HERMLE **Sieva-3**

User Manual

HERMLE
LABORTECHNIK

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1. GENERAL INFORMATION

1.1 Indended use

The Sieva 3 is a filter centrifuge. Here, solids are separated from a liquid medium with the assistance of accessories (basket). The centrifuge is only intended for this purpose, i.e. only liquids may be centrifuged. Any other use is not considered as intended.

1.2 Danger, precautions and warranty

Before putting the centrifuge into operation, please read this instruction manual carefully.

This device may only be operated by trained specialist stuff. They must have carefully read the operating manual and be familiar with the function of the device.

To protect people and environment the following precautions should be observed:

- During centrifugation, the presence of people and the setting up of hazardous materials is prohibited within 30 cm around the centrifuge according to the regulations of EN 61010-2-020.
- The HERMLE **SIEVA 3** is non explosion-proof and must therefore not be operated in explosion-endangered areas or locations. Centrifugation of flammable, explosive, radioactive, or such substances, which chemically react with high energy, is strictly prohibited. The final decision on the risks associated with the use of such substances is the responsibility of the user of the centrifuge.
- Never spin toxic or pathogenic material without adequate safety precautions, i.e. centrifugation of buckets / tubes without or with defective hermetic sealings is strictly prohibited. The user is obliged to perform appropriate disinfection procedures in case dangerous substances have contaminated the centrifuge and or its accessories. When centrifuging infectious substances, always pay attention to the General Laboratory Precautions. If necessary, contact your safety officer!
- It is prohibited to run the centrifuge with rotors other than listed for this unit.
- Under no circumstances open the lid of the centrifuge while the rotor is still running or rotating with a speed of > 2m/s

The following rules must be strictly adhered to:

- Do not operate the centrifuge in case it is not installed correctly.
- Do not operate the centrifuge when dismounted (e.g. without housing).
- Do not run the centrifuge when mechanical or electrical assembly groups have been tampered with unauthorized persons.
- Do not use accessories such as rotors and buckets, which are not exclusively approved by HERMLE Labortechnik GmbH, except commercially available centrifuge tubes made of glass or plastic.
- Do not spin extremely corrosive substances, as they may cause material damages and impair mechanical resistance.
- Do not operate the centrifuge with rotors or buckets, which show any signs of corrosion or mechanical damage.

- If the basket is removed, no liquids must be filled into the centrifuge chamber. There is a risk of engine failure.
- The baskets must not be filled at a standstill. The filling must only be carried out when the baskets are spinning.

The manufacturer is responsible for safety and reliability of the centrifuge, only if:

- The unit is operated in accordance with this instruction manual.
- Modifications, repairs or other adjustments are performed by HERMLE-authorized personnel and the electrical installation of the related location corresponds to the IEC-regulations.

1.3 Short description

The Sieva-3 is a filtration centrifuge with microprocessor control. All parameters are accessible via buttons and selected with the control field. All pre-selected and current values will be shown permanently on the LCD-display.

The set parameters remain stored after the centrifugation.

The lid is locked and unlocked by an electromagnetic lid lock.

The centrifuge is powered by a maintenance-free and silent induction motor.

1.4 Warranty

The centrifuge was delivered and handed over after completion of all tests and quality controls. If, however, manufacturing defects are found during routine operation, you are entitled to replacement for the basic unit and all rotors supplied within 24 months of the delivery date. Incorrect operation, use of a different type and unauthorised modifications to the rotors or the centrifuge invalidate the warranty claim completely.
Only original spare parts from Hermle Labortechnik GmbH may be used!
We reserve the right to make changes at any time in the interests of technical development!

2. INSTALLATION

2.1 Delivery Package

- 1 Centrifuge Sieva -3
- 1 Instruction Manual Sieva-3
- 1 Hex key
- 1 Allen key
- 1 Power cord

Rotor(s) / Accessories will be packaged either inside the centrifuge or separately.

2.2 Unpackaging

Model **Sieva-3** is supplied in a carton on a palett. Remove the strap retainer and lift the carton. Now the centrifuge is standing free on the pallet. Lift the centrifuge on both sides with an appropriate number of helpers and place it on the laboratory table (see Figure 1

Attention! Do not lift the centrifuge under the lid or by the drainpipe!

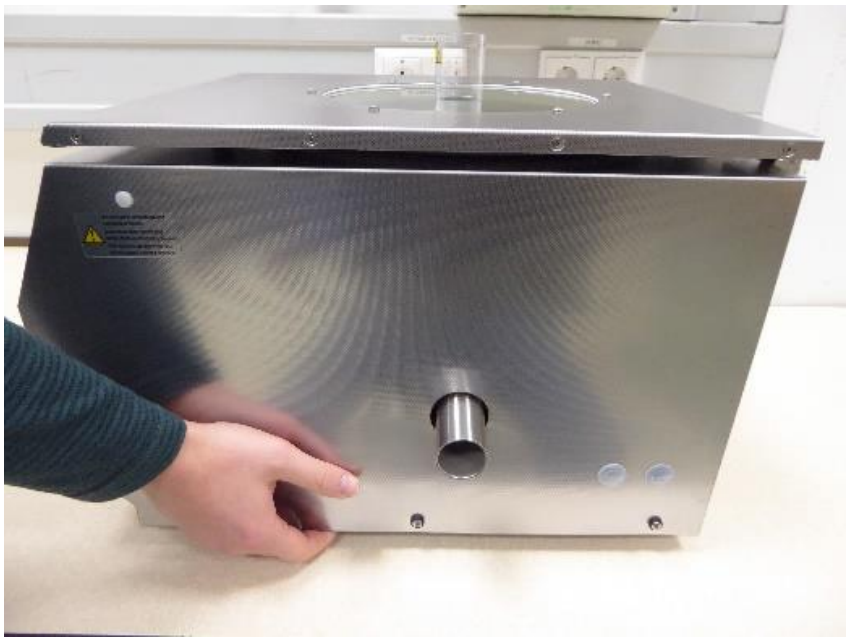


Figure 1

The instruction manual must be kept with the centrifuge, at all times!

2.3 Space Requirements

The centrifuge should be installed on an even, solid surface, if possible on a laboratory cabinet / table or some other solid vibration free surface.

During centrifugation, the centrifuge must be placed in a way, that there is a minimum space of 30 cm/11.81in on each side of the unit, according to EN 61010-2-020 standards.

Do not place the centrifuge next to a window or a heater where it could be disposed to excessive heat, as the performance of the unit is based on an ambient temperature of 23°C/73.4°F.

2.4 Installation

Follow these steps:

- Check whether the power supply corresponds with the one specified on the manufacturer's rating label, mounted on the rear pane.
- The power connection for the centrifuge requires a **separate** one-site protection, with 16 A (Type K).
- In case of emergency, there must be an emergency switch off installed outside of the room, in order to disconnect the power supply from the unit.
- Connect the centrifuge, with the mains.
  (The socket for the power cord must be easy to reach, respectively easy to disconnect).
- Switch on, by using the mains power switch (I).
- Open the lid, by using the button LID.
- Remove the transport securing device of the motor.

