Multi Purpose Centrifuge

SuperVario - N

SuperVarioN

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Contents

1. Assembling and starting

Put the centrifuge on a plain and horizontal place. Then plug the main cable into a wall socket capable to supply the centrifuge with about 6 amperes.
Caution: Use a safety type wall socket with a well grounded safety contact! Do not use any other socket type!
The main switch is located on the right side of the front panel. Switch the centrifuge on by pressing it. After approx. 2 or 3 sec. the display is lighting. Now press key "STOP/OPEN" and the lid locking is set free.
Then switch off the centrifuge by pressing again the main switch. Open the lid and remove all packing material used for protecting the motor during transportation. Possible residues of adhesive tape have to be removed.
Put the desired head on the motor spindle and fasten it by the tommy screw and the washer. The tommy screw should be fastened strongly by hand (but without a tool).

2. Using the centrifuge

2.1. Functions of the keys

This button is for choosing a methode. The chosen methode will be shown by a glowing LED.

Gerb	Gerber methode	- Butyrometer
Babc	Babcock methode	- Babcock bottles
Rose	Röse-Gottlieb	- Mojonnier tubes
Admi	Admi	- Admi(Solubility index tube)
Free	Free	- Free programmable

Setting of desired speed

Setting of desired temperature

Setting of desired centrifuging time

Start of centrifuge

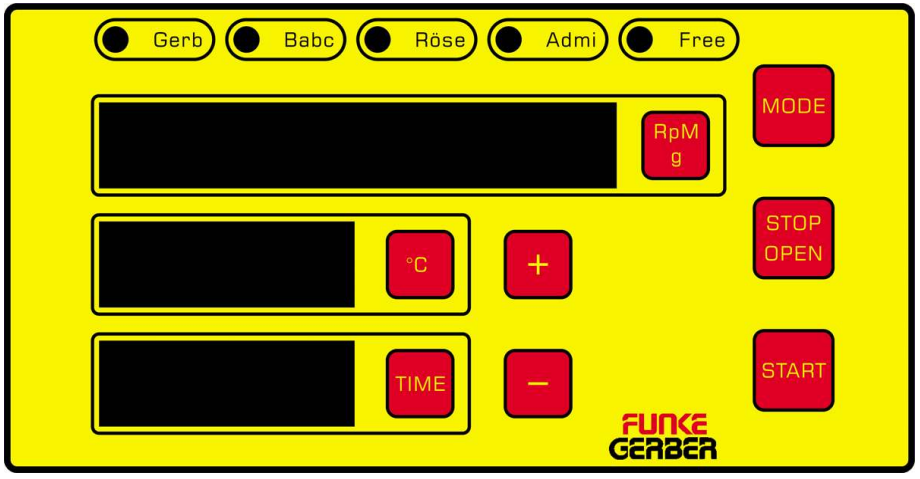
Stop of the centrifuge and open

Raising the value while setting a parameter

Decreasing a value while setting a parameter.

2.2. Operation

2.2.1. Display/Button board



The temperature can be adjusted in steps of 0,5 °C and the centrifuging time in minutes. All settings are non-volatile. They remain stored even in case the centrifuge is switched off or the mains cable is disconnected. All settings can be made only when centrifuge is in standby (not while centrifuging).

2.2.2. Setting to operation

After having assembled and prepared the centrifuge according to point 1 of this manual the display is showing the desired speed (revolutions per minute), the actual temperature (in oC) and the desired centrifuging time by the active mode. Take care that the device is set up according to the desired analysis method, i.e. the values (as per point 3) are set properly.

