. ▪ Input overview with counter function ▪ Input menu can be reached via program creation ▪ External signal for basic programs ▪ Quick programming via start screen	BA00479C/07/EN/15.13 BA00487C/07/EN/15.13 BA00488C/07/EN/15.13 BA00489C/07/EN/15.13 BA00486C/07/EN/01.11 SD01068C/07/EN/01.12
04/2011	01.02	Extension ▪ HART communication ▪ Mathematics functions Improvement ▪ Modified software structures ▪ Adapted factory settings ▪ User-defined measuring screens	BA479C/07/EN/14.11 BA487C/07/EN/14.11 BA488C/07/EN/14.11 BA489C/07/EN/14.11
04/2010	01.00	Original software	BA479C/07/EN/04.10 BA487C/07/EN/04.10 BA488C/07/EN/04.10 BA489C/07/EN/04.10

2 Maintenance

⚠ WARNING

Process pressure and temperature, contamination, electrical voltage

Danger! Risk of serious or fatal injury!

- ▶ De-energize the device before removing the rear panel.
- ▶ Power can be supplied to switching contacts from separate circuits. De-energize these circuits before working on the terminals.
- ▶ If a sensor has to be removed during maintenance work, avoid hazards posed by pressure, temperature and contamination.

NOTICE

Electrostatic discharge (ESD)

Risk of damaging the electronic components!

- ▶ Take personal protective measures to avoid ESD, such as discharging beforehand at PE or permanent grounding with a wrist strap.
- ▶ For your own safety, only use genuine spare parts. With genuine parts, the function, accuracy and reliability are also ensured after maintenance work.

2.1 Recommended maintenance

Maintenance work has to be carried out at regular intervals to ensure the efficient operation of the sampler.

The maintenance work comprises:

- Replacing the wear parts
- Cleaning the device

The cleaning intervals depend heavily on:

- The medium
- The ambient conditions of the sampler (dust etc.)
- The programming intervals

For this reason, adapt the cleaning intervals to your specific requirements but always ensure that these cleaning tasks are performed regularly.

Replacing wear parts

Wear parts are replaced by Endress+Hauser Service at one- and two-year intervals. Please contact your local sales center in this regard.

Endress+Hauser offers its customers a maintenance contract. With a maintenance contract, you can increase your level of operational safety and relieve your operating staff of some of their workload. Ask your Endress+Hauser Service Organization for detailed information on maintenance contracts.

2.2 Replacing the pump tube

⚠ CAUTION

Danger! Rotating parts!

- ▶ Take the sampler out of service before opening the peristaltic pump.
- ▶ Safeguard the sampler against accidental operation while working on the open peristaltic pump.

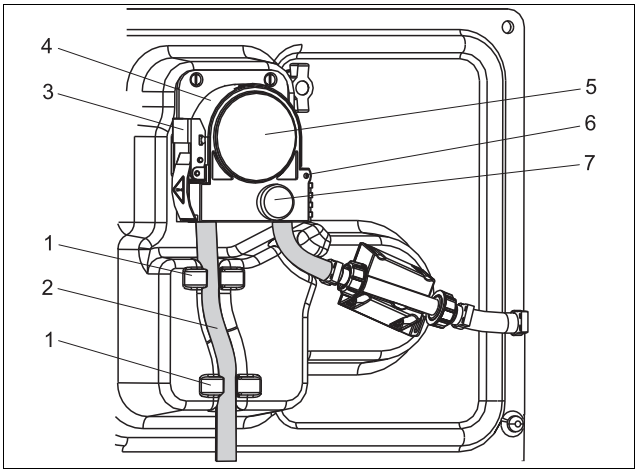
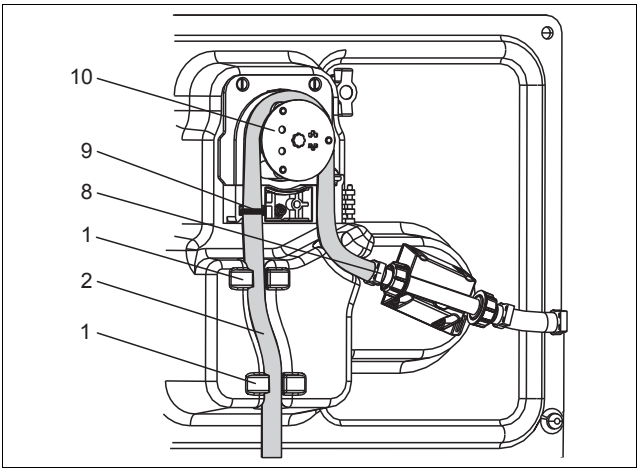


