CHRIST
Freeze Dryers

OPERATING MANUAL

Rotational-Vacuum-Concentrator

RVC 2-25

(Part No. 100225 / 100235 / 100245)

M A R T I N C H R I S T

Gefriertrocknungsanlagen GmbH

Version 01.2004

english

Operating Manual RVC 2-25

Order Number:

Serial Number:

In case of inquiries or repair please state the above numbers.

For service please contact:

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Preface

Dear customer,

congratulations for purchasing the rotational-vacuum-concentrator **RVC 2-25**.

The newly developped rotational-vacuum-concentrator **RVC 2-25** is especially designed for use as a "Personal Concentrator" during various analysis applications. The rotational-vacuum-concentrator **RVC 2-25** concentrates efficiently precipitates containing DNA/RNA, proteins and similar materials within shortest possible time. The application-oriented rotor programme provides a high sample capacity, e. g. from 108 x 1.5 ml reaction vials up to 2 carriers for 1 microtiter plate each.

The innovative drive system of the rotational-vacuum-concentrator **RVC 2-25** without any rotating parts outside the rotor chamber guarantees safe operation.

A special feature of the **RVC 2-25** is the user-friendly operation using the two-knob-control with LCD-display. All process parameters can be easily adjusted, e. g. temperature (between +30°C up to +60 °C) and time (5 minutes to 12 hours).

We thank you for your confidence and wish you a successful application of the rotational-vacuum-concentrator **RVC 2-25**.

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1 General Information

1.1 Technical Data

Manufacturer:	Martin Christ Gefriertrocknungsanlagen GmbH Postfach 17 13 D-37507 Osterode am Harz
Type:	Rotational-vacuum-concentrator RVC 2-25

Part.Nr.	100225	100235	100245
Electrical connection	230V 50/60 Hz	115V 60Hz	100V 50/60 Hz
Power consumption	0,847 kVA	kVA	kVA
Rated power	0,805 kW	kW	kW
Max. current consumption	3,5 A	A	A
Mains fuse	4 A F	A F	A F
Coldapplianceoutput Max.	0,5 A	A	A

Temperatur	+30°C up to +60°C
Speed (rpm)	1350
Relative centrifugal force (RCF)	235

Physical data:

Dimensions (without vacuum pump):	Width: 315 mm Height: 260 mm Depth: 460 mm (incl. Vacuumconnection)
Height with fully opened lid (without vacuum pump)	575 mm
Max lid opening angel	82°
Weight (without vacuum pump):	approx. 21 kg
EMC according to EN 55011:	Class B
Ambient temperature:	climateclass SN +10°C up to +32°C (higher temperatures on request)
Noise level DIN 45365	44dB(A)

Equipment connections:

Vacuum connection	Small flange connection DN16KF (ISO28403, DIN2861)
Aeration connection	Hose nozzle DN3 (outside diameter 4,5mm)

1.2 Standards and Regulations

Please refer to the enclosed EU-Statement of Conformity rotational-vacuum-concentrator **RVC 2-25**.

1.3 Supply includes

Scope of supply includes:

1 wrench SW 2,5
1 operating manual and detailed technical documentation

Scope of supply does not include:

- The initiation will be carried out on request against charging of expense.

1.4 Rotor program RVC 2-25

Standard rotors

Vessel volume	Vessel number per device	Vessel dimensions Ø x length designation / standard / features	angel of attack (reference vertical line)	maximum rotor number per device	construction	material	Part No.
0,2 ml	216 (3 rotors each 72)	Ø6 mm x 20 mm [Eppendorf]	45°	3 rotors	fixed angle-solid rotor	aluminium black anodized	110283
1 ml	48	Ø5 mm x 100 mm	30°	------	adapter receiver	aluminium black anodized	112208 [3)]
1,5 ml to 2,2 ml	108 (3 rotors each 36)	Ø10,8 mm x 38 mm Eppendorf	45°	3 rotors	fixed angle-solid rotor	aluminium black anodized	124552
2 ml approx.	108 (3 rotors each 36)	Ø12 mm x 36 mm with flat bottom	40°	3 rotors	fixed angle-solid rotor	aluminium black anodized	110369
2ml approx. 4ml	72 (3 rotors each 36) 72 (3 rotors each 36)	Ø11,6mm x 32mm with flat bottom Ø12,7mm x 46mm with flat bottom	28° 28°	2 rotors[1)]	fixed angle-solid rotor (combirotor) both vessel typs are usable simultaneous	aluminium black anodized	110507
5 ml	60 [1)] (2 rotors each 30)	Ø14,7 mm x 45 mm with flat bottom	30°	2 rotors [1)]	fixed angle-solid rotor	aluminium black anodized	110391
5ml	72 (3 rotors each 24)	Ø16,5 x 35 mm with flat bottom front side thread Ø 18mm x 6 mm	40°	2 rotors	fixed angle-solid rotor	aluminium black anodized	110392
5 ml / 7 ml	48	Ø12,5 mm x 75 mm to 85 mm	30°	1 rotor	fixed angle-disc rotor	aluminium black anodized	124562
8 ml / 10 ml	36	Ø12 mm to ∅13 mm x 100 mm to 120 mm	25°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124563
10 ml/12 ml/15 ml	24	Ø16 mm to 16,5 mm x 80 mm to 125 mm with round or conical bottom (incl. FALCON)	20°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124566
13ml	36	Ø15,2 mmx 100 mm	------	------	adapter receiver	aluminium black anodized	110516 [2)]
15ml	36 or 27	Ø18 mm x 100 mm or Ø18 mm x 120 mm	20°	1 rotor	fixed angle- disc rotor	aluminium black anodized	110515
30 ml	12	Ø24 mm x 105 mm to 120 mm Ø25 mm x 105 mm	25°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124575
50 ml	8	Ø29,5 mm to 30 mm x 115 mm to 120 mm FALCON	30°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124580

50 ml	8	Ø34,5 mm x 100 mm to 120 mm	28°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124584
100 ml	6	Ø45 mm x 100 mm to 120 mm	28°	1 rotor	fixed angle- disc rotor	aluminium black anodized	124595
microtiter plate	2	plate format max. 86,5 mm x 128,5 mm x 20,3 mm	90°	1 rotor	swing-out rotor with 2 carriers	aluminium black anodized	124600
------	------	------	------	------	Intermediate ring height: 20 mm	aluminium black anodized	110393

[1] To use two rotors, it's required to put one Intermediate ring, Part No. 110393, between the two rotors.

[2] Only in conjunction with fixed angle- disc rotor, Part No. 110515

[3] Only in conjunction with fixed angle-disc rotor, Part No. 124562

1.5 Safety Instructions

1.5.1 ATTENTION! Disconnect Mains Plug!

As current-carrying parts are accessible inside the unit, the mains plug must be disconnected before the side panels are opened. For maintenance, the unit must be switched off with the mains switch.

1.5.2 ATTENTION! Hot Surface!

This chapter only deals with the solvent resistant safety glass lid, not for the Acrylic- respectively Plexiglas lid.
The surface of the lid[1)] can reach temperatures of over +50°C.
Use the heat-insulated handle bar of the lid to open and close the lid[1)].
The lid[1)] must have room temperature for care and maintenance as well as for transport purposes of the RVC 2-25. Turn off the power switch and let the lid[1)] cool down.