2.2.3. Start of centrifuge

Attention: Recheck the right fastening of the tommy screw !
The test bottles have to be placed symmetrically to avoid unbalances. Afterwards the lid is closed and pressed down until an audible catching can be heard. Then press the key START and start centrifuging.
In case the lid was erroreously closed and the centrifuge has not yet started it can be opened by pressing the key STOP/OPEN.
At the end of centrifuging time the centrifuge is braking and opening the lid locking. The braking time depends on the speed. It is between about 15 sec. (at 600 rpm) and 25 sec. (at 1100 rpm) Braking times are preset.
The centrifuge switches off automatically in case it is out of balance and the free moveable motor is touching the housing.
Hint: On account of safety reasons every switching off due to unbalance is followed by a braking. Same is done in case of a coarse knocking on

the centrifuge. In order to stop the centrifuge by hand press the key START a second time.
Hint: The centrifuge can only be started with lid locked and in case it is not in the setting modus.
Attention: The centrifuge bowl is to be kept always clean. In case glasses were broken it should be cleaned immediately

3. Settings

3.1. Setting of Speed

First press key "RpM/g". Then use the keys marked with arrow to find the new desired speed.
The desired speed is variable between 600 and 1130 rpm in steps of 10.
Press the key "RpM/g" a second time in order to store the desired value.

3.2. Setting of Temperature

First press key "°C". The display is showing the set temperature. It can be altered by the two keys marked with arrow.
By pressing the key "°C" a second time the desired temperature is stored and the display is showing again the actual temperature.
Notice! During standby the centrifuge reduces the heating to avoid local overheat. The amount of reduction is 10 °C.

3.3. Setting of Centrifuging time

First press key "TIME". By using the two keys marked with arrow the new desired time can be set.
By pressing the key "TIME" a second time this setting is stored.

4. Informations about using

Following some questions and answers that may occur.:

- How to charge head A?
Head A has 36 places. When using butyrometers of measuring method (1 stopper) all 36 positions can take a butyrometer. When centrifuging butyrometers of weighing method (2 stoppers) or Babcock bottles max. 18 positions can be used (every second one).

- What is happening when centrifuge starts and brakes?
The centrifuge need approx. 30 sec. for reaching 600 rpm and up to 70 sec. for reaching 1100 rpm with head A fully loaded. Due to construction a higher speed than the set one is not possible - neither when starting nor when centrifuging.
The brake is electrically activated and therefore smooth and nearly shock-free.

- How is the heating acting?
The heating is only active at a desired speed of 1000 rpm and above regardless whether centrifuge stops or is running. At the beginning at least 30 minutes are necessary for reaching 65 °C.
Notice! During standby the centrifuge reduces the heating to avoid local overheat. The amount of reduction is 10 °C.

- How to open centrifuge at failure of current supply?
On the bottom side of the front part there is a black cap. In case of emergency loosen this cap by a sturdy screw driver and pull the cord fastened inside.
Attention! This should be done only in case of emergency. The cap is mostly destroyed after it and has to be exchanged. Using the centrifuge

with cord lying open is forbidden.

- Why is the last decimal point of temperature lighting sometimes?
This lighting point indicates that heating is actually activated.

- Centrifuge does not correspond to key START. What may be the reason?
The lid locking is not wholly catched. Press again. The catching can be heard. When the centrifuge is braking no key can be used. This is a fact.
Further, the centrifuge cannot be started while setup is in process. (please see point 2.2.1).

- After start centrifuge brakes immediately. What may be the reason?
The centrifuge is not placed horizontally or is unbalanced. This can be tested by holding the tommy screw and moving the freely mounted motor slightly into all directions. There should be a space of 3 to 5 mm.

- Are there fuses and are they exchangeable?
Yes, the centrifuge has one (from 2/95 two) main fuse (6,3 ampere, delay action) and a fuse for the electronics (0,16 ampere, medium delay action). Both fuses are mounted on the print board in the lower part of the centriuge.
In order to exchange the fuses the centrifuge is to be disconnected from the mains and to be put gently on its side. Then the base plate can be screwed off (6 screws). Now the fuses are accessible.

- While setting the centrifuge sometimes only points are visible. What is the meaning of that?
When the centrifuge features are to be set up and one of the keys

"RpM/g", "oC" or "TIME" are pressed the displays show

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to indicate the start of setting modus. Quitting the setting modus will not activate the points.

- Immediately after switching on the centrifuge displays "br.." and startes to brake. Why this?

The centrifuge was previousely interrupted while centrifuging or braking - maybe by failure of power. On next startup it performs at first a noninterruptable brake (for security). This takes about 30 seconds. After that the lid can be opened.

