

MEASURING QUALITY. SINCE 1796



# DENSITY METER | DS7000 SERIES

USER MANUAL





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# Chapter 1 - Safety

## 1.1 Basic safety information



- These operating instructions must be read carefully and understood prior to using the device.
- These operating instructions must constantly be available on-site during the entire lifespan of the device.
- All tasks may only be performed by qualified specialist staff.
- All tasks must be performed with caution.
- All safety and usage instructions in this manual must be complied with.
- Damage to the device which affects safety must be dealt with immediately.

## 1.2 General sources of danger

### Damage to persons:



#### Danger caused by electricity

- Only switch the device on if there is no damage to the device and the mains cable.
- Only start up devices which have been professionally installed and enabled.
- Before cleaning the device, switch it off and isolate it from the power supply.
- Do not allow any liquids to get inside the device.
- Do not spray the device to clean it.
- Only connect the device to the power supply when it is completely dry.
- Before replacing the fuse, isolate it from the power supply.

### Damage to devices:



#### Damage to the device caused by improper use

- In order to avoid damage caused by the build-up of condensation, wait at least one hour after transporting the device from a cool area (e.g. refrigerated room) before connecting the device to the power supply.
- Do not place the device near heat sources (e.g. heating).
- Do not expose the device to direct sunlight.
- Ensure that air is permitted to circulate freely.
- Clean the device using **only** neutral cleaning products.
- In case of contamination with aggressive chemicals, clean the device **immediately** using a neutral cleaning agent.

## 1.3 Personnel qualifications

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Only staff who have received an induction may work with this device.

## Chapter 2 - About this manual

### 2.1 Typographical conventions

---

- Lists** Lists are bulleted:
- List 1
  - List 2

**Instructions for use** Instructions that must be carried out in a particular order are numbered consecutively:

1. Step 1
2. Step 2

Instructions which do not have to be carried out in a particular order are listed with bullet points:

- ▶ Step 1
- ▶ Step 2

**Labelling of operating and display features** Keys are represented as follows: METHODS  
Display text: *Alarm profile*

References to other chapters are shown as follows:



See Chapter 7 Start-up.

Additional important information is shown as follows:



**Note!**  
Additional important information.

### 2.2 Significance of warning messages

---

If there is a risk of danger or damage, this is highlighted by warning messages. The following warning messages are used in these documents.



**Danger**  
This warning message warns of an **immediately** dangerous situation which may lead to severe injury and death.



**Warning**  
This warning message warns of a **potentially** dangerous situation which may lead to severe injury and death.



**Caution**

This warning message warns of a potentially dangerous situation which may lead to slight or moderate injury



**Attention!**

This warning message warns of damage to the device.

## Chapter 3 - Functional specification

The density meters DS7000 work according to the frequency oscillator principle and are very easy to use.

The density meter DS7000 can be operated as follows:

- with drying unit DS7050 (for manual filling)
- with drying unit DS7050 and peristaltic pump DS7070
- with drying unit DS7060 and peristaltic pump DS7070

The peristaltic pump DS7070 with drying unit (DS7050/DS7060) enables semi-automatic sample filling with subsequent cleaning and drying of the frequency oscillator.

If drying unit DS7060 is connected, unplugging and plugging in is not necessary for drying the frequency oscillator with the 3/2 way butterfly valve.

The control and entry of parameters is effected via the density meter.

The flow rate can be adjusted directly using the variable rotation speed. A time-controlled start/stop mode enables the dosage of fixed volumes.

The DS7000 makes use of frequency oscillators consisting of glass - inspection of the bubble-free filled frequency oscillator is possible through a window.

The sample to be measured is filled into the measurement chamber using a Luer disposable syringe or with the help of the peristaltic pump and is tempered with the internal Peltier temperature control.

The measurement is started by pressing the button, the density meter waits until the sample has reached the desired temperature and automatically starts the sample measurement.

The results are shown on the display and are saved in a data bank.

If required, the results can be printed and exported.

The density meter is intended for use in FDA-regulated areas through GLP compliance, built-in user administration and complete network capability for simple integration into the laboratory environment and connection to a LIMS.

All data (measured values, parameters and methods) are organised in an SQL database.

Selected results can be exported in Excel/HTML format onto a USB stick and a firmware update can be carried out easily using a

USB stick.

### 3.1 Features at a glance

- Measurement according to the frequency oscillator method
- Bright touchscreen display with intuitive operation in 6 languages
- Quick, efficient measurement within minutes (typically 1-3min) plus tempering
- Very efficient, integrated Peltier tempering (10-40 °C) with high accuracy
- Drying unit and peristaltic pump including filling via integrated peristaltic pump or syringe possible
- Sample resistance: All parts that are in contact with samples consist of glass and PTFE. Luer or UNF connections available
- Compact powder-coated metal housing including integrated air pressure sensor
- Low costs for consumables
- Output of all important measuring data
- User administration with optional password protection and 2 authorisation levels
- Integrated SQL database for information storage
- USB interface for data export and firmware updates as well as connection of keyboard or barcode scanner
- RS-232 interface for a serial printer
- Ethernet interface for direct connection to the PC (remote monitoring via internet possible)
- PDF export

- Direct printing on PostScript-enabled network printer possible
- Complete GMP/GLP capability: Password protection, data protection, automatic hard copy or data output in CSV format
- Corresponds to the relevant international standards such as Pharmacopoeia, OIML, ASTM
- Calibration certificate in accordance with N.I.S.T.
- IQ/OQ/PQ start-up modes possible
- Extremely low-maintenance and long-lasting
- 3 year warranty with registration

## 3.2 Areas of application

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Determining mixture ratios and quantity control in the following industries:

### **Beverage industry:**

Beer, condiments, fruit juice, sugar, soft drinks, spirits and dairy drinks.

### **Chemical industry:**

Acids, bases, salts, solvents, goods receipt and final control, controlling of raw materials and controlling of the mixture ratio.

### **Food industry:**

Jam, confiture, honey, glucose or fructose, syrup, jelly, mustard, ketchup, sauces, soups, convenience products, mayonnaise, ice cream, baby food, confectionary manufacturing and dairy products.

### **Motor industry:**

Oils, lubricants, battery acid and antifreeze.

### **Metalworking:**

Machining coolants and their emulsion solution with water.

### **Petrochemicals:**

Oils, lubricants, quality control of fuels and additives.

### **Cosmetic and pharmaceutical industry**

Creams, ointments, pastes, emulsions, lotions, beauty products, perfume, flavours, solvents, cleaners, shampoo, soaps, infusion solutions, urine and quality control of liquid medications and active ingredients.

### **Viniculturists:**

Grape juice, must, wine, sparkling wine and liqueur.

### **Sugar industry:**

%Brix, purity of sugar and its primary products as well as syrup concentration.

## Chapter 4 - Device description

This chapter will deal with the following topics:

- Device types
- Delivery content
- Device views with descriptions
- Overview of the menus
- Measuring principle

### 4.1 Overview of device types

Device type	Devices plus optional accessories
DS7000	Density meter with drying unit DS7050. For manual filling, rinsing and drying.
	Density meter with peristaltic pump DS7070 and drying unit DS7050: For manual and semi-automatic filling, rinsing and drying.
	Density meter with peristaltic pump DS7070 and drying unit DS7060: For manual and semi-automatic filling, rinsing and drying without unplugging and plugging in of hose connectors.

### 4.2 Delivery content

- Density meter
- Mains cable
- Touchscreen pen
- Operating manual

#### Optional accessories

- Peristaltic pump including hoses
- Drying unit (DS7050) including hoses
- Drying unit (DS7060) with 3/2 way butterfly valve.including hoses no unplugging and plugging in of the hoses required.
- Standard hose set
- Acid-resistant hose set
- Network cable
- Barcode scanner (handheld scanner)
- Mini keyboard with silicon coating (USB connection)
- Printer



See **order information**.

## 4.3 Device views DS7000

### 4.3.1 Front view



Fig. frontal view DS7000 with drying unit and peristaltic pump

1	Drying unit DS7070
2	Hose connectors
3	Peristaltic pump
4	Touchscreen
5	Frequency oscillator for sample in-feeding



### 4.3.2 Rear view

Besides the mains connection and the main switch, the DS7000 has connectors for the management of the results data and a connector for the peristaltic pump.



Fig. rear view of DS7000

1	Mains switch
2	Fuse
3	Network connector
4	Network connector: Connection of a Laboratory Information and Management System (LIMS) or connection to an available network. If there is internet access, remote control is also possible.
5	USB connection Updates of device firmware can be carried out or measurement records can be exported using the USB stick.
6	Printer connection (serial interface) for direct output of the results.
7	Connection for peristaltic pump DS7070

## 4.4 Frequency oscillator with connecting pieces

The frequency oscillator has two connection pieces. One for the sample infeed and one for discharge.



Fig. hose connections on the frequency oscillator

1	Infeed piece
2	Drainage piece

Standards connecting pieces and acid-resistant connecting pieces are available.

### 4.4.1 Standard hoses and standard connection pieces

Manual sample in-feeding using a Luer syringe

Connectors and hoses for manual sample in-feeding using a Luer syringe:

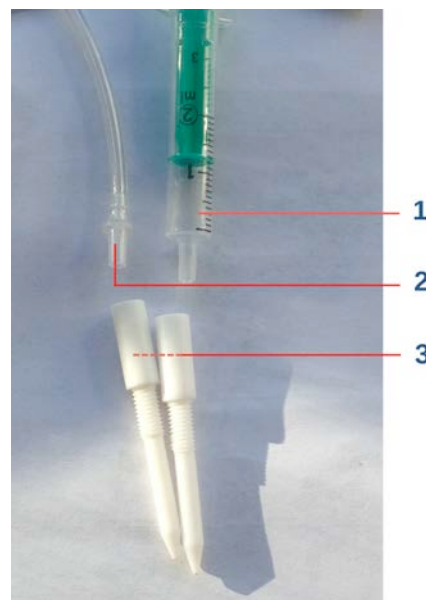


Fig. standard connecting pieces for standard hoses and Luer syringe

1	Luer syringe for sample in-feeding
2	Standard hose with Luer cone for drainage
3	Standard connection pieces

Semi-automatic sample in-feeding

Hoses and hose connectors for semi-automatic sample in-feeding:

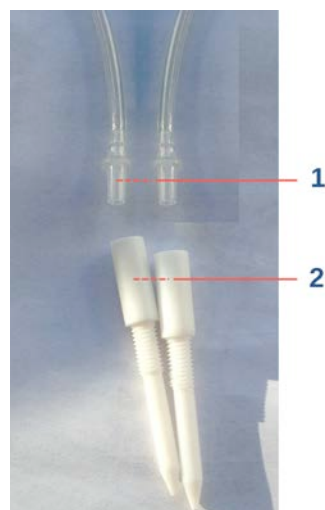


Fig. standard connecting pieces for standard hoses

1	Standard hose with Luer cone
2	Standard connecting pieces for standard hoses

#### 4.4.2 Acid-resistant hoses and connecting pieces

##### Semi-automatic sample in-feeding

Acid-resistant hoses and connecting pieces should be used for aggressive samples.  
Acid-resistant hoses and connecting pieces for semi-automatic sample feeding:

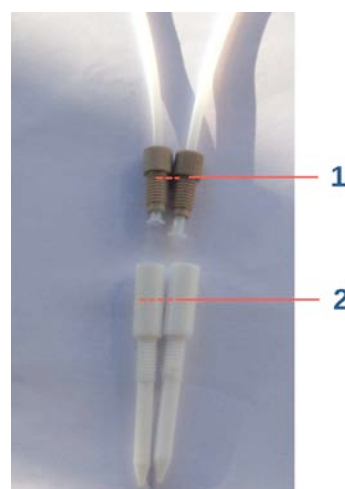


Fig. acid-resistant hoses and connecting pieces

1	PTFE hoses with UNF hollow bolt (brown)
2	UFN connection pieces (with internal thread)

##### Manual sample in-feeding using a Luer syringe

If a Luer syringe is used to feed in a sample, instead of the hose (semi-automatic sample in-feeding), an adapter (3) must be used.

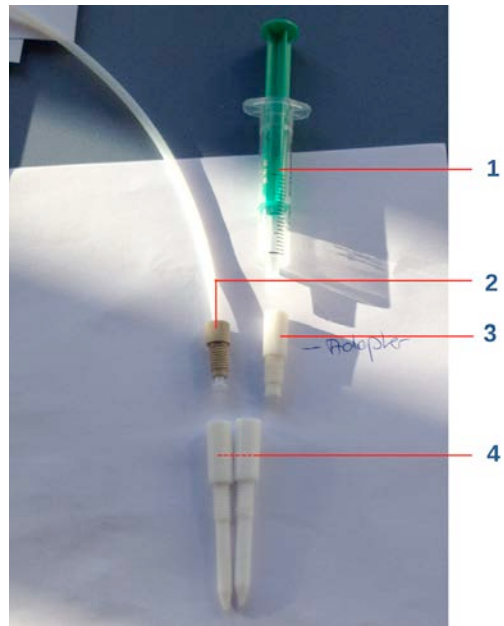


Fig. acid-resistant hoses and adapter for the Luer syringe

1	Luer syringe
2	PTFE hoses with UFN hollow bolt (brown)
3	Adapter for the Luer syringe (with external thread)
4	UFN connection pieces (with internal thread)

## 4.5 Peristaltic pump DS7070

The peristaltic pump is connected to the density meter and transports the sample and the rinsing fluid into the frequency oscillator.  
 The pump is fitted with a TPE peristaltic pump hose in order to guarantee the highest possible level of chemical resistance.  
 The control and entry of parameters is effected via the density meter.  
 The flow rate can be adjusted directly using the variable rotation speed. A time-controlled start/stop mode enables the dosage of fixed volumes.

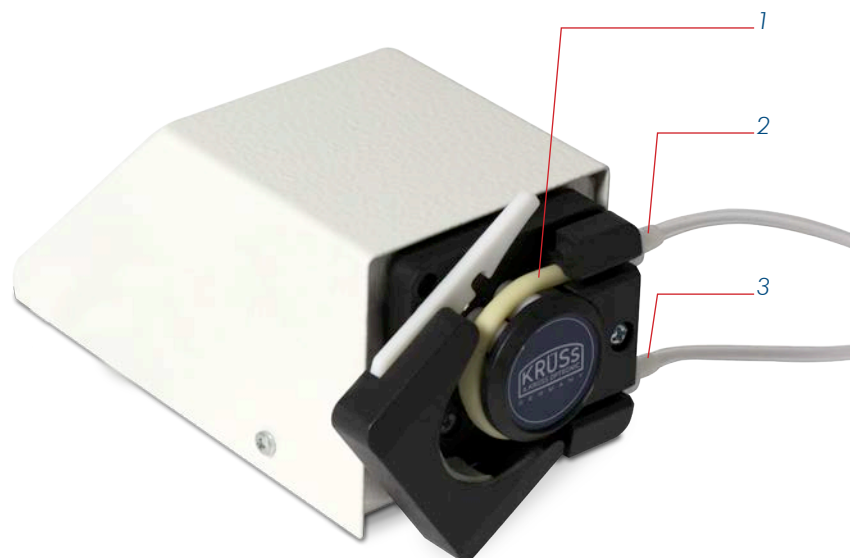


Fig. peristaltic pump DS7070

1	Density meter connection cable
2	Peristaltic pump hose (TPE)
3	UFN connection (with inner threading) for connecting to waste
4	UFN connection (with inner threading) for connecting to the frequency oscillator

## 4.6 Drying unit

There are two different drying units:

- Drying unit DS7050
- Drying unit DS7060

Both drying units have a cartridge with silica gel to dry the sucked-in air.

### 4.6.1 Drying unit DS7050

The drying unit DS7050 has **one** hose connection.

The drying unit DS7050 can be connected to the density meter with or without the peristaltic pump.



Fig. Drying unit DS7050

1	Cartridge with silica gel
2	Hose connection for connecting to frequency oscillator

The drying unit's hose is connected to the frequency oscillator for the drying procedure and is removed again afterwards.

#### 4.6.2 Drying unit DS7060

The drying unit DS7060 has **two** hose connections.

The drying unit DS7060 has a 3/2 way butterfly valve. Thanks to the 3/2 way butterfly valve, unplugging and plugging in is not necessary for drying the frequency oscillator.

The drying unit DS7060 can only be operated together with the peristaltic pump DS7070.



Fig. Drying unit DS7060

1	Cartridge with silica gel
2	Hose connection (upper) to peristaltic pump and waste vessel
3	Hose connection (lower) to frequency oscillator

## 4.7 DS7000 with drying unit DS7050 without peristaltic pump

### 4.7.1 Setup



Frontal view DS7000 with hose connections and without peristaltic pump

1	Drying unit DS7050 with cartridge and silica gel
2	Frequency oscillator for sample in-feeding
3	Drainage piece for the waste hose
4	Infeed piece with Luer syringe
5	Waste hose to waste container

### 4.7.2 Hoses

There are three hoses for filling the sample, rinsing and drying:

- **Filling hose** for filling the sample/rinsing solution into the frequency oscillator
- **Waste hose** from the frequency oscillator to the waste container
- **Air hose** for drying the frequency oscillator

### 4.7.3 Hose connections and flow direction for measurement and rinsing

---

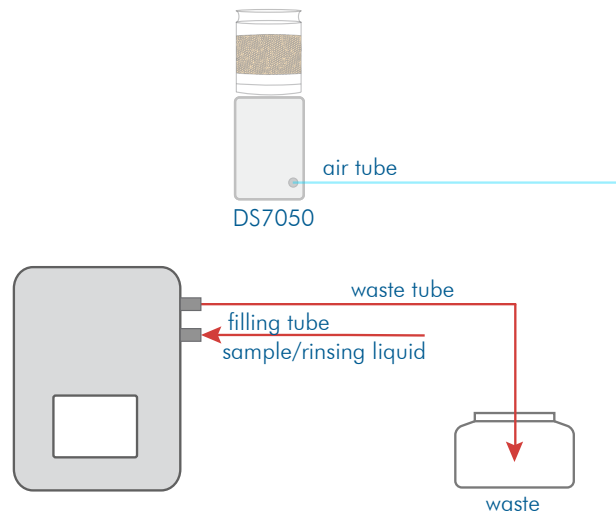


Fig. hose connections and flow direction for measurement and rinsing

### 4.7.4 Hose connections and flow directions for drying

---

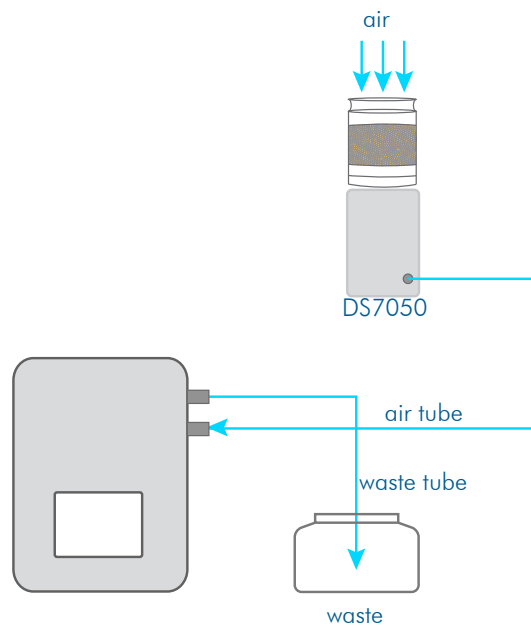


Fig. hose connections and flow direction during drying



## 4.8 DS7000 with drying unit DS7050 and peristaltic pump DS7070

### 4.8.1 Setup



Fig. DS7000 with drying unit DS7050 and peristaltic pump

1	Drying unit DS7050 with cartridge and silica gel
2	Hose connectors
3	Peristaltic pump DS7070
4	Touchscreen
5	Frequency oscillator for sample in-feeding

### 4.8.2 Hoses

There are four hoses for filling the sample, for rinsing and drying:

- **Filling hose** for filling the sample/rinsing solution into the frequency oscillator
- **Waste hose** leads from the frequency oscillator to the pump
- **Waste hose** leads from pump to waste vessel
- **Air hose** frequency oscillator & drying unit

### 4.8.3 Hose connections and flow direction for measurement and rinsing

The flow direction fundamentally depends on the pump rotation. In the following examples, the direction of rotation is counter-clockwise (to the left).

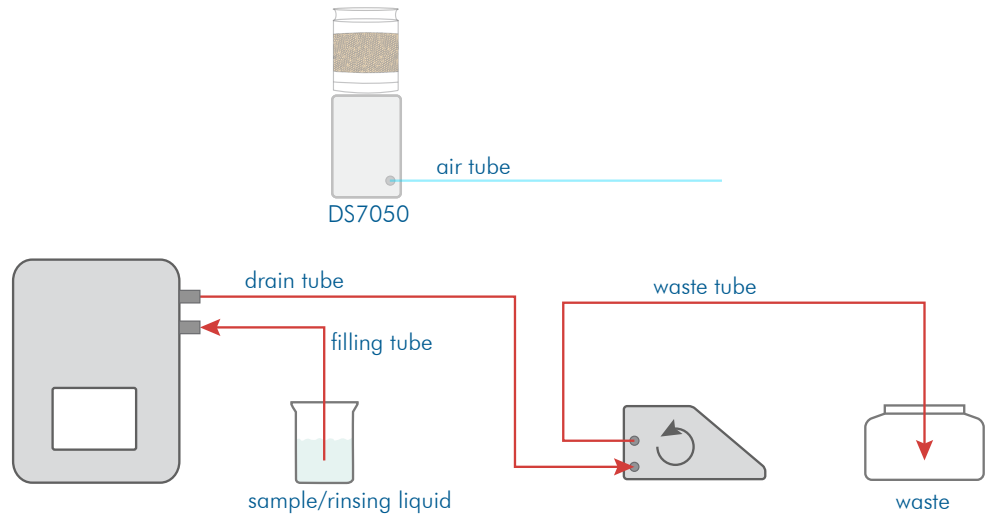


Fig. hose connections and flow direction for measurement and rinsing

### 4.8.4 Hose connections and flow direction for drying

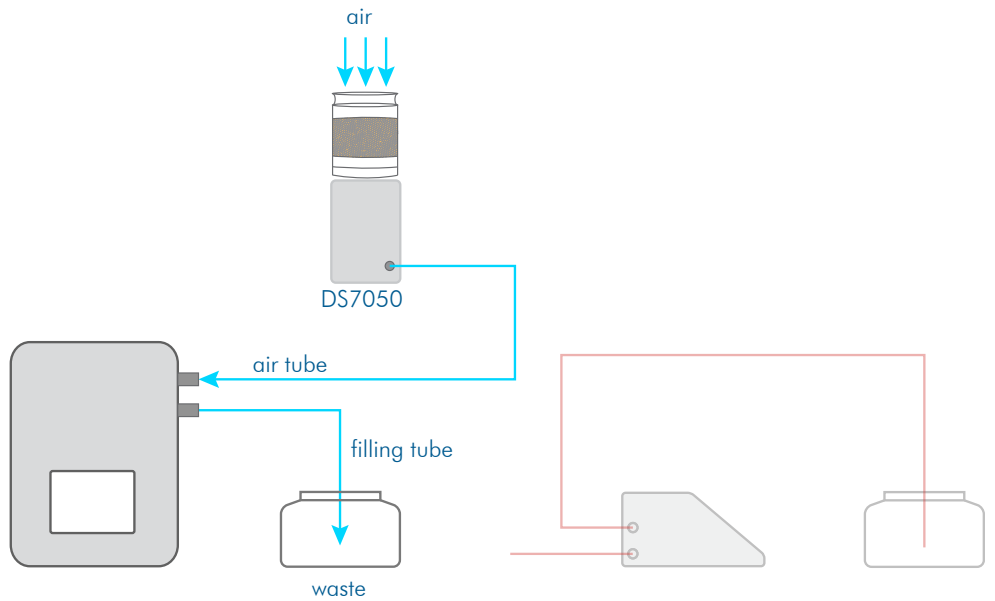


Fig. hose connections and flow direction during drying

## 4.9 DS7000 with drying unit DS7060 and peristaltic pump DS7070

### 4.9.1 Setup



Fig. DS7000 with drying unit DS7060 and peristaltic pump

1	Drying unit DS7050 with cartridge and silica gel
2	Hose connectors
3	Peristaltic pump DS7070
4	Touchscreen
5	Frequency oscillator for sample in-feeding

### 4.9.2 Hoses

There are **four** hoses for filling the sample, for rinsing and drying:

- **Filling hose** for filling the sample/rinsing solution into the frequency oscillator
- **Waste hose** leads from the frequency oscillator to the drying unit
- **Connecting hose** from drying unit to pump
- **Waste hose** leads from pump to waste vessel

### 4.9.3 Hose connections and flow direction for measurement and rinsing

The flow direction in the frequency oscillator depends on the pump rotation. In the following examples, the direction of rotation is counter-clockwise (to the left).

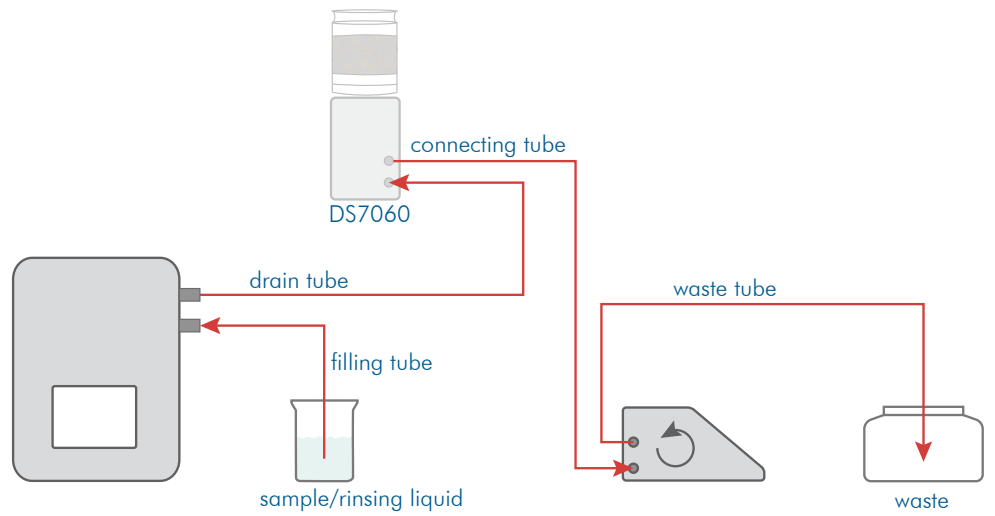


Fig. hose connections and flow direction for measurement and rinsing

### 4.9.4 Hose connections and flow direction for drying

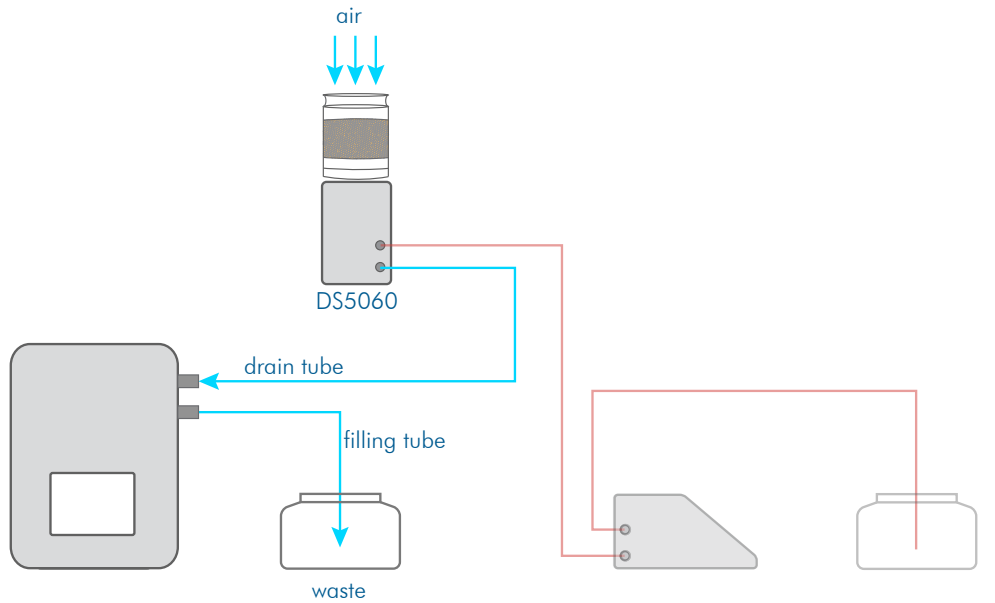


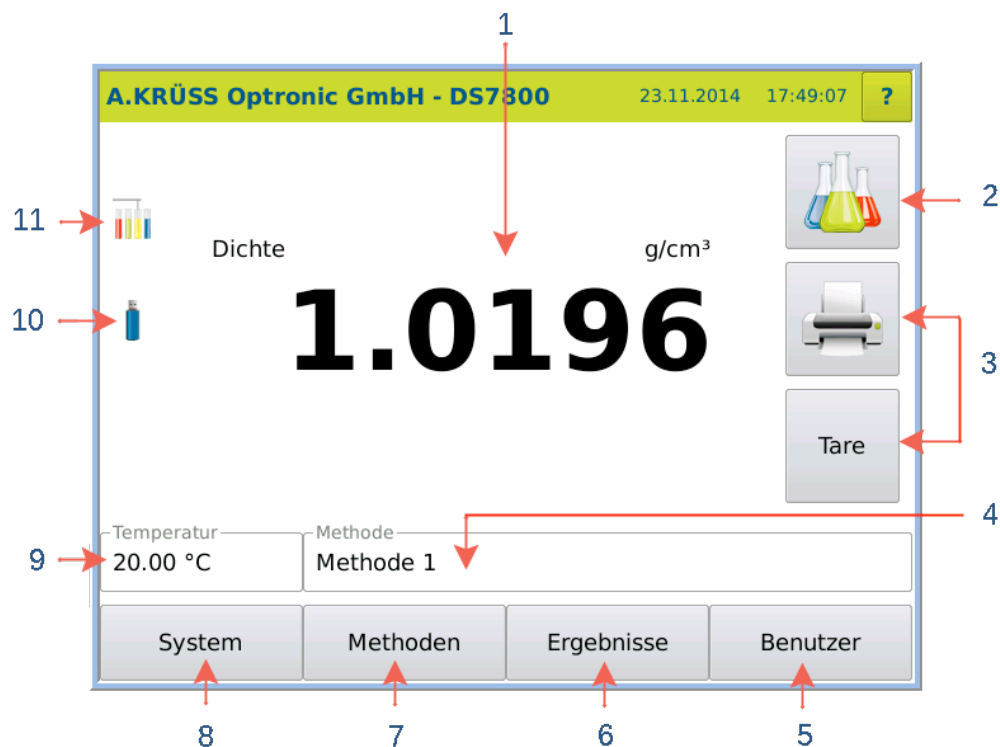
Fig. hose connections and flow direction during drying

## 4.10 Screen description

### 4.10.1 Main menu

In this menu, measurements are taken and the result with the most important parameters is displayed.

The SYSTEM, METHODS, RESULTS and USER keys lead to additional submenus.



The display changes depending on the device structure and settings:

Position	Description
1	Displays measurement outcome with unit.
2	Initiates measurement.
3	User-specific functions
4	Displays the current method and opens a selection menu for changing the method.
5	Opens the User menu.
6	Opens the Outcome menu for outcome management.
7	Opens the Method menu. All method parameters are defined in the Method menu.
8	Opens the System menu for device settings.
9	Temperature or air pressure display. Selection menu: <i>Temperature, air pressure, alternating</i> (alternately displays temperature and air pressure.)
10	USB stick is connected.
11	Autosampler is connected.

### 4.10.2 System menu

The SYSTEM key opens the system menu. All device settings are defined in the system menu.



See the chapter **System menu**.

**Systemeinstellungen bearbeiten**

Benutzerprofil

Allgemein	Bearbeiten
-----------	------------

Allg.	Drucker	Funktionen	Netzwerk	Service	Opt.
-------	---------	------------	----------	---------	------

Tare [g / cm <sup>3</sup> ]	Firmware	Datenbank
<input type="text"/>	7.101	7.016
Messwertjustierung	API-Version	Eco-Version
<input type="text"/>	4.200	6.165
	SQL-Script	Fernwartung
	ausführen	verbinden

Abbrechen			Ok
-----------	--	--	----

### 4.10.3 Methods menu

The METHODS key opens the methods menu. Methods are accessed, defined, modified, disabled and deleted in the Methods menu.



See the chapter **Methods menu**

**Methoden**

Name

Methode 1	▼	Bearbeiten
-----------	---	------------

Skala 1	Skala 2	Temp.	Einst.	Sampl.	Reinigung	Opt.
---------	---------	-------	--------	--------	-----------	------

Skala	Einheit	Auflösung
Dichte*	g/cm <sup>3</sup>	0.0001
Parameter	Vorgabe	Eingabe
<input type="text"/>	0	Nein
Temperaturkompensation	Viskositätskorrektur	
keine	keine	

Abbrechen	Export	Drucken	Ok
-----------	--------	---------	----

#### 4.10.4 Results menu

The OUTCOME key opens the outcome menu. The last 999 measurements are stored in the results menu along with all associated settings and parameters. Columns can be displayed or hidden and the results can be filtered, printed or exported.



See the chapter **Results menu**.

Ergebnisse - 7							
Datum+Zeit	Benutzer	Methode	Probe	Skala1	Mess1	Einheit1	Temp [°C]
26.11.2014 19:01:32	Administrator	Methode 1	4 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:47:51	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:47:06	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:46:54	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:40:48	Administrator	Methode 1	3 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 11:32:18	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
21.11.2014 11:52:02	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	

Abbrechen    Export    Drucken    Filter

#### 4.10.5 User menu

The USER key opens the user menu. The user menu is used to define users and allocate them permissions, define logins and change display colours.



See the chapter **User menu**.

Benutzer		
Name		
Administrator		Bearbeiten
Allgemein    Farben    Optionen		
Berechtigung	Login	Gültig bis
Administrator	Administrator	unbeschränkt
Zuletzt angemeldet am	Passwort	
09.09.2014 16:03:38		
Fehlgeschlagene Login-Versuche	Abmelden	
0		
Abbrechen	Export	Drucken    Ok

## 4.11 Measuring principle

---

The density measurement is carried out according to the frequency oscillator principle. Hereby a sample is filled into a swinging tube. The change in the oscillating frequency following the changed oscillation mass enables the determination of the sample's density.

The following applies:  $r = A \times T^2 + B$

A and B are instrument constants of the oscillator.  
A and B are determined through calibration.  
A substance's density depends on the concentration and the temperature.



## Chapter 5 - Basic operation

The device is operated via the display using a touchscreen.

### 5.1 Switch menu levels

Operation is controlled via menus and submenus.

You can access the submenus via the buttons SYSTEM, METHOD, RESULTS and USER.

The previous menu level can be accessed by pressing CANCEL or OK.

### 5.2 Edit settings and parameters

In order to edit settings and parameters in individual menus, press the PROCESS key.

**Systemeinstellungen**

Benutzerprofil

Allgemein Bearbeiten

Allg. Drucker Funktionen Netzwerk Service Opt.

Druckerauswahl Druckmethode

PDF-Datei direkt

Seitenlayout Breite [mm] Höhe [mm]

DIN A4 Hochformat 210 297

Speicherort Logo

USB-Stick Werkseinstellung

Abbrechen Export Drucken Ok

**Menu in editing mode:** Parameters which can be changed are highlighted grey.  
The ability of users to change parameters depends on access rights.

**Systemeinstellungen bearbeiten**

Benutzerprofil  
Allgemein Bearbeiten

Allg. **Drucker** Funktionen Netzwerk Service Opt.

Druckerauswahl Druckmethode  
PDF-Datei direkt

Seitenlayout Breite [mm] Höhe [mm]  
DIN A4 Hochformat 210 297

Speicherort Logo  
USB-Stick Werkseinstellung

Abbrechen Ok

## 5.3 Save/do not save input

You can save changes by pressing OK or not save them by pressing CANCEL.

**Systemeinstellungen bearbeiten**

Benutzerprofil  
Allgemein Bearbeiten

Allg. **Drucker** Funktionen Netzwerk Service Opt.

Druckerauswahl Druckmethode  
PDF-Datei direkt

Seitenlayout Breite [mm] Höhe [mm]  
DIN A4 Hochformat 210 297

Speicherort Logo  
USB-Stick Werkseinstellung

Abbrechen Ok

### 5.3.1 Save input

**OK:** Saves the input provisionally, leaves the submenu and returns to the previous menu.



#### Information

All other submenus must be exited (until you reach the main menu) by pressing OK, before the input is finally saved.

### 5.3.2 Do not save input

---

**Cancel:** Leaves the submenu without saving the settings.



#### Information

Provisionally saved values in other submenus are not saved either!

## 5.4 Editing authorisations

---

The system settings may only be modified by users with administrator permissions or where necessary only by the administrator.

## 5.5 User-specific definitions

---

You have the opportunity to define the same system settings for all users (global) or user-specific.

For user-specific definitions, the following system options must be activated:

- SYSTEM > Tab *Opt.* > *Activate User administration.*
- SYSTEM > Tab *Opt.* > *Individual systems settings.*



*Date, Time, Date format and Time format* can only be set globally (SYSTEM > Tab *Gen.*).

## 5.6 Disabled methods

---

A method is disabled even when only one setting which affects this method is disabled.

#### Example:

You have disabled a newly defined scale for one method.

Now, when you access the method which uses this scale, you receive an error message. You can only use the method again when the scale is enabled.

## 5.7 Device version and data

---

1. Click on the Help symbol in the Start window.

The device data shall be displayed:

The screenshot shows a dialog box titled 'Informationen' with a yellow header. It contains three tabs: 'Allgemein', 'Werkskalibrierung', and 'Kundenkalibrierung'. The 'Allgemein' tab is active. Under the 'Gerät' section, it displays 'xxxx , Messbereich: -90° bis +90° , temperiert' and 'Seriennummer: ???'. Under the 'Firmware' section, it lists: 'Firmware: 7.101', 'Datenbank: 7.016', 'Eco-Version: 4.502', 'API-Version: 4.200', and 'Release: 06.10.14 21:14'. At the bottom left, there is copyright information: '©2007-2014 A.KRÜSS Optronic GmbH, Alsterdorfer Strasse 276-278, 22297 Hamburg, Deutschland'. An 'OK' button is located at the bottom right.