[1)] Solvent resistant safety glass lid (optionally available)

1.5.3 ATTENTION! Solvents!

Acidic or products with a high solvent concentration cannot be dried without special protective measures and devices such as e. g. a cooling trap for protection of the vacuum pump (if necessary, check with our works).

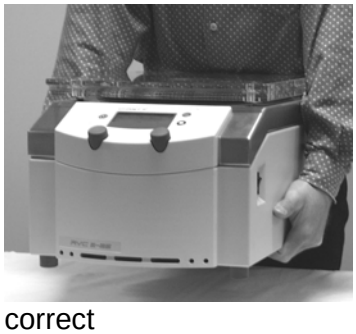
Special caution is necessary when using azides as a dangerous explosive develops with copper or nonferrous material! A check with our works is absolutely necessary!

1.5.4 NOTE! Cleaning and Care of the Unit!

For infectious, toxic, pathogene and radioactive substances the corresponding safety regulations must be considered.

1.5.5 NOTE! Transport Note!

The rotational-vacuum-concentrator may be carried by one person gripping under the unit from the sides.
Do not touch the plastics-controlboard for transportation or putting up.



correct

incorrect

1.6 Forbidden Operations

1. Operation of not carefully installed rotational-vacuum-concentrator.

2. Operation in hazardous locations

3. Do not place potential dangerous material, as e. g. glass vessels containing liquids, near the rotational-vacuum-concentrator (minimum distance 30 cm).

4. Operation without panels.

5. Operation by non authorized personnel.

6. Attention!: Do not open the lid and reach into the rotor chamber by running rotor.

7 Do not move or push the equipment by operating. Leaning and supporting is not allowed.

8. Operation with not correctly installed rotor.

9. Operation with accessories not allowed by the manufacturer, except commercial vessels of glass and synthetic materials. The use of poor commodity goods is not recommended. During operation breaking glass or bursting vessels can cause dangerous situations.

10 Operation with not specified tubes.

11 Operation with damaged and corrosive rotors

12. Operation with very corrosive substances which can cause damages to material and effect mechanical strength of lid, chamber and rotor.

13. Do not spin substances which could react upon the supply of high energy during the drying process.

14. Do not dry explosive substances.

15. Substances which could damage the material of the rotor, the chamber or the lid anyhow must not be dried or only under consideration of special safety measures. Infectious, toxic, pathogene or radioactive substances must be dried in suitable vessels only.

2 Installation and Initiation

2.1 Site

ATTENTION! In order to ensure air circulation, papers, cloths or similar things must not be placed under the unit!

The unit should be positioned on a horizontal ground. The ambient temperature should be within approx. +15°C and +25°C.

A distance of at least 30 cm to the wall should be kept. The unit should not be positioned near radiators or heat sources. Direct insolation must be avoided.

Following connections are necessary on site:

2.2 Mains Supply

The operating voltage on the name plate must correspond to the local supply voltage!

CHRIST rotational-vacuum-concentrators are units of safety class I and include a three-pole connection cable and a shockproof plug.

2.3 Fuses on Site

The rotational-vacuum-concentrator must be protected typically with 16 A G fuse.

2.4 Earth Conductor Check

For earth conductor check there is a potential equalization screw at the rear panel of the rotational-vacuum-concentrator. An earth conductor check can be carried out using an appropriate measuring instrument.

3 Initiation

3.1 Initial Start-Up

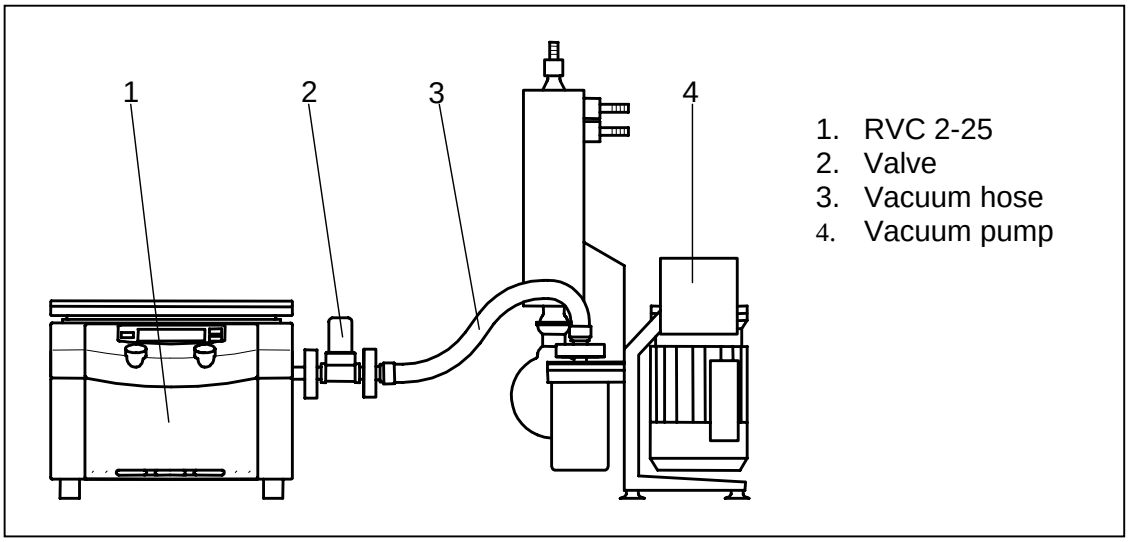
ATTENTION! Take care that the rotational-vacuum-concentrator is carefully installed (see point 2 Installation and Initiation).

3.1.1 Connection of Cooling trap and/or vacuum pump

There are different possibilities for pumping and concentration of the vapours by the rotational-vacuum-concentrator **RVC 2-25**.

Pumping the vapours by a vacuum pump, e.g. the vacuum-chemical-mebran-pump MZ 2C or MD 4C with following condensation of the vapours in a water-cooled emission condenser.

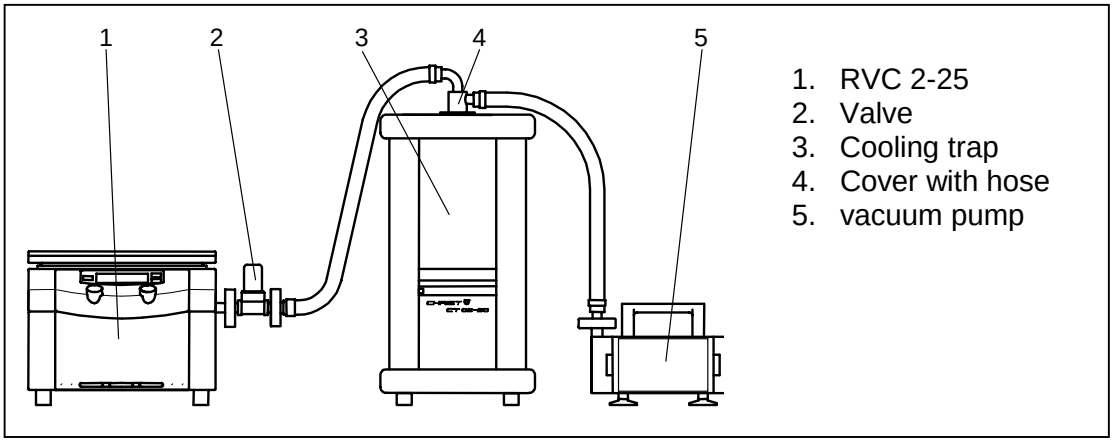
For low-boling, containing solvent samples



The Vacuum pump will be connected with the rotational-vacuum-concentrator **RVC 2-25** according to the scheme above. The connector of the valve will be pluged into the socket on the backside of the unit.