2.5 Signs and Indications of the Centrifuge

2.5.1 Product Nameplate (Example)

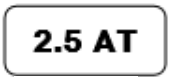
Company Address:	Hermle Labortechnik GmbH, Siemensstr. 25, D-78564 Wehingen
TYPE:	Type Designation of the Product
REF:	Order No. of the Product
SN:	Serial No. of the Product
	Manufacturer
	Date of Manufacture
MAX. Drehzahl:	Max. Speed Allowed of the Unit
KIN. EN.:	Max. Kinetic Energy with Corresponding Roto
U/I/f:	Allowable Voltage / Max. Current / Frequency
P:	Electrical Input Power
	Operating Manual Indication
	Labeling, Standards and Guidelines
	Instructions for Disposal
	RoHS-Compliance Label

2.5.2 Warning and Information Signs

Attention! Check the fastening of the rotor nut before each run

Take off mains plug before opening the housing or the emergency release

Power Input



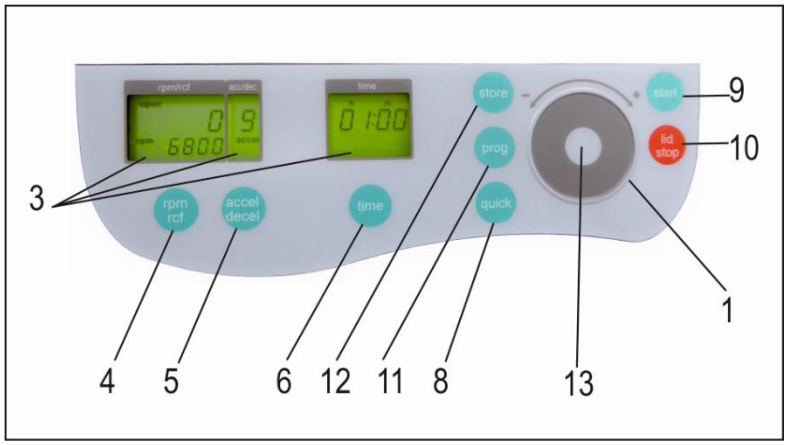
Fuse 2,5 AT

Direction of Rotation – clockwise rotation for the rotor drive

Attention! Hot Surface
(Only for model with the preparation for external temperature equalization)

Warning notice External Temperature Equalization (see Chapter 4.8)

2.6 Operating and Display Elements



1	control field	Run Parameters
3	LCD	Control Panel Display
4	rpm/rcf	Speed / g-force
5	accel/decel	Acceleration / Deceleration
6	time	Centrifugation time
8	quick	Short Running
9	start	Start Centrifugation
10	lid/stop	Lid Release / Stop Centrifuge
11	prog	Retrieving Stored Programs
12	store	Program Store
13	LED light	Shows the status of the centrifuge

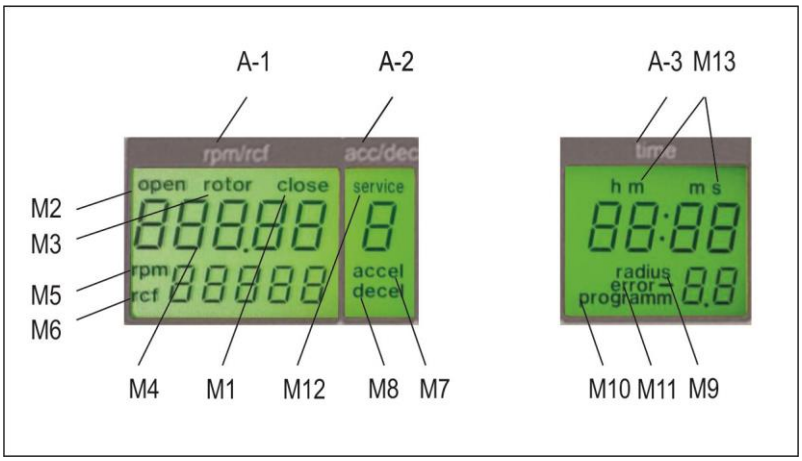
2.6.1 LED light

The LED light indicates the current operation state of the centrifuge. The following table shows all operating states.

Color of LED light	Operating state
Green	Run complete, lid is closed
Yellow	Lid opened, no sleep mode
Red flashing fast	Error message
Red flashing slow	Centrifuge runs
Yellow flashing slow	Sleep mode
Red – Green flashing slow	Standard settings menu

2.6.2 LCD-Display

The following picture shows the individual elements of the LCD-display.



Display Fields:

A-1	Display Field – "rpm/rcf"
A-2	Display Field – "acc/dec"
A-3	Display Field – "time"

Messages/Lettering of the Display Fields:

M1	"close"	M8	"decel"
M2	"open"	M9	"radius"
M3	"rotor"	M10	"program"
M4	Rotor-No.	M11	"error"
M5	"rpm"	M12	"service"
M6	"rcf"	M13	h m s
M7	"accel"		

2.7 Installation of the rotor

2.7.1 Mounting of the centrifugal basket

Place the basket onto the shaft mounting. Make sure that the driving pins on the shaft mounting and the borings on the bottom of the basket are in the correct position. Hold the basket with one hand and secure the fixing nut with the help of the hex key by turning it clockwise (see Figure 1).

To ensure safe operation, the motor mounting must be regularly checked for tightness and secured, if necessary. Therefore remove the fixing nut from the basket. Hold the basket with one hand and tighten the motor mounting with the help of allen key by turning it clockwise (see Figure 2).

Figure 1

Figure 2

ATTENTION:
The perforated basket must not be filled during standstill! Filling of this basket may only be carried out when it is rotating. The speed does not matter. If the perforated basket is filled while the centrifuge is still at standstill, the liquid can get into the interior and damage the centrifuge.

The non-perforated basket can be filled while it is stationary, but without overfilling it. Overfilling would also damage the centrifuge.

2.7.2 Loading and Overloading of Rotors

The maximum load permitted for the rotor is determined by the manufacturer, as well as the maximum speed allowed for this rotor (see label on rotor), must not be exceeded.

The liquid the rotors are loaded with, should have a max. homogeneous density of 1.2 g/ml or less when the rotor is running at maximum speed

In order to spin liquids with a higher density, the speed has to be reduced, according to the following formula:

$$\text{Reduced speed } n_{red} = \sqrt{\frac{1{,}2}{\text{higher density}}} \times \text{max. speed } (n_{max}) \text{ of the rotor}$$

Example:

$$n_{red} = \sqrt{\frac{1{,}2}{1{,}7}} \times 4.000 = 3.360 \text{ rpm}$$

2.7.3 Removing of the rotor

Hold the basket with one hand and untighten the fixing nut of the basket by turning the hex key counter clockwise. Lift the rotor from the motor mounting.

2.7.4 Functional principle of the baskets

The baskets of Sieva-3 are available in two versions. As a perforated and a non-perforated basket.

The perforated basket 221.07 V02 is used for the filtration method. Therefore, a filter with desired pore size is placed into the inner wall of the basket. Due to the centrifugal force, small particles of the solution remain suspended in the filter and the filtered liquid is pressed through the holes of the basket (see Figure 3).

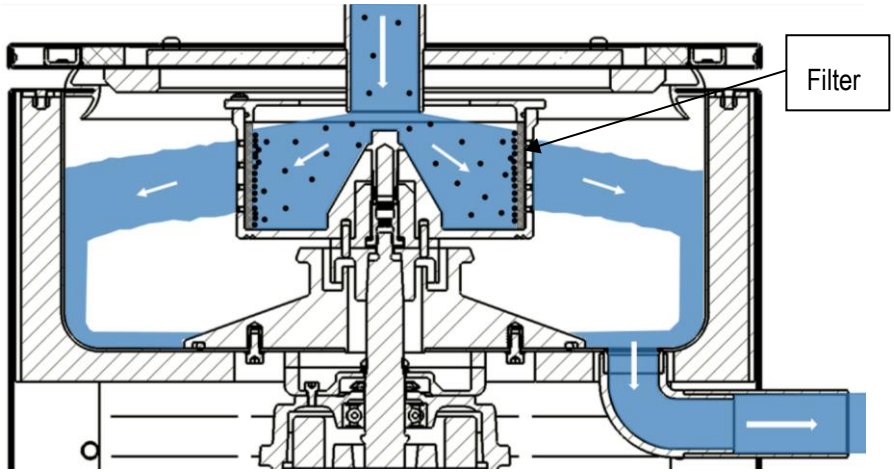


Figure 3: Filtration method

The non-perforated basket 221.07 V04 is used for decantation method. After adding of the solution, the sediment is pressed against the inner wall of the basket and stands upright due to the centrifugal force. The light liquid is discharged via the opening in the lid of the basket (see Figure 4).