Informationen	
Allgemein   Werkskalibrierung   Kundenkalibrierung	
Gerät	
xxxx , Messbereich: -90° bis +90° , temperiert	
Seriennummer: ???	
Firmware	
Firmware:	7.101
Datenbank:	7.016
Eco-Version:	4.502
API-Version:	4.200
Release:	06.10.14 21:14
©2007-2014 A.KRÜSS Optronic GmbH Alsterdorfer Strasse 276-278 22297 Hamburg, Deutschland	
OK	

## Chapter 6 - Installation

### 6.1 Select site



#### Attention!

Overheating damage

- Do not place the device near heat sources (e.g. heating).
- Do not expose the device to direct sunlight.
- Ensure that air is permitted to circulate freely.



#### Important note!

Shocks and direct sunlight lead to incorrect measurement results.

The installation site should fulfil the following conditions:

- The site should be free of vibration or shocks.
- The surface should be flat and stable.
- Do not expose the device to direct sunlight.

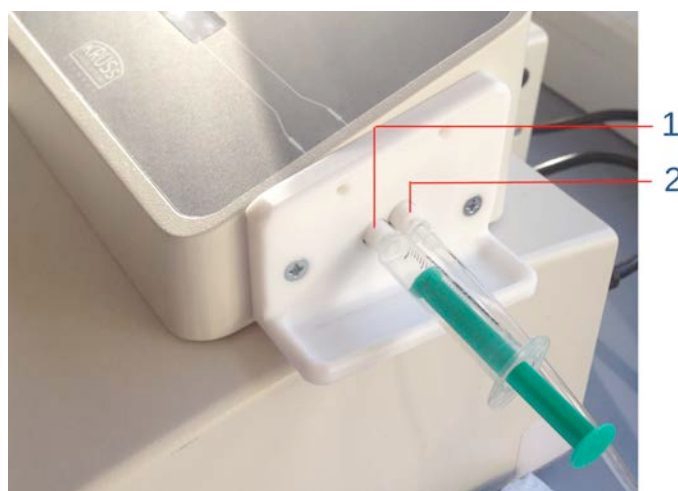
### 6.2 Connect hoses to the frequency oscillator

Depending on the type of filling (manual or semi-automatic) and the connecting pieces on the frequency oscillator, the hoses that must be connected are different.

#### 6.2.1 Standard connections and Luer syringe for manual filling

If the sample or the rinsing fluid is to be filled into the frequency oscillator manually with a Luer syringe through the infeed piece, proceed as follows:

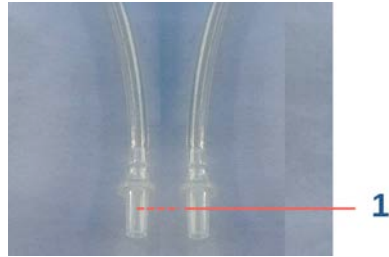
1. Stick the drain hose into the drainage piece (2)
2. For filling, stick the Luer syringe into the infeed piece (1).



1	Standard infeed piece for the Luer syringe
2	Standard drainage piece for the draining hose

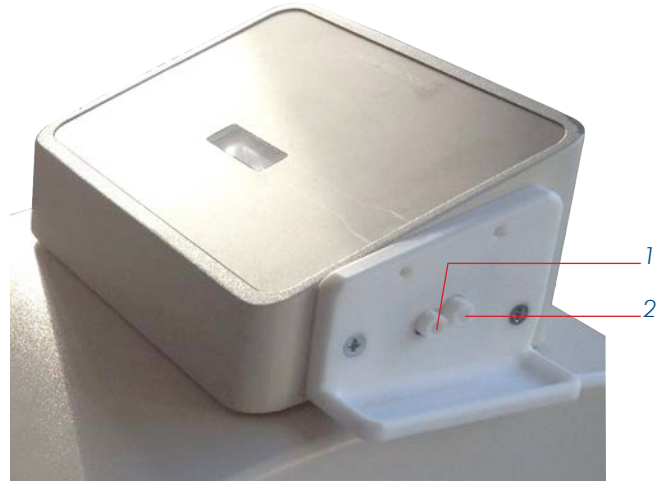
### 6.2.2 Standard connections for semi-automatic filling

The standard filling and draining hoses have a male Luer connector (1).



The hoses must be installed as follows:

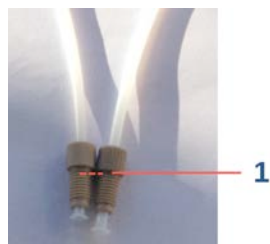
1. Stick the filling hose into the infeed piece (1)
2. Stick the drain hose into the drainage piece (2)



1	Infeed piece consisting of PTFE with female Luer connectors.
2	Acid-resistant drainage piece

### 6.2.3 Acid-resistant hoses for semi-automatic filling

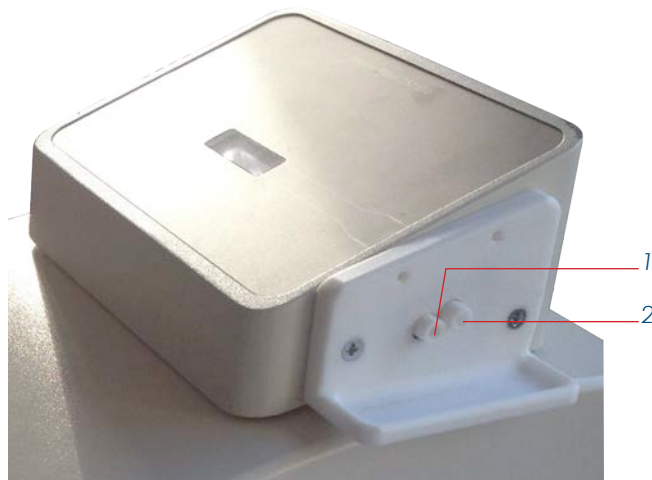
The acid resistant filling and draining hoses have a connector with an external thread (1) and are screwed into the connecting pieces, which are also acid-resistant.



1	Acid-resistant hoses and connectors with external threading
---	---

The hoses must be installed as follows:

1. Screw the filling hose into the infeed piece (1)
2. Screw the drain hose into the drainage piece (2)



1	Infeed piece
2	Drainage piece

#### 6.2.4 Acid-resistant hoses for manual filling with a Luer syringe

For working with the Luer syringe, an adapter (3) must be screwed into the infeed piece (1).

1. Screw the adapter (3) into the infeed piece (1)
2. Screw the drain hose into the drainage piece (2)



1	Acid-resistant infeed piece
2	Drainage piece with acid resistant draining hose
3	Adapter for the Luer syringe

## 6.3 Install DS7000 with drying unit DS7050 and without peristaltic pump

On delivery, the drying unit mentioned in the order, including a cartridge with silica gel and the infeed and drainage pieces are already installed.

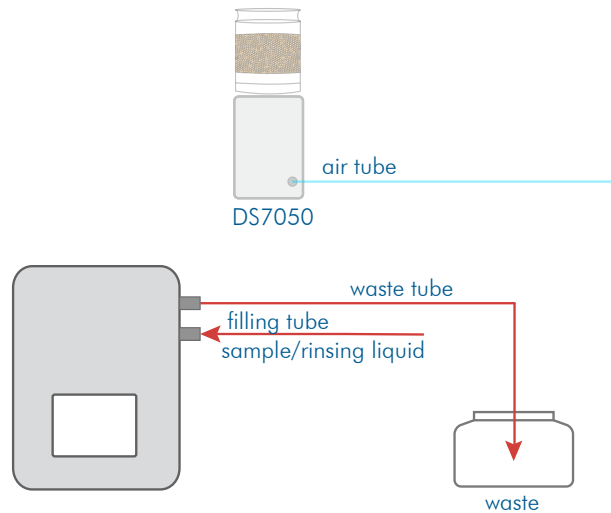


### Important note!

If the silica gel is discoloured, it can no longer absorb **any** moisture and must be renewed. Replace the silica gel as described in the Maintenance chapter.

All that remains is for the hose connections to be established as follows:

1. Connect the hoses as shown in the overview.



## 6.4 Install DS7000 with drying unit DS7050 and peristaltic pump

On delivery, the drying unit mentioned in the order, including a cartridge with silica gel and the infeed and drainage pieces are already installed.

All that remains is for the peristaltic pump and the hoses to be connected.



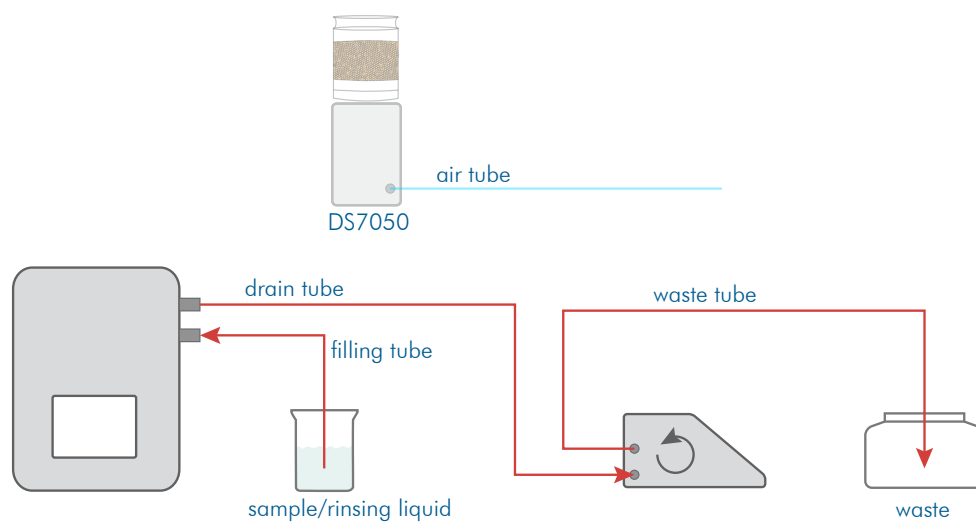
### Important note!

If the silica gel is discoloured, it can no longer absorb **any** moisture and must be renewed. Replace the silica gel as described in the Maintenance chapter.



### 6.4.1 Establish hose connections for DS7050

1. Connect the hoses as shown in the overview.



### 6.4.2 Connect peristaltic pump DS7070

1. Attach the connecting cable from the peristaltic pump to the density meter



## 6.5 Install DS7000 with drying unit DS7060 and peristaltic pump

On delivery, the drying unit mentioned in the order, including a cartridge with silica gel and the infeed and drainage pieces are already installed. All that remains is for the peristaltic pump and the hoses to be connected.

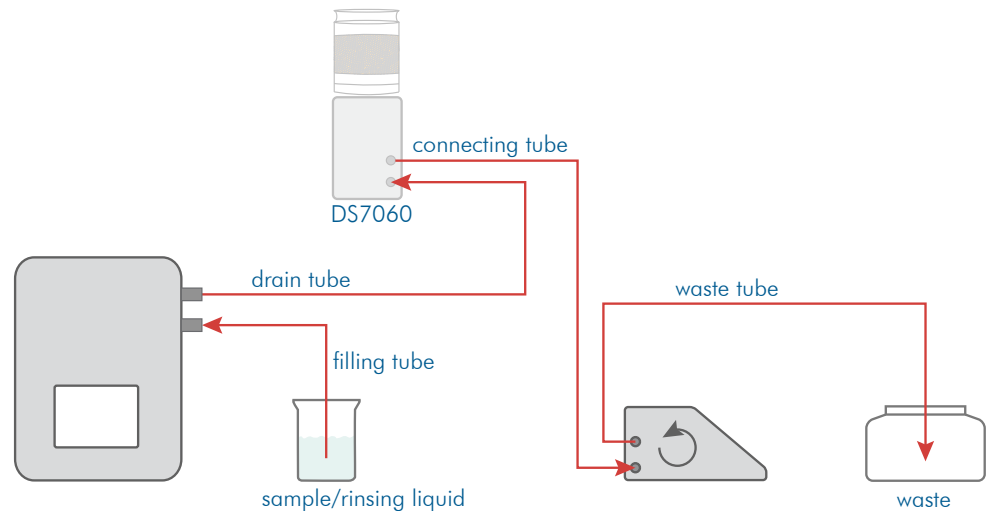


### Important note!

If the silica gel is discoloured, it can no longer absorb **any** moisture and must be renewed. Replace the silica gel as described in the Maintenance chapter.

### 6.5.1 Establish hose connections for DS7060

1. Connect the hoses as shown in the overview.



### 6.5.2 Connect peristaltic pump DS7070

1. Attach the connecting cable from the peristaltic pump to the density meter



## 6.6 Connect printer

---

1. Connect the printer to the serial interface (1).
2. Connect the printer's mains cable to the power supply.
3. Configure the printer in the menu `SYSTEM > Tab Printer > Printer selection > Serial ASCII printer`.



## 6.7 Connect network printer

---

To transmit the measurement results to the network printer:

1. Connect the network printer to the density meter (1) using the network printer cable.



Configure the network printer in the menu `SYSTEM > TabPrinter > Printer selection > network printer`.

## 6.8 Connect the density meter to the LIMS

---

Your measurement results can be directly transmitted to the LIMS.

1. Connect the density meter with the LIMS using the network cable (1).



2. Configure the network connection in the menuSYSTEM > Network.

## 6.9 Connect the density meter to the mains.

---



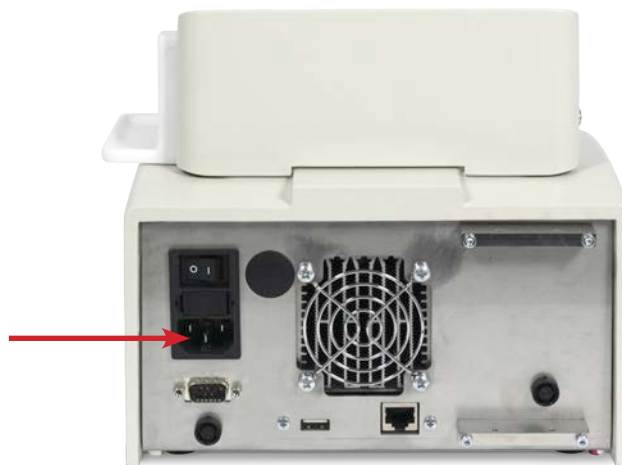
### Attention

Damage to electrical parts due to the build-up of condensation.

- Wait at least one hour after transporting the device from a cool area (e.g. refrigerated room or outside) before connecting the device to the power supply.

1. Plug the network cable into the density meter (1).
2. Connect the density meter to the power supply using the mains cable.

Permitted voltage source: 90 V...240V, 50/60 Hz



## Chapter 7 - Initial start-up

The density meter can be taken into operation following installation. For the initial start-up, the frequency oscillator must be thoroughly rinsed and dried. It may be necessary for the settings of the peristaltic pump to be adjusted to the length of the hoses.

The cleaning procedure depends on the device types:

- Device without peristaltic pump
- Device with peristaltic pump DS7070 and drying unit DS7050
- Device with peristaltic pump DS7070 and drying unit DS7060
- Device with Autosampler

For the device types with peristaltic pump DS7070 and Autosampler the **sample feeding** and **final cleaning** must be defined in the current method.



See the chapter **Method menu** for how to define **sample feeding**, **intermediate cleaning** and **final cleaning**.

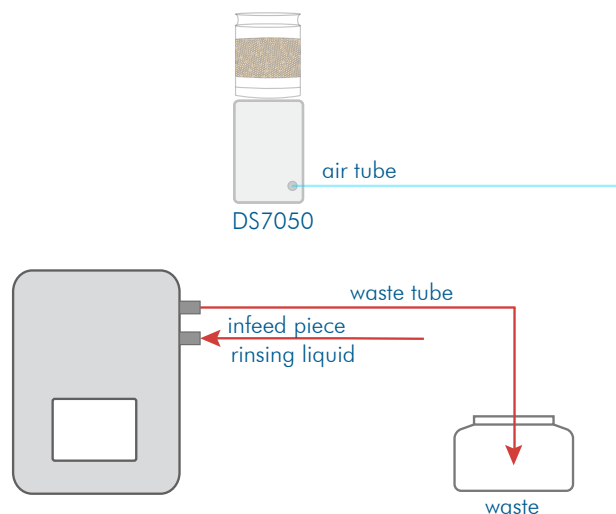
### 7.1 Switch on device

1. Switch on the density meter (switch on the back of the device).  
The last accessed or factory-defined method will be displayed.

### 7.2 Manually clean frequency oscillator without peristaltic pump DS7070

Rinse frequency oscillator with the Luer syringe

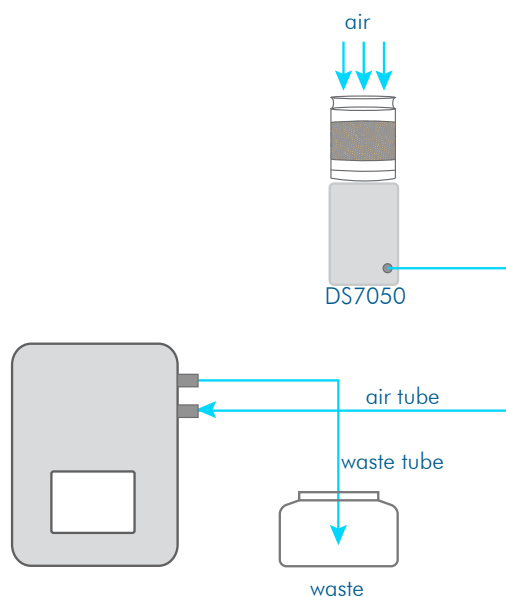
1. Connect the hoses - as shown in the diagram.
2. Stick the Luer syringe into the infeed piece.
3. Rinse the frequency oscillator with a minimum of 10 ml distilled water.





**Dry frequency oscillator** To dry the frequency oscillator, prepare the device as follows:

1. Remove the Luer syringe.
2. Connect the drying unit's air hose to the infeed piece on the frequency oscillator.
3. Place an empty waste vessel underneath the waste hose.



**Caution**

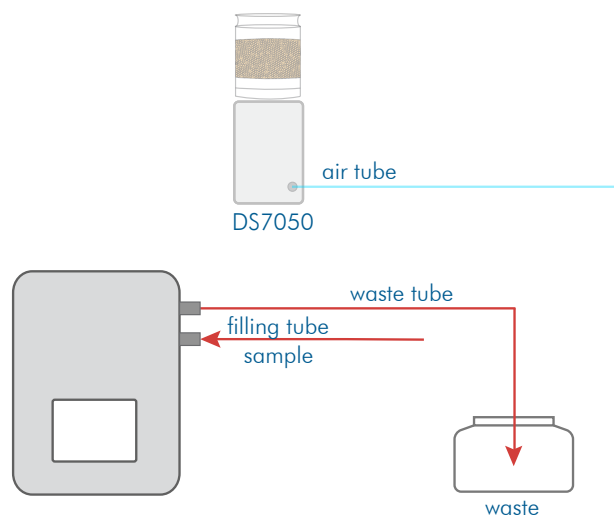
If the waste hose juts into the waste liquid during the drying process, there is a strong spray.

- Use an empty waste vessel where possible.
- Take care to ensure that the end of the hose does not fall into the liquid.
- Wear suitable protective equipment when using corrosive liquids.

4. Start the drying unit by pressing **SYSTEM** > *Tab Functions* > *Air pump* **START**.



5. Stop drying by pressing SYSTEM > Tab Functions > Air pump STOP.
6. Remove the air hose from the frequency oscillator.



Now measurement of samples can begin.



See the chapter **System menu** for how to assign functions to the keys.

### 7.3 Clean with peristaltic pump DS7070 and drying unit DS7050

After installation, before the first measurement is carried out on the device, the frequency oscillator must be cleaned.

For this, a method must first be defined, in which the peristaltic pump and the cleaning procedure are defined.

You have two options for performing cleaning:

- with individual functions
- with defined cleaning procedures



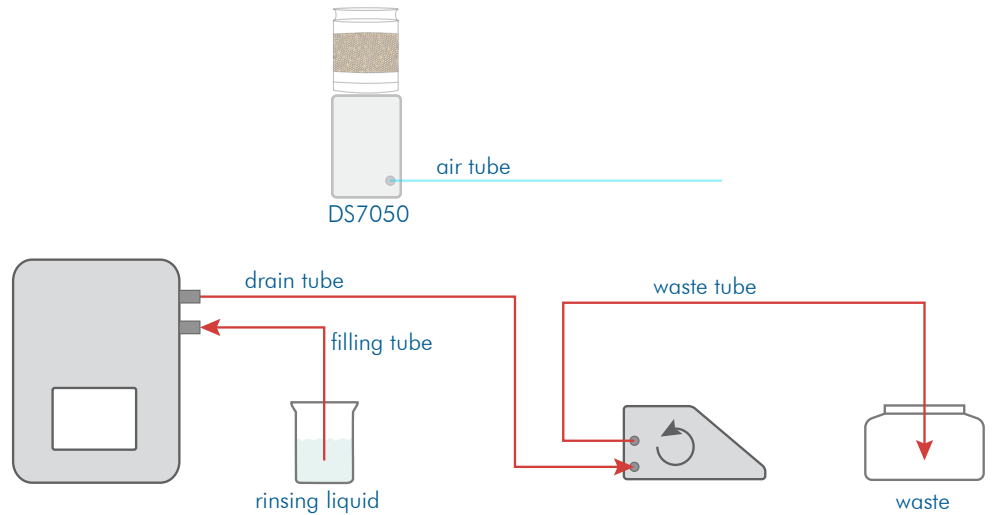
See the chapter **Method menu** > Tab Cleaning for how to define cleaning procedures.

### 7.3.1 Clean frequency oscillator with individual functions



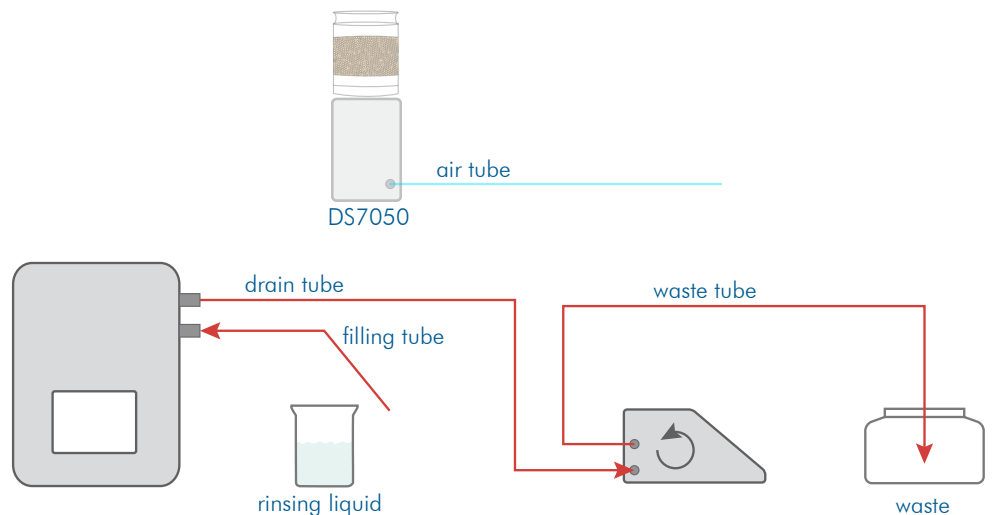
See the chapter **System menu** for how to assign functions to the keys.

- Rinse**
1. Fill a rinsing vessel with the rinsing solution or distilled water and hang the filling hose in the rinsing vessel.
  2. Place the waste vessel underneath the waste hose.



3. Press **SYSTEM** > *Tab Functions* > Peristaltic pump **START** to transport the liquid into the frequency oscillator.
4. Rinse the sample chamber with a minimum of 10 ml distilled Water.
5. Stop the pump by pressing **SYSTEM** > *Tab Functions* > Peristaltic pump **STOP** if no more liquid should be sucked in.

- Drain**
1. Remove the hose from the rinsing vessel.

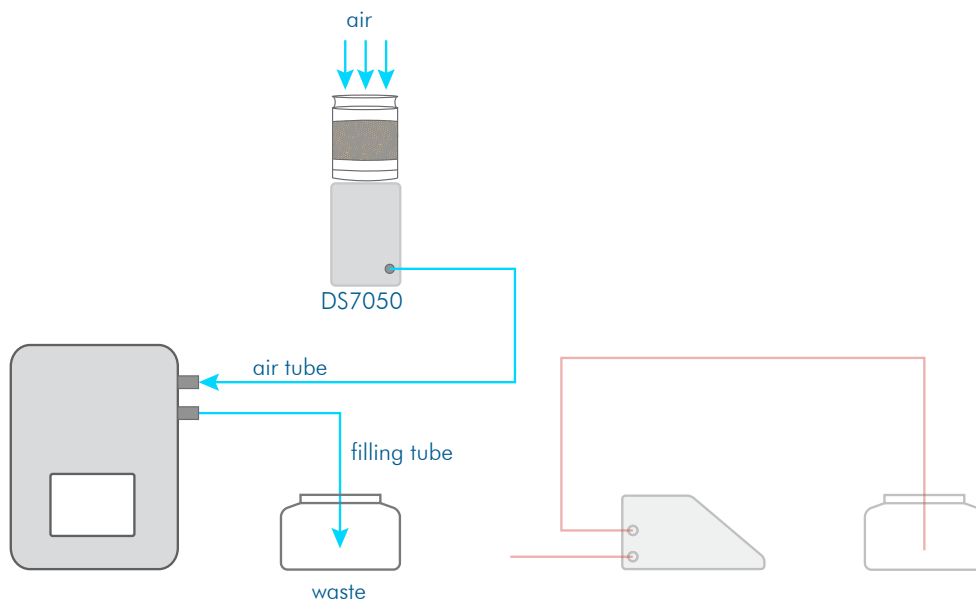


2. Press **SYSTEM** > *Tab Functions* > Peristaltic pump **START** to remove liquid from the frequency oscillator.
3. Press **SYSTEM** > *Tab Functions* > Peristaltic pump **STOP** if no more liquid is dripping from the waste hose.



**Dry** For the next step (drying the frequency oscillator), prepare the device as follows:

1. Connect the air hose to the draining piece on the frequency oscillator.
2. Hang the filling hose in an empty waste vessel.



#### Caution

Danger of spraying. If the hose juts into the waste liquid during the drying process, there is a strong spray.

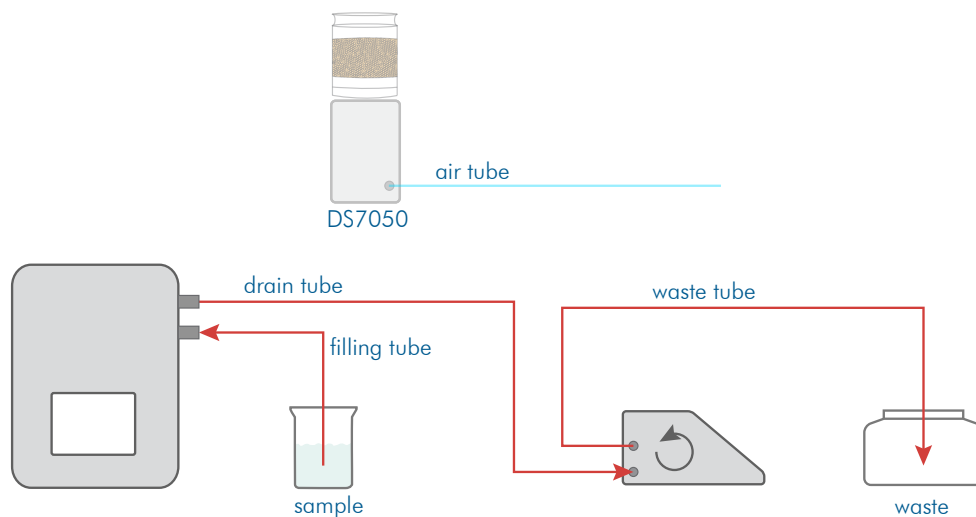
- Use an empty waste vessel where possible.
- Take care to ensure that the end of the hose does not fall into the liquid.
- Wear suitable protective equipment when using corrosive liquids.

3. Press SYSTEM > Tab *Functions* > Air pump *Start*.
4. Stop the air pump by pressing SYSTEM > Tab *Functions* > Air pump *STOP* when the frequency oscillator is dry.

The frequency oscillator should now be clean and dry.

**Preparation for measurement** Prepare the hoses as follows for the measurement:

1. Remove the air hose from the frequency oscillator and connect the drainage hose.
2. Clean the filling hose, if needed, from the outside and hang it in the sample to be measured.



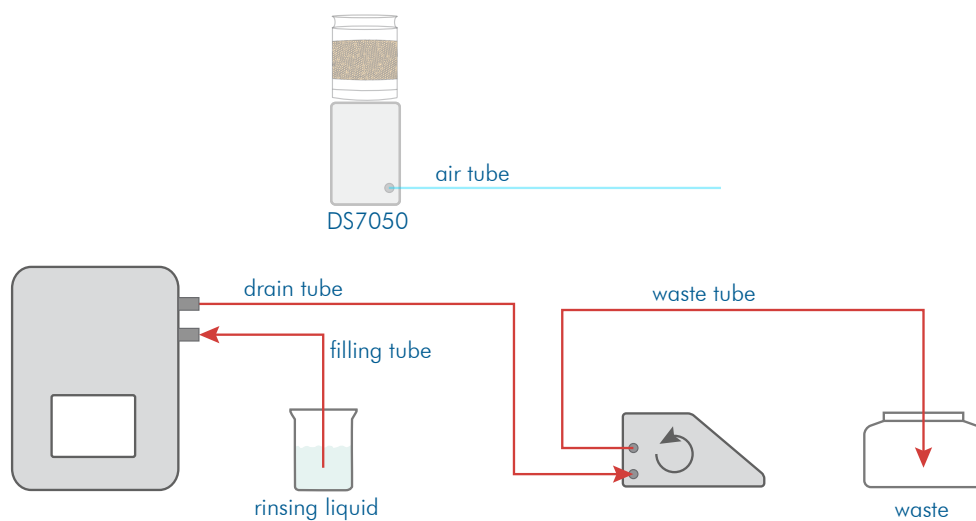
### 7.3.2 Clean frequency oscillator with cleaning procedure



See the chapter **Method menu** > Tab **Cleaning** for how to define cleaning procedures.

#### Rinse

1. Access the method with the defined cleaning procedure steps.
2. Fill a rinsing vessel with distilled water or a suitable solvent and hang the filling hose in the rinsing vessel.
3. Place the waste vessel underneath the waste hose.



4. Start step 1 of the cleaning procedure with SYSTEM > Tab *Functions* > Function Cleaning.



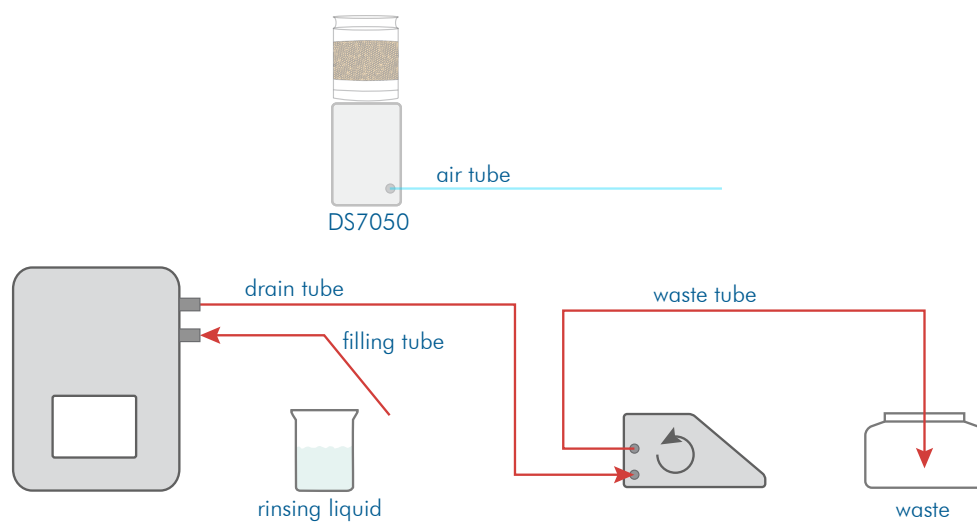
The *Cleaning* function performs the cleaning procedure which is defined in the *Methods*.

In step 1, the rinsing solution is sucked up by the peristaltic pump and the peristaltic pump is stopped when the pumping time is over.

#### Drain

Before the next, second step (sucking up the rinsing solution), the filling hose must be removed from the rinsing vessel.

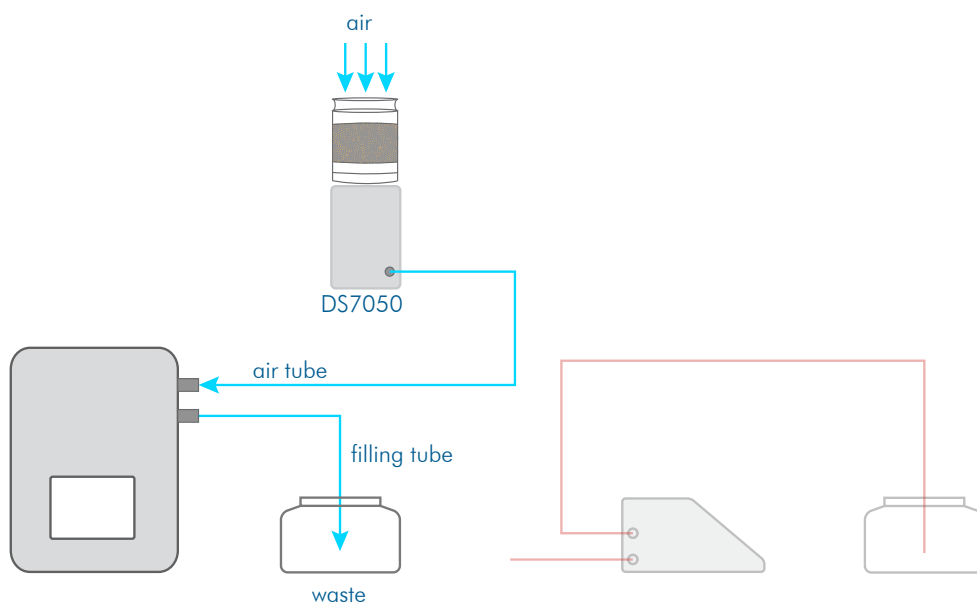
1. Remove the filling hose from the rinsing vessel.



2. Begin the second step.  
The cleaning solution is pumped off.

**Dry** For the next, third step (drying the frequency oscillator), prepare the device as follows:

1. Disconnect the drain hose from the draining piece on the frequency oscillator.
2. Connect the air hose to the draining piece on the frequency oscillator.
3. Hang the filling hose on the frequency oscillator in an empty waste vessel.



#### Warning

If the hose juts into the waste liquid during the drying process, there is a strong spray.

- Use an empty waste vessel where possible.
- Take care to ensure that the end of the hose does not fall into the liquid.
- Wear suitable protective equipment when using corrosive liquids.

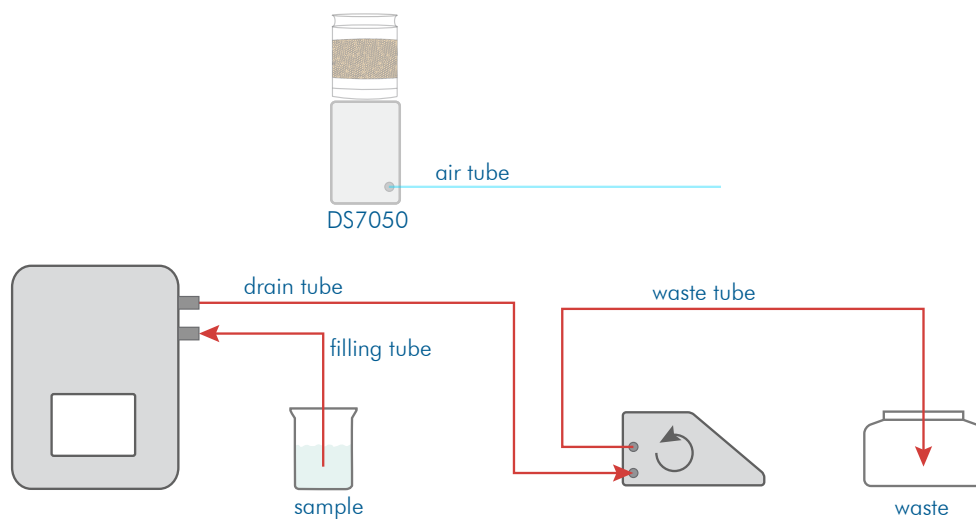
4. Start the next, third step (drying).  
The air pump stops after a set time.

The frequency oscillator should now be clean and dry.

#### Preparation for measurement

Prepare the hoses as follows for the measurement:

1. Remove the air hose from the frequency oscillator and connect the drainage hose.
2. Clean the filling hose, if needed, from the outside and hang it in the sample to be measured.



