



# **Velocity 30R**

## Benchtop Centrifuge

Instruction manual



Model VELOCITY 30R High-Speed Refrigerated Benchtop Centrifuge

Revision: D01-202006

## 1 PRODUCT DESCRIPTION

- 1.1 Usage in accordance with safety standards
  - 1.1.1 General Information
    - 1.1.1.1 Hazards and precautions
    - 1.1.1.2 Brief description
    - 1.1.1.3 Safety Standards
    - 1.1.1.4 Extent of supply
    - 1.1.1.5 Warranty
- 1.2 Installation
  - 1.2.1 Installation of the centrifuge
    - 1.2.1.1 Unpacking the centrifuge
    - 1.2.1.2 Space requirements
    - 1.2.1.3 Installation
- 1.3 Technical Data
- 1.4 Conformity Declaration
- 1.5 Basic Setup and the "operating data" mode
  - 1.5.1 Access to the "basic adjustments" mode
  - 1.5.2 Temperature indication
  - 1.5.3 Sound signal turn on/off
  - 1.5.4 Volume pre-selection of a sound signal
  - 1.5.5 Song selection for sound signal - end of the run
  - 1.5.6 Keyboard sound turn on/off
  - 1.5.7 Call up of the "operating data" mode

## 2 OPERATION

- 2.1 Installation of rotors
  - 2.1.1 Mounting and loading angle rotors
  - 2.1.2 Mounting and loading swing out rotors
  - 2.1.3 Overloading of rotors
  - 2.1.4 Removing the rotors
- 2.2 Operation
  - 2.2.1 Power switch
  - 2.2.2 Lid release
  - 2.2.3 Lid lock
  - 2.2.4 Pre-selection of speed/RCF-value
  - 2.2.5 Pre-selection of running time
  - 2.2.6 Pre-selection of brake intensity and acceleration
  - 2.2.7 Pre-selection of temperature
  - 2.2.8 Pre-cooling
  - 2.2.9 Radius correction
  - 2.2.10 Storage of programs
  - 2.2.11 Recall of stored programs
  - 2.2.12 Leaving program mode
  - 2.2.13 Starting the centrifuge
  - 2.2.14 "Stop" key
- 2.3 Safety features
  - 2.3.1 Imbalance detection

## 3 MAINTENANCE

- 3.1 Service and Maintenance
  - 3.1.1 Maintenance and cleaning
  - 3.1.2 Glass breakage
  - 3.1.3 Disinfection of Alu-rotors
  - 3.1.4 Disinfection of PP-rotors

## **CONTENTS**

### **4 TROUBLESHOOTING**

- 4.1 Error messages: Cause / Solution
- 4.2 Survey of possible error messages and their solutions
  - 4.2.1 Lid release during power failure
  - 4.2.2 Description of the error message system
  - 4.2.3 Error messages

### **5 RECEIPT OF CENTRIFUGES TO REPAIR**

### **6 DISPOSAL**

# 1 PRODUCT DESCRIPTION

## 1.1 Usage in accordance with safety standards

### 1.1.1 General information

#### 1.1.1.1 Hazards and precautions

**Before setting the centrifuge into operation, please read this instruction manual carefully!**

This centrifuge must not be operated by unqualified personnel not being familiar with the correct use of the unit.

Always, use the original accessories only!

**For your safety, please review the following precautions:**

- The **DYNAMICA VELOCITY 30R** is not explosion-proof and therefore must not be operated in explosion-endangered areas or locations. During centrifugation, it is prohibited to stay within the safety zone of 30 cm around the centrifuge or deposit hazardous substances within this area.
- Centrifugation of flammable, explosive and radioactive substances or substances which reacts with high energy, is strictly prohibited!
- 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 obligated 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  $> 2$  m/s.

**Following rules must strictly be adhered to:**

- Do not operate the centrifuge in case it is not installed correctly.
- Do not operate the centrifuge when dismounted (e.g. without metal cover).
- Do not run the centrifuge when mechanical or electrical assembly groups have been tampered with by unauthorized persons.
- Do not use accessories such as rotors and buckets, which are not exclusively approved by Dynamica Scientific Limited, 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 sign of corrosion or mechanical damage.

# 1 PRODUCT DESCRIPTION

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

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

## 1.1.1.2 Brief description

Model **VELOCITY 30R** is a high-speed benchtop refrigerated centrifuge capable of running swing out and angle rotors. All relevant run parameters can easily be set with the display keys and be pre-selected with the main adjustment knob. All pre-selected and actual values are permanently displayed on the large LCD. The lid is latched and released with an electromagnetic lid lock.

The centrifuge has a powerful, maintenance-free brushless induction drive with a low noise level. It also has a CFC-free hermetically sealed refrigeration system (refrigerant type R 404 a).

## 1.1.1.3 Safety standards

The centrifuge corresponds with the General Requirements for Medical Units Regulations (MedGV) (group 3).

The following standards have been considered for the production of our centrifuges:

- Accident Prevention Regulation for electrical units and installations UVV VBG 4
- Accident Prevention Regulation for centrifuges as per BGR 500; Chapter 2.11; Part 3
- DIN 58970 part 1, 2 and 4 for centrifuges and tubes
- Electrical Interference Suppression according to interference degree B as per VDE 0871
- Electrical Safety as per IEC 1010-1 and IEC 1010-2-D
- European Standard PR EN 61 010-1 and PR EN 61 010-2-2

## 1 PRODUCT DESCRIPTION

### 1.1.1.4 Extent of supply

Following parts are supplied as accessories with each centrifuge:

- 1 instruction manual
- 1 Allen key for removing rotors

Spare fuses are at the rear side of the centrifuge.

### 1.1.1.5 Warranty

The centrifuge has been subjected to thorough testing and quality controls.

In the case of any manufacturing faults occurring, the centrifuge and rotors are covered by warranty for one year from the date of delivery.

This warranty becomes invalid in case of mishandling, negligence and in case of inappropriate usage of spare parts and / or accessories as well as any unauthorized modification to the unit.

**Technical modification rights are reserved by the manufacturer with respect to technical improvement.**

## 1.2 Installation

### 1.2.1 Installation of the centrifuge

#### 1.2.1.1 Unpacking the centrifuge

Model **VELOCITY 30R** is supplied in a pallet carton.

Remove the strap retainer, open the carton, remove the cover carton and the centrifuge. The instruction manual must always be kept with the centrifuge.

#### 1.2.1.2 Space requirements

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

In order to enable a safe and smooth operation, level the centrifuge with a spirit level.

The centrifuge must be placed in a way, that there is a minimum space of 30 cm on each side of the unit in order to ensure necessary heat dissipation.

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

Safety regulations require that the safety area of 30 cm around the unit is marked in order to indicate that neither hazardous substances nor persons should be within this area during centrifugation.

# 1 PRODUCT DESCRIPTION

## 1.2.1.3 Installation

Follow these steps:

- Check whether power supply corresponds with the one named in the manufacturer's rating label which is mounted on the rear panel.
- The line voltage circuit breaker is max. 16 A (type K) slow release for commonly used instruments.
- In case of emergency, there must be an emergency switch off installed outside the room in order to disconnect the power supply of the unit.
- Remove the transport spacer blocks from the inside of the chamber (see following photos).



