

**EBA 20
EBA 20 C**



Repair instructions

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1 Introduction

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



Interventions and modifications at centrifuges, which have been conducted by persons not authorized by the Andreas Hettich GmbH & Co. KG company, are at their own risk and entail the loss of all guarantee and liability claims. In such an event any guarantee claim or liability claim against the Andreas Hettich GmbH & Co. KG company expires.

- Only original spare parts and original accessories licensed by the Andreas Hettich GmbH & Co. KG company are allowed to be utilised.



If no original spare parts or no original accessories are used, any guarantee claim or liability claim against the Andreas Hettich GmbH & Co. KG company ceases to exist.

- Information about the operation of the centrifuge please see operating instructions.
- We reserve all rights for these technical documents.

2 Symbol meanings



Symbol on the machine:

Attention, general hazard area.

Before using the centrifuge implicitly read the operating instructions and pay attention to the safety relevant references!



Symbol in this document:

Attention, general hazard area.

This symbol refers to safety relevant warnings and indicates possibly dangerous situations.

The non-adherence to these warnings can lead to material damage and injury to personal.



Symbol in this document:

Warning! Danger for human lives by electric shock.



Symbol in this document:

This symbol refers to important circumstances.



Symbol on the machine and in this document:

Symbol for the separate collection of electric and electronic devices according to the guideline 2002/96/EG (WEEE). The device belongs to Group 8 (medical devices).

Applies in the countries of the European Union, as well as in Norway and Switzerland.

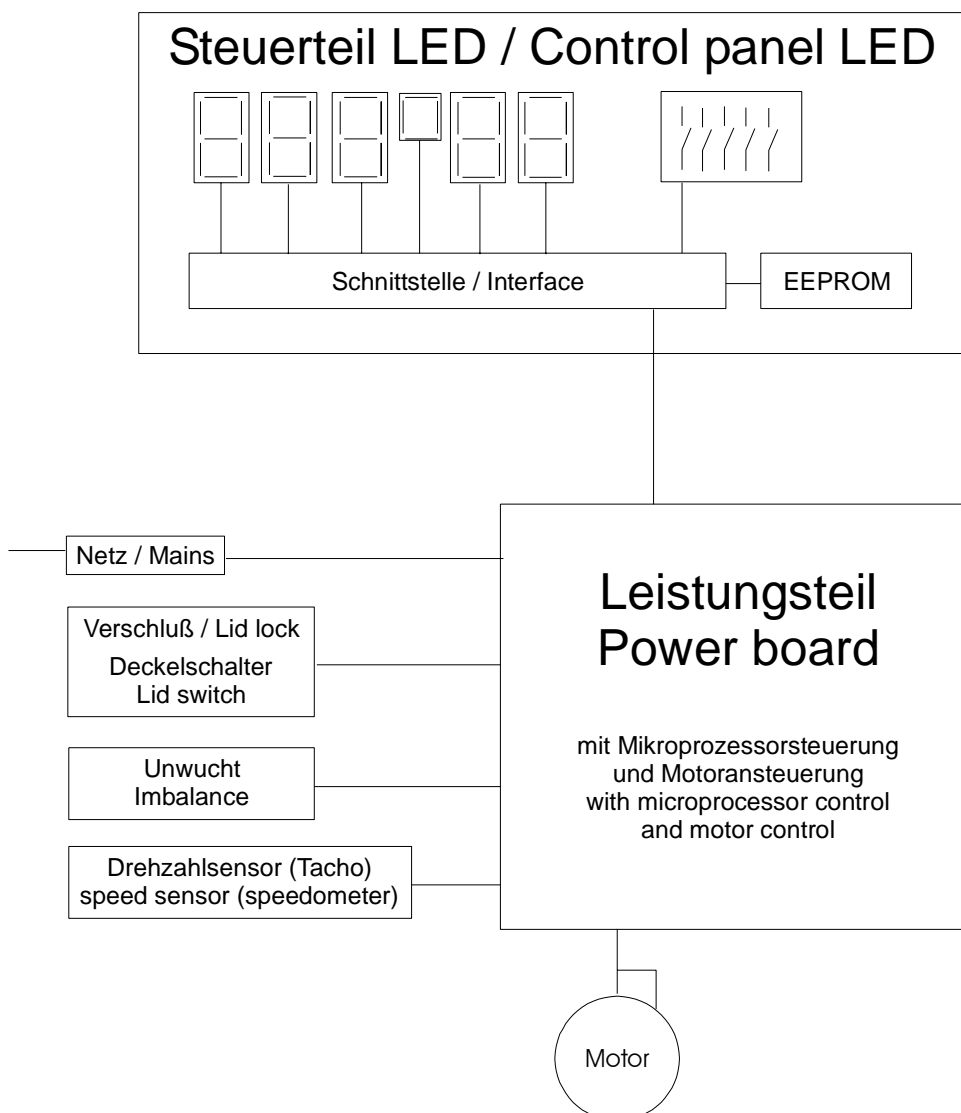
3 Description of the centrifuge

The EBA 20 / EBA 20 C is a microprocessor-controlled centrifuge which is comprised of the following electrical components:

- Control panel
- Power board
- Motor with speed sensor (speedometer)
- Lid lock system
- Imbalance switch (only with EBA 20 C)



All electronic components are on mains, due to the DC-coupling



3.1 Control panel A3

The control panel have only restricted control tasks, it disposes of the following characteristics:

- Input panel for operation parameters
- Indication elements
- Transmission of the signals to the power board via the interface.
- Storing of centrifuge version
- Storing the machine version and the brake setting.
By means of the machine version the power board is informed which kind of centrifuge has to be controlled. Then the power board takes the corresponding values from the ROM.
e.g. Max. Speed
 Acceleration and deceleration ramps
- Communication with the power board via TTL interface.