Fig. 1: Opening the peristaltic pump

1 *Retainer*
2 *Pump tube*
3 *Fastening clip*
4 *Pump bracket*
5 *Pump head cover*
6 *Positioning pin*
7 *Knurled head screw*

ÖOpen the peristaltic pump as follows:

1. Take the sampler out of service by pausing a program that is currently running.
2. Open the fastening clip (item 3) and push the pump bracket (item 4) upwards.
3. Remove the knurled head screw (item 7) and open the pump head cover (item 5) to the right.



1 Retainer
2 Pump tube
8 Clamp
9 Marking ring
10 Roller

Fig. 2: Replacing the pump tube

1. Remove the clamp (item 8) and remove the pump tube (item 2) from the pump.
2. Remove any silicone deposits on the roller (item 10) and the flexible pump bracket.
3. Make sure the roller and all the rolls turn smoothly and evenly.
4. Apply some lubricant to the roller.
5. Secure the new pump tube to the pressure sensor with the clamp (item 8).
6. Guide the pump tube around the roller and insert the marking ring into the groove (item 9), see → 2.
7. Close the pump head cover and screw it tight. Close the pump bracket.
8. Under Menu/Diagnostics/Term information/Pump tube life reset the tube life to zero by selecting "Reset".

Calibrate the sample volume each time you replace a pump tube.
--> See Operating Instructions BA00489C "Calibration".

NOTICE

Incorrect sample volume

- Only reset the tube life counter to zero once you have successfully replaced the pump tube in order to avoid incorrect dosing of the medium.

2.3 Cleaning

2.3.1 Housing

Clean the housing with soap-based commercially available cleaning agents.

NOTICE

Prohibited cleaning agents

Danger of damaging the housing surface or housing seal!

- For cleaning purposes, never use concentrated mineral acids or bases.
- Never use organic cleaners such as benzyl alcohol, methanol, methylene chloride, xylene or concentrated glycerol cleaner.
- Never use high-pressure steam for cleaning purposes.

2.3.2 Wetted parts

After cleaning, rinse all wetted parts thoroughly with clear water to ensure that all cleaning agent residue has been removed so it cannot affect subsequent medium samples.