Condensation of the vapours in front of the vacuum pump with a cooling trap e.g. CT 02-50 or CT 04-50 in connection with a mounted vacuum pump.

For water-based substances and low-boling solvents



Rotational-vacuum-concentrator **RVC 2-25**, cooling trap and vacuum pump will be connected according to the scheme above. The connector of the valve will be pluged into the socket on the backside of the unit.

3.2 Operation Elements

The rotational-vacuum-concentrator **RVC 2-25** has a compact design and can easily be operated. All important data and events are indicated comprehensibly on the LC-display.

At the rear panel of the unit there are following electrical connections:

- Mains connection for connector incl. fuse rack to take 2 quick-acting fuses
- Connection for a electromagnetic stop valve.
- Central grounding point
- Optional available RS 232 or RS 485 data interface

The mains switch is at the right side panel.

On the front side there are the operation elements for starting and stopping the system, opening the lid and preselecting set value time and temperature.

3.3 Switching On of the System

After providing the system with the necessary connections, it can be switched on by operating the mains switch.

After switching on, the display indicates the test display, the version number of the control software and then the current set and actual values of the system.

During the test display, which shows all segments of the LCD-display, all keys are illuminated.

The software version is displayed as follows:

Set parameter line: set **01** h : **83** min set °C (software version 1.83)
Actual parameter line: **13** h : **12** min **99**°C (date of writing)

The set value time for automatic operation can be selected in 5-minute-steps in a range of 5 minutes to 12 hours. When turning the potentiometer for set value time to the right limit stop, the sign for infinity and a set value time "-- h : --" are displayed. With this setting the system will operate until it is stopped manually or by a stop instruction memorized via the data interface.

The set value temperature can be adjusted in 1-degree-steps in a range of +30°C to +60°C. It is immediately initiated on the display after the version number has been indicated (preparation time). After end of the process (pressing the stop button or reaching the set time) the heater will be deenergize until a startcommand follows or the lid is opened. Heating up is indicated by a heating spiral symbol on the display.

ATTENTION! The **RVC 2-25** heats the rotor chamber up to the preselected set value even if the lid is opened!

The set values may be changed during the running process. The set values are protected against undesigndly misplace by running process. The protectian can be nullified by fitful turning the Button ¼ of the whole rotation. So it is possible to change the set-valves during the runnig process. 25 Seconds later the internal protection will be activated again.

The current state of the system is indicated by further display symbols. The chamber symbol shows "lid opened resp. closed", "chamber is aerated" or "chamber is evacuated".

The rotor symbol indicates rotor movement.

The current process time and chamber temperature are displayed in the actual parameter line.

The knobs "Start", "Stop" and "Open lid" can only be operated when they are illuminated.

3.4 Starting the System

After charging the rotor chamber, the lid is pressed down until it is locked. The closed lid is indicated on the panel. The knobs "Start" and "Open lid" are illuminated. After operating the start-key, the knob "Stop" is illuminated and rotor speed increases.

At a rotor speed of 810 rpm the aeration valve closes. At 900 rpm the electromagnetic stop valve opens and the chamber is evacuated. The rotor accelerates up to 1350 rpm.

During operation the actual operation time is added up to max. 4 days (96 hours). When reaching this, the time display begins with 0 hours again.

3.5 Stopping the System

The operating system can be stopped either manually by pressing the illuminated stop-key or by reducing the set value operation time below the reached actual value. When reaching the preselected set value time, the system is stopped automatically. The reached actual value remains on the display until the system is started again or the lid is opened.

If the process is stopped, the electromagnetic stop valve is closed and then the aeration valve is opened. The chamber is aerated for 20 seconds while the rotor is running. During the aeration phase none of the operation knobs is illuminated. After a safety phase of 10 seconds the knobs "Start" and "Open lid" are illuminated.

Now the lid can be unlocked by operating the lid-key. If the lid shall not open, the lid-key can be operated again after a waiting period of 5 seconds. As soon as the lid is opened, all key indications and the actual value operation time are deleted. The pre-temperating will be activated, if a set value (> +30°C) is adjusted.

3.6 Installing and loading of rotors

The loaded rotor push up to the impact onto the rotor accommodation.

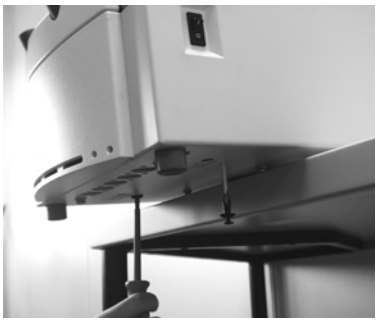
correct	incorrect
	
	
	
	

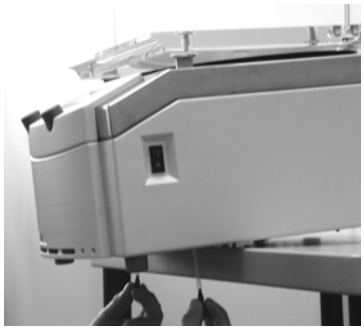
3.7 Power Failure

During operation the actual values are stored in regular intervals. If a running process is interrupted by e.g. a power failure, the rotational-vacuum-concentrator will automatically continue the process with the latest stored values. During an interruption the chamber remains separated.

3.8 Emergency Lid Release

If the unit cannot be opened via the lid-key, the so-called emergency lid release can be used. It is on the underside of the unit next to the right or to the left front casing foot.





Attention! To guarantee that the rotor has stopped and the compression compansation has concluded the Emergency Lid Release may soonest operate 10 minutes after the malfunction.

Proceeding:

1. Turn off the power switch
2. Pull off the mains-connection
3. Please wait until the rotor stops and the rotor chamber is ventilate.
4. Unscrew the two black recessed head screw.
5. Grip the stopper with a screw driver or a similar tool and remove it.
   Remark: This stopper is connected to a mechanically working release string.
6. Pull the stopper with string vertically downwards until the lid locks unlock.
7. Open the right and the left lock in this way.
8. Open lid.
9. After using the emergency lid release, assemble stopper with string in reverse order.
10. Trouble shooting, contact service department if necessary.

ATTENTION! Do not use the emergency lid release to open the lid during regular operation.

3.9 Error Messages

A malfunction is displayed on panel "set value time" in the form of "Er : XX". "XX" is the error code. If a malfunction has occured, the display changes every second between error code and set value time until the malfunction will be acknowledged.

