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Please read these operating instructions thoroughly prior to using the **BÜCHI** Fraction Collector **C-660**. Keep these instructions in immediate proximity of the device so that they are accessible at all times.
The device should only be connected to the power supply and switched on when the necessary preparations have been concluded.

Chapter 2 contains important safety information. Knowledge of this safety information is essential to the safe operation of the unit.

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en, version B (29 pages)	**Order no.**
C-660 Operating Instructions	**96969**

1 Scope of Delivery



Figure 1.1: Fraction Collector C-660

Description	Order no.
Fraction Collector C-660	**44900**
1 regional power cable, 1.5 m:	
Type CH	**10010**
Type grounded plugs (D, F)	**10016**
Type GB	**17835**
Type USA	**10020**
Type AUS	**17836**

Table 1.1: Scope of Delivery

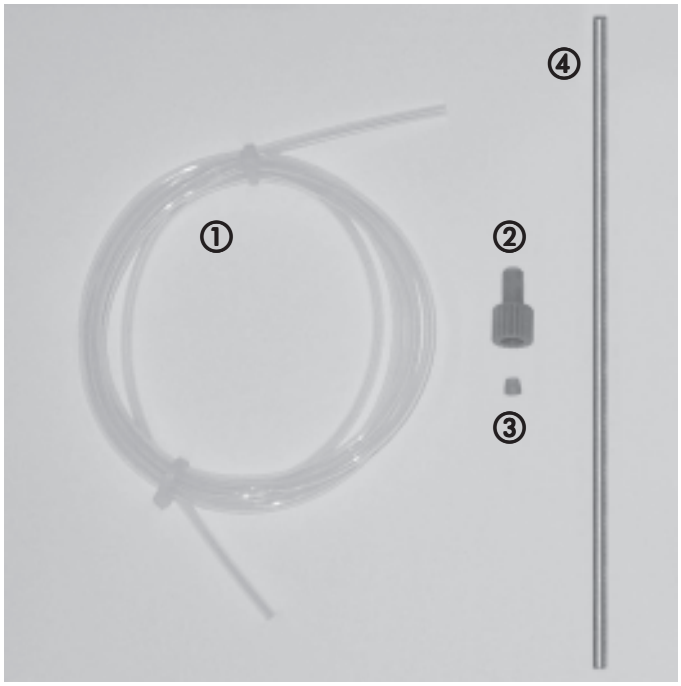


Figure 1.2: Standard Accessories

Enclosed Parts	
① FEP tubing 1/8” x 1/16”	**44354**
④ 1 tubing guide	**20780**
③ 5 ferrules, 1/8”, green	**40961**
② 5 fittings, 1/8”, green	**40956**
1 Operating Instructions:	
German	**96968**
English	**96969**
Spanish	**96970**
French	**96971**
Italian	**96972**

Table 1.2: Standard Accessories

2 Safety

The device has been built according to the latest technical standards and recognized technical safety regulations. Yet some risks and hazards may still exist:

- if the device is not used according to the instructions;
- if the device is operated by inadequately trained personnel.

2.1 Symbols



Stop
Information concerning hazards that could result in significant property damage or to life-threatening injuries.



Warning
Information concerning hazards that could result in damage to health or property.

Please note
Information indicattng technical requirements. Failure to observe may result in disturbances, inefficiency and reduced productivity.

2.2 Requirements of the Operator

The device may only be used by lab personnel and other persons having an overview, on the basis of training or practical experience, of the hazards involved in the operation of the device.

Personnel lacking this training or persons currently in training require thorough instruction. The operating instructions form the foundation for this purpose.

2.3 Proper Use

The Fraction Collector C-660 has been conceived of and constructed as a lab device. Its correct usage is for the optimal and reliable collection of individual aqueous and/or organic fractions in predetermined or customized racks (e.g. chromatography or Syncore racks).

Correct usage of the Fraction Collector C-660 also includes its maintenance and careful handling of the device on the basis of the specifications given in the operating instructions.

2.4 Inproper Use

Any other usage than that mentioned in the above or any usage not corresponding to the technical data is considered to be incorrect usage. The operator bears exclusive responsibility for any damages resulting from such usage.

Particularly the following applications are not allowed:

- use of the device in areas requiring explosion proof apparatus
- the collection of samples that explode upon impact, friction, heat or sparking or that are combustible (e.g. explosive substances, etc.)
- use in human medicine diagnostics
- preparation of food

2.5 General Hazards

General hazards arise from

- the substances and solutions used
- defective FEP tubing
- false positioning of the collector arm
- insufficiently long connection tubings
- damaged glassware in which the fractions are collected
- defective valves



The removal of lids with the assistance of a commercially available tool is not permitted, with the exception of authorized maintenance and repair personnel. The device may not be operated with damaged glassware.

Contact with electrically live parts represents a serious health danger!

2.6 Safety Measures

The wearing of personal protective gear such as **safety glasses** and **lab coat** is obligatory.

The Fraction Collector C-660 is not explosion proof. Potential ignition sources should not be positioned near the collector.

These operating instructions must be available to the operators at the location of the device at all times as a component of the Fraction Controller C-660. This also applies to these instructions in additional languages, which can be ordered separately.

Legal Regulations

Regional and local laws and regulations must also be observed.

Responsibility of the Operator

The operator is responsible for the instruction of his personnel. These operating instructions can be ordered in other languages for this purpose.

The operator must inform the manufacturer immediately of any incidents occurring when using the device that are relevant to matters of safety.

Modifications

Modification of the device or of its replacement or accessories parts or usage of replacement parts or accessories other than those mentioned in these operating instructions is only allowed with the written permission of BÜCHI Labortechnik AG.

Only those parts of the Fraction Collector C-660 required for the carrying out of the function may be installed or dismantled. This is possible by hand or with the supplied tool. The removal of safety apparatus and coverings is not permitted, with the exception of authorized maintenance personnel. Contact with electrically live parts represents a serious hazard to health!

3 Function

The inert construction design of the Fraction Collector enables the automatic collection of both organic and aqueous fractions without metal contact.

3.1 Functions Principle

- Up to 12 liters (48 x 250 ml) or up to 240 fractions of 20 ml can be collected.
- All Syncore racks are predefined.
- A simple teach-in enables the definition of up to 11 user-specific rack types.

Other features include

- fractionation with or without detector.
- an integrated RS-232 interface for data transfer to PC.
- an integrated peak detector.
- two detector inlets and two recorder outlets.
- optional monitoring of the level of the waste bottle.
- optional waste diverter valve recommended for flowrates > 10 ml/min.

4 Putting into Operation

Inspect for damages after unpacking. It is important that possible transport damage is immediately recognized upon unpacking. It may be necessary to report transport damages to your supplier.

The original packaging should be kept for possible later transport or storage.

4.1 Point of Use

In order to avoid annoyance caused by bad smells or possible damage to health caused by volatile solutions, we recommend setting up the Fraction Collector C-660 with an exhaust system. It should thereby be ascertained that the device is not exposed to aggressive substances such as acids, bases and solvents, which can have a negative influence on the useful life.