The power supply for the control panel is transmitted via the flat ribbon cable:

Pin 1 GND
Pin 4 +5V

3.2 Power board A1

The power board is an combination of:

- Control panel
- Voltage supply
- Motor-control


The power board carries out the following tasks:

- Power supply 15 V, DC for imbalance switch
- Power supply 5 V, DC for control panel and speed sensor
- Plugging station of the motor
- Control of the motor with triac phase-angle control
- Monitoring of the motor current.
- Braking of the motor with brake resistor
- Plugging station of the imbalance switch (only with EBA 20 C)
- Evaluation of the imbalance switch (only with EBA 20 C)
- Plugging station of the lid lock
- Control of the lid lock magnet at stand still of the rotor.
- Evaluation of the lid lock signal (lid open or closed).
- Communication with the control panel via TTL interface
- Error evaluation.

3.3 Motor M1

- The motor is connected via a plug to the power board.
- The motor is a collector-motor with carbon brushes.
- The motor is controlled by the power board.

3.4 Lid lock Y1

- Opening of the lid lock is prevented by a latch. The lid lock can only be opened when the relay REL 602 on the power board is energised. This occurs when the rotor is at standstill, mains power is applied and the key  is pressed. The solenoid is energized for three seconds and releases the latch.
- The centrifuge can only be started when the lid is closed. A microswitch on the lid lock detects the position of the lid lock (open/closed) and report it to the power board.

3.5 Imbalance switch S2 (only with EBA 20 C)

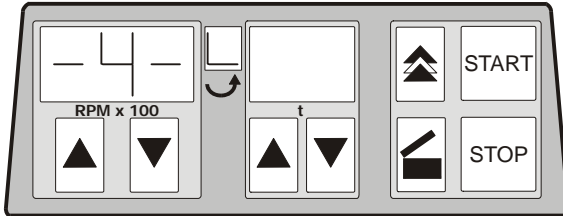
- A microswitch (break contact) detects any imbalance.
- Imbalance can only be detected in running mode (starting, centrifuging and braking).
- If any imbalance is detected, the drive is changed over to braking.

4 Troubleshooting procedures

- Fuses in installation in which centrifuge is installed are intact.
- Mains input fuses of centrifuge are intact.
- Supply voltage present at (see circuit diagram):
 - Connecting cable
 - Appliance plug
 - Mains switch
 - Power board A1, plug ST1.1 (L) and ST1.2 (N)
- Look for the displayed error code in the chapter "Error messages".
- Remedy the error according to the instructions.
- Carry out a functional check after every repair and whenever a component is replaced, see chapter "Functional check after a repair".

5 Error messages

The error message will be indicated in the speed display of the front panel
e.g. :



5.1 MAINS RESET

- Switch off the mains switch.
- Wait at least for 10 seconds and then switch on the mains switch again.

5.2 Brief description

Display.	Fault	Brief description	Page
- 1 -	Tacho error	Tacho pulses break down	10
- 2 -	System reset	Mains interrupt	10
- 3 -	Imbalance	Imbalance on the motor axis	10
- 4 -	Communication	Communication error	11
- 5 -	Overload	Fault in the motor or the motor control	11
- 7 -	Overspeed	Fault in the power board	11
	Versions Error	Wrong machine version setting	12
- d -	Lid lock error	Fault in lid lock system	12

5.3 Description and elimination of errors

– 1 – Tacho error

Error	Speed sensor pulses (tacho) break down.
Error consequence	Drive switch off and brakes with the adjusted brake level.
Error cause	<ul style="list-style-type: none">• Carbon brushes worn out.• Speed sensor (tacho) defective.• Power board (A1) defective.• Loosen contact in plug ST5.
Measurement	<ol style="list-style-type: none">1. power board A1 / ST5 between pin 2 (GND) and pin 3 (+5V)2. power board A1 / ST5 between pin 1 and pin 2 (GND) (pulses: 0V, 5V, 0V, 5V etc. / 6 pulses per revolution) See also section 11.2.2.
Error code reset	Wait for a time duration of 100 sec. After this perform a MAINS RESET.

– 2 – System reset

Error	Mains interrupt during a run
Error consequence	Drive switch off and brakes with the adjusted brake level.
Error cause	<ul style="list-style-type: none">• Power supply has failed.• Loosen contact in mains lead, appliance plug or the internal electrical wires.
Error code reset	<ol style="list-style-type: none">1. Wait for rotor standstill.2. Open the lid and press key START or perform a MAINS RESET.

– 3 – Imbalance

Error	Imbalance on motor axle
Error consequence	Drive switch off and brakes with the adjusted brake level.
Error cause	EBA 20: <ul style="list-style-type: none">• Plug ST6 is unplugged or has loose contact.• Power board (A1) is defective. EBA 20 C: <ul style="list-style-type: none">• Weight difference in rotor components.• Imbalance switch is defective or not connected.• Imbalance switch is disadjusted (Adjustment see section "Imbalance switch-off (only with EBA 20 C)").• Loose contact in cable or plug ST6.• Power board (A1) is defective.

Measurement Imbalance switch, plug ST6 pin 1 to Pin 4.
Switch is an opener. See also section 11.2.4.

Error code reset Open the lid after standstill

– 4 – Communication

Error Communication error between control board (A3) and power board (A1).

Error consequence Drive switches off and rotor runs down unbraked.

Error cause

- Loose contact in flat ribbon cable.
- Control board (A3) defective.
- Power board (A1) defective.