All malfunctions are acknowledged by one of the following measures:
- Re-start (operating start-key after previous stop)
- Opening and closing the lid when the rotor is at standstill (recognition of a new process)
- Mains power is switched off and on again (Power-On-Reset)
- By means of instruction "reseterr" via the data interface

The system distinguishes the possible malfunctions according to following criterions:
Error codes 01...19: Malfunction with immediate switching-off (without aeration phase)
Error codes 20...39: Malfunction with regular switching-off (incl. aeration phase)
Error codes 40...99: Internal system error without switching-off (for display)

Error code	**Meaning and possible reason**
Er 04:	The drive is switched on and the rotor symbol is missing. *Rotor is mechanically blocked or malfunction of drive system electronics.*
Er 05	Imbalance switches is respond. *The rotor is loaded imbalanced.*
Er 07:	The rotor is in overspeed range (> 1800 rpm). *Malfunction of drive system electronics.*
Er 08:	The rotor is overloaded or stiff (after 20 seconds < 1000 rpm) *The rotor bearings are worn out, the rotor is mechanically braked or malfunction of drive system electronics.*
Er 21:	The actual value temperature is >67°C and heating is switched off. *Malfunction of heating control system.*
Er 41:	The latest stored actual values are incomplete or unserviceable. *Malfunction of data memory.*
Er 42:	The current actual values could not be stored. *Malfunction of data memory.*
Er 45:	The operation keys cannot be recognized. *Malfunction of keys controller.*
Er 61:	The desired set value temperature has not been reached. *Heating capacity is insufficient. Malfunction of set value temperature acquisition respectively excess temperature switching-off.*

3.10 Error Correction

Error	Measure
Unit cannot be started	
1. Power failure	Mains plug connected?
	Check fuses and replace if necessary
2. Lid is not closed	Lid locks must lock on the left and on the right side
3. Microswitch defective	Call service (see page 2)
No indication on the display	
	Mains plug connected?
	Check fuses and replace if necessary
No heating	
1 End of the process is reached	Open the lid and start the appliance again
2. Safety switch or electronics defective	Call service (see page 2)
3. Heating collar defective	Call service (see page 2)
Set value temperature exceeded	
1. External heat irradiation	Position unit differently
2. Heating control system defective	Call service (see page 2)
Vacuum is not reached	
1. Incorrect position of the eccentric rings of the small flange connections (connection vacuum pump – cooling trap - vacuum hose – RVC 2-25)	Open small flange connections, center the eccentric rings exactly, use vacuum grease if necessary
2. Lid gasket not tight	Clean, grease with vacuum grease if necessary, if gasket is defevtive call service
3. Aeration valve defective (not closing)	Call service (see page 2), seal the connection piece of the aeration valve manually with e.g. a rubber stopper
Lid cannot be opened	
1. Power failure	Mains plug connected?
	Check fuses and replace if necessary
2. Lid is sticking	Operate emergency lid release, trouble shooting, call service if necessary
3. Microswitch or electronics defective	Call service (see page 2)

4 Operation with Data Interface

Optionally, a data interface can be integrated in the rotational-vacuum-concentrator **RVC 2-25**. This offers a wide spectrum of possibilities for operation of the unit and for visual representation of the running process.

Manual operation of the unit and operation via the data interface are carried out with equality of access.

4.1 Terminal Program

The easiest possibility of communication is using a usual commercial terminal program. Transmission is carried out in the ASCII-format. The transmission parameters are 9600 baud, 8 bit, 1 stop bit and no parity bit.

Following commands are supported:

Command	**Parameter**	**Meaning**	**Response**
vers	none	display of version	RVC 2-25 Rev:1.83, 13.12.1999
start	none	start RVC	none
stop	none	stop RVC	none
door	none	open lid	none
status2	none	current device status part 1 *bit 0:error occured (=1)* *bit 1:RVC switched on/off (=1/=0)* *bit 2:lid opened/closed (=1/=0)* *bit 3:heating on/off (=1/=0)* *bit 4:electromagnetic stop valve on/off (=1/=0)* *bit 5:aeration valve on/off (=1/=0)* *bit 6:irrelevant* *bit 7:manual/remote control (=1/=0)*	device status in hex-format
status3	none	current device status part 2 *bit 0:continuous operation on/off* *bit 1:Heating closed (inactive) chosen/not chosen (=1/=0)* *Bit 7:Prozess ended (=1)* *Bit 2-6: not used*	device status in hex-format
reset	none	carry out system reset	none
reseterr	none	delete occured error	none
cmderr	none	discover command error	00 = command understood 01 = command incorrect
syserror	none	indicate error code	00 = no error existing 01-99 = error code
temp	none	indicate actual value temperature in °C	XX (°C)

IN_PV_2	none	indicate actual value temperature in °C	XX (°C)
time	none	indicate actual value time in minutes	XXXXXX (minutes)
IN_PV_3	none	indicate actual value time in minutes	XXXXXX (minutes)
speed	none	indicate actual value speed in rpm	XXXXXX (rpm)
IN_PV_1	none	indicate actual value speed in rpm	XXXXXX (rpm)
settemp	30 – 60	enter set value temperature	none
OUT_SP_2	30 – 60	enter set value temperature	none
settime	5 – 730	enter set value time in minutes	none
OUT_SP_3	5 – 730	enter set value time in minutes *times of more than 725 minutes initiate continuous operation*	none
getsettemp	none	indicate set value temperature in °C	XX (°C)
IN_SP_2	none	indicate set value temperature in °C	XX (°C)
getsettime	none	indicate set value time in minutes	XXXXXX (minutes)
IN_SP_3	none	indicate set value time in minutes	XXXXXX (minutes)