4.2 Electrical Connections

Check that the voltage of the socket agrees with the voltage given on the device plate. The device should always be plugged into a grounded socket. External couplings and extension cords must have a grounded conductor (3-poled couplings, cables or sockets). No interruption of the grounded conductor is permitted. The risk of electrical shock due to an internal defect is thus avoided. Electrostatic discharges can damage the machine and cause fires.

4.3 Installation

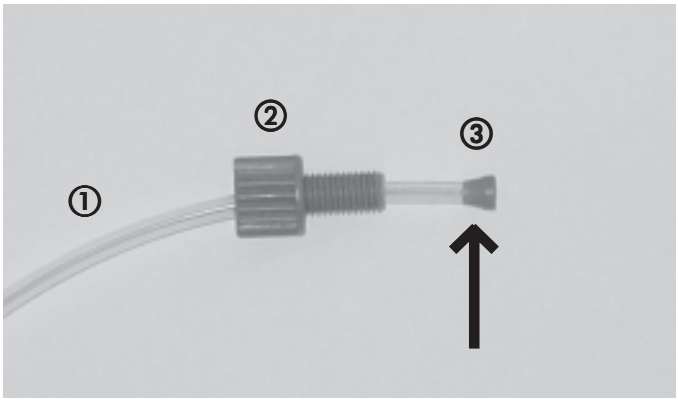
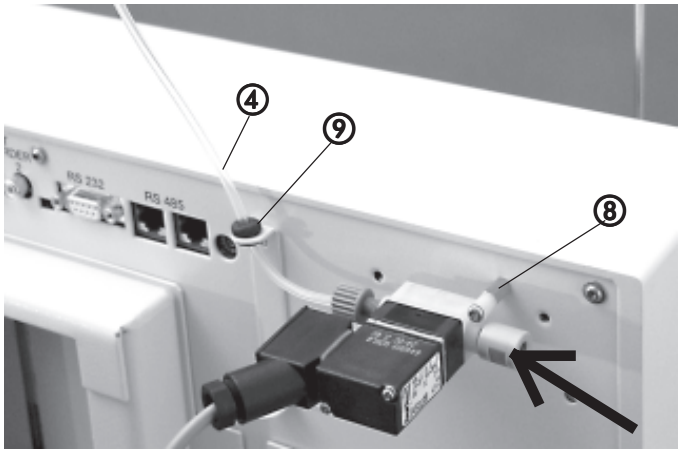


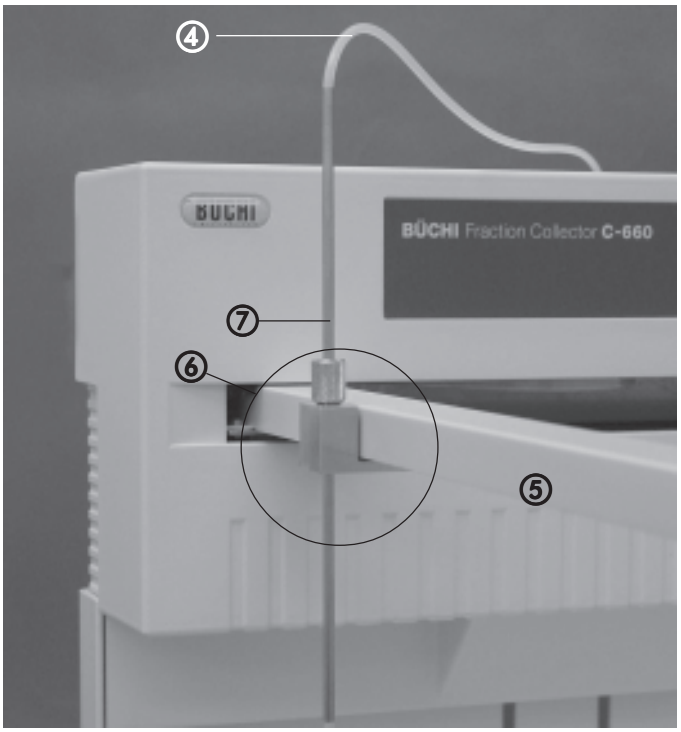
Figure 4.1: Installation of fitting and ferrule

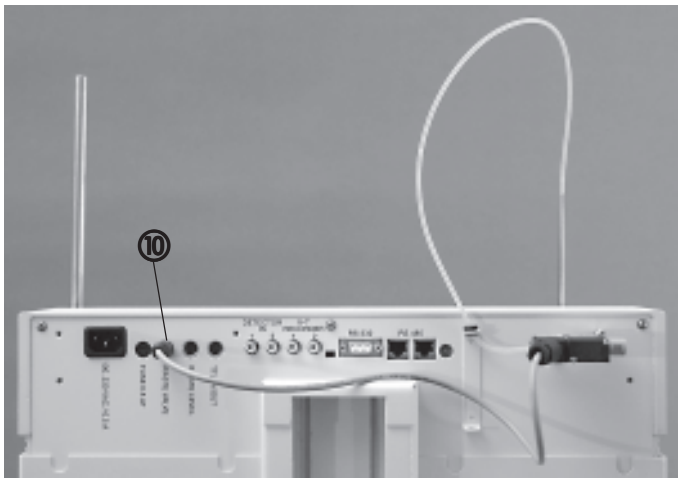
The following describes the Fraction Collector C-660 in its function as a Fraction Collector.

Place the Fraction Collector on an even surface in such a way that the rear side remains accessible. Connect the power cable.
You will require a valve to control the solvent.

The tubing ① containing the fraction comes from the chromatography column. The fitting ② and ferrule ③ are attached to the free end. Mount the fitting ② and ferrule ③.
Press the tubing ① with the ferrule ③ onto a table surface in order to firmly seal the tubing ① end and the ferrule ③.



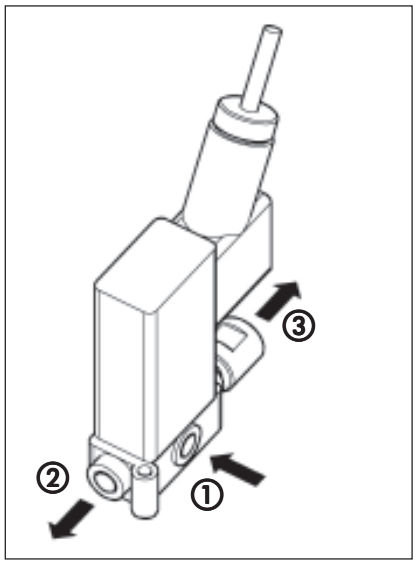




Bilder 4.2 a-c: Installation from the Waste Diverter Valve

Optional Waste Diverter Valve

If the flowrate of the pumps exceeds 10 ml/min waste diverter valve is recommended.



Installation:
Screw the tubing coming from the detector into the inlet ①. Outlet ② leads to the collection arm of the fraction collector. Ensure that the FEP tubing ④ is long enough to reach even the farest corner position of the collector arm ⑤. Outlet ③ leads to the waste bottle.
The waste diverter valve can be fixed at the backside of the Fraction Collector.

The collector head ⑤ is found on the collector arm ⑥ of the Fraction Collector. Clamp the tubing guide ⑦ (metal pipe) tightly into the collector head ⑥.