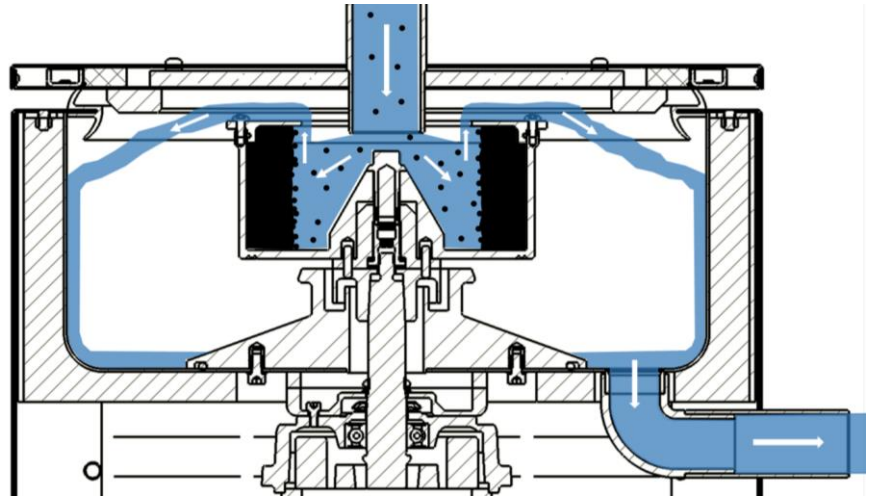


Figure 4: Decantation method

3. BASIC ADJUSTMENTS

3.1 Adjustment of the Rotor Type

In the centrifuge model **SIEVA-3** no rotor adjustment can be done.

3.2 Access to the Mode: “Standard settings“

While starting this model, the following basic settings can be performed:

- Acoustic Signal Turn On / Off
- Volume Pre-Selection of Sound Signal
- Song Selection of Sound Signal "end of run"
- Keyboard Sound On / Off
- Sleep Mode On / Off

The following operating data can be retrieved in this mode:

- Number of Starts
- Operating Hours of Centrifuge
- Operating Hours of Motor
- Software Version
- Frequency Converter Software
- Error List
- Function of the Imbalance Switch
- Operation of Keyboard
- Hardware Version
- Serial Number and year of manufacturing of the control board
- Update touch control panel

Open the centrifuge lid and shut off the main switch. Now switch on again the main switch.For approximately 3 seconds “SIEVA“ will be shown in the display. Press during this time the keys “time“ (6) and “lid“ (10) simultaneously. As a result, a display test is administered for approx. 3 seconds. All possible indications will appear at the same time (see Figure 5). The LED light is flashing alternately with green and red color.

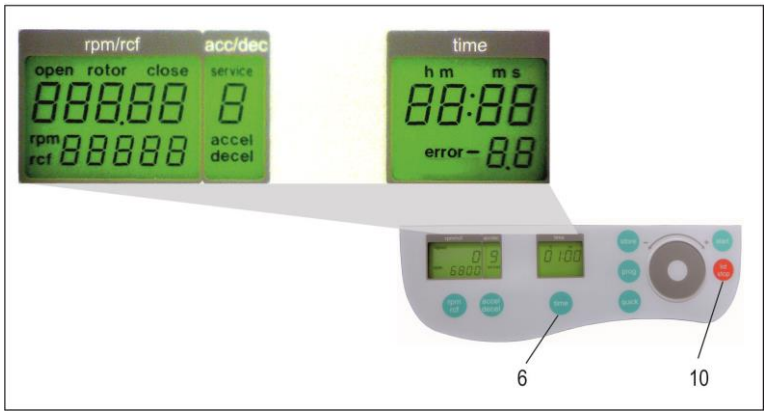


Figure 5

ATTENTION:

- The normal program mode can be changed back again by switching off the centrifuge, for a short period!
- All changed settings must be confirmed by the key, “start” (9). A confirmation screen will appear with the word, “store”, in the display “rpm/rcf” (A-1) - Only then the pre-selections are valid!

3.3 Acoustic Signal Turn On / Off

Proceed as illustrated, under point 3.2, to enter this program mode, press the key; "accel/decel" (5). In the display, "accel/decel" (A-2) flashes the word, "service". Select the letter, "L" with the control field (1). As a result, appearing in the display "rpm/rcf" (4), are the words, "On Sound". By pressing the key, "rpm/rcf" (4), the word "On" flashes, and the sound can be switched off with the control field (1), (see Figure 6).

After the settings have been stored by user, the normal program mode can be changed back again by switching off the centrifuge, for a short period.

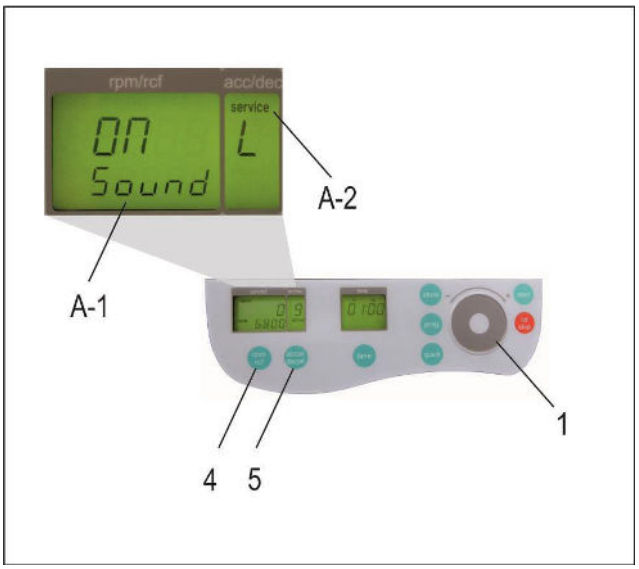


Figure 6

3.4 Volume Pre-Selection of Sound Signal

Proceed as illustrated, under point 3.2, to enter this program mode, press the key "accel/decel" (5). In the display, "accel/decel" (A-2), flashes the word, "service". Select the letter, "U" with the control field (1). As a result, appearing in the display, "rpm/rcf" (A-1), are the words, "Vol=0- 9/Sound". By pressing the key, "rpm/rcf" (4), the desired volume can be adjusted between 0 (low) and 9 (loud), with the adjustable knob (1), (see Figure 7).

After the settings have been stored by user, the normal program mode can be changed back again by switching off the centrifuge, for a short period.

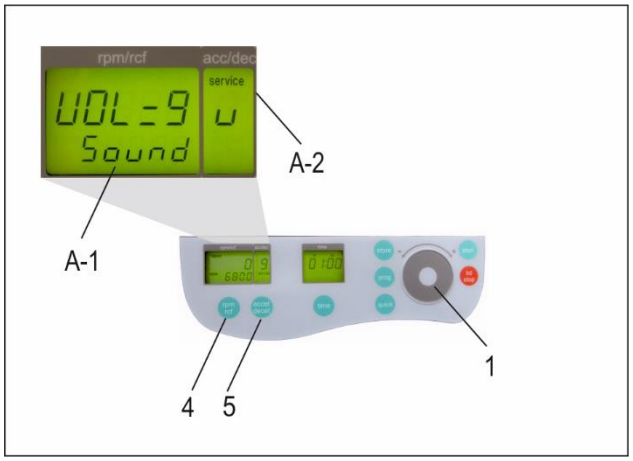


Figure 7

3.5 Song Selection – End of Run

Proceed as illustrated, under point 3.2, to enter this program mode, press the key, "accel/decel" (5). In the display, "accel/decel" (A-2) flashes the word, "service". Select the letter, "G" with the control field (1). As a result, appearing in the display, "rpm/rcf" (A-1), the word " SonGo/Sound". After pressing the key „rpm/rcf“ (4), select a song with the adjusting knob (1), (see Figure 8).

