Hettich AG │Seestrasse 204a │ 8806 Bäch │ Switzerland
Tel. +41 44 786 80 20 │ info@hettich.ch │ www.hettich.ch

Succursale Suisse Romande │1357 Lignerolle │ Tél. +41 44 786 80 26

Cell Washer Centrifuge Helmer UltraCW II

Cell Washer Centrifuge Rotolavit II

Operating Instructions

manufactured by

Hettich AG
Seestrasse 204a
CH-8806 Baech / Switzerland

phone +41 (0)44 786 80 20
info@hettich.ch
www.hettich.ch

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KONFORMITÄTSERKLÄRUNG / DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE / DICHIARAZIONE DI CONFORMITA

Name und Adresse des Herstellers	Hettich AG, Seestrasse 204a,
Name and address of the manufacturer	CH-8806 Baech, Switzerland
Nom et adresse du fabricant	Tel.: +41 44 / 786 80 20, Fax. +41 44 / 786 80 21
Nome e indirizzo del produttore	info@hettich.ch

Wir erklären in alleiniger Verantwortung, dass das Medizinprodukt für die In-vitro-Diagnostik
We declare, with sole responsibility, that the medical product for in-vitro diagnostics
Par la présente, nous déclarons sous notre seule responsabilité que le produit médical pour le diagnostic in-vitro
Dichiariamo sotto la nostra unica responsabilità che il dispositivo medico-diagnostico in vitro

Hettich Rotolavit II

und / and / et / e

Helmer UltraCW II

ab Seriennummer / from serial-number / à numéro de serie / a partire dal numero di serie

0000030

gefertigt in der Schweiz / manufactured in Switzerland / fabriqué en Suisse / prodotto in Svizzera

mit folgender Klassifizierung nach der Richtlinie über In-vitro-Diagnostika 98/79/EG
classified as follows according to the directive on in vitro diagnostic medical devices 98/79/EC
avec la classification selon la directive relative aux dispositifs médicaux de diagnostic in vitro 98/79/CE
con la classificazione secondo la direttiva relativa ai dispositivi medico-diagnostici in vitro 98/79/CE

A

ohne / without / sans / senza

Notified Body

allen Forderungen der Richtlinie über In-vitro-Diagnostika 98/79/EG entspricht, die anwendbar sind.
meets all the provisions of the directive on in vitro diagnostic medical devices 98/79/EC which apply to it.
remplit toutes les exigences de la directive relative aux dispositifs médicaux de diagnostic in vitro 98/79 CE qui le concernent.
soddisfa tutte le disposizioni della direttiva relativa ai dispositivi medico-diagnostici in vitro 98/79/CE che lo riguardano.

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Angewandte gemeinsame technischen Spezifikationen, harmonisierte Normen, nationale Normen oder andere normative Dokumente Applied common technical specifications, harmonised standards, national standards or other normative documents Spécifications techniques communes, normes harmonisées, normes nationales et autres documents normatifs appliqués Specifiche tecniche comuni, norme Armonizzate o nazionali applicate, altri Documenti normativi applicati	EN 61010-1 EN 61010-2-020 EN 61326-1 RoHS II Directive 2011/65/EU*
Zertifiziertes Qualitätsmanagement-System gemäss Certified quality management system in accordance with Système de management de la qualité certifié d'après Sistema di gestione della qualità certificato conforme a	ISO 9001:2008 ISO 13485:2012

Baech, 2. Juni 2017	Doris Friedlos Geschäftsleiterin / CEO / Directrice général / Gerente
Ort, Datum / Place, date / Lieu, date / Luogo, data	Name und Funktion / Name and function / Nom et fonction / Nome e funzione

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1 Used terms and signs

In this manual and on the device itself, certain common terms and signs are used to warn you of possible dangers or to give you hints that are important in avoiding injury or damage. Observe and follow these hints and regulations to avoid accidents and damage. These terms and signs are explained below

1.1 Explanation of the terms

Warning is used whenever you or somebody else could be injured if you do not observe the accompanying safety regulation

Caution is used for information that is important for avoiding damage

1.2 Explanation of the signs

Caution is used for information that is important for avoiding damage

Symbol on the device:
Attention, general hazard area.
Before using the device, make sure you read the operating instructions and observe the safety information!

Symbol in this document:
Attention, general hazard area.
This symbol refers to safety relevant warnings and indicates possibly dangerous situations.
The non-adherence to these warnings can lead to material damage and injury to personal.

Symbol in this document:
This symbol refers to important circumstances.

.

Symbol on the device and in this document:
Beware of biohazard.

Symbol on the device and in this document:
Symbol for the separate collection of electric and electronic devices according to the guideline 2002/96/EG (WEEE). The device belongs to Group 8 (medical devices).
Applies in the countries of the European Union, as well as in Norway and Switzerland

Symbol in this document:
Disconnect the mains plug

Symbol in this document:
Wear protective gloves

Symbol in this document:
Important or useful additional information

2 Use according to the specifications

This device is a medical product (laboratory centrifuge) within the context of the IVD Directive 98/79/EC. This appliance is for cleaning erythrocytes and for carrying out quick anti-human globulin tests (direct and indirect Coombs' tests) when cross-matching, looking for and differentiating anti-bodies as well as when determining features of rare blood groups. During a washing process, which consists of several wash cycles, the physiological saline solution is added successively, the erythrocytes are sedimented by the centrifugation process, and finally the physiological saline solution is decanted again. After manually adding the anti-human globulin serum, a further centrifugation speeds up the agglutination test.

The device is only intended for the designated purpose.

Another use or one which goes beyond this, is considered to be non-intended. The company Hettich AG is not liable for damage resulting from this.

Observing all information in the operating instructions and complying with the measures described therein is also a part of the intended use.

2.1 Versions

The device is available in different configurations. If specific equipment features or functions are available only for certain configurations, this is indicated at the relevant points in this manual.
The functions described in this manual refer to the latest software version.
Due to individual configurations, illustrations in this manual may be slightly different from the actual appearance. Function and operation are identical. This manual was written in accordance of the software-version 1.00.386

For operation of the device with HETTICH History-software, observe the separate manual
For service and repair (see cha. 12), please refer also to the separate service manual

2.2 Storage and forwarding the operator-manual

This instruction manual belongs with the device and should always be stored where persons working on the device have access to it. It is the responsibility of the owner to ensure that persons who are working or will work on the device are informed as to the whereabouts of this operator manual. We recommend that it is always stored in a protected location close to the device. Make sure that the instruction manual is not damaged by fluid or humidity. If the device is sold on or transported and then set up again at a different
location, the operator manual must go with it.

2.3 Responsibility of the owner

The owner of the device

- is responsible for the flawless condition of the device and for its proper operation in accordance to the specifications
- is responsible for ensuring that persons who are to operate or service the device are qualified to do this, have been instructed accordingly and are familiar with the operating manual at hand
- must know about the applicable guidelines, requirements and operational safety regulations, and train staff accordingly
- is responsible for ensuring that unauthorized persons have no access to the device
- is responsible for ensuring that the maintenance plan is adhered to and that maintenance work is carried out properly (see chapter 12)
- has to ensure that the device and its surroundings are kept clean and tidy, for example through corresponding instructions and inspections
- is responsible for ensuring that personal protective clothing is worn by operating personnel, e.g. work-clothes, a.e. protective gloves
- is responsible for ensuring that before starting to work with this device all qualifications are released, the IQ (Installation-Qualification), the OQ (Operational-Qualification) and PQ (Process-Qualification)
- is responsible for periodic rutine to flush, clean and disinfect the device as well, descripted in chapter 12, and take care for controlling the used Fluid for the ne eded quality
- is responsible for the use of the passwort-protection, user-settings (cha.8.6.2)

2.4 Requirements of the operating personnel

The device may only be operated and maintained by persons who are of legal age and have been instructed accordingly. Personnel who are to be trained, instructed or who are undergoing general training may only work with the appliance under the continuous supervision of an experienced person.

Repairs may only be performed by qualified electricians and are authorised to do so by the manufacturer. The regulations in the separate service manual must be observed.

2.5 Changes and alternation

No unauthorized changes or alterations may be made to the device. No parts may be added or inserted which have not been approved by the manufacturer.
Unauthorized modifications or changes result in the CE declaration of conformity losing its validity and the device should no longer be operated.
The manufacturer is not liable for any damage, danger or injuries that result from unauthorized changes or alterations, or from non-observance of the regulations in this manual

2.6 Warranty

No claim of warranty will be considered by the manufacturer unless ALL instructions in this manual have been followed, particular chapter 12, esspcially the Flow-sensor and the magnetic-valve are excluded from a warranty-exchange if they are enriched with salt-cristalls.

No claim of warranty will be considered by the manufacturer when an unauthorized modification was implemendet or not authorized parts are installed

3 Notes on safety

No claim of warranty will be considered by the manufacturer unless ALL instructions in this manual have been followed.

The centrifuge should be installed on a good, stable base. We suggest that none other critical device, like a balance, microscope or HPLC, is placed onto the same base.

When the centrifuge is running, according to EN / IEC 61010-2-020, no persons, dangerous substances or objects may be within the safety margin of 300 mm around the centrifuge.

Rotors, suspensions and accessories that possess traces of corrosion or mechanical damage or if their term of use has expired may not be used any longer.

The centrifuge may no longer be put into operation when the centrifuging chamber has safety-related damages.