## 7.4 Clean with peristaltic pump DS7070 and drying unit DS7060

You have two options for performing cleaning:

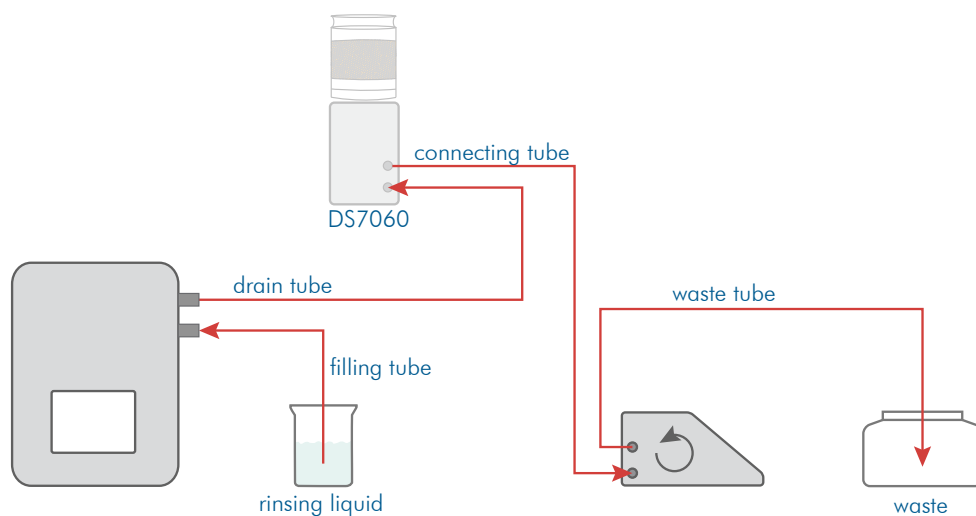
- with individual functions
- with defined cleaning procedures

### 7.4.1 Clean frequency oscillator with individual functions



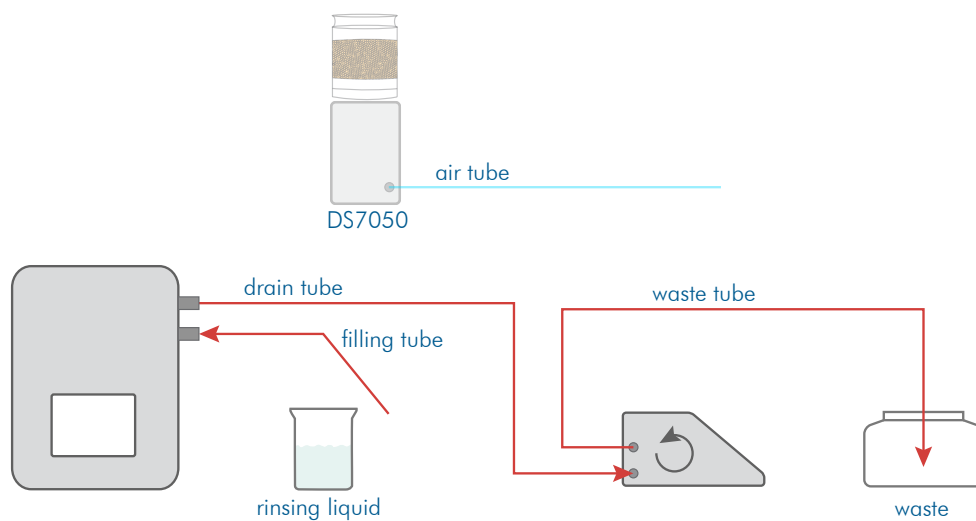
See the chapter **System menu** for how to assign functions to the keys.

- Rinse**
1. Fill a rinsing vessel with the rinsing solution or distilled water and hang the filling hose in the rinsing vessel.
  2. Place the waste vessel underneath the waste hose.



3. Press SYSTEM > Tab Functions > Peristaltic pump START to transport the liquid into the frequency oscillator.
4. Stop the pump by pressing SYSTEM > Tab Functions > Peristaltic pump STOP if no more liquid should be sucked in.

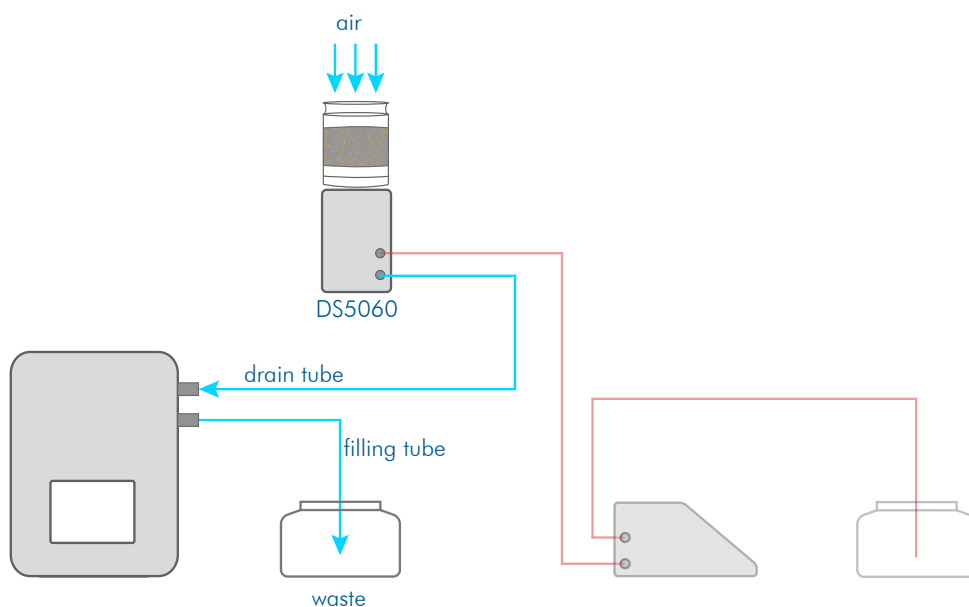
- Drain**
1. Remove the filling hose from the rinsing vessel.



2. Press SYSTEM > Tab Functions > Peristaltic pump START to remove liquid from the frequency oscillator.
3. Press SYSTEM > Tab Functions > Peristaltic pump STOP if no more liquid is dripping from the waste hose.

- Dry** For the next step (drying the frequency oscillator), prepare the device as follows:

1. Place an empty waste vessel underneath the filling hose.



### Warning

If the hose juts into the waste liquid during the drying process, there is a strong spray.

- Use an empty waste vessel where possible.
- Take care to ensure that the end of the hose does not fall into the liquid.
- Wear suitable protective equipment when using corrosive liquids.

2. Press SYSTEM > Tab *Functions* > Air pump *Start*.
3. Stop the air pump by pressing SYSTEM > Tab *Functions* > Air pump STOP when the frequency oscillator is dry.

The frequency oscillator should now be clean and dry.

## 7.4.2 Clean frequency oscillator with cleaning procedure

The procedure for cleaning the frequency oscillator with drying unit DS7060 and peristaltic pump DS7070 is carried out as follows.

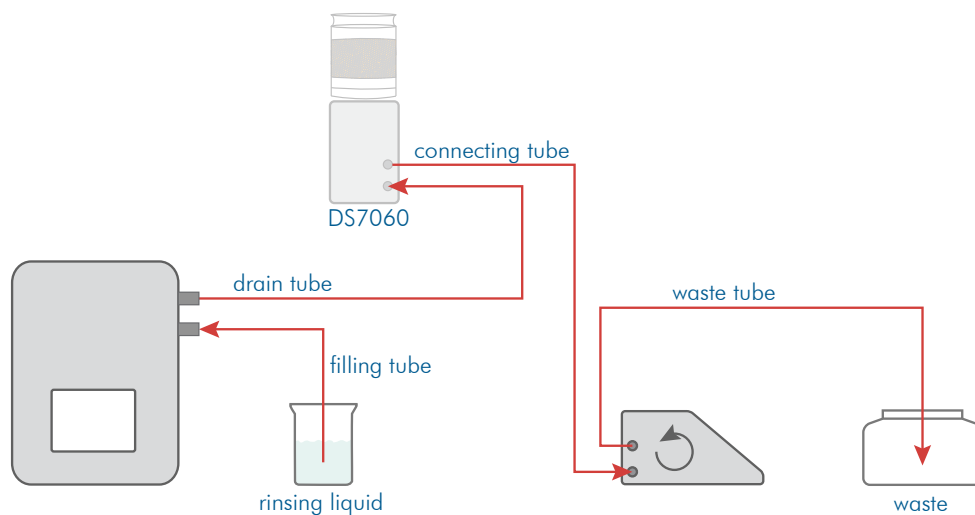
**Condition** The cleaning procedures must be defined in the method accessed.



See the chapter **Method menu** > Tab **Cleaning** for how to define cleaning procedures.

**Rinse**

1. Access the method with the cleaning procedure.
2. Fill a rinsing vessel with distilled water or a suitable solvent and hang the filling hose in the rinsing vessel.
3. Place the waste vessel underneath the waste hose.



4. Start the cleaning procedure with SYSTEM > Tab *Functions* > Function *Cleaning*.

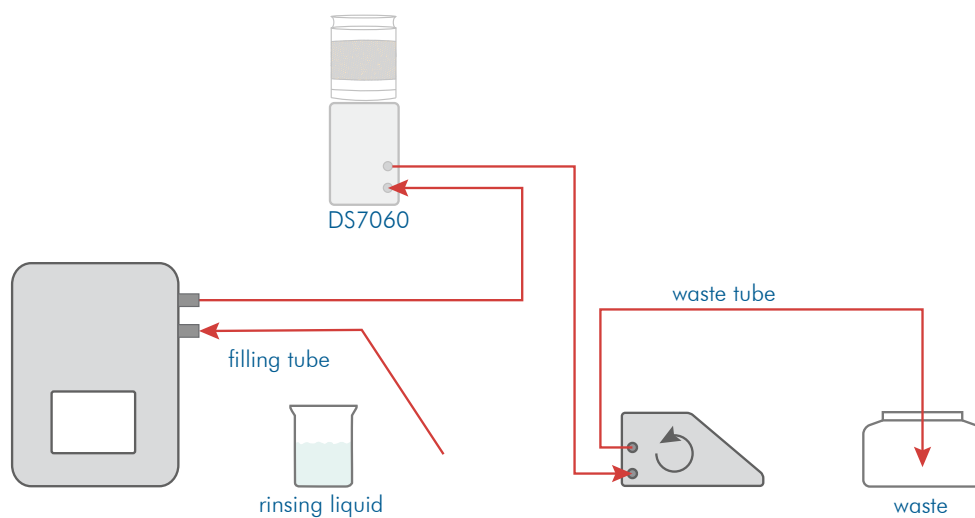


The *Cleaning* function performs the cleaning procedure which is selected in *Methods*.

In the first step, the rinsing solution is sucked up by the peristaltic pump and the peristaltic pump is stopped when the pumping time is over.

**Drain** Before the next, second step (sucking up the rinsing solution), the hose must be removed from the rinsing vessel.

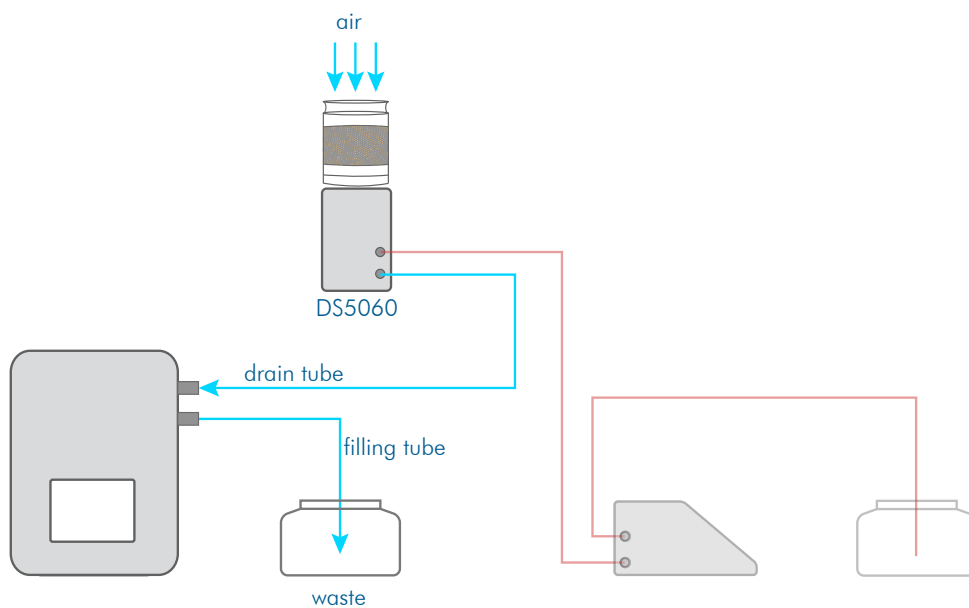
1. Remove the filling hose from the rinsing vessel.



2. Begin the second step.  
The cleaning solution is pumped off.

**Dry** For the next, third step (drying the frequency oscillator), prepare the device as follows:

1. Hang the filling hose in an empty waste vessel.



### Warning

If the hose juts into the waste liquid during the drying process, there is a strong spray.

- Use an empty waste vessel where possible.
- Take care to ensure that the end of the hose does not fall into the liquid.
- Wear suitable protective equipment when using corrosive liquids.

2. Start the next, third step > Drying.  
The air pump stops after a set time.

The frequency oscillator should now be clean and dry.

## 7.5 Check filling level of the frequency oscillator

For semi-automatic filling of the frequency oscillator with the peristaltic pump the filling of the frequency oscillator must be checked.

The speed and time of sample uptake are defined with the pumping parameters.

The factory setting values for the pump are as follows:

- Revolution speed: 50 rpm
- Pumping time: 10 s
- Counter-clockwise rotation

The pumping time and revolution speed should only be modified where required (e.g. for very viscous samples).

### Check filling level

1. Access the required method via METHOD.
2. Present a sample with normal viscosity.
3. Start the measurement with the MEASURE KEY.  
The peristaltic pump starts and switches off again after the defined pumping time.
4. Check whether the liquid is visible at the other end of the frequency oscillator.  
The frequency oscillator is then completely full of the sample.

If the frequency oscillator is not completely full, the fill level can be adjusted via the pump settings.



To find out how to adjust pump settings, see below.

## 7.6 Adjust pump settings

If the frequency oscillator is not completely full, the pump settings should be adjusted in the following order:

- First, adjust the *speed* to the properties (e.g. viscosity) of the sample to be measured.
- Then adjust the *pumping time*.

### This is the procedure

1. Press METHODS > Tab Sampl. > EDIT.

**Methoden bearbeiten**

Name

Methode 1
▼

Umbenennen

Skala 1

Skala 2

Temp.

Einst.

Sampl.

Reinigung

Opt.

Probenzufuhr	Pumpzeit [s]	Drehzahl [1/min]
DS7070	10	50
		Drehrichtung
		rechts

Abbrechen

Löschen

Neu

Ok



2. Increase/reduce the *rotation speed* in small increments.
3. Save the entry by pressing OK.
4. Start a measurement with the MEASURE KEY.
5. Check whether the sample is being transported in the hose as required.
6. Repeat the process where required.

## Chapter 8 - Routine operation

This chapter will deal with the following topics:

- What must be done after the device has been switched on.
- How to prepare your device.
- How to prepare measurements.
- How to start measuring.
- How to print results.
- How to export results.

### 8.1 Prepare device

#### 8.1.1 Switch on device

1. Switch on the device using the mains switch (on reverse).  
The device will boot up and the last method used will be accessed.
2. Switch the printer on if necessary.

#### 8.1.2 Register users

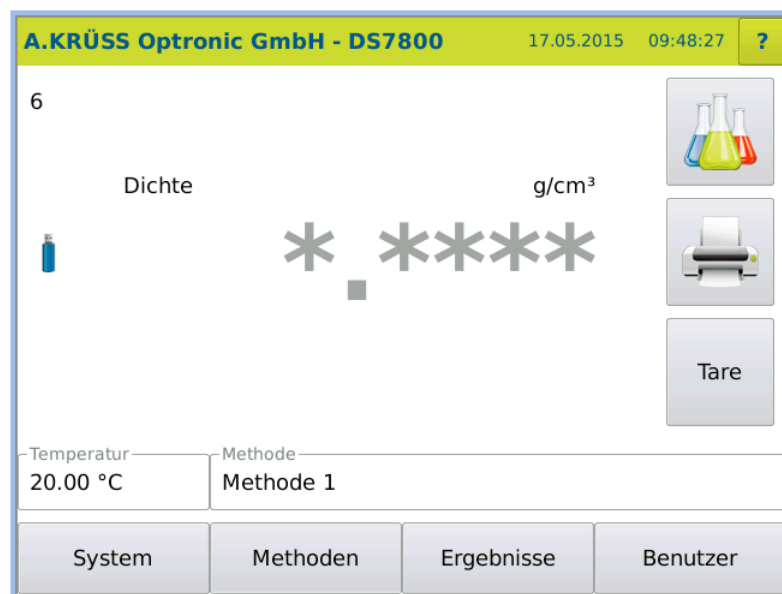
If user registration is activated, the login screen will appear before opening the main menu.



A login on the device is activated via *User > User administration > Activate login*.

1. Enter your user name and password.

The main menu will be opened with the last method used.



User administration is described in Chapter **User menu**.

### 8.1.3 Switch users

1. In the main menu, press USER > LOG OUT.

A new user can now log in.

### 8.1.4 Select method

1. Press METHOD.

The Method menu will open.

2. Select the method required using the selection menu.
3. Save the selection by pressing OK.

or

4. Click on the displayed method in the main menu and select the method required.



How to define the method is described in the chapter **Methods menu**

### 8.1.5 Sample numbers

---

Sample numbers are serially (from 1 to 999) assigned in general.  
After sample number 999, the next number is 001.

### 8.1.6 Measure QC sample

---



For the measurement of the QC sample, an individual QC method should be defined and the measuring option should be activated under **METHOD > Tab Opt. > Quality control**.

If the samples to be measured are quality controls:

1. Access the QC method.

The results will be labelled in the result list with QC.



How to define the QC methods is described in the chapter **Methods menu > Measure quality control**

## 8.2 Present sample

---

Depending on the device type the samples are presented either manually or semi-automatically.

### 8.2.1 Present sample manually

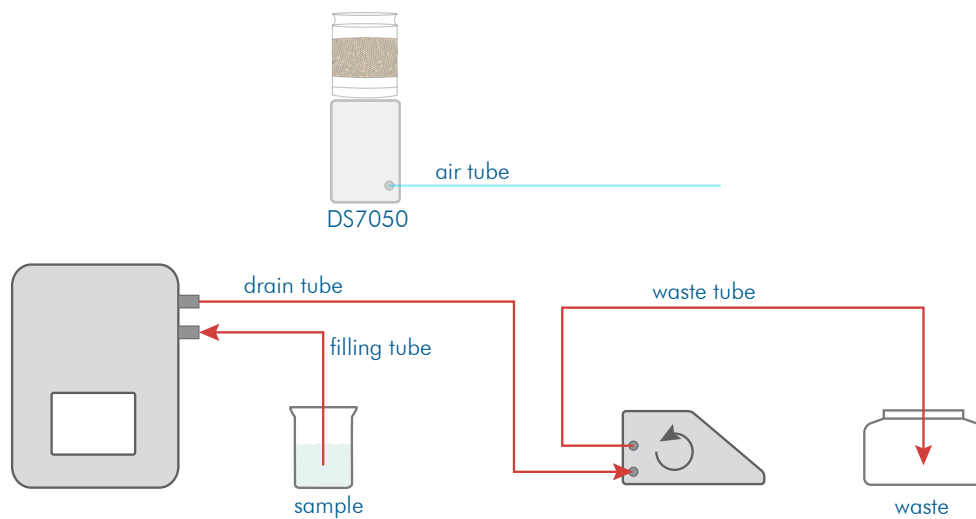
---

1. Fill the sample into the frequency oscillator through the filler neck using the Luer syringe.  
The frequency oscillator must be completely filled and free of streaks and gas bubbles.



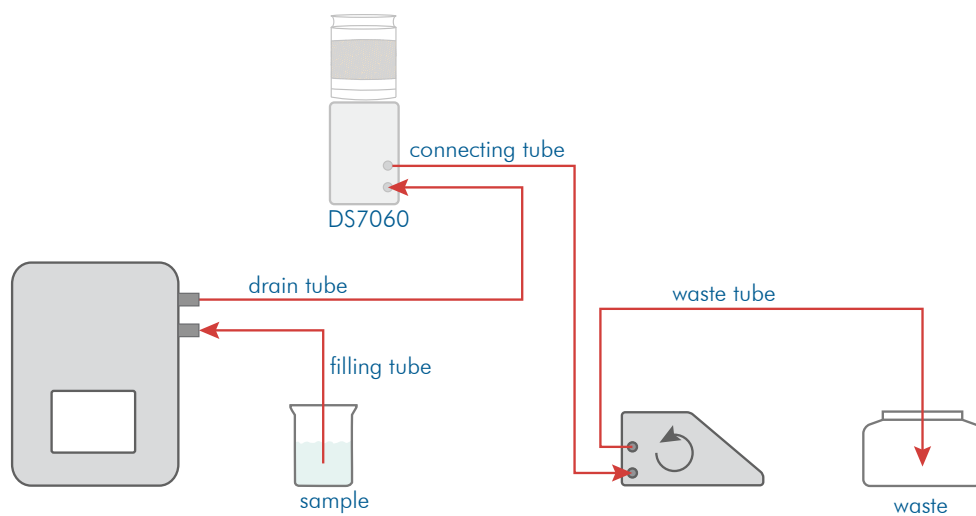
## 8.2.2 Present sample semi-automatically with peristaltic pump and drying unit DS7050

1. Hang the filling hose in the sample.
2. Hang the waste hose in the waste vessel.



## 8.2.3 Present sample semi-automatically with peristaltic pump and drying unit DS7060

1. Hang the filling hose in the sample.
2. Hang the waste hose in the waste vessel.



## 8.2.4 Present the sample plate for the auto sampler

---

1. Place the samples on the sample plate.



## 8.2.5 Begin measurement

---

The start-up behaviour is different depending on whether temperature control is switched on or not.



### No temperature control!

If there is **no** defined set temperature, there is no temperature control and the measurement can begin immediately.

If there is a significant temperature difference between the sample and the room temperature, you should wait a moment before measuring. If the sample has not yet reached the correct temperature, this shall lead to incorrect results.



1. Press the Measure key.

The measurement is taken.

## 8.2.6 Insert comment

---

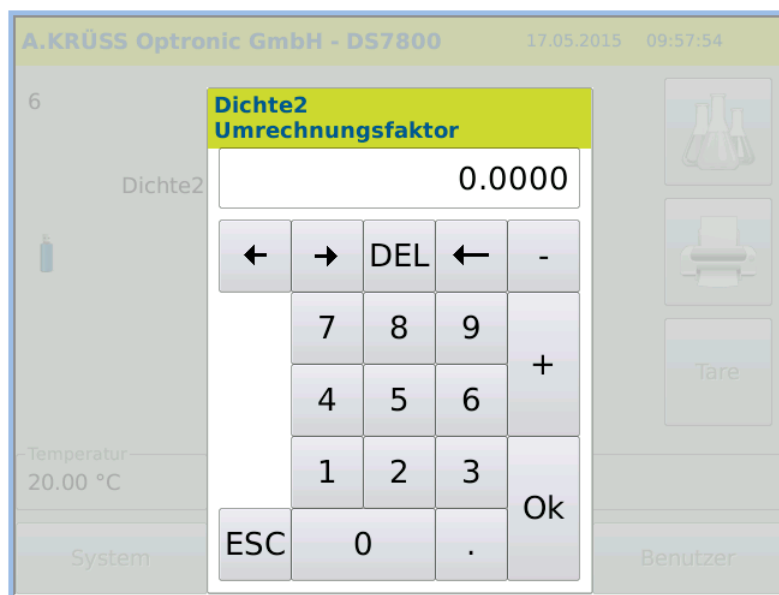
If you have activated Comment under METHOD > Opt. , you can enter a comment after pressing the Measure key:



1. Enter the desired text.
2. Confirm the entry by pressing OK.

## 8.2.7 Input standard value

If the method parameter METHOD > Scale1 > Input is set to Yes, the dialog box opens for entering the standard value.



1. Enter the standard value for calculating the measurement result.

## 8.2.8 Define sample series for auto sampler

After pressing the Measure key, the dialog box opens for entry of the sample series and sample numbers.

1. Input the name of the series directly.
- or
2. Activate *Automatic* to name the sample series automatically.
3. Enter the first and last sample number of the sample series.
4. Press START to begin the measurement.

## 8.2.9 Start-up behaviour without temperature control

If the system is not set to temperature control (METHODS > Temp.), the temperature is not controlled.

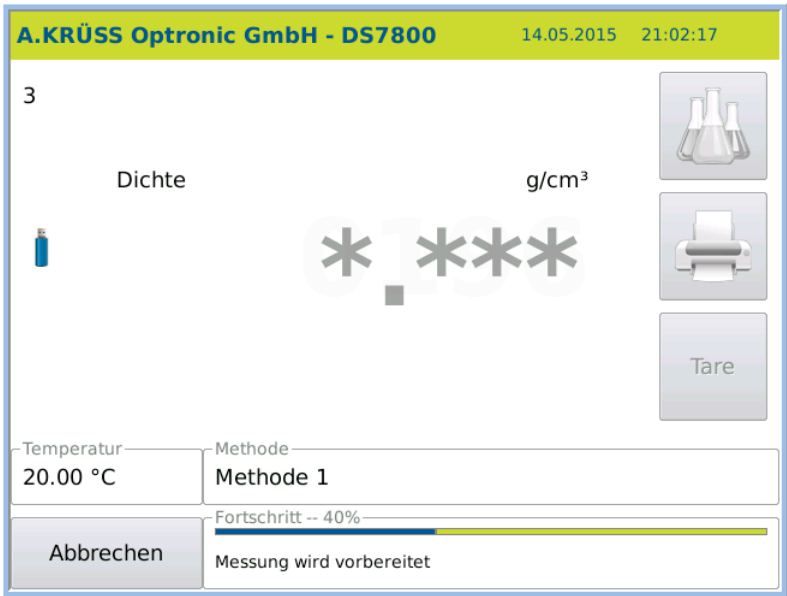
The measurement is begun immediately using the MEASURE KEY.

## 8.2.10 Start-up behaviour with temperature control

If temperature control is switched on (METHODS > Temp.), the temperature is checked. The MEASURE KEY can be pressed at any time. The measurement only begins automatically when the intended temperature is reached.

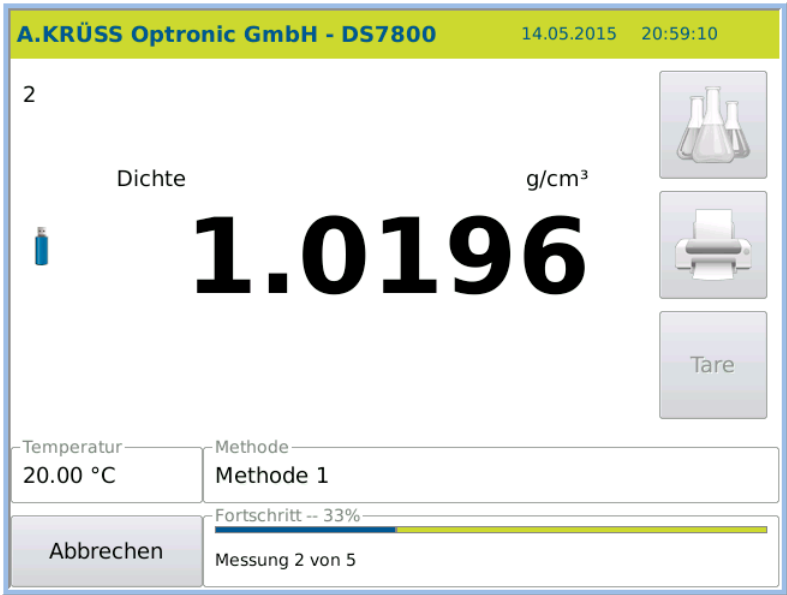
**Stabilisation period** If a stabilising period (METHODS > Temp.) is entered, the measurement is begun automatically after this period has passed.





### 8.3 Measurement

- One-shot measurements** For **one-shot measurements**, a one-shot measurement is performed. For **interval measurement**, the defined number of measuring points is measured at set intervals.
- Interval measurement** For **interval measurement**, the defined number of measuring points is measured at set intervals. The measurement process is displayed:



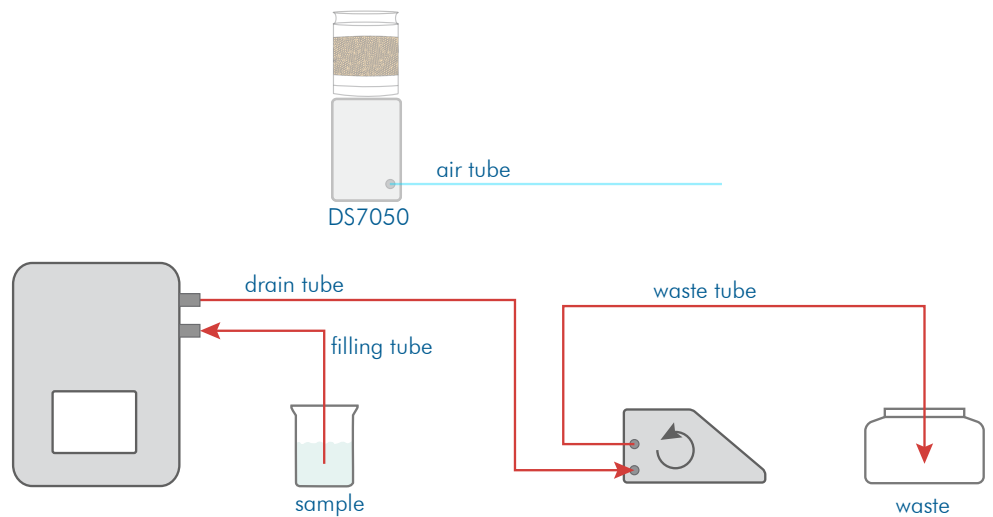
- Continuous measurement** For **continuous measurement**, measurements are taken at set intervals. The measurement is started when the method is accessed. A small green spot next to the Measure key indicates measurement is taking place.



The results are not saved automatically. Individual measurement results are **saved** by pressing the MEASURE KEY. The measurement is **stopped** when another method is accessed. The results are labelled in the results list under RESULT > Measurement mode: Continuous measurement.

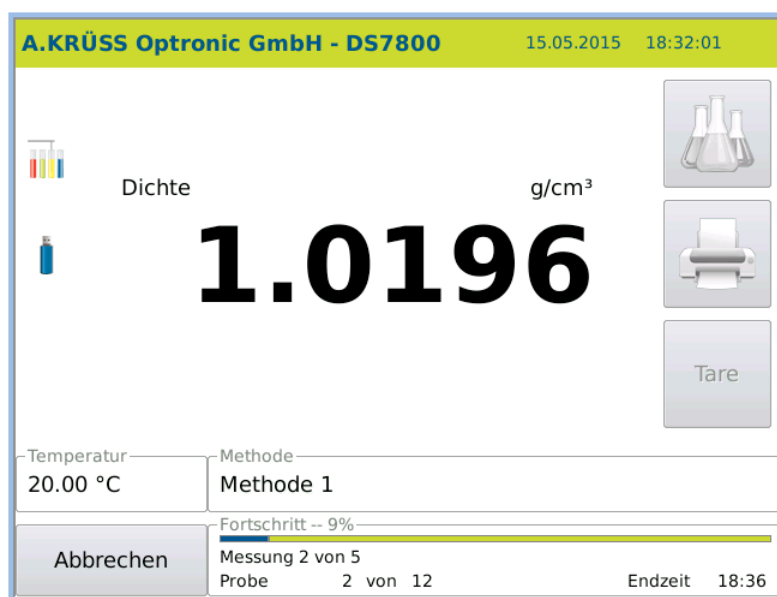
## 8.4 Measuring process with peristaltic pump DS7070

After pressing the MEASURE KEY the sample is sucked up and measured.



## 8.5 Measurement procedure with Autosampler

For automated sample presentation, the sample is transported into the frequency oscillator and measured after the MEASURE KEY has been pressed and the sample series entered.



The sample is transported into the measurement system by means of the peristaltic pump. If the value is stable, it is saved. Once it is saved, the measurement system is rinsed automatically.

To take the following measurement the rotor is moved to the next sampling position.

## 8.6 Clean the frequency oscillator for the next sample

After the measurement is taken, the frequency oscillator must be cleaned for the next sample.



### Important note!

Insufficient cleaning of the frequency oscillator leads to sample carryover and therefore incorrect results.



### TIP!

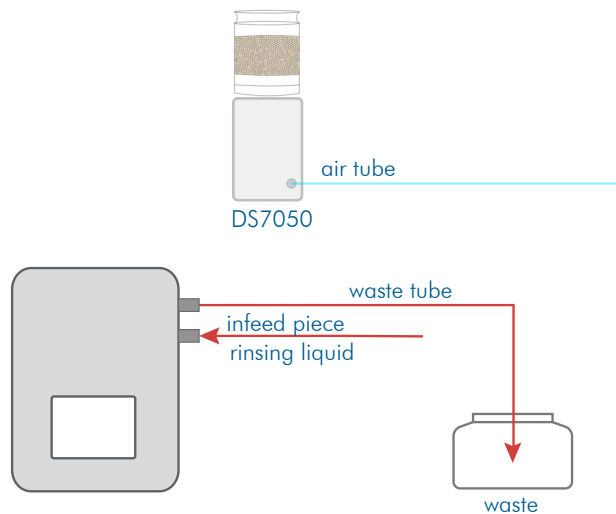
Create a method with a cleaning procedure for this rinsing process. Access this method and start cleaning by pressing SYSTEM > Tab *Functions* > Function CLEANING



Cleaning is described in detail in the chapter **Initial start-up**.

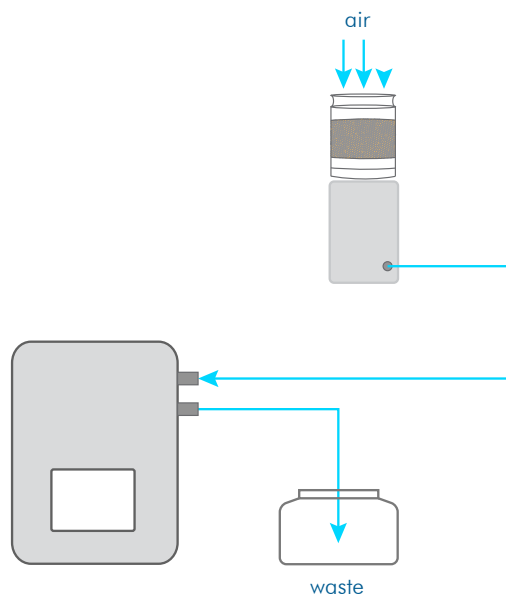
## 8.6.1 Manually clean without peristaltic pump DS7070

1. Clean the sample with a minimum of 10 ml distilled water.



To dry the frequency oscillator, prepare the device as follows:

1. Connect the hoses as shown in the diagram.
2. Place an empty waste vessel underneath the hose end.



3. Start drying by pressing SYSTEM > Tab *Functions* > Air pump START.
4. Stop drying by pressing SYSTEM > Tab *Functions* > Air pump STOP.

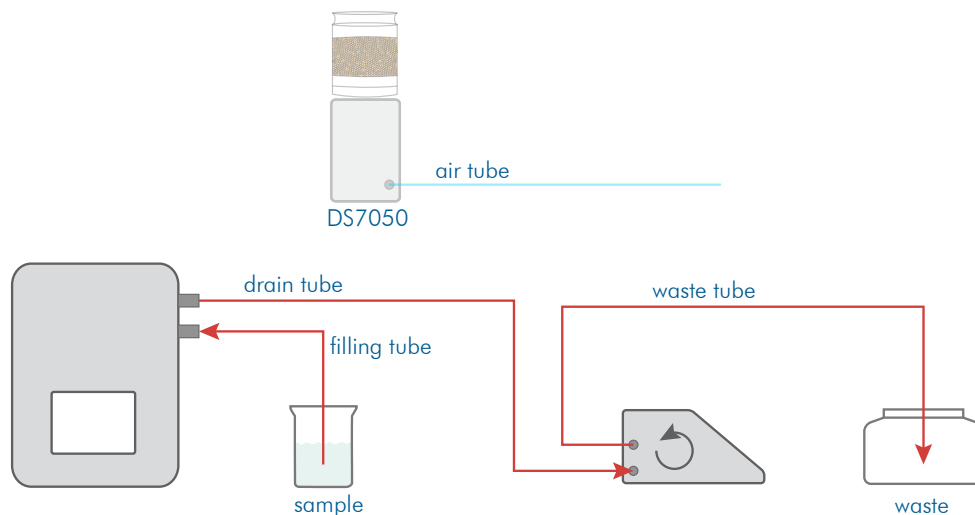
Then the next sample can be filled.

## 8.6.2 Clean semi-automatically with peristaltic pump and drying unit DS7050

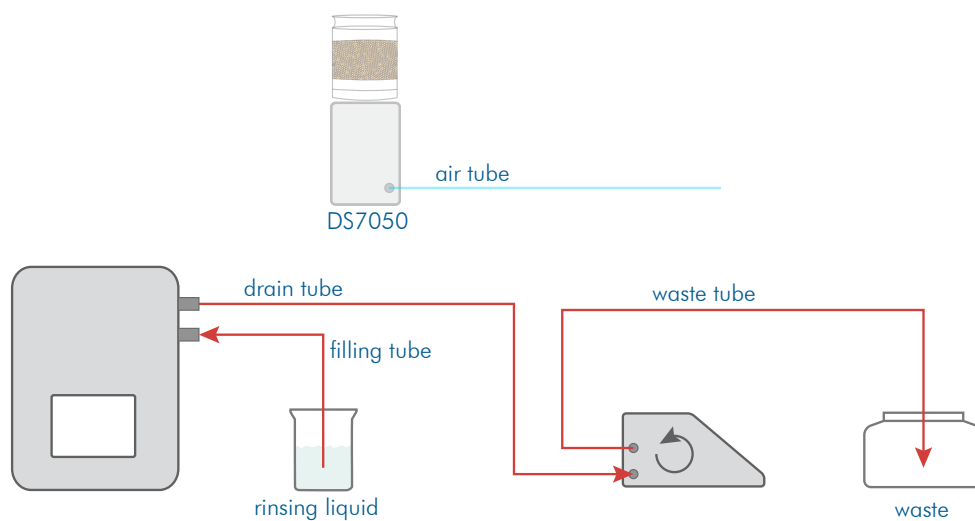
Within a measurement series the next sample is either

- **displaced** with the previous one
- or
- **rinsed with rinsing fluid**

**Sample displacement** 1. Wipe the filling hose and hang it in the sample to be measured next.



**Interim rinsing** 1. Hang the filling hose in the rinsing solution and start the pump by pressing **SYSTEM > Tab Functions**



2. Remove the filling hose from the rinsing vessel.
3. Stop the pump by pressing **SYSTEM > Tab Functions**, when no more liquid is discharged from the frequency oscillator.
4. Wipe the filling hose

Subsequently the next sample can be filled.