Version with vacuum pump

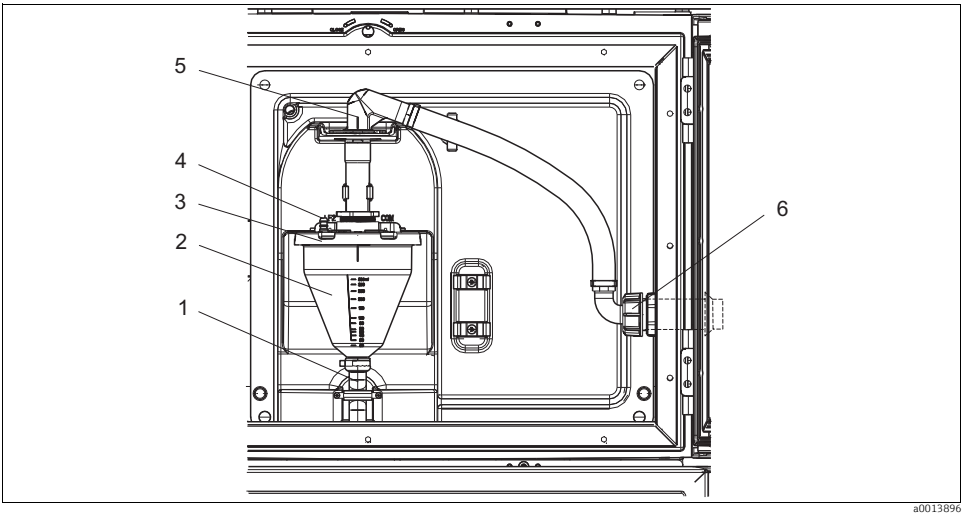


Fig. 3: Version with vacuum pump

1 Outlet hose
2 Dosing chamber
3 Dosing chamber cover
4 Air hose connection
5 Lock for intake hose
6 Thread adapter nut for intake hose

Clean the wetted parts as follows:
1. Release the thread adapter nut on the intake hose (item 6).
2. Turn the intake hose to the "open" position at the hose lock (item 5) and remove the hose from above.
3. Release the air hose (item 4) and remove the dosing chamber (item 2) from the front along with the outlet hose (item 1).
4. Open the bayonet lock (item 3) and open the dosing chamber.
5. Clean these parts (hoses, dosing chamber etc.) with water or soapsuds. Use a bottle brush if necessary.
   You can wash the dosing chamber and dosing chamber cover in a dishwasher at 60 °C.
6. Make sure the dosing pipe is set correctly and set the old value if necessary.
7. Reinstall the cleaned parts in reverse order.

Version with peristaltic pump

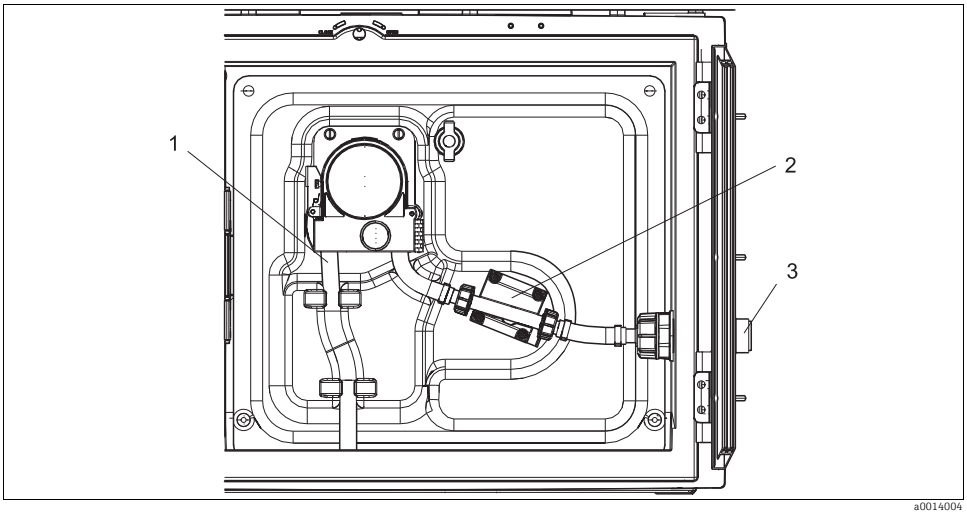


Fig. 4: Version with peristaltic pump

1 Pump tube
2 Pressure sensor
3 Tube connection

Clean the wetted parts as follows:

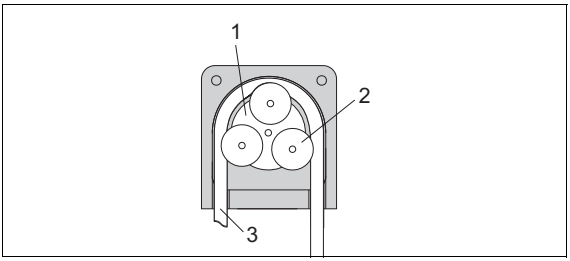
1. Release the sample supply at the tube connection (item 3).
2. Connect a container containing clear water to the tube connection.
3. Remove the bottles from the sample compartment.
4. Rinse the wetted parts with clear water by taking a manual sample or by performing a pump test (under Menu/Diagnostics/Systemtest/Reset/Peristaltic pump -> Pump purge/Pump suction).
5. Release the couplings to the left and right of the pressure sensor (item 2). Clean the tube piece carefully with a bottle brush and rinse it with clear water.
6. Reconnect the sample supply to the tube connection and put the bottles back in the sample compartment.

Interior of peristaltic pump

⚠ WARNING

Danger of injury due to rotating parts!

- ▶ Do not open the bracket of the peristaltic pump while the pump is running.
- ▶ Safeguard the sampler against accidental operation while working on the open peristaltic pump.



1 Pump rotor
2 Roller
3 Pump tube

Fig. 5: Interior view of the peristaltic pump

1. Take the sampler out of service by pausing a program that is currently running.
2. Open the peristaltic pump as described in the "Replacing the pump tube" section.
3. Remove the pump tube.
4. Remove any silicone deposits on the roller and the flexible pump bracket.
5. Make sure the roller turns smoothly and evenly.

Cleaning the distribution arm

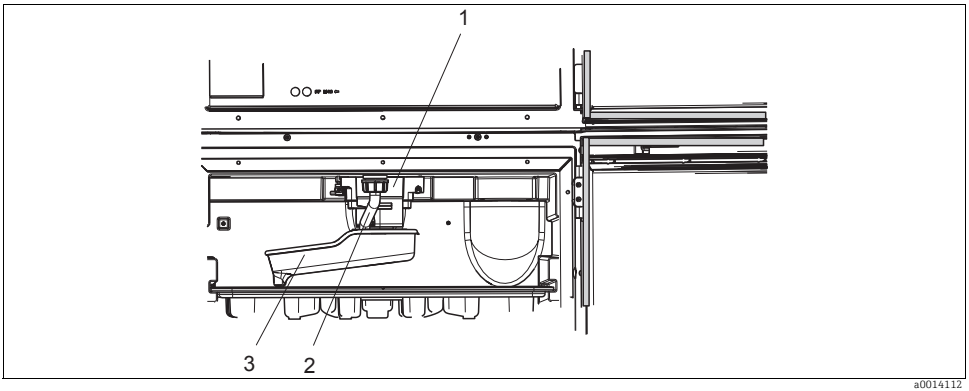


Fig. 6: Sample compartment

1 Distribution arm motor
2 Outlet pipe
3 Distribution arm

Clean the distribution arm as follows:
1. Release the outlet pipe (item 2).
2. Push up the splash guard.
3. Remove the distribution arm from the front.
4. Remove the cover.
5. Clean these parts with water or soapsuds. Use a bottle brush if necessary.
6. Reinstall the cleaned parts in reverse order.

Make sure the distribution arm is seated correctly! The distribution arm must be locked as otherwise the rotation movement could be blocked or the system might no longer approach the bottles correctly.

2.3.3 Sample compartment

The sample compartment has a fully integrated plastic inner lining.

Clean the sample compartment as follows:
1. Remove the bottle trays and the distribution pan.
2. Remove the distribution arm.
3. Spray-clean the sample compartment with a water hose.

You can wash the PE and glass bottles in a dishwasher at 60 °C.