For centrifuges without temperature control, when the room temperature is increased and/or if the device is frequently used, the centrifuging chamber could be heated up. Therefore, it can't be ruled out that the sample material might be changed due to the temperature.

Before the initial operation of your centrifuge you should read and pay attention to the operating instructions. Only personnel that has read and understood the operating instructions are allowed to operate the device.

The centrifuge may not be operated in explosion-endangered areas.

The centrifuge should not be used with:
- inflammable or explosive materials
- materials that react with one another producing a lot of energy

Along with the operating instructions and the legal regulations on accident prevention, you should also follow the recognised professional regulations for working in a safe and professional manner. These operating instructions should be read in conjunction with any other instructions concerning accident prevention and environmental protection based on the national regulations of the country where the device is to be used.

This centrifuge is a state-of-the-art piece of equipment which is extremely safe to operate. However, it can lead to danger for users or others if used by untrained staff, in an inappropriate way or for a purpose other than that it was designed for.

The centrifuge should not be moved or knocked during operation.

In case of fault or emergency release, never touch the rotor before it has stopped to turning.

To avoid damage due to condensate, when changing from a cold to a warm room the centrifuge must either heat up for at least 3 hours in the warm room before being connected to the mains, or run hot for 30 minutes in the cold room.

Only the rotors and accessories approved by the manufacturer for this device may be used, see chapter “rotor and accessories”. Before centrifuge tube-holders, reducers, which are not listed in the chapter “rotors and accessories”, the user should make sure they can be used by asking the manufacturer of the device.

When centrifuging with maxim revolutions per minute the density of the materials or the material mixtures may not exceed 1.2 kg/dm^3.

The centrifuge may only be operated when the balance is within the bounds of acceptability (< 5g = ±2,5g)

If users have to centrifuge hazardous materials or compounds contaminated with toxic, radioactive or pathogenic micro-organisms, they should take appropriate work-instructions measures.

Repairs must only be carried out by personnel authorised to do so by the manufacturer.

Only original spare parts and original accessories licensed by the manufacturer are allowed to be utilised.

Components contaminated with blood (e.g. rotor, centrifugation area) must after replacement be disposed of in the special waste for materials contaminated with blood.

The following safety regulations apply:
EN / IEC 61010-1 and EN / IEC 61010-2-020 as well as their national deviations.

The safe operation and reliability of the centrifuge can only be guaranteed if:
- the centrifuge is operated in accordance with the operating instructions
- the electrical installation on the site where the centrifuge is installed conforms to the demands of EN / IEC stipulations
- the tests for device safety required in the respective countries, e.g. in Germany in accordance with BGV A1 and BGR 500, are carried out by an expert.

4 Behaviour in case of malfunctions and irregularities

The device may only be used in a flawless condition. If you as the operator notice irregularities, malfunctions or damage, immediately take the device out of work and inform your superior.

You can find on correcting malfunctions in chapter 13.

4.1 Remaining risks

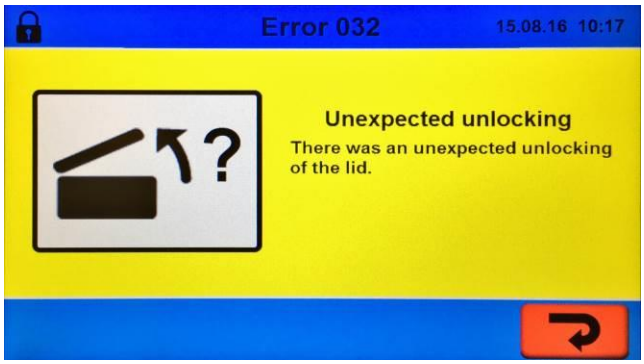
The device is built according to the state-of-the-art and the recognized safety regulations. If used and handled improperly, there could be life-threatening danger to the user or third parties, or the device could be impaired or there could be other property damage. The device is only to be used for its intended purpose and only when it is in safe working condition.
Malfunctions which could affect safety must be corrected immediately.

4.2 Switching off the device in an emergency

Push the On/Off switch on the rear-panel to its Off-position or / and disconnect the power plug. This disconnects the device from the power supply at all poles.

4.3 Emergency release

The lid cannot be opened during power failure. An emergency release has to be executed by hand.



For emergency release disconnect the centrifuge from the mains.
Open the lid only during rotor standstill.
Only the plastic release pin provided may be used for emergency release.

- Switch off the mains switch (switch position "0").
- Look through the window in the lid to be sure that the rotor has come to a standstill.
- Insert the release pin horizontally into the hole. Push the unlocking pin in until the handle can be lifted when the pin is pressed in.
- Open the lid.
- Error appears on display after switch on the centrifuge.

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5 Technical specifications

tab. 1.0

model	UltraCW II			
part-number	900000	900030	900200	900230
model	Rotolavit II			
part-number	1008-00	1008-02	1008-03	1008-04
ext. power-supply	100V - 240VAC, 1~			
mains frequency	50Hz - 60Hz			
protection class	class I			
connected load	144VA			
current consumption	0,7A@230VAC or 6A@24VDC			
power	150W			
fuse	10A/250V F			
optional second pump	no	yes	no	yes
optional car-battery DC-input	no	no	11V - 30VDC	
width [mm / inch]	330mm / 13inch			
depth [mm / inch]	480mm / 18,9inch			
height [mm/"] closed	280mm / 11inch			
height [mm/"] open	580mm / 22,9inch			
weight [kg / lb]	24,4 / 53,8		24,7 / 54,5	
capacity, standard	12 x 5ml			
capacity, optionally	24 x 5ml			
Speed, radius	3500 RPM, 105mm			
force	1438 RCF			
kinetic energy, max.	250Nm			
max. allowed density	1,2kg /dm^3			
obligatory inspection (BGR 500)	no			
EMC	IEC61326-3-2 / FCC CFR47 part 15, ed 2015 class B			
noise level				
ambient conditions EN / IEC61010-1 altitude ambient temperature humidity storage temperature	Not suitable for use in explosion-endangered areas indoors only up to 2000m above sea-level 18°C to 30°C / 64,4°F to 86°F 20% to 80%rH / non-condensing 5°C to 50°C / 41°F to 122°F			

6 Unpacking the centrifuge

Do not lift by the front panel.
Observe the weight of the centrifuge, refer to Technical specifications (cha. 6).
Take care, you could injure your skin on the border of the cardboard packaging carton

Lift up the centrifuge on both sides and take it out of the box with an adequate amount of people to help you.

According to the laboratory instrument standards EN / IEC 61010-2-020 an emergency switch to separate power supply in the event of a failure must be installed in the building electrical system.
This switch has to be placed remote from the centrifuge, preferred outside of the room in which the centrifuge is installed or near by the exit of this room.

Position the centrifuge in a stable and level manner in a suitable place. During set-up, the required safety margin of 300 mm around the centrifuge is to be kept according to EN / IEC 61010-2-020.1
When the centrifuge is running, according to EN / IEC 61010-2-020, no persons, dangerous substances or objects may be within the safety margin of 300 mm around the centrifuge

To avoid damage, do not unpack the appliance until you reach the installation site.
Check the delivery note to ensure that the delivery is complete.
Check the appliance for damage.

If you notice deviations from the delivery note, damage or irregularities, do not put the appliance into operation, but inform the haulage company and your supplier

If it is possible keep the transportation material and the transportation safety device on a save and dry place.

6.1 Storage after delivery

If the device is first to be stored after delivery, then check the box from outside for damage and if it is so inform the haulage company and your supplier immediately. For the storage-conditions refer tab. 1.0 technical specifications

6.1.1 Installation after storage

If the storage-ambient was outside the working-ambient, then you must let acclimatize the device for 24 hours to the new ambient without to connect the power (fig. 7.1 pos. 4)

6.2 Delivery checklist

1 drainage hose (∅ 14,3 mm) with connector
1 fill hose (∅ 7,1 mm) with connector, Inlet 1 (Saline), with intake pipe; for the physiological saline solution
1 fill hose (∅ 7,1 mm) with connector, Inlet 2 (Fluid 2), with intake pipe; for a secondary solution *1
1 power-cord
1 operator manual
1 battery-cord (with open wires) *2
1 release-pin

The rotor(s) and associated accessories are included in the delivery in the quantity ordered.

*1 would be delivered only by devices with the optional secondary pump (p/n 900030, 900230, 1008-02 and 1008-04)

*2 would be delivered only by devices with the optional car-battery DC-input (p/n 900200, 900230, 1008-03 and 1008-04)

6.3 Disposing of packaging material

Dispose of the packaging material (cardboard, polyurethane-foam, tie and plastic-bag) in accordance with the applicable disposal regulations for the respective material in your country. If you have questions about that, please contact your local supplier.

6.4 Transportation

If you have to transport the device and you do not have anymore the original packaging material, then please contact your local supplier because the device is too heavy and its motor and rotor must be protected during transportation.