After the settings have been stored by user, the normal program mode can be changed back again by switching off the centrifuge, for a short period.

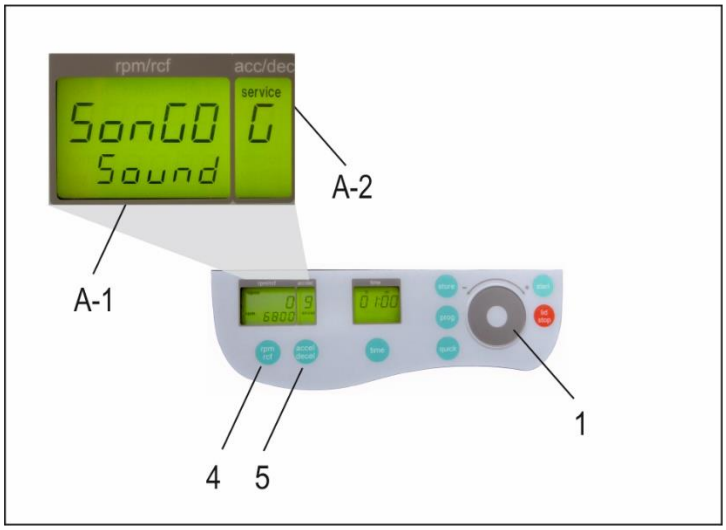


Figure 8

3.6 Keyboard Sound Turn On / Off

Proceed as illustrated, under point 3.2, to enter this program mode, press the key, "accel/decel" (5). In the display; "accel/decel" (A-2) flashes the word, "service". Select the letter, "b" with the control field (1). As a result, appearing in the display, "rpm/rcf" (A-1), the word "ON/BEEP". By pressing the key, "rpm/rcf" (4), the keyboard sound (On) or (Off) can be turned on, with the adjustable knob (1), (see Figure 9).

After the settings have been stored by user, the normal program mode can be changed back again by switching off the centrifuge, for a short period.

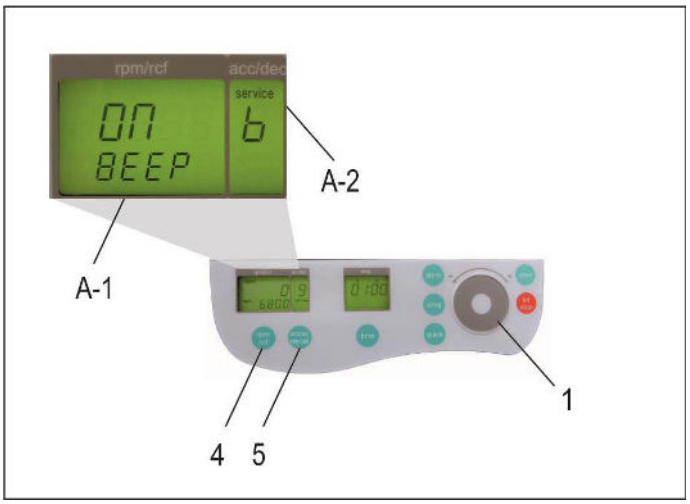


Figure 9

3.7 Sleep Mode Setting

After not using the centrifuge for 5 minutes, the centrifuge automatically falls into sleep mode. The display is switching off and the LED light is flashing slowly with yellow color. By pressing any key, the centrifuge will be reactivated. The sleep mode can be deactivated or set in the range between 1 – 60 minutes.

Proceed as illustrated, under point 3.2, to enter this program mode, press the key, "accel/decel" (5). In the display, "accel/decel" (A-2) flashes the word, "service". Select the letter "I" with the control field (1). As a result, appearing in the display, "rpm/rcf" (A-1), the word "SLEEP". After pressing the key „rpm/rcf“ the sleep mode can be turned off or pre-set to the needed value by turning the control field (1).

After the settings have been stored by user, the normal program mode can be changed back again by switching off the centrifuge, for a short period.

3.8 Retrieving Operation Data

In the function, "Basic Adjustments" the operating data, of the centrifuge, can be retrieved. Please proceed as described, under point 3.2, to enter this program mode.

Press the key "accel/decel" (5). In the display, "accel/decel" (A-2) flashes the word, "service".

With the control field (1) the following information can be retrieved:

A = Previous Starts of the Centrifuge
H = Previous Operating Hours
h = Running Time of the Motor
S = Software Version
r = Freqincy Converter Software
E = List of Previous Error Messages
F = Function of the Imbalance Sensor
P = Operating of Keyboard
d = Hardware-Version
y = Serial Number and year of manufacturing of the control board
n = Update touch control panel (only by trainer service staff)

The list of the last 99 error messages can be looked over by pressing the key “rpm/rcf” (4) and leaf through it with the control field (1). The respective error codes appear in the display “rpm/rc” (A-1) (see Figure 10). The first two numbers indicate the appeared errors ongoing from 00 to 99, the last two numbers indicate the error code. Please refer to, "Table 4: " (see APPENDIX p. 32)

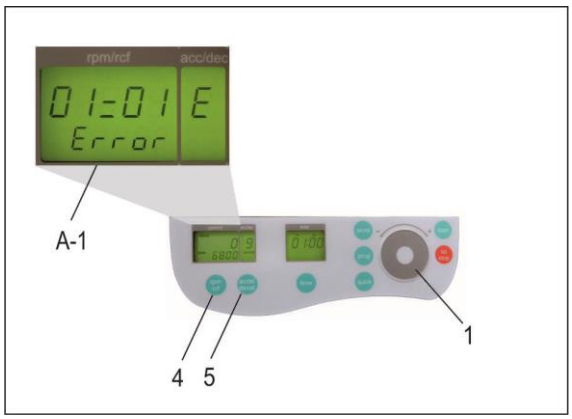


Figure 10

4. OPERATION

4.1 Power Switch

The power switch is located on the left site of the centrifuge housing (see Figure 11).

Figure 11: Power Switch

ATTENTION:

After turning on the power switch, open the centrifuge lid first, before starting the centrifuge.

4.2 Centrifuge Lid

4.2.1 Lid Release

After the run, properly close the lid of the centrifuge, appearing in the display, "rpm/rcf"(A-1) with the word, "close" (M1). At the same time the actual rotor type, for example “221.57”, is shown in the display. By pressing the key, "lid" (10), the lid of centrifuge can be released. As soon as the lid is completely released, the word, "open" (M2) appears. The lid of the centrifuge is now able to be opened.

For all number marked text, please refer to Figure 12.

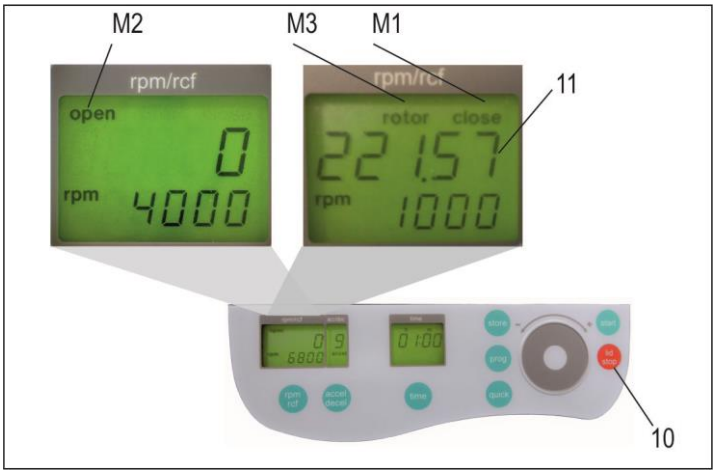


Figure 12

4.2.2 Lid Lock

The lid must only be closed slightly. After closing the lid, the word "open" (M2) will no longer be displayed. As a sign that the centrifuge is ready for starting, appearing in the display, "rpm/rcf"(A-1), the word "close" (M1). Simultaneously, the word "rotor" (M3) appears, as well as the code number of the rotor, which is in the centrifuge, along with all rotor specific data, for example: max. speed, acceleration etc., are available.