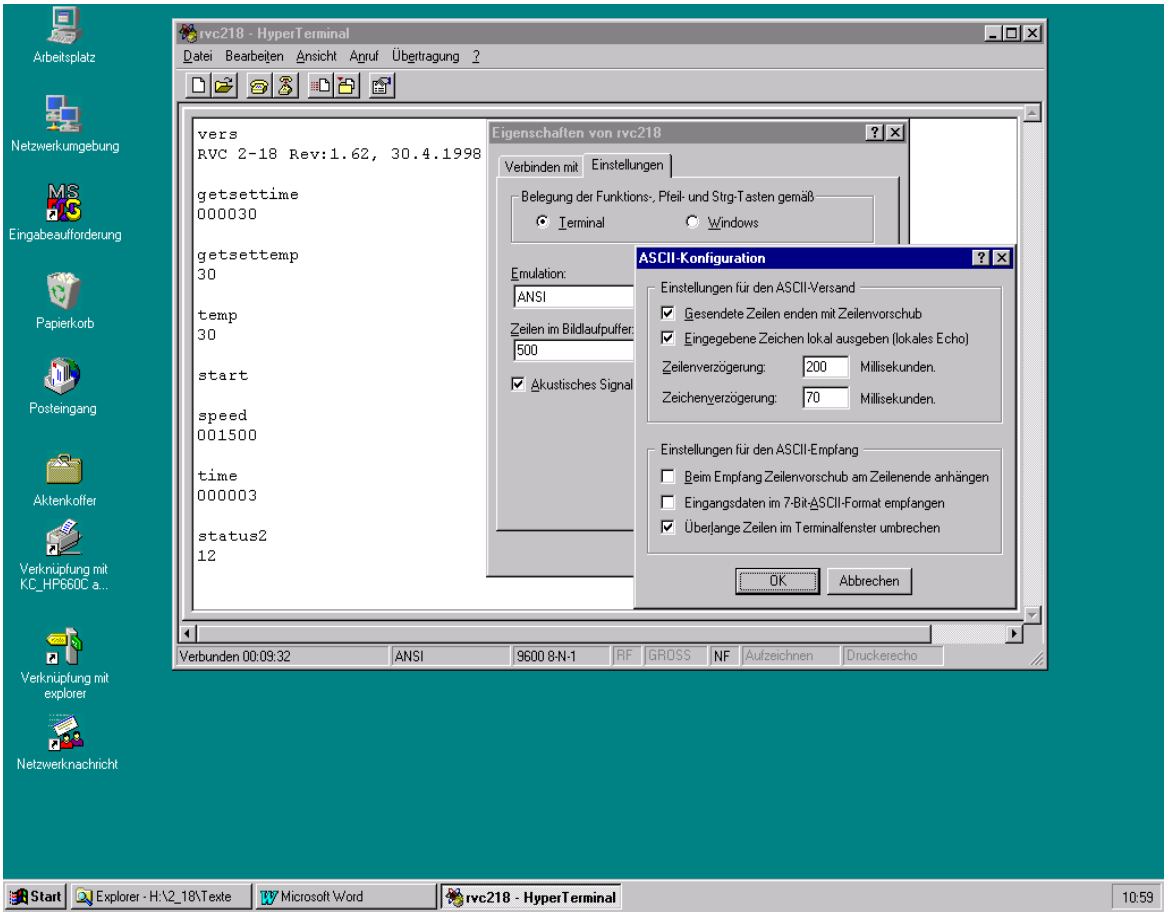


Fig. 1: [RVC 2-18] Example of a configuration and remote control with commands via hyperterminal under Windows NT 4.0

4.2 Labworldsoft

Another possibility is communication with the PC-program Labworldsoft by company Labworld-Online GmbH, Neumagenstraße 27, D-79219 Staufen.

If the rotational-vacuum-concentrator **RVC 2-25** is operated by Labworldsoft, operation via the unit is subordinate.

Labworldsoft is for operating systems Windows 3.x / 95 and communicates with laboratory units of different manufacturers. It offers the possibility to exchange, visualize, store and document the data of these units. A detailed functional description about Labworldsoft can be find in the relevant software documentation of company Labworld-Online GmbH.

For the rotational-vacuum-concentrator **RVC 2-25** it must be considered that a minumum scanning rate of 50 milliseconds per measured value is kept.

The following examples will explain the working with Labworldsoft and the rotational-vacuum-concentrator **RVC 2-25**.

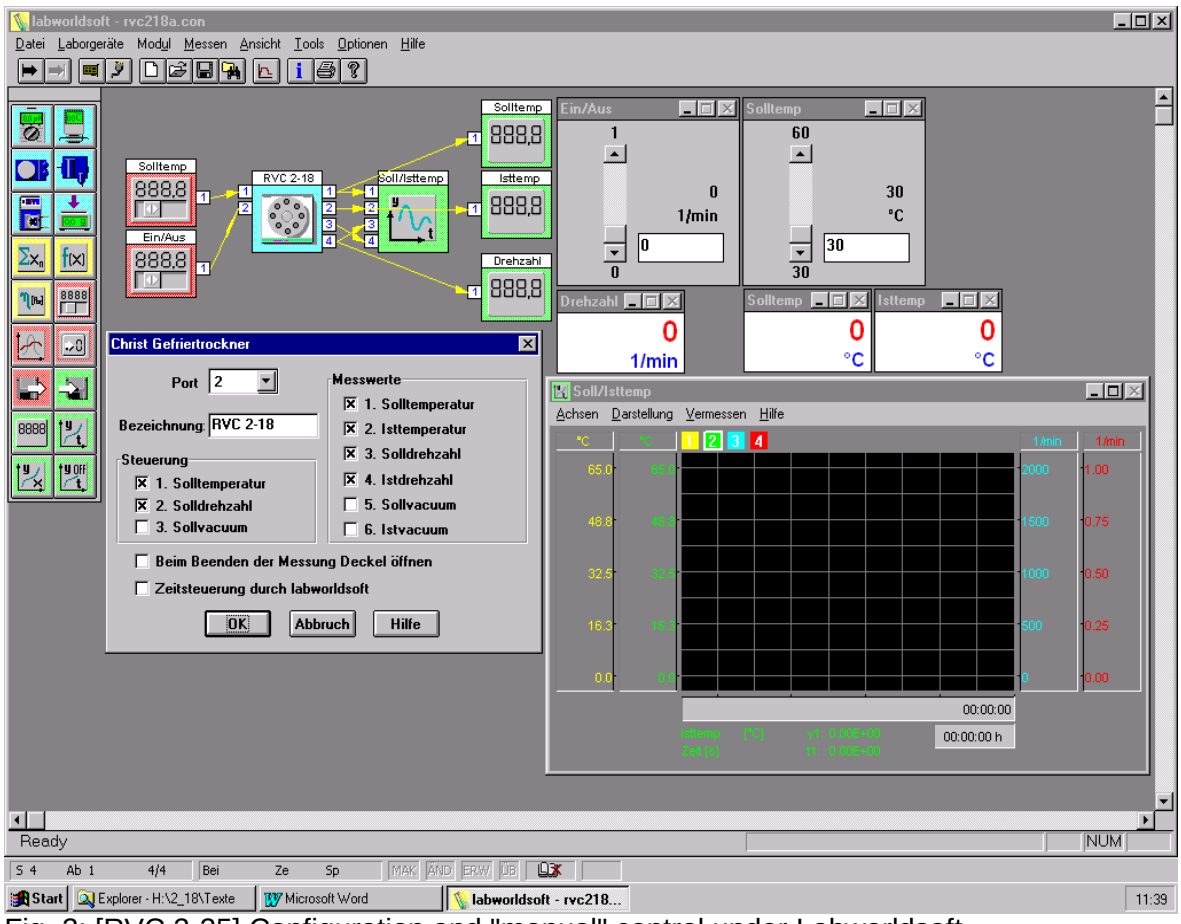


Fig. 2: [RVC 2-25] Configuration and "manual" control under Labworldsoft

The rotational-vacuum-concentrator **RVC 2-25** is to be find under "Christ Freeze Dryers" in menu "Laboratory Units".

Fig. 2 shows a typical configuration. The set value temperature can be adjusted within the specified range. The set value speed can be used for switching on/off with the parameters 0 and 1 and is therefore identical with the terminal commands "start" and "stop".

All processed data (set and actual values) can be marked as measured values for further processing. Vacuum parameters are not processed by the rotational-vacuum-concentrator **RVC 2-25**.

The RVC inputs shown on fig. 2 are supplied by the slider controls "set value temperature" and "on/off" for control of the unit. The configured measured values are shown as four output signals on the X/Y-recorder and on the digital instruments. The rotational-vacuum-concentrator **RVC 2-25** processes the set and actual values as integers.