Ensure that the height of the tubing guide ⑦ is correct. It should be at least 1 cm above the tube rim, so that it doesn't damage the tubing during operation.

Now direct the FEP-tubing ④ from valve outlet ② through the fixation ⑨ and afterwards through the tubing guide ⑦ so that it projects approximately 3 mm out.

Connect the valve to the WASTE VALVE connection ⑩ .

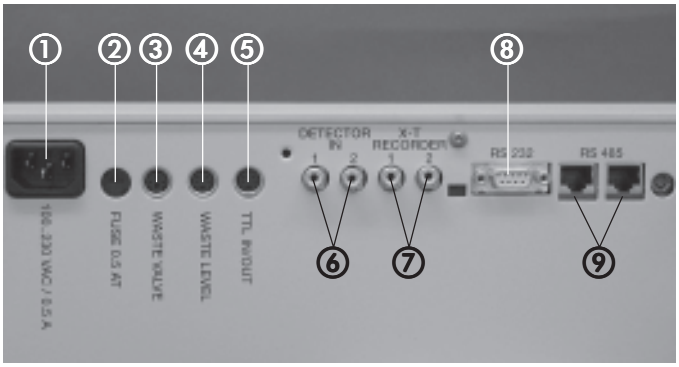


Figure 4.4: Connections of Fraction Collector

The Fraction Collector has the following connections:

① Power cable

② FUSE 0.5 AT : Fuse

③ WASTE VALVE : Valve control

④ WASTE LEVEL : Waste bottle level monitoring

⑤ TTL IN/OUT : TTL connection

⑥ DETECTOR IN 1,2 : Detector inputs 1 + 2

⑦ X-T RECORDER 1,2 : Chart recorder outlets 1 + 2

⑧ RS 232 : Series data interfaces

⑨ RS 485: 2x Bus interface for peripheral devices (Fraction Collector, pumps, etc.)

5 Operation

Please ensure that the device was correctly put into operation according to the instructions in chapter 4.

5.1 Arrangement of the Controls



Figure 5.1: Front view of the Fraction Collector

① START/NEXT key

② STOP/PAUSE key

③ Display

④ Selector switch (Rotate-and-press knob)

⑤ ON/OFF (Power switch)

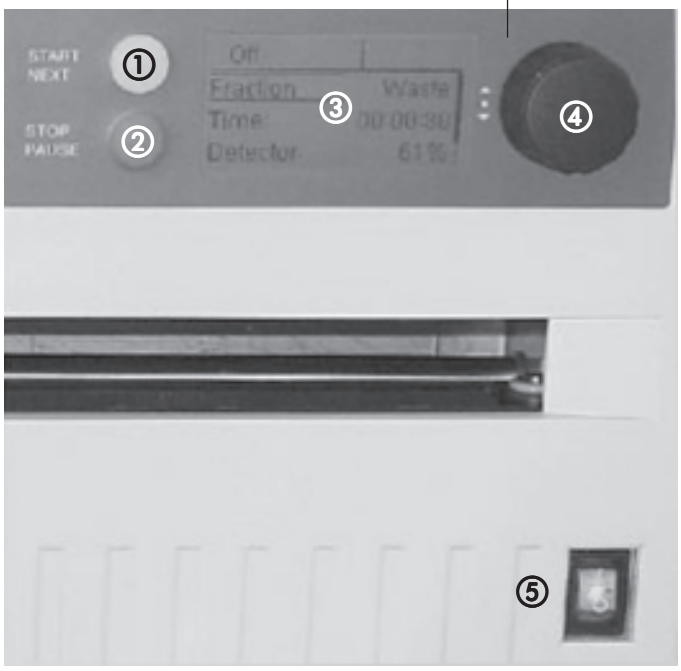


Figure 5.2: Controls of the Fraction Collector

Control	Function
START/NEXT key (green)	Starts the Fraction Collector from rest or pause status. Simultaneously starts the connected pump system. Carries out a tube change when the device is running.
STOP/PAUSE key (red)	Pressing once results in pause, pressing twice stops the program.
Display	Displays parameters and values.
Selector switch (Rotate-and-press knob)	Operation of the menu by rotating and pressing.
ON  OFF	Power switch

5.2 Display

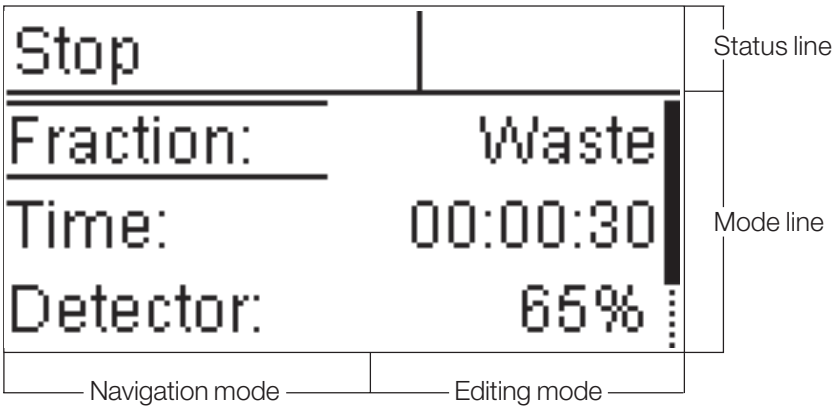


Figure 5.3: Overview of the display

The display is divided into **Status** and **Mode** lines. The status line is fixed. On the left side it shows the five potential states of the Fraction Collector. On the right side the status line shows the remaining lead time, the remaining collection time or the residual volume of the relevant fraction.
The following states are possible:

Status	Description
Collect	The fractions can be collected according to time, or volume .
Delay	The solvent is directed into the waste container. The actual collection procedure begins only after the end of the lead time.

The Fraction Collector is in collection status:

PAUSE	1x press the STOP/PAUSE key	The program sequence is interrupted and the BÜCHI pump modules are stopped. (no Reset). Other brand pumps will not be stopped. The program sequence is continued with the START key.
STOP	2x press the STOP/PAUSE key	The Fraction Collector stops and the collector arm returns to its initial position. Running programs are permanently aborted. The pump modules are stopped.
START	1x press the START/NEXT key	The collector arm changes to the next tube.

The Fraction Collector is in pause status:

STOP	1x press the STOP/PAUSE key	The Fraction Collector stops and returns to its initial position. Running programs are permanently aborted. The pump modules are stopped.
START	1x press the START/NEXT key	The program sequence is continued.
Error	The error number is displayed and the START-/STOP keys are locked. Report the incident to Service.	

The mode line shows the navigation and editing mode you are in. It can be controlled with the selector switch by rotating and pressing.

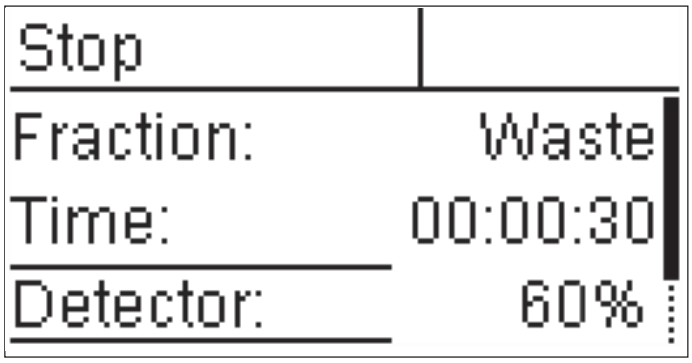


Figure 5.4: Parameters enclosed in two lines cannot be altered

Parameters surrounded by lines can not be changed.