For all number marked text, please refer to Figure 12.

ATTENTION:

Before closing the lid, please check if the rotor is tightened.

4.3 Pre-Selection

4.3.1 Pre-Selection of Speed and RCF-Value

By selecting the key, "rpm/rcf" (4), pre-selection is activated. By pressing the key once, the word "rpm" (M5) flashes. By pressing the key again, the pre-selection of the centrifugal forces can be chosen. The flashing word, "rcf" (M6), will appear.

The desired values can be selected, with the control field (1). In the display (A-1), the regulated value is shown permanently: before, during and after the run.

This pre-selected value will be stored, as long as a new pre-selection is made.

For all number marked text, please refer to Figure 13.

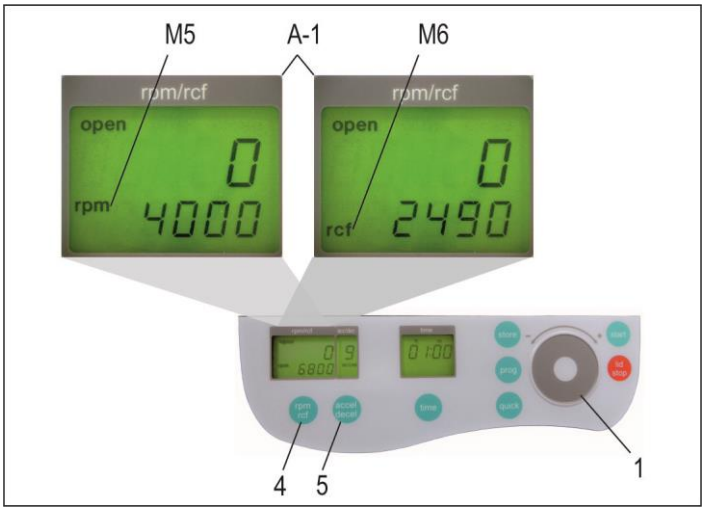


Figure 13

As long as no rotor is inserted, the speed is adjustable between 200 rpm and the maximum revolution of the centrifuge.

If there is a rotor in the centrifuge, the speed can only be pre-selected up to the maximum permissible revolution of that rotor. It is the same with the pre-selection of the RCF-Value. The setting range is between 20 xg and the maximum permissible centrifugal force of the rotor.

The permissible max. speed of the SIEVA-3 with the rotor 221.07 V02/04 is **10000 rpm** or **7825 xg**.

4.3.2 Pre-Selection of Running Time

The running time can be pre-selected in 3 different ranges: from 10 seconds up to 99 hours 59 minutes.

1. Range from: 10 seconds up to 59 minutes 50 seconds, in steps of 10 seconds
2. Range from: 1 hour up to 99 hours 59 minutes, in steps of 1 minutes
3. Range: Continuous Run "cont", can be interrupted by the key, "stop" (10).

- The running time can be pre-selected, with the lid opened or closed.
- To activate the setting of the running time, press the key "time" (6).
- In the display, "time" (A-3) flashes the indication: "m : s" or "h : m", depending on the previous setting.

To set the desired value, use the control field (1). After exceeding 59 min 50 sec, the indication changes automatically to, "h : m". After exceeding 99 hours 59 min, the word "cont" appears in the display, "time" (A-3).

The continuous run can only be interrupted by pressing the key, "stop" (10). The time counts down, as soon as the set speed is reached.

For all number marked text, please refer to Figure 14.

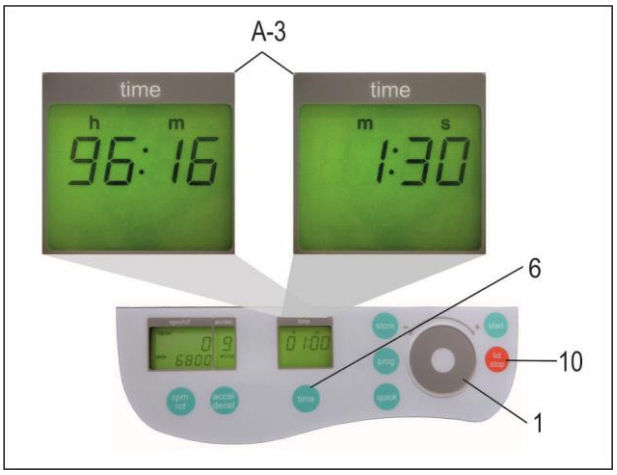


Figure 14

4.3.3 Pre-Selection of Brake Intensity and Acceleration

Selecting the key, "accel/decel" (5), this function is activated.

By pressing the key once, the word "accel" (M7) flashes, in the display "accel/decel" (A-2). The desired acceleration can be pre-selected, with the control field (1). The value 0 is equivalent to the lowest acceleration and the value 9 is equivalent to the highest acceleration.

By pressing the key "accel/decel" (5) twice, in the display "accel/decel" (A-2), indicates the word "decel" (M8). Now the desired brake intensity can be pre-selected, with the control field (1). The value 9 is equivalent to the shortest possible brake time and the value 0 to longest possible brake time.

For all number marked text, please refer to Figure 15.

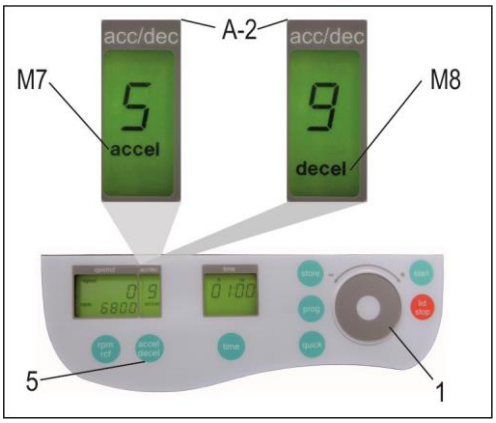


Figure 15

This table shows the acceleration and deceleration stages 0 and 9 of the empty baskets:

	Acceleration		Deceleration	
Rotor-Number	Stage 0	Stage 9	Stage 0	Stage 9
221.07 V02	135	15	450	18
221.07 V04	135	15	640	18
	in seconds			
	Acceleration time from 0 min^{-1} - n_{max}		Decceleration time from n_{max} - 0 min^{-1}	

4.4 Program

4.4.1 Storage of Programs

The program stores up to 99 runs, with all relevant parameters, including the used rotors. Any free program number is available and can be retrieved.

Put the desired rotor into the centrifuge. By pressing the key, "prog" (11), in the display "time" (A-3) appears the word "program", (see Figure 16). With the adjustable knob (1), choose the desired program number.

If a program number is already occupied, in the display "rpm/rcf" (A-1), the words "rotor" (M3) and e.g. "221.57" (M4) will appear, (see Figure 16). Free program numbers will appear as 0.

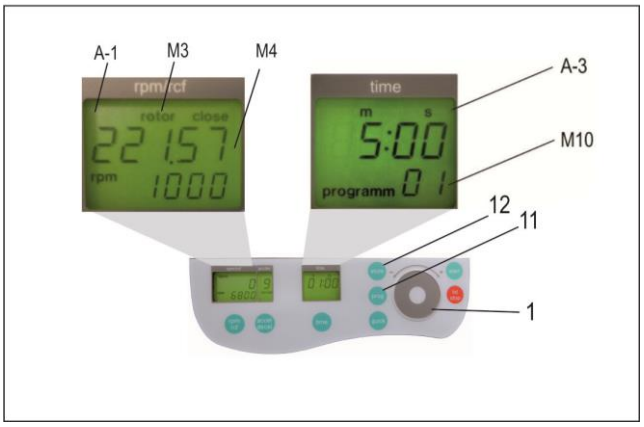


Figure 16

Close the lid of the centrifuge, now proceed as described above, to set all important run parameters. If the lid isn´t closed, when storing the program in the display "rpm/rcf" (A-1), flashes alternately the word "FirSt" and "CLOSE Lid" (see Figure 17). When starting the run without storing the program, in the display "rpm/rcf" (A-1), flashes alternately the word "First" and "PrESS StoreE", (see Figure 19).