2.3.4 Ventilator and liquefier

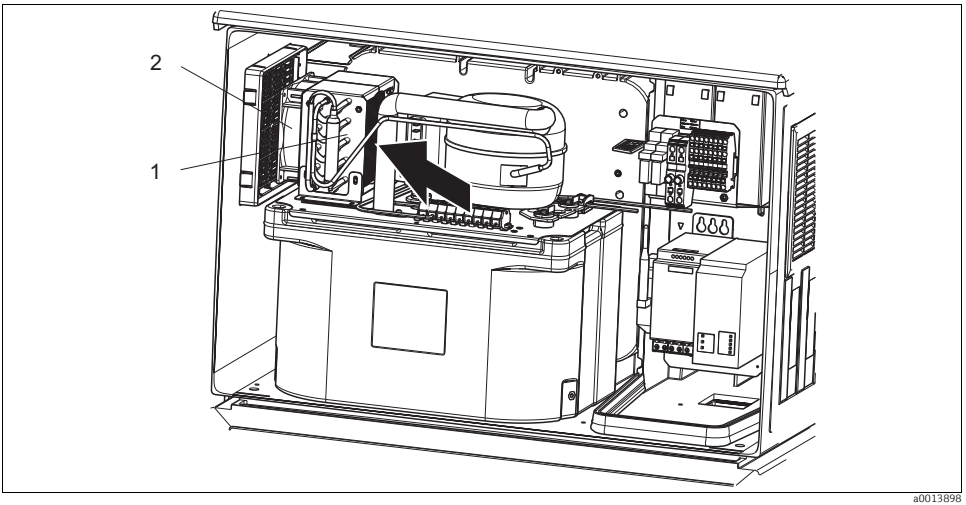


Fig. 7: Cleaning the climate control module

1 Liquefier
2 Ventilator

Clean the liquefier and ventilator with compressed air.

2.4 Calibration

Distribution arm
The position of the distribution arm is set at the factory.

Sampling volume
The sample volume of the peristaltic pump is also calibrated at the factory. The dosing volume of the vacuum pump is preset to 200 ml at the factory.

All information on calibration is provided in BA00489C "Calibration".

2.5 Technical support

We recommend the purchase and use of an SD card (see accessories). You can save the entire sampler configuration on the SD card (see -> BA00487C "Operation & settings", "Data management" section) and make the data available to the service team should you be in need of technical assistance.

3 Repair

3.1 Spare parts

Contact your Endress+Hauser Service if you have any questions regarding spare parts.