### TIP!

Create a method with a cleaning procedure for this rinsing process. Access this method and start cleaning by pressing **SYSTEM > Tab Functions > Function CLEANING**



Cleaning is described in detail in the chapters **Initial start-up** and **Methods menu**.

### 8.6.3 Clean semi-automatically with peristaltic pump and drying unit DS7060

Within a measurement series the next sample is either

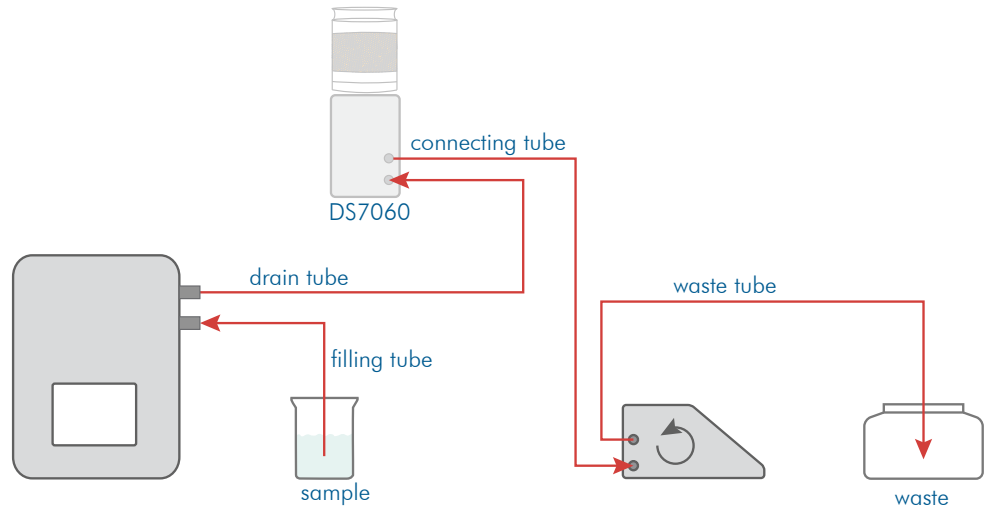
- **displaced** with the previous one

or

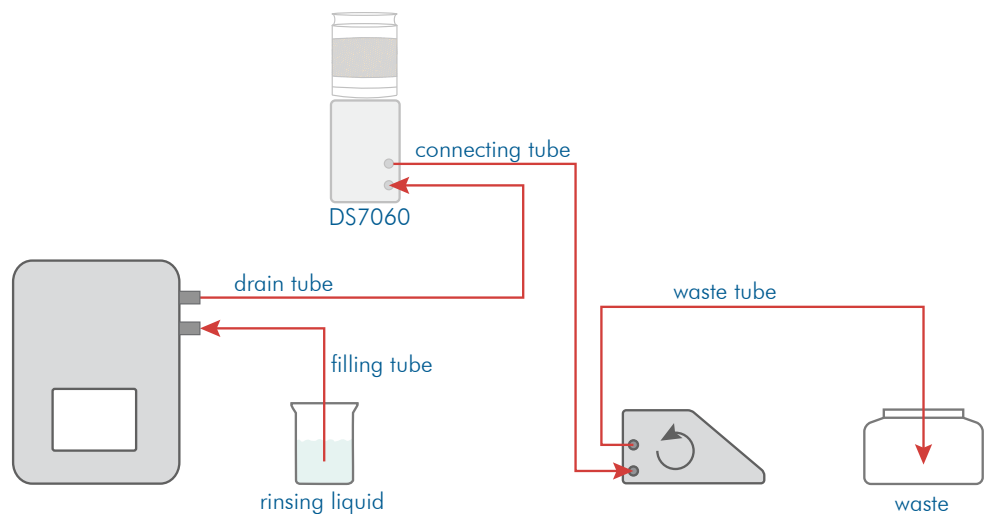
- **rinsed with rinsing fluid**

Drying is explained using a device with drying unit DS7050 as an example.

- Sample displacement** 1. Wipe the filling hose and hang it in the sample to be measured next.



- Interim rinsing** 1. Hang the filling hose in the rinsing solution and start the pump by pressing **SYSTEM > Tab Functions**



2. Remove the filling hose from the rinsing vessel.
3. Stop the pump by pressing **SYSTEM > Tab Functions** , when no more liquid is discharged from the frequency oscillator.
4. Wipe the filling hose.

Subsequently the next sample can be filled.



**TIP!**

Create a method with a cleaning procedure for this rinsing process. Access this method and start cleaning by pressing **SYSTEM > Tab Functions > Function CLEANING**



Cleaning is described in detail in the chapters **Initial start-up** and **Methods menu**.

#### 8.6.4 Clean frequency oscillator with Autosampler

Between samples, the frequency oscillator is cleaned automatically as defined in the method.



Cleaning is described in detail in the chapters **Initial start-up** and **Methods menu**.

### 8.7 Autosampler operation with firmware version 7.215 and above

With firmware version 7.215, the operation of the autosampler via the software has been improved and expanded. It is now possible to define the exact measurement sequence without templates, to pause the sample series and to edit it in the paused state, as well as to measure previous sample series.

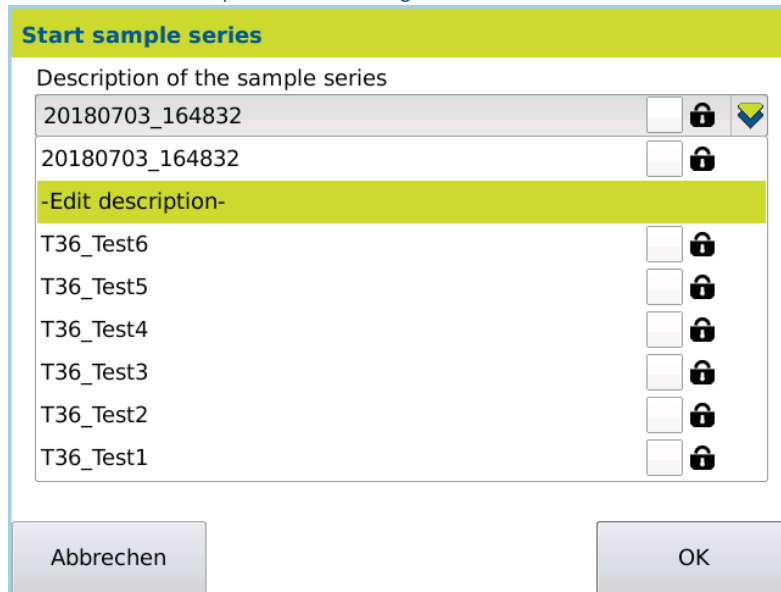
All new and revised features are described below.

#### 8.7.1 Start sample series menu

If the sample feeding is set to autosampler in the currently selected method, the autosampler is activated and no templates are used, the *Start sample series* menu is accessible via the measurement button in the main menu.

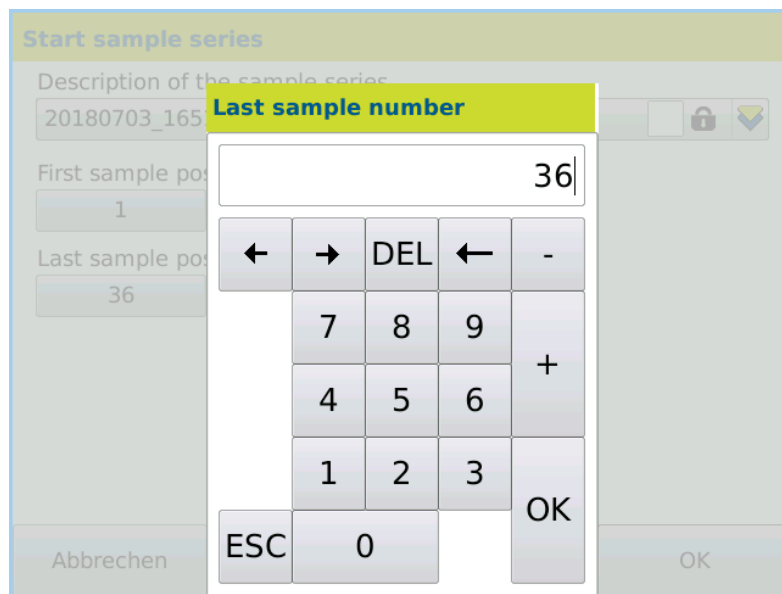
The name of the sample series can be edited in the *Start sample series* menu. Automatically, a new sample series is given a name which corresponds to the format YYYYMMDD\_hhmmss. YYYY stands for year, MM for month, DD for day, hh for hour, mm for minute and ss for second. This name can be edited.

- This is the procedure
1. Click on the line containing the name of the sample series >-Edit description-
  2. Enter the name you want to assign and confirm with OK



In the *Start sample series* menu, you can also specify the first and last sample position to be measured. Without further editing in the *Configure sample series* menu, the positions on the sample plate of the autosampler are measured stepwise within these limits.

- This is the procedure
1. Click on the line containing the number of the first sampler position
  2. Enter the first sample position and confirm with OK
  3. Click on the line containing the number of the last sampler position
  4. Enter the last sample position and confirm with OK



No negative values can be entered for the sample positions. In addition, all values must be present on the currently installed sample plate. The maximum last sample position is automatically detected and set at the start of the *Start Sample Series* menu as the last sample position.



## 8.7.2 Configure sample series menu

The *Configure sample series* menu is accessible via the *Start sample series* menu by pressing the *OK* button.

The name of the sample series can be edited in the *Configure sample series* menu just as it is in the *Start sample series* menu.

The table of the measurement sequence contains all sample positions to be measured on the sample plate. During the sample series, the sample positions are measured in the order of the rows of the table.

At the start of the *Configure sample series* menu, the table contains as many rows as was predefined in the *Start sample series* menu. The top row contains the first sample position and the bottom row the last sample position.

Individual or multiple rows can be selected via touch screen (highlighted in green) or deselected. By pressing the table headings, the entire table is selected or deselected.

Rows can be removed from the table.

- This is the procedure**
1. Select the row you want to remove
  2. Press *Remove*

New rows can be added to the table. The following rules apply:

- Rows are always inserted below the last selected row.
- New rows automatically get a sample position, which is 1 greater than the previous row.
- If the automatically assigned sample position already exists in another row, an input field is opened, which awaits the entry of a sample position. This also applies if the automatically assigned sample position is greater than there are positions on the sample plate.
- No row can be generated without a valid sample position.
- New rows await the input of a sample ID. An empty sample ID can be confirmed.
- Several rows are added in succession, each awaiting an input of a sample ID. This only applies if the automatically assigned sample position is not already assigned in a different row or is greater than there are positions on the sample plate.
- Adding multiple rows can be stopped by pressing the *Cancel* button.

- This is the procedure**
1. Select the row under which you want to add a new row
  2. Press *Add*
  3. Enter the sample position of the new row and confirm with *OK* (this point is only necessary if no automatically assignable sample position is possible)

4. Enter the sample ID of the new row and confirm with OK

In existing rows, the sample positions can not be edited. In existing rows, the sample ID can be added or edited. Only the sample ID from the selected rows are added or edited.

**This is the procedure**

1. Select all rows whose sample ID you want to add or edit
2. Press *Edit sample ID*
3. Enter the sample ID of the new row and confirm with OK
4. There are as many requests for an editing of the sample ID, as rows were selected

Rows can be moved within the table using the arrow keys. Each press of the arrow key moves the rows one position in the corresponding direction. The top row cannot be moved up and the bottom row cannot be moved down. Any number of rows that do not have to be consecutive can be moved at the same time.

**This is the procedure**

1. Select the row you want to move
2. Use the arrow keys to move the row up or down.

Measurements displays the number of measurements already taken (see chapter *Pause the sample series*) and the total number of measurements to be performed. Thus, the total number of measurements corresponds to the number of rows in the table.

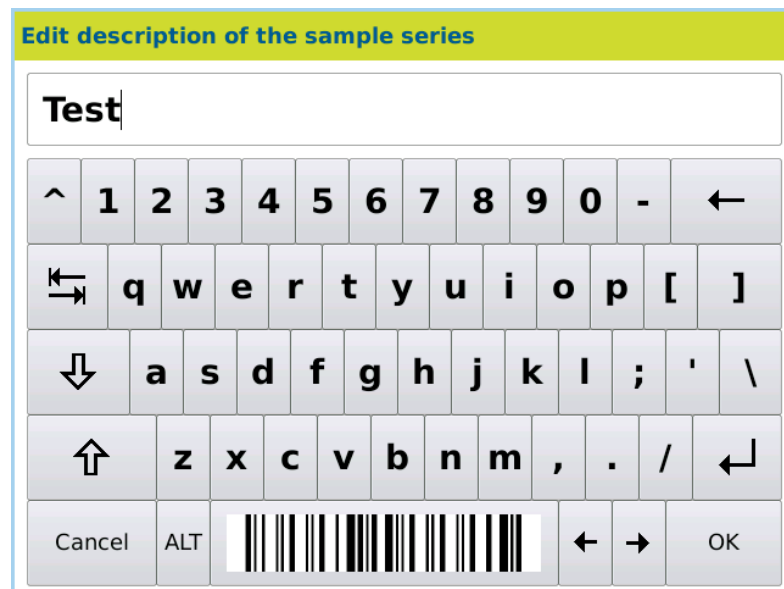
With the button *Start* the sample series is started. Thereafter, the samples are measured according to the order within the table.

### 8.7.3 Configure measuring sequence using a barcode scanner

With the help of a barcode scanner, the measuring sequence of the sample series can be edited quickly and easily. To do this, the barcode scanner must be connected to the device before the measurement button has been pressed in the main menu.

In the *Configure sample series* menu, the following functions are available when the barcode scanner is connected:

- If a row to be created automatically can be added (the automatically assigned sample position is not already assigned in a different row or is greater than there are positions on the sample plate), a new row is created by scanning a barcode.
- This new row automatically receives a sample position and as sample ID the barcode that is scanned.
- In the function *Edit sample ID*, scanned barcodes are entered directly as sample ID.
- Via a barcode which is located on the spacebar of the input screen, the input can be confirmed directly.



This makes it possible to enter the barcodes of several samples without putting the barcode scanner down.

#### 8.7.4 Measure previous sample series

---

It is possible to measure previous sample series. These past sample series can be restarted directly or edited and started.

Previous sample series can be recalled within the *Start sample series* menu or in the *Configure sample series* menu.

In the *Start sample series* menu, the first and last sample position of previous sample series cannot be changed.

In the *Configure sample series* menu, all editing can be performed without restrictions.

Recalled previous sample series contain all entries and changes (measuring sequence, sample ID, ...) of the previous sample series.

Previous sample series are listed in the drop-down menu under the name of the sample series below the entry *-Edit description-*.

The previous sample series are sorted according to the time of their last call. The most recently accessed previous sample series is at the top of the list.

##### This is the procedure

1. Click on the line containing the name of the sample series
2. Click on a previous sample series

All entries and changes of the current sample series (measuring sequence, sample ID, ...) are discarded when a previous sample series is recalled.

A total of 8 previous sample series are stored in a circular buffer. If 8 previous sample series are stored and a new previous sample series is recorded, the oldest previous sample series is removed.

The recording of a sample series is carried out by confirming the button *Start* in the *Configure sample series* menu.

If a previous sample series is recalled and edited, but the name of the sample series is not changed, a confirmation to overwrite the previous sample series is needed, when the *Start* button is pressed.

Confirm with *Yes* overwrites the previous sample series with the new sample series.

Cancel with *No* displays the *Configure sample series* menu again.

If a previous sample series is recalled, edited and the name of the sample series has been changed, this request does not occur.

#### 8.7.5 Protect sample series

---

In the *Start sample series* menu and *Configure sample series* menu, the currently edited and all previous sample series can be protected.

Protected sample series cannot be overwritten and they are not removed from the circular buffer.

Protected sample series remain in the system until the user removes the protection status.

At any given time, only 5 protected sample series can be present in the system.

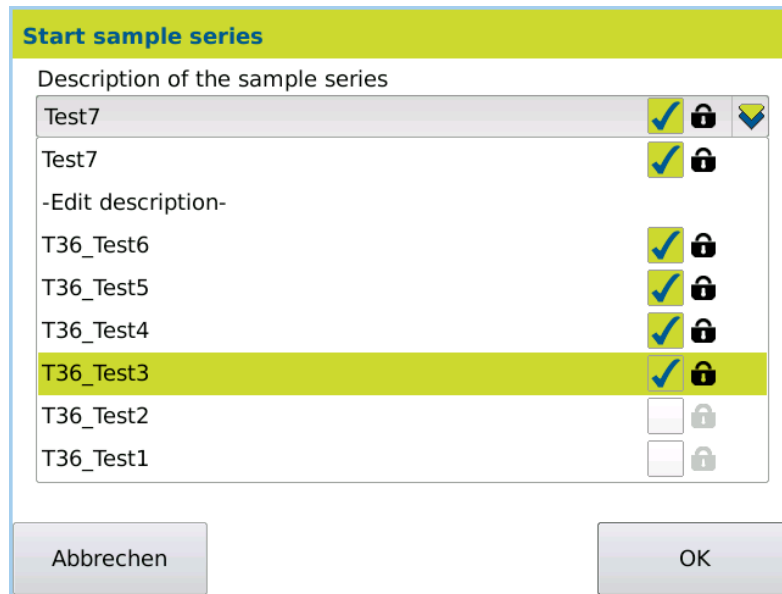
A checkmark next to the lock symbol in the name of the sample series identifies a sample series as protected.

Protected sample series are listed directly under the entry *-Edit description-*.

##### This is the procedure

1. Click on the check box next to the lock symbol to protect the currently edited sample series.

2. Click on the line containing the name of the sample series
3. Then click on the check boxes next to the lock symbols of the previous sample series you want to protect.



### 8.7.6 Pause the sample series

It is possible to pause an already running sample series and to edit all still to be performed measurements of the sample series.

#### This is the procedure

1. During a running sample series, click on the Cancel button.
2. A window with three buttons appears:
  - a. *Continued*: Closes the window and the sample series continues
  - b. *pause sample series*: Pauses the sample series and opens the *Configure sample series* menu. In doing so, the currently measured sample will be finished first.
  - c. *abort sample series*: Cancels the sample series immediately

While the selection window is visible, the sample series continues to run in the background.

If a sample series is paused, the *Configure sample series* menu opens.

In the paused state of the sample series, it is not possible to change the name of the sample series.

In the paused state of the sample series, it is not possible to edit or delete rows of already measured samples.

In the paused state of the sample series, it is possible to add and remove rows.

In the paused state of the sample series, it is possible to edit the samples ID of rows.

In the paused state of the sample series, it is possible to move rows.

If a sample ID is edited in the paused state, it is shown in italics.

The paused sample series can be continued by pressing the *Start* button. Thereby, no new sample series will be saved in the circular buffer. This means that neither a new sample series is created nor a sample series overwritten.

If the sample series is continued, the samples are measured according to the order within the table.

By clicking the *Cancel* button, the sample series is aborted and discontinued.

### 8.7.7 Autosampler operation with activated templates

If in the currently selected method the sample feeding is set to *autosampler*, the autosampler is activated and templates are used, the *Configure sample series* menu appears directly in the main menu via the measurement button.

**Sampler templates**

Name  
 Template Edit

General Options

Content

	No.	Id
1	5	Water
2	6	Milk
3	10	Juice
4	23	Beverage

New line  
Remove line

Cancel Export Print OK

In the *Configure sample series* menu, all entries of the template are displayed in the table of the measuring sequence.

**Configure sample series**

Description of the sample series  
 20180724\_093745

Measuring sequence

Pos	ID
5	Water
6	Milk
10	Juice
23	Beverage

Measurements  
 0/4

Edit sample ID  
Add  
Remove

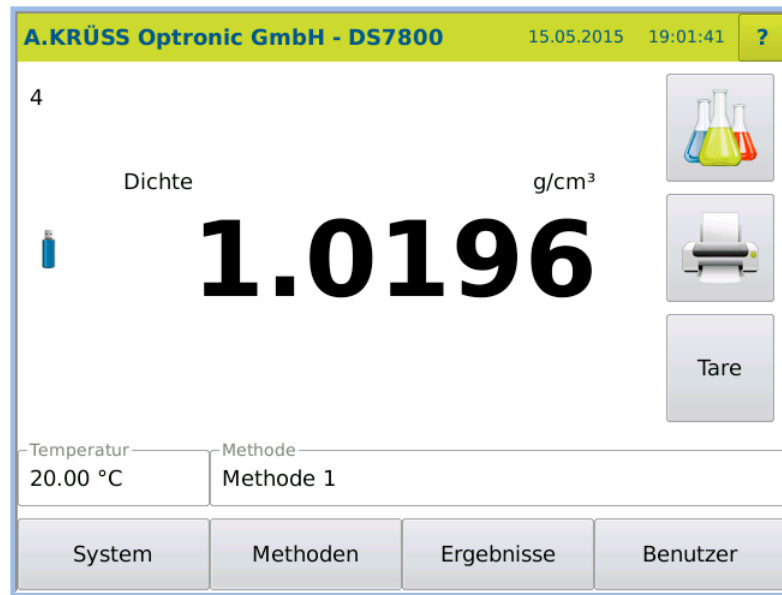
Cancel Export Print Start

The editing of the name of the sample series and the measuring sequence is performed in the same way as in the autosampler operation without the use of templates. When using templates, only previous sample series created with the selected template can be recalled.

It is not possible to recall previous sample series that originated from another template. It is not possible to recall previous sample series that were created while templates were deactivated.

## 8.8 Measurement results

The measured result is displayed with the unit and the sample number.



### 8.8.1 Result presentation

If an alarm profile (METHOD > Set.) is set, the results are checked to determine whether they are within the upper and lower limits. If the results are outside the limits, they are labelled as follows:

Results below the lower limit value	-----
Results above the upper limit value	++++

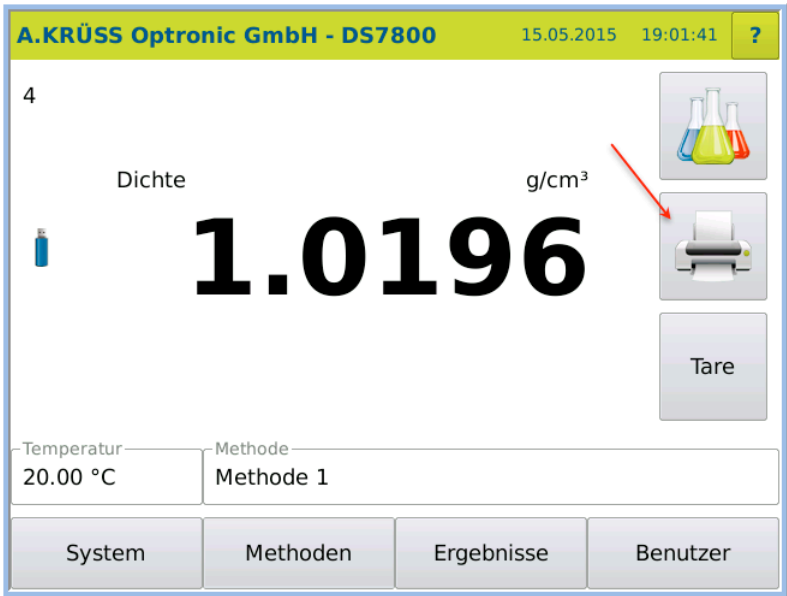
### 8.8.2 Print measuring result

If a printer (serial ASCII, network or PDF file) is configured, the measurement result can be printed manually using the key *Print:Result* or automatically directly after the measurement.



For a description of how to configure the printer, see the chapter **System menu > Tab Printer**.

**Manual printing** 1. Press the Printer key.



The result is printed.



The key *Print: Result* is allocated to a key in the main menu as part of the factory settings.

**Automatic printing** For automatic printing, the option *METHOD > Opt. > Automatic print* must be activated.

### 8.8.3 Export and print result list

All measurement results shown in the result list may be exported and printed. The data printed can be selected specific to the user under *RESULTS > FILTER > CONFIGURE COLUMNS*.

**This is the procedure** 1. Press **RESULTS**.

The results menu opens. All results are shown in a table.

Ergebnisse - 16							
Datum+Zeit	Benutzer	Methode	Probe	Skala1	Mess1	Einheit1	Temp [°C]
15.05.2015 18:34:08	Administrator	Methode 1	7 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:33:44	Administrator	Methode 1	6 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:33:20	Administrator	Methode 1	5 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:32:57	Administrator	Methode 1	4 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:32:33	Administrator	Methode 1	3 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:32:09	Administrator	Methode 1	2 Dichte	1.0196	g/cm³	20.00	
15.05.2015 18:31:46	Administrator	Methode 1	1 Dichte	1.0196	g/cm³	20.00	
14.05.2015 21:02:27	Administrator	Methode 1	3 Dichte	1.0196	g/cm³	20.00	
14.05.2015 20:59:18	Administrator	Methode 1	2 Dichte	1.0196	g/cm³	20.00	
14.05.2015 20:58:16	Administrator	Methode 1	1 Dichte	1.0196	g/cm³	20.00	

**Print** 2. Press **PRINT** to print the results list.

The selected (marked) results are printed on the connected printer.

- Export**
1. Press EXPORT to export the results list.  
The selected results are exported.



How result lists are printed and exported is comprehensively described in the chapter **Results menu** .

## 8.8.4 Filter results pane

If you would like to filter the results pane (**from-to**), do the following:

1. Double-click on the first result to be filtered.
2. Select the START VALUE (1) in the window that opens.  
The first value to be produced is now at the top of the results list.
3. Double-click on the last result to be filtered.
4. Select the END VALUE (2) in the window which opens.  
The selected results pane is displayed:

Ergebnisse - 16							
Datum+Zeit	Benutzer	Methode	Probe	Skala1	Mess1	Einheit1	Temp [°C]
15.05.2015 18:34:08	Administrator	Methode 1	7 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:33:44	Administrator	Methode 1	6 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:33:20	Administrator	Methode 1	5 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:32:57	Administrator	Methode 1	4 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:32:33	Administrator	Methode 1	3 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:32:09	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
15.05.2015 18:31:46	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
14.05.2015 21:02:27	Administrator	Methode 1	3 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
14.05.2015 20:59:18	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
14.05.2015 20:58:16	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	

Buttons: Abbrechen, Export, Drucken, Filter

The filtered results pane can then be printed with PRINT and exported with EXPORT .



How results are filtered is comprehensively described in the chapter **Results menu** .

## 8.8.5 Filter QC results

1. Press RESULTS > FILTER > ADDITIONAL FILTERS > Tab *Additional filters*.
2. Press EDIT.
3. Activate *Quality control*.



4. Save the entry by pressing OK.

The list with the QC results is displayed.



How to filter results is comprehensively described in the chapter **Results menu**.

## 8.9 Final cleaning

After the measurements are complete, the frequency oscillator must be thoroughly cleaned.



Dried sample can only be removed with great difficulty.



Cleaning is described in detail in the chapters **Initial start-up** and **Methods menu**.

## 8.10 Switch off device

1. Switch the device off using the mains switch on the back of the device.

## Chapter 9 - Methods menu

The chapter Methods menu deals with the following topics:

- Access methods menu
- Explanation of all method parameters
- Create and define new methods
- Change methods
- Define sample feeding
- Define cleaning procedures

**Permissions** The method parameters may be modified by users with administrator permissions. User-specific methods may be modified by users who are affected by them.

### 9.1 Methods menu overview

#### 9.1.1 Access methods menu

1. Press METHODS.

The methods menu will be opened with the last method used.

#### 9.1.2 Method parameters

**Method menu** Methods and parameters are selected in the methods menu:

Tabs/Keys	Explanatory notes
Name	Name and selection menu of pre-defined methods.

Tabs/Keys	Explanatory notes
Scale 1	Two measurement scales can be defined.
Scale 2	<ul style="list-style-type: none"> <li>• Scale 1, the primary scale. It is shown larger in the upper area in the main menu.</li> <li>• Scale 2, the secondary scale. Where required, this can be additionally defined and is shown smaller and in the lower area in the main menu.</li> </ul> <p>For both scales, the following parameters can be defined and selected independently of each other:</p> <ul style="list-style-type: none"> <li>• Scale</li> <li>• Unit</li> <li>• Resolution</li> <li>• Parameter</li> <li>• Default</li> <li>• Entry</li> <li>• Temperature compensation</li> <li>• Viscosity correction</li> </ul>
Temp.	<p>This tab is only available for devices with temperature control. Temperature control can be switched on and off.</p> <p>Temperature control parameters:</p> <ul style="list-style-type: none"> <li>• Target temperature</li> <li>• Tolerance</li> <li>• Stabilisation (delay time for start of measurement)</li> </ul>
Set.	<p>Under settings, the following can be selected/adjusted:</p> <ul style="list-style-type: none"> <li>• Measurement mode (individual, interval and continuous measurement)</li> <li>• Alarm profiles</li> </ul>
Sampl.	<p>Selection menu for sample feeding.</p> <ul style="list-style-type: none"> <li>• manual (e.g. with Luer Lock syringe)</li> <li>• DS7070 (Peristaltic pump)</li> <li>• Autosampler (AS80 or AS90)</li> </ul>
Cleaning	<p>This tab is only available for devices with a peristaltic pump.</p> <p>Selection menu for cleaning procedure:</p> <ul style="list-style-type: none"> <li>• none</li> <li>• List of all cleaning procedures already defined in the device</li> <li>• -Manage cleaning proc.-, to define cleaning procedures.</li> </ul> <p>The cleaning procedure selected here in the method is always <b>final cleaning</b>.</p>
Opt.	<p>The following measurement options can be activated:</p> <ul style="list-style-type: none"> <li>• Comment</li> <li>• Quality control</li> <li>• Automatic printing</li> <li>• Pause interval measurement</li> <li>• Lock method</li> </ul>
<div style="border: 1px solid gray; padding: 2px; text-align: center;">Bearbeiten</div>	Edit parameters of a method.
<div style="border: 1px solid gray; padding: 2px; text-align: center;">Export</div>	Exports the selected method and its parameters.
<div style="border: 1px solid gray; padding: 2px; text-align: center;">Drucken</div>	Prints the selected method and its parameters.
<div style="border: 1px solid gray; padding: 2px; text-align: center;">OK</div>	The settings are confirmed, the method menu is closed and the start menu is opened.
<div style="border: 1px solid gray; padding: 2px; text-align: center;">Abbrechen</div>	The method menu closes without saving the entry and the start menu opens.

**Processing mode** In Edit mode, new methods can be created and parameters can be modified.

1. Click on METHODS > EDIT to enter Edit mode.  
All parameters highlighted in grey may be selected and modified.

**Methoden bearbeiten**

Name

Methode 1
▼

Umbenennen

Skala 1   Skala 2   Temp.   Einst.   **Sampl.**   Reinigung   Opt.

Skala	Einheit	Auflösung
Dichte*	g/cm <sup>3</sup>	0.0001

Parameter	Vorgabe	Eingabe
	0	Nein

Temperaturkompensation	Viskositätskorrektur
keine	keine

Abbrechen

Löschen

Neu

Ok

Keys	Explanatory notes
	Rename method.
	Opens the menu to create a new method.
	After a confirmation prompt, deletes the method displayed.
	The settings are confirmed, the method menu is closed and the start menu is opened.
	The method menu closes without saving the entry and the start menu opens.

## 9.2 Create new method

**Permissions**    New methods can be created by users with administrator rights .



For defining user-specific settings, under SYSTEM > Tab *Opt.*, the system options *Activate user administration* and *Individual system settings* must be activated.

**Set method name**    1. Click on METHODS > EDIT.  
The Method menu in Edit mode is opened.

2. Click NEW.

The input window for the name of the new method is opened.

### Define method parameters

3. Click on the grey key *Name of the new method to be created*.
4. Enter the name of the method required.

To confirm the method parameters of the current method:

5. Activate the option *Import data of the current method*.
6. Press OK to save input.

The method menu will be re-opened for further editing.

7. Select the following method parameters or define new ones:
  - Scale 1 and 2
  - Temperature control
  - Settings such as measuring mode and alarm profile
  - Sample feeding
  - Cleaning procedures
  - Measurement options



How to select method parameters and define new ones is described in the following sections.

## 9.3 Change method names

The method names can be modified at any time.

1. Select the method to be modified under Name.
2. Click on METHODS > EDIT.

3. Click on RENAME.  
The new name input dialog box will open.
4. Enter the new name and save it by pressing OK.

## 9.4 Scale 1 and Scale 2 tab

There are predefined measuring scales and user-defined measuring scales.



The pre-defined measuring scales **cannot** be modified.

- Open dialog box
1. Click on METHODS > Tab *Scale 1* or *Scale 2* > EDIT.

The parameters for the current method are displayed. The menu is in edit mode.

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. Einst. **Sampl.** Reinigung Opt.

Skala Einheit Auflösung  
Dichte\* g/cm<sup>3</sup> 0.0001

Parameter Vorgabe Eingabe  
 0 Nein

Temperaturkompensation Viskositätskorrektur  
keine keine

Scale 1 and Scale 2															
Scale	Selection menu of pre-defined (marked with *) and user-defined measurement scales.														
	<table border="1"> <tr> <td>Density*</td> <td>The value actually measured in g/cm<sup>3</sup>.</td> </tr> <tr> <td>Relative density 20/20*</td> <td>Has no unit. The relative density 20/20 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 20 °C.</td> </tr> <tr> <td>Relative density 20/4*</td> <td>Has no unit. The relative density 20/4 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 4 °C.</td> </tr> <tr> <td>Alcohol concentration (OIML)*</td> <td></td> </tr> <tr> <td>Brix-Scale*</td> <td></td> </tr> <tr> <td>Sulphuric acid concentration*</td> <td></td> </tr> <tr> <td>- Manage scales-</td> <td>Change and define user-defined scales.</td> </tr> </table>	Density*	The value actually measured in g/cm <sup>3</sup> .	Relative density 20/20*	Has no unit. The relative density 20/20 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 20 °C.	Relative density 20/4*	Has no unit. The relative density 20/4 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 4 °C.	Alcohol concentration (OIML)*		Brix-Scale*		Sulphuric acid concentration*		- Manage scales-	Change and define user-defined scales.
Density*	The value actually measured in g/cm <sup>3</sup> .														
Relative density 20/20*	Has no unit. The relative density 20/20 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 20 °C.														
Relative density 20/4*	Has no unit. The relative density 20/4 is calculated by dividing the density of the sample at a temperature of 20 °C by the density of pure water at a temperature of 4 °C.														
Alcohol concentration (OIML)*															
Brix-Scale*															
Sulphuric acid concentration*															
- Manage scales-	Change and define user-defined scales.														
Unit	<p>Units for the pre-defined scales:</p> <ul style="list-style-type: none"> <li>• Density &gt; g/cm<sup>3</sup></li> <li>• Relative density for 20/20 and 4/20 &gt; none°</li> <li>• Alcohol concentration (OIML) &gt; Vol.-% OIML</li> <li>• Brix &gt; %Brix</li> <li>• Sulphuric acid concentration &gt; weight-%</li> </ul>														
Resolution	<p>Resolution selection list:</p> <p>Resolutions <b>Scale 1</b>: 0.1; 0.01; 0.001; 0.0001</p> <p>Resolutions <b>Scale 2</b>: 0.1, 0.01; 0.001; 0.0001</p>														
The following parameters are defined under METHODS > Scale 1/2 > Scale >-Manage scales- :															
Parameters	Displays whether a conversion factor is being used. The value for the conversion factor can once be pre-set as a fixed parameter under Default or each time directly before measurement (Entry > Yes).														
Default	Fixed conversion factor value.														
Entry	<p>Yes/no display,</p> <p><b>Yes:</b> a value can be entered prior to every measurement.</p> <p><b>No:</b> A fixed assigned value is used to calculate the results.</p>														

Temperature compensation	
If the results at the temperatures given always deviate by a certain amount, the results can be automatically corrected by temperature compensation. The following options are available:	
none	There is no temperature compensation.
-Manage temperature comp.-	User-defined entry of temperature compensation. Value pairs are entered for this purpose (temperature and corresponding measurement value). The coefficients for calculation are determined from these value pairs
Viscosity correction	

### 9.4.1 Define new scale

This is the procedure

1. Click on METHODS > Tab *Scale 1* or *Scale 2* > EDIT.  
The Method menu will open.



2. Select under *Scale* > -Manage scales-.  
The scale dialog box will open.



3. Press EDIT > NEW to define a new scale.

Define new scale name 4. Click on the grey key and enter the name of the scale.

Define scale parameters To import the settings of the current scale:  
5. Activate the option *Import data of the current scale.*

**Neue Skala anlegen**

Aktuelle Skala  
Dichte\*

Name der neu anzulegenden Skala  
Dichte 2

Daten der aktuellen Skala übernehmen

Abbrechen   Ok

6. Press OK to save input.

The newly created scale can then be defined further.

