

Operating Instructions

HAEMATOKRIT 24

Please enter the following data:

- Inventory number
- Monitoring number
- Set-up location

This operating instruction has to be used for the centrifuges bearing the following manufacturing Nos. :
(the manufacturing No. of a centrifuge can be see from ist name plate)

Type of centrifuge	Tension	Article No.	manufacturing No
HAEMATOKRIT 24	230 V/240 V	2075	XXXX-01
HAEMATOKRIT 24	115V	2075-01	XXXX-02



Certificate of EU - Conformity

as defined by the EU regulations

- for machines 89/392/EWG, amended by regulations 91/368/EWG, 93/44/EWG and 93/68/EWG, appendix II A
- for electro-magnetic compatibility 89/336/EWG, amended by regulations 91/263/EWG, 92/31/EWG and 93/68/EWG
- for low voltage 73/23/EWG, amended by regulation 93/68/EWG

We, Messrs. Andreas Hettich
Gartenstraße 100
D-78532 Tuttlingen,

hereby certify that centrifuge model(s)

HAEMATOKRIT 24

is (are) manufactured in accordance with the following standards and regulations:

EN 61010 part 1 and 2

EN 55011

in addition the following national standards and regulations are applied:

VBG 1 DIN 58970

VBG 4 BS 4402

VBG 7z

VBG 20

Tuttlingen 24.07.1998

Hettich Zentrifugen

i. V. H. Pistor, sales manager

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1. Purpose

The centrifuge is used to measure the Haematokrit level in the blood according to DIN 58933.

2. Notes on Safety



- The centrifuge is constructed according to the state of the art and is safe to operate.
- However, it can be a source of danger for the user or for third parties, if it is not used by trained personnel or used improperly or used for purposes for which it is not intended.
- Before starting up the centrifuge, the operating instructions must be read and kept in mind.
- Besides the operating instructions and the binding rules for accident prevention, the recognized technical rules for working safely and properly in this field must be kept in mind.
- The operating instructions must be supplemented by instructions based on existing national regulations of the user's country for preventing accidents and for protecting the environment.
- The centrifuge must be set up in such a way that it can be operated stable.

When setting it up, the following points must be noted:

- a safety zone of 300 mm must be maintained about the centrifuge, according to IEC 1010-2-2.
- Persons and hazardous substances may not occupy this safety zone, as long as the centrifuge is operating.
- The centrifuge must be loaded evenly.
- The centrifuge containers may be filled only with the maximum fill quantity specified by the manufacturer.
- The centrifuge containers must be filled outside the centrifuge
- Only accessories approved by the manufacturer may be used.
- Centrifugation with an impermissible imbalance is not allowed.
- The centrifuge may not be operated in rooms where there is a hazard of explosion.
- Centrifugation with
 - combustible or explosive materials
 - materials which react chemically with one another with high energyis prohibited.
- When centrifuging hazardous substances or mixtures of substances which are toxic, radioactive, or contaminated with pathogenic micro-organisms, the user must take appropriate measures.
Centrifugation of materials belonging to Risk Group II and higher (see "Laboratory Biosafety Manual" of the World Health Organization) is not permitted.
- Operation of the centrifuge with strongly corrosive substances, which can impair the mechanical strength of rotors, suspensions, and accessories, is not permitted.
- Rotors, suspensions, and accessories exhibiting strong traces of corrosion or mechanical damage may not be used for centrifugation.
- To prevent corrosion phenomena from cleaning or disinfecting agents, the special use instructions of the manufacturer of the cleaning or disinfecting agent absolutely must be adhered to.

In case of doubt, appropriate information is to be obtained from the manufacturer of the cleaning or disinfecting agent.

- Only original spare parts and approved original accessories may be used.
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- The centrifuge is a device of Group 3 of the Medical Device Ordinance MedGV.
- Safety regulations in accordance with
IEC 1010-1/-2
DIN - EN61010 Part 1,2
- The centrifuge is guaranteed to be safe and reliable only if
 - the centrifuge is operated in accordance with the operating instructions,
 - repair work is performed by persons authorised by the manufacturer,
 - the electrical installation, at the place where the centrifuge is set up, corresponds to the requirements of IEC specifications,
 - the prescribed tests according to UVV-VBG7z (Accident Prevention Ordinance-) §15 (1) have been performed by an expert.