**The socket for the power cord must be easy to reach for easy disconnection!**

## 1.3 Technical Data

Manufacturer	Dynamica Scientific Limited	
Type / Model	VELOCITY 30R	
Dimensions		
Width	71.5 cm	
Depth	51 cm	
Height	42 cm	
Weight	91 kg	
Noise level (max.)	60 +2.0 dB (A)	
Max. speed	30000 rpm	
Max. volume	6 x 250 ml	
Max. RCF	65390 x g	
Admissible density	1.2 kg/dm³	
Admissible kinetic energy	4.440 Nm	
Electrical connection AC	230 V / 50 Hz 1 ph	120 V / 60 Hz 1 ph
Current	7A	15 A
Connected load	1600 Watt	1800 Watt
Interference suppression	VDE 0871, Funkentstörgrad B	
Test obligations	yes	
To be filled in by purchaser:		
Inventory-No.:	<div></div>	
Check-No.:	<div></div>	
Location:	<div></div>	
Maintenance contract:	<div></div>	
Your service department	Dynamica Scientific Limited	
Your agent	<div></div>	

## 1 PRODUCT DESCRIPTION

### 1.4 Conformity declaration

Please refer to the conformity declaration in the package



# 1 PRODUCT DESCRIPTION

## 1.5 Basic adjustments

When putting the centrifuge into operation, you have the options to set up using the following basic adjustments:

1. Temperature indication in °C or °F
2. Sound signal turn on/off
3. Volume pre-selection of a sound signal
4. Song selection of sound signal "end of run"
5. Keyboard sound turn on/off

You can also call up the following operating data in this mode.

1. Number of starts
2. Operating hours of the centrifuge
3. Software-version
4. Error list
5. Operation of imbalance sensor
6. Operation of keyboard
7. Display test

### 1.5.1 Access to mode "Basic Adjustments"

If the centrifuge is still turned off, for software version up to 1.26, press simultaneously the keys "time" (10) and "prog" (21) and turn on the main switch of the centrifuge. For the software version 1.27 onwards, press the keys "time" (10) and "lid" (22) simultaneously and release both keys again. As a result, a display test is executed for approx. 5 seconds. All possible indications will appear at the same time (see photo 1).



#### ATTENTION:

Please note that you must enter the program as described under point 1.5.1 in order to change the adjustments in points 1.5.2 - 1.5.7. After you have stored the settings you can change to the normal program mode again by switching off the centrifuge for a short while.

## 1 PRODUCT DESCRIPTION

### 1.5.2 Temperature indication

Proceed as described in point 1.5.1 to enter this program mode and then press the key "accel/decel" (12). The word "service" appears in the display "accel/decel". Now select the letter "C" with the adjusting knob (9). As a result, the word "CELSI/temp" appears in the display "rpm/rcf" (17). If you press the key "rpm/rcf" (8) now, the word "CELSI" flashes and you can change the display to Fahrenheit "FAREN" using the adjusting knob (9) (see photo 2).

After you have stored the settings you can change to the normal program mode again by switching off the centrifuge for a short while.



Photo 2

### 1.5.3 Sound signal turn on / off

Proceed as described under point 1.5.1 to enter this program mode and then press the key "accel/decel" (12). The word "service" will appear in the display "accel/decel". Now select the letter "L" with the adjusting knob (9). As a result, the words "On sound" appears in the display "rpm/rcf" (17). If you press the key "rpm/rcf" (8) now, the word "On" flashes and you can switch off the sound "Off" with the adjusting knob (9) (see photo 3).

After you have stored the settings you can change to the normal program mode again by switching off the centrifuge for a short while.



Photo 3

## 1 PRODUCT DESCRIPTION

### 1.5.4 Volume pre-selection of the sound signal

Proceed as described under point 1.5.1 to enter this program mode and then press the key "accel/decel" (12). The word "service" will appear in the display "accel/decel". Now select the letter "U" with the adjusting knob (9). As a result, the words "Vol=/Sound" will appear in the display "rpm/rcf" (17). After pressing the key "rpm/rcf" (8), you can adjust the desired volume between 0 (low) and 9 (loud) using the adjusting knob (9). (see photo 4)

After you have stored the settings you change to the normal program mode again by switching off the centrifuge for a short while.



Photo 4

### 1.5.5 Song selection for sound signal - end of the run

Proceed as described under point 1.5.1 to enter this program mode and then press the key "accel/decel" (12). The word "service" will appear in the display "accel/decel". Now select the letter "G" with the adjusting knob (9). As a result, the word "Song" will appear in the display "rpm/rcf" (17). After pressing the key "rpm/rcf" (8), you can select a song using the adjusting knob (9). (see photo 5)

After you have stored the settings you can change to the normal program mode again by switching off the centrifuge for a short while.



Photo 5

## 1 PRODUCT DESCRIPTION

### 1.5.6 Keyboard sound turn on / off

Proceed as described under point 1.5.1 to enter this program mode and then press the key "accel/decel" (12). the word "service" will appear in the display "accel/decel". Now select the letter "b" with the adjusting knob (9). As a result, the word "BeeP-x".appears in the display "rpm/rcf" (17) After pressing the key "rpm/rcf" (8), you can turn the keyboard sound on (On) or off (Off) with the adjusting knob (9). (see photo 6)

After you have stored the settings you can change to the normal program mode again by switching off the centrifuge for a short while.



Photo 6

#### ATTENTION:

All settings changed must be confirmed using the key "store" (20). Only when the word "store" appears in the display "rpm/rcf" (17) - Only then the pre-selections are valid!! (see photo 7)



Photo 7

## 1 PRODUCT DESCRIPTION

### 1.5.7 Call up of operating data

you can call up the operating data of the centrifuge in the "Basic Adjustments" mode. Please proceed as described in point 1.5.1 to enter this mode.

Press the key "accel/decel" (12). The word "service" will appear in the display "accel/decel".

With the adjusting knob (9) the different information can be called up:

A = previous start of the centrifuge

H = previous operating hours

S = software version

E = list of previous error messages

The list of the last 99 error messages can be looked over by pressing the key "rpm/rcf" (8) and scroll through it by the adjusting knob (9). The respective error codes appear in the display "rpm/rcf" (17).

Please look up in chapter 4.2.3 of this instruction manual for the relevant meanings. (see photo 8)

Here as well you must shortly switch off the centrifuge for changing to the normal program mode again.



## 2 OPERATION

### 2.1 Installation of rotors

#### 2.1.1 Mounting and loading angle rotors

Clean the drive shaft as well as the rotor mounting boring with a clean, grease-free piece of cloth.

Place the rotor onto the drive shaft. (see photo 9)

Take care that the rotor is fully installed onto the motor shaft.



Photo 9



Photo 10

#### **ATTENTION:**

For safety reasons, always ensure that the rotor fixing screw is tightened before each run. (see photo 10)

## 2 OPERATION

Hold the rotor with one hand and secure the rotor to the shaft by turning the fixing screw (1) clockwise. Tighten the fixing screw with enclosed Allen key (see photo 11).



Photo 11

It is allowed to operate e.g. an 8-place-rotor with 2 or 4 loaded tubes only. But the loaded borings must be opposite to each other.