**Skalen bearbeiten**

Name  
Dichte 2

Allgemein **Umrechnung** Optionen

Basierend auf Skala  
Brix-Skala\*

Einheit  
g/cm<sup>3</sup>

Parameter  
Dichte Wasser (20 °C)

Vorgabe  
0.998203

Eingabe  
Nein

Abbrechen   Ok

7. Select the desired data under the tabs *General*, *Conversion* and *Options*.

**General tab** In the tab *General*, the basic data for the scale is defined.

**Skalen bearbeiten**

Name  
 Dichte2 ▼ Umbenennen

Allgemein Umrechnung Optionen

Basierend auf Skala  
 Brix-Skala\* ▼

Einheit  
 g/cm<sup>3</sup> ▼

Parameter  
 Dichte Wasser (20 °C) ▼

Vorgabe  
 0.998203

Eingabe  
 Nein

Abbrechen
Löschen
Neu
Ok


General					
<i>Based on scale</i>	Selection menu for: <ul style="list-style-type: none"> <li>• none</li> <li>• pre-defined scales (labelled *)</li> <li>• defined scales</li> </ul> The settings from the selected scale are accepted for the new scale.				
<i>Unit</i>	Selection menu for: <ul style="list-style-type: none"> <li>• none</li> <li>• pre-defined units</li> <li>• defined units</li> <li>• -Manage units-</li> </ul>				
<i>Parameters</i>	Conversion factors and formulas can be defined for calculating measurement results. <ul style="list-style-type: none"> <li>• none</li> <li>• Density water [20 °C]</li> <li>• Density water [4 °C]</li> <li>• Conversion factor</li> <li>• -Manage parameters-</li> </ul>				
<i>Default</i>	A fixed assigned value is used to calculate the measurement result.				
<i>Entry</i>	As an alternative to a fixed assigned value, an individual assigned value can be entered prior to every measurement. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">Yes</td> <td>An assigned value entry window opens before every measurement.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>A fixed assigned value is used.</td> </tr> </table>	Yes	An assigned value entry window opens before every measurement.	No	A fixed assigned value is used.
Yes	An assigned value entry window opens before every measurement.				
No	A fixed assigned value is used.				

**Conversion tab** In the tab *Conversion*, the calculation formula for measurement results is defined.

**Skalen bearbeiten**

Name  
 

**Allgemein** **Umrechnung**

Umrechnung  
 

Formel

M = Messwert  
 P = Parameter

Conversion															
<i>None</i>	There is no conversion of measurement results.														
<i>Linear</i>	<p>The conversion factor for the calculation of measurement results is calculated in a linear fashion. A measurement value and the associated parameters are entered for this purpose:</p> <div style="border: 1px solid black; padding: 5px;"> <p>Formel</p> <input type="text"/> <p>M = Messwert P = Parameter</p> </div>														
<i>Polynomial</i>	<p>The conversion factor for the calculation of measurement results is calculated using a polynomial. Input and output values can be entered for this purpose:</p> <div style="border: 1px solid black; padding: 5px;"> <p>Eingabe</p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th>Eingangswert</th> <th>Ausgangswert</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>0</td> <td rowspan="3"><input type="button" value="Neue Zeile"/></td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> <td>0</td> </tr> </tbody> </table> </div>		Eingangswert	Ausgangswert		1	0	0	<input type="button" value="Neue Zeile"/>	2	0	0	3	0	0
	Eingangswert	Ausgangswert													
1	0	0	<input type="button" value="Neue Zeile"/>												
2	0	0													
3	0	0													
<i>Table</i>	<p>The conversion factor for the calculation of measurement results is calculated using a table. Input and output values can be entered for this purpose:</p> <div style="border: 1px solid black; padding: 5px;"> <p>Eingabe</p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th>Eingangswert</th> <th>Ausgangswert</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>0</td> <td rowspan="2"><input type="button" value="Neue Zeile"/> <input type="button" value="Zeile entfernen"/></td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> </tr> </tbody> </table> </div>		Eingangswert	Ausgangswert		1	0	0	<input type="button" value="Neue Zeile"/> <input type="button" value="Zeile entfernen"/>	2	0	0			
	Eingangswert	Ausgangswert													
1	0	0	<input type="button" value="Neue Zeile"/> <input type="button" value="Zeile entfernen"/>												
2	0	0													
<i>Formula</i>	<p>The conversion factor for the calculation of measurement results is calculated in a linear fashion. A measurement value and a parameter are entered and mathematically linked for this purpose.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Formel</p> <input type="text"/> <p>M = Messwert P = Parameter</p> </div>														

**Options tab** In the tab *Options*, the defined scale can be locked.

**Skalen bearbeiten**

Name  
 Dichte 2 ▼ Umbenennen

Allgemein **Umrechnung** Optionen

Skalenoptionen  
 Skala sperren

Abbrechen Löschen Neu Ok

Options	
Disable scale	<input checked="" type="checkbox"/> Activated, the defined scale is disabled. This is not available in the selection menu for the definition of Scale 1 or 2. <input type="checkbox"/> Deactivated, the defined scale is not disabled. This is available in the selection menu for the definition of Scale 1 or 2.

## 9.4.2 Define calculation formula



A formula **cannot** be defined for factory settings scales.

This is the procedure

1. Click on METHODS > Tab *Scale 1* > EDIT
2. Click on *Scale: Manage scale* > EDIT > Tab *Conversion*
3. Select under *Conversion*: the *Formula*.

**Skalen bearbeiten**

Name  
 Dichte 2 ▼ Umbenennen

Allgemein **Umrechnung** Optionen

Umrechnung  
 Formel ▼  
 Keine  
 Linear  
 Polynom  
 Tabelle  
**Formel**

Abbrechen Löschen Neu Ok

The dialog box opens:



4. Click on the grey key under *Formula*.

The formula definition dialog box opens:



5. Enter the required formula (e.g.  $M/1.84$ ).

M	Measured value
P	Parameters

6. Save the entry by pressing OK.

The formula is saved and the subsequent measurement result is calculated with this formula.

**Skalen bearbeiten**

Name  
 Dichte 2 ▼ Umbenennen

Allgemein **Umrechnung** Optionen

Umrechnung  
 Formel ▼

Formel  
 M/1.84 ↗

M = Messwert  
 P = Parameter

Abbrechen Löschen Neu Ok

### 9.4.3 Define temperature compensation



A temperature compensation **cannot** be defined for factory settings scales (labelled \*).

This is the procedure

1. Click on METHODS > Tab *Scale 1* or *Scale 2* > EDIT.  
The method menu is in edit mode.
2. Select under *Temperature compensation* > *-Manage temperature compensation-*.

The temperature compensation dialog box will open.

**A.KRÜSS Optronic GmbH**

Name  
 Temptest ▼ Bearbeiten

Umrechnung **Optionen**

Umrechnung Zieltemperatur [°C]

Keine 0

Abbrechen Export Drucken Ok

Define new scale name 3. Press EDIT > NEW.

**Neue Temperaturkompensation anlegen**

Aktuelle Temperaturkompensation

Name der neu anzulegenden Temperaturkompensation

Daten der aktuellen Temperaturkompensation übernehmen

Abbrechen Ok

4. Click on the grey key and enter the name of the temperature compensation.

Define temperature compensation

To confirm the current compensation settings (e.g. ICUMSA):

5. Activate the option *Import data of the current temperature compensation*.

**Neue Temperaturkompensation anlegen**

Aktuelle Temperaturkompensation

Name der neu anzulegenden Temperaturkompensation

Daten der aktuellen Temperaturkompensation übernehmen

Abbrechen Ok

6. Confirm the entry by pressing OK.

For the new temperature compensation, the conversion can then be selected and the target temperature defined.



**Temperaturkompensationen bearbeiten**

Name  
Temp.Komp.1

Umrechnung

Umrechnung  Zieltemperatur [°C]

7. Select the conversion (*Linear, Polynomial, Table or Formula*) for the temperature compensation and enter the data.
8. Enter the *Target temperature*.
9. Confirm the entry by pressing **OK**.

#### Conversion tab

In the tab *Conversion*, conversion factors can be defined for the measurement results.

Conversion	Explanatory notes																							
<i>none</i>	There is no conversion.																							
<i>Linear</i>	<p>The factor for temperature compensation is calculated in a linear fashion. Two actual temperatures with associated measurement values are entered for this purpose:</p> <table border="1"> <thead> <tr> <th colspan="2">Eingabe</th> </tr> <tr> <th></th> <th> <table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> </tbody> </table> </th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> </tbody> </table>	Eingabe			<table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> </tbody> </table>	Isttemperatur	Messwert	1	0	2	0	1	0	2	0									
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Isttemperatur	Messwert																							
1	0																							
2	0																							
1	0																							
2	0																							
<i>Polynomial</i>	<p>The factor for temperature compensation is calculated using a polynomial. Actual temperatures with associated measurement values can be entered for this purpose:</p> <table border="1"> <thead> <tr> <th colspan="2">Eingabe</th> <th></th> </tr> <tr> <th></th> <th> <table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> </tbody> </table> </th> <th><input type="button" value="Neue Zeile"/></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td></td> </tr> <tr> <td>2</td> <td>0</td> <td></td> </tr> <tr> <td>3</td> <td>0</td> <td></td> </tr> </tbody> </table>	Eingabe				<table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> </tr> </tbody> </table>	Isttemperatur	Messwert	1	0	2	0	3	0	<input type="button" value="Neue Zeile"/>	1	0		2	0		3	0	
Eingabe																								
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1	0																							
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3	0																							
1	0																							
2	0																							
3	0																							
<i>Table</i>	<p>The temperature compensation is calculated in a table. Actual temperatures with associated measurement values can be entered for this purpose:</p> <table border="1"> <thead> <tr> <th colspan="2">Eingabe</th> <th></th> </tr> <tr> <th></th> <th> <table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> </tbody> </table> </th> <th> <input type="button" value="Neue Zeile"/>  <input type="button" value="Zeile entfernen"/> </th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td></td> </tr> <tr> <td>2</td> <td>0</td> <td></td> </tr> </tbody> </table>	Eingabe				<table border="1"> <thead> <tr> <th>Isttemperatur</th> <th>Messwert</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> </tbody> </table>	Isttemperatur	Messwert	1	0	2	0	<input type="button" value="Neue Zeile"/> <input type="button" value="Zeile entfernen"/>	1	0		2	0						
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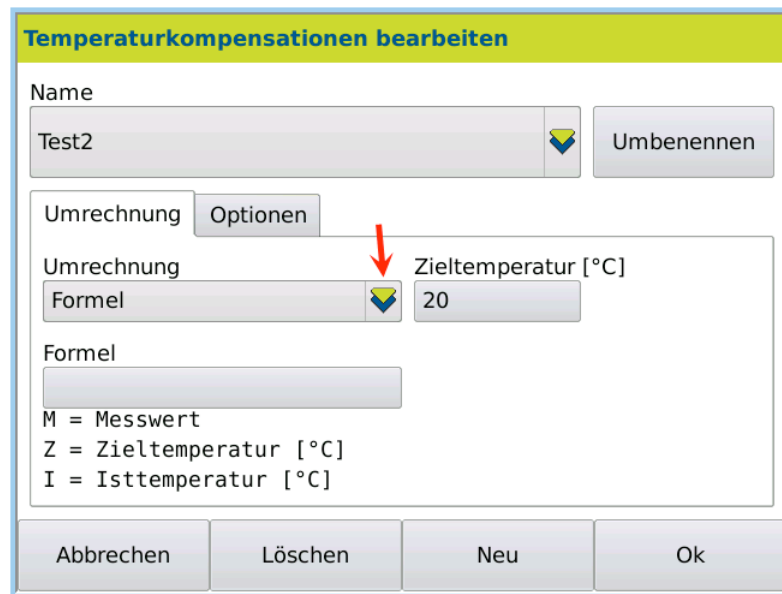
<i>Formula</i>	The temperature compensation is calculated using a formula. A measurement value, the target temperature and the actual temperatures are mathematically linked for this purpose. <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Formel</p> <input style="width: 100%;" type="text"/> <p>M = Messwert Z = Zieltemperatur [°C] I = Isttemperatur [°C]</p> </div>
<i>Target temperature</i>	Target temperature input

**Options tab** In the tab *Options*, the defined temperature compensation can be locked.

Options	
<i>Disable temperature compensation</i>	<input checked="" type="checkbox"/> Activated, the defined temperature compensation is disabled. This is not available in the selection menu for the definition of Scale 1 or 2.  <input type="checkbox"/> Deactivated, the defined temperature compensation not disabled. This is available in the selection menu for the definition of Scale 1 or 2.

#### 9.4.4 Define temperature compensation formula

- This is the procedure
1. Click on METHODS > Tab *Scale 1* > EDIT.
  2. Select under *Temperature compensation*: *-Manage temperature compensation-*.
  3. Click on > EDIT > Tab *Conversion* > *Conversion: Formula*.



4. Click on the grey key under *Formula*.

**Temperaturkompensationen bearbeiten**

Name  
 Test2 ▼ Umbenennen

Umrechnung Optionen

Umrechnung Zieltemperatur [°C]  
 Formel ▼ 20

Formel ↙

M = Messwert  
 Z = Zieltemperatur [°C]  
 I = Isttemperatur [°C]

Abbrechen    Löschen    Neu    Ok

The formula definition dialog box opens.

**Temperaturkompensationen bearbeiten**

**Formel**

M\*0.257\*(I-Z)

M	Z	I		EXP	←	→	DEL	←
$\sqrt{x}$	$\log_{10}(x)$			7	8	9	(	)
$x^2$	Ganzzahl			4	5	6	×	÷
$x^y$	Runden			1	2	3	+	-
$\ln(x)$	Absolut			ESC	0	.	Ok	

5. Enter the required formula e.g.  $M \times 0.257 \times (I - Z)$ .

M	Measured values
T	Target temperature
I	Actual temperature

6. Save the entry by pressing OK.

**Result** The formula is saved and the subsequent measurement results are calculated using this formula.

**Temperaturkompensationen bearbeiten**

Name  
 ▼ Umbenennen

Umrechnung Optionen

Umrechnung Zieltemperatur [°C]  
 ▼

Formel

M = Messwert  
Z = Zieltemperatur [°C]  
I = Isttemperatur [°C]

Abbrechen Löschen Neu Ok

## 9.5 Temp. tab

For **devices with temperature control**, the target temperature, tolerance and stabilisation time can be pre-set.

In the case of temperature control, constant temperature monitoring and regulation takes place.

No target temperature indicates device/room temperature. There is no temperature check. Measurement can be started at any time.

Open dialog 1. Click on METHODS > Tab *Temp.*

The temperature control dialog box opens.

**Methoden**

Name  
 ▼ Bearbeiten

Skala 1 Skala 2 Temp. Einst. Sampl. Reinigung Opt.

Temperierung Solltemperatur [°C]

Toleranz [°C]

Stabilisierung [s]

Abbrechen Export Drucken Ok

## Explanatory notes

Temperature control	
Target temperature	Required temperature entry.
Tolerance [°C]	Enter the permitted temperature difference from the required value that the measurement can be started with.
Stabilisation [s]	The measurement begins once the stabilisation period is complete.

## Define temperature control

1. Click on METHODS > Tab Temp. > EDIT.

The temperature control dialog box opens.

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. Einst. Sampl. Reinigung Opt.

Temperierung  
ein   
aus  
ein

Solltemperatur [°C]  
25.0

Toleranz [°C]  
0.2

Stabilisierung [s]  
0

2. Select Temperature control on.
3. Enter the target temperature tolerance and stabilisation period.
4. Save the entry by pressing OK.

## Result

For the next start of this method, the current temperature is constantly checked and regulated.

## 9.6 Settings tab

For each method, the following measurement settings can be defined.

- Measurement mode
- Alarm profiles

## Open dialog box

1. Click on METHODS > Tab Settings

The measurement settings dialog box will open.

**Methoden bearbeiten**

Name

Methode 1
▼

Umbenennen

Skala 1
Skala 2
Temp.
Einst.
Sampl.
Reinigung
Opt.

Messmodus

Intervallmessung
▼

Intervall [s]

3

Messungen

5

Alarmprofil

kein
▼

Abbrechen

Löschen

Neu

Ok

Explanatory notes

Measurement mode	Explanatory notes
	<p>The measurement mode is used to determine the number of measurements. Labelling of measurement modes in the results memory:</p> <p>0 = One-shot measurement                      1 = Interval measurement                      2 = Continuous measurement</p>
<i>One-shot measurement</i>	For <i>One-shot measurement</i> , <b>one</b> measurement value is recorded.
<i>Interval measurement</i>	<p>For <i>interval measurement</i>, several measurement values are recorded at set intervals. A mean value is calculated from the measurement values and displayed. The individual measured values and the associated raw values (nD) can be produced in the results list where required.</p> <p><i>Interval [s]</i> = 2 to 600, in whole numbers  <i>Measurements</i> = number of measurements 2 -99, in whole numbers</p>
<i>Continuous measurement</i>	<p>For <i>continuous measurement</i>, measurement values are recorded at set intervals.</p> <p>The measurement is <b>started</b> when the method is accessed. A small green spot next to the Measure key indicates measurement is taking place.</p> <p>The results are not saved automatically. Individual measurement results are <b>saved</b> by pressing the Measure key. The measurement is <b>stopped</b> when another method is accessed.</p> <p>The results are labelled under RESULT &gt; <i>Measurement mode: Continuous measurement</i>.</p>
<b>Alarm profile</b>	
<p>Lower and upper limit values can be set for the measurement values of a method. If the limit values are exceeded or not met, the measurement result is labelled. The alarm profiles can <b>only</b> be defined for the results of Scale 1. The labelled measurement results can be filtered in the results menu.</p> <p><b>Selection menu::</b></p>	
<i>none</i>	There is no evaluation of measurement results with the defined limit values.
Alarm profiles list	Pre-defined alarm profiles.

-Manage alarm profiles-

The alarm profile definition and editing dialog box opens.

## 9.6.1 Define measurement mode

- This is the procedure
1. Click on METHODS > Tab Settings> EDIT.  
The methods menu will be opened with the last method used.
  2. Select the required measurement mode under *Measurement mode*.

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. **Einst.** Sampl. Reinigung Opt.

Messmodus  
Intervallmessung  3  5

Alarmprofil  
kein

3. Enter the parameters for the selected measurement mode.
4. Save the entry by pressing OK.

**Result** The measurement mode for recording measurement values is set.

## 9.6.2 Alarm profiles

Open dialog box 1. Click on METHODS > Tab Settings > EDIT.

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. **Einst.** Sampl. Reinigung Opt.

Messmodus Intervall [s] Messungen  
Intervallmessung 3 5

Alarmprofil  
kein    
kein  
-Alarmprofile verwalten-

2. Select Alarm profiles > Manage alarm profiles.

The dialog box for the definition of an alarm profile is opened.

**Alarmprofile**

Name

Allgemein Optionen

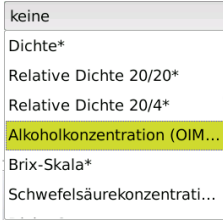
Basierend auf Skala Einheit

Unterer Grenzwert

Oberer Grenzwert







**General tab** In the tab *General* , the alarm profile is defined with limit values.

General tab	Explanatory notes
<i>Based on scale</i>	<p>Selection of units based on pre-defined scales. The alarm profiles can <b>only</b> be defined for result of Scale 1.</p> <p>Basierend auf Skala</p>  <p>Scales labelled * are factory-defined.</p>
<i>Unit</i>	The unit is based on the selected scale.
<i>Lower limit value</i>	If the measured sample is below the defined lower limit value, the result is labelled -----.
<i>Upper limit value</i>	If the measured sample is above the defined upper limit value, the result is labelled + + + +.

**Options tab** In the tab *Options* , the defined alarm profile can be locked and/or released.

Options tab	Explanatory notes
<i>Disable alarm profile</i>	<p><input checked="" type="checkbox"/> Activated, the current alarm profile is disabled and cannot be used.</p> <p>The alarm profile <b>cannot</b> be disabled if the alarm profile is already in use in other methods.</p>

Keys

Keys	
	Opens a dialog box for the definition of a new alarm profile.
	Deletes current alarm profile.
	The settings are confirmed, the method menu is closed and the start menu is opened.
	The method menu closes without saving the entry and the start menu opens.

### 9.6.3 Define and modify alarm profiles

New alarm profiles can be created and alarm profiles which are already defined can be edited.

This is the procedure

1. Click on METHODS > Tab *Settings*> EDIT.
2. Select Alarm profiles > -Manage alarm profiles-

3. Click on EDIT.

The dialog box is in edit mode for the modification of an existing profile or the creation of a new alarm profile.

**Changing existing alarm profile**

1. In order to edit an existing alarm profile, select the alarm profile to be edited under *Name* .

**Create a new alarm profile**

1. To create a new alarm profile, click NEW.
2. Click on the grey key and enter the name (e.g. upper limit value) for the alarm profile.
3. Confirm the entry by pressing OK.

The alarm profile definition dialog box opens.

Define alarm profile 1. Select the scale with the required unit.



The alarm profiles can **only** be defined for the results of Scale 1. The scale must be identical to Scale 1 in the method parameters of the selected method.

2. Activate the check box and enter the upper and lower limit values.

3. Save the entry by pressing OK.

**Result** The alarm profile can then be selected in the method menu under tab *Settings > Alarm profiles* .  
 If the measurement result exceeds the upper limit value of e.g. 42, the result is labelled with ++++ in the results list.  
 If the measurement result is goes below the lower limit value, the result is labelled with ---- in the results list.

## 9.7 Sampl. tab

---



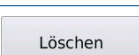

Under tab *Sampl.*, the type of sample feeding with the associated settings is selected and defined.

- Manually
- with DS7070
- with autosampler

**Open dialog box** 1. Click on METHODS > Tab *Sampl.* > EDIT.

The selection menu for sample feeding is available:

## Explanatory notes

Sample feeding	Explanatory notes
<i>manual</i>	Manual sample feeding with Luer syringe.
<i>DS7070</i>	Peristaltic pump for semi-automatic filling and cleaning.
<i>Autosampler</i>	Autosampler for fully automatic filling and cleaning. Our autosamplers AS80 and AS90 are supported.
Keys	
	The settings are accepted, the method menu is closed and the start menu opens.
	The method menu closes without saving the entry and the start menu opens.
	Deletes the current method.
	Creates a new method

### 9.7.1 Manual sample feeding

For devices without peristaltic pumps, the sample is filled manually into the frequency oscillator.

Following measurement, the sample is also rinsed off with water or a solvent compatible with the sample.

Drying is then manually triggered via the function SYSTEM > Tab *Functions* > AIR PUMP .

### 9.7.2 Define sample feeding with DS7070

During sample uptake, the peristaltic pump DS7070 transports the presented sample into the frequency oscillator. Various throughput speeds are adjustable. Highly viscous liquids should be transported more slowly to avoid air bubbles being transported along with them.

The factory setting values for the pump are as follows:

- Revolution speed: 50 rpm
- Pumping time: 10 s

- Direction of rotation clockwise

The pumping time and revolution speed should only be modified where required (e.g. for very viscous samples).

The pre-defined factory settings are found under:

- METHODS > Method X > Tab *Sampl.* for sample feeding.

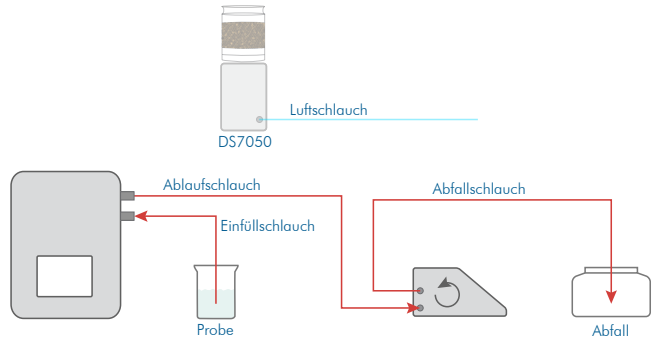
Where required, these settings can be modified.

**This is the procedure** The peristaltic pump is defined as follows:

1. Click on METHODS > Tab *Sampl.* > EDIT.
2. Under sample feeding *DS7070*, select:



3. Enter the *Pumping time* and *Revolution speed* where required.
4. Save the entry by pressing OK.

Parameters/keys	Explanatory notes
<i>Pumping time [s]</i>	Pumping time for the sample to be pumped into the frequency oscillator. 0 to 65535 s, default 10 s
<i>Revolution speed [1/m]</i>	Revolution speed while the sample is being pumped into the frequency oscillator. 1 to 50 rpm, default 50 rpm
<i>Direction of rotation</i>	Direction of rotation of the pump for sample uptake: <i>left</i> 

Parameters/keys	Explanatory notes
OK	The settings are accepted, the method menu is closed and the start menu opens.
Abbrechen	The method menu closes without saving the entry and the start menu opens.
Löschen	Deletes the current method.
Neu	Creates a new method.

### 9.7.3 Define sample feeding with autosampler.

Sample uptake and the intermediate cleaning procedure must be defined for the autosampler specific to method.

There are pre-defined factory settings. Where required, these can be copied and/or modified.

**This is the procedure** The sample feeding is defined as follows:

1. Click on METHODS and select the method required.
2. Press tab *Sampl.* > EDIT.
3. Under Sample feeding *Autosampler*, select:

**Explanatory notes**

Parameters/keys	Explanatory notes
	The following three parameters ( <i>pumping time</i> , <i>rotation speed</i> and <i>rotational direction</i> ) are only used for sample uptake into the frequency oscillator.
<i>Pumping time [s]</i>	Pumping time for sample uptake: 0 to 65535 s, default 10 s
<i>Revolution speed [1/m]</i>	Revolution speed of pump during sample uptake: 1 to 50 rpm, default 50 rpm
<i>Direction of rotation</i>	Direction of rotation of the pump: <ul style="list-style-type: none"> <li>• <i>right</i> &gt; for sample uptake and pumping the sample out</li> <li>• <i>left</i> &gt; only for rinsing and drying</li> </ul>

Explanatory notes

Parameters/keys	Explanatory notes
	The following two parameters ( <i>Sampler mode</i> and <i>Interim cleaning procedure</i> ) define the procedure after sample measurement.
<i>Sampler mode</i>	Selection menu: <ul style="list-style-type: none"> <li>• <i>Displacement</i>: The sample is sucked in and pumped off after measurement. The next sample then replaces the old sample. There is no intermediate cleaning.</li> <li>• <i>Intermediate cleaning</i>: The sample is sucked in and pumped off after measurement. The hoses are then rinsed and dried. This intermediate cleaning procedure must be defined.</li> </ul>
<i>Intermediate cleaning procedure</i>	Intermediate cleaning between individual samples on selection of <i>Sampler mode</i> > <i>Intermediate cleaning</i> . Selection menu: <ul style="list-style-type: none"> <li>• <i>none</i> &gt; only for sampler mode <i>Displacement</i></li> <li>• <i>already defined</i> cleaning procedures. There are pre-defined factory-set interim cleaning procedures.</li> <li>• <i>-Manage cleaning procedure-</i> to define and change Intermediate cleaning procedures.</li> </ul>
<i>Template</i>	Selection menu: <ul style="list-style-type: none"> <li>• none</li> <li>• pre-defined templates</li> <li>• <i>-Manage templates-</i></li> </ul>
OK	The settings are confirmed, the method menu is closed and the start menu is opened.
Abbrechen	The method menu closes without saving the entry and the start menu opens.
Löschen	Deletes the current method.
Neu	Creates a new method

### 9.7.4 Define intermediate cleaning for autosampler

If the frequency oscillator is to be rinsed and dried after every measurement, this intermediate cleaning must be defined.

The cleaning procedure *intermediate cleaning* is defined in the factory settings.

How to define intermediate cleaning is described in the following example.

**Example**

The intermediate cleaning of AS80 should include the following steps:

- **Step 1:** *Sampler: rinse*, to draw cleaning fluid into the frequency oscillator: Time 30 s, anticlockwise rotation, rpm 50, continues automatically
- **Step 2:** *Pause*, to soften the cleaning solution in the frequency oscillator: 10 s, continues automatically
- **Step 3:** *Sampler:* to rinse the frequency oscillator with water and empty it: Time 30 s, anticlockwise rotation, rpm 50, continues automatically
- **Step 4:** *Dry* to dry the frequency oscillator: 20 s, continues automatically

**This is the procedure**

1. Press METHODS > Tab *Sampl.* > EDIT.

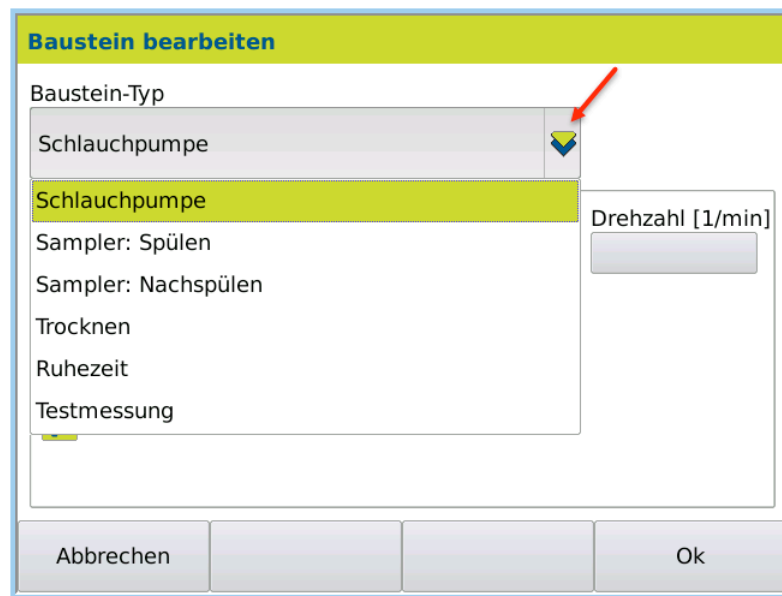


2. Select *-Manage cleaning procedure-* and press EDIT.
3. Press NEW to create a new cleaning procedure.
4. Enter the name of the cleaning procedure *AS80 intermediate rinsing and drying* and save it by pressing OK.

The cleaning procedure *AS80 intermediate rinsing and drying* can then be composed using individual modules.

5. Press ADD.

The dialog box with the module types for selection opens.



**Step 1:** The cleaning procedure should begin by sucking in the cleaning solution. The next step  
**Sampler: Rinse** should then be carried out automatically.

1. Under *Module type*, select the module *Sampler: Rinse*.
2. Enter for *Time* 30 s, *Rotation* anticlockwise, *rpm* 50.
3. Activate *Auto-confirmation* to begin the next step automatically.



4. Confirm the entry by pressing OK.

**Step 2:** The cleaning solution should soak in for 10 s. The next cleaning procedure should then  
**Define pause** begin automatically.

1. Press ADD.
2. Under *Module type*, select the module *Pause*.
3. For the pause, enter *Time* 10 s and activate *Auto-confirmation*.

4. Confirm the entry by pressing OK.

**Step 3: Sampler: rinse** After the pause, the cleaning solution should be rinsed out of the frequency oscillator with water and sucked empty.

1. Press ADD.
2. Under *Module type*, select the module *Sampler: Rinse*.
3. Enter for *Time* 30 s, *Rotation* anticlockwise, *rpm* 50.
4. Activate *Auto-confirmation* to begin the next step automatically after 30 s.

5. Confirm the entry by pressing OK.

**Step 4: Dry** Once it has been emptied completely, the frequency oscillator should be dried and then the next step (sample uptake) should begin automatically.

1. Press ADD.
2. Enter for *Time* 20 s.
3. Activate *Auto-confirmation* to begin the next sample automatically after the cleaning procedure is complete.

**Baustein bearbeiten**

Baustein-Typ  
Trocknen

Zeit [s]  
20

Autobestätigung

Abbrechen Ok

4. Confirm the entry by pressing OK.

Save cleaning procedure

1. Once the cleaning procedure is defined, press OK.

**Reinigungsprozeduren bearbeiten**

Name  
AS80-Zwischenspülen&Trocknen Umbenennen

Allgemein Optionen

Eingabe

Schritt	Baustein	AutoOk
1	Sampler: Spülen, Zeit = 30 [s], Richtung = rechts, Drehzahl = 50 [1/min]	Ja
2	Ruhezeit, Zeit = 10 [s]	Ja
3	Sampler: Nachspülen, Zeit = 30 [s], Richtung = rechts, Drehzahl = 50 [1/min]	Ja
4	Trocknen, Zeit = 10 [s]	Ja

Hinzufügen  
Bearbeiten  
Entfernen

Abbrechen Löschen Neu Ok

The dialog box is closed and the cleaning procedure is then available for selection in the menu METHOD > Tab *Sampl.* > *Intermediate cleaning procedure* .


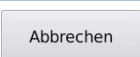
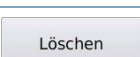

## 9.8 Cleaning tab

Cleaning procedures under METHODS > Tab *Cleaning* are only for final cleaning. The final cleaning is performed depending on the structure of the refractometer:

- With the peristaltic pump DS7070, the final cleaning is initiated via SYSTEM > Tab *Functions* > Function: *Cleaning* starts.
- With the autosampler, final cleaning takes place automatically once the measurement series is complete.

Open dialog box 1. Click on METHODS > Tab *Cleaning* > EDIT.

Explanatory notes

Parameters	Explanatory notes
<i>Cleaning procedure</i>	Selection menu: <ul style="list-style-type: none"> <li>• <i>none</i></li> <li>• <i>already defined</i> cleaning procedures and factory-defined.</li> <li>• <i>-Manage cleaning procedure-</i> to define cleaning procedures.</li> </ul>
Keys	
	The settings are accepted, the method menu is closed and the start menu opens.
	The method menu closes without saving the entry and the start menu opens.
	Deletes the current method.
	Creates a new method

### 9.8.1 Cleaning procedure modules

Modules/steps	Explanatory notes
<i>DS7070 Peristaltic pump</i>	The following must be defined for the peristaltic pump: <ul style="list-style-type: none"> <li>• Time [s]</li> <li>• Direction of rotation (clockwise/anticlockwise)</li> <li>• Revolution speed [1/min]</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: once rinsing is complete, the next cleaning module will automatically be performed.</li> <li>– deactivated: once rinsing is complete, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>

Modules/steps	Explanatory notes
Autosampler: Rinse	For the rinsing of the measurement cell with the autosampler, the following must be defined: <ul style="list-style-type: none"> <li>• <i>Time</i> [s]</li> <li>• <i>Direction of rotation</i> (clockwise/anticlockwise)</li> <li>• <i>Revolution speed</i> [1/m]</li> </ul> This module sucks rinsing fluid into the frequency oscillator.
	<ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: once rinsing is complete, the next cleaning module will automatically be performed.</li> <li>– deactivated: once rinsing is complete, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>
Autosampler: Rinse	For the rinsing of the autosampler, the following must be defined: <ul style="list-style-type: none"> <li>• <i>Time</i> [s]</li> <li>• <i>Direction of rotation</i> (clockwise/anticlockwise)</li> <li>• <i>Revolution speed</i> [1/m]</li> </ul> This module rinses the frequency oscillator with water and then empties it.
	<ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: once rinsing is complete, the next cleaning module will automatically be performed.</li> <li>– deactivated: once rinsing is complete, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>
Dry	For drying, the following must be defined: <ul style="list-style-type: none"> <li>• <i>Time</i> [s]</li> </ul> This module switches the air pump on for a defined period of time.
	<ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: once drying is complete, the next cleaning module will automatically be performed.</li> <li>– deactivated: once drying is complete, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>
Pause	The following must be defined for a pause: <ul style="list-style-type: none"> <li>• <i>Time</i> [s]</li> </ul> This module waits for a defined period.
	<ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: after the pause, the next cleaning module will automatically be performed.</li> <li>– deactivated: after the pause, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>
Test measurement	A test measurement is conducted. <ul style="list-style-type: none"> <li>• <i>After test measurement, continue from step:</i> <ul style="list-style-type: none"> <li>– do not continue</li> <li>– Selection list: All modules used in the cleaning procedure are listed. You can choose which step to continue with.</li> </ul> </li> </ul>
	A test measurement is conducted. <ul style="list-style-type: none"> <li>• <i>Auto-confirmation</i> <ul style="list-style-type: none"> <li>– activated: once the test measurement is complete, the next cleaning module will automatically be performed.</li> <li>– deactivated: once the test measurement is complete, you will be prompted as to whether the next cleaning module should be performed.</li> </ul> </li> </ul>

## 9.8.2 Define cleaning procedure for DS7070

How to define a cleaning procedure is described in the following example.

**Example** Final cleaning with the peristaltic pump DS7070 is composed of the following steps and defined:

- **Step 1:** *Peristaltic pump*, to draw water into the frequency oscillator: time 30 s, anticlockwise rotation, rpm 50, continues automatically
- **Step 2:** *Pause*, to soften the water in the frequency oscillator 10 s, continues automatically
- **Step 3:** *Peristaltic pump*, to remove water from the frequency oscillator: Time 30 s, anticlockwise rotation, 50 rpm, **Stop** once performed (hose must be reconnected when using drying unit DS7050) or **automatically continue** once performed (when using drying unit DS7060, no reconnection is required).
- **Step 4:** *Dry*, to dry the flow cell: 20 s, stop once performed

This is the procedure

1. Press METHOD > Tab *Cleaning* > EDIT.
2. Select *-Manage cleaning procedure-*

3. Press EDIT.

**Reinigungsprozeduren bearbeiten**

Name

Allgemein **Optionen**

Eingabe

4. Press NEW to create a new cleaning procedure.
5. Enter the name of the cleaning procedure (e.g. *Final cleaning*) and save the name by pressing OK.

**Reinigungsprozeduren bearbeiten**

Name

Endreinigung

Allgemein **Optionen**

Eingabe

Schritt	Baustein	AutoOk

The cleaning procedure *Final cleaning* can then be composed using individual modules.

#### Compose modules

1. Press ADD.

The dialog box with the module types for selection opens.



The cleaning procedure should begin by sucking in the cleaning solution. The next step should then be carried out automatically.

#### Step 1: Peristaltic pump connection

1. Press ADD.
2. Under *Module type*, select the module *Peristaltic pump*.

3. Enter for *Time* 30 s, *Rotation* anticlockwise, *rpm* 50.
4. Activate *Auto-confirmation*.
5. Confirm the entry by pressing OK.

#### Step 2: Pause

The cleaning solution should soak in for 10 s. The hose must then be removed from the cleaning solution, i.e. auto-confirmation must be deactivated.

1. Press ADD.
2. Under *Module type*, select the module *Pause*.

3. Enter *Time* 10s for the pause.
4. Deactivate *Auto-confirmation*, in order to remove the hose from the rinsing vessel before pumping off the cleaning solution.
5. Confirm the entry by pressing OK.

**Step 3: Peristaltic pump**

The liquid should be pumped off after the pause. Auto-confirmation is then activated or deactivated depending on whether the drying unit DS7050 or DS7060 is in use.

- **Activated:** Stop once performed, hose must be reconnected for use with drying unit DS7050.

or

- **Deactivated:** Automatically continue once performed, hoses do not need to be reconnected for use with drying unit DS7060.