- Which speed is requested for the customary analyses?

For Gerber - method set the speed to 1100 RpM.
For method according to Roese - Gottlieb (Mojonnier tubes) set the speed to 600 RpM.
For ADMI - methode set the speed to 900 RpM.
That values are valid only in connection with the appr. heads:
*Head A for Gerber / 1100 UpM
*Head B for Roese-Gottlieb / 600 UpM
*Head C for det. of solutibility / 900 UpM
The main point in centrifuging is the effective RCA (Relative Centrifugal-Acceleration). This depends not only on the speed, but also on geometric properties, on kind and dimension of the used head.

5.Tabular summary on Relative Centrifugal Acceleration

Speed 1/min	Head A G-No. tolerance (+G/ -G)		Head B G-No. tolerance (+G/ -G)		Head C G-No. tolerance (+G/ -G)	
600	105	+7 / -1	77	+5 / -1	77	+5 / -1
620	112	+7 / -1	82	+5 / -1	82	+5 / -1
640	119	+7 / -1	87	+5 / -1	87	+5 / -1
660	127	+7 / -1	93	+5 / -1	93	+5 / -1
680	135	+8 / -1	98	+5 / -1	98	+6 / -1
700	143	+8 / -1	104	+5 / -1	104	+6 / -1
720	151	+8 / -1	----	----	110	+6 / -1
740	160	+8/ -2			117	+6 / -1
760	168	+9/ -2			123	+7 / -1
780	177	+10/ -2			130	+7 / -1
800	186	+10/ -2			136	+7 / -1
820	196	+11/ -2			143	+7 / -1
840	206	+12/ -3			150	+8 / -1
860	215	+13/ -4			157	+8 / -1
880	226	+15/ -5			165	+8 / -1
900	236	+16/ -6			172	+8 / -1
920	247	+16/ -7			180	+8 / -1
940	257	+17/ -8			----	----
960	268	+17/ -10				
980	280	+17/ -12				
1000	291	+18/ -14				
1020	303	+18/ -17				
1040	315	+18/ -19				
1060	327	+18/ -22				
1080	340	+18/ -26				
1100	352	+19/ -29				
1120	365	+19/ -32				

Notice: The tolerance values refer to the empty and full loaded head, (A/B/C respectively) and a supply voltage of 230 volt.

6. Technical data

Current	230 V A/C 50..60 Hz
Power input	1200 W
Weight (empty)	26 kg
Total height with lid	460 mm
Charging height (without lid)	370 mm
Diameter	590 mm
Height of panel(center)	360 mm
Speed	600..1130 rpm
max. temperature allowed	up to 68 °C
Temperature range	up to 68 °C
Centrifuging time	1 - 99 minutes
Unbalance activation	at a deviation of about 3-5 mm
Lid lock	built-in, mechanical lock delocking electrically
Disconnection of heating	below 1000 rpm
heat reduction on standby	10 °C
Acoustic signal	standard: none on request: available for pressing keys and at the end of centrifuging time