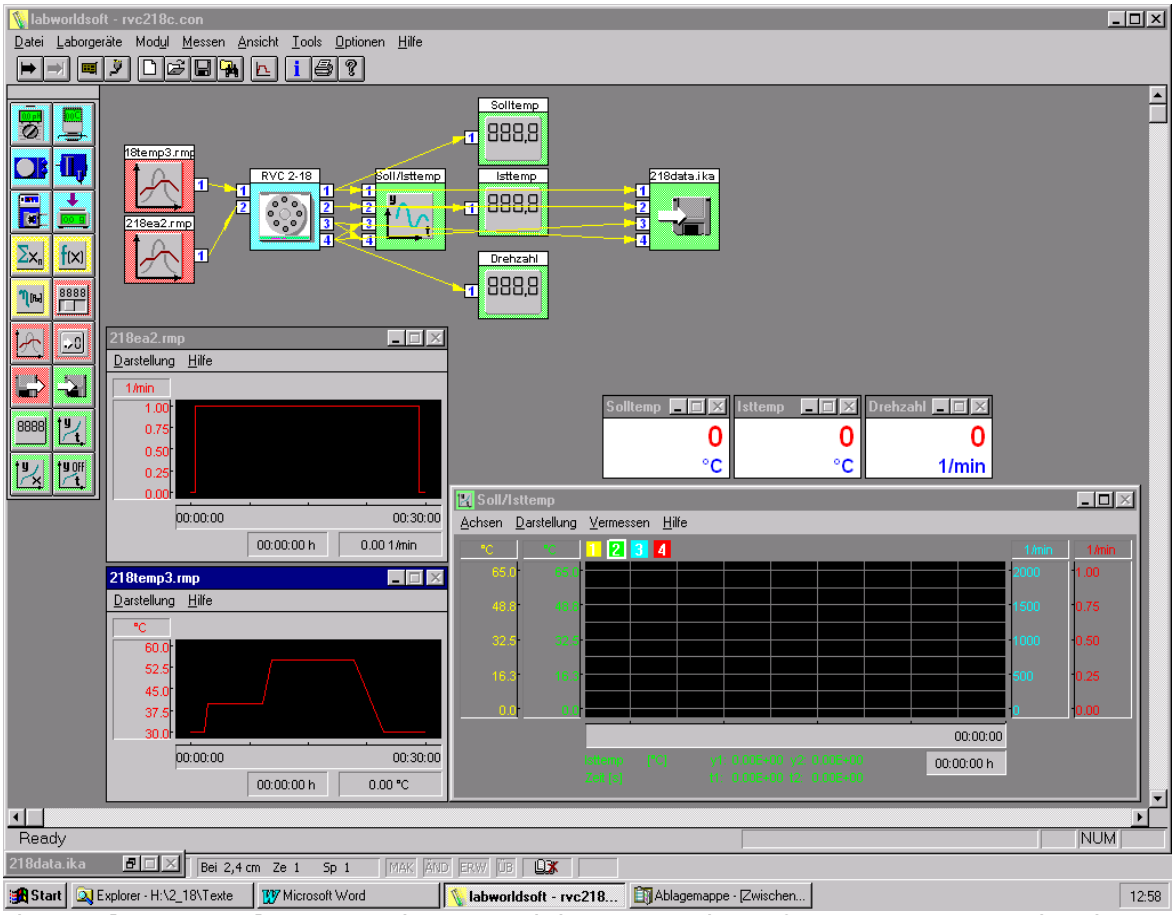


Fig. 3: [RVC 2-18] "Automatic" control by pre-setting of ramps. Measured value storage.

In fig. 3 the experimental setting of fig. 2 is slightly changed. The slider controls for pre-setting of set values are replaced by so-called ramp functions. The ramps made by drag and drop facilitate automatic process run. They control the switching-on/off and the processing of temperature profiles of the rotational-vacuum-concentrator **RVC 2-25**. The current measured values are additionally logged in a data file (in this example "218data.ika").

As fig. 4 will show, a stored data file can be shown in offline operation again and processed in real-time, if desired.

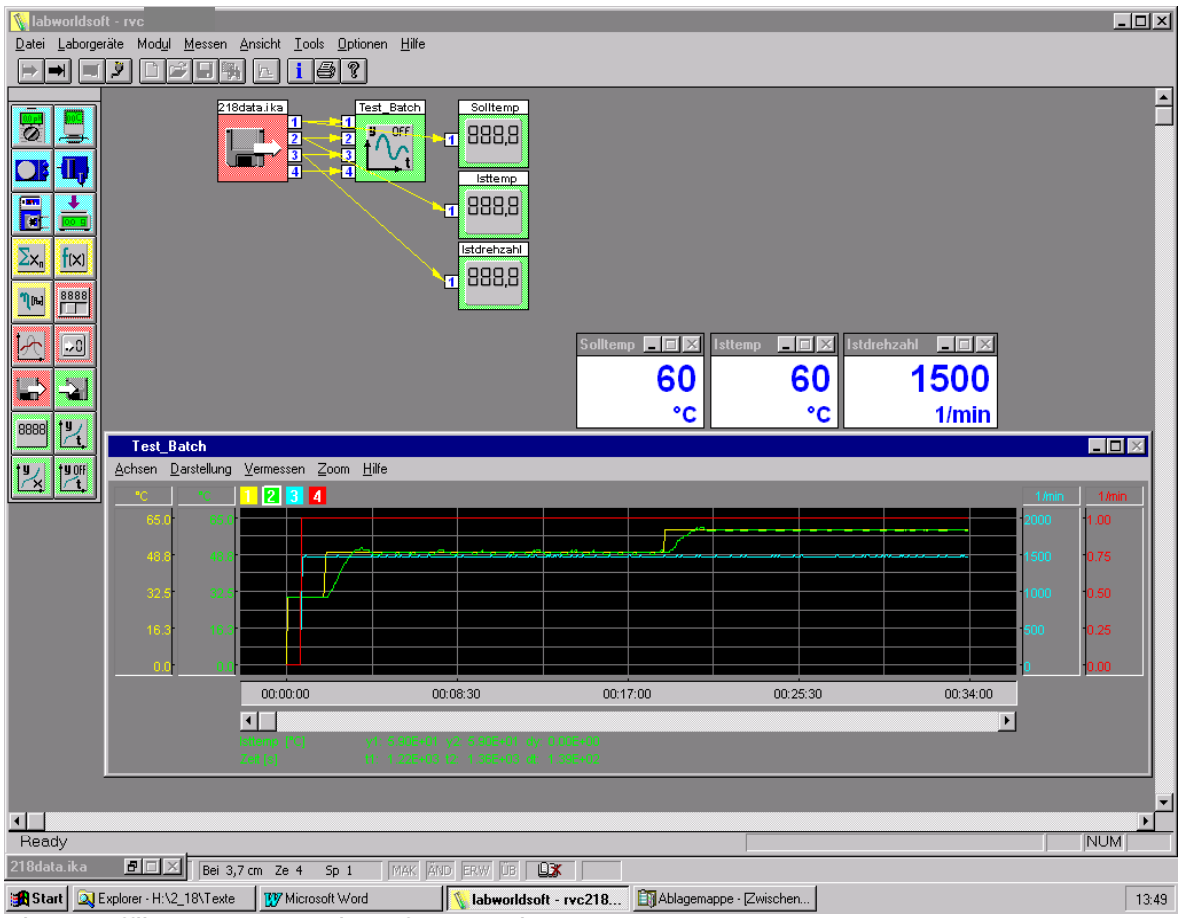


Fig. 4: Offline representation of a stored process run.