Error code reset MAINS RESET after standstill.
If the MAINS RESET is performed before the rotor has standstill, the set speed and the rotation will be indicated in the display until the rotor has standstill.

– 5 – Overload

Error Power board detects overload.

Error consequence Drive switches off and rotor runs down unbraked.

Error cause

- Power board (A1) defective.
- Motor defective (windings or bearings)

Measurement Measure motor coils, see section 11.2.1.

Error code reset Perform a MAINS RESET after standstill

– 7 – Overspeed

Error System recognises excess speed.

Error consequence Drive switches off and rotor runs down unbraked.

Error cause

- Power board (A1) defective.

Error code reset Perform a MAINS RESET after standstill.

– d – Lid lock error

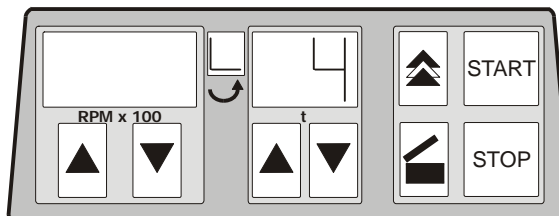
Error	Lid lock is open during centrifugation.
Error consequence	Drive switches off and rotor runs down unbraked.
Error cause	<ul style="list-style-type: none"> • Microswitch at lid lock is defective. • Power board (A1) defective. • Loosen contact in Plug ST4 at pin 5 and pin 6. • Mechanical defect at the lid lock. • Emergency release was executed during centrifugation.
Measurement	Remove plug ST4 and measure between pin 5 and pin 6: Lid opened : $\approx 0 \Omega$ Lid closed: $\infty \Omega$ See also section 11.2.3.
Error code reset	Perform a MAINS RESET after standstill.

5.4 Defects without Error indications.

No speed indication / Machine-Version-Error

Error	After switching on the centrifuge the speed indicator extinguish and in the time indicator appears the set machine version.
Error cause	<ul style="list-style-type: none"> • Wrong machine version adjusted.


Example for indication




Proceed as the followings:

1. Set the correct machine version with the keys ▲ ▼ beneath the time indicator.
 EBA 20 = 1
 EBA 20 C = 5
2. Press the key (STOP) in order to store the set machine version.
3. Perform an MAINS RESET.

The lid can not be opened

Error	The lid can not be opened. The rotation display shows  (lid open).
Error cause	<ul style="list-style-type: none"> • Microswitch at lid lock is defective • Loosen contact on plug ST4 / pin 5 and pin 6 • Power board (A1) or control panel (A3) defective
Measurement	Remove plug ST4 and measure on the plug between pin 5 and pin 6: Switch closed: $\approx 0 \Omega$ Switch: open $\infty \Omega$ See also section 11.2.3.
Opening the lid	Release the lid by using the emergency release.

The lid can not be opened

Error	The lid can not be opened. The rotation display shows  (lid closed).
Error cause	<ul style="list-style-type: none"> • Solenoid on lid lock is defective • Loosen contact on plug ST4 / pin 1 and pin 3 • Power board (A1) or control panel (A3) defective
Measurement	Remove plug ST4 and measure on the plug between pin 1 and pin 3. See also section 11.2.3.
Opening the lid	Release the lid by using the emergency release.

No display

Error	No power supply on control board (A3)
Error consequence	No operation possible
Error cause	<ul style="list-style-type: none"> • No mains supply • Power board (A1) defective • Control board (A3) defective • Interruption in the flat ribbon cable between power board (A1) and control board (A3)
Measurement	<ol style="list-style-type: none"> 1. Mains supply, power board A1, plug ST1.2 (L) to ST1.1 (N) 2. Power board A1, plug ST3 pin 4 (+5V) to pin 1 (GND) 3. Control board A3, plug ST1 pin 4 (+5V) to pin 1 (GND)

6 Settings and enquiries

6.1 Setting the machine version

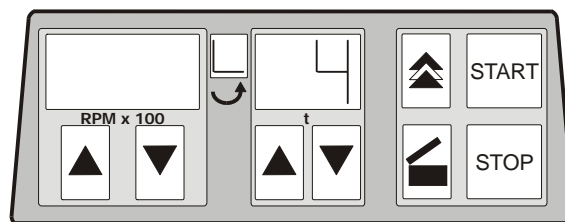
The machine version stored in the control panel must correspond to the centrifuge model. Control panels supplied as spare part are set to machine version 4 (ROTOFIX 32).

After installing the control panel the EBA 20 must be set to machine version 1 and the EBA 20 C to machine version 5.

If another machine version than 1 or 5 is set in the control panel, the set machine version will appear in the display after switching on the centrifuge.


Now the correct machine version has to be set as follows:



1. Set the correct machine version for EBA 20 or EBA 20 C by using the ▲ and ▼ keys beneath the time indicator.



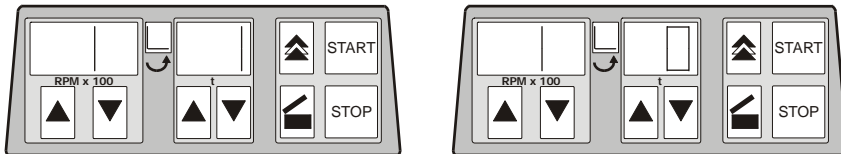
2. Press the key **STOP** in order to store the set machine version.

6.2 Enquiry the machine version

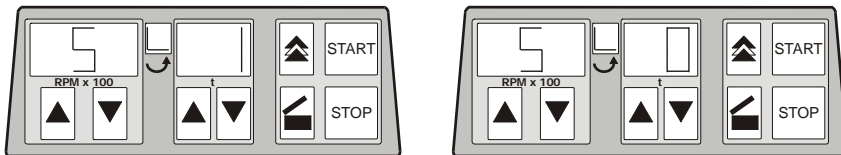
 The enquiry of the machine version is only possible if the rotor is at standstill.