3.1.1 Peristaltic pump

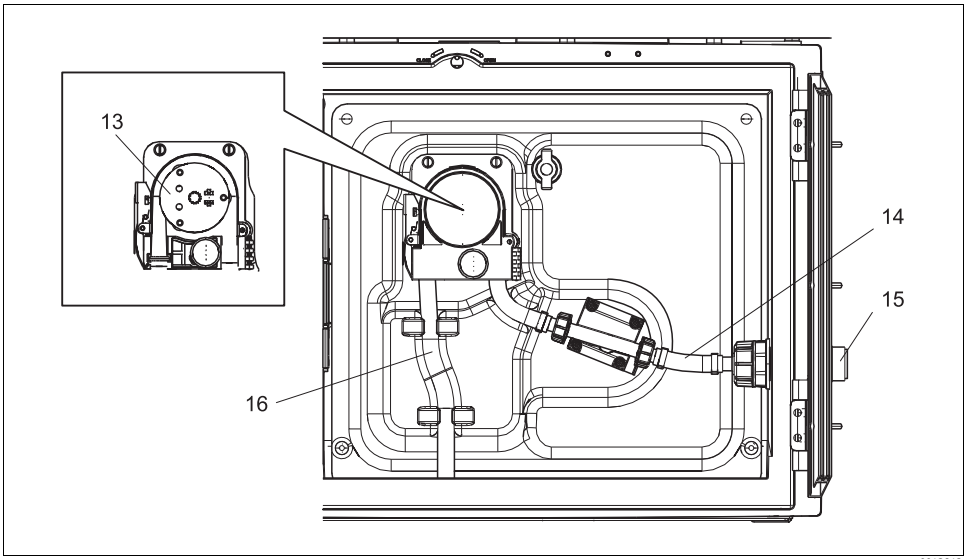


Fig. 8: Spare parts for version with peristaltic pump

Item No.	Designation and contents	Order number Spare parts kit
13	Roller	71103288
14	Connecting tube with connection	71110972
15	Feedthrough, sample infeed ID 10 with cylinder pin	71110857
	Seal set: O-ring ID=12.42 W=1.78 OD=15.98 EPDM, 2 pcs O-ring ID=20.92 W=2.62 OD=25.53 EPDM, 2 pcs O-ring ID=13.00 W=4.00 OD=21.00 NBR, 1 pc	71110928
16	Pump tube, 2 pc. set Pump tube, 25 pc. set	71111191 71111192

3.1.2 Vacuum pump

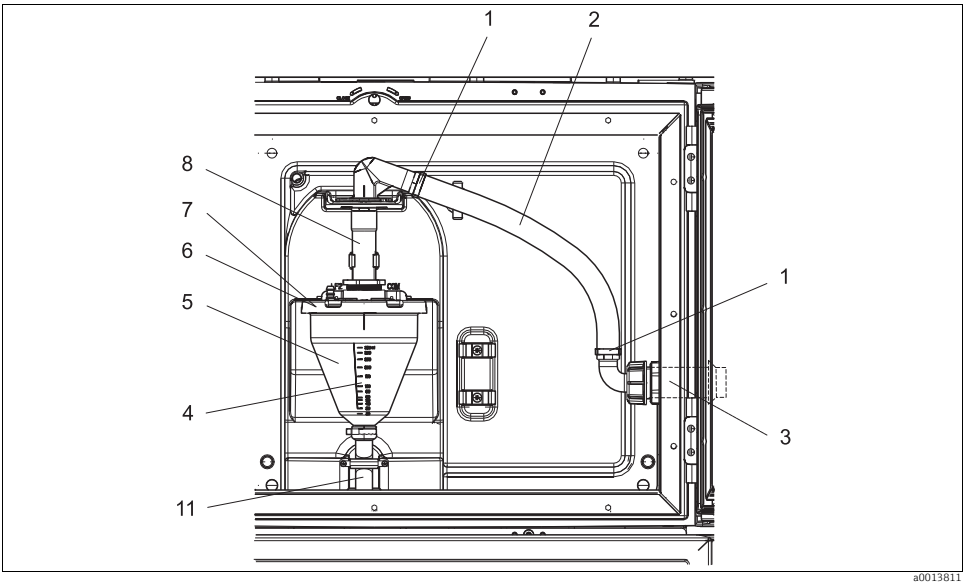


Fig. 9: Spare parts for version with vacuum pump (view in front of pump holder)

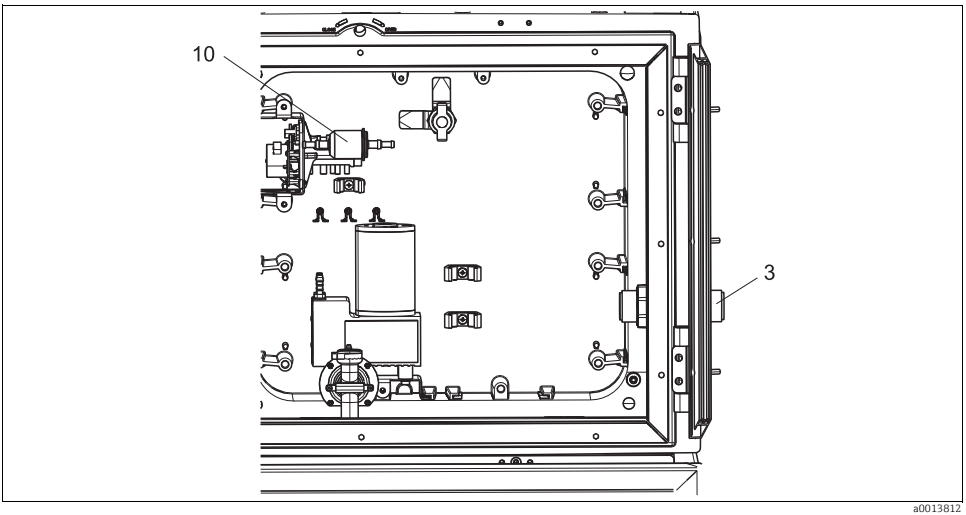


Fig. 10: Spare parts for version with vacuum pump (view behind pump holder)