Figure 17

Figure 18

For alteration of data, press the key "store" (12), for approx. 1 second. If the program is stored correctly, the word "StorE" appears in the display "rpm/rcf" (A-1). As a result, the word "program" (M10) disappears. As soon as the key "store" (12) is no longer displayed, the word "programm xx" (M10) reappears, (the xx stands for the chosen program place).

If all program numbers are occupied, take an old number that is not needed any longer and replace it with the new parameters.

4.4.2 Recall of Stored Programs

To recall stored programs, press the key "prog" (11), with the lid already closed. Inside the display "time" (A-3), appears "programm --"(M10). With the control field (1), pre-select the desired program number. In the respective displays, the stored values, for that program, will appear.

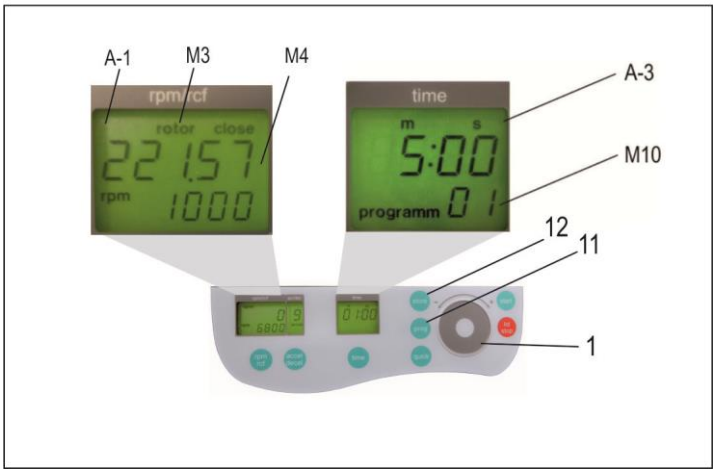


Figure 19

4.4.3 Leaving Program Mode

To leave the program mode, press the key, "prog" (11). Then, inside the display "time", appears the word "programm".

Set the display to "programm--" (M10) with the control field (1).

For all number marked text, please refer to Figure 19.

4.5 Starting and Stopping the Centrifuge

4.5.1 Starting the Centrifuge

Start the centrifuge with either the "start" key (9), or the "quick" key (8). With the "start" key (9), stored runs or runs with manually pre-selected parameters can be started. During the centrifugation the LED light is flashing slowly with red color. When the respective pre-selected running time has ended, the centrifuge will stop automatically.

By pressing the "quick" key (8), the centrifuge accelerates up to the pre-selected revolution. In the display "time" (A-3), the passed running time is indicated from the moment the "quick" key (8) is pressed. By releasing the "quick" key (8), the centrifuge stops and the running time is indicated, until the lid is opened.

For all number marked text, please refer to Figure 20.

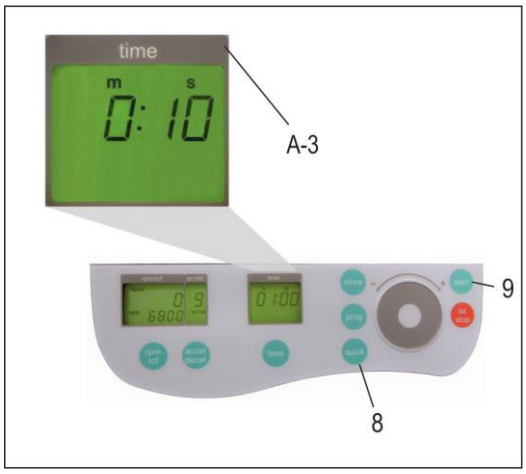


Figure 20

4.5.2 Stopping the Centrifuge

With the "stop" key (10), the run time can be interrupted, at any time, (see Figure 21). After pressing the key, the centrifuge decelerates with the respective pre-selected intensity, down to a standstill. After the centrifugation is finished, the LED lights with green color.

Figure 21

4.6 Imbalance Detection

With fast filling of the basket in the acceleration phase, an imbalance can occur. In this case, the centrifuge switches off the drive immediately and the basked decelerates to standstill.

The display "time" (A-3) will show the word "error" (M11) and the number "01" appears.

When inside the display "time" (A-3), the word "error" along with the number "02" appear, (see Figure 22) the cause may be as follows. -> The imbalance switch is defective.

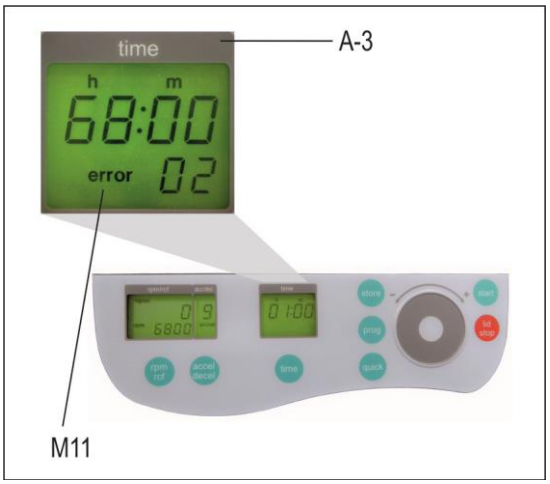


Figure 22

4.7 Volume Flow

The volume flow of the medium to be analysed may be max. 3.5 l/min. When the flow rate is higher, the temperature of the drive increases until it is switched off automatically for safety reasons.

4.8 External Temperature Control

The Sieva-3, with the preparation for external temperature equalization, is equipped with a copper pipe winding around the centrifuge chamber. On the side of the housing there are screw connections with an internal thread of G ¼“. Hence, nipples of various sized can be used.
The tempering liquid may have a max. temperature between 10°C and +90°C. The liquid may be pumped through the cooper pipe winding with a max. pressure of 5 bar.

5. MAINTENANCE

5.1 Maintenace and Cleaning

General Care:

Maintenance of the centrifuge is dependent on prolonging the life of the rotor, the rotor chamber and the rotor accessories. Please be sure to clean the accessories, especially the sealing of the aerosol-tight rotors and insert bolts, of swing out rotors. Following, lubricate the bolts or sealing, with the recommended HERMLE Rotorgrease - Order No.: 38-5656.

Please pay special attention to anodized aluminum parts. Breakage of rotors can be caused by the slightest damages.

In case of rotors, buckets or tube racks becoming in touch with corrosive substances, the affected area must be cleaned, thoroughly.

Corrosive substances, such as, must be avoided: alkalis, alkaline soap solutions, alkaline amines, concentrated acids, solutions containing heavy metals, water-free chlorinated solvents, saline solutions, e.g. salt water, phenol, halogenated hydrocarbons.

5.2 Cleaning Units, Rotors, Accessories:

- Turn the device off and disconnect from the power supply, before beginning any cleaning or disinfecting. Do not pour liquids into the housing interior.
- Spray disinfectant on the device.
- Thorough cleaning not only has its purpose in hygiene, but also in avoiding pollution based corrosion.
- In order to avoid damaging anodized parts, such as rotors, reduction plates etc.; only pH-neutral Detergents, with a pH-value of 6-8, may be used for cleaning. Alkaline cleaning agents must not be used, (pH-value > 8).
- After cleaning, please ensure all parts are dried thoroughly, either by hand or in a hot-air cabinet (Max. Temperature + 50°C/122°F).
- It is necessary to coat anodized aluminium parts with anti-corrosion oil regularly, in order to increase their life-span and reduce corrosion predisposition.
- Due to humidity or not hermetically sealed samples, condensation may form. The condensation has to be removed from the rotor chamber, with a soft cloth regularly

The maintenance procedure has to be repeated every 10 to 15 runs, but at least once a week!