7 Install the wash-centrifuge

7.1 Connections

1 mounting-bracket for the Power-supply
2 ON / OFF main-switch
3 Ethernet-interface
4 DC-power-input *1
5 fuse, fuse-holder
6 inlet 1, Saline
7 inlet 2, solution 2 *1
8 outlet, Drain
A solution-tube to the lid

*1 refer to the technical specifications comparing to the part-number from your device, tab 1.0

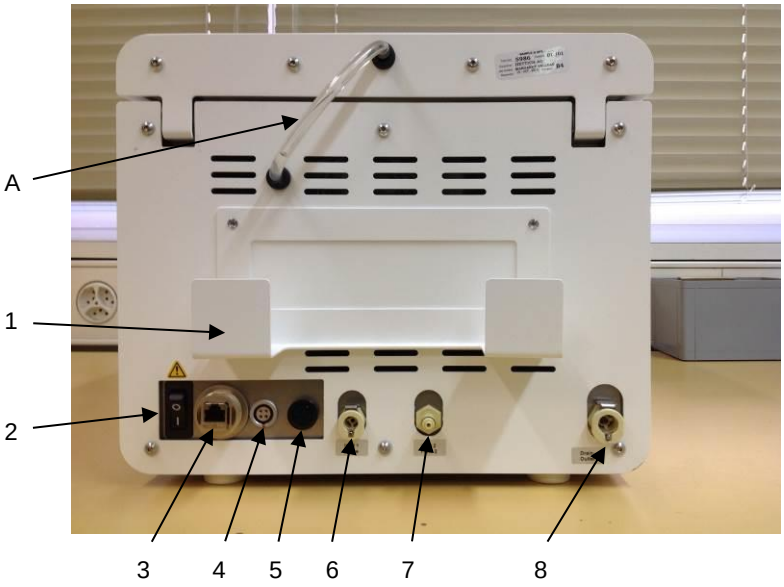


figure 7.1

9 emergency release hole, refer to chapter 4.3

figure 7.2

If you use the device connected to a car- or truck-batterie without the option, then the devise could get damages

Refer to the technical specifications comparing to the part-number from your device, tab 1.0
Let install the option only from an authorisied distributor

If you install the device in a car, truck, ship or another mobile ambient, then you must protect the device with the transportation-foam during transportation and you must take care to the ambient conditions that they are conform to mthe tec. specifications

7.2 First steps

Take care to the chapter 3.2.6 before starting with the installation.
Install the power-supply in its mounting-bracket on the rear-side, see fig. 7.1 pos. 1 and plug the connector to the DC-input, pos. 4 on the fig. 7.1. Plug the provided main-power-cable into the power-supply and the other side to the power-source.

Observe the country-specific regulations when making connections (e.g. in Germany with residual current circuit breaker). Observe the connection and power ratings, see on the label and the technical specification. Make sure to establish a safe PE-conductor-connection.

Lay the powercable so that

- it is always accessible and within reach, so it can be disconnected in the event of a failure
- no one can trip over it
- it does not come into contact with some solution, e.g. water or saline, mechanical parts, e.g. shakers or mixers, or hot parts, e.g. ovens or torch

Plug the connector from the fill-hose to the inlet 1 on the rear-side, see on fig. 7.1 pos. 6, and dip the other side with the metal-part into the container with the saline-solution.

If the fill-hose is to short for your installation and it is not possible to move closer the can with the solution and you need an oversized fill-hose (from your local distributor), then you must validate the flush- and the refill pump-programs for correct operation.

If your device have the optional inlet 2, plug the connector from the fill-hose 2 to the inlet 2 on the rear-side, see on fig. 7.1 pos. 7, and dip the other side with the metal-part into the container with the fluid 2-solution.

Take care that it is not possible to interchange the ends from the tubes and the cans or containers, otherwise all probes will be disturbed!

If you are working with the optional PC-software for the history, you have to install a patch-cable, cat. 5a or higher, to the Ethernet-interface, see on fig. 7.1 pos. 3, and the other-side to the local interface or direct to a computer. Refer also to the separate manual for that software.

Plug the connector from the drainage-hose to the outlet on the rear-side, see on fig. 7.1 pos. 8, and put the other side into the waste.

Take care that the drainage-hose will lie flat onto the base, if not and it is like figure 74 the device will get a damage.

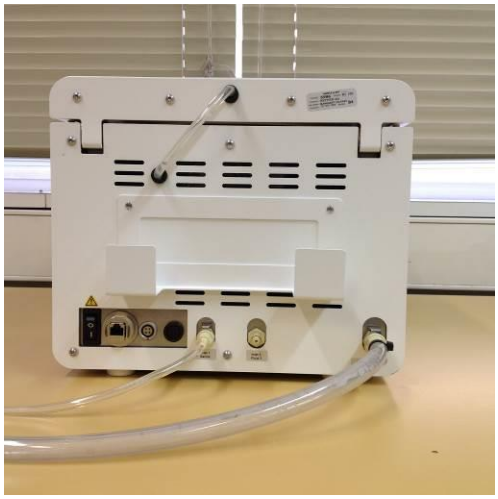
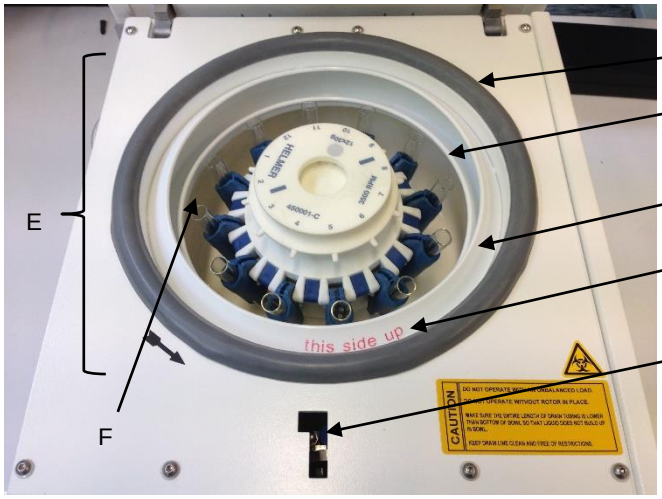


figure 7.3

figure 7.4



A seal
B splash guard receiver
C splash guard cap
C1 inscription
D lid-lock access-hole
E centrifugation area
F bowl

this inscription, C1, is only for that picture in red

figure 7.5

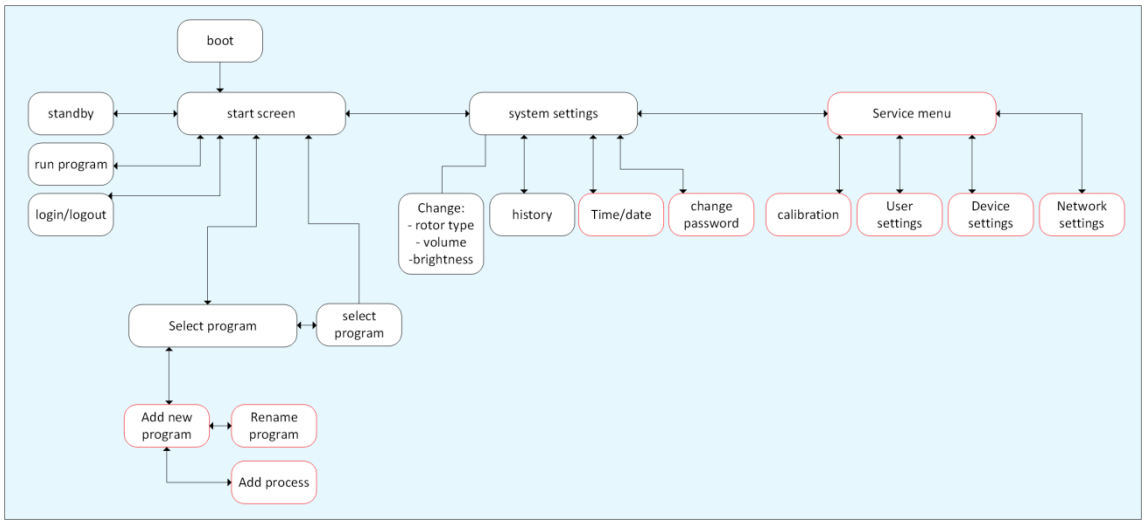
7.3 Start the wash-centrifuge

Push the ON / OFF main-switch, fig. 7.1 pos. 2, to the ON position. The start-initialization needs app. one minute.

When the main-screen occurs push the lid-open button and open the lid, chapter 8.2 pos.5, remove the transportation safety device from the top of the rotor and keep it on a save place.

8 Operation settings

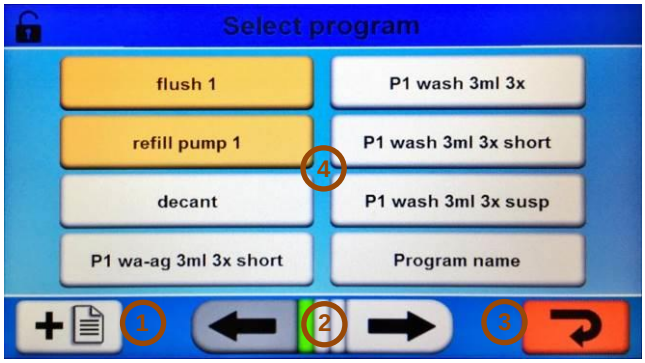
8.1 Overview



8.2 Start Screen

	Describtion	Login
1	stand-by modus - black screen and reduced power	
2	system settings set device settings	
3	user/service login login for service and program function	
4	select program choose a program	
5	open lid	
6	start program	
7	show the name of selected program	