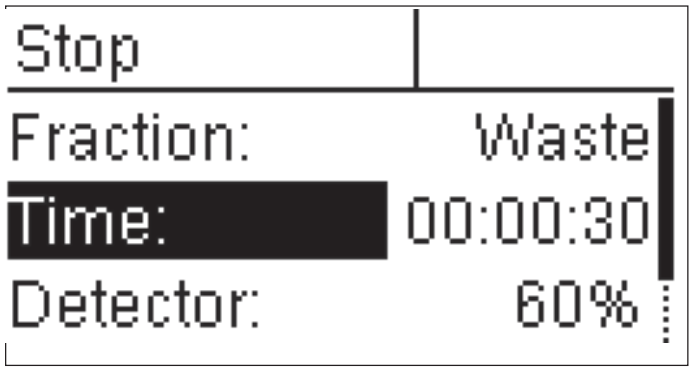


Figure 5.5: Parameters highlighted in a dark color can be altered

On the other hand, the navigation parameters, which have a dark background, can be changed and selected. The scroll bar on the right shows you where you are in the menu.

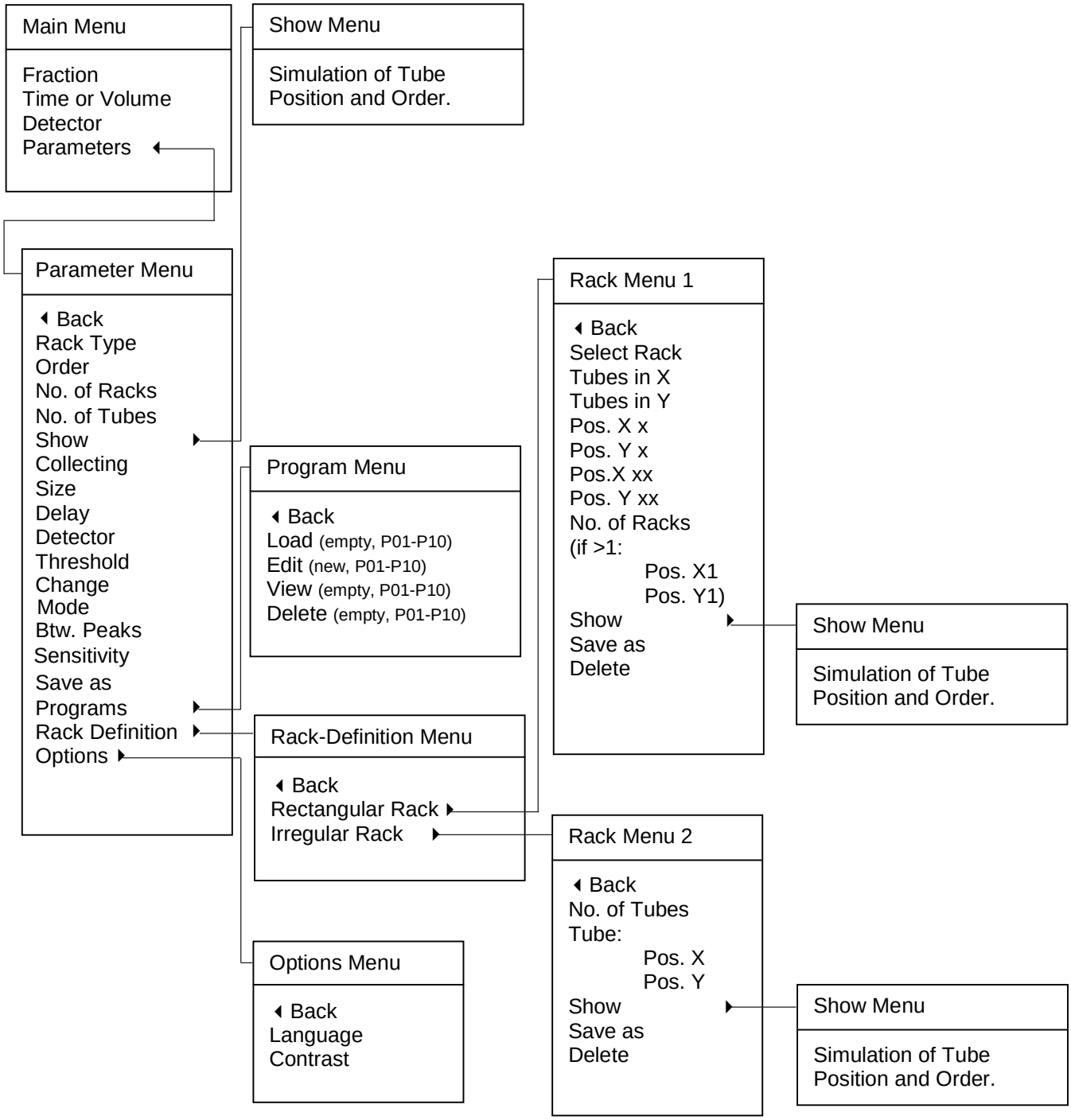
With the selector switch you can navigate through the menu. You select the desired parameters by rotating the knob, and confirm your selection by pressing it. The cursor jumps into the editing mode or, if it is already in the editing mode, into the next line (for program operation only in the stop mode). You set the desired values by rotating the selector switch. Press the selector switch in order to confirm the new value. After 10 seconds without confirmation the cursor jumps back to the old parameters and into the navigation mode.

5.3 Operation

Turn on the Fraction Collector with the power switch. The display shows the software version for a few seconds. The main menu with the last used values and parameters then appears automatically.

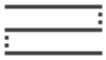
You can move through the menu by rotating the selector switch. Select your parameters or compose a new program.

5.3.1 Systematic of the Menu Guide



5.3.2 Parameters

Main Menu	**Description**
Fraction	Displays the current fraction.
Time or Volume	It is possible to collect according to time and volume. This setting is selected in the Parameters menu under the *Collect* point.
Detector	The line appears when a detector has been selected.
Parameter ▸	Jumps into **Parameter Menu**.