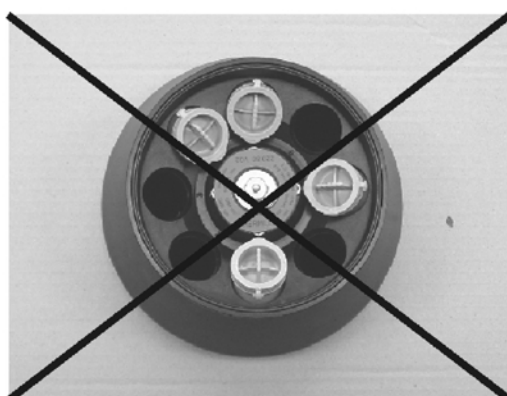


Photo 12: Incorrect



Photo 13: Correct

**ATTENTION:**  
Before the operation, tighten the rotor lid, if applicable!!

## 2 OPERATION

### 2.1.2 Mounting and loading swing-out rotors

Clean the drive shaft as well as the device hole of the rotor with a clean and grease-free cloth. Put the rotor onto the motor shaft. Take care that the rotor is fully installed onto the motor shaft.

Hold the rotor with one hand and secure the rotor to the shaft by turning the rotor nut (1) clockwise. Tighten rotor nut with the enclosed Allen key (see photo 11).

The charging of the buckets and the adapters must be done appropriately as in photo 14 and photo 15.

**In principle, the swing-out rotors may be taken in operation first if all buckets or racks are put into the rotor.**

**The bolts at the rotor must be greased with silicone grease.**

The glasses have to be filled evenly by eye and put into the drillings or tube racks. The weight difference of the loaded buckets should not exceed approx. 1.0 g.

It is allowed to operate e.g. a 4-place-rotor with 2 loaded buckets only. But the loaded buckets must be opposite to each other. Make sure that the unloaded buckets must also be put inside the rotor (see photos 14 and 15).

#### ATTENTION:

**Swing out rotors may be taken in operation only if all locations are filled with the same sorts of buckets or carriers!**

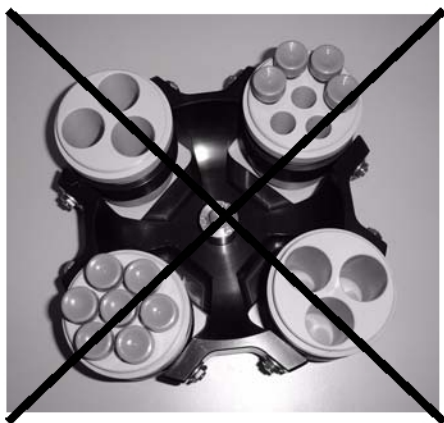


Photo 14: Incorrect



Photo 15: Correct



## 2 OPERATION

### 2.1.3 Overloading of rotors

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

The liquids the rotors are loaded with, should have an average 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:

$$\text{Reduced speed } n_{\text{red}} = \sqrt{\frac{1.2}{\text{higher density}}} \times \text{max. speed } (n_{\text{max}}) \text{ of the rotor}$$

Example:

$$n_{\text{red}} = \sqrt{\frac{1.2}{1.7}} \times 4.000 = 3.360 \text{ rpm}$$

#### ATTENTION:

Please read the manufacturer's notes referring to the breaking point of the used tubes.  
In case of any questions, please contact the manufacturer!

### 2.1.4 Removing the rotor

Untighten the rotor fixing screw and lift the rotor vertically out of the centrifuge.

#### ATTENTION:

Do not operate the centrifuge with rotors or buckets which show any signs of corrosion or mechanical damage.

Do not operate with extremely corrosive substances that could damage the rotor and buckets.

### 2.2 Operation

#### 2.2.1 Power switch

The power switch is located on the bottom, left side of the unit.  
The power switch is also the main fuse of the centrifuge.

**Attention:**

**After turning on the power switch you must open the lid of the unit first, prior to starting the centrifuge.**

#### 2.2.2 Lid release

After the run, respectively closing the lid of the centrifuge, the word "close" (1) appears in the display "rpm/rcf". If there is a rotor in the centrifuge, it appears additionally the word "rotor" (3), as well as the code number of the respective rotor i. e. "nr 15" (4) will appear. During the run you can call up the rotor type at any time by pressing the key "lid" (5). If there is no rotor in the centrifuge the word "rotor" (3) and the word "no" (4) appears. By pressing the key "lid" (5) you can release the lid of the centrifuge. As soon as the electromagnetic lid is completely released, it appears the word "open" (2). Now you can open the lid of the centrifuge.

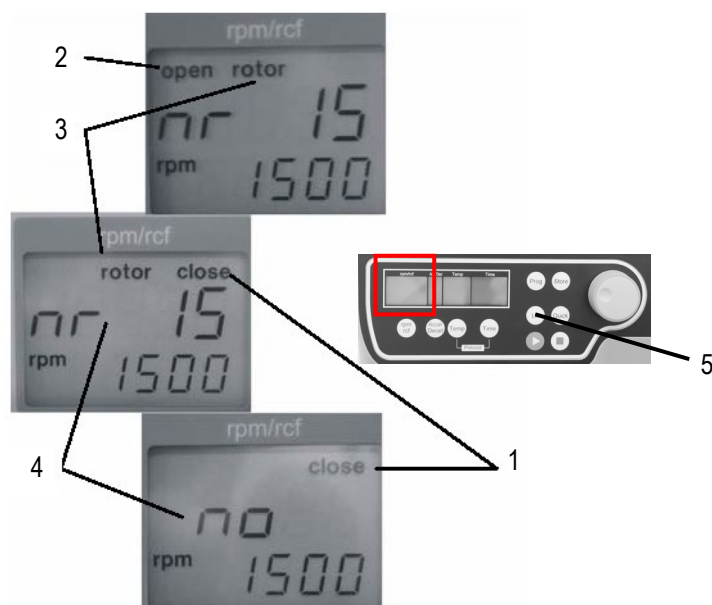


Photo 16

#### 2.2.3 Lid lock

**Attention:**

Before closing the lid please ensure that the rotor is tight, and that all 4 buckets have been put in the swing-out rotor.

The lid must only be laid down slightly. An electromagnetic lid lock closes the lid automatically, at the same time the word "open" (2) disappears.

As a sign that the centrifuge is ready to start the word "close" (1) appears in the display "rpm/rcf".

Simultaneously the word "rotor" (3), as well as the code number of the rotor, which is in the centrifuge i. e. "nr 15" (4) appears in that display).

With that all rotor specifically data, like e. g. max. speed, acceleration etc., are adopted.

## 2 OPERATION

### 2.2.4 Pre-selection of speed / RCF-value

Through the key "rpm/rcf" (8) this pre-selection is activated. By pressing the key once the word "rpm" (6) flashes.

By pressing the key once again the pre-selection of the centrifugal forces may be chosen. Then the flashing word "rcf" (7) appears.

You can set the desired values with the adjusting knob (9). In the display (17) the regulated value is shown permanently, before, during and after the run.

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 until 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 maximum speed of the VELOCITY 30R is 30000 rpm.