5 Care and Maintenance

Use soap water or other water-soluble, mild agents for cleaning of the rotational-vacuum-concentrator. Avoid corrosive and aggressive substances. Do not use alkaline solutions or solvents or agents with abrasive particles. Remove product residues from the chamber using a cloth. It is recommended to open the lid when the rotational-vacuum-concentrator is not in use so that moisture can evaporate. **If there is the risk of toxic, radioactive or pathogene contamination, special safety measures must be considered and kept.**

For care of accessories special safety measures must be considered as these are measures ensuring operational reliability at the same time.

Chemical reactions as well as stress-corrosion (combination of changing pressure and chemical reaction) can affect or destroy the structure of the metals and the synthetic parts. Hardly detectable cracks on the surface expand and weaken the material without visible signs. When detecting a visible damage of the surface, a crack, a mark or any other change, also corrosion, the part (rotor, etc.) must be replaced immediately.

In order to avoid damages, lid, lid gasket, rotor chamber and rotor must be cleaned regularly.

Cleaning of accessories should be carried out external to the rotational-vacuum-concentrator once a week or preferably after every use. **If there is the risk of toxic, radioactive or pathogene contamination, special safety measures must be considered and kept.**

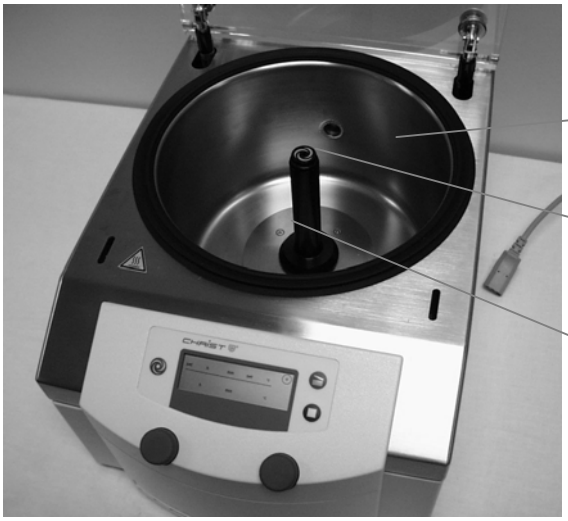
Especially aluminium parts are extremely corrosive. A neutral agent with a pH-value between 6 and 8 should be used for such parts. Alkaline agents (pH > 8) must be avoided. Thus life time is increased and corrosion is reduced.

Careful maintenance through the user increases life time and avoids premature failure of accessories. Damages caused by insufficient care do not constitute a warranty claim.

All usual disinfectants like e. g. Meliseoptol, Sagrotan, Buraton or Terralin can be used. Attantion! Prove the compatibleness of the Lid, see also in the appendix : Chemical Behavior ®PLEXIGLAS
The rotational-vacuum-concentrator and the accessories consist of different materials. A possible imcompatibility must be considered. For autoclaving the temperature stability of the individual material must be checked. Please contact us regarding proper methods to use. **If dangerous materials are used, the rotational-vacuum-concentrator and the accessories must be disinfected.**

5.1 Cleaning the rotor chamber

By soilings or after tubes-fracture the rotor chamber and the drive shaft must be cleaned immediately to avoid corrosion and ball bearing detriments.
Strategy:



1. Open lid.
2. Turn off the power switch. Disconnect mains-cable.

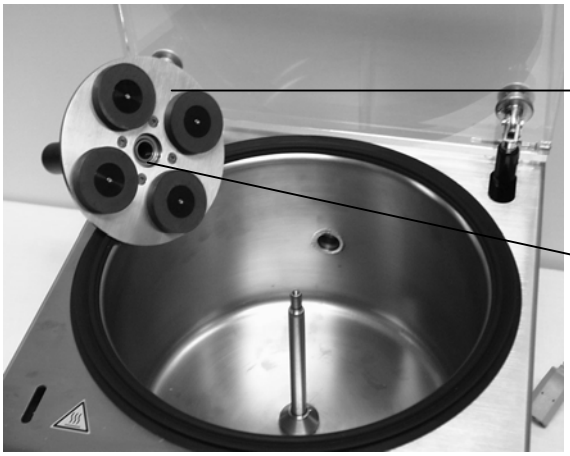
Attention! Hot surface. Cool down the rotor chamber.

3. Grip the drive shaft and pull off the cap with a rotational movement.
4. Remove the socket head screw with the hexagon socket screw key (size 2,5mm).

5. Take of thrust piece inclusive compression spring vertically upward from the axle.

6. Take the drive shaft vertically from the axle.

7. Now the rotor chamber can be cleaned with cleaning agent or disinfectant.



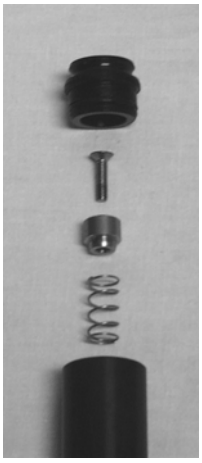
8. Cleaning the rotor storage inclusive the magnet-coupling.
   Attention! It may not arrive cleaning agent or disinfectant into the ball bearings of the drive shaft. The ball bearing grease could be washed out. This can lead to irreperable errors.

9. Clean thrust piece, compression spring and socket head screw.

10. Clean the cap and coat the O-ring of the cap thinly with vacuum grease.

11. Cleaning the lid with disinfectant or cleaning agent.
    Attention ®PLEXIGLAS-lid (Acryl; PMMA)**!** Check the material compatibility of the lid in opposite to the assigned cleaning agent in a small place outside of the normal range of vision.

12. Push the drive shaft onto the axle.



cap

socket head screw

thrust piece

compression spring

drive shaft

13. Move the thrust piece inclusive compression spring on the axle and bolt on with the socket head screw.

14. Push cap fully onto the drive shaft.

15. Connect power and switch on the device with the power switch.

16. Execute test run.
    Remark: Shuold the device not achieve the necessary number of revolutions, the distance between magnetic clutch rotor chamber bottom could be too large. (Best value: 2,4 ± 0,3mm). In this case you press the drive shaft downward, as described in no. 12.

6 Checks by Operator

The operator has to pay attention that important parts of the rotational-vacuum-concentrator necessary for safety are not damaged.

This especially refers to:

1. Lid and lid locks
2. Seals
3. Vacuum pump
4. Accessories, especially changes of structure like corrosion, cracks, material abrasion etc.

Furthermore, the earth conductor check must be carried out regularly.

M A R T I N C H R I S T

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Initial Operating Instruction RVC 2-25

1. Switch on the system approx. 30 minutes before starting the evaporation process (mains switch of the RVC 2-25 at the right side, switch on the cooling trap and/or the vacuum pump)
   Close lid manually, select set value temperature (right setting knob).
   Attention: Do not operate the system without this preparation time, otherwise the vacuum pump could be damaged.

2. Open lid with the lid-key (yellow), place the rotors onto the shaft (e.g. 3 rotors for Ebbendorf-tubes Vol. = 2 ml, max 36 tubes each rotor).

3. Close lid manually (Start-knob lights green, knop “open light” lights yellow).

4. Select set value operation time with the left setting knob. Possible time selections:
   a.) Selection of operating time from 5 minutes up to 12 hours in steps of 5 minutes.
   b.) Continious operating with manual stop: turn the setting knob to the right, exeeding the 12 hours position.