Parameter Menu	**Description**
◂ back	Jumps back into **Main Menu**.
Rack type	The predefined rack types FC4 – FC60 and Syncore Racks R4 – R96 can be selected. Customized racks are saved under C01 - C10 and U11.
Order	The sequence according to which the individual fractions are filled into the tubes can be entered.
	 The collector arm works within one rack line by line from left to right and vice versa. Same time intervals between fraction change.
	 The collector arm works within one rack line by line only from left to right.
	 The collector arm works within one rack by column from left to right and vice versa. Same time intervals between fraction change.
	 The collector arm works within one rack by column only from left to right.
	If customized racks are used whose collection starts in another corner, the pictogram doesn't reproduce the path precisely.
No. of racks	Number of racks on the drip tray of the Fraction Collector.
No. of tubes	Shows how many tubes are actually in the racks.
Show ▸	Shows the position of the individual tubes in the rack in the display and simulates the progression of the collector arm.
Collecting	It is possible to set whether collection should take place in fixed time intervals or according to volume (only in connection with a BÜCHI pump).
Size	Determines total time or volume according to which the tubes are filled.
Delay	The time prior to the start of the collection function can be entered.
Detector	Activates the peak collection function according to detector 1 or detector 2. Default: No detector.
Threshold	Defines the signal strength in % of the end-scale deflection at which the peak collection function is activated. A tube change occurs whenever this threshold is exceeded or is fallen short of.
Sensitivity	Defines the sensitivity of the peak defection. According to the noise of detector. Sensitivity 4 is the most sensitive and 1 the setting with the lowest sensitivity.

Change		Defines the criteria for a tube change:
		A tube change takes places after threshold is exceeded and upon detection of minima.
		A tube change takes places after threshold is exceeded and upon detection of minima, and also upon detection of maxima
Mode		Collection occurs only during the detected peaks. The fractions between the peaks are directed to the waste container, as well as substances not recorded by the detector.
		Collection occurs during and between the peaks. All fractions are thus collected.
Between peaks		Fractionation time or volume, if the detector signal is below threshold.
Save as		The entered parameters can be saved under P01 – P10.
Programs ▸		Jumps into the **Program Menu**.
Rack Definition ▸		Jumps into the **Rack Definition Menu**.
Options ▸		Jumps into the **Options Menu**.

Program Menu	**Description**
◂ back	Jumps back into the **Parameter Menu**.
Load (empty, P01–P10)	The previously saved programs P01 - P10 can be loaded.
Edit (new, P01–P10)	New programs can be created and saved or existing programs changed.
View (empty, P01–P10)	“Empty” is displayed when no programs have as of yet been saved. Otherwise, existing programs are loaded and displayed. However, they can not be changed in this mode.
Delete (empty, P01–P10)	“Empty” is displayed when no programs have yet been saved. Otherwise, the previously defined programs P01 - P10 are deleted.

Rack Definition Menu	**Description**
◂ back	Jumps back into the **Parameter Menu**.
Rectangular rack ▸	Jumps into **Rack Menu 1** (Rectangular rack).
Irregular rack ▸	Jumps into **Rack Menu 2** (Irregular rack).

Options Menu	**Description**
◂ back	Jumps back into the **Parameter Menu**.
Language	The appropriate operating language can be selected.
Contrast	Contrast of the graphical display.

Rack Menu 1 (rectangular rack)		**Description**
◂ back		Jumps back into the **Rack Definition Menu**.
Select rack		You can select the predefined rack types FC4 – FC60 and Syncore Racks R4 – R96 or your own racks under C01 - C10 and U11.
Tubes in X		Number of tubes in X-direction.
Tubes in Y		Number of tubes in Y-direction.
Pos. X 1		Position of the 1st tube in the X-direction (0.1 mm steps).
Pos. Y 1		Position of the 1st tube in the Y-direction (0.1 mm steps).
Pos. X xx		Position of the last tube (xx) in the X-direction (0.1 mm steps).
Pos. Y xx		Position of the last tube (xx) in the Y-direction (0.1 mm steps).
No. of Racks		The number of racks used is shown when the number of racks is >1:
	Rack	Shows the selected rack.
		Pos. X 1 The starting point of the first tube in the X-direction is given.
		Pos. Y 1 The starting point of the first tube in the Y-direction is given.
Show	▸	Shows the position of the individual tubes in the rack on the display and simulates the progression of the collector arm.
Save as		The entered parameters can be saved under C01 – C10.
Delete (empty, C01 – C10)		"Empty" is displayed if no racks have yet been saved. Otherwise, the previously defined racks C01 – C10 can be deleted with a yes/no query.

Rack Menu 2 (irregular rack)		**Description**
◂ back		Jumps back into the **Rack Definition Menu**.
No. of tubes		Number of tubes can be entered.
	Tube	The subsequently defined tube can be entered.
		Pos. X Position of the tube in the X-direction.
		Pos. Y Position of the tube in the Y-direction.
Show	▸	Shows the position of the individual tubes in the rack in the display and simulates the progression of the collector arm.
Save as U11		The entered parameters can be saved under U11.
Delete		"Empty" is displayed if no programs have been saved. Otherwise, the previously defined programs P01 - P10 can be deleted with a yes/no query.

5.4 Further Information

Drip Tray

The drip tray collects overflowing fractions and thus prevents contamination of the lab workspace. It also offers an optimal place to put used racks.

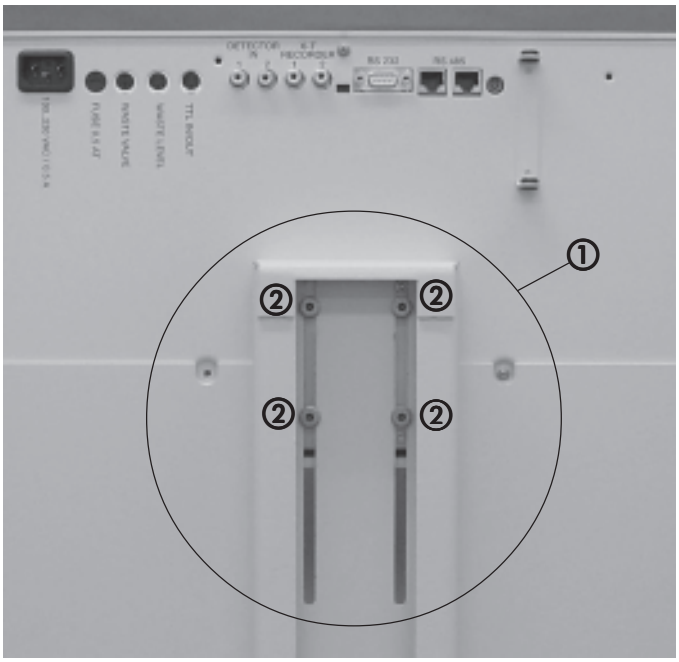


Figure 5.6: Vertically adjustable height of the Fraction Collector

Setting the Height ①

The distance between the collector arm and the tubes can be regulated at the rear of the Fraction Collector.

Never hold the Fraction Collector tightly on the collector arm. This can damage the sensitive controls.

Please ensure that the distance between the collector arm and the tube rim is at least 1 cm to prevent damage to the tubes.

Hold the upper part of the Fraction Collector tightly on the housing and loosen the four screws ② on the rear side. Position the collector arm at the desired height and tighten the screws.

Description of Interface RS 232

The interface works with 9600 Baud, straight parity, 8 data bits and 1 stop bit.
Output is supplied via a PC or a printer. An example is shown in Figure 5.8.

The header of the table is always written in English and appears when a program is started (transition from rest status into collecting status). Data lines are then written in an interval of one second until the program is finished or rest status has been reached again.