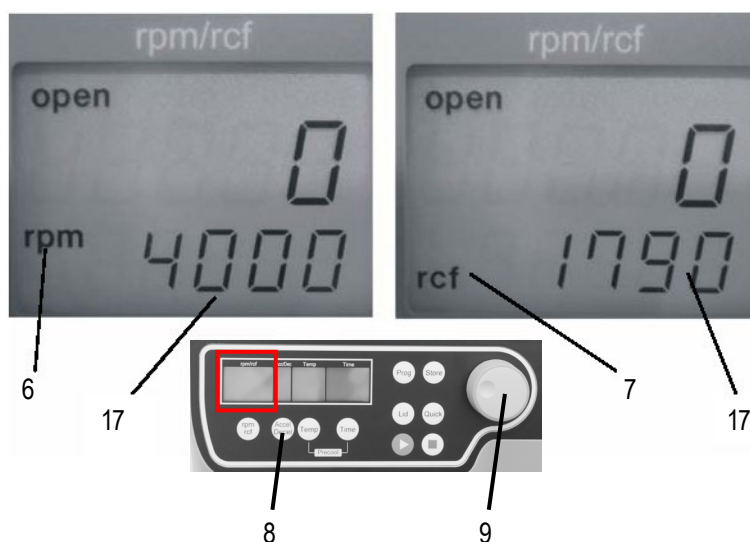


Photo 17

### Max. Revolution per minutes of the valid rotors VELOCITY 30R

Rotor-Number	Max. Revolution	RCF Value
221.21 V01	10000 rpm	15650 xg
221.18 V01	12000 rpm	18510 xg
221.20 V01	20000 rpm	41140 xg
221.22 V01	21000 rpm	41410 xg
221.17 V01	20000 rpm	42030 xg
221.23 V01	30000 rpm	65390 xg
221.19 V01	4500 rpm	2830 xg
221.15 V01	4000 rpm	2990 xg
221.16 V01	4500 rpm	2720 xg

#### Attention:

Please also check the maximum permissible revolutions of your test tubes! (Indicated by the manufacturer)

## 2 OPERATION

### 2.2.5 Pre-selection of running time

The running time can be pre-selected in three 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 minute
3. Range continuous run, which can be interrupted by the key "stop" (25).

The running time can be pre-selected with the lid open or closed.

To activate the setting of the running time press the key "time" (10).

In the display "time" flashes "m : s" or "h : m" (11), depending on the previous setting. To set the desired value using the adjusting knob (9). After exceeding 59 min 50 sec the indication changes automatically to "h : m". After exceeding of 99 hours 59 min the word "cont" appears in the display "time". That continuous run can only be interrupted by pressing the key "stop" (25). The display shows always the remaining running time.

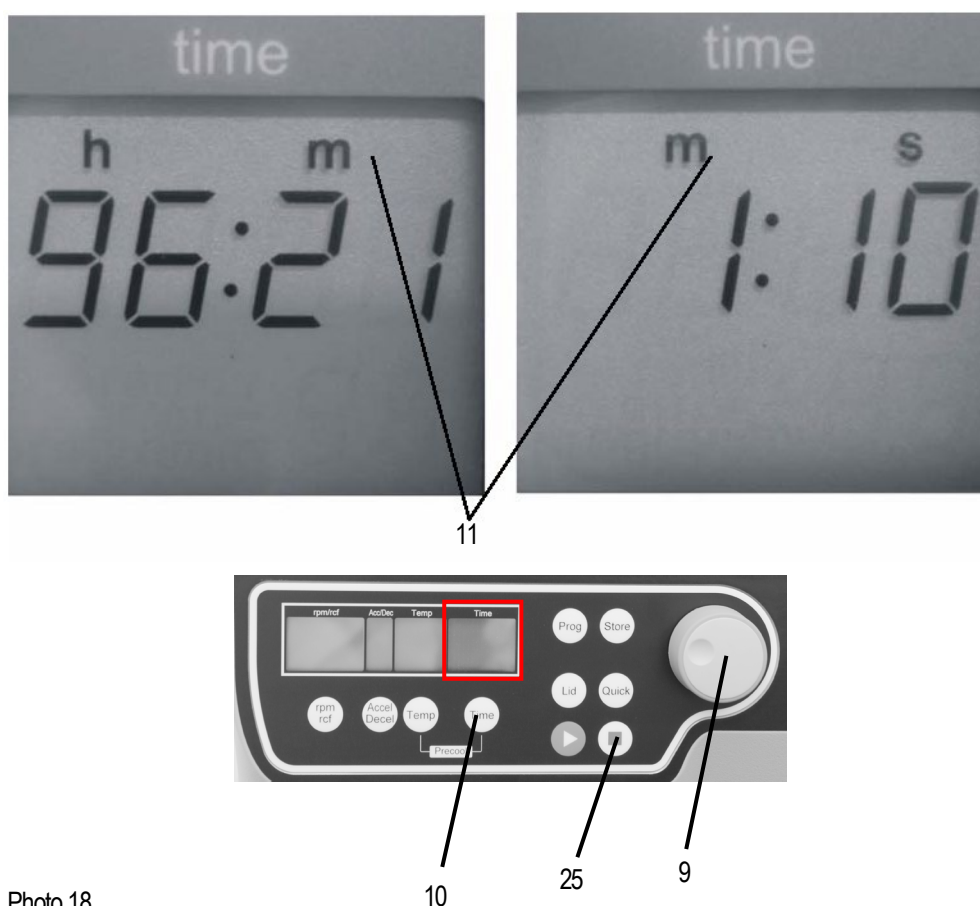


Photo 18

## 2 OPERATION

### 2.2.6 Pre-selection of brake intensity and acceleration

Through the key "accel/decel" (12) this function is activated.

By pressing the key once the word "accel" (13) flashes in the "acc/dec" display. The desired acceleration can be pre-selected by the adjusting knob (9). The value 0 and 9 is equivalent to the lowest the highest acceleration respectively.

By pressing the key "accel/decel" (12) twice, in the display "acc/dec" indicates the word "decel" (14).

Now the desired brake intensity can be pre-selected by the adjusting knob (9). The value 9 is equivalent to the shortest and the value 0 to the longest possible brake time.