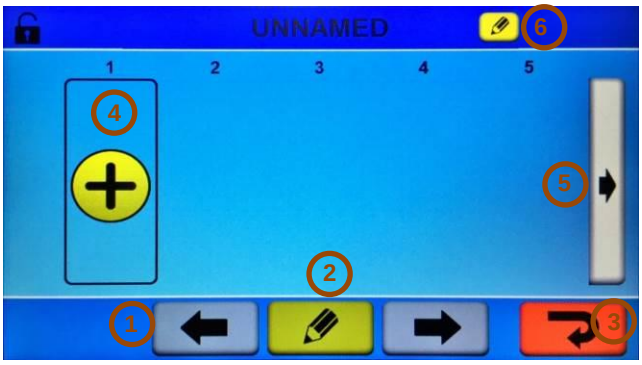
8.3 Select program



	Description	Login
1.	add a new program	x
2.	navigate through the existing program listing	
3.	back to start screen	
4.	existing programs	

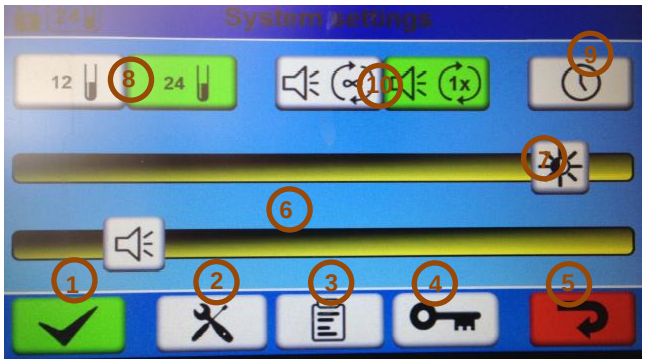
Each program must be validated by the user with **the custom tube**.

8.4 Add a new program



	Description	Login
1.	select a existing process of the program	x
2.	edit process	x
3.	back without saving to select a program	x
4.	add process	x
5.	navigate through the existing process of the program	x
6.	rename the program	x

8.5 System Settings



	Describtion	Login
1	save changes	
2	service menu	x
3	history	
4	edit passwort	x
5	back without saving to start screen	
6	volume control	
7	brightness control	
8	change rotor type[1]	x
9	time settings	x
10	program-end beep	

[1]It is necessary to enter the rotor type used (12-place or 24-place) in order to calculate the filling volume and it is only possible to enter the rotor type when the rotor has stopped.

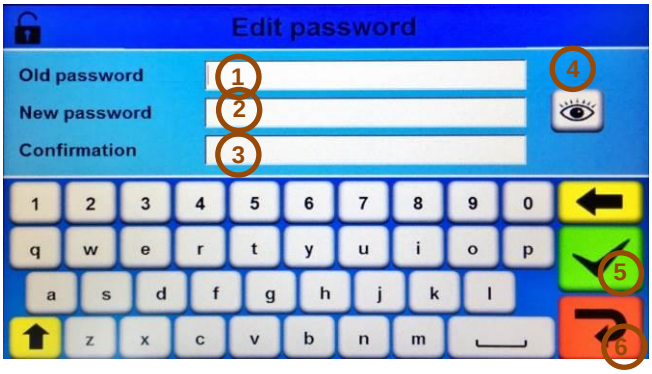
8.5.1 History

Description	Login
- select a date to show the carried out programs	
1. return to system settings 2. last or next month i the day with a yellow background has some saved datas / runs	

8.5.2 Time settings

Description	Login
- wheel adjuster for date and time	
1. accept changes	
2. discard changes and return to system settings	

8.5.3 Edit password

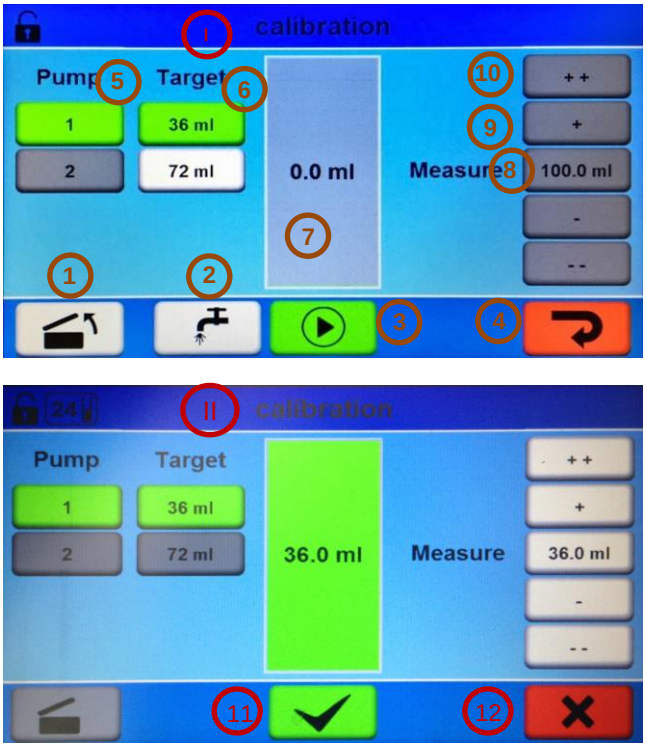


Description	Login
1. insert old password	x
2. insert new password	x
3. repeat new password to confirm	x
4. show / hide passwords	x
5. accept changes	x
6. discard changes and return to system settings	x

8.6 Service menu

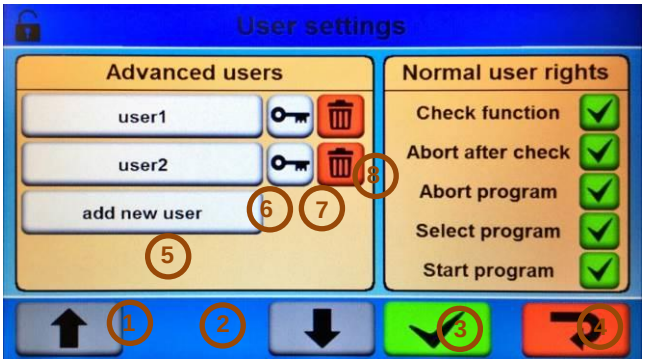
Description	Login
1. calibration	x
2. user settings	x
3. device settings	x
4. network settings	x
5. back to system settings	x

8.6.1 Calibration



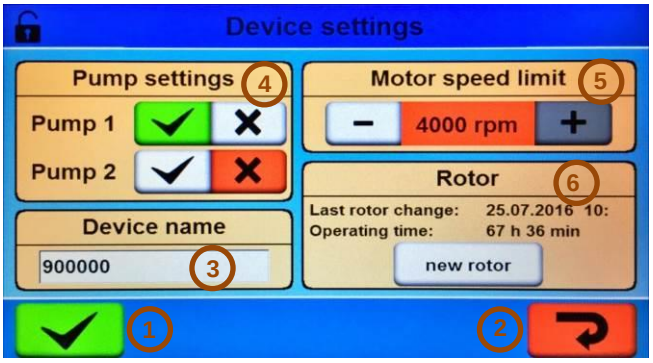
Description	Login
I first screen	x
1. open lid	x
2. fill in solution (refill / undefined)	x
3. start calibration	x
4. back to service menu without calibrating	x
5. select pump	x
6. select target for measurement	x
7. indicate filling level	x
8. target measure	x
9. graduate decimal point 0.1ml	x
10. graduate decimal point 1ml	x
II second screen	x
11. accept and save the calibration and back to the first screen	x
12. discard the calibration and back to the first screen	x

8.6.2 User settings



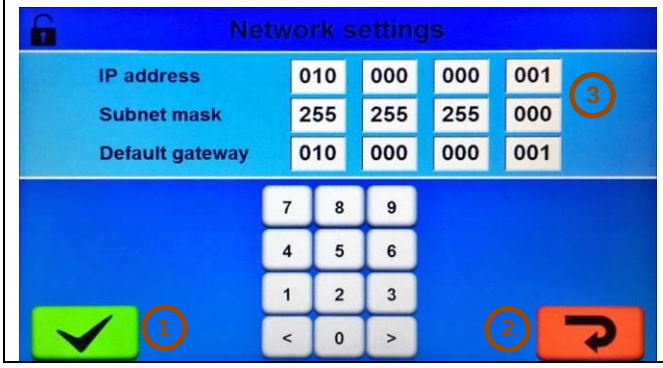
Description	Login
1. go upward in user list	x
2. go downward in user list	x
3. save users	x
4. back to service menu without saving	x
5. add a new user	x
6. set password	x
7. delete user	x
8. select/deselect user rights	x

8.6.3 Device settings



Description	Login
1. save changes	x
2. back to service menu without saving	x
3. change device name	x
4. activate/deactivate pumps	x
5. adjust motor speed limit	x
6. add new rotor	x

8.6.4 Network settings



Description	Login
1. save changes	x
2. back to service menu without saving	x
3. current network settings	x

9 Program

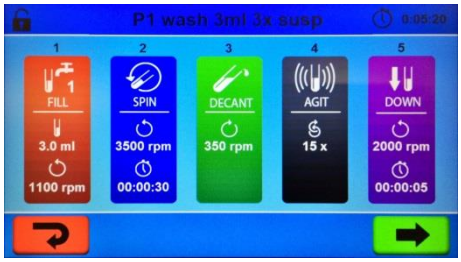
9.1 Start the program

Start screen:
- “decant” is the actual loaded program
- Push “start program” to start
- To select another program push the button 

Select a program.

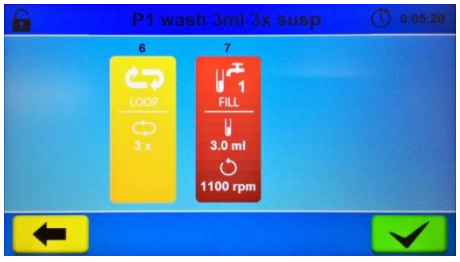
To add a new program see chapter 0.