Example:

Time (s)	Flow A (ml/min)	Flow B (ml/min)	Rack R4	X	Y	Tube	Waste	Det 1(%) 100%=1V	Det 2(%) 100%=1V	Press (bar)
1	100	0	1	760	470	0	X	123	8	0
2	100	0	1	760	470	1		121	8	0.5
3	100	0	1	760	470	2		123	8	1.1
4	100	0	1	2260	1560	3		130	7	1.2
5	100	0	1	2260	1560	4		131	6	1.2
6	100	0	1	760	1560	5		133	7	1.2

Figure 5.8: Interface RS 232

The „Time“ column displays the time since the beginning of the program in seconds. The range extends from 0 to 999999s (app. 15 days). It subsequently starts again at zero.

The tube number („Tube“) is given as 0 and the character „x“ written in the „Waste“ column in the Wait, Pause and Error states. While the arm is moving from one position to the next, the new tube number and tube position are entered and the „Waste“ column is not marked.

The „Flow A“ and „Flow B“ columns indicate the flow in milliliters per minute with two places after the decimal. The dissolution is thus 10 ml/min.
If work is carried out without a BÜCHI pump, the low entry is always 0.
The position of the collector arm is given in columns „X“ and „Y“ in 0.1 mm steps.

The flow rate in the protocol corresponds to the value displayed on the pump. However, the rotational speed of the pump can deviate by up to 20 % due to the calibration. The actual rotational speed of the pump is not given in the protocol!

Peak Detection

General:
The Fraction Collector is normally set to the detector signal of 1 V end-scale deflection.
A calm detector signal is the prerequisite for a problem-free peak collection function. Most detectors have adjustable time constants, which serve to smooth the signal.

Function:
The integrated peak detector enables an automatic fraction change on the basis of the minima and maxima of the peak. The following definitions are necessary for the configuration of the Fraction Collector:

Parameter	Description
Detector 1 or 2	A detector must be selected and connected to the correct socket. This definition determines which detector signal will be evaluated for a fraction change. If no detector has been selected, the peak collection function is turned off. The peak collection function is automatically activated at the start when a detector is chosen.
Threshold	The threshold value defines the signal strength at which the peak collection function is activated. The peak collection function is shut off at signal strengths below the threshold value. The threshold value is entered as a % of the end-scale deflection (with a detector signal of 1V end-scale deflection,1% corresponds to a signal level of 10 mV) and serves to suppress occurring noise signals. A tube change occurs each time the signal exceeds or falls short of the threshold value.
Change	Here you can define whether a fraction change should only be triggered at a peak minima or both at peak minima and maxima. A fraction change at the peak maximum allows for an automatic division of peak into 'front' and 'rear' halves. Especially in the case of only slightly separated peaks, this procedure allows the multiple extraction of a fraction with sufficient purity for the subsequent analysis.
	 A tube change takes place before and after the minima.
	 A tube change takes place after minima and maxima.
Mode	Here you define whether the solvent of the entire chromatographic run or only the fractions are collected in the prepared tubes during a peak. In the second case the solvent is directed to the waste container between the peaks. The optional waste diverter valve 044964 is necessary for this function.
	 Collection occurs only during the detected peaks. The fractions between the peaks are directed to the waste container, as well as substances not recorded by the detector.
	 Collection occurs during and between peaks, meaning that all fractions are collected.

Between peaks (only mode)	Fraction sizes between peaks (Signal<Threshold): Serves to define different fraction sizes during and between the peaks. The time defined in the main menu or the corresponding volume is the valid maximum fraction size during a peak. Both times or volumes can differ. This makes it possible to break down a peak into smaller fractions but still makes it possible to fill the tubes to the maximum between the peaks. **Both times are independent of one another and must be individually defined!**
Sensitivity	The adjustment of various switching sensitivities. Range 4 shows the most sensitive, Range 1 the most sluggish switching behavior. This function enables adjustment of the collection function to the relevant slope of the peak. Peaks with short elution times have steep flanks and the switching decision must be correspondingly quick. Conversely, peaks with longer elution times have considerably flatter flanks and are usually somewhat more agitated; such peaks require a more sluggish switching decision. The following serves as a rule of thumb: - Use Range 3 for separations on small columns with diameters of 12...15, range 2 for larger columns. - Switch over to the next lower range if the peak detector switches too often. Switch over to the next highest range if it switches too sluggishly or 'overlooks' unambiguous switching criteria.

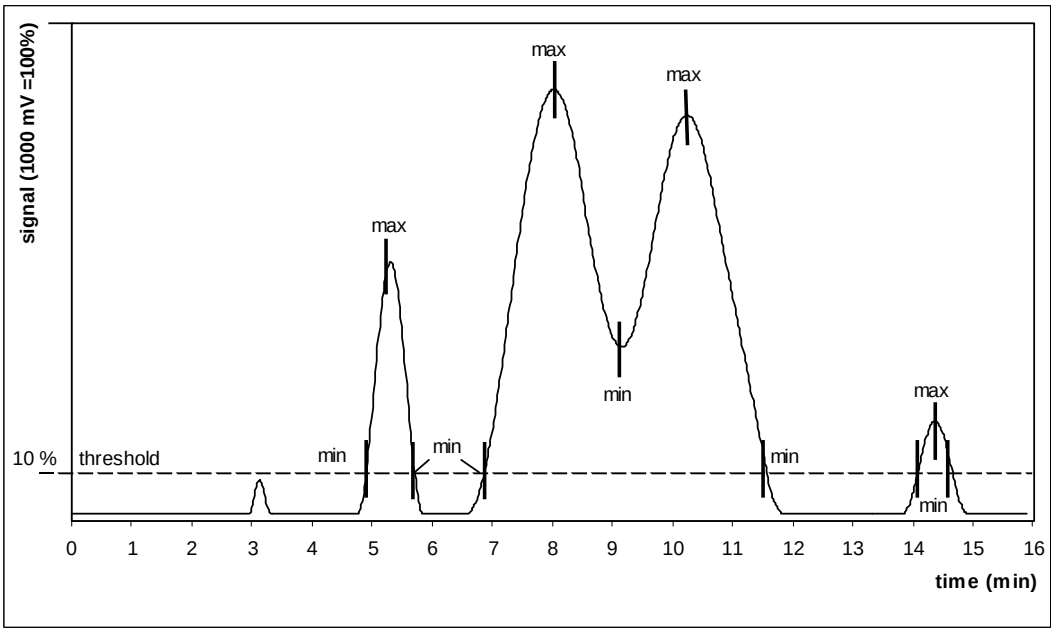


Figure 5.9: Example diagram of a detection after peak minimum (min) and peak maximum (max) with a threshold of 10%.

6 Error Messages

There is an optical and acoustical alarm in case of an error. Pressing the selector switch one time stops the alarm tone. You can read now the alarm text on the display. Pressing the selector switch again , quits the error. If the error is not existing anymore you can continue working.

There are several error codes existing for a quick and easy diagnosis. Only a few codes are relevant for the customer. Please contact service if error code (07 – 32) appears.

Shut off the Fraction Collector and switch it on again if *Arm is jammed* appears in the display, thus enabling the collector arm to reposition itself.
Please contact Service if this measure is unsuccessful.

7 Maintenance

All instructions with reference to the properly functioning status of the Fraction Collector are to be observed. This also includes periodic cleaning and checking for damage.