If these points are not adhered to, no warranty claim can be asserted with the manufacturer.

3. Reference Symbols



Attention, note documentation!

4. Scope of Delivery

The following accessories are delivered together with the centrifuge:

			Order No.
1	Connecting cable		
	- 230 V design		4718
	- 115 V design		6083
2	Carbon brushes		E603
2	Fuse inserts		
	- 230 V design	F 1,2 AH, 250 V	2384
	- 115 V design	T 3,5 AH, 250 V	E770
10	Buffer tray		
1	Set of Operating Instructions		B004-01.gb


5. Technical Data

Manufacturer	Hettich Centrifuges D-78532 Tuttlingen	
Type Designation	HAEMATOKRIT 24	
Part No.	2075	2075-01
Line voltage ($\pm 10\%$)	230/240V ac	115V ac
Line frequency	50 Hz	60 Hz
Line frequency	0,57 A	1,3 A
Power consumption	120 W	130 W
Fusing: - centrifuge	F 1,25 A	T 3,5 A
Permissible density	1,2 kg/dm ³	
RPM	12800	
Acceleration RCF	15570	
Radius	85 mm	
Acceleration time	≈ 24 s	
Deceleration time	≈ 54 s	
Kinetic energy	750 Nm	
Test obligation	no	
Set-up site - Ambient temperature - Relative humidity	5°C to 40°C max. 80% up to 31°C, decreasing linearly to 50% at 40°C	
Specimen temperature elevation	15 K	
Device protection class	I	
Radio interference suppression	EN 55011 A	
Noise level (rotor-dependent)	62 dB(A)	
Dimensions		
• Width	245 mm	
• Depth	280 mm	
• Height	180 mm	
Approximate weight	3 kg	

6. Initial Start-up

- The space requirement can be found under dimensions in the chapter on "Technical Data".

The centrifuge must be set up stable at a suitable location. When setting up the centrifuge, the required safety zone of 300 mm about the centrifuge must be kept in mind, according to IEC 1010-2-2.

 Persons or hazardous substances may not be located within the safety zone as long as the centrifuge is in operation.

- Check whether the line voltage agrees with the specification on the type plate.
- Before starting up the centrifuge for the first time, remove the transport safety device around the centrifuge disk.
- The connecting cable of the centrifuge must be connected to a standard mains receptacle.
- Open the cover.

 Open the cover only if the rotor is stationary !

- Remove the rotor cover by pressing the pressure lock.
- Insert the HETTICH Haematokrit capillary, filled approx. 80%, sealed on one side, order no. 2074 or 1072, into the Haematokrit plate.


The sealed side must sit inside on the base of the plug-in buffer tray.

The buffer tray has two functions:

1. It serves as a buffer for the capillary during centrifugation.
2. It catches liquid from capillaries that are not sealed correctly during centrifugation.

Opposite places must be occupied.

- Press the cover centrally on the rotor. The cover must latch audibly.
- Close the cover of the centrifuge.


 The centrifuge can be started only with the cover closed.
If the cover is opened during centrifugation, the drive will shut off.
With the cover open, do not touch the rotating centrifuge disk.

7. Centrifugation with Preselected Time

- The relative centrifugal acceleration RCF is 15570.
- The guide value for the centrifuging time according to DIN 58933 is

$$\begin{aligned} \text{time} &= 100000 : \text{RCF} \\ &= 100000 : 15570 &= 6,42 \text{ min} \end{aligned}$$

- Set the centrifuging time at the timer.

 For centrifuging times less than 3 min, first advance the timer to 15 minutes, then set it back to the desired time.

- After about 24 seconds, the maximum RPM of 12800 has been reached.
- After the time elapses, the drive will turn off.
- After about 54 seconds (unbraked), the rotor will come to a stop.
- Open the cover only when the rotor is at rest.
- Remove the rotor cover.
- Perform the Haematokrit measurement.

8. Haematokrit Measurement

8.1. Sealing the Haematokrit capillary

- Press the unwetted, dry side of the filled capillary vertically into the sealing putty, order no. 2077, as far as it will go.
- Tilt the capillary slightly to the side, so that the stopper comes away from the base, and pull the capillary out of the putty.

The 0% line on the evaluation disc corresponds to the height of the stopper in the capillary when it has been pressed into the sealing putty once.