1. Press ADD.
2. Under *Module type*, select *Peristaltic pump*.

3. Enter for *Time* 30 s, *Rotation* anticlockwise, rpm 50.

4. Deactivate *Auto-confirmation*, in order that the cleaning procedure stops after 30 s and can only continue with your confirmation.
5. Confirm the entry by pressing OK.

**Step 4: Dry** Once the cleaning solution has been sucked up, the frequency oscillator should be dried.

1. Press ADD.

**Baustein bearbeiten**

Baustein-Typ  
Trocknen

Zeit [s]  
20

Autobestätigung

Abbrechen Ok

2. Select the module type *Dry*.
3. Enter 20 s for *Time*.
4. Activate *Auto-confirmation* to begin the next step automatically once drying is complete.
5. Confirm the entry by pressing OK.

**Save cleaning procedure** 1. Once the cleaning procedure is defined, press OK.

**Reinigungsprozeduren bearbeiten**

Name  
Endreinigung Umbenennen

Allgemein Optionen

Eingabe

Schritt	Baustein	AutoOk
2	Ruhezeit, Zeit = 10 [s]	Ja
3	Schlauchpumpe, Zeit = 30 [s], Richtung = rechts, Drehzahl = 50 [1/min]	Nein
4	Trocknen, Zeit = 20 [s]	Ja
5	Testmessung, danach bei Schritt 4 fortsetzen.	Nein

Hinzufügen  
Bearbeiten  
Entfernen

Abbrechen Löschen Neu Ok

The dialog box is closed and the cleaning procedure is then available in the selection menu.

### 9.8.3 Define cleaning procedure for the autosampler

- Example** The final cleaning of the autosampler should include the following steps:
- **Step 1:** *Sampler: Rinse*, to draw cleaning fluid into the flow cell: Time 30 s, anticlockwise rotation, rpm 50, automatically continues
  - **Step 2:** *Pause*, to soak the cleaning solution in the flow cell: 10 s, automatically continues
  - **Step 3:** *Sampler: Rinse*, to rinse the flow cell with water and empty it: Time 30 s, anticlockwise rotation, rpm 50, automatically continues
  - **Step 4:** *Dry*, to dry the flow cell: 20 s, automatically continues
  - **Step 5:** *Test measurement*, measurement of empty flow cell. The measurement result is examined. If the result is not in the defined range, it should be dried and measured again.

This is the procedure 1. Press METHOD > Tab *Cleaning* > EDIT.

2. Select *-Manage cleaning procedure-* and press EDIT.

3. Press NEW to create a new cleaning procedure.
4. Enter the name of the cleaning procedure (e.g. *AS80 final cleaning*) and save it by pressing OK.

The cleaning procedure *AS80 final cleaning* can then be assembled out of individual modules.

#### Compose modules

1. Press ADD.

The dialog box with the module types for selection opens.

#### Step 1: Sampler: Rinse

The cleaning procedure should begin by sucking in the cleaning solution.

1. Press ADD.
2. Under *Module type*, select the module *Sampler: Rinse*:

3. Enter for *Time* 30 s, *Rotation* anticlockwise, *rpm* 50.
4. Activate *Auto-confirmation* to begin the next step automatically.
5. Confirm the entry by pressing OK.

**Step 2: Pause** The cleaning solution should soak in for 10 s. The next cleaning procedure should then be carried out automatically.

1. Press ADD.
2. Under *Module type*, select the module *Pause*.

3. For the pause, enter *Time* 10 s and activate *Auto-confirmation*.
4. Confirm the entry by pressing OK.

**Step 3: Sampler: Rinse** After the pause, the cleaning solution should be sucked up and the frequency oscillator be rinsed out with water. The next cleaning procedure (*Drying*) should then be carried out automatically.

1. Press ADD.
2. Under *Module type*, select the module *Sampler: Rinse*.

**Baustein bearbeiten**

Baustein-Typ  
Sampler: Nachspülen

Zeit [s] 30 Drehrichtung links Drehzahl [1/min] 50

Autobestätigung

Abbrechen Ok

3. Enter for *Time* 30 s, *Rotation* anticlockwise, *rpm* 50.
4. Activate *Auto-confirmation*, in order for drying to occur automatically after rinsing.
5. Confirm the entry by pressing OK.

**Step 4: Dry** Once it has been rinsed, the frequency oscillator should be dried and then the next step (test measurement) should begin automatically.

1. Press ADD.

**Baustein bearbeiten**

Baustein-Typ  
Trocknen

Zeit [s] 20

Autobestätigung

Abbrechen Ok

2. Enter 20 s for *Time*.
3. Activate *Auto-confirmation* to begin the next step (test measurement) automatically once drying is complete.
4. Confirm the entry by pressing OK.

**Step 5: Define test measurement** After drying, a test measurement should be carried out and it should be dried again if there is an incorrect result.

1. Press ADD.
2. Under *Module type*, select the module *Test measurement*.

**Baustein bearbeiten**

Baustein-Typ  
 Testmessung

Nach Testmessung fortsetzen bei Schritt  
 4: Trocknen

Autobestätigung

Abbrechen Ok

3. Select Step 4: Dry, to dry the frequency oscillator again.
4. Deactivate Auto-confirmation to stop the cleaning procedure.
5. Confirm the entry by pressing OK.

Save cleaning procedure

1. Once the cleaning procedure is defined, press OK.

**Reinigungsprozeduren bearbeiten**

Name  
 AS80 Endreinigung Umbenennen

Allgemein Optionen

Eingabe

Schritt	Baustein	AutoOk
1	Sampler: Spülen, Zeit = 30 [s], Richtung = rechts, Drehzahl = 50 [1/min]	Ja
2	Ruhezeit, Zeit = 10 [s]	Ja
3	Sampler: Nachspülen, Zeit = 30 [s], Richtung = rechts, Drehzahl = 50 [1/min]	Ja
4	Trocknen, Zeit = 20 [s]	Ja

Hinzufügen Bearbeiten Entfernen

Abbrechen Löschen Neu Ok

The dialog box closes. The cleaning procedure is then available for selection in the menu METHOD > Tab Cleaning > Cleaning procedure .



**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. Einst. Sampl. **Reinigung** Opt.

Reinigungsprozedur  
Standard-Zwischenreinigung  
reinigung1  
Standard-Endreinigung  
Trocknen  
Standard-Zwischenreinigung  
AS80 Endreinigung  
-Reinigungsproz. verwalten-

#### 9.8.4 Change cleaning procedures

- This is the procedure
1. Press METHOD > Tab *Cleaning* > EDIT.
  2. Select *-Manage cleaning procedure-*.

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. Einst. Sampl. **Reinigung** Opt.

Reinigungsprozedur  
Trocknen  
keine  
reinigung1  
Standard-Endreinigung  
Trocknen  
-Reinigungsproz. verwalten-

3. Under *Name*, select the cleaning procedure (e.g. *Standard final cleaning*) to be modified.



4. Press EDIT to change the selected cleaning procedure.



5. Select the module to be modified.
6. The module can be modified under EDIT.
7. With ADD you can add further modules to the cleaning procedure

## 9.9 Opt. tab

In Opt. tab, the following additional measurement functions can be activated and/or deactivated:

- Comment
- Quality control
- Automatic printing
- Interval measurement with pause
- Lock method

Open dialog box 1. Click on METHODS > Tab Opt. > EDIT.

The measuring options are displayed:

**Methoden bearbeiten**

Name  
Methode 1

Skala 1 Skala 2 Temp. Einst. Sampl. Reinigung **Opt.**

Messoptionen

Kommentar

Qualitätskontrolle

Automatischer Ausdruck



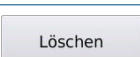

Intervallmessung mit Pause

Methode sperren

Explanatory notes

Measurement options	Explanatory notes
<i>Comment</i>	<p>Prior to the beginning of a measurement, a comment can be manually entered for each sample number or a barcode can be read.</p> <p>The comment and/or barcode are assigned to the relevant sample number and entered in the results list in the <i>Comment</i> column.</p> <p><input checked="" type="checkbox"/> Activated, the comment is entered when the measurement is begun.</p> <p><input type="checkbox"/> Deactivated, if you would not like to make comments, deactivate this function.</p> <p>Results with a comment can then be filtered for printing and exporting.</p>
<i>Quality control</i>	<p><input checked="" type="checkbox"/> Quality control activated.</p> <p>Measurement results will be entered in the result list in the QC column.</p> <p>QC results can then be filtered for printing and exporting.</p>
<i>Automatic printing</i>	<p><input checked="" type="checkbox"/> Once the measurement is complete, the result is automatically printed at a selected printer (SYSTEM &gt; Printer &gt; Printer selection).</p>

Explanatory notes

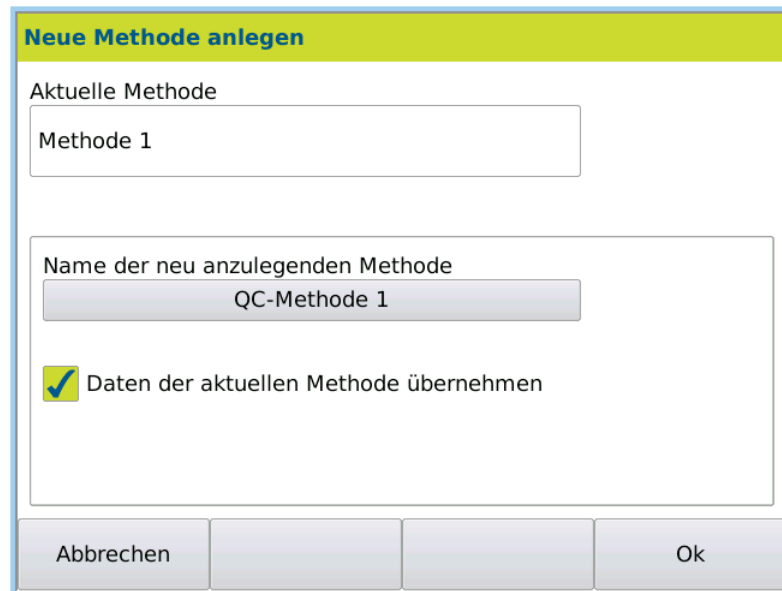
Measurement options	Explanatory notes
<i>Interval measurement can pause</i>	<input checked="" type="checkbox"/> For selected interval measurement, individual measurements are begun with the Measure key.
<i>Lock method</i>	The active method can be disabled. <input checked="" type="checkbox"/> Activated, the current method is disabled and cannot be used for measurements.
Keys	
	The settings are confirmed, the method menu is closed and the start menu is opened.
	The method menu closes without saving the entry and the start menu opens.
	Deletes the current method.
	Creates a new method

### 9.9.1 Measure quality controls

**Objective** In order to be able to specially label and filter measured QC samples in the results list, the QC method must be defined and the measurement option *Quality control* must be activated.


**Define QC method**

1. Access the method for which you would like to measure QC samples.
2. Press EDIT > NEW to create a new method.



3. Enter the name, e.g. **QC method 1**.
4. Activate *Import data of the current method*.  
All parameters from **Method 1** are confirmed.
5. Press OK to save.

**Methoden bearbeiten**

Name  
 QC-Methode 1  Umbenennen

Skala 1 | Skala 2 | Temp. | Einst. | Sampl. | Reinigung | **Opt.**

Messoptionen

Kommentar

Qualitätskontrolle

Automatischer Ausdruck

Intervallmessung mit Pause

Methode sperren

Abbrechen | Löschen | Neu | Ok

6. Click on the Tab *Opt.* > EDIT
7. Activate *Quality control*.
8. Confirm entries by pressing OK.

#### Measure QC samples



1. Access **QC method 1**.

**A.KRÜSS Optronic GmbH - DS7800** 17.05.2015 19:19:23 ?

8 (QC)

Dichte g/cm<sup>3</sup>

 **1.0196**

  Tare

Temperatur: 20.00 °C Methode: QC-Methode 2

System | Methoden | Ergebnisse | Benutzer

2. Start the measurement with the MEASURE KEY.

**Result** The results will be labelled in the result list with QC in the QC column.

**Ergebnisse - 23**

Datum+Zeit	Benutzer	Methode	QC	Probe	Skala1	Mess1	Einheit1	Temp
15.05.2015 18:36:06	Administrator	Methode 1	Normal	12	Dichte	1.0196	g/cm³	
15.05.2015 19:01:33	Administrator	Methode 1	Normal	4	Dichte	1.0196	g/cm³	
17.05.2015 09:35:54	Administrator	Methode 1	Normal	5	Dichte	1.0196	g/cm³	
17.05.2015 09:40:05	Administrator	Methode 1	Normal	6	Dicht...	1.0196	g/cm³	
17.05.2015 19:18:15	Administrator	Methode 1	Normal	7	Dichte 2	2.96	g/cm³	
17.05.2015 19:19:14	Administrator	Methode 2	Normal	8	Dichte	1.0196	g/cm³	
17.05.2015 19:22:27	Administrator	Methode 2	QC	9	Dichte	1.0196	g/cm³	
17.05.2015 19:23:20	Administrator	QC-Methode 2	QC	10	Dichte	1.0196	g/cm³	
17.05.2015 19:23:37	Administrator	QC-Methode 2	QC	11	Dichte	1.0196	g/cm³	

Abbrechen    Export    Drucken    Filter

QC samples can then be filtered for printing and exporting.

**Ergebnisse - 3 ( Filter 'QC-Filter' )**

Datum+Zeit	Benutzer	Methode	QC	Probe	Skala1	Mess1	Einheit1	Temp
17.05.2015 19:22:27	Administrator	Methode 2	QC	9	Dichte	1.0196	g/cm³	2
17.05.2015 19:23:20	Administrator	QC-Methode 2	QC	10	Dichte	1.0196	g/cm³	2
17.05.2015 19:23:37	Administrator	QC-Methode 2	QC	11	Dichte	1.0196	g/cm³	2

Abbrechen    Export    Drucken    Filter



How to filter QC results is described in the chapter Results menu filter QC sample.

## 9.9.2 Disable/release methods

**Objective** You can disable/release access for any method.

**This is the procedure** 1. Click on METHODS > Tab *Opt.* > EDIT.

The measuring options are displayed.

2. Activate and/or deactivate the option *Disable method*.
3. Save the settings by pressing OK.

**Result** The method is/is not available in the selection menu METHOD > *Name* .

## 9.10 Configure peristaltic pump DS7070

The peristaltic pump transports the presented sample into the frequency oscillator. Various throughput speeds are adjustable. Highly viscous liquids should be transported more slowly to avoid air bubbles being transported along with them.

The factory setting values for the pump are as follows:

- Revolution speed: 50 rpm
- Pumping time: 10 s
- Anticlockwise rotation

### 9.10.1 Select sample feeding

1. Access the required method.
2. Select under METHOD > Tab *Sampl.* > EDIT.
3. Select *Sample feeding DS7070*.

The factory setting values are displayed.

With factory setting values, complete filling of the frequency oscillator is usually guaranteed. The pumping time and revolution speed should only be modified where required (e.g. for very viscous samples).

### 9.10.2 Select final cleaning

Once a measurement series is complete or before decommissioning, a final cleaning should be performed.

Where required, this cleaning procedure can be modified and/or newly created.

1. Press METHOD > Tab *Cleaning* > EDIT.
2. Select final cleaning from *Cleaning procedure* .

3. Save the selection by pressing OK.

### 9.10.3 Start final cleaning

Final cleaning is begun as follows:

1. Access the method with the final cleaning selected under tab *Cleaning*.
2. Start the final cleaning under SERVICE > Tab *Functions* > Function *Cleaning*.

The final cleaning selected in the method will be performed.

### 9.10.4 TIP for intermediate cleaning

If you would like to perform intermediate cleaning between measurements, we recommend that you define a method that has an intermediate cleaning procedure as final cleaning.



1. Access the method with intermediate cleaning selected under Tab *Cleaning*.
2. Start the cleaning via SERVICE > Tab *Functions* > Function *Cleaning*.  
The cleaning selected in the method will be performed.

## 9.11 Configure autosampler

---

To work with the autosampler, the sample uptake, type of sample uptake, intermediate cleaning and final cleaning must be defined. All autosampler settings are specific to the method.

### 9.11.1 Sample uptake

---

The speed and time of sample uptake are defined with the pumping parameters.

The factory setting values for the pump are as follows:

- Revolution speed: 50 rpm
- Pumping time: 10 s
- Counter-clockwise rotation

The pumping time and revolution speed should only be modified where required (e.g. for very viscous samples).

### 9.11.2 Method: Select sample feeding

---

1. Access the required method via METHOD.
2. Select under METHOD > Tab *Sampl.* > EDIT.
3. Select *Sample feeding* autosampler.

The factory setting values are displayed.

With factory setting values, complete filling of the frequency oscillator is usually guaranteed. The pumping time and revolution speed should only be modified where required (e.g. for very viscous samples).

### 9.11.3 Method: Select intermediate cleaning

---

If the frequency oscillator requires cleaning between individual measurements, intermediate cleaning must be selected in the current method.

1. Access the required method via METHOD.
2. Select under METHOD > Tab *Sampl.* > EDIT.
3. Select *Sampler mode* > *Intermediate cleaning* .
4. Select the required intermediate cleaning from *Intermediate cleaning procedure* .

#### 9.11.4 Method: Select final cleaning

---

1. Access the required method via METHOD.
2. Select under METHOD > *Tab Cleaning* > EDIT.
3. Select the required final cleaning under *Cleaning procedure* .

There are pre-defined factory-set cleaning procedures for final cleaning.

#### 9.11.5 Start final cleaning

---

Final cleaning is begun as follows:

1. Access the method with the final cleaning selected under tab *Cleaning*.
2. Start the final cleaning under SERVICE > *Tab Functions* > Function *Cleaning*.

The final cleaning selected in the method will be performed.

## Chapter 10 - System menu

All device settings are adjusted in the system menu.  
The system settings can be defined for all users or user-specifically.

### 10.1 General tab

The general settings are:

- Date and time
- Date format
- Time format
- Language
- Decimal marker
- LCD brightness
- Temperature unit (Celsius/Fahrenheit)

The date and the time are globally assigned. All other settings can be user-defined where required.

**Permission** General system settings may **only** be modified by users with administrator permissions.

#### 10.1.1 Access system menu

This is the procedure 1. Press SYSTEM.

The system menu opens.

2. To make changes, press EDIT.

The fields for editing are now in Edit mode.

3. Choose the required settings and save the selection by pressing OK.

### 10.1.2 Explanatory notes

Settings	Explanatory notes
<i>Date and time</i>	Date and time selection menu (global setting)
<i>Date format</i>	The required date format is selected via a selection list. <ul style="list-style-type: none"> <li>• dd.MM.yyyy,</li> <li>• dd/MM/yyyy,</li> <li>• dd-MM-yyyy</li> <li>• MM/dd/yyyy</li> </ul>
<i>Time format</i>	The required time format is selected via a selection list. <ul style="list-style-type: none"> <li>hh:mm:ss</li> <li>hh:mm:ss ap</li> <li>hh.mm.ss</li> </ul>
<i>Language</i>	The required language is selected via a selection list. German/English/French/Spanish/Italian/Portuguese
<i>Decimal marker</i>	The decimal marker is selected via a selection list. Full stop or comma.
<i>LCD brightness</i>	LCD brightness adjustment slider (25% to 100%).
<i>Temperature</i>	Temperature unit selection: °Celsius (° C) or °Fahrenheit (°F).
Export	Exports system settings.
Drucken	Prints system settings on the configured printer.
OK	The settings are accepted, the system menu is closed and the start menu opens.
Abbrechen	The system menu closes without saving the input and the start menu opens.

### 10.1.3 Set date

This is the procedure 1. Click SYSTEM > EDIT > Date.

The date selection calendar opens.



2. Click on the current date.
3. Save the selection by pressing OK.

### 10.1.4 Set time

This is the procedure 1. Click SYSTEM > EDIT > Time.

The selection menu opens.



2. Select the hours, minutes and seconds.
3. Save the selection by pressing OK.

### 10.1.5 Select the date and time format

- This is the procedure
1. Click SYSTEM > EDIT.
  2. Open the selection menu *Date format and/or time format*.
  3. Select the *Date format and/or time format*.
  4. Save the selection by pressing OK.

### 10.1.6 Adjust screen brightness

- This is the procedure
1. Click SYSTEM > EDIT > *LCD brightness*.
  2. Change the brightness with the slider.
  3. Save the selection by pressing OK.

### 10.1.7 Select temperature unit

- This is the procedure
1. Click SYSTEM > EDIT.
  2. Open the selection menu *Temperature measurement* and choose the temperature unit
  3. Save the selection by pressing OK.
  4. Select the relevant settings using the selection lists and save the selection by pressing OK.

## 10.2 Printer tab

The printers are:

- Serial ASCII printer
- Network printer
- PDF file

### Permission

All printer settings may **only** be modified by users with administrator permissions. The printer settings may be global or user-defined.



For user-specific settings, the option *Activate user administration and Individual system settings* must be activated under SYSTEM > Tab Opt..

### 10.2.1 Access printer menu

This is the procedure 1. Press SYSTEM > Tab *Printer*.

The printer menu opens:

2. To make changes, press EDIT.

The fields for editing are now in Edit mode.

### 10.2.2 Define serial interface for printer

An ASCII printer can be connected to the serial interface.

### This is the procedure

1. Press SYSTEM > Tab *Printer* > EDIT.
2. Select from *Printer selection* > *Serial ASCII printer*.

**Systemeinstellungen bearbeiten**

Benutzerprofil

Allgemein Bearbeiten

Allg. **Drucker** Funktionen Netzwerk Service Opt.



Druckerauswahl  
 Serieller ASCII-Drucker ▼

Baudrate: 9600 ▼      Daten-Bits: 8 ▼      Stoppbits: 1 ▼

Parität: Keine ▼      Xon / Xoff: Nein ▼

Abbrechen   Ok

3. Select the relevant settings using the selection lists and save the selection by pressing OK.

Serial ASCII printer	An ASCII printer of your choice can be connected to the serial interface.
Baud rate	2400/4800/9600/19200/38400/57600/115200
Data bits	7/8
Stop bits	1/2
Parity	None/odd/even
Xon / Xoff	Software protocol on/off
	The settings are accepted, the system menu is closed and the start menu opens.
	The system menu closes without saving the input and the start menu opens.

### 10.2.3 Define network printer

- This is the procedure
1. Press SYSTEM > Tab Printer > EDIT.
  2. Select from Printer selection > Network printer.



3. Select the relevant settings using the selection lists and save the selection by pressing OK.

Network printer	The data is printed out via the network printer.
Page layout	Selection menu of pre-defined and user-defined formats. <b>Pre-defined formats:</b> <ul style="list-style-type: none"> <li>– DIN A3 landscape</li> <li>– DIN A4 portrait</li> <li>– DIN A4 landscape</li> <li>– Letter portrait</li> <li>– Letter landscape</li> <li>– Legal portrait</li> <li>– Legal portrait</li> </ul> <b>User-defined:</b> Input of width and height in mm.
Queue and IP address	Input window for queue and IP address.
Print method	Selection menu: direct/buffered direct = page is printed immediately buffered = the page is only printed when it is full.
File format	Selection menu: PDF/PS (PostScript)
Width [mm]	Input in mm (for selection Page layout > User-defined).
Height	Input in mm (for selection Page layout > User-defined).
Logo	Logo (for print-out) from factory setting or imported from USB stick. Selection menu: <ul style="list-style-type: none"> <li>– Factory setting = Krüss logo.</li> <li>– -USB stick import- = Imports the logo in jpg or png format from a USB stick.</li> </ul>
OK	The settings are accepted, the system menu is closed and the start menu opens.
Abbrechen	The system menu closes without saving the input and the start menu opens.





## 10.2.4 Define PDF file

This is the procedure

1. Press SYSTEM > Tab Printer > EDIT.
2. Select from Printer selection > PDF file.

3. Select the relevant settings using the selection lists and save the selection by pressing OK.

PDF file	The data is filed in a PDF file on printing.
Page layout	Selection menu of pre-defined and user-defined formats. <b>Pre-defined formats:</b> <ul style="list-style-type: none"> <li>– DIN A3 landscape</li> <li>– DIN A4 portrait</li> <li>– DIN A4 landscape</li> <li>– Letter portrait</li> <li>– Letter landscape</li> <li>– Legal portrait</li> <li>– Legal portrait</li> <li>– Legal portrait</li> </ul> <b>User-defined:</b> Input of width and height in mm.
Save location	Selection menu: <ul style="list-style-type: none"> <li>– USB stick = the PDF file is saved on the USB stick.</li> <li>– Network release = the PDF file is saved on the released network drive.</li> <li>– /tmp = the PDF file is saved in the TEMP folder.</li> </ul>
Print method	Selection menu: direct/buffered
Width	Input in mm (for selection Page layout > User-defined).
Height	Input in mm (for selection Page layout > User-defined).
Logo	Logo (for print-out) from factory setting or imported from USB stick. Selection menu: <ul style="list-style-type: none"> <li>– Factory setting = Krüss logo.</li> <li>– -USB stick import- = Imports the logo in jpg or png format from a USB stick.</li> </ul>

	The settings are accepted, the system menu is closed and the start menu opens.
	The system menu closes without saving the input and the start menu opens.

### 10.2.5 Add logo for print-out

---

**Conditions** Only in *Printer selection: PDF file/Network printer*

**This is the procedure**

1. Press SYSTEM > Printer > EDIT
2. Select the desired option from Logo (Factory setting or Import from USB stick).
3. Confirm the selection by pressing OK.

## 10.3 Funktions tab

Device functions are accessed in the *Functions* tab. Before these functions can be defined and/or used, they must be assigned to keys.

There are 2 keys in the main menu and 6 keys in the function menu for this allocation.

The keys in the function menu can be allocated once and the keys in the main menu may be allocated multiple times.

The keys in the main menu are pre-defined in the factory settings. They can be modified at any time.

### Permission

The **assignment** of functions to keys and the **definition** of functions may be carried out by users with administration rights.

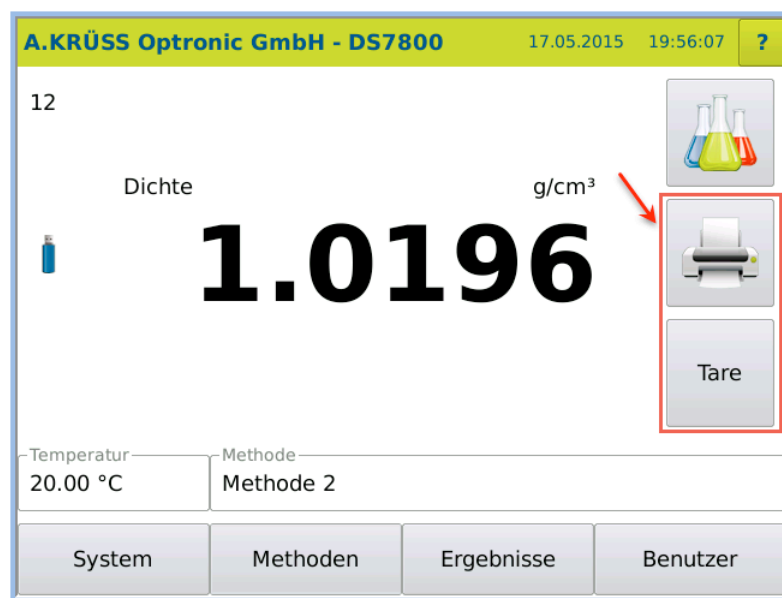
The functions may be defined globally or specifically to the user.



For user-specific settings, under SYSTEM > Tab Opt., the option *Activate user administration* and *Individual system settings* must be activated.

### Keys in main menu

Pre-defined allocation in factory settings for the two main menu keys:



### Keys in function menu

Example of allocation of six keys in the function menu SYSTEM > Tab Functions:



### 10.3.1 Access function menu

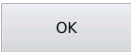
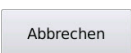
This is the procedure 1. Press SYSTEM > Tab *Functions* > EDIT.



The available functions may be found in selection mode.

### 10.3.2 Available functions

Available functions	Explanatory notes
<i>User: Log off</i>	Logs the user off.
<i>Tare</i>	For the calculation of an offset (tare) which is then automatically included in the result calculation. For this purpose, the target value (g/cm <sup>3</sup> ) of the present sample is entered together with the number of measurements with which the sample is to be measured. A mean value is calculated from the measurements and the difference between the measured result and the target value is calculated. This difference is then automatically taken into account in all future sample measurements.
<i>Peristaltic pump</i>	The following actions may be performed with the peristaltic pump: <ul style="list-style-type: none"> <li>• <i>Stop</i></li> <li>• <i>Start</i></li> <li>• <i>Start left</i></li> <li>• <i>Start right</i></li> <li>• <i>Start Stop</i></li> </ul>
<i>Air pump</i>	The following actions may be performed with the dry pump: <ul style="list-style-type: none"> <li>• <i>Stop</i></li> <li>• <i>Start</i></li> <li>• <i>Start Stop</i></li> </ul>
<i>Cleaning</i>	Performs the cleaning procedure that is selected in the current method.
<i>Print: Result</i>	The function triggers printing. This is not required if printing occurs automatically.

Available functions	Explanatory notes
<i>Print: Result details</i>	The function triggers printing of the result details.
<i>Scales: Manage</i>	Opens the <i>Scales</i> submenu for editing scales.
<i>Methods: Cleaning</i>	Opens the method menu for the selection of pre-defined cleaning procedures. New cleaning procedures can be defined via <i>-Manage cleaning proc.-</i> . See the chapter <b>Methods menu</b> .
<i>System: Printer</i>	Opens the submenu for editing printer settings.
<i>System: Functions:</i>	Opens the function window with the available functions and defined keys. It is helpful to be able to access all function keys directly from the main menu.
	The settings are accepted, the system menu is closed and the start menu opens.
	The system menu closes without saving the input and the start menu opens.

### 10.3.3 Assign function keys

The example explains how the function *Cleaning* in the **function window** is assigned to a key.

This is the procedure 1. Press SYSTEM > Tab *Functions* > EDIT.

The available functions may now be found in selection mode.



2. Click on the function *Cleaning*, for example.

The following selection window opens:

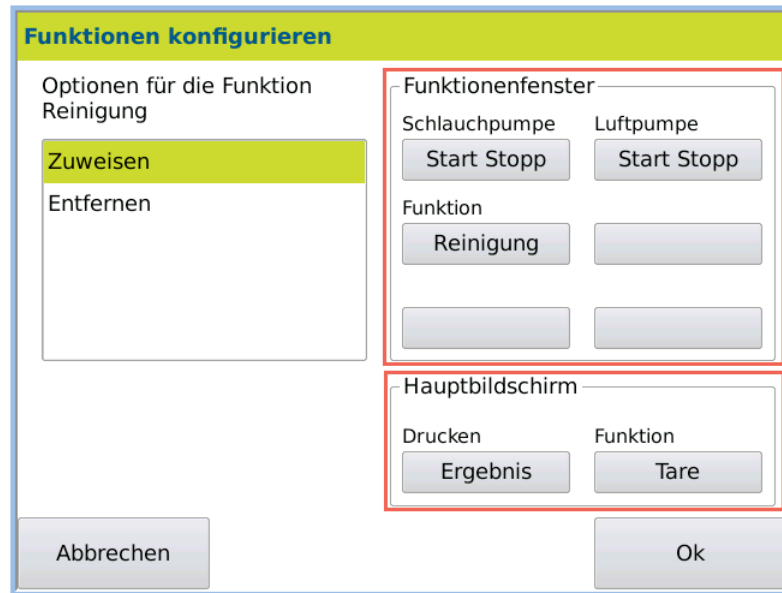




If you would not like to assign the selected function to any key, click in the grey field next to the small selection window. The small selection window closes.

3. To assign the function *Cleaning* to a key, click on ASSIGN.

The key selection window in the **function window** and in the **main screen** will open.

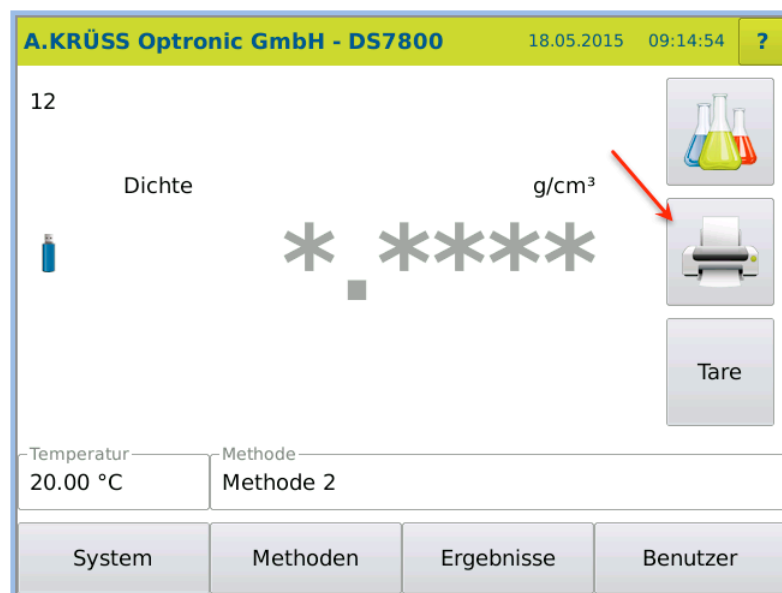


4. Select the option *Assign*.
5. Click on a key in the *Function window*.
6. Confirm the entry by pressing OK.

**Result** You may now access the function *Cleaning* in the function window under SYSTEM > Tab *Functions*.

### 10.3.4 Allocate function keys multiple ways

**Objective** Both main screen keys can also be allocated multiple functions. In the example, the function *Cleaning* is also allocated to the PRINT (Result) key.



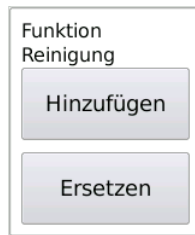
- This is the procedure
1. Press SYSTEM > Tab *Functions* > EDIT.
  2. Select *Cleaning*.

The following selection window opens:

3. To assign a function to a key, click on ASSIGN.

4. Select the option *Assign* in the next window and click on the key to be overwritten **RESULT**.

A small dialog box will open where you can determine whether the key is being allocated with multiple functions or whether the new function replaces the old function.



ADD	Multiple allocation of the selected key.
REPLACE	Overwrite the selected key.

5. Click on the required option (ADD/REPLACE).
6. Save the selection by pressing OK.

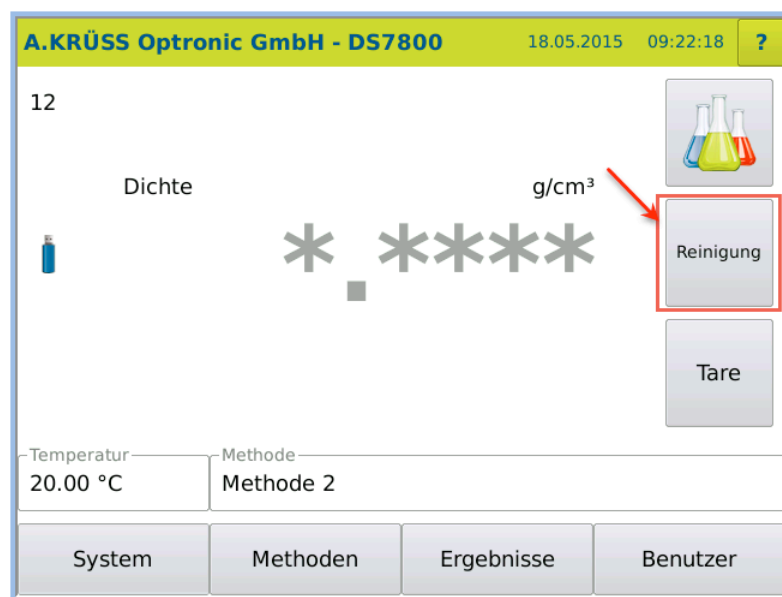
Result of multiple allocation

Results for ADDITION > **Multiple allocation:**



Result of key replacement

Results for REPLACE > **Printer key:**





### 10.3.5 Delete key function

**Objective** The function of a user-defined key can be deleted.

**This is the procedure** 1. Press SYSTEM > Tab *Functions* > EDIT.

The function menu opens in edit mode:

2. Select the function to be deleted, e.g. cleaning.

A small selection window opens:

3. Click on ASSIGN.

The small selection window closes and the options dialog box opens.

4. Select the option *Remove* and click on the function to be deleted.

5. Confirm the entry by pressing OK.

**Result** The function *Cleaning* on the key is deleted.

## 10.4 Network tab

The following network settings are possible:

- IP address
- DHCP client
- Subnet mask
- Gateway
- LIMS device name

**Permission** The network settings may **only** be modified by users with administrator permissions.

**This is the procedure** 1. Press SYSTEM > Tab *Network* > EDIT.

The function menu opens in edit mode:

Parameters	Explanatory notes
DHCP client	<p><b>dynamic:</b> No additional input necessary. The IP address is assigned automatically when a DHCP server is active in the network.</p> <p><b>static:</b> <i>Input:</i></p> <ul style="list-style-type: none"> <li>• IP address</li> <li>• Subnet mask</li> <li>• Gateway</li> </ul>
LIMS device name	Input the device name for the LIMS (laboratory information and management system).
<input type="button" value="OK"/>	The settings are accepted, the system menu is closed and the start menu opens.
<input type="button" value="Abbrechen"/>	The system menu closes without saving the input and the start menu opens.

## 10.5 Service tab

In the Service tab, the following functions can be performed:

- Tare
- Measurement calibration
- Firmware update
- Run SQL script
- Remote monitoring

**Permission** Device settings and functions may **only** be modified by users with administrator permissions.

### 1.1.1 Access service menu

1. Press SYSTEM > Tab Service > EDIT

The service menu opens in edit mode:

**Systemeinstellungen bearbeiten**

Benutzerprofil

Allgemein Bearbeiten

Allg. | Drucker | Funktionen | Netzwerk | **Service** | Opt.