7.1 Cleaning



The Fraction Collector is to be disconnected from the power supply prior to cleaning and the tubes should be cleared with clean compressed air or nitrogen.

The Fraction Collector should be cleaned with a damp cloth (water or diluted soap-suds). The operating elements and the plug should also be visually inspected.

7.2 Customer Service

Interventions in the Fraction Collector may only be carried out by authorized service personnel. These are people with well-grounded technical training and awareness of the hazards resulting from failure to observe the safety precautions. BÜCHI customer service offices are supplied with a device-specific service manual, which can only be obtained by authorized personnel.
The addresses of the official BÜCHI customer service offices are given on the last cover page of these operating instructions. Please direct technical questions and application problems to these offices in case of malfunction.

BÜCHI customer service is equipped to supply the following services:

- replacement parts
- repair service
- maintenance
- technical consultation
- service contracts

8 Taking out of Operation

8.1 Storage/Transportation

The device should be thoroughly cleaned. Substance residue must be removed without exception in order to avoid the risk of persons being caused harm due to contact. The device should be stored and transported in its original packaging.

8.2 Disposal

We have provided a list of the materials used in the Appendix, Chapter 10.2, in order to enable the disposal of the device in an environmentally-friendly manner. In this way it can be ensured that the parts are separated and can be reused. Please observe valid regional and local laws concerning disposal.

9 Replacement Parts and Accessories

Only **BÜCHI** original accessories and replacement parts guarantee completely safe usage and functionality of the device. The use of replacement parts and accessories other than those from **BÜCHI** is only allowed with the permission of **BÜCHI** AG. The general safety rules and chapter 7 are to be observed when assembling or dismantling the device.

Inspect the functionality of the device prior to putting into operation.

9.1 Optional Accessories

Article	Usage	Order no.
① Waste valve	Valve for the Fraction Collector. Prevents dripping during the fraction change.	**44964**
② Chromatography table incl. holder and screws	For space-saving set-up of the Sepacore line incl. holder and screws for the Pump Manager.	**44310**
③ Tubing fitting set	For connecting the waste valve.	**44021**
④ Waste level sensor	Optimal accessory for the Fraction Collector. The ultrasound sensor avoids overflowing of the waste container. The sensor range lies between 10 – 60 cm (sensor to solvent). Connector for GL 45 glass threads.	**44336**
⑤ 4 Racks FC 12	Set of 4 racks FC 12 – Each for 12 tubes at 250 ml with diameter of 40 mm (without tubes).	**44957**
⑥ 4 Racks FC 30	Set of 4 racks FC 30 – Each for 30 tubes at 50 ml with diameter of 26 mm (without tubes).	**44958**
⑦ 4 Racks FC 60	Set of 4 racks FC 60 – Each for 60 tubes at 20 ml with diameter of 17 mm (without tubes).	**44959**
⑧ 10 250 ml Tubes for rack FC 12	Diameter of 39 mm; height of 300 mm	**44960**
⑨ 20 50 ml Tubes for rack FC 30	Diameter of 25 mm; height of 185 mm	**44961**
⑩ 100 20 ml Tubes for rack FC 60	Diameter of 16 mm; height of 160 mm	**44962**
⑪ Back pressure regulator 2 bar	Optimal accessory for detectors. Is mounted between the detector and the Fraction Collector and prevents the formation of air bubbles in the measuring cell of the detector.	**44337**