1. Switch off the mains switch.
2. Keep the key  beneath the speed display and the key  pressed simultaneously.
3. Switch on the mains switch and release the keys again.
The speed indicator shows the machine version and the time indicator shows the set brake step: e.g.:


EBA 20:




EBA 20 C:





If the machine version and brake step are not displayed, press the  key under the speed indicator until they are displayed.

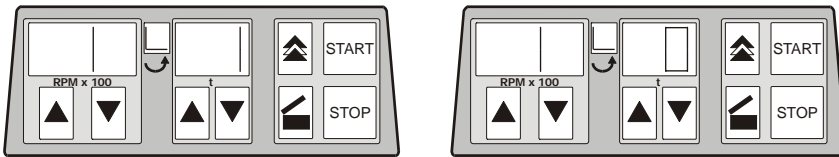
4. To exit the machine version display press the key  or perform a MAINS-RESET.

6.3 Enquiry the programme versions

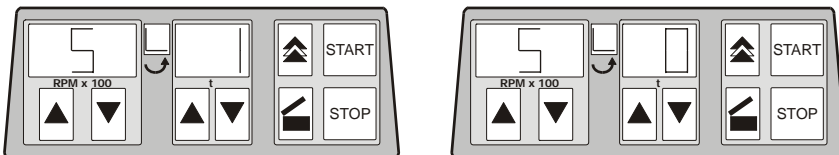
 The enquiry of the programme versions is only possible if the rotor is at standstill.


1. Switch off the mains switch.
2. Keep the key  beneath the speed display and the key  pressed simultaneously.
3. Switch on the mains switch and release the keys again.
The speed indicator shows the machine version and the time indicator shows the set brake step.

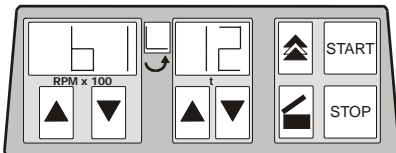
EBA 20:




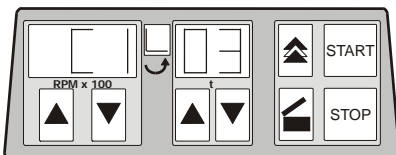
EBA 20 C:




4. Press the key  beneath the speed indicator so often until the programme version of the control panel (e.g. b1.12) is displayed.






5. Press the key  beneath the speed indicator again.
The programme version of the power board (e.g. C1.03) is displayed.



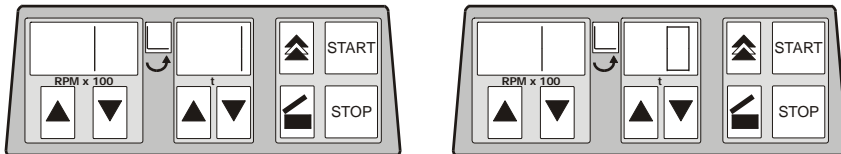
6. To exit the programme versions display press the key  or perform a MAINS-RESET

6.4 Setting the brake step

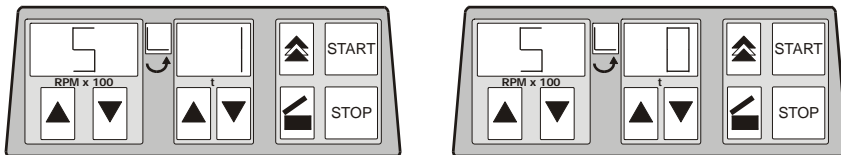
 The setting of the brake step is only possible if the rotor is at standstill.


1. Switch off the mains switch.
2. Keep the key  beneath the speed display and the key  pressed simultaneously.
3. Switch on the mains switch and release the keys again.
The speed indicator shows the machine version and the time indicator shows the set brake step: e.g.:




EBA 20:





EBA 20 C:





If the machine version and brake step are not displayed, press the  key under the speed indicator until they are displayed.

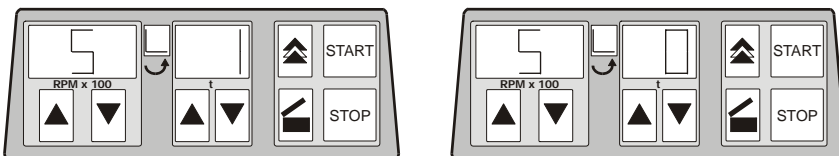
4. Set the desired brake step with the keys   beneath the time display.
Step 1 = short run-down time, Step 0 = long run-down time.
For run-down times, see chapter "Anhang/Appendix, Rotor und Zubehör/Rotor and accessories" in the operating instructions.
5. Press the key  to save the setting.


6.5 Locking the input of the speed, time and brake step and locking the key (only with EBA 20 C)






 Locking of the  key and locking of the input of the speed, time and brake step is only possible with machines with machine version 5 (EBA 20 C) and a programme version of the control panel from b1.40.

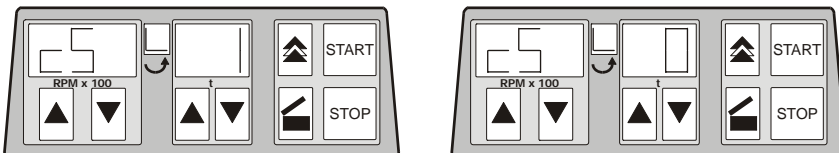
The activation and deactivation of the lock is only possible if the rotor is at standstill.