Item No.	Designation and contents	Order number Spare parts kit
1	Fastening clips for suction hose, 10 pcs	71113508
2	Internal intake hose, complete, including 110° angular piece, 90° hose connection nipple, thread adapter nut 1" PP, 2 x fastening clips, 3 x O-rings	71111048
3	Feedthrough, sample infeed ID 13 with cylinder pin	71110853
4	Dosing pipe 350 ml with O-ring	71110628
5	Glass dosing chamber, 350 ml, with fixing ring and O-ring	71103168
	Plastic dosing chamber, 350 ml, with O-ring	71103173
6	Conductive dosing chamber flange, with conductivity sensors, insulation sleeves and O-ring	71102985
7	Capacitance dosing chamber flange, complete	71103166
8	Dosing chamber inlet with sealing ring, intermediate ring and pipe clamp	71111006
10	Air filter for vacuum pump, 2 pcs Hose, silicone, 320 mm (12.6")	71103283
	Seal set for dosing chamber: O-ring ID=102.00 W=3.00 OD=108.00 NBR, 1 pc O-ring ID=15.00 W=2.00 OD=19.00 EPDM, 1 pc O-ring ID=20.00 W=2.00 EPDM, 1 pc O-ring ID=18.00 W=2.00 OD=22.00 EPDM, 1 pc	71103176
11	Dosing hose to distributor, 2 pc set. Dosing hose to distributor, 25 pc set.	71111188 71111189

3.1.3 Climate control module

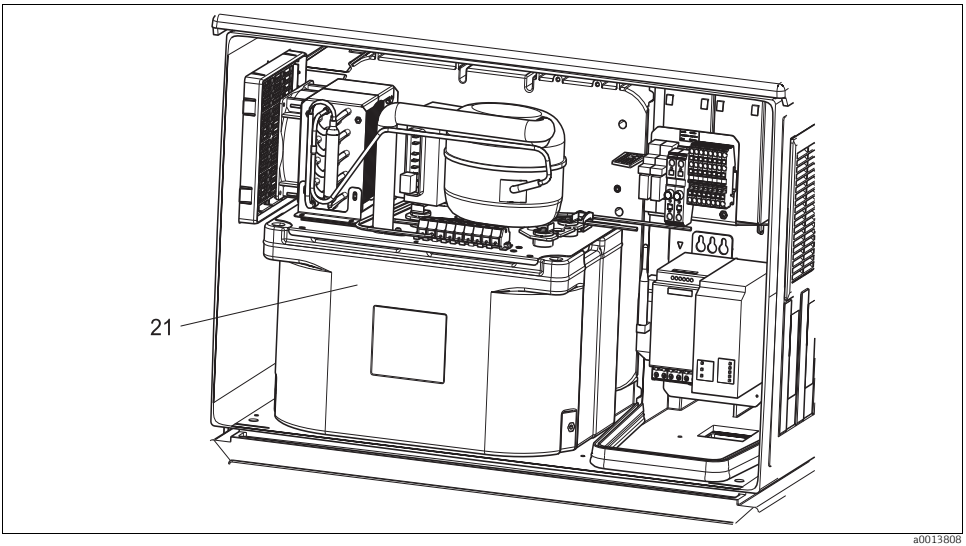


Fig. 11: Spare parts, view of climate control module

Item No.	Designation and contents	Order number Spare parts kit
21	Complete climate control module, unpainted	71092603
	Complete climate control module, painted	71113854