Each program must be validated by the user with the custom tube. If the tube will be changed then the program must be revalidated!



After select the program each process is displayed.

Check the program and all settings for each process!



- To load the program push 

- The now loaded program-name is displayed
- Push “Start program” to start

- The program starts
- The actual process is highlighted
- Push “CHECK” that the lid will open as soon as the actual process is finished

9.2 Stop a running program

- To stop the program push “STOP” at the buttom right.

- confirm with 
- back with 

9.3 Pre-intalled programs

Pre-installed programs system:

- flush
- refill pump

user:

- agit and spin
- decant
- spin 30sec 3500
- susp 3ml spin 30sec
- wash red cells 3ml 3x
- wash 3ml 3x and anti
- wash white cells Tspot

9.3.1 flush

This preinstalled system-program is especially to flush the external and also the internal tubing-system – for that the first FILL-process will ignore some air-bubbles into the system.

If you delet this program, only a specialist can reload it

9.3.2 refill pump

This preinstalled system-program is especially to refill the external and also the internal tubing-system with the used and needed solution without to spin and will ignore some air-bubbles into the system.

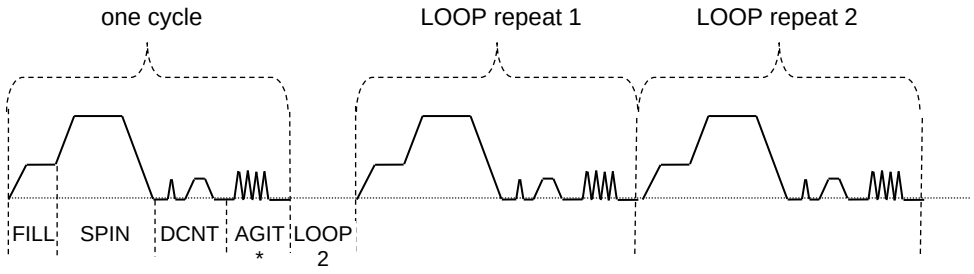
If you delet this program, only a specialist can reload it

9.3.3 wash red cells 3ml 3x

This preinstalled program is as an example visualized

The process-values are:

- FILL 3.0ml 800RPM
- SPIN 30sec 3500RPM
- DECANT 370RPM
- AGIT 19x
- LOOP 2x



9.3.4 agit and spin

The process-values are:

- AGIT 19x
- SPIN 30sec 3500RPM

9.3.5 decant

The process-values are:

- DECANT 370RPM

9.3.6 spin 30sec 3500

The process-values are:

- SPIN 30sec 3500RPM

9.3.7 susp 3ml spin 30sec

The process-values are:

- FILL 3.0ml 800RPM
- SPIN 30sec 3500RPM

9.3.8 wash 3ml 3x and anti

The process-values are:

- FILL 3.0ml 800RPM
- SPIN 30sec 3500RPM
- DECANT 300RPM
- AGIT 15x
- LOOP 2x
- CHECK
- SPIN 30sec 3500RPM

9.3.9 wash white cells Tspot

The process-values are:

- FILL 2.5ml 900RPM
- SPIN 7min 2260RPM
- DECANT 370RPM
- AGIT 100x
- LOOP 1x

9.4 Process descriptions

9.4.1 Principle

A program can have at maximum 20 different proceses, but only with 1 LOOP process. It doesn't matther with which process a program starts except with a LOOP process or a CHECK process and it could also have only one process.

9.4.2 FILL 1 process

	Filling in the physiological saline solution. The tubes are filled with physiological saline solution at a rotation speed of 1100RPM. The number of revolutions per minute is adjustable from 0RPM to 2500RPM. The fill-volume is adjustable from 0,1ml to 10ml per tube. The default-value is 800RPM and 3.0ml. The physiological saline solution is injected directly into the tubes, in order to receive a good resuspension of the cells.

The best results are with a speed of 900RPM for both kind of rotor-types.
The device will calculate the complete volume itself for the preseted rotor

9.4.3 FILL 2 process

	Filling in the secondary solution. The tubes are filled with solution at a rotation speed of 1100RPM. The number of revolutions per minute is adjustable from 0RPM to 2500RPM. The fill-volume is adjustable from 0,1ml to 10ml per tube. The default-value is 800RPM and 3.0ml.

Only selectable if your device have installed the optional second pump (part-number **900030, 900230, 1008-02 and 1008-04)**

9.4.4 DOWN process

	Down. The number of revolutions per minute is adjustable from 0RPM to 3500RPM. The time-duration is adjustable from 0s to 20s. The default-value is 2000RPM and 5s. Centrifugation run to centrifuge the remaining droplets on the inner-side of the tubes to the bottom of the tube.

9.4.5 SPIN process

	Sedimentation. The number of revolutions per minute is adjustable from 0RPM to 3500RPM. The time-duration is adjustable from one second to two hours (0:00:01 to 2:00:00). The default-value is 3500RPM and 30seconds (0:00:30) The erythrocytes are sedimented by a selectable rotation speed. The time only begins to count after the set rotation speed is reached. After the time has elapsed, a quick braking follows to prevent a resuspension of the pellet.

It is not possible to work with an endless spin process.
If it is necessary to work with a longer single spin process, it is possible to add a loop-process for the desired time-duration

9.4.6 DECANT process

	Decanting. The number of revolutions per minute is adjustable from 0RPM to 2500RPM. The excess is decanted at the selectable rotation speed. During decanting, the rotor turns in the opposite direction of the normal rotation so that the solution will be decanted. The default-value is 370RPM.

The correct speed must be validated with the used tubes for the best possible results because the different inner surfaces of the tubes, e.g. glass-tubes or plastic-tubes, there will get also different results when the speed is optimized for 10mm-tubes but the used tubes are 12mm-tubes.

If the DECANT speed is too high then it is possible that the washed cells will also be decanted!
If the DECANT speed is too low then it is possible that too much solution will stay into the tubes and during the next FILL process the tubes will overfilled!

9.4.7 AGIT process

	Agitating, shaking. The numbers of shakings are adjustable from 0x to 500x. The default-value is 15x. The pellet is loosened again for the subsequent wash cycle by a fast, brief movement of the rotor and the tube-holders.

9.4.8 LOOP process

	Loop. This process makes only sense as a following process from minimum one other process. The numbers of loops are adjustable from 1x to 100x. The default-value is 2x. After the foregone process is finished, all foregone processes will be repeated with the adjustable value.

If the foregone process is a spin-process with a duration-time of 2 hours and the loop-process is adjusted to 1x, then the program will repeat the spin-process one time with the duration of 2 hours, that means that the device spins for 4 hours.

After the LOOP Process you can add every other process except a LOOP Process, that means you can program to wash out cells with two cycles unstead of tree with a DECANT process with a speed of a.e. 320RPM so that some small amount of solution will stay into the tubes and after the LOOP process you add the same processes again but the speed from the DECANT process is a.e. 370RPM so that the tubes are empty of the Solution.

9.4.9 CHECK process

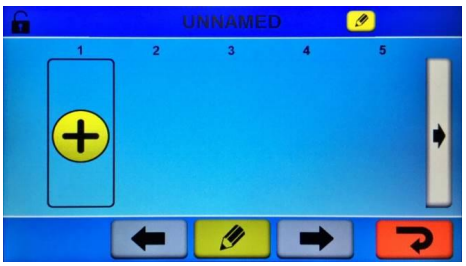
	Check, pause. This process makes only sense as a following process from minimum one other process. After the foregone process is finished the program will be paused and the lid will open. The user can check the probes or can add some other fluids with a pipette to the probes. When the lid will be closed, then the program will continue.

If the forgone processes are a wash-cycle you can add during the check-process the anti-human globulin serum, the following processes are if nessecary a AGIT-process and a SPIN-process

9.5 Add a new program

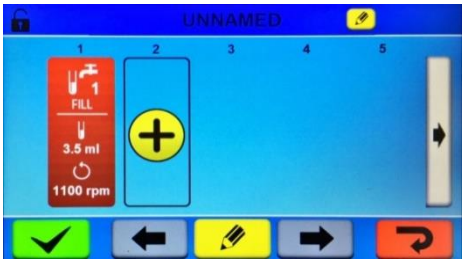
Go to:

- Select a program: 
- Add a new program 

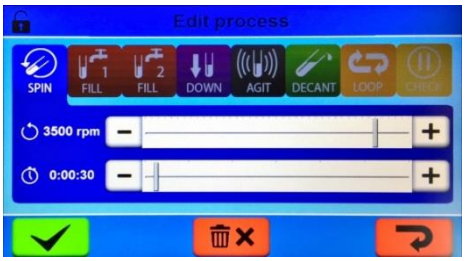


- To add the first process push: 
- To edit the name push:
  at the top 

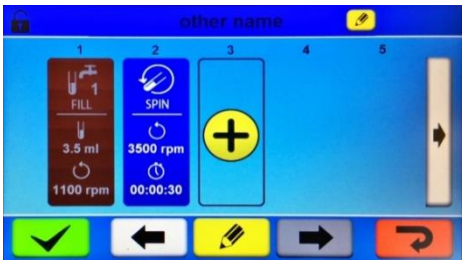
- In this example the first process is “FILL 1”
- push to choose the FILL 1 symbol
- Below with the bar you can choose the filling capacity and the rotation speed at which it should be filled in.
- To accept the FILL 1 process push 



- To add another process click: 



- In this example secondly add the process “Spin”
- Push to choose the Spin symbol
- Below with the bar you can choose rotation speed and the duration of the process
- To accept the SPIN process push 



- To add more process push 

- By selecting a process you can switch the process to the previous process position
- To switch to left push 
- Or after the next process position to right 

- To edit a process select it and push below: 

- To save push 

- to view process 6 to 10, 11 to 15 and 16 to 20, push at the right side, backwards at the left side 

Each program must be validated with at minimum 12 probes with a 12-place rotor and equivalent 24 probes with a 24-place rotor and compared with another device or methode.