1. Switch off the mains switch.
2. Keep the key  beneath the speed display and the key  pressed simultaneously.
3. Switch on the mains switch and release the keys again.
The speed indicator shows the machine version and the time indicator shows the set brake step:



If the machine version and brake step are not displayed, press the  key under the speed indicator until they are displayed.


4. Keep the key  pressed and then press the key  beneath the speed indicator. In the speed indicator the letter "c" is displayed, this means that the input of the speed, time and brake step is now locked and the keys ,  and  are deactivated.



To deactivate the lock also keep the key  pressed and then press the key  beneath the speed display.

5. Press the key  to save the setting.

6.6 Lid lock control

The lid can be opened when the rotor is at standstill and the key  is pressed. The solenoid on the lid lock remains energized for three seconds.

6.7 Imbalance switch-off (only with EBA 20 C)

The permissible imbalance is specified for rotor E1824 by the indication of the difference in weight of opposite rotor positions.

When having a difference in weight within the range of 6g to 12g during run-up, the drive has to switch off before reaching 1500 RPM.

The imbalance switch-off is adjusted by changing the distance of the imbalance switch.

With a test run with the indicated differences in weight the imbalance switch-off will be checked.

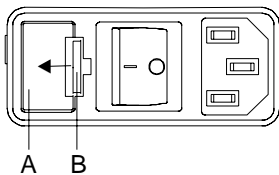
Adjusting the imbalance switch:

- Loosen both screws at the angle bracket of the imbalance switch on the outer part of the housing floor until you can shift it.
- Set the permissible imbalance by shifting the angle bracket.
- Tighten both screws at the angle bracket of the imbalance switch again.
- Check the imbalance switch-off with a test run.

7 Change mains input fuse



Switch off the mains switch and separate the centrifuge from the mains!



The fuse holder (A) with the mains input fuses is located next to the mains switch.

- Remove the connecting cable from the machine plug socket.
- Press the snap-fit (B) against the fuse holder (A) and remove.
- Exchange defective mains input fuses.



Only use fuses with the rating defined for the type.
See the following table.

- Reinsert the fuse holder until the snap-fit clicks shut.
- Reconnect the centrifuge to the mains supply.

Model	Type	Fuse	Order no.
EBA 20	2002	T 1,6 AH/250V	E891
EBA 20 C	2002-C		
EBA 20	2002-01	T 3,15 AH/250V	E997
EBA 20 C	2002-01C		

8 Functional check after a repair

After a repair a functional check of the unit must be carried out. For functional check a test run with the loaded rotor must be performed.

During the test run the followings must be checked:

- Function of the keys and the display.
- Run-up and slow-down time, max. speed of the rotor. Values see operating instructions chapter "Anhang/Appendix, Rotoren und Zubehör/Rotors and accessories".
- Sample temperature. Values see operating instructions chapter "Anhang/Appendix, Rotoren und Zubehör/Rotors and accessories".
- Imbalance switch-off (only with EBA 20 C). Values see chapter "Imbalance switch-off (only with EBA 20 C)".
- Current consumption. Values see chapter "Technical specification".

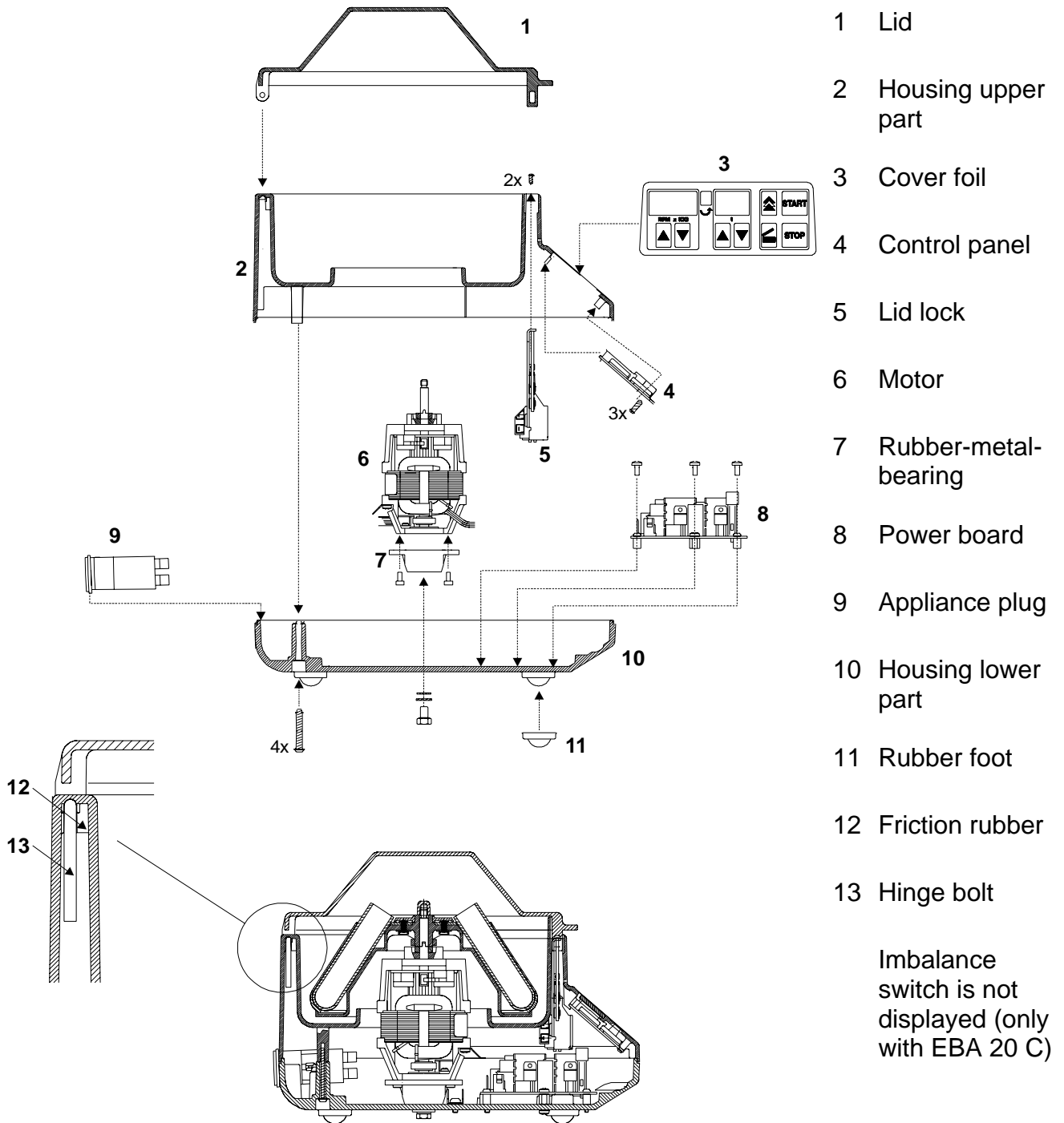
After the test run a safety test must be carried out. Check the following values:

- Insulation resistance > 2 M Ω
 - Protective conductor resistance < 0.2 Ω
 - Leakage current < 3.5 mA *
- * limit according to EN 61010-1

A laboratory centrifuge do not belong to those medical appliances which may be tested according to the regulation IEC 60601-1 or corresponding national medical electronic standards. Laboratory centrifuges are classified as laboratory equipment.

The regulations applying to laboratory equipment are IEC 61010-1 or European standard EN 61010-1.

9 General arrangement of the components



10 Assembling and disassembling components

Component	Abbreviation	Plug	Connected to board	Description in section
Carbon brushes				10.1
Motor	M1	ST1	A1	10.2
Rubber-metal bearing		--	--	10.2
Power board	A1	--	--	10.3
Control panel	A3	--	--	10.4
Flat ribbon cable			A1 to A3	10.5
Lid lock	Y1	ST4	A1	10.8
Mains switch	Q1	--	A1	10.6
Appliance plug	--	--	--	10.6
Imbalance switch (only with EBA 20 C)	S2	ST6	A1	10.7



Before assembling or disassembling components, the following working processes must first be carried out to reach the components.

Make a note of the plug numbers !

The components are assembled in reverse order !

- Open the lid.
- Switch mains switch off (position 0).
- Disconnect the centrifuge from the mains.
- Remove the rotor.
- Remove the four fastening screws for the upper part on the bottom of the centrifuge. Place the upper part carefully beside the centrifuge.

10.1 Replacing the carbon brushes



Always replace both carbon brushes at the same time!

- Lift pressure spring away from the carbon brush.
- Pull the carbon brush out of the holder.
- Remove carbon dust.
- Insert new carbon brush into the holder.
- Carefully place the pressure spring on the carbon brush.

10.2 Motor M1 / Rubber-metal bearing

- Pull off plugs ST1 and ST5 from the power board A1.
- Unscrew the fastening screw of the rubber-metal bearing at the lower part of the housing.
- Lift the motor upwards out of the centrifuge and pull off the earth connection.
- Unscrew the rubber-metal bearing from the motor.

- Before the motor is installed, the rubber-metal bearing must be checked for possible wear or cracks and must be replaced if necessary.
- Exchange the motor.

10.3 Power board A1

- Unplug all plugs and cables from the power board.
- Remove the five fastening screws of the power board A1.
- Exchange the power board A1.

10.4 Control panel (A3)

- Remove the three fastening screws and lift up the control panel carefully.
- Unplug the flat ribbon cable from the power board A1.
- Exchange the control panel.

10.5 Flat ribbon cable

- Unplug the flat ribbon cable from the power board A1.
- Unplug the flat ribbon cable from the control board A3.
- Exchange the flat ribbon cable.

10.6 Appliance plug with mains switch

- Strip the appliance plug from the lower housing.
- Remove the plugs and the earth connection.
- Exchange the appliance plug.

10.7 Imbalance switch S2 (only with EBA 20 C)

- Pull off plug ST6 from the power board A1.
- Remove the fastening screws of the imbalance switch S2 from the sheet metal holder.
- Exchange the imbalance switch.
- Adjust the imbalance switch, see section "Imbalance switch-off (only with EBA 20 C)".

10.8 Lid lock Y1

- Remove the two fastening screws of the lid lock on the upper part of the housing.
- Unplug the cable from the microswitch and the solenoid of the lid lock.
- Pull off the earth connection from the lid lock.
- Exchange the lid lock.