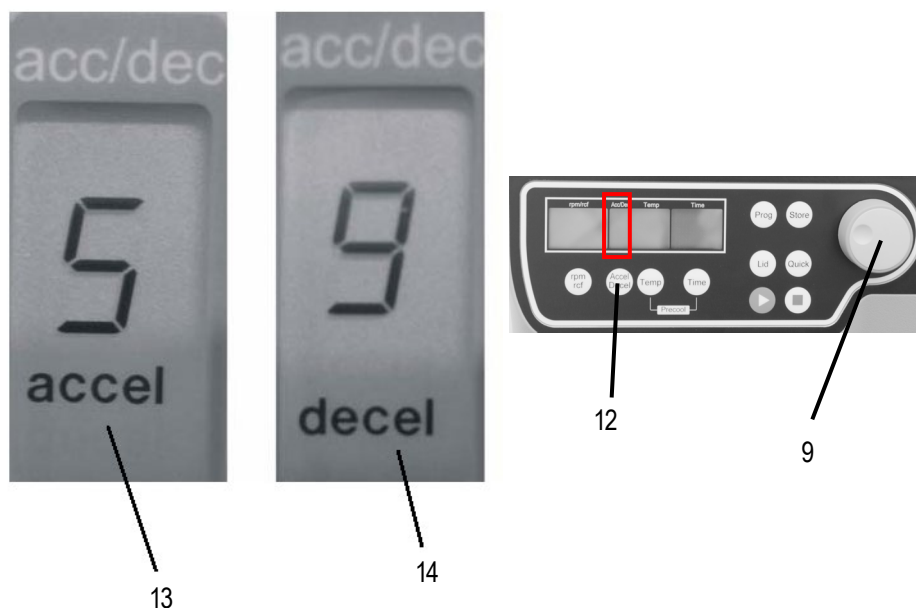


Photo 19

### Acceleration- and deceleration times VELOCITY 30R (120 V / 230 V) in seconds

Rotor-Number	Acceleration values		Deceleration values	
	Level 0	Level 9	Level 0	Level 9
221.21 V01	700	130	3000	130
221.18 V01	500	60	1700	70
221.20 V01	510	110	1700	90
221.22 V01	900	80	700	80
221.17 V01	660	70	600	75
221.23 V01	440	50	380	70
221.19 V01	110	15	930	20
221.15 V01	160	18	440	20
221.16 V01	180	25	300	30

## 2 OPERATION

### 2.2.7 Pre-selection of temperature

This function is activated by the key "temp" (15). The indication "°C" (16) flashes and by adjusting knob (9) the desired test temperature can be pre-selected in steps of 1°C in a range from -20°C up to +40°C. The value is indicated permanently in the display (18) - before, during and after the run.

**Please note that the respective lowest temperatures of the rotors at maximum speed!**

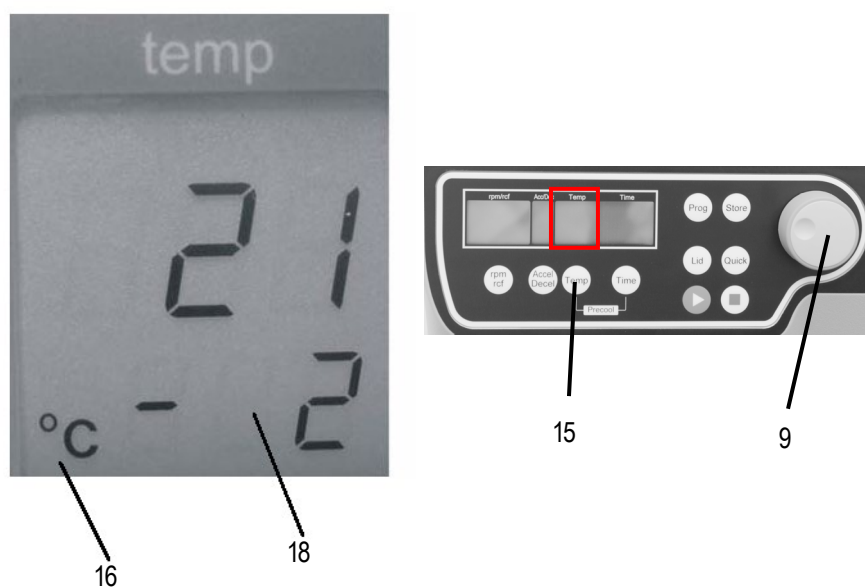


Photo 20

#### Lowest temperatures VELOCITY 30R (120 V / 230 V)

Rotor-Number	max. rpm
221.21 V01	+1°C
221.18 V01	-10°C
221.20 V01	+18°C
221.22 V01	+10°C
221.17 V01	+8°C
221.23 V01	+6°C
221.19 V01	-20°C
221.15 V01	-20°C
221.16 V01	-7°C

All temperature indications refer to room temperature of 23°C. If exceeding this value or direct solar radiation to the centrifuge, these values can't be kept.

## 2 OPERATION

### 2.2.8 Pre-cooling

If the samples are temperature-sensitive, it is useful to pre-cool the centrifuge, the rotor and eventually the buckets to the working temperature required. Therefore insert the desired rotor and pre-set the respective temperature. You can start the run by simultaneous pressing "temp" (15) and "time" (10). The unit will automatically choose a rotational speed that is equivalent to 20 % of the permitted rotational speed of the respective rotor during the run. You can leave the pre-cooling run pressing the "stop" key (25) after the pre-set temperature is reached.

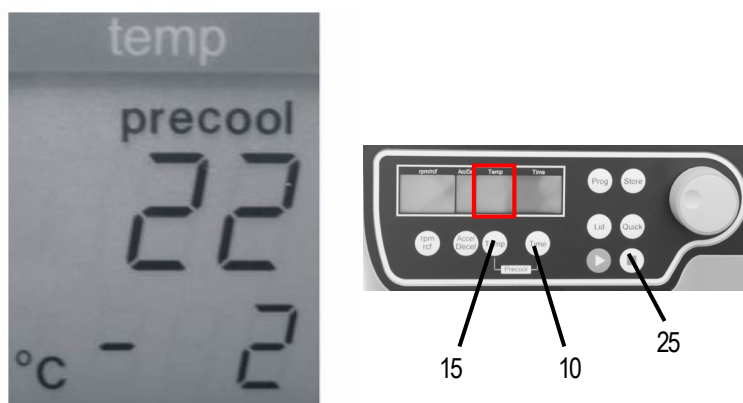


Photo 21

Depending on the inserted rotor, the pre-cooling will take approximately 10 to 20 min.

### 2.2.9 Radius correction

The radius of the respective rotor could be changed if you use an adaptor or reducer.. In that case you can correct the radius manually by the following procedures:

Press and hold the keys "time" (10) and "prog" (21) simultaneously.

The word "radius" (22) will appear on the "time" display. By adjusting knob (9) you can pre-select the respective radius correction in a range of -0,1 cm up to -9,9 cm in steps of 0.1 cm.

As soon as you have set a radius correction, the word "radius" (22) appears which will stay on until you put the radius correction back to 0 again.

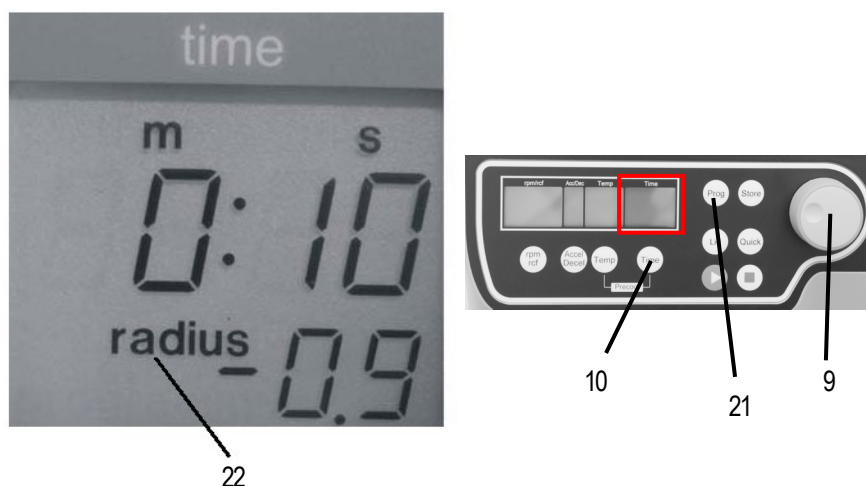


Photo 22

## 2 OPERATION

### 2.2.10 Storage of programs

You can store up to 99 runs with all relevant parameters, incl. the rotors used. You can use any free program number and call it up again.