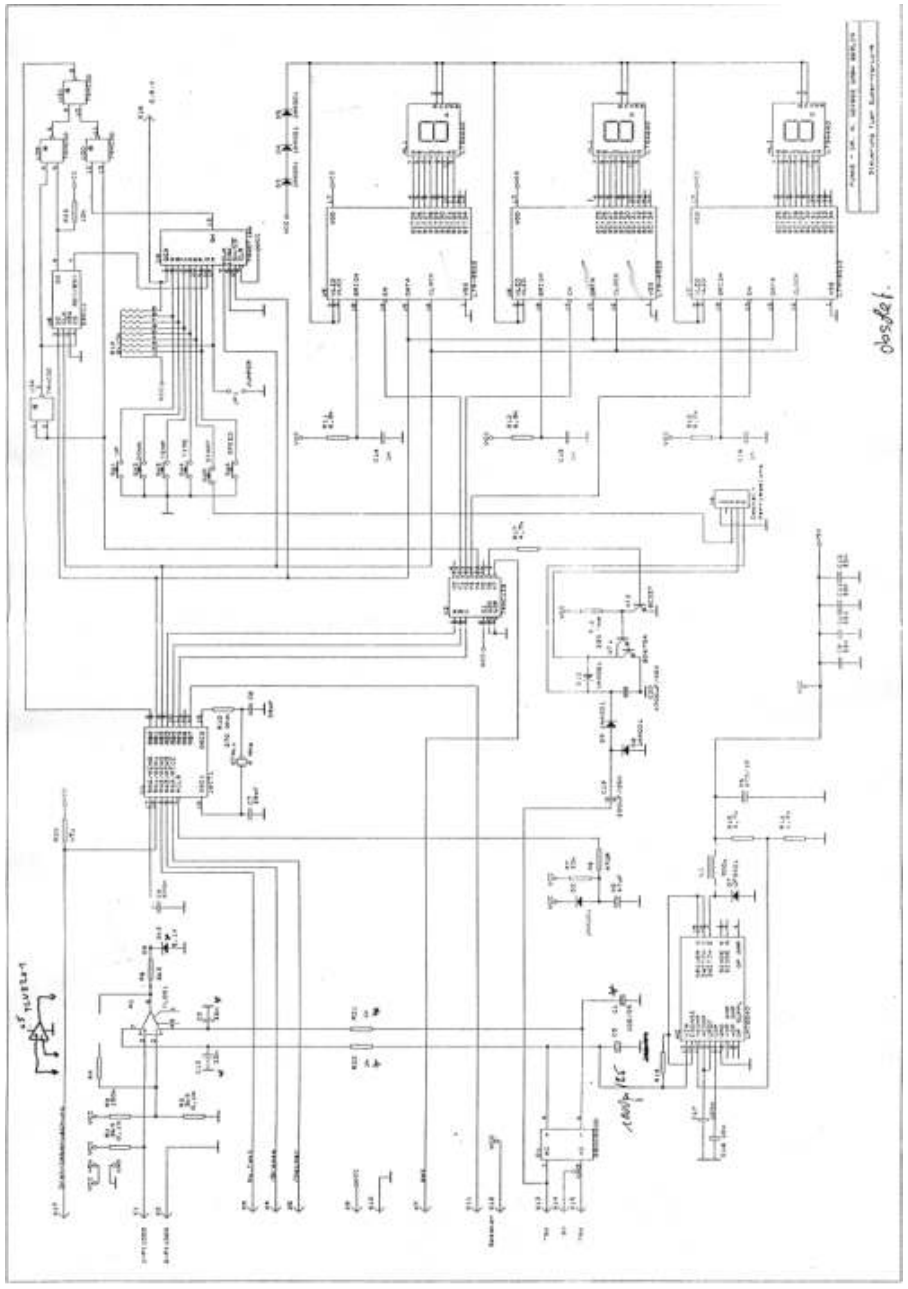
7. Ordering data

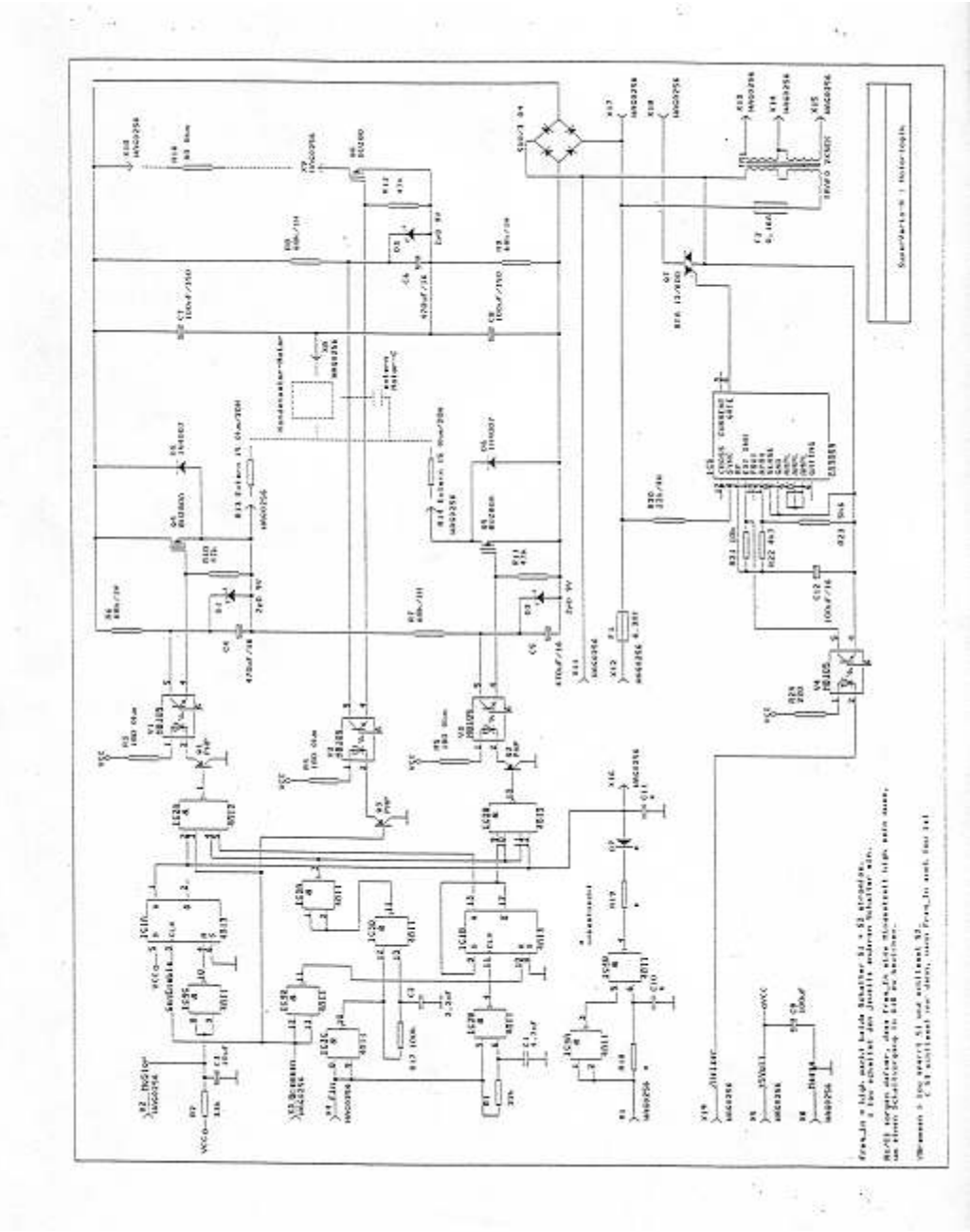
Cat.No.	Designation
3680	Centrifuge SuperVario-N
3685	Head A (up to 36 butyrometers / up to 18 Babcockbottles)
3686	Head B (protective drum for 8 Mojonnier tubes)
3687	Head C (up to 6 solubility index tubes)
3631	Bucket for butyrometer of aluminium alloy