If you change the used tubes, the reason doesn't meather, e.g. the size or from plastic style to glass-style or the supplier don't support the used tubes anymore, you must revalidate all used programs.

10 Adjusting

10.1 Entering the rotor type

It is necessary to enter the rotor type used (12-place or 24-place) in order to calculate the filling volume.
It is only possible to enter the rotor type when the rotor has stopped.

To adjust the settings:

- Go into the system settings (start screen, cha. 8.2, pos. 2)
- Change to the actual used and inserted rotor-type, 12-place or 24-place (cha. 8.5, pos. 8)
- Save the done setting and go back to the start-screen with the button save changes (cha. 8.5, pos. 1)

10.2 Calibrating the filling volume

- Go into the system settings (start screen, cha. 8.2, pos. 2)
- Go into the service menu (system settings, cha. 8.5, pos. 2)
- Go into the calibration (service menu, cha. 8.6, pos. 1)
- Open the lid (cha. 8.6.1, pos. 1)
- Check that the 36ml target (cha. 8.6.1, pos. 6) is green for use a 50ml graduated measuring cylinder, conform to DIN/EN/ISO 4788 and equivalent the 72ml target for a 100ml cylinder
- Remove the rotor and hold a cup underneath the injection-tube and push the button fill in solution (cha. 8.6.1, pos. 2) and take attention that no air-bubbles are into the solution-tube at the back-side of the lid (fig.7.1, pos. A)
- hold a cylinder underneath the injection-tube inside from the lid and push the button start calibration (cha. 8.6.1, pos.3)
- Adjust the reading from the cylinder at the target measure (cha. 8.6.1, pos. 8) with the buttons “+” or “-“ graduate decimal point 0.1ml and “++” or equivalent “- -“ graduate decimal point 1ml
- Accept the calibration (cha. 8.6.1, pos. 11) or discard the calibration (cha. 8.6.1, pos. 12)
- If it was necessary to adjust the calibration, then check the calibration again.
- Exit with the button go back to the service menu (cha. 8.6.1, pos. 4)

Do a calibration-check

- monthly
- befor a validation
- after a maintenance

10.3 Audible signal

- 2 second intervals if an error occurs
- in 10 second intervals after the program has ended and the rotor has stopped.

The audible signal can be stopped by opening the lid or by pushing any button.

The signal after completion of the program can be activated or deactivated in the following manner, if the rotor is at standstill:

- To adjust the volume go at the start screen and push the button for the system settings (cha. 8.2, pos. 2)
- Adjust the volume by varying the slider at the bar (cha. 8.5, pos. 6), at the totally left side the audible signal is deactivated
- Select your preferred mode for the audible signal after the program is ended with only one beep or with an endless interval of 10 seconds during one hour
- confirm it with the button save changes (cha. 8.5, pos. 1)

If an alarm or the program-end beep is running then the Stand-by mode will activate till after 60 minutes instead of the normal 10 minutes, but the display will go to the dark-mode after 10 minutes instead of the normal 5 minutes

10.4 Relative centrifugal force (RCF)

The relative centrifugal force (RCF) is given as a multiple of the acceleration of gravity (g). It is a unit-free value and serves to compare the separation and sedimentation performance.

These values are calculated using the formula below:

$$RCF = \left(\frac{RPM}{1000}\right)^2 \times r \times 1{,}118 \qquad \Rightarrow \qquad RPM = \sqrt{\frac{RCF}{r \times 1{,}118}} \times 1000$$

RCF = relative centrifugal force
RPM = rotational speed (revolutions per minute)
r = centrifugal radius in mm = distance from the centre of the turning axis to the bottom of the tube, see cha. 16.1, Rotors and accessories.

The relative centrifugal force (RCF) stands in relation to the revolutions per minute and the centrifugal radius.

10.5 Querying operating hours

Go into the system settings (start screen, cha. 8.2, pos. 2),
Go into the service menu (system settings, cha. 8.5, pos. 2),

11 Centrifugation of materials or mixtures of materials with a density higher than 1.2 kg/dm³

When centrifuging with maxim revolutions per minute the density of the materials or the material mixtures may not exceed 1.2 kg/dm³.
The speed must be reduced for materials or mixtures of materials with a higher density.

The permissible speed can be calculated using the following formula:

$$\text{Reduced speed}(n_{red}) = \sqrt{\frac{1.2}{\text{Greater density}[kg/dm^3]}} \text{ x maximum speed[RPM]}$$

e.g.: maximum speed RPM 3500, density 1.6 kg/dm³

$$n_{red} = \sqrt{\frac{1.2\ kg/dm^3}{1.6\ kg/dm^3}} \text{ x } 3500\ RPM = 3031\ RPM$$

In the exceptional case that the maximum loading indicated on the hanger is exceeded, the speed must also be reduced.

The permissible speed can be calculated using the following formula:

$$\text{Reduced speed}(n_{red}) = \sqrt{\frac{\text{maximum load}[g]}{\text{actual load}[g]}} \text{ x maximum speed[RPM]}$$

e.g.: maximum speed RPM 3500, maximum load 300 g, actual load 350 g

$$n_{red} = \sqrt{\frac{300\ g}{350\ g}} \text{ x } 3500\ RPM = 3240\ RPM$$

If in doubt you should obtain clarification from the manufacturer.

12 Maintenance and servicing

The device can be contaminated.

Pull the mains plug before cleaning.

For safety reasons you must wear gloves and a respiratory mask when cleaning the equipment used for blood processing.

Before any other cleaning or decontamination process other than that recommended by the manufacturer is applied, the user has to check with the manufacturer that the planned process does not damage the device.

- Centrifuges, rotors and accessories must not be cleaned in rinsing machines.
- They may only be cleaned by hand and disinfected with liquids.
- The water temperature must be between 20 – 25°C, 68°F – 77°F.
- Only detergents/disinfectants may be used which:
  - have a pH between 5 - 8
  - do not contain caustic alkalis, peroxides, chlorine compounds, acids and alkaline solutions
- In order to prevent appearances of corrosion through cleaning agents or disinfectants, the application guide from the manufacturer of the cleaning agent or disinfectant are absolutely to be heeded.
- Certain preservation agents, in azide-free saline solutions can cause long term damage effects to the plastic parts in the device. Regular cleaning prevents salt deposits and lengthens the life span of these parts.

12.1 Centrifuge

- The following must be carried out daily:
  - Check the tubes and their attachments. The tubes must not be cracked or blocked and must be securely attached. Do not forget the solution-tube to the lid (fig. 7.1, pos. A). The used saline solution must be allowed to flow off freely through the drainage hose.
  - The centrifugal area must be clean and free from dried up salt crystals and other deposits. Clean the centrifugation area, the splash guard receiver and the splash guard cap with a moist cloth or sponge. The splash guard receiver and the covering ring can be removed from the centrifugation area for cleaning, refer to Chapter "Removal of the splash guard receiver and cap".
  - Check the filling volume of the saline solution (see the “Adjusting the filling volume” chapter 10.2).
  - The system must be rinsed through with distilled water to avoid formation of salt crystals, refer to Chapter "12.5 Flush system with deionised or destilled water".
- It is important that the tubes are kept clean and free from dried up salt crystals and other deposits.
- The system must be regularly cleaned, refer to Chapter "Clean system with cleaning solution". It is recommended to clean the appliance at least once a week.
- Clean the centrifuge housing and the centrifuging chamber regularly, using soap or a mild detergent and a damp cloth if required. This serves as hygiene protection and prevents corrosion caused by impurities.
- Ingredients of suitable detergents:
  soap, anionic tensides, non-ionic tensides.
- After using detergents, remove the detergent residue by wiping with a damp cloth.
- The surfaces must be dried immediately after cleaning.
- Lightly rub the rubber seal of the centrifuge chamber with talcum powder or a rubber care product after each cleaning.
- Surface disinfection:
  - If infectious materials penetrates into the centrifugal chamber this is to be disinfected immediately.
  - Ingredients of suitable disinfectants:
    ethanol, n-propanol, isopropyl alcohol, glutardialdehyde, quaternary ammonium compounds.
  - After using disinfectants, remove the disinfectant residue by wiping with a damp cloth.
  - The surfaces must be dried immediately after disinfecting.
- Removal of radioactive contaminants:
  - The agent must be specifically labelled as being an agent for removing radioactive contaminants.
  - Ingredients of suitable agents for removing radioactive contaminants:
    anionic tensides, non-ionic tensides, polyhydrated ethanol.
  - After removing the radioactive contaminants, remove the agent residue by wiping with a damp cloth.
  - The surfaces must be dried directly after removing the radioactive contaminants.
- The centrifuging chamber is to be checked for damage monthly and and after a glass-breakage

If damage is found which is relevant to safety, the centrifuge may no longer be put into operation. In this case, notify Customer Service.