Put the needed rotor into the centrifuge. By pressing the key "prog" (21) display the word "programm" (19) appears on the "time" display. By adjusting the knob (9) you can choose the desired program number.

If a program number is already occupied, the word "nr ???" will appear on the "rpm/rcf" display otherwise "0" will be displayed. (see photo 23)

Close the lid of the centrifuge. Now proceed as already described to set all important run parameters. For the adaption of data press the key "store" (20) for approx. 1 second. As a result the word "programm" (19) disappears. As soon as the key "store" (20) is released, it the word "program xx" reappears - the (xx) stands for the chosen program number.

If all program numbers are occupied you can take an old number and overwrite the program using the new parameters.

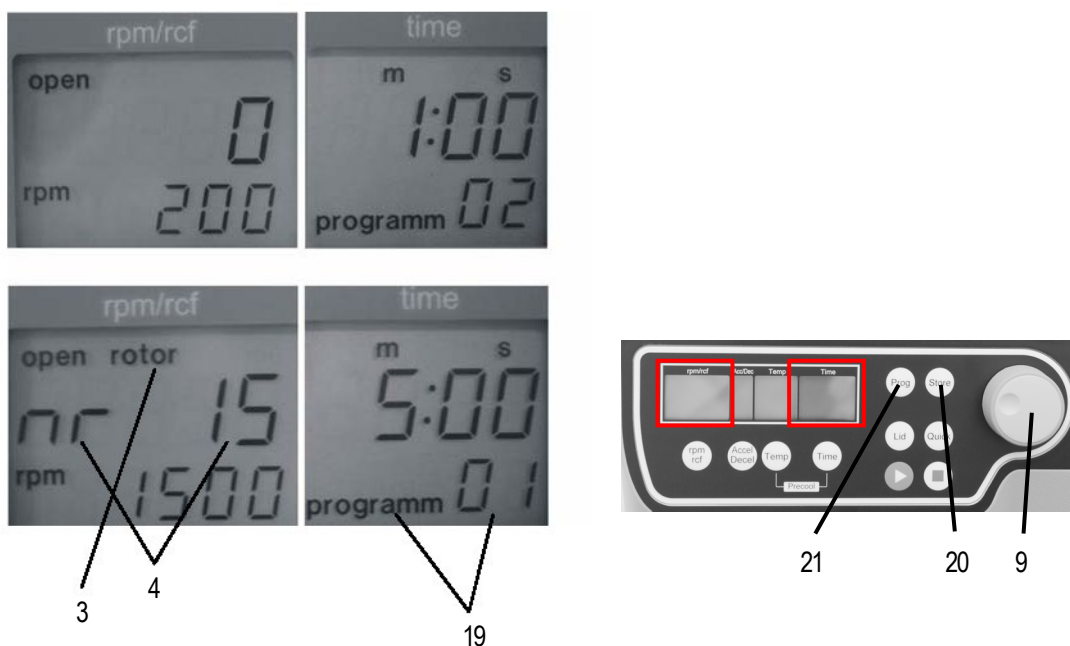


Photo 23



## 2 OPERATION

### 2.2.11 Recall of stored programs

To recall a stored program press "prog" (21) while the lid is closed. The word "programm - - " (19) will appear on the "time" display. Using the adjusting knob (9) you can pre-select the desired program number. In the respective displays there will appear the stored values for that program.

In case the wrong rotor has been inserted for the pre-selected program, the word "rotor" (3) will appear on the display "rpm/rcf". The word "FALSE" (4) and the stored rotor number "nr xx" (4) will flash by turns.

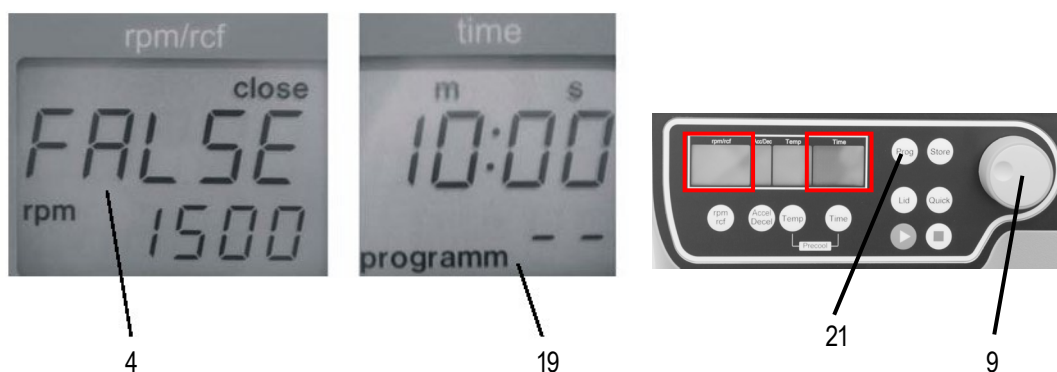


Photo 24

### 2.2.12 Leaving program mode

To leave the program mode, just press the key "prog" (21). Then the word "Programm XX" (19) appears in the display "time".

Set the display to "programm - -" with the adjusting knob (9).

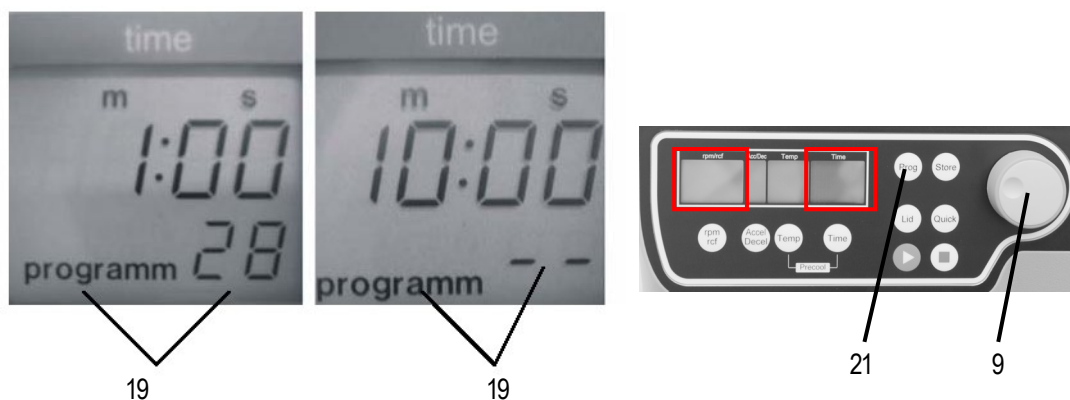


Photo 25

## 2 OPERATION

### 2.2.13 Starting the centrifuge

You can start the centrifuge either with the "start" key (23) or the "quick" key (24).