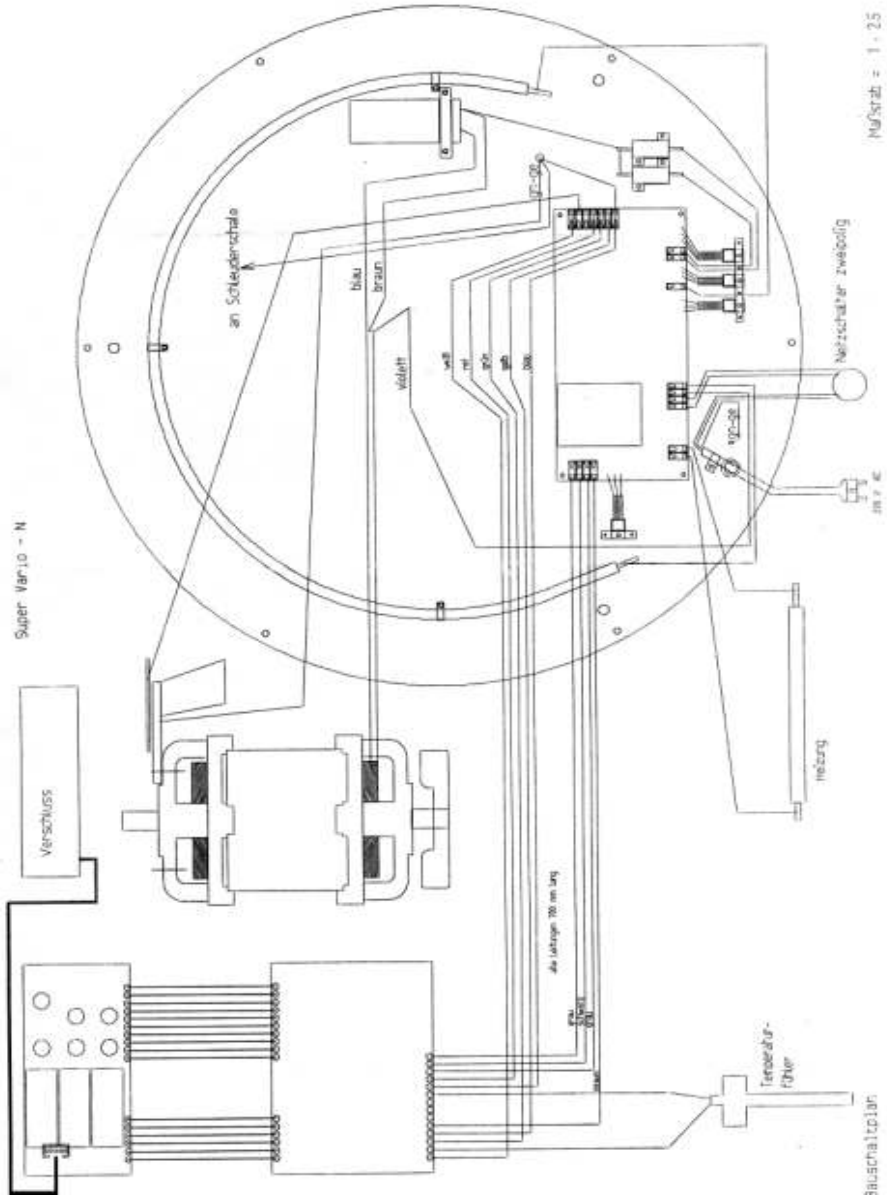
3632	Bucket for Babcock bottles
3633	Bucket for solubility index tube

8. Spare parts

Art.No.	Designation
3680-010-Dok	Users manual and reference
3680-021	Centrifuge bowl, stainless steel
3680-022	Front part
3680-023	Main control
3680-024	Motor-control
3680-025	Motor GEFEG ES 9080-4AL-RL, completed
3680-031	Lid lock
3680-032	Hinge, complete
3680-121	Handle of lid
3680-191	Lid
3680-201	Washer for head fastening
3680-241	Threaded bolt for tripod hanging
3680-242	Formed part, rubber, for tripod hanging
3680-243	Metal washer for tripod haning
3680-244	Rubber feet
3680-248	Tommy screw for fastening the head
3680-251	Cap for emergency opener
3680-254	PT100 temperature sensor
3680-257	Main switch
3680-258	Cap for main switch
3680-259	Motor capacitor 24 uF
3680-260	Clamp for motor capacitor
3680-261	Fuse 6,3 A delay action
3680-262	Fuse 160 mA medium delay action
3680-263	Foil key board







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CE

Certificate

EC-Conformity Declaration

We hereby declare that in view of its design and construction the instrument "SuperVario-N" meets the requirements of the EC rules "machines" with regard to the request of safety and health.

We declare further that all Instruments are strictly tested by our internal quality test
procedure: Each Instrument has passed the end production control.
In case of modification in use this declaration becomes invalid.

Type of Instrument:	SuperVario-N, Laboratory centrifuge
Art-No.:	3680
	Connection: 230 V/ 50Hz, 500VA
Applicable EU rules:	93/44/EWG
	72/23/EWG
	89/336/EWG
	EN 61010-1
Applicable Standards:	IDF105
	ISO 1211
	DIN 10310
	DIN 58970

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