Table 9.1: Optional Accessories of the Fraction Collector

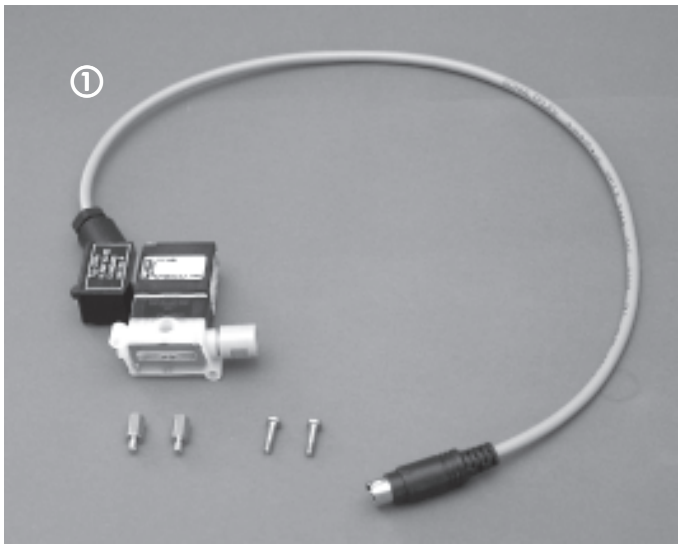


Bild 9.1: Waste Diverter Valve



Bild 9.1: Tubing Fitting Set

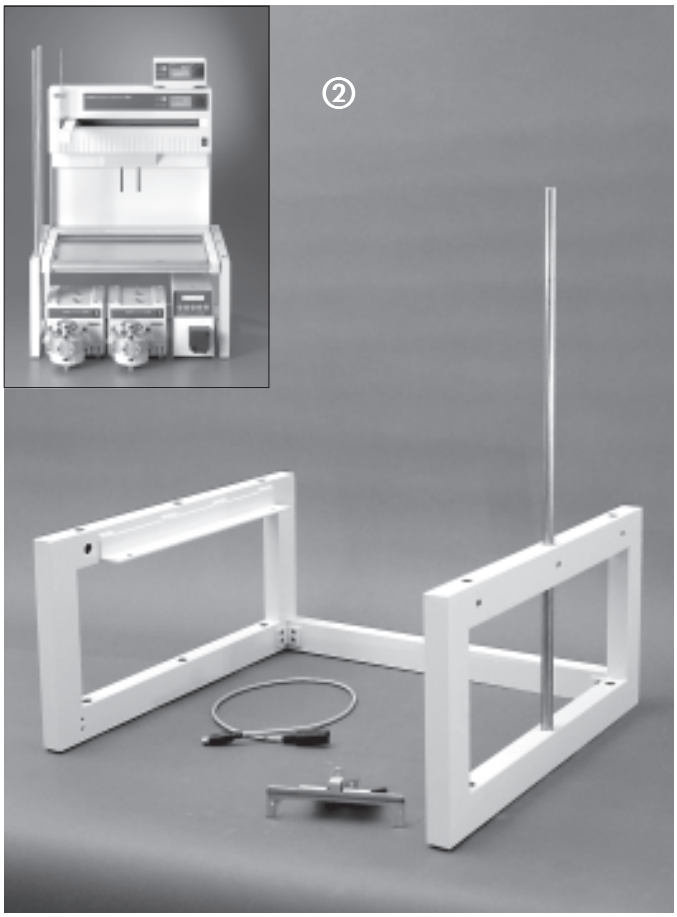


Figure 9.1: Chromatography Table



Bild 9.1: Waste Level Sensor

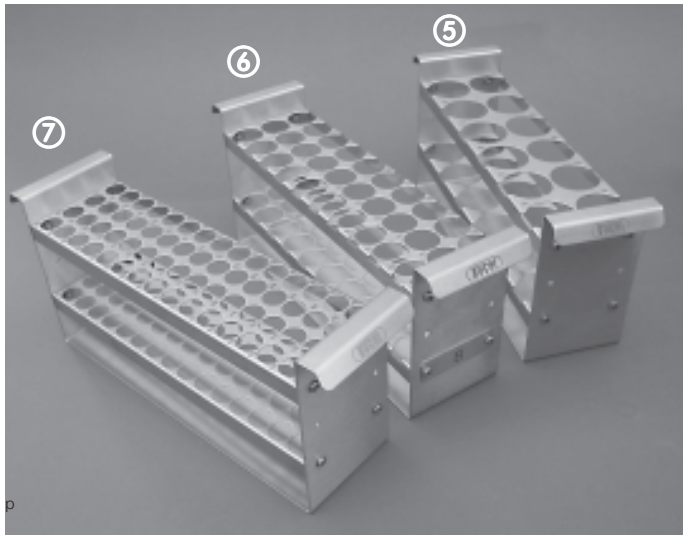


Bild 9.1: Fraction Collector Racks



Figure 9.1: Optional Accessories of the Fraction Collector, part 2

9.2 Replacement Parts

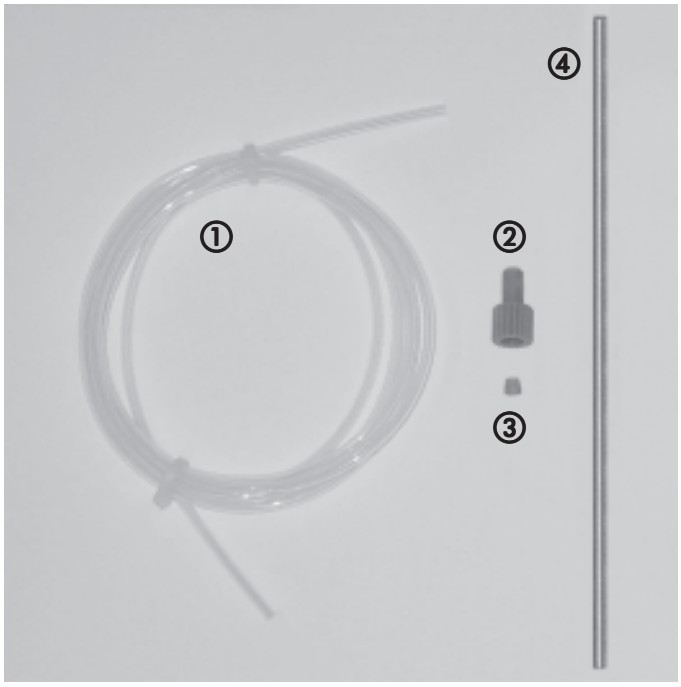


Figure 9.2: Replacement Parts

Description	Order no.
① FEP tubing, 1/8” x 1/16”, 5 m	**44354**
④ 1 Tubing guide, 0.2 m	**20780**
③ 25 Ferrules, 1/8”, green	**40961**
② 25 Fittings, 1/8”, green	**40956**
1 FEP Tubing 1/16” x 1/32”, 5 m	**44357**
25 Ferrules, 1/16”, grey	**44269**
25 Fittings, 1/16”, grey	**44816**
⑤ Tubing guide nut	**44938**
⑥ Tubing guide collet	**22121**

Table 9.2: Replacement Parts

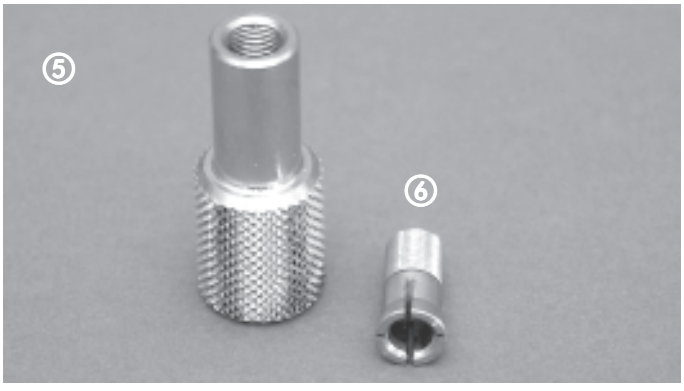


Bild 9.3: Replacement Parts

See also page 8, picture number 6.

10 Appendix

10.1 Technical Data

BÜCHI Fraction Collector C-660	
Order no	44900
Supported racks	4x FC60: 4x (60 x 20 ml tubes)
	4x FC30: 4x (30 x 50 ml tubes)
	4x FC12: 4x (12 x 250 ml tubes)
	Syncore Racks (R4, R6, R12, R24, R48, R96)
	Teach-in-function of 11 user-specific racks
Collection area (W x D)	440 mm x 350 mm
Collection modes	Time (internal timer 1s – 100 h)
	Volume (only with BÜCHI Sepacore pumps)
	Peak (together with a detector)
Fuse	T500 mA L 250 V
Site condition	Maximum relative humidity 80% for temperatures up to 31° C decreasing linearly to 50% relative humidity at 40° C
Peak detection types	Peak, slope, threshold
Peak detection, number	Monitoring of 1 or 2 detector signals
Display	Back-lit LCD graphic display 28 x 64 pixels (58 x 29 mm)
Dialog languages	E / G / F / I / SP
Power consumption	25 W
Mains voltage	100 – 230 VAC +/- 15 % 50/60 Hz
Interfaces	2x RS - 485 (system bus)
	1x RS - 232 (process data output)
	1x Mini-DIN (waste valve)
	1x Mini-DIN (TTL In/ alarm monitoring and/or ext. start)
	1x Mini-DIN (level sensor for waste container)
	2x Cinch In (detector signal input)
	2x Cinch Out (detector signal and fraction change marker)
Installation category	II
Degree of pollution	2
Dimensions (W x D)	465 mm x 470 mm
Height (H)	Adjustable from 370 mm to 460 mm
Weight	14 kg
Certificate	CE; CSA c pending

Table 10.1: Technical Data

10.2 Materials Used

Parts	Component
Housing	PUR foam
Tubing	FEP
Fitting	POM
Ferrule	ETFE
Cone ring	POM
Drip tray	steel
Chromatography table	alumina

Table 10.2: Materials Used

10.3 Declaration of Conformity

We **BÜCHI** Labortechnik AG
Postfach, CH-9230 Flawil
Switzerland

declares, as exclusively responsible party, that the product:
BÜCHI Fraction Collector **C-660**

with which this declaration is concerned, conforms to the following norms:

EN 61010-1:2001 (~ IEC 1010-1)
Safety regulations for electrical measuring, control, regulating and lab devices: general requirements

EMV-Emission
EN 61326:1997 / A1: 1998 / A2: 2001
Electrical equipment for measurement, control and laboratory use -
EMC requirements

EMV Immunity
EN 61326:1997 / A1: 1998 / A2: 2001
Electrical equipment for measurement, control and laboratory use -
EMC requirements

Conforming to the regulations of the EU guideline:
73/23/EWG (electrical resources/low voltage guidelines)
89/336/EWG (electromagnetic compatibility)

Flawil, 15.06.2003

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