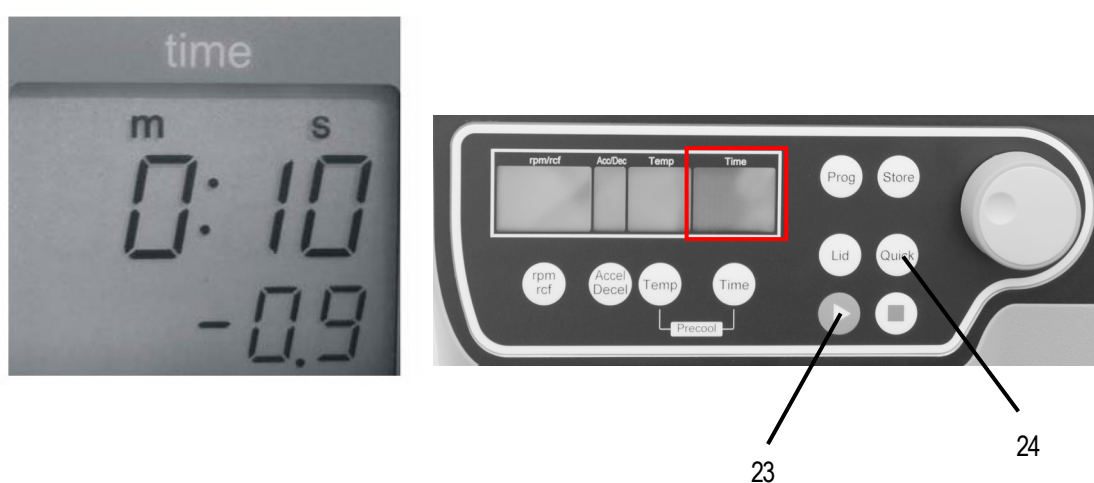
With the "start" key (23) you can start a stored run or runs with manually pre-selected parameters.

The centrifuge will stop automatically when the respective pre-selected running time has ended. Using the "quick" key (24) you can start runs, which will last just a few seconds.

By pressing the "quick" key (24) the centrifuge accelerates up to the pre-selected revolution.

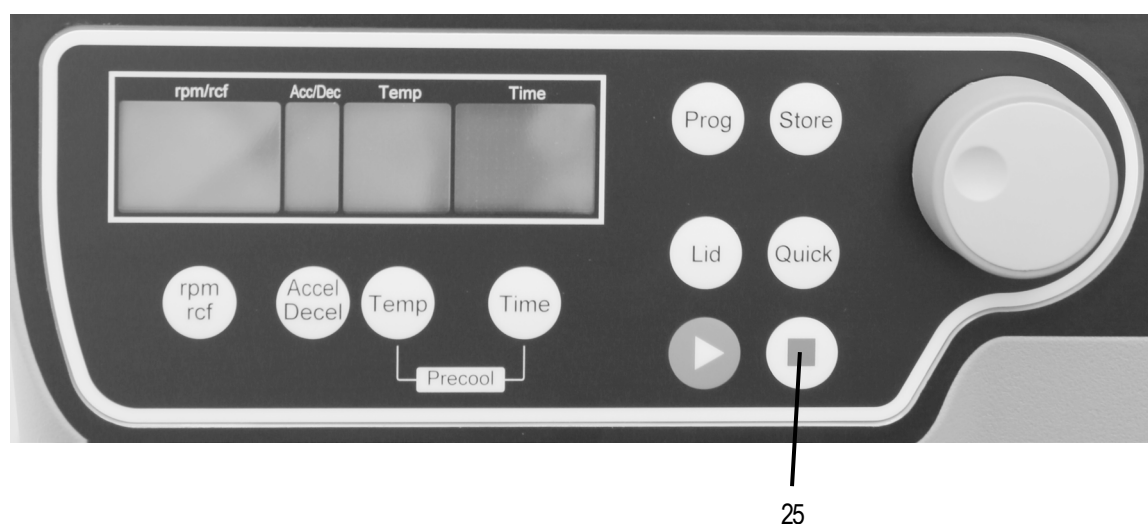
In the "time" display the running time is indicated after reaching the pre-selected revolutions.

By releasing the "quick" key (24) the centrifuge stops and the running time is indicated until the rotor standstill.



### 2.2.14 The "STOP" key

You can interrupt the run at any time using the "stop" key (25). After pressing the key the centrifuge decelerates with the respective pre-selected intensity until standstill.



## 2 OPERATION

### 2.3 Safety features

#### 2.3.1 Imbalance detection

In case of the rotor not being loaded equally, the drive will turn off during acceleration. The rotor will then decelerates until standstill.

In the "time" display the word "error" together with the number "01" (26) appear when the weight difference of the samples is too big. Weigh the samples precisely. Load the rotor as described in chapter 2.1.1.

When the word "error" together with the number "02" (26) appears in the "time" display , it could be due to the following reasons:

- The imbalance switch is not correctly adjusted.
- The imbalance switch is defective.



26

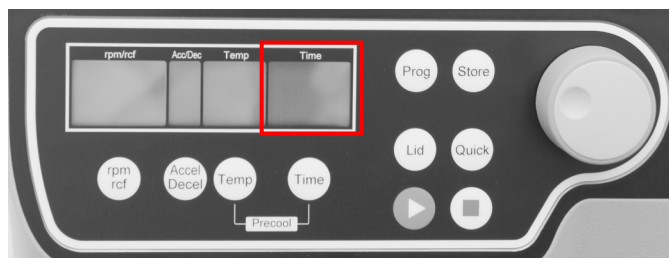


Photo 28

## 3 MAINTENANCE

### 3.1 Service and maintenance

#### 3.1.1 Maintenance and cleaning

##### **Maintenance:**

Maintenance of the centrifuge is confined to keeping the rotor, the rotor chamber and the rotor accessories clean as well as lubricating the rotor insert bolts of the swing-out rotor (if available) regularly.

Vaseline which is available in nearly every store, is the most suitable lubricant. The Vaseline used must be free of resin and acids. Lubricants containing molybdate and graphite are not allowed.

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

In case of rotors, buckets or tube racks getting in touch with corrosive substances, the concerned spots have to be cleaned carefully.

Corrosive substances are for instance:

- Alkalies
- Alkaline soap solutions
- Alkaline amines
- Concentrated acids
- Solutions containing heavy metals
- Water-free chlorinated solvents
- Saline solutions, e.g. saltwater

##### **Cleaning:**

Thorough cleaning is not only for hygiene but also to avoid corrosion based on pollution.

In order to avoid damaging the anodized parts such as rotors, reduction plates etc., only Detergents with a pH-value of 6-8 may be used for cleaning. Alkaline cleaning agents (pH-value > 8) must not be used.

After cleaning, please ensure all parts are thoroughly dried either by hand or in a hot-air cabinet (max. Temperature + 50°C).

It is necessary to coat anodized aluminum parts with anti-corrosion oil regularly in order to increase their life-spans and reduce corrosion predisposition.

Condensation may be formed due to humidity or not hermetically sealed samples. The condensate has to be removed from the rotor chamber regularly with a soft cloth.

**The maintenance procedure has to be repeated every 10 to 15 runs, or at least once a week.**

## 3 MAINTENANCE

### 3.1.2 Glass breakage

The rate of glass tube breakage increases with increasing g-values. Glass splinters have to be removed immediately from the rotor, buckets, adapters and the rotor chamber. Fine glass splinters will scratch and therefore damage the protective surface coating of the 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 contaminate the rotor chamber, the rotor, the buckets and the samples.