3.1.4 Sample compartment

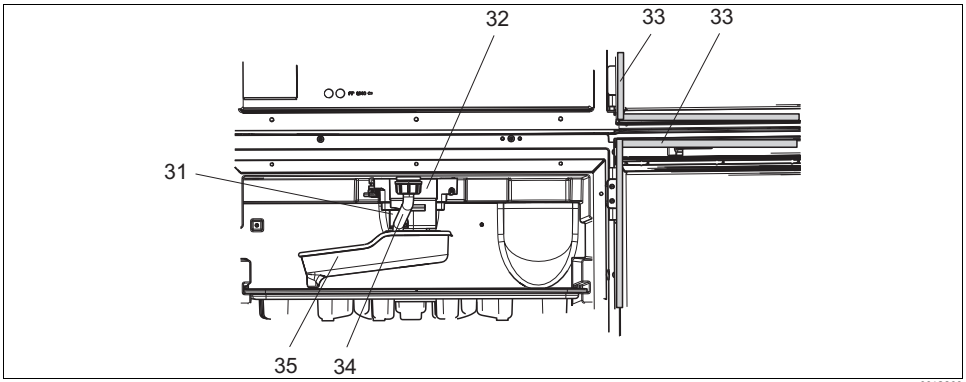


Fig. 12: Sample compartment, upper part

Item No.	Designation and contents	Order number Spare parts kit
31	Complete distribution arm drive shaft	71113519
32	Distribution arm motor with housing and securing screws	71101959
33	Gasket for dosing chamber door and sampling compartment door	71103293
34	Outlet pipe with thread adapter nut	71110970
35	Distribution arm with adapter plate and splashguard	71098113

3.2 Return

The sampler is repaired on site.
Contact your Endress+Hauser Service Department.

3.3 Disposal

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

4 Accessories

The most important accessories available at the time this document went to print are listed below.
Contact your Service Department or sales center for accessories that are not listed here.

4.1 Accessories for Liquistation CSF33

Order No.	Bottle tray + bottles + cover
71111152	Bottle tray + 6 x 3 liter (0.79 US gal.) PE+ cover
71111154	Bottle tray + 12 x 1 liter (0.26 US gal.) PE + cover
	Distributor plate; centering plate
71111158	Distributor plate for 2 x 6 bottles
71111159	Distributor plate for 2 x 12 bottles
	Bottles + covers
71111164	1 liter (0.26 US gal.) PE + cover, 24 pcs.
71111167	3 liter (0.79 US gal.) PE + cover, 12 pcs.
71111169	13 liter (3.43 US gal.) PE + cover, 1 pc.
71111172	30 liter (7.92 US gal.) PE + cover, 1 pc.
	Complete suction line
71111233	Suction line ID 10 mm (3/8"), clear PVC, fabric-reinforced, length 10 m (33 ft), strainer V4A
71111235	Suction line ID 13 mm (1/2"), green PVC, spiral-reinforced, length 10 m (33 ft), strainer V4A
	Suction line, rolled goods
71111482	... m, suction line ID 10 mm (3/8"), clear PVC
71111485	... m, suction line ID 13 mm (1/2"), green PVC
	Strainer
71111184	Strainer V4A for ID 10 mm (3/8"), 1 pc.
71111185	Strainer V4A for ID 13 mm (1/2"), 1 pc.
	Tubing customized; vacuum pump
71111188	Dosing tubing to distributor, 2 pc. set; material: silicone
71111189	Dosing tubing to distributor, 25 pc. set; material: silicone
	Tubing customized; peristaltic pump
71111191	Pump tubing, long and short tubing included, 2 pcs. of each; material: silicone
71111192	Pump tubing, long and short tubing included, 25 pcs. of each; material: silicone
	Communication; software
71110815	SD card, 1 GB, Industrial Flash Drive

Index

www.addresses.endress.com

Endress+Hauser

People for Process Automation