12.2 Rotor

- It is important that the rotor is kept clean and free from dried up salt crystals and other deposits.
- Either soak the rotor in warm, distilled water or pour the water directly down into the rotor for a few minutes. The water must flow out of all the injection nozzles.
- If the injection nozzles are blocked, insert the included plastic pin into the injection nozzles and carefully slide it in and out until the nozzles become clear again.
- In order to prevent corrosion and material changes, rotors and accessories must be cleaned regularly with soap or a mild detergent and a damp cloth. Cleaning is recommended at least once a week. Contaminants must be removed immediately. Ingredients of suitable detergents:
  soap, anionic tensides, non-ionic tensides.
- After using detergents, remove detergent residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
- The rotors and accessories must be dried directly after cleaning.
- Disinfection:
  - If infectious material should get on the rotors or accessories, they must be appropriately disinfected.
  - Ingredients of suitable disinfectants:
    glutaraldehyde, propanol, ethyl hexanol, anionic tensides, corrosion inhibitors.
  - After using disinfectants, remove disinfectant residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
  - The rotors and accessories must be dried directly after disinfection.
  - Removal of radioactive contaminants:
  - The agent must be specifically labelled as being an agent for the removal of radioactive contaminants.
  - Ingredients of suitable agents for removing radioactive contaminants:
    anionic tensides, non-ionic tensides, polyhydrated ethanol.
  - After removing the radioactive contaminants, remove agent residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
  - The rotors and accessories must be dried directly after removing the radioactive contaminants.
  - The rotor is to be checked for corrosion damage every month.The rotor is to be checked for corrosion damage every month.

If there are signs of wearing or corrosion, e.g. cracks in the material, the rotors and accessories must no longer be used.

12.3 Autoclaving

The system must be regularly disinfected and cleaned, refer to Chapter 12.6 Clean system
None parts from the device and its accessories are made for autoclaving

12.4 Removal of the splash guard receiver and cap

The splash guard receiver and the splash guard cap can be removed from the bowl (fig. 7.5, pos. F), centrifugation area, (fig. 7.5, pos. E), for cleaning.

Removal of the splash guard receiver and the splash guard cap:
- Remove the splash guard cap (fig. 7.5, pos. C) from the bowl (fig. 7.5, pos. F)
- Carefully flap the inner sealing ring (fig. 7.5, pos. A) upwards and remove the splash guard receiver (fig. 7.5, pos.B) out of the centrifugation area.

Installation of the splash guard receiver and splash guard cap:
- at the back of the centrifugation area carefully flap the sealing ring (fig. 7.5, pos. A) upwards and push the splash guard receiver (fig. 7.5, pos. B) under the sealing ring (fig. 7.5, pos. A)
  The drain hole of the splash guard receiver must be located above the drain hole in the bowl
- Carefully flap the sealing ring upwards around the splash guard receiver on the inside and press the splash guard receiver carefully downwards. The splash guard receiver (fig. 7.5, pos. B) must be located below the sealing ring (fig. 3, pos.).
- Place the splash guard cap (fig. 7.5, pos.) onto the splash guard receiver in such a way that the inscription "this side up" can be read, refer to fig. 7.5, pos. C / C1

12.5 Flush system with deionized or destilled water

- Take off the Saline-tube, solution 1, from the physiological saline solution container and dipping it it to provided flask with deionized or destilled water
- Start the system-program “flush”
- Take off the Saline-tube from the flask and dipping it back to the saline solution container
- Open the lid and drying the centrifuging area

Let stay the deionized or destilled water into the system till you will start with the next wash-procedure to protect the system from crystallyiced salt cristalls

Take care to rinse the system with the flush-program befor starting any other program, otherwise the probes will be disturbed.

12.6 Clean system with cleaning solution

- Prepare in a beaker about 400ml of 0.5% sodium hypochlorite cleaning solution, prepare also deionized or destilled water in a flask
- Take off the Saline-tube, solution 1, from the physiological saline solution container and dipping it it to the beaker with the 0.5% sodium hypochlorite cleaning solution
- Start the system-program “flush”
- Wait 5 minutes
- Take off the Saline-tube from the beaker and dipping it into the flask with deionized or ndestilled water
- Start the system-program “flush”
- Open the lid and drying the centrifuging area
- Take off the Saline-tube from the flask and tipping it into the saline solution container
- Start the system-program “flush”
- Check the filling volume by doing the procedure “10.2 calibrating the filling volume”
- Take off the Saline-tube from the saline solution container and dipping it it to the flask with deionized or destilled water
- Start the system-program “flush”
- Let stay the deionized or destilled water into the system till you will start with the next wash-procedure and take care to rinse the system with the flush-program befor starting any other program

12.7 Glass breakage

In a case of glass breakage, the pieces of glass and leaked centrifugal liquid must be carefully removed from the centrifugal area and tube holders.

The leakage could involve infectious materials, the area must be disinfected immediately.
The drain-hole from the bowl should be blocked, a.e. with a plug, pencil rubber or with a crimped over tissue, so that none piece of glass can fall down into the drain-hole and block the drain-outlet connector on the rear-side of the device, fig. 7.1, pos. 8, befor starting to remove all broken pieces of glass.

Before continue to work
- The bowl must be checked for scratches, if so a technician must replace it => call your local distributor.
- The tube-holder, where a tube was breaked must be replaced, the rotor and its tube-holders must be checked for scratches and the rotor must be checked for correct function, if so or you are unable to resolve that, then the rotor must be replaced.

Take care that never will be used tubes which
- are fallen to the floor
- has cracks in the glas

12.8 Repairs

Repairs and periodic maintenances from the device (internal from the device where it is nessecary to open the case) must be done ONLY from the manufacturer authorised emploees
ONLY original parts, authorised from the manufacturer, must be used for repair

12.9 Rotor-crash

WARNING In a case of a rotor-crash you must immediately contact the manufacturer or your local service support to ask for instructions befor you touch the device or some piece of it

If you can not reach somebody, then make pictures from different views and you are allowed to inject the device and the surrounding area with a disinfectant, but not anything else!

12.10 Maintenance schedule

Recommended minimum requirements. Regulations for your organization or physical conditions at your organization may require maintenance items to be performed more frequently and or only by designated service personnel

Task	Frequency			
	daily	weekly	monthly	annually
Inspect the tubing and drain and clear obstructions if necessary	X			
Inspect the tubing connections and secure them if necessary	X			
Flush the system with deionized or destilled water	X			
Clean and dry the interior after normal usage to prevent corrosion and contamination	X			
Flush the system with cleaning solution		X		
Clean the fill ports on the rotor		X		
Check the saline volume setting and calibrate it if necessary Frequency varies by length of service			X	
Check the rotor speed and calibrate it if necessary				X
Inspect the rotor for wear, corrosion, and damage Replace the rotor if these conditions exist			X	
Inspect the tube holders for wear and damage Replace tube holders if they are worn or damaged, or after they have been in use for two years			X	
Clean the exterior		X		
Replace the supply and drain tubing				X
Replace the tube holder inserts for 10 mm x 75 mm tubes				X

Replace the tube-holders every two years
Replace the rotor, every four years (including the tube-holders)

13 Faults and Errors

13.1 Operator faults

Fault	Cause	Remedy
Incomplete wash cycle	– A 24-place rotor is being used, even though a 12-place rotor has been set as the rotor type. – The filling volume is set too low. – The injection nozzles are blocked.	– Check the **ROTOR:** parameter in the system settings. – Check the volume (ml) and speed from the FILL-process in the used program. – Clean the injection nozzles.
Pellet does not form on the base of used tube	– The revolutions per minute during the centrifugation run for the agglutination test are too low. – The tube holders are left hanging in the decantation position – Wrong used tube-type tube	– Check the spin-process from the used program. – Check the rotor functions. – Check if the used tube is the same as during the program-validation
No pellet/pellet too small	– A 12-place rotor is being used, even though a 24-place rotor has been set as the rotor type. – The filling volume is set too high. – Wrong used tube-type tube	– Check the **ROTOR:** parameter in the program. – Check the **SALINE (ml)** parameter in the program. – Check if the used tube is the same as during the program-validation
The liquid is not decanted.	– The rotor mechanism is defective. – The revolutions per minute during the DECANT-process are too low.	– Check the rotor functions – Check the spin-process from the used program.