Do not rotate the capillary in the sealing putty.
If the capillary is rotated in the sealing putty, the stopper may loosen in the capillary, and the capillary will become leaky.
The liquid will escape during centrifugation.

8.2. Evaluation after centrifugation

- Reading the Haematokrit value -

- Reading must only be performed with the rotor stationary and the centrifuge lid open.
- Using the evaluation disc set the liquid column in the capillary to 100% and read off the Haematokrit value.

Perform the setting as follows:

1. Bring the capillary to be evaluated into position (1 - 24)
2. Secure the Haematokrit plate
3. Move the evaluation disc in the Haematokrit plate until the 100% line of the evaluation disc is in line with with the top edge of the liquid column.
4. Read off the Haemokrit value at the top edge of the erythrocyte column.

Repeat steps 1 to 4 until all the capillaries have been evaluated.

9. Care / Maintenance



Before using cleaning or disinfecting methods, other than those recommended by the manufacturer, the user must make certain that the intended method will not damage the device.

- For hygienic reasons, clean the centrifuge regularly. Clean with soap or a mild detergent and water as necessary.
- Adhering contamination's are to be avoided, since these can initiate a corrosion process.
- The 24 plug-in buffer trays can be removed upwards out of the plate for rinsing and cleaning.
- In the event of heavy contamination, the Haematokrit plate can be removed from the centrifuge for rinsing and cleaning.

The plate is inserted and removed as follows:

1. Loosen the tensioning nut in the centre of the plate and unscrew it.
2. Push back and pull off the plate vertically from the cylindrical motor shaft.
3. When inserting and pressing the plate onto the motor shaft, you must ensure that the motor shaft carrier pin is located in the groove at the bottom of the plate.
4. Secure the plate onto the motor shaft with the tensioning nut.



The tensioning nut in the centre of the plate is for securing the plate onto the motor shaft.
It also serves as the lock for the cap and evaluation disc in the plate.
The tensioning nut must always be firmly secured to the motor shaft.

9.1. Glass Breakage

- Depending on usage of the centrifuge and the quality and condition of the capillary it is possible that one of the 24 buffer trays may be damaged. Glass breakage will occur.
- After glass breakage has occurred, or after the liquid has escaped, the relevant buffer tray must be removed from the plate immediately. It must be carefully rinsed and cleaned.
Glass slivers must be totally removed, as glass slivers in the buffer tray will cause further breakage of glass.
A damaged buffer tray must be replaced immediately.

10. Repair



Repairs may be performed only by a person authorized by the manufacturer.

10.1. Replacement of the Mains Input Fuses



Isolate the centrifuge from the mains!

Pull the line cord from the connector socket.

The fuses are situated in the connector socket.

- Open the cover at the connector socket.
- Press the spring at the fuse holder towards the fuse holder, and pull out the fuse holder together with the fuse.
- Replace the fuse (included with delivery of the unit).

11. Customer Service / Service

If the centrifuge breaks down, or if the centrifuge is defective, only a person authorized by the manufacturer is authorized to eliminate the damage.

In this case, please contact the Hettich customer service.

Before contacting customer service, please note the following:

1. the centrifuge type
2. the factory number

Both data can be found on the type plate of the centrifuge.



Please note down the defective behaviour.

These data are absolutely necessary for re-establishing the design condition quickly.

12. Spare Parts List

Spare Part	HAEMATOKRIT 24	
	230 V	115V
Motor	E941	
- Carbon brush	E603	
- Dog pin	E488	
Rubber-metal bearing	E476	
- anti-twist device	E879	
Connecting cable	4718	6083
Connector socket	E351	
- Fuse holder	E352	
Fuse insert	F 1,25 AH, 250 V	---
	T 3,5 AH, 250 V	E770
Radio interference suppression filter	2377	
Micro-switch	0286	
Angle piece for micro-switch	2357	
Switching panel	0243	
- Switching panel	2207	
Timer	E869	
- Rotary handle	5897	
Upper section	2367	
- Buffer (fixing the read-off plate)	2212	
- Friction rubber	2211	
- Cover plate	E299	
Cover	E943	
- Buffer	E958	
- Hinge pin	2359	
Rubber foot	0236	
Transformer	---	E865

13. Accessories

Haematokrit plate	2050
- Cover	E1426
- Buffer tray (100 pieces)	E1400
- Tensioning nut	E956