Tare [g / cm<sup>3</sup>] Firmware Datenbank

7.101 7.016

Messwertjustierung API-Version Eco-Version

4.200 6.165





SQL-Skript Fernwartung

ausführen verbinden

Abbrechen   Ok

### 1.1.1 Service explanatory notes

Parameters	Explanatory notes
Tare	For the calculation of an offset (tare) which is then automatically included in the result calculation. For this purpose, the target value (g/cm <sup>3</sup> ) of the present sample is entered together with the number of measurements with which the sample is to be measured. A mean value is calculated from the measurements and the difference between the measured result and the target value is calculated. This difference is then automatically taken into account in all future sample measurements.

Parameters	Explanatory notes
<i>Measurement calibration</i>	The density meter is calibrated using the measurement calibration. A measurement calibration is carried out in order to enable correct measurements and to remove systemic measurement deviations. For measurement calibration, two measurements are taken: First measuring point: empty sample space (air) Second measuring point: Water (degassed)
<i>Firmware</i>	The key shows the current version. The key starts the software update from a USB stick. The new software is emailed to you by the manufacturer. There are firmware updates for: <ul style="list-style-type: none"> <li>• Operating interface</li> <li>• Measurement module.</li> </ul>
<i>Database</i>	Database version information field.
<i>API version</i>	Information field
<i>Eco version</i>	Information field
<i>SQL script</i>	With an SQL script, you can expand the data stock of the device (e.g. new methods) or correct it. The SQL script is run using a connected USB stick. If the log file is activated, all SQL script actions are recorded in a log file on the USB stick.
<i>Remote monitoring</i>	Remote monitoring of the device is possible via an internet connection. Krüss has no right of access to the data.
	The system menu closes without saving the input and the start menu opens.
	Exports system settings.
	Prints system settings.
	The settings are accepted, the system menu is closed and the start menu opens.

### 1.1.2 Calculate tare

**Permission** The tare can **only** be calculated and modified by users with administrator permissions.

**This is the procedure** 1. Press SYSTEM > Tab Service > EDIT > Tare [g/cm<sup>3</sup>].

The control value and measurement number input dialog box will open:

**Tare**

Sollwert in g/cm<sup>3</sup>                      Anzahl Messungen

**0.0**    **10**

Füllen Sie die Probe in die Messzelle und drücken Sie "Messen".

Abbrechen                      Löschen                      Messen

2. Enter the sample control value in g/cm<sup>3</sup> and the number of measurements.
3. Fill the sample into the frequency oscillator.
4. Press MEASURE.  
The measurements are carried out and the tare offset is calculated and displayed.

**Tare**

Tare Offset in g/cm<sup>3</sup>

**0.9803**

Drücken Sie "Speichern", um den berechneten Offsetwert zu übernehmen.

Abbrechen                      Speichern

5. Save the value by pressing SAVE.  
The result is saved provisionally with the date and time.

**Systemeinstellungen bearbeiten**

Benutzerprofil  
Allgemein Bearbeiten

Allg. Drucker Funktionen Netzwerk Service **Opt.**

Tare [g / cm<sup>3</sup>] ↖ 0.9803 Firmware 7.101 Datenbank 7.016

Messwertjustierung API-Version 4.200 Eco-Version 6.165

SQL-Script ausführen Fernwartung verbinden

Abbrechen   Ok

6. Press OK to save the value permanently.  
A previously saved tare value will be overwritten.
7. Press CANCEL if the result should not be saved.  
The previously saved blank value is then retained.

**Result** This tare value is taken into account in the calculation for all measurement results.

### 7.1.1 Delete tare

An existing tare value can be deleted.

- This is the procedure**
1. In the main menu, press TARE.
  - or
  2. Press SYSTEM > TabService > EDIT> TARE.
  3. Click on DELETE.  
The tare value will be set to zero.
  4. Press SAVE.
  5. Press OK to delete the value permanently.

**Result** The tare value is set to zero.

### 5.1.1 Measurement calibration

**General information** A measurement calibration is carried out in order to enable correct measurements and to remove systemic measurement deviations.  
For measurement calibration, two measurements (air and water) are taken, in order to calculate the deviation.



**Note!**

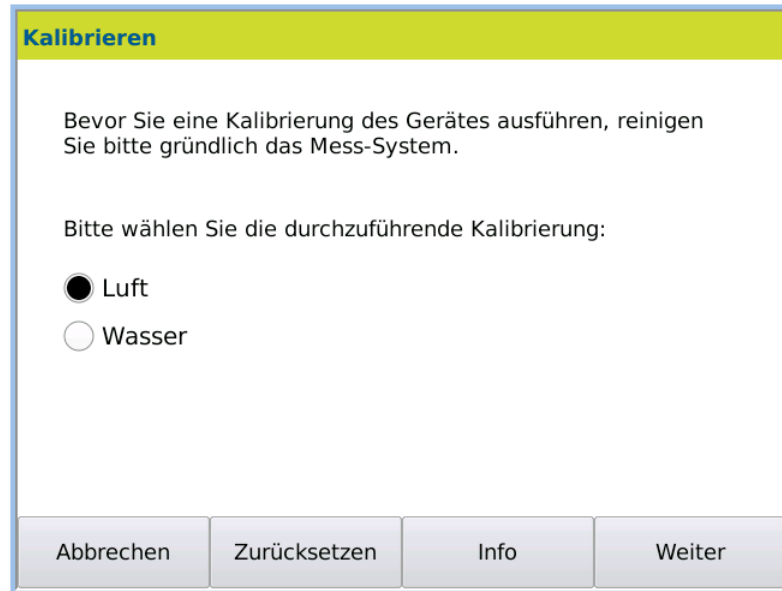
The frequency oscillator must be very accurately tempered in order to achieve a precise measurement.

For temperature control, the currently measured temperature is constantly displayed during tempering.  
The temperature display differs as follows:

Temperature display	
<b>Red</b>	The measured temperature lies <b>above</b> the target temperature.
<b>Blue</b>	The measured temperature lies <b>below</b> the target temperature.
	Measured temperature = target temperature.

This is the procedure 1. Press SYSTEM > Tab Service > EDIT > Measurement calibration.

The dialog box for measurement calibration opens:



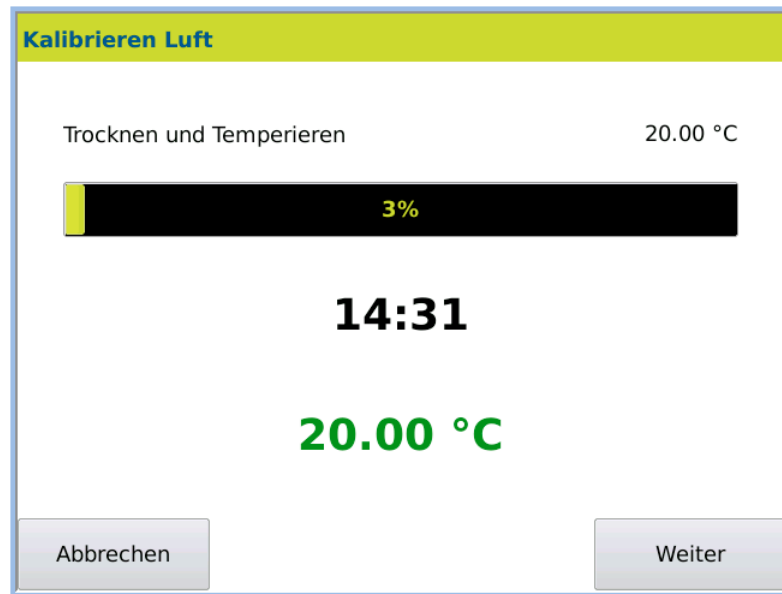
Keys	Explanatory notes																																	
Air / water	Option Air or Water. Results for air and water must be present for the calculation																																	
	Starts measurement calibration.																																	
	<p>Opens a window with the previous calibration results.</p> <p><b>Kalibrierinformationen</b></p> <p><b>Letzte Kalibrierung</b></p> <table border="1"> <tbody> <tr> <td>Kalibrierpunkt Wasser</td> <td>=</td> <td>1.01965</td> </tr> <tr> <td>Temperatur Wasser</td> <td>=</td> <td>20.00000</td> </tr> <tr> <td>Kalibrierpunkt Luft</td> <td>=</td> <td>1.01965</td> </tr> <tr> <td>Temperatur Luft</td> <td>=</td> <td>20.00000</td> </tr> <tr> <td>Steigung</td> <td>=</td> <td>=2245012278000000.00000</td> </tr> <tr> <td>Offset</td> <td>=</td> <td>=-2289126769000000.0000</td> </tr> <tr> <td>Datum</td> <td>=</td> <td>21.05.2015 15:37</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Datum+Zeit</th> <th>Benutzer</th> <th>Offset</th> <th>Steigung</th> </tr> </thead> <tbody> <tr> <td>21.05.2015 15:37:11</td> <td>Administrator</td> <td>-2289130000000000.00000</td> <td>22450100000000</td> </tr> <tr> <td>21.05.2015 15:11:22</td> <td>Administrator</td> <td>-2289130000000000.00000</td> <td>22450100000000</td> </tr> </tbody> </table> <p>Under TABLE the results can be selected and printed in a sorted manner. Close the window by pressing OK .</p>	Kalibrierpunkt Wasser	=	1.01965	Temperatur Wasser	=	20.00000	Kalibrierpunkt Luft	=	1.01965	Temperatur Luft	=	20.00000	Steigung	=	=2245012278000000.00000	Offset	=	=-2289126769000000.0000	Datum	=	21.05.2015 15:37	Datum+Zeit	Benutzer	Offset	Steigung	21.05.2015 15:37:11	Administrator	-2289130000000000.00000	22450100000000	21.05.2015 15:11:22	Administrator	-2289130000000000.00000	22450100000000
Kalibrierpunkt Wasser	=	1.01965																																
Temperatur Wasser	=	20.00000																																
Kalibrierpunkt Luft	=	1.01965																																
Temperatur Luft	=	20.00000																																
Steigung	=	=2245012278000000.00000																																
Offset	=	=-2289126769000000.0000																																
Datum	=	21.05.2015 15:37																																
Datum+Zeit	Benutzer	Offset	Steigung																															
21.05.2015 15:37:11	Administrator	-2289130000000000.00000	22450100000000																															
21.05.2015 15:11:22	Administrator	-2289130000000000.00000	22450100000000																															
	<p>The values are set to Gradient = 1,00000000 and Offset = 0,00000000. By pressing SAVE the previous values are deleted and the above settings are applied.</p>																																	



Keys	Explanatory notes
Abbrechen	Cancels the process and closes the window.

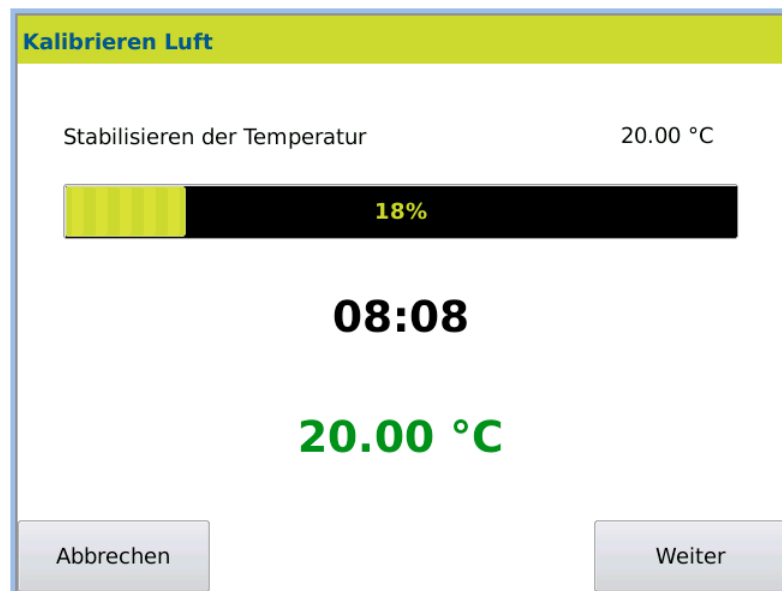
**Measure air**

1. Clean the frequency oscillator very carefully.
2. Select *Air* in the dialog window.
3. Press NEXT, to start the *air calibration* .  
First, the frequency oscillator is dried and tempered.



4. If the target temperature (**green**) has been reached, press NEXT.

Subsequently a window is opened in which the *Temperature stabilisation* can be followed.



5. Press NEXT once the temperature is stable.  
The measurement begins.

**Kalibrieren Luft**

Messung mit Luft

Messung 3

**1.01965 g/cm<sup>3</sup>**

Temperatur                      Luftdruck

**20.00 °C**                      **1023 hPa**

Abbrechen                      Weiter

The air value is measured and the result is displayed.

**Kalibrieren Luft**

**Ergebnis der Kalibrierung**

Luftdruck	=	1023
Temperatur Luft	=	20.00
Sollwert Luft	=	0.00121567
Messwert Luft	=	1.01965000
Anzahl Messungen	=	10

Kann Zweipunktkalibrierung nicht durchführen.  
Kalibrierpunkt für Wasser ist nicht vorhanden.

Abbrechen                      Speichern

6. Press **SAVE**, to apply the measurement values.

**Systemeinstellungen bearbeiten**

Benutzerprofil

Allgemein Bearbeiten

Allg. Drucker Funktionen Netzwerk Service **Opt.**

Tare [g / cm<sup>3</sup>] Firmware Datenbank

21.05.2015 14:09 0.9803 7.101 7.016

Messwertjustierung API-Version Eco-Version

Kalibrierpunkt Wasser fehlt 4.200 6.165

SQL-Script Fernwartung

ausführen verbinden

Abbrechen   Ok

## Measure water

**Important!**

The water must be free of air bubbles to ensure a correct measurement.

2. Click *Measurement calibration*  
CALIBRATION POINT WATER MISSING is displayed on the button, for as long no water value is present.
3. Select *Water* and press NEXT.
4. Enter the water target temperature.
5. Press NEXT.

If the measured temperature has reached the target value (**green**) and the temperature is stable:

6. Press NEXT.  
The measurement begins.

**Kalibrieren Wasser**

Messung mit Wasser

Messung 2

**1.01965 g/cm<sup>3</sup>**

Temperatur

**20.00 °C**

Abbrechen Weiter

After the measurement is complete the window with the calculated *Offset* and *Gradient* values is opened.

**Kalibrieren Wasser**

**Ergebnis der Kalibrierung**

Temperatur Wasser	=	20.00
Sollwert Wasser	=	0.99820140
Messwert Wasser	=	1.01965000
Anzahl Messungen	=	10
Steigung	=	2245012277886263.50000
Offset	=	-2289126769146728.0000

Abbrechen Speichern

7. Apply the values with SAVE.

**Systemeinstellungen bearbeiten**

Benutzerprofil

Allgemein Bearbeiten

Allg. | Drucker | Funktionen | Netzwerk | Service | Opt.

Tare [g / cm <sup>3</sup> ]	Firmware	Datenbank
21.05.2015 14:09    0.9803	7.101	7.016
Messwertjustierung	API-Version	Eco-Version
21.05.2015 15:11	4.200	6.165
	SQL-Script	Fernwartung
	ausführen	verbinden

Abbrechen Ok

8. Apply the values permanently using OK.

**Result** The density meter is calibrated.

## 10.6 Perform firmware update

**Condition** The new device software is sent to you by email.

**This is the procedure**

1. Set up the "update" directory on your USB stick.
2. Add the files sent to you by email to the "update" directory.



**Save result data!**

The database can be overwritten during an update. All results are then deleted.

➤ Save and/or export your result data **before** the firmware update.

3. Press SYSTEM > Tab Service > EDIT.

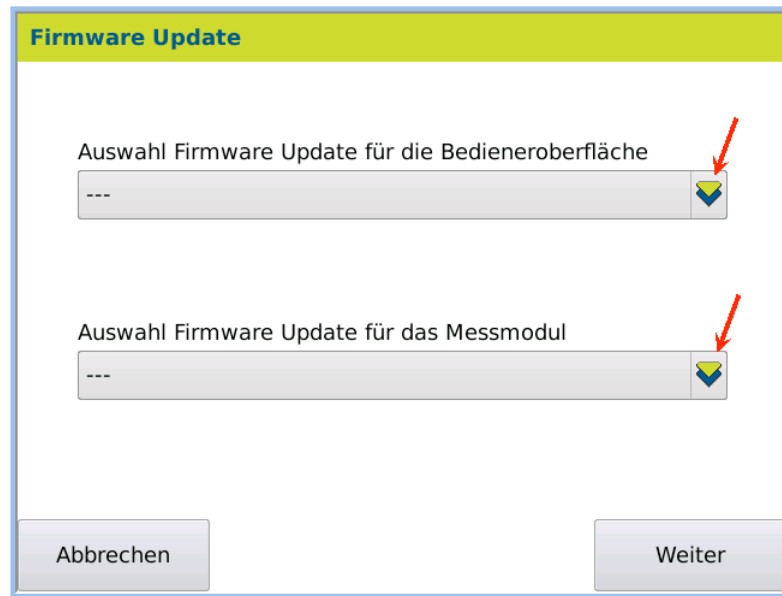
The screenshot shows the 'Systemeinstellungen' (System Settings) dialog box. The 'Service' tab is selected, and the 'Firmware' field is highlighted with a red box, showing the value '7.101'. Other fields include 'Allgemein', 'Datenbank', 'API-Version', 'Eco-Version', 'SQL-Skript', and 'Fernwartung'. The dialog box has a yellow header and a grey footer with buttons for 'Abbrechen', 'Export', 'Drucken', and 'Ok'.

4. Press the key *Firmware*.

The *Firmware Update* dialog box will open.

5. Connect the USB stick with the new software to your device.  
6. Press NEXT.

The update selection dialog box:



7. Select firmware updates.
8. Begin the firmware update by pressing START.

The firmware update will be performed.



**Do not switch off device!**

During the update, the device has no functional program to restart.

- Do NOT turn off the device during the firmware update!

9. Wait until the process is complete.  
Once the update is complete, a result report will be displayed.

**Upon completion**

1. Press OK.
2. Remove the USB stick.
3. Restart the device.

**Result**

The device is now ready with the new device software for further measurements. The software version is displayed via SYSTEM > Service > Firmware or in the main menu under ? .

### 10.6.1 Run SQL script

**Function objective**

Running an SQL script can modify the device's data storage e.g. new methods can be added or existing ones can be corrected.



Only run scripts if you are sure that they come from the manufacturer.

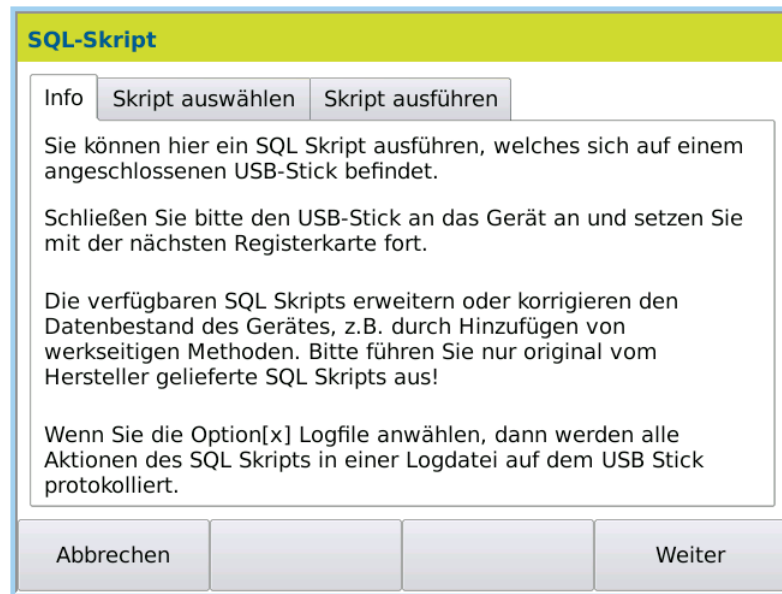
**This is the procedure**

Before running an SQL script, please create a directory on a USB stick called "SQL" and copy the script to there.

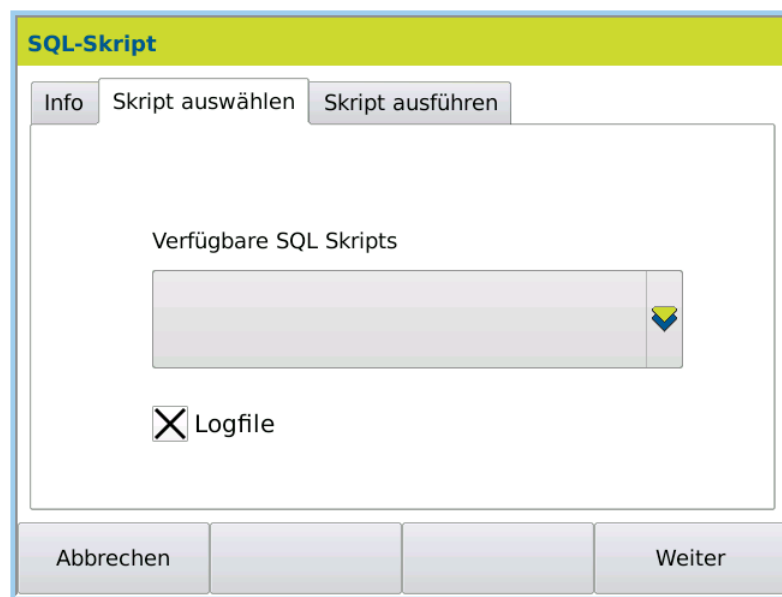
**Select script**

1. Press SYSTEM > Tab Service > RUN SQL SCRIPT.

The SQL Script dialog box opens.



2. Click NEXT or the tab *Select script*.
- If you would like the script run to be recorded in a log file on the USB stick:
3. Activate *Logfile* [X]



- Run script**
4. Connect the USB stick with the SQL script to the device.
  5. In the selection menu *Available SQL scripts*, select the required script from the USB stick.
  6. Click on the tab *Run script*.
  7. To begin the data transfer, press NEXT.  
The script will be run and the data transferred.

**Result** The transferred data is then available.

## 10.7 Opt. tab

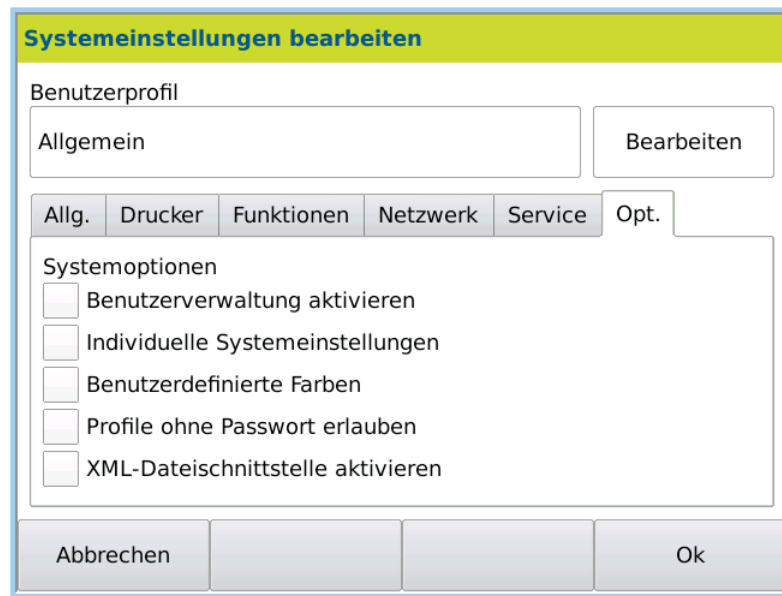
The following functions can be activated in the *Opt.* tab:

- Activate user administration
- Individual system settings
- User-defined colours
- Enter profile without password
- Activate XML file interface

**Permission** The system options may **only** be modified by users with administrator permissions.

**This is the procedure** 1. Press SYSTEM > Tab *Opt.* > EDIT.

The Option menu opens:



System options	Explanatory notes
<i>Activate user administration</i>	<input checked="" type="checkbox"/> activated, user administration is activated. The user must log in to the device with their name and their password where necessary. <input type="checkbox"/> deactivated, logging into the device is not required.
<i>Individual system settings</i>	<input checked="" type="checkbox"/> activated, system settings can be user-defined and changed. These system settings then only apply to the current user. This option can only be activated when user administration is also activated. <input type="checkbox"/> deactivated, system settings apply for all users ( <i>User profile: General</i> ).
<i>User-defined colours</i>	<input checked="" type="checkbox"/> activated. <input type="checkbox"/> deactivated.
<i>Allow profile without password</i>	<input checked="" type="checkbox"/> activated. All users can work with the device by logging in without entering a password. <input type="checkbox"/> deactivated, profiles must be created with a password.



System options	Explanatory notes
Activate XML file interface	<input checked="" type="checkbox"/> activated <input type="checkbox"/> deactivated.
<input type="button" value="OK"/>	The settings are accepted, the system menu is closed and the start menu opens.
<input type="button" value="Abbrechen"/>	The system menu closes without saving the input and the start menu opens.

### 1.1.1 Activate user administration

User administration can be activated and/or deactivated.

If user administration is activated, the device can only be operated via login (name and password).

If user administration is deactivated, it is not necessary to log in to the device.

This is the procedure 1. Press SYSTEM > Tab *Opt.* > EDIT.

2. Activate *User administration*.

**Result** If you have activated user administration for the first time, you will be asked to create an administrator password. Then, the user must log in to the activated user administration with their name and password.

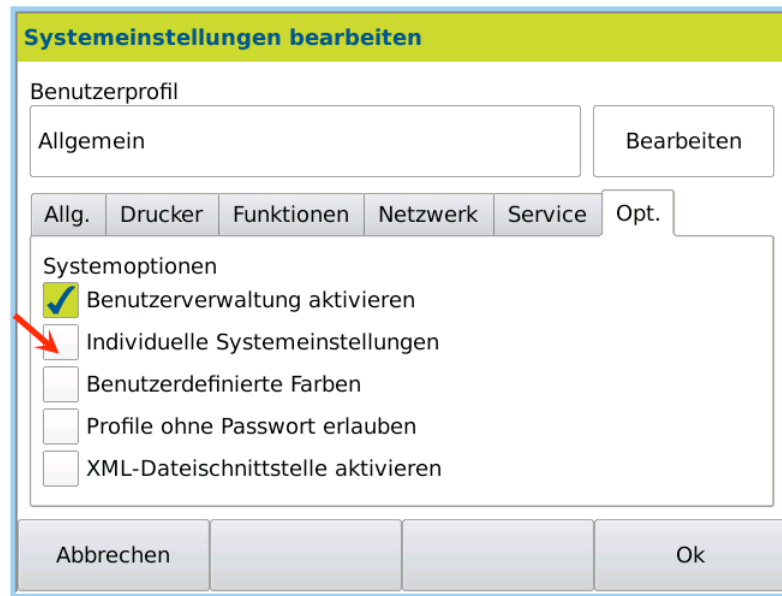
### 2.1.1 Individual system settings

The *Individual system setting* enables implementing, changing and saving user-specific settings.

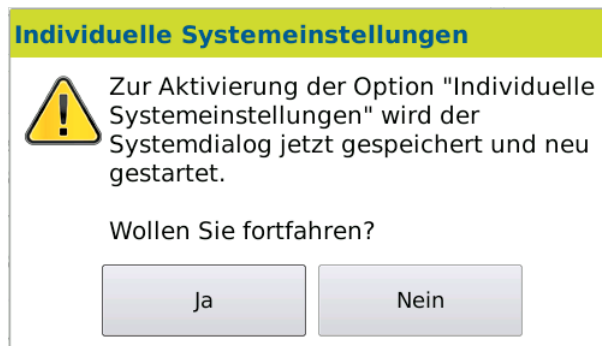


The *Individual system settings* option can only be activated when the *User administration* option is also activated.

This is the procedure 1. Press SYSTEM > Tab *Opt.* > EDIT.  
2. Activate *User administration*.



3. Activate *Individual system settings*.  
A dialog box opens asking if you would like to continue:



4. Press YES if you would like to activate the *Individual system settings*.

**Result** The *User profile* changes from the user *General* to the logged-in user (for example, the administrator).



Now all settings in the system menu, with the exception of the date and time, can be user-defined, changed and saved.

## 10.8 Audit Trail

The audit trail is available since firmware version 7.214.

The device contains an audit trail function. This function offers a computer-generated and timestamped recording off all changes which are relevant for the measurement or the system when using the device. The logged history is stored safely and is neither editable nor erasable.

When the audit trail is activated, both the settings at the time of a measurement and the measurement result itself are traceable in combination with the result menu.

### 10.8.1 Activating the audit trail

The audit trail can be activated and deactivated in the system setting menu. To do this administrator rights are needed.

This is the procedure 1. Press *System* > Tab *Opt.* > *Edit*.

The screenshot shows a dialog box titled "Edit system settings". At the top, there is a "User profile" section with a "General" tab and an "Edit" button. Below this is a tabbed interface with tabs for "Gen.", "Printer", "Functions", "Network", "Service", and "Opt.". The "Opt." tab is selected, revealing a "System options" section with the following settings:

- Activate user administration
- Use individual system settings
- Activate Audit-Trail
- Comment Audit-Trail-Log
- Activate LIMS interface

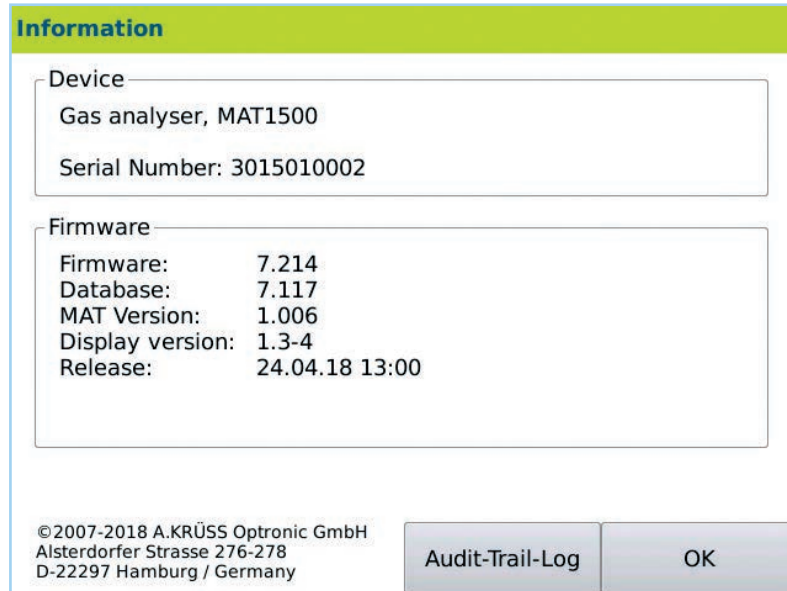
At the bottom of the dialog, there are "Cancel" and "OK" buttons.

2. The system option *Activate Audit-Trail* activates or deactivates the audit trail.
3. The system option *Comment Audit-Trail-Log* activates or deactivates the comment option of the audit trail. If this option is activated, every audit trail log entry has to be commented.
4. To confirm the activation press OK

## 10.8.2 Opening the audit traillog

To access the audit trail log the window for the device information has to be selected. Only users with administrator rights have access to the audit trail log.

This is the procedure 1. Press the icon ? within the start screen > *Audit-Trail-Log*.



## 10.8.3 Recorded content

Each entry of the audit trail saves ten specific values. These values offer an unambiguous assignment of the changes.

Audit-Trail-Log									
ID	Menu	Object	Register	Field	old value	new value	Comment	User	Date+time
1	System	General	Opt.	Acti...	No	Yes		System	30.04.2018 15:03:33

The audit trail entries are sorted automatically by their IDs. The newest entry will be shown first.

The following table shows the meaning of the columns used in the audit trail log.

Value	Meaning
<i>ID</i>	A unique entry identifier. The consecutive number starts by 1.
<i>Menu</i>	The name of the menu where the setting can be found.
<i>Object</i>	The name of the object to which the setting belongs.
<i>Register</i>	The name of the tab where the setting can be found.
<i>Field</i>	Name of the setting.
<i>old value</i>	The old option for the setting.
<i>new value</i>	The new option for the setting.

Value	Meaning
<i>Comment</i>	An annotation about the setting changes entered by the user. Available only if the commentary feature is enabled in the system options.
<i>User</i>	The name of the user who was logged in and made the change.
<i>Date+time</i>	The timestamp when the change was saved.

#### 10.8.4 Functionality of the entry creation

Changing the settings within the menus System, Methods or User by pressing OK and returning to the start screen causes an entry in the audit trail.

If more than one change was made, an appropriate number of entries will be generated in the audit trail.

If a new object is created (Method, Scale, User, etc.) every possible setting for the object will be saved in the audit trail log.

Erasing an object leads to a single entry in the audit trail. Only the process of erasing will be saved.

Cancel refuses all changes. No change will be saved in the audit trail log.

If one setting is changes several times before clicking OK, only the last state will be saved in the audit trail log.

The following example shows the audit trail entry for changing the date format.

Audit-Trail-Log									
ID	Menu	Object	Register	Field	old value	new value	mm	User	Date+time
2	System	General	Gen.	Format of date	dd.MM.yyyy	dd-MM-yyyy	Date	G...	30-04-2018 15:12:04

## 10.8.5 Printing or exporting the audit trail log

If a printer is configured (network or PDF file), the audit trail log can be printed or exported. Printing or exporting the audit trail log will always result in a complete audit trail log. It is not possible to print parts of the audit trail log.

Printing the audit trail log is not supported by the serial ASCII printer.

Only users with administrator rights can view the audit trail log, hence administrator permission is needed for printing the audit trail log.

1. Press the icon ?
2. Press *Audit-Trail-Log*.

Audit-Trail-Log							
ID	Menu	Object	Register	Field	old value	new value	Comment
33	System	General	Opt.	Activate user administration	No	Yes	User
32	System	User2	Functions	Main screen 2			User
31	System	User2	Functions	Main screen 1		Print: Result	User
30	System	User2	Functions	Function window 6			User
29	System	User2	Functions	Function window 5			User
28	System	User2	Functions	Function window 4			User
27	System	User2	Functions	Function window 3			User
26	System	User2	Functions	Function window 2			User
25	System	User2	Functions	Function window 1			User
24	System	User2	Printer	Xon/Xoff		Nein	User
23	System	User2	Printer	Parity		None	User
22	System	User2	Printer	Stop bits		1	User

Cancel      Export      Print      OK

- Printing**
1. Press *Print*
  2. If *PDF file* is selected as the active printer, the name of the file has to be entered

- Export**
1. Press *Export*.
  2. Choose CSV or HTML as file format.
  3. Enter the name of the file.

Audit-Trail-Log							
ID	Menu	Object	Register	Field	old value	new value	Comment
33	System	General	Opt.	Activate user administration	No	Yes	User
32	System	User2	Functions	Main screen 2			User
31	System	User2	Functions	Main screen 1		Print: Result	User
30	System	User2	Functions	Function window 6			User
29	System	User2	Functions	Function window 5			User
28	System	User2	Functions	Function window 4			User
27	System	User2	Functions	Function window 3			User
26	System	User2	Functions	Function window 2			User
25	System	User2	Functions	Function window 1			User
24	System	User2	Printer	Xon/Xoff			User
23	System	User2	Printer	Parity			User
22	System	User2	Printer	Stop bits			User

**File format selection**

CSV file (Excel)

HTML file (WEB browser)

Cancel      Export      Print      OK

## Chapter 11 - Results menu

All measured values are saved in the results list. The user can select what appears in this results list. The list can be exported and printed completely or in filtered form. Filters can be user-defined and saved.

This chapter deals with the following topics:

- Access results menu
- Access result details
- Create results list
- Filter results according to time period
- Filter results
- Define, change and access filters
- Filter QC samples
- Export results
- Print results

### 11.1 Access results menu

1. Press RESULTS.

The results are sorted and displayed according to date. Which data (columns) are displayed can be individually defined.

Ergebnisse - 7							
Datum+Zeit	Benutzer	Methode	Probe	Skala1	Mess1	Einheit1	Temp [°C]
26.11.2014 19:01:32	Administrator	Methode 1	4 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:47:51	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:47:06	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:46:54	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 17:40:48	Administrator	Methode 1	3 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
23.11.2014 11:32:18	Administrator	Methode 1	2 Dichte	1.0196	g/cm <sup>3</sup>	20.00	
21.11.2014 11:52:02	Administrator	Methode 1	1 Dichte	1.0196	g/cm <sup>3</sup>	20.00	

Buttons: Abbrechen, Export, Drucken, Filter

Keys	Explanatory notes
Filter	Opens a dialog box for filtering, sorting and displaying measurement results.
Export	Exports the selected results from the results list onto a USB stick in the formats <i>CSV file (Excel)</i> , <i>HTML file (web browser)</i> or <i>PDF file</i> .
Drucken	Prints the selected results from the results list depending on the selected printer.
Abbrechen	The system menu closes without saving the entry and the start menu opens.

## 11.2 Access result details

The details of a measurement result, one-shot measurement results and the corresponding raw values and statistics are accessed as follows.

- This is the procedure
1. Press RESULTS.
  2. Double-click on the required result row.

Info	Auswahl	Filter
Details	Alles auswählen	Startwert
	Zurücksetzen	Endwert
		Zurücksetzen

3. In the selection menu, click DETAILS.


The overview results data are displayed.

Ergebnis Detailanzeige		
Übersicht	Einzelwert	Statistik
Gruppen ID Messung	=	17
Datum + Uhrzeit	=	17.05.2015 09:35:54
Benutzername	=	Administrator
Methodenname	=	Methode 1
Probennummer	=	5
1: Dichte	=	1.0196 g/cm <sup>3</sup>
Temperatur	=	20.00 °C
Messmodus	=	Intervall 5 x 3 s

Abbrechen		Export	Drucken
-----------	--	--------	---------

- Display individual values
4. Click on the *Individual value* tab.



Ergebnis Detailanzeige					
Übersicht		Einzelwert		Statistik	
Datum+Zeit	Nr.	Rohwert1	1: Dichte	Temp [°C]	
17.05.15 09:35:42	1	1.0196	1.0196	20.00	
17.05.15 09:35:45	2	1.0196	1.0196	20.00	
17.05.15 09:35:48	3	1.0196	1.0196	20.00	
17.05.15 09:35:51	4	1.0196	1.0196	20.00	
17.05.15 09:35:54	5	1.0196	1.0196	20.00	

Abbrechen      Export      Drucken

Display statistics      5. Click on *Statistics* tab.