If you detect a variable fill-volume over a tolerance of ±15% of the setting, then you must check the fill-port from the rotor and if necessary you must clean or exchange it

13.2 Software Error Codes

Error Code	Error Name	Description	Possible reasons
0	No error	Program was successful, no error has occurred	
1	Running	Program is still running, so far no error has been detected (should never be visible in history)	
		Motor error	
10	Motor startup error	Motor could not be started (no speed could be detected)	• Motor is blocked • Motor cable connection problem • Motor power supply problem
11	Motor acceleration error	Motor could not accelerate within tolerance (motor was too slow)	• Wrong rotor type selected • Mechanical friction too big
12	Motor acceleration error	Motor could not accelerate within tolerance (motor was too fast)	• Wrong rotor type selected
13	Motor speed error	Motor could not hold the desired speed (motor was too slow)	• Wrong rotor type selected Maximum of motor speed limit too high (4000 RPM can maybe not been hold) • Motor speed control does not work as intended • Motor speed reading failure

14	Motor speed error	Motor could not hold the desired speed (motor was too fast)	• Motor speed control does not work as intended • Motor speed reading failure
15	Motor break error	Motor could not slow down within tolerance	• Wrong rotor type selected
16	Motor internal error	Motor has signalized an error	• Motor blocked • Motor over temperature • Motor power supply error
17	Motor power supply	The 24 V of the motor supply is not available	• Lid is detected as open
		Liquid injection system error	
20	Pump error	Pump was not able to pump the desired amount of liquid	• Pipe blocked • Pump not working • Flow sensor not working
21	Liquid container empty	Not enough liquid available or air is in the pipe	• Liquid container empty • Air in the pipe • Flow sensor problem
		Lid error	
30	Lid blocked	Open or check button was pressed, but the lid could not be opened.	• Lid mechanically blocked
31	Unlocking failed	Open or check button was pressed, but the lock could not be unlocked.	• Motor was still rotating at the time the command for unlocking was received • Problem with the lock
32	Unexpected unlocking	Lid was opened without a request.	• Emergency unlocking was used
33	Lid detection failure	Lid sensor has detected an opening of the lid, but the lock sensor still signalizes the lock is closed	• Wrong lid detection of the lid sensor • Wrong lock detection of the lock sensor
		System error	
40	Program reading error	It was not possible to read the complete program.	• Program file is corrupted • Not enough heap memory was available
41	Image loading failed	Not all images could be loaded	• An image is missing on the flash • An image on the flash is corrupted
42	Eeprom error	Loading data from eeprom failed. (reading not possible or checksum for the data is incorrect)	• Eeprom not initialized (login of a service user needed) • Communication failure
		Miscellaneous	
50	Unknown	An error has occurred, but the kind of the error could not be identified	• Unexpected behavior
51	Program interrupted	A running program was interrupted.	• Power interrupted during a running program.
52	Program aborted by user	The program was aborted by the user	• User has aborted the program
53	Imbalance	The program was stopped because of an imbalance of the rotor	• Rotor was not loaded symmetrically • Positioning of the imbalance sensor not correct
			• •

Screen-freeze:
- If a screen-freeze ocours, not the normal stand-by mode (push anywhere onto the dark display), Perform a mains reset

Perform a MAINS RESET:
− Switch off the mains switch (position "0", fig. 7.1, pos. 2).
− Wait at least 10 seconds and then switch on the mains switch again to position "1".

Check the history for the last run and report the error-code to your local service support

Befor you open the lid with the release-pin (cha. 4.3) you must check through the window into the lid that the rotor is at a standstill position

If it is not possible to close the lid => check if there is a small part is fallen into the lid-lock access-hole (fig. 7.5, pos. D), if so then contact your local service-support

13.3 Changing the fuse

Switch off the mains switch and remove the power-plug from the external power-supply from the mains!

Srew the cap from the fuse-holder, fig. 7.1, pos. 5, off by turning it counter-clockwise, 1/8-turn, and pull it out with the fuse. Exchange the defective fuse and tightly screw it including the cap back into the fuse-holder by turning it in clockwise direction.

Only T10A/125VAC, 6.3 x 32 mm fuses with UL and CSA approval, (order no. UC.E114)
cap, for fuse holder, 6.3 x 32 mm, (order no. UC.E104)
F10AA/250VAC, 5.0 x 20 mm fuses with UL and CSA approval, (order no. UC.E118)
cap, for fuse holder, 5.0 x 20 mm, (order no. UC.E116) may be used.

14 Returning the device or some parts of it

If the device, some parts of it or its accessories are returned to Hettich AG or the local supplier, in order to provide protection for people, the environment and materials, it has to be decontaminated and cleaned before being shipped, a declaration should to be apply onto the device, respectively onto the parts.

Before returning the device, a transport securing part has to be installed.
Before returning the device or some parts of it, by some local suppliers you should ask for an RMA-number (Return Authorization Number)

We reserve the right to refuse contaminated devices or accessories.
Costs incurred for cleaning and disinfection are to be charged to the customer.

We ask for your understanding in this matter.

15 Storage

Before storage the device, it should be decontaminated and cleaned to protect people, the environment and property. We suggest to put a declaration onto the device with the date, sign and the solution.

The appliance may only be stored under the following conditions:

- in an enclosed, dust-free room conform to the storage-ambient, refer to the tech. specifications (cha. 5, tab. 1)
- frost-free
- disconnected from the power supply

15.1 Disposal

Before disposal, the device must be decontaminated and cleaned to protect people, the environment and property. Please also observe all other regulations applicable in this context. We suggest to apply a declaration onto the device with the date, sign and the solution.

When you are disposing of the device, the respective statutory rules must be observed.
Pursuant to guideline 2002/96/EC (WEEE), all devices supplied after August 13, 2005 may not be disposed as part of domestic (household), or industrial waste. The device belongs to group 8 (medical devices) and is categorized in the business-to-business field.
The icon of the crossed-out trash can shows that the device may not be disposed as part of domestic waste.
The waste disposal guidelines of the individual EC countries might vary Contact your supplier or the local department for treatment of waste.
There is a lithium battery in the main-electronic-board of the device. Remove it and dispose of it in accordance with the regulations in your country.

Note for Germany:
The device may not be left at public or communal recycling or collection points, if necessary, contact your supplier or the local department for treatment of waste.

Hettich AG │Seestrasse 204a │ 8806 Bäch │ Switzerland
Tel. +41 44 786 80 20 │ info@hettich.ch │ www.hettich.ch

Succursale Suisse Romande │1357 Lignerolle │ Tél. +41 44 786 80 26

Log

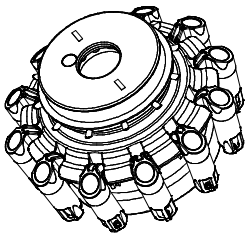
serialnumber:_____ inventorynumber: _____

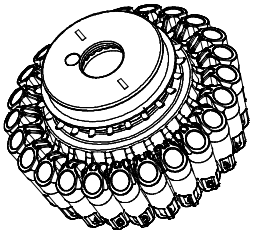
date	description, work	sign

16 Appendix

16.1 Rotors and accessories

16.1.1 For the UltraCW II

CW-1012-A	CW.E2197						
Dekantierrotor 12-fach / Decant rotor 12-places  45°							
	Reduzierung / adapter						
	CW.E2551 [1]						
							
	Röhrchen / tube						
							
Kapazität / capacity ml	3	5					
Maße / dimensions ∅ x L mm	10 x 75	12 x 75					
Anzahl p. Rotor / number p. rotor	12	12					
Drehzahl / speed RPM	3500 [2]						
RZB / RCF	1438						
Radius / radius mm	105						

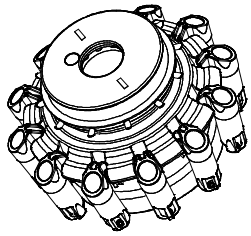
CW.1024-A	E2197						
Dekantierrotor 24-fach / Decant rotor 24-places  45°							
	Reduzierung / adapter						
	CW.E2551 [1]						
							
	Röhrchen / tube						
							
Kapazität / capacity ml	3	5					
Maße / dimensions ∅ x L mm	10 x 75	12 x 75					
Anzahl p. Rotor / number p. rotor	24	24					
Drehzahl / speed RPM	3500 [2]						
RZB / RCF	1438						
Radius / radius mm	105						

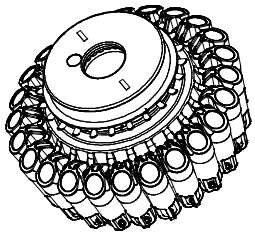
1) one piece
2) max. speed 3500RPM / 1438RCF => recheck with the supplier / distributor / manufacturer of the tubes

Hettich AG │Seestrasse 204a │ 8806 Bäch │ Switzerland
Tel. +41 44 786 80 20 │ info@hettich.ch │ www.hettich.ch

Succursale Suisse Romande │1357 Lignerolle │ Tél. +41 44 786 80 26

16.1.2 For the Rotolavit II

1017-A	E2197						
Dekantierrotor 12-fach / Decant rotor 12-places  45°							
	Reduzierung / adapter						
	1019 [1]						
							
	Röhrchen / tube						
							
Kapazität / capacity ml	3	5					
Maße / dimensions ∅ x L mm	10 x 75	12 x 75					
Anzahl p. Rotor / number p. rotor	12	12					
Drehzahl / speed RPM	3500 [2]						
RZB / RCF	1438						
Radius / radius mm	105						

1018-A	E2197						
Dekantierrotor 24-fach / Decant rotor 24-places  45°							
	Reduzierung / adapter						
	1019 [1]						
							
	Röhrchen / tube						
							
Kapazität / capacity ml	3	5					
Maße / dimensions ∅ x L mm	10 x 75	12 x 75					
Anzahl p. Rotor / number p. rotor	24	24					
Drehzahl / speed RPM	3500 [2]						
RZB / RCF	1438						
Radius / radius mm	105						

1) set with 12 pieces
2) max. speed 3500RPM / 1438RCF => recheck with the supplier / distributor / manufacturer of the tubes

16.1.3 Document History

rev.	date	supersession	Revision description
1.0	23.May 2017	01 - 06	Contents, desc. of preloaded programs
1.1	24.May 2017	1.0	Correction p/n from accessories, implementation of Document Histotry
1.2	4. June 2017	1.1	Edit chapter 12, 13, new CE-declaration and correction of typing errors
1.3	7. June 2017	1.2	Edit chapter 12, new header