- Connect the unit to the power supply only after the equipment is completely dry.
- Do not implement disinfection with UV-, beta- and gamma-rays or other high energy radiation.
- Metal rotors can be autoclaved.
- Rotor lid can also be autoclaved, (Max. 121°C/250°F, 20 min).
- The tube racks are made of PP and **cannot** be autoclaved, at 134°C/273°F.

5.3 Cleaning and Disinfecting of the Unit

1. Open the lid, before turning off the unit. Disconnect from the power supply.
2. Open the rotor nut, by turning the rotor key counter-clockwise.
3. Remove the rotor from the motor mounting
4. For cleaning and disinfection of the unit and the rotor chamber, use the above mentioned cleaner.
5. Clean all accessible areas of the device and its accessories, including the power cord, with a damp cloth.
6. Wash the rubber seals and rotor chamber thoroughly, with water.
7. Rub the dry rubber seals with glycerol or talc, to prevent these from becoming brittle. Other components of the unit, e.g. the motor shaft or rotor, should **not** be greased.
8. Dry the motor shaft with a soft, dry and lint-free cloth.
9. Examine the unit and accessories for damage.

Remove adherent dust, at least every 6 months, from the ventilation slots in the centrifuge, by using a soft brush.

5.4 Cleaning and Disinfection of the Rotor

1. Clean and disinfect: the rotors, rotor lids and adapters, with the cleaner previously mentioned above.
2. Use a bottle brush to clean and disinfect the rotor bores.
3. Rinse the rotors, rotor lid and adapter, with clear water. Particularly, the drillings of the angle rotors.
4. When drying the rotors and accessories, set on a towel. Place the angle rotors, with bores down, to dry.
5. Dry the rotor cone with a soft, dry and lint-free cloth, check for damage. Do not grease the rotor cone.

5.5 Disinfection

In case of infectious material spilling into the centrifuge, the rotor and rotor chamber have to be disinfected promptly after the run. Rotors may be autoclaved at a maximum temperature of 121 °C/250°F.

5.6 Autoclaving

The recommended time for autoclaving: 15 – 20 min at 121°C/250°F, (1 bar)

ATTENTION: The sterilization time of 20 min. must not be exceeded. Continuous sterilization will cause reduction in the mechanical resistance, of the plastic material.

Before autoclaving the PP-rotor and adapter, thoroughly clean to avoid the burning of dirty residue.

Please disregard any consequences of chemical residues to plastic materials, at ambient temperatures. At high temperatures, autoclaving residue may corrode and destroy the plastic. The objects must be thoroughly washed with distilled water, after the cleaning, but before the autoclaving. Residues of any cleaning liquids, may cause fissures, whitening and stains.

5.7 Gas Sterilization

Adapters, bottles and rotors may be gas sterilized, with Ethylenoxyd. According to the duration of the application, allow items to properly air out, after the sterilization and before usage

ATTENTION: The temperature may rise during the sterilization; rotors, adapters and bottles should not be fully closed, keep completely unscrewed.

5.8 Chemical Sterilization

Bottles, adapters and rotors may be treated, with the usual liquid disinfectants.

ATTENTION: Before applying any other, Cleaning Resp. Decontamination Method, other than what was recommended by the manufacturer, contact the manufacturer to ensure that it will not damage the unit or the rotor.

5.9 Glass Breakage

With high g-values, the rate of glass tube breakage increases. Glass splinters have to be removed immediately from rotor, buckets, adapters and the rotor chamber itself. Fine glass splinters will scratch and therefore damage the protective surface coating of a rotor. If glass splinters remain in the rotor chamber, fine metal dust will build up, due to air circulation. This very fine, black metal dust will severely pollute the rotor chamber, the rotor, the buckets, and the samples.

If necessary, replace the adapters, tubes and accessories, to avoid further damage. Check the rotor bores regularly, for residue and damage.

ATTENTION: Please check the relevant specifications of the tubes centrifuges with the manufacturer!

5.10 Lifetime of Rotors, Round and Rectangular Buckets, Accessories

Rotors and rotor lid made of aluminum or stainless steel, have a operating time of **max. 7 years** from first use.

Transparent rotor lids and caps, made of PC or PP, as well as rotors, tube racks and adapters of PP, have a maximum operating time of up to **3 years,** from first time use.

Conditions for the Operating Time:

Proper use, damage-free condition, recommended care.

6. TROUBLE SHOOTING

6.1 Error Messages: Problem / Solution

The error messages are listed to help localize possible errors faster.

The possible error referred to in this chapter may not always be the case, as they are only theoretically occurring errors and solutions.

Always keep us informed about any kind of error occurring, which is not listed in this chapter. With this information provided, we are able to improve and complete this operation manual.

Many thanks in advance for your support.

HERMLE Labortechnik GmbH

6.2 Survey of Possible Error Messages and Solutions

6.2.1 Lid Release during Power Failure (Emergency Lid Release)

In case of power failure or malfunction, the lid of the centrifuge can be opened manually, in order to protect samples.

Please proceed as follows:

- **Switch the centrifuge off and unplug the power cord, wait until the rotor is at a standstill, (this may take several minutes).**
  On the left hand side of the centrifuge housing, there is a plastic stopper. Remove this stopper and behind is a hexagon nut.
- Take the delivered box spanner, put it into the hole and lock the box spanner with the hexagon nut (Figure 23).
- Turn the box spanner to the right (clockwise), up to the limit.
  ATTENTION: Only turn to the limit, don´t tighten the nut.
- Open the lid if the centrifuge
- Switch the centrifuge on again, to proceed the regular function.

Figure 23

6.2.2 Description of the Error Message System

The error message, "error" (M11), is shown in the "time" (A-3) display, (see Figure 24). For more detailed information, refer to Table 4: , (see Appendix P.32).

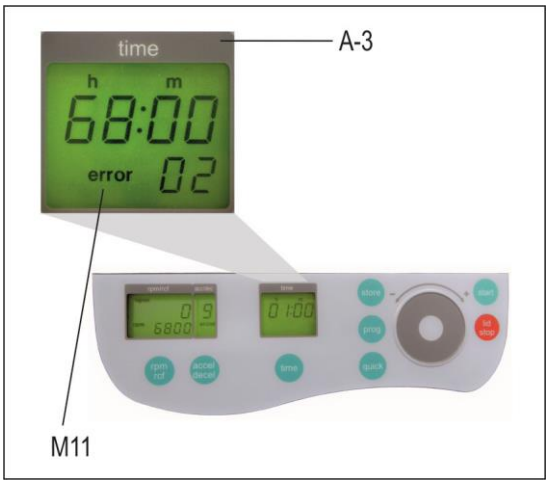


Figure 24

6.2.3 Procedure while error 14

If Error 14 occurs, there is a problem with the speed sensor. The centrifuge lid is closed for undefined period of time and in the "rpm/rcf" (A-1) display shows the lettering "USEr GuidE" (see FIgure 25).

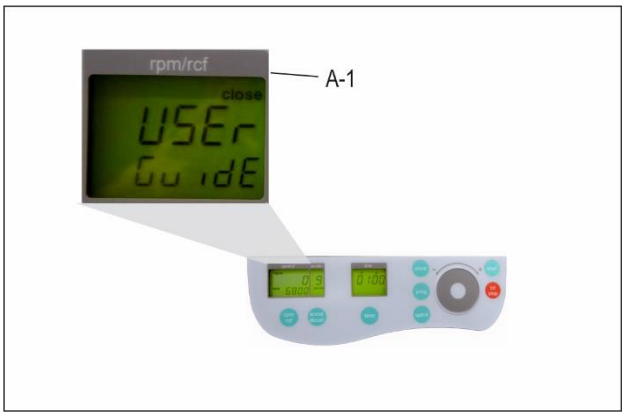


FIgure 25

To reopen the centrifuge lid, switch off the device and wait until the rotor has come to a **standstill!** Take from chapter 4.3.3 the maximum deceleration time of the respective rotor. Level 0 corresponds to unbreaked rundown, which occurs at error 14. If the centrifuge lid is opened before standstill of the rotor, a following error can occur.