**ATTENTION:**

**Please check the relevant specifications of the centrifuges tubes with the manufacturer.**

### 3.1.3 Disinfection of alu-rotors

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

The rotor and rotor chamber should be cleaned with a universal, neutral disinfection agent, e.g. on formalin base. A disinfection spray is the most suitable as it can reach all difficult to access spots easily.

**ATTENTION:**

**Before applying any other cleaning resp. decontamination method other than the one recommended by the manufacturer, contact the manufacturer to ensure that it will not damage the unit or the rotor.**

### 3.1.4 Disinfection of PP-rotors

**Autoclaving**

The recommended time for autoclaving: 15 - 20 min at 121°C (1 bar)

**ATTENTION: The sterilization time must not exceed 20 minutes.** Sterilization again and again will reduce the mechanical resistance of the plastic material.

The PP-rotor and adapter must thoroughly be cleaned to avoid the burning in of dirty residues Before the autoclaving.

You can disregard the effect of some chemical residues on plastic materials at ambient temperatures. But at the high temperatures during autoclaving, those residues may corrode and damage the plastic. The objects must be washed thoroughly with distilled water after cleaning but before the autoclaving. Residues of any cleaning liquids may cause fissures, whitening and stains.

**Gas sterilization**

Boxes, bottles and rotors may be gas sterilized with Ethylenoxid. Depends on the duration of the application, you may give a long enough an airing time to the items after the sterilization before using them again.

**ATTENTION: Because the temperature may rise during sterilization, rotors, boxes and bottles must not be closed and must be unscrewed completely.**

**Chemical sterilization**

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

## 4 TROUBLESHOOTING

### 4.1 Error messages: cause / solution

#### Preface:

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

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

Always, please keep us informed about any kind of error occurs, which is not listed in this chapter. Only through your information, we are able to improve and complete this instruction manual.

Many thanks in advance for your support.

Dynamica Scientific Limited

### 4.2 Survey of possible error messages and their solutions

#### 4.2.1 Lid release during power failure (Emergency Lid Release)

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

Please proceed as follows:

- Switch off the centrifuge and unplug the power cord.
- On the left side of the centrifuge housing, there is a plastic stopper. Remove this stopper where you will find a hexagon nut.
- Take the spanner, insert it into the hole and lock the hexagon nut with the spanner.
- Now turn the box spanner to the right side (clockwise) until it reaches the limit.  
**ATTENTION:** Just turn to the limit, don't tighten the nut.
- Now open the lid of the centrifuge.
- Switch the centrifuge on again and continue working. (see photo 29)



Photo 29

## 4 TROUBLESHOOTING

### 4.2.2 Description of the error message system

The error message is shown in the "time" display through particular figures (26). At the same time the word "error" (26) is indicated in the display (see photo 30).

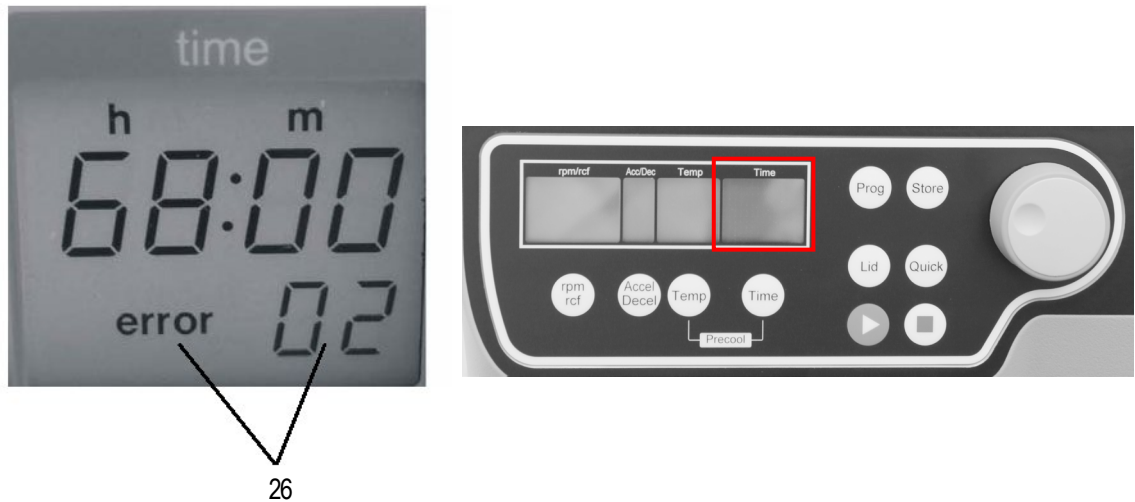


Photo 30

### 4.2.3 Error messages

#### Errors that may be indicated in the LCD:

Error No.:	Description
01	Imbalance occur
02	Imbalance sensor is defective
08	Transponder in the rotor is defective
11	Temperature sensor is defective
12	Chamber over heated
14	Leap of speed is too big between 2 measurements
33	Open lid while the motor is running
34	Lid contact defective Motor is
38	blocked
40	Communication with frequency converter disturbed during the start
41	Communication with frequency converter disturbed during the stop
42	Short circuit in the frequency converter
43	Undervoltage frequency converter
44	Overvoltage frequency converter
45	Over temperature frequency converter
46	Over temperature motor
47	Over current frequency converter
48	Timeout between the control unit and frequency converter
49	Other error frequency converter
55	Overspeed
99	The rotor is not allowed in this centrifuge

## 5 RECEIPT OF CENTRIFUGES TO REPAIR

### 5 Receipt of centrifuges to repair

In case of returning the centrifuge to the manufacturer for repairing, please note the following:

The centrifuge **must** be decontaminated and cleaned before shipment for the protection of persons, environment and material.

We reserve the right not to accept contaminated centrifuges.

Further more, all costs occurred for the cleaning and disinfection of the units will be charged to the customer's account.

Thank you for your cooperation!



### 6 Disposal

Please take care that you comply with the respective legal regulations when you dispose of the unit.

According to the directive 2002/96/EG (WEEE) all units delivered after the 13.08.2005 must not be disposed of with the domestic waste.

This unit belongs to group 8 (Medical Units) and is ranged in the Business-to-Business-Field.



This symbol of the crossed out garbage bin indicates that the unit must not be disposed of with the domestic waste.

Please also note that the disposal regulations may be different in the particular EU-Countries.

Should there be any questions about this matter please contact your distributor.







## The Velocity Range

### Bench Top Centrifuges

#### **Dynamica Scientific Limited**

4 Bain Square, Kirkton Campus,  
Livingston EH54 7DQ, United Kingdom

P: +44 1908 211 900

F: +44 1908 211 909

Email: [info@dynamica-eu.com](mailto:info@dynamica-eu.com)

Web: [www.dynamica-eu.com](http://www.dynamica-eu.com)

#### **Asia**

#### **Dynamica (Asia) Limited**

Unit 06, 26/F Tower 1, Ever Gain Plaza,  
88 Container Port Road, Kwai Chung  
N.T., Hong Kong

P: +852 2751 9488

F: +852 2751 9477

Email: [info@dynamica-asia.com](mailto:info@dynamica-asia.com)

Web: [www.dynamica-asia.com](http://www.dynamica-asia.com)