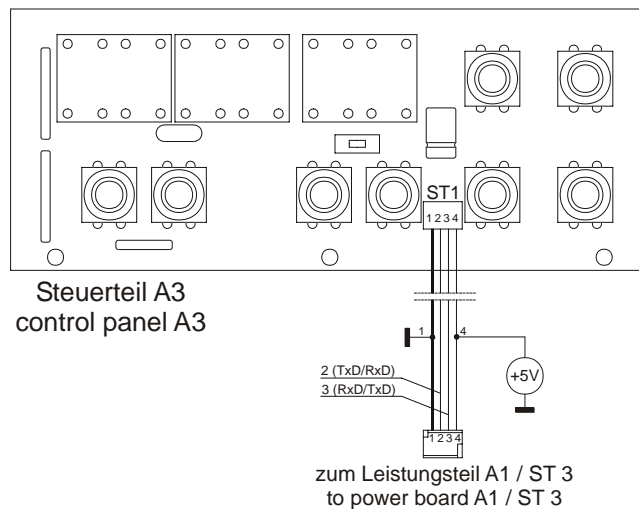
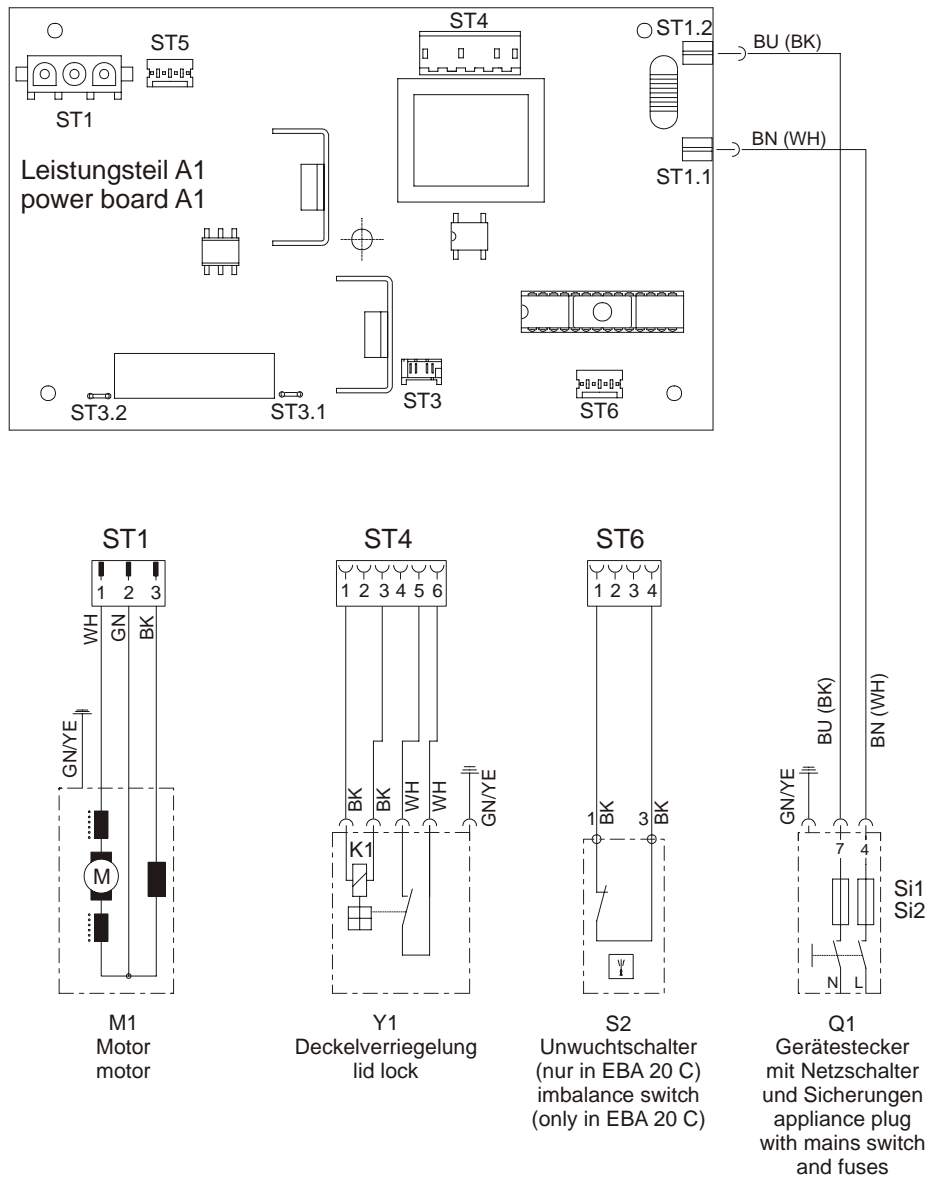
11 Technical documents

11.1 Connecting diagrams

11.1.1 Abbreviations of the cable colours

Abbreviation	Colour
BK	black
BN	brown
BU	blue
GD	gold
GN	green
GNYE	green-yellow
GY	grey
OG	orange
PK	pink
RD	red
SR	silver
TQ	turquoise
Transp.	transparent
VT	violet
WH	white
YE	yellow

11.1.2 Connecting diagram EBA 20 / EBA 20 C



11.2 Signals and measurements

11.2.1 Motor M1

Field coil

Pull off plug ST1 and measure at the plug between pin 2 and pin 3:

230 V version: $\approx 110 \Omega$

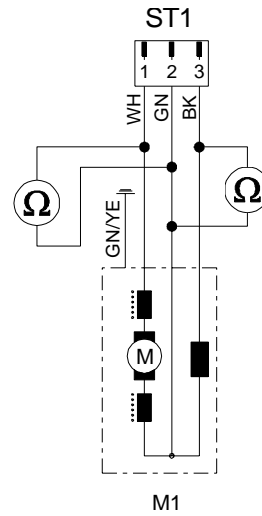
115 V version: $\approx 28 \Omega$

Armature coil

Pull off plug ST1 and measure at the plug between pin 1 and pin 2:

230 V version: $\approx 70 \Omega$

115 V version: $\approx 18 \Omega$



11.2.2 Speedsensor B3 (speedometer)

Supply voltage:

Measure at plug ST5 between pin 2 (GND) and pin 3:

+5V

0V

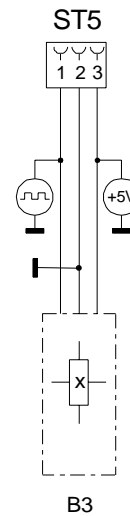
speedometer signal:

Measure at plug ST5 between pin 2 (GND) and pin 4:

+5V

0V

Tachosignal / tachometer signal
6 pulses per revolution



11.2.3 Lid lock Y1

Lid switch:

Remove plug ST4 and measure at the plug between pin 5 and pin 6:

Switch actuated: $\infty \Omega$

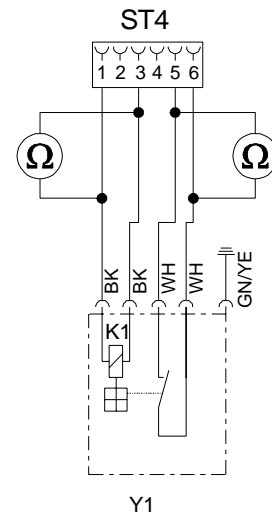
Switch not actuated: $\approx 0 \Omega$

Solenoid K1

Remove plug ST4 and measure at the plug between pin 1 and pin 3:

230 V version: $\approx 2.25 \text{ K}\Omega$

115 V version: $\approx 400 \Omega$

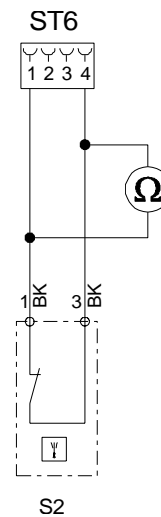


11.2.4 Imbalance switch S2 (only with EBA 20 C)

Remove plug ST4 and measure at the plug between pin 1 and pin 4:

Switch actuated: $\infty \Omega$

Switch not actuated: $\approx 0 \Omega$




11.3 Technical specifications

Manufacturer	Andreas Hettich GmbH & Co. KG D-78532 Tuttlingen	
Model	EBA 20	
Type	2002	2002-01
Mains voltage ($\pm 10\%$)	208 - 240 V 1~	100 - 127 V 1~
Mains frequency	50 - 60 Hz	50 - 60 Hz
Connected load	65 VA	70 VA
Current consumption	0.28 A	0.6 A
Max. capacity	8 x 15 ml	
Allowed density	1.2 kg/dm ³	
Speed (RPM)	6000	
Force (RCF)	3461	
Kinetic energy	850 Nm	
Obligatory inspection (BGR 261)	no	
Ambient conditions (EN 61010-1)	<p>Indoors only</p> <p>Up to 2000 m above sea level</p> <p>2°C to 40°C</p> <p>Maximum relative humidity 80% for temperatures up to 31°C, linearly decreasing to 50% relative humidity at 40°C.</p>	
– Set-up site		
– Altitude		
– Ambient temperature		
– Humidity		
– Excess-voltage category (IEC 60364-4-443)	II	
– Pollution degree	2	
Device protection class	I	
Not suitable for use in explosion-endangered areas.		
EMC		
– Emitted interference (suppression of radio interference)	EN 55011, Group 1, Class B EN 61000-3-2 EN 61000-3-3	FCC Class B
– Interference immunity	EN 61000-6-1	----
Noise level (dependent on rotor)	≤ 54 dB(A)	
Dimensions		
– Width	231 mm	
– Depth	292 mm	
– Height	216 mm	
Weight	approx. 4 kg	

Manufacturer	Andreas Hettich GmbH & Co. KG D-78532 Tuttlingen			
Model	EBA 20 C			
Type	2002-C	2002-01C		
Mains voltage ($\pm 10\%$)	208 - 240 V 1~	100 - 120 V 1~		
Mains frequency	50 - 60 Hz	50 - 60 Hz		
Connected load	90 VA	100 VA		
Current consumption	0.4 A	0.8 A		
Max. capacity	2 x CellPaker® containers each with 10 ml blood			
Allowed density	1.2 kg/dm ³			
Speed (RPM)	4500			
Force (RCF)	1472			
Kinetic energy	850 Nm			
Obligatory inspection (BGR 261)	no			
Ambient conditions (EN 61010-1)	<p>Indoors only</p> <p>Up to 2000 m above sea level</p> <p>2°C to 40°C</p> <p>Maximum relative humidity 80% for temperatures up to 31°C, linearly decreasing to 50% relative humidity at 40°C.</p>			
– Set-up site				
– Altitude				
– Ambient temperature				
– Humidity				
– Excess-voltage category (IEC 60364-4-443)	II			
– Pollution degree	2			
Device protection class	I			
Not suitable for use in explosion-endangered areas.				
EMC	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> – Emitted interference (suppression of radio interference) EN 55011, Group 1, Class B EN 61000-3-2 EN 61000-3-3 – Interference immunity EN 61000-6-1 </td> <td style="width: 50%; vertical-align: top; text-align: center;"> FCC Class B ---- </td> </tr> </table>		– Emitted interference (suppression of radio interference) EN 55011, Group 1, Class B EN 61000-3-2 EN 61000-3-3 – Interference immunity EN 61000-6-1	FCC Class B ----
– Emitted interference (suppression of radio interference) EN 55011, Group 1, Class B EN 61000-3-2 EN 61000-3-3 – Interference immunity EN 61000-6-1	FCC Class B ----			
Noise level (dependent on rotor)	≤ 63 dB(A)			
Dimensions	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> – Width – Depth – Height </td> <td style="width: 50%; vertical-align: top; text-align: center;"> 230 mm 304 mm 216 mm </td> </tr> </table>		– Width – Depth – Height	230 mm 304 mm 216 mm
– Width – Depth – Height	230 mm 304 mm 216 mm			
Weight	approx. 4 kg			

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