Once the rotor has come to a standstill, open the centrifuge lid with the emergency release. Proceed as described in chapter 6.2.1, P. 25. After opening the centrifuge lid, switch on the device again. Error 14 and the lettering "USEr GuidE" should be eliminated.

If this error occurs again, please contact the service.

6.2.4 Procedure while error 38 – Lid motor is blocked

The lid motor is blocked and for 10 seconds the error massage “error 38” is shown in the display “time” (A-3). After expiring of this error message please press the key “lid” (10). If the lid lock doesn´t loose, repeat this procedure two or three more times. If the lid lock still doesn`t loose, the lid must be opened by using the manual emergency release. Proceed as described in chapter 4.2.1. After opening the centrifuge lid, switch on again the device. The lid lock adjusts itself in the basic position. The closing process can be carried out normally again.

If these errors occurs again, please contact the service.

7. TRANSPORT, STORAGE AND DISPOSAL

7.1 Transport

- Before transporting, take out the rotor.
- Only transport the unit in its' original packaging.
- Use a transport aid, for transporting over longer distances, to fix the motor shaft.

	Air Temperature	Rel. Humidity	Air Pressure
General Transportation	-25 to 60 °C	10 to 75 %	30 to 106 kPa
	-13°F to 140°F		

7.2 Storage

During storage of the centrifuge, the following environmental conditions must be observed:

	Air Temperature	Rel. Humidity	Air Pressure
Transport Packaging	-25 to 55 °C	10 to 75 %	70 to 106 kPa
	-13°F to 131°F		

7.3 Disposal

Information on the disposal of electrical and electronic equipment in the European Community:

Within the European Community, disposal for electrically powered equipment is dictated by national regulations based on the EU Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE2).

According to this directive, all devices supplied **after** 13.08.2005 in the business-to-business sector, in which this product is classified, may no longer be disposed of with municipal waste or household waste. To document this, they are marked with the following label:

As this device is a device used exclusively for business purposes (B2B), it must not be handed into public waste disposal companies.

The device can be disposed of by stating the date of purchase and the device number at:

Hermle Labortechnik GmbH, Siemensstraße 21, 78564 Wehingen, WEEE-Reg. No. DE 55649821

For all devices delivered before 13.08.2005, the last user is responsible for proper disposal.

RoHS Declaration of Conformity

HERMLE Labortechnik GmbH, Siemensstraße 25, 78564 Wehingen, Germany, hereby declares that all components produced are in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 08.06.2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

8. APPENDIX

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Tabelle 1: Technical Data

Manufacturer	**HERMLE Labortechnik GmbH 78564 Wehingen**			
Model Type	**Sieva-3**			
Dimension				
Width	38 cm			
Depth	50 cm			
Hight	32 cm			
Weight without rotor	37 kg			
max. Speed	10000 rpm			
max. Volume	500 ml			
max. RCF	7825 x g			
Allowed density	1,2 kg/dm^3			
Allowed kinetic energy	6300 Nm			
Mains Power Connection AC	230 V / 50 Hz 1 ph		120 V / 60 Hz 1 ph	
Voltage Fluctuation	± 10%		± 10%	
Current Consumtion	3,5 A		6,8 A	
Power Consumption	0,8 KW		0,81 KW	
Radio Interference	IEC 61326-1			
Audit Requirement (BGR 500)	no			
Ambient Conditions (EN/IEC 61010-1)				
- Environment	for indoor use only			
- High	Use up to an altitude of 2000 m above MSL			
- Ambient Temperature	2°C up to 35 °C			
- Max. Relative Humidity	Max. relative humidity 80 % for temperatures up to 31°C, decreasing linearly to 50 % relative humidity up to 35°C.			
- Overvoltage Category (IEC 60364-4-443)	II			
- Degree of Contamination	2			
Class of Protection	I			
Not suitable for use in hazardous environments				
EMC Interference Emmission	EN / IEC 61326-1 Class B	FCC Class B	EN / IEC 61326-1 Class B	FCC Class B
Noise Level (depending on the rotor)	64-70 dB(A), depending on the rotor and the filter paper			
Write from the Operator				
Inventory-No.:				
Monitoring-No.:				
Environment:				
Maintenance Contract:				
Responsible Service Office	**HERMLE Labortechnik GmbH**		**Dealer or Service Office**	
	Siemensstraße 25			
	78564 Wehingen			
	Tel.: (49)7426 / 96 22-17			
	Fax: (49)7426 / 96 22-49			
Responsible Dealer				

Table 2: Max. Speed and RCF-Values for Permissible Rotors

Rotor Number	Max. Speed	RCF Value
221.07 V02	10000 rpm	7825 xg
221.07 V04	10000 rpm	7825 xg

Table 3: Permissble Net Weight

Rotor Number	Max. Speed	Permissible Net Weight
221.07 V02	10000 rpm	600 g
221.07 V04	10000 rpm	600 g

Table 4: Error Messages

Error-No.:	Description
1	Imbalance arose
2	Imbalance sensor is defective
4	Imbalance switch has been activated for longer than 5 seconds
8	Transponder in the rotor is defective
14 USEr GuidE	Leap of speed is too large between two measurements. Centrifuge lid is closed for undefined period of time
16	Standstill detection defective
33	Open lid while motor is running
40	Communication with frequency converter disturbed during start
41	Communication with frequency converter distirbed during stop
42	Short circuit in the frequency converter
43	Under-voltage frequency converter
44	Overvoltage frequency converter
45	Over temperature frequency converter
46	Over temperature motor
47	Over current frequency converter
48	Timeout between control unit and frequency converter
49	Other error frequency converter
55	Over Speed
99	Rotor not allowed in this centrifuge
FALSE	Inserted rotor does not exist in the program
rotor no	Rotor is not detected

Table 5: Abbreviations

Symbol / Abbreviation	Unit	Description
U (=rpm)	[min^{-1}]	Revolutions per Minute
RZB(=rcf)	[x g]	Relative Centrifugal Force
PP	-	Polypropylene
PC	-	Polycarbonate
accel	-	Acceleration
decel	-	Deceleration
prog	-	Program

Redemption Form / Decontamination Certificate

Decontamination Certificate of Goods Returned upon Delivery

Enclose all returned shipping items and modules necessary!

The complete, full declaration about the decontamination is a prerequisite for the assumption and further processing of the return. If no corresponding explanation is enclosed, we carry out decontamination with costs at your expense.

Surname; Last Name: _____

Organization / Company: _____

Street: _____

ZIP CODE: _____ **place:**_____

Telephone: _____ **fax:**_____

E-Mail: _____

Please fill out in block capitals!

Pos.	Quantity	Decontaminated Object	Serial No.	Description/Comment
1				
2				
3				
4				

Are the parts listed above in touch with the following substances?

Health endangering watery solutions, buffers, acids, alkalis:……..... ☐ Yes ☐ No

Potentially infectious agents: …….. ☐ Yes ☐ No

Organic reagents and solvent: ……..……..... ☐ Yes ☐ No

Radioactive substances: ……..…☐ α..☐ β..☐ γ.. ☐ Yes ☐ No

Health endangering proteins: ……..... ☐ Yes ☐ No

DNA: ……. ☐ Yes ☐ No

Have these substances reached the equipment/assembly? …….. ☐ Yes ☐ No

If so, which ones:

_____

Description of the measures for the decontamination of the listed parts:

I confirm the proper decontamination:

Company/Dept ._____ Place and Date: _____

Signature of the authorized person: _____