Ergebnis Detailanzeige					
Übersicht		Einzelwert		Statistik	
Anzahl Messungen	=				5
Mittelwert 1: Dichte	=				1.0196
Standardabw. 1: Dichte	=				0.0000
Rauschen 1: Dichte	=				0.0000
Mittelwert Temp [°C]	=				20.00
Standardabw. Temp	=				0.000
Rauschen Temp	=				0.000

Abbrechen      Export      Drucken

## 11.3 Create results list

### 11.3.1 Sort results list in descending or ascending order

- This is the procedure
1. Press RESULTS > FILTER.  
The filter menu will open.

Sortieren Letztes Ergebnis am Ende	Aktiver Filter
Anzeige Spalten konfigurieren	Zuletzt verwendete Filter QC
	Weitere Filter...
	Filter zurücksetzen

2. Click under *Sort* on the key LAST RESULT AT START or LAST RESULT AT END.  
The results will be listed in the desired order.

### 11.3.2 Configure results columns

It is possible to select which data appears in the results list.








- This is the procedure
1. Press RESULTS > FILTER > CONFIGURE COLUMNS.  
The column selection dialog box opens.
  2. Click on the required field in the *Available fields* pane.

**Ergebnisse - Spalten konfigurieren**

Verfügbare Felder		Ausgewählte Felder
Probenserie	↑	Datum+Zeit
Skala2	↑	Benutzer
Mess2	↓	Methode
Einheit2	↓	Probe
Luftdruck	↓	Skala1
Solltemp [°C]	→	Mess1
TC1	→	Einheit1
TC2	→	Temp [°C]
<input type="checkbox"/> Einzelmessungen		<input type="checkbox"/> Alle Felder
Abbrechen		Standard
		OK

3. Use the arrow key to move the marked field into the *Selected fields* pane.
4. Save the selection by pressing OK.

**Result** The target temperature will be displayed in the results list.

Display/keys	Explanatory notes
<i>Available fields</i>	Displayed here are the remaining available fields which were not selected for the output.
<i>Selected fields</i>	Selected fields are displayed for the results output.
 	Moves the highlighted field up/down in the order of the results columns in the results output.
 	Moves the highlighted field to the other window, left or right.
<i>One-shot measurements</i>	<input checked="" type="checkbox"/> activated.
<i>All fields</i>	<input checked="" type="checkbox"/> activated. All available fields are selected for the results output and are moved into the right-hand window.
	Resets the <i>Selected fields</i> to the standard selection.
	The settings are confirmed, the dialog box closes and the results menu opens.
	The dialog box closes without saving the input and the result menu opens.

## 11.4 Filter results according to time period

### 11.4.1 Select time period

To select a time period in the results list, a *Start value* and an *End value* are determined as required.

This is the procedure

1. Press RESULTS.
2. Double-click on the first result row to be shown.

The following selection window opens:

Info	Auswahl	Filter
		
		
		

3. Click on START VALUE.  
All results from this start value are displayed.
4. Double-click on the last result to be shown.
5. In the selection window, click END VALUE.

**Result** The results in the selected area are displayed.  
The displayed results can then be printed using PRINT and exported using EXPORT

## 11.4.2 Reset time period

---

- This is the procedure
1. Press RESULTS > FILTER.
  2. In the selection window, click RESET.

The period is reset and all results are displayed again.

## 11.5 Filter results

---

If only certain results from the results list are to be shown, the results can be filtered according to the following criteria:

- according to date and time (from - until)
- according to methods
- according to users
- according to text in comment field
- QC results only
- last sample series only

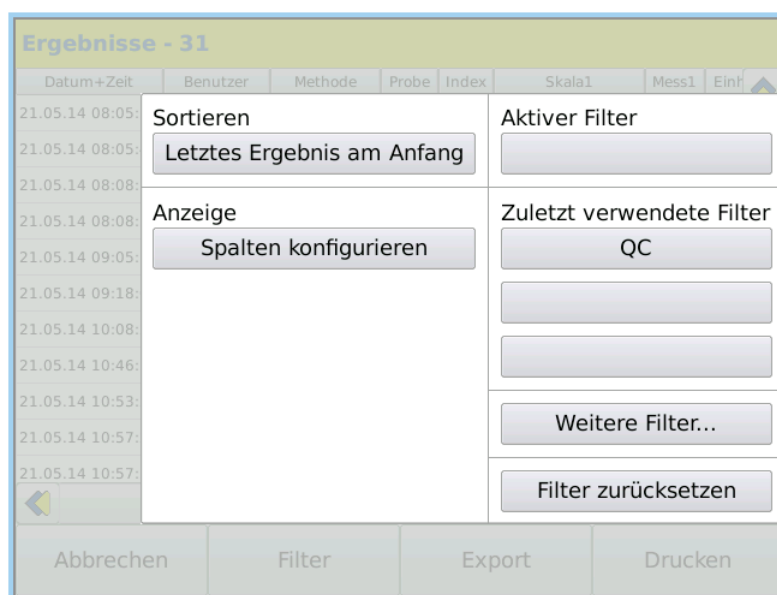
The defined filters can be saved and accessed again when required.

### 11.5.1 Open filter menu

---

1. Press RESULTS > FILTER.

The filter menu will open.



### 11.5.2 Filter menu functions

Display/keys	Explanatory notes
<i>Sort</i>	Sorts results according to date in ascending or descending order.
<i>Display</i>	Selection of data columns for result output.
<i>Active filter</i>	Displays the active filter. The filter must be previously defined for this display.
<i>Last filters used</i>	Shows the last filter used. Three keys can be set up to enable rapid access. Additional defined filters can be accessed under ADDITIONAL FILTERS.
<i>Additional filters</i>	Opens the dialog box <i>Results data filter</i> , in which data filters can be defined according to <i>Date+Time</i> , <i>Method+User+Text</i> , <i>Quality control</i> and <i>Last sample series</i> .
<i>Reset filter</i>	Resets the active filter.

## 11.6 Define, change and access filters

Filters can be user-defined and are available to all users.

### 11.6.1 Access filters

This is the procedure      Defined filters are accessed as follows:

1. Press RESULTS > FILTER.

The filter selection dialog box will open.



2. Select the required filters using the keys or *Additional filters* .

Under ADDITIONAL FILTERS..., **all** defined filters are displayed via the selection menu:



3. Click on the required filter and confirm the selection by pressing OK.

**Result** The filter is loaded and active.

## 11.6.2 Define and save filter

It is possible to define and save different filters.  
The saved filters can be accessed again when required.

**This is the procedure** 1. Press RESULTS > FILTER > ADDITIONAL FILTERS.

The data filter dialog box will open:

2. To define a new filter, press EDIT > NEW.

The dialog box *Create new results filter* opens:

3. Enter the filter name under *Name of the new results filter to be created*.
4. Tick the box if you would like to *Accept current filter adjustment*.
5. Save the entry by pressing OK.

The filter options input dialog box opens.

**Ergebnisse - Datenfilter bearbeiten**

Name  
Kontrollwerte

Datum+Zeit Benutzer+Methode+Text Weitere Filter

Zurücksetzen von 01.10.2014 00:00:00

bis 10.10.2014 23:59:00

6. Click on the required tabs and select the options.

Tab	Explanatory notes
<i>Date+Time</i>	Filter results according to date and time.
<i>User+Method+Text</i>	Filter results according to user, method and comment text.
<i>Additional filters</i>	Filter quality controls and last sample series.

7. Save the newly defined data filter by pressing OK.

**Result** The new filter is loaded and active. The new filter is then available for selection via RESULTS > FILTER.

**Ergebnisse - Datenfilter**

Name  
Kontrollwerte

QC

Filter Datum  
Kontrollwerte 00:00:00

bis 10.10.2014 23:59:00



### 11.6.3 Filter according to date and time

The results are to be displayed for a certain time period or date.

- This is the procedure**
1. Press RESULTS > FILTER > ADDITIONAL FILTERS...
  2. Click on the tab *Date + Time*.
  3. Click on EDIT.

**Result** The required results are displayed.

4. Click on the keys *from.. until* and enter the date and time.
5. Confirm the entry by pressing OK.

The results in the selected time period are displayed.

### 11.6.4 Filter according to user, method and comment

If results from only one user, one method or one special comment are to be displayed, select the following filter options.

- This is the procedure**
1. Press RESULTS > FILTER > ADDITIONAL FILTERS...
  2. Click on the tab *User+Method+Text*.
  3. Click on EDIT.

4. Select the required *User*, *Method* and/or *Text in comment field*.
5. Confirm the selection by pressing **OK**.

### 11.6.5 Filter QC samples

**Conditions** Only QC results should be displayed.  
In order to be able to filter QC results, quality control must be activated under **METHODS > Tab Opt.**

**This is the procedure**

1. Press **RESULTS > FILTER > ADDITIONAL FILTERS...**
2. Click on the tab *Additional filters*.
3. Click on **EDIT**.

4. Activate the check box *Quality control*.
5. Confirm the entry by pressing **OK**.

**Result**

The QC results are displayed.

## 11.6.6 Filter last sample series

The results in the last measured sample series can be displayed as follows.

- This is the procedure
1. Press RESULTS > FILTER > ADDITIONAL FILTERS...
  2. Click on the tab *Additional filters*.
  3. Click on EDIT.

4. Activate the check box *Last sample series*.
5. Confirm the entry by pressing OK.

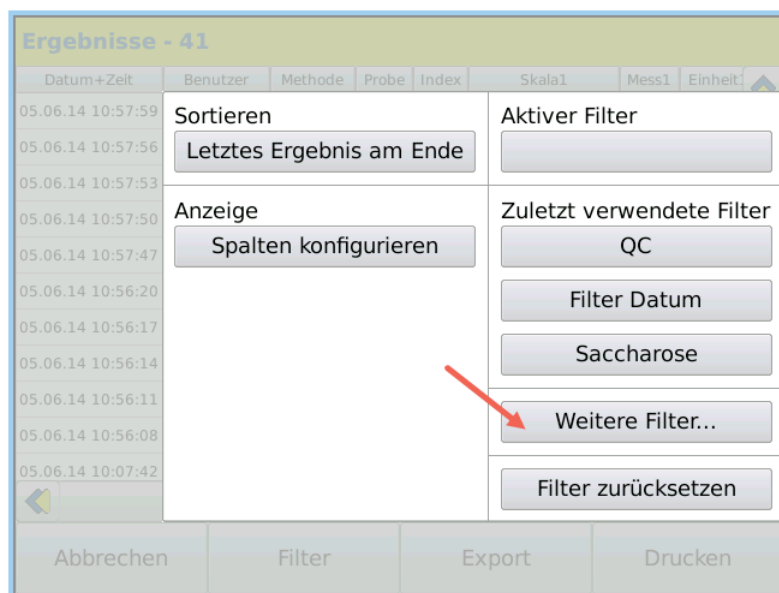
**Result** The results of the last sample series are displayed.

## 11.6.7 Edit existing filters

Existing filters may be modified.

- This is the procedure
1. Press RESULTS > FILTER.

The filter selection dialog box will open.



2. Click on ADDITIONAL FILTERS... > EDIT.

The dialog box *Edit data filter* opens:



3. Select the filter to be modified under *Name*.
4. Click on the tabs and select the required options.
5. Save the entry by pressing OK.

**Result** The filter is modified and saved.

### 11.6.8 Reset existing filter

An active filter can be reset at any time without the filter being deleted from the filter list.

- This is the procedure
1. Press RESULTS > FILTER.  
The filter selection dialog box opens.
  2. Click on RESET FILTER.

Result The active filter is reset and all of the results in the result list are displayed again.

## 11.7 Export results

All individual or filtered measurement results can be transferred to a USB stick.

1. Connect the USB stick to the device.
2. Press RESULTS to open the results list.
3. Filter the required results via > FILTER.
4. Press EXPORT and select the export format (CSV/HTML file).

The screenshot shows a table titled 'Ergebnisse - 20' with the following columns: Datum+Zeit, Benutzer, Methode, Probe, Skala1, Skala2, QC, and Einheit. The table contains 10 rows of data. An 'Auswahl Dateiformat' dialog box is open over the 'Export' button, showing two options: 'CSV-Datei (Excel)' and 'HTML-Datei (WEB-Browser)'. The 'Export' button is highlighted in the dialog box.

Datum+Zeit	Benutzer	Methode	Probe	Skala1	Skala2	QC	Einheit
04.10.2014 19:39:03	Administrator	Methode 1	1 Opt. Rotation			Normal	°
04.10.2014 19:39:18	Administrator	Methode 1	2 Opt. Rotation			Normal	°
04.10.2014 19:42:31	Administrator	Methode 1	3 Opt. Rotation			Normal	°
04.10.2014 19:45:01	Administrator	Methode 1	4 Opt. Rotation			Normal	°
04.10.2014 19:46:54	Administrator	Methode 1	5 Opt. Rotation			Normal	°
04.10.2014 19:49:38	Administrator	Methode 1					
04.10.2014 19:49:44	Administrator	Methode 1					
04.10.2014 19:50:31	Administrator	Methode 1					
05.10.2014 17:00:37	Administrator	QC-Methode 1					

5. Give the export file a different name from the one suggested where necessary.
6. Save the entry by pressing OK.

The export takes place. The selected results are exported to the USB stick in the selected format.



#### Important note!

Remove the USB stick only after export is complete. Only then are the exported results securely saved on the USB stick.

## 11.8 Print results

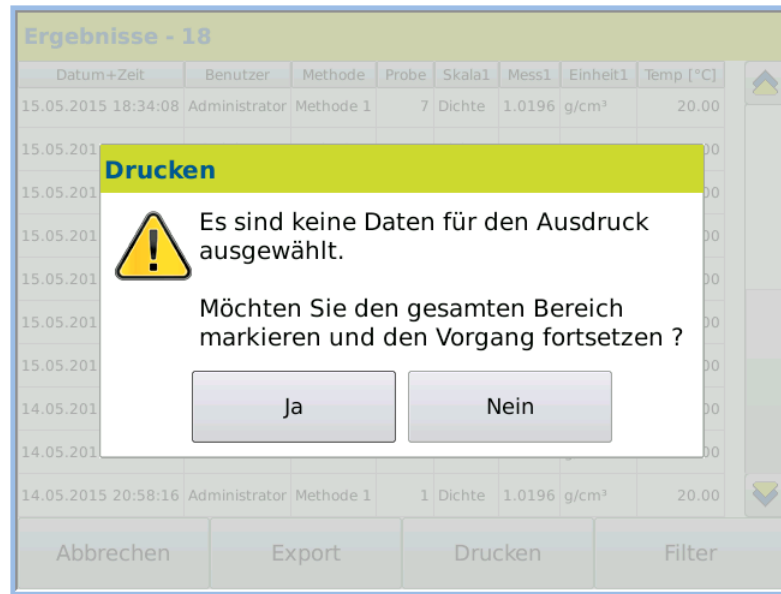


Only marked results are printed.

This is the procedure

1. Press RESULTS.
2. If required, filter the results to be printed.
3. Mark the results to be printed.
4. Press PRINT.

If you have not marked any results, the following dialog window opens:



5. Press YES to print all results displayed in the results menu.
6. Press NO to cancel the printing process.  
Subsequently you can mark the results to be printed and start the printing process afresh.

The selected results are printed on the defined printer.

## Chapter 12 - User menu

User administration allows user-specific device operation. Depending on the user settings, the user can log in with or without a password.

**Permission** All user settings may **only** be modified by users with administrator permissions.



Users can only be defined if under SYSTEM > Tab Opt. > Activate user administration is activated.

### 12.1 User menu overview



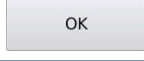

#### 12.1.1 Access user menu

1. Press USER.

The user menu opens with the settings of the current user.

#### 12.1.2 Explanatory notes

Settings	Explanatory notes
Name	Name and selection menu of pre-defined users.
<b>Tab</b>	
General	Dialog box for <ul style="list-style-type: none"> <li>• New user creation.</li> <li>• Display of all relevant information about the user.</li> <li>• Key to log a user out.</li> </ul>
Colours	The background and text colour selection dialog box opens.

Settings	Explanatory notes
Options	User options for the selected user: <ul style="list-style-type: none"> <li>• Block user</li> <li>• Block after 3 login attempts</li> <li>• Reset password</li> </ul>
Keys	
	Exports user settings.
	Prints user settings on the configured printer.
	The settings are accepted, the user menu is closed and the start menu opens.
	The user menu closes without saving the input and the start menu opens.

## 12.2 General tab




Open dialog Press USER > Tab General.

The user menu opens with the settings of the current user.



General tab		
Permission	Selection menu: Administrator/User/Guest	
	Administrator	The user with <b>administrator</b> rights has permissions for all functions.
	User	<b>Users</b> can take measurements, select methods and operate all results functions. They cannot <b>alter</b> method settings <b>or</b> system settings.



<i>Login</i>	Shows the name of the current user. The name can be changed using the key. The key opens the input window for a new login name.	
<i>Valid until</i>	Selection window: <i>unlimited/establish date of validity.</i>	
	<i>unlimited</i>	Validity unlimited.
	<i>Establish date</i>	If the permissions are intended to be valid only for a limited period, a period of validity can be entered.
<i>Password</i>	The key opens the input window for a <b>new</b> password.	
<i>last logged in on</i>	The user last logged in at this time.	
<i>Failed login attempts</i>	Information on the number of failed login attempts by the current user.	
	Current user logs out. The login window for the next user opens. This is only shown if activated under SYSTEM > Tab Opt. > Activate user administration.	
	A new user is created.	
	In Edit mode, the selected user can be deleted following prior security prompt.	

### 12.2.1 Create new user

The following parameters must be defined for each user:

- Name
- Login name
- Password
- Minimum password length
- Permission
- Validity



Users can only be defined if under SYSTEM > Tab Opt. > Activate user administration is activated.

This is the procedure

1. Press USER > Tab General > EDIT
2. Press NEW to define a new user.

The user name entry dialog box opens.

**Eingabe neuer Benutzername**

musterfrau|

^	1	2	3	4	5	6	7	8	9	0	ß	←
↔	q	w	e	r	t	z	u	i	o	p	ü	+
↓	a	s	d	f	g	h	j	k	l	ö	ä	#
↑	y	x	c	v	b	n	m	,	.	-	↵	
Abbrechen	ALT							←	→	OK		

- Enter the *user name* and *login name*.  
The following info window is displayed:

**Neuer Benutzer angelegt**

**i** Ein neuer Benutzer  
musterfrau  
wurde erfolgreich angelegt.

OK

- Confirm the defined user by pressing OK.  
The user is created.

**Benutzer bearbeiten**

Name  
musterfrau

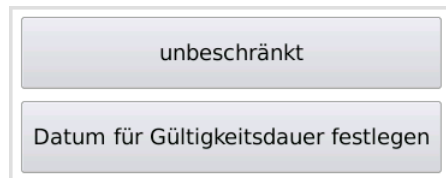
Allgemein

Berechtigung  Login  Gültig bis

Zuletzt angemeldet am  Passwort

Fehlgeschlagene Login-Versuche

- Click on *Permission* and select *Permission (User or Administrator)*.
- Click on *Valid until*.



7. Select either *unlimited* or enter the *duration of validity*.
8. Confirm entries by pressing OK.

The user is completely defined.

## 12.2.2 Log in with or without password

---

The password is entered by the user themselves when they first log in.



If a user profile is to be able to work with the device without entering a password, the following option must be activated: SYSTEM > Tab Opt. > *Allow profile without password*.

## 12.2.3 Change password

---

The password can be changed by the user themselves at any time.

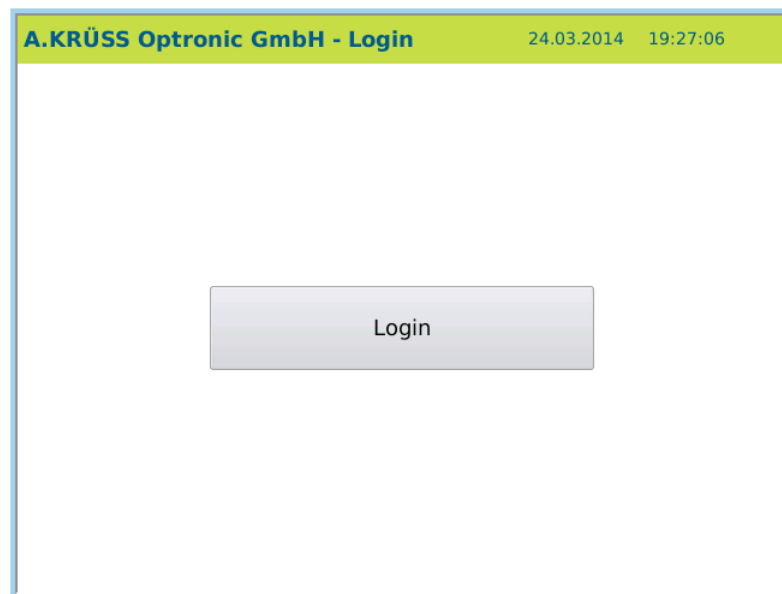
1. Press USER > Tab *General* > EDIT.
2. Click on PASSWORD and enter the new password.
3. Save the new password by pressing OK.

## 12.2.4 Logging users in and out

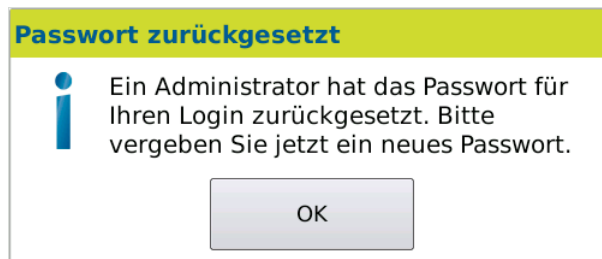
---

**Condition** User administration must be activated: SYSTEM > Tab Opt. > *Activate user administration*.

**Log in** | Once the device is switched on and/or when a user logs out, the following dialog box appears:



On the first login, the user is asked to define a password:



1. Press OK.
2. Enter your personal password.  
For security, the password must be entered again.

The password is saved. The user name and password are then requested when logging in on subsequent occasions.



After 3 login attempts, the user is blocked. The blocked user can only be reset by the administrator under USER > Tab *Options* .

- Log off**
1. Press USER > LOG OFF.

The user is logged off and the login window for new user login opens.

## 12.2.5 Edit user

**Condition** The user can only be edited by the administration.

**This is the procedure**


1. Press USER > Tab *General*.
2. Under *Name* , select the user to be edited and press EDIT.

The dialog box for user settings can be found in Edit mode.

3. Change the required settings and save the input by pressing OK.

## 12.3 Colour tab

There are two pre-defined settings for the colour scheme of the display. Additional user-specific colour settings may be defined.




**Conditions** In order to be able to define user-defined colours, the following system options must be activated under SYSTEM > Tab *Opt.* :

- Activate user administration
- Individual system settings

In order for the user-defined colours to be used, they must be activated under SYSTEM > Tab *Opt.* > *User-defined colours*.

**Open dialog** 1. Press USER > Tab *Colours* > EDIT.

The background and text colour settings dialog box will open.

Colour tab	
<i>Colour scheme</i>	Selection menu for: <ul style="list-style-type: none"> <li>• factory-defined colour schemes (labelled with *)</li> <li>• user-defined colour schemes</li> <li>• <i>-Manage colour schemes-</i>: define and change user-defined colour schemes</li> </ul>
<i>Background</i>	Displays the background colour of the selected colour scheme.
<i>Text</i>	Displays the text colour of the selected colour scheme.
	The user menu closes without saving the input and the start menu opens.
	A new user is created.
	The settings are accepted, the user menu is closed and the start menu opens.

### 12.3.1 Select colour

This is the procedure      1. Press USER > Tab Colours > EDIT.

2. Select one of the pre-defined *Colour schemes*.
3. Save the selection by pressing **OK**.

The selected colour scheme is set.

### 12.3.2 Define user-specific colour



In order for the user-defined colours to be used, they must be activated under **SYSTEM > Tab Opt. > User-defined colours**.

This is the procedure

1. Press **USER > Tab Colours > EDIT**.

2. Select *-Manage colour scheme-*.  
The colour scheme dialog box opens:

3. Press EDIT > NEW.

The new colour name definition dialog box will open.

4. Enter the name of the new colour scheme and confirm input by pressing OK.

5. If desired, activate *Copy current colour scheme* if you would like to adopt the colour setting of the current colour scheme.

6. Confirm the entry by pressing OK.

The dialog box *Edit colour scheme* for colour definition will open:



**Background tab** 1. Click on the tab *Background* to define the background.

The background colour can be selected as follows:

- directly via the keys *Red, Green, Blue*
- By entering the *Colour code*
- via the key *Current background colour*

2. Confirm the selection by pressing **OK**.  
The dialog box *Edit colour scheme* opens again.

**Text** 1. Click on the tab *Text* to define the text.

The text colour can be selected as follows:

- directly via the keys *Red, Green, Blue*
- By entering the *Colour code*
- via the key *Current text colour*

2. For the *text*, enter the RGB colours (*Red, Green, Blue*) or *Colour code*.
3. Save the settings by pressing **OK**.

**Options tab**

1. Click on the tab *Options* to lock or release the new colour scheme.

2. To lock the function, activate *Lock colour scheme* or
3. Deactivate the function to release it.
4. Save the settings by pressing **OK**.

**Result** The defined colour scheme is then available in the selection menu under **USER > Tab Colours > EDIT > Colour scheme**.

**Benutzer bearbeiten**

Name  
Administrator ▼ Umbenennen

Allgemein **Farben** Optionen

Farbschema ▼ Hintergrund Text

- KRÜSS 1\*
- KRÜSS 1\*
- KRÜSS 2\*
- Benutzer 1\*\*
- Benutzer 2** (highlighted with red arrow)
- Farbschemas verwalten-

Abbrechen Löschen Neu Ok

## 12.4 Options tab

Under the tab *Options*, you can lock a user and reset the password.

Open dialog box 1. Press USER > Tab *Options* > EDIT.

The menu opens:

**Benutzer bearbeiten**

Name  
Administrator ▼ Umbenennen

Allgemein **Farben** Optionen

Benutzeroptionen

- Benutzer sperren
- Nach 3 Login Versuchen sperren
- Passwort zurücksetzen

Abbrechen Löschen Neu Ok

User options	Explanatory notes
<i>Block user</i>	<input checked="" type="checkbox"/> activated. The selected user is blocked and has no access to the device. This option can be activated by users with administrator rights or is activated automatically if the user enters the incorrect login details 3 times.
<i>Block after 3 login attempts</i>	<input checked="" type="checkbox"/> activated. After three failed login attempts, the user is blocked from the system and the password is reset. The option <i>Block user</i> is automatically activated. Users with administrative rights must deactivate the <i>Block user</i> option. Next time the user logs in, they can log in again with their password or, if the option <i>Reset password</i> was activated, the user must create a new password.
<i>Reset password</i>	<input checked="" type="checkbox"/> activated. The password is reset. On the next login, the user must enter a new password.
<input type="button" value="Abbrechen"/>	The user menu closes without saving the input and the start menu opens.
<input type="button" value="Neu"/>	A new user is created.
<input type="button" value="OK"/>	The settings are accepted, the user menu is closed and the start menu opens.

## Chapter 13 -Scenarios of user administration

With the firmware version 7.214, the user administration has been extended, which makes it possible to log in via different access authorisations. These different options are described in more detail in the following scenarios. The term *operator distinction* refers in the following to the distinction of the human users of the device and not to the user accounts.

### 13.1 Without operator distinction

---

If the user administration is deactivated (no check mark at the system option *Activate user administration* in *System > Tab Opt.*), the default setting is used.

In this case, any user who has access to the system can make all settings and changes with the maximum rights.

The system uses the user name *General*. This name is used for all database entries.

Access to the user administration is blocked so that information about the different users is not accessible.

### 13.2 Without operator distinction, but with protected configurations

---

In this scenario, anyone can use the system but is not allowed to change the system settings.

To meet this scenario, please activate the *user administration* in *System > Tab Opt. > Activate user administration* (check mark). You need administrator rights for this.

In addition, please enable automatic login of a user. This user must have the rights of a User and has not been assigned a password. You need administrator rights for this.

**This is the procedure**    1. Press *User > Tab Options > Edit > Automatic login*

Each time the device is restarted, the user with the automatic login is logged in directly and the device is ready for use.

Automatic login can not be enabled for users with administrator rights.

To make system settings in this scenario, first log off the user, and then log in with a user with administrator rights.

### 13.3 Without operator distinction, but with protected configurations and access protection

In addition to the previous scenario, you can protect access to the system with a password. This gives everyone access to the system that knows the password and enters it correctly. Changes to the system settings are still not allowed.

To meet this scenario, a user who has the rights of a User and who is automatically logged in must be assigned a password at creation.

If the user who is automatically logged in enters an incorrect password, each user of the device can log in with their login and password afterwards. This is then equivalent to the scenario With operator distinction.

To make system settings in this scenario, first log off the user, and then log in with a user with administrator rights.

Supplementary, you can forbid the user who has the rights of a User and who is automatically logged in to change their password. You need administrator rights for this.

**This is the procedure** 1. Press *User > Tab Options > Edit > Lock password*

**Edit user**

Name

User 2 Rename

General Options

User options

Block user

Block after 3 login attempts

Lock password

Automatic login

Cancel Delete New OK

## 13.4 With operator distinction

If every user of the system should have their own access, the user administration must be activated and in addition no user must have the automatic login activated.

Users without the automatic login must have a password. If this was not assigned when creating the user, the password must be created when the user logs in for the first time.

For users who have the rights of a User, you can specify whether a password change is allowed. You need administrator rights for this.

The initial creation of the password is not affected by this setting.

It is not possible for users who have the rights of an administrator to prohibit the change of the password.

If you restart the device, you will be asked to enter a valid login with the corresponding password to log in.

## Chapter 14 - Maintenance and care

This chapter deals with the following topics:

- What must be done daily/weekly
- Change the fuse
- Replace silica gel
- Maintenance performed by Service

### 14.1 Maintenance and care plan

When	What
daily	When measuring is complete, clean the frequency oscillator with distilled water or a solvent compatible with the sample.
weekly	Clean the display and casing with commercially available cleaning or disinfecting agents.
Where applicable	For device calibration see Chapter <b>System settings &gt; Measurement calibration</b> .
	The measuring chamber should be closed after cleaning and drying preceding longer periods without measurements being carried out (one day or over the weekend). See chapter <b>Close the measurement chamber</b> .
	Change the silica gel
	Change the fuse

### 14.2 Change the fuse



Pull out the network plug from the thermostat before changing the fuse.



1. Pull out the network plug.
2. Replace the fuse below the mains switch.
3. Reconnect the network plug.

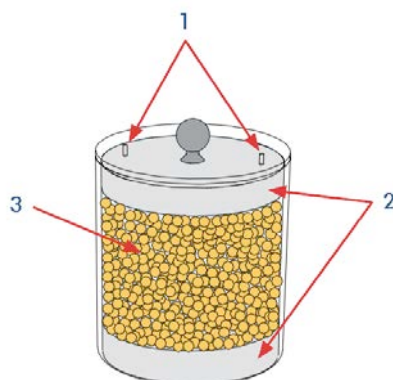


## 14.3 Change the silica gel

---

If the silica gel is discoloured, it can no longer absorb moisture and must be renewed.

1. Twist off the cartridge.



2. Fill the cartridge with silica gel.
3. Place the cartridge onto the drying unit and screw it on tight.

## 14.4 Maintenance performed by Service

---

The density meter DS7000 does not require any regular maintenance performed by Service. In the event of function disruptions, please contact:

**A.KRÜSS Optronic GmbH**  
Alsterdorfer Strasse 276–278  
22297 Hamburg / Germany

Tel. +49 40 514317-0  
Fax. +49 40 514317-60  
Web: [www.kruess.com](http://www.kruess.com)  
E-Mail: [service@kruess.com](mailto:service@kruess.com)

## Chapter 15 - Troubleshooting table

This chapter should help you to quickly remove any errors which arise.

Error	Possible causes	Resolution
False measurements	Contaminated frequency oscillator.	Clean the frequency oscillator.
	The frequency oscillator is too moist and dilutes the sample.	<ul style="list-style-type: none"> <li>• Drying the measurement chamber</li> <li>• Replacing the cartridge</li> </ul>
	The saved tare value is no longer up-to-date.	Measure the tare value again. See Chapter <b>System menu &gt; Tab Service</b> .
	Calibration data are no longer up-to-date.	Calibrate the density meter. See Chapter <b>System menu &gt; Tab Service</b> .
Poor precision	Frequency oscillator and filling hose have not been carefully cleaned between sample measurements.	<ul style="list-style-type: none"> <li>• After every measurement, clean the frequency oscillator carefully and thoroughly with 10 to 15 ml distilled water or a solvent compatible with the sample.</li> <li>• Carefully wipe filling hose from the outside when changing the sample.</li> </ul>
	The sample has not yet reached the temperature defined in the method.	Wait until the sample has reached the desired temperature.
Measurement cannot be started	The measurement time delay has not yet elapsed.	Wait for time delay to pass. Enter a shorter time delay. See the chapter Methods menu.
	Target temperature value not yet reached.	Wait for temperature control.
	Temperature tolerance set too low.	Increase temperature tolerance. See Chapter <b>Methods menu &gt; Tab Temp</b> .
No longer possible to log in	Timeout.	Contact the administrator. The administrator can change the timeframe.
	<i>Incorrect username and/or password</i>	<ul style="list-style-type: none"> <li>• Enter correct username and/or password.</li> <li>• Contact the administrator if necessary.</li> <li>• Pay attention to case-sensitivity.</li> </ul>
No display	Blown fuse	Change the fuse.
	<i>Loose mains cable</i>	Plug in mains cable securely.

## Chapter 16 - Transport, storage and disposal

### 16.1 Transport

---

For transport, please be aware of the following:

- Please only use the original packaging for transport, including the plastic mouldings.
- Please only transport at an ambient temperature of -20 to +60 °C and max. 95% humidity.

### 16.2 Storage

---

Please store the device for a longer period only at an ambient temperature of +5 to +45 °C and max. 95% humidity.

### 16.3 Disposal

---

Should you dispose of the product, please comply with the relevant legal provisions. Information on the disposal of electric and electronic devices in the European Community. Electrically-operated devices are disposed of in accordance with national regulations, which are based on the EC Directive 2002/96/EC on waste electric and electronic devices (WEEE).

This states that from 13.08.2005 all devices supplied in the business-to-business sector (to which this product belongs) may no longer be disposed of in communal or household waste.



They are labelled with this symbol.

Upon disposal, please comply with the applicable legal provisions.

As regulations differ from country to country, we recommend contacting your suppliers if necessary.

In Germany the labelling requirement has been in effect since 23.03.2006.

The manufacturer must offer an appropriate return option for all devices supplied after 13.08.2005.

For all devices supplied before 13.08.2005, the last user is responsible for their proper disposal.

## Chapter 17 - Appendix

### 17.1 Glossary

NIST	National Institute of Standards and Technology
GLP	Good Laboratory Practice (quality assurance system)
LIMS	Laboratory Information Management System
FDA	Food and Drug Administration
ICUMSA	International Commission for Uniform Methods of Sugar Analysis

### 17.2 Technical specifications

Designation	Specifications
Measurement range	0.0000 – 2.9999 g/cm <sup>3</sup>
Accuracy of measurement value	DS7700: ±0.001 g/cm <sup>3</sup> DS7800: ±0.0001 g/cm <sup>3</sup>
Accuracy	0.0001 g/cm <sup>3</sup>
Measurement modes	Individual, interval and continuous measurement
Scales	Pre-set scales (absolute und relative density, Alcohol- und Sulfuricacid-concentration, %Brix) and user-defined scales.
Measuring time after tempering	approx. 1 s
Sample volume in case of manual injection	approx. 0.9 ml
Viscosity correction	with user-defined scales
Adjustment	2-point: Air and distilled water
Housing	Cast aluminium
Sample container	Borosilicate glass
Display	LCD TFT 5.7" 320x240 Pixel
Operation	Touchscreen
Operating voltage	100 V...240 V, 50/60 Hz, 120 W
Temperature compensation	Linear, Polynom, Table, Formula
Temperature sensor	Pt100 (Class A)
Sample temperature range	10 – 40 °C
Reproducibility	+/-0.02 °C
Ambient temperature	10 – 35 °C
Result memory	999 results
Printer connection	RS-232 serial interface
Network connector	Ethernet interface for connection to the PC and LIMS
USB connection	for data transfer and firmware update

## 17.3 Order information

Parts description	Description	Order No.
Density meter		

## 17.4 Warranty provisions

A.KRÜSS Optronic provides the warranty for materials and manufacturing of the digital polarimeter family for a period of 24 months from the date of delivery. During this warranty period, A.KRÜSS Optronic will deal with defects through repairs or exchange, if these fall within the warranty claim.

The device must be returned to A.KRÜSS Optronic for warranty repairs or service. A.KRÜSS Optronic shall bear the costs of the customer's delivery of products for warranty repairs. Otherwise, these shall also be the customer's responsibility.

A.KRÜSS Optronic guarantees that the hardware, which is customised by A.KRÜSS Optronic for this device, shall operate without error when used according to our manufacturer's instructions.

However, A.KRÜSS Optronic does not guarantee the error-free uninterrupted operation of the device or that this operating manual does not contain errors. It also accepts no liability for subsequent damages.

### **Warranty limitation:**

The above guarantee does not extend to errors and defects caused by improper use, software not supplied by A.KRÜSS Optronic, modification, misuse or operation outside the stated environment or unauthorised maintenance.

Further claims are not guaranteed and recognised. A.KRÜSS Optronic expressly does not guarantee the ability to use the device or its commercial use in certain cases.

A.KRÜSS Optronic reserves the right to amend this operating manual and the technical data of this device at any time.

This digital polarimeter can be delivered only when it is properly packed in the complete original packing including the plastic moulding. Request replacement packaging from your supplier where required.

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**22297 Hamburg / Germany**

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Web [www.kruess.com](http://www.kruess.com)