5. Activate the automatic evaporation process by pressing the start-knop (green); rotor speed increases up to 810 rpm -> aeration valve closes automatically (therefore bumping and foaming of the material is avoided) -> at 900 rpm the electromagnetic stop valve opens the connection to the vacuum pump -> further increase of the rotor speed until 1350 rpm.

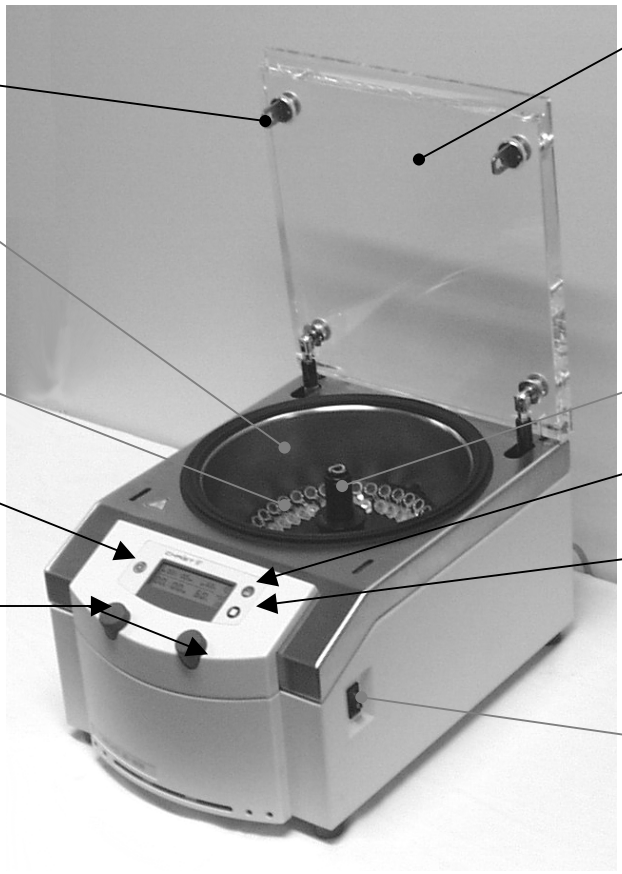
6. During operation the stop knob (red) only can be activated. Therefore it is possible to stop the evaporation process either in case of a time-programmed run or a according to manual operation. Automatic steps of process end; no illumination of operating knobs, electromagnetic stop valve closes connection to the vacuum pump -> aeration valve opens, rotor speed 1350 rpm remains for approx. 20 seconds (aeration phase, avoiding bumping and faoming of the material) -> rotor electromagnetically decelerates to a complete stop -> after a safety phase of approx. 10 seconds the knob “open lid” (yellow) and the start knob (green) are illuminated.

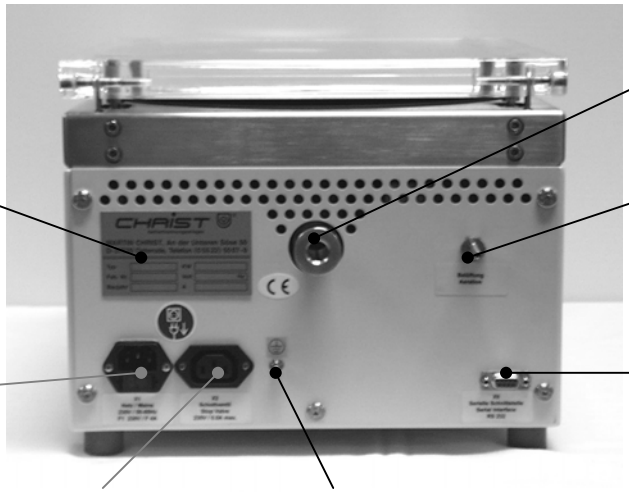
7. Deactivate the lid lid lock device by pressing the knob “open lid” (yellow)

8. Unload rotors.

9. Next evaploration process possible.
   Remarks for power failture safety: the RVC 2-25 stores actual process parameters on a cyclic basis every 5 minutes. In case of power failture the electromagnetical stop valve closes automatically, rotor chamber will be ventilated by the Ventilation valve. After restart of the power supply the evaporation process continues with the last stored parameters.

Functions- and control elements





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Chemical Behaviour

PLEXIGLAS® GS
PLEXIGLAS® XT

The stated behaviour was established for the grades PLEXIGLAS GS 215, 218, 221, 222, 224, 231, 233, 240, 245 and 2458 as well as for PLEXIGLAS XT. The extruded materials are, however, attacked more easily by solvents.

For greater chemical resistance, grade PLEXIGLAS GS 209 is recommended.

The data given refer to a test temperature of 23 °C and presuppose stress-free installation.

The behaviour of the material in practice depends largely on the temperature in use. In case of doubt, we advise you to consult us as to the chemical resistance for particular applications.

The results obtained for all products, especially the branded ones, refer to the production batch tested in each case.

Paints, etc.
o Acrylic paints and lacquers
+ Non-aromatic benzines
- Nitrocellulose lacquers
+ Oil paint, pure
- Thinners in general

Antistatics
+ HB 155
+ Antistatic fluid and cleaning agent

Technical baths
+ Electroplating baths
+ Photochemical baths

Building materials and protectives
- Bitumen emulsion
+ Cement
+ Gypsum
o Hot bitumen
+ Mortar
+ Red lead

Chemicals, solvents, etc.
a) General
- Acetic acid, concentrated
o Acetic acid, up to 25%
- Acetone

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+ Alum
+ Aluminium chloride
+ Aluminium oxalate
+ Aluminium sulphate
- Ammonia water
+ Ammonium sulphate
- Amyl acetate
- Aniline
+ Arsenic
+ Arsenic acid
+ Battery acid
- Benzaldehyde
- Benzene
+ Benzine, pure
- Bromine
- 1-Butanol
- Butyl lactate
+ Butyric acid, up to 5%
+ Calcium chloride
+ Calcium hypochlorite
- Carbon disulphide
- Carbon tetrachloride
- Chlorinated hydrocarbons
- Chlorine, liquid
o Chlorine water
- Chloroethyl ether
- Chlorophenol
o Chromic acid
+ Citric acid, up to 20%
+ Copper sulphate
- Cresol
+ Cyclohexane
- Diacetone alcohol
o Diamyl phthalate
- Dibutyl phthalate
+ Diethylene glycol
- Dioxane
- Ether
- Ethyl acetate
- Ethanol, concentrated
o Ethanol, up to 30%
- Ethyl bromide
- Ethyl butyrate
- Ethylene bromide
+ Ferric chloride
+ Ferrous chloride
+ Ferrous sulphate
+ Formic acid, up to 2%
o Formic acid, up to 40%
+ Glycerol
+ Glycol
+ Heptane
+ Hexane
+ Hydrochloric acid
+ Hydrofluoric acid, up to 20%
+ Hydrogen peroxide, up to 30%
+ Iodine, metallic

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+ Lactic acid, up to 20%
+ Magnesium chloride
+ Magnesium sulphate
+ Manganese sulphate
+ Mercury
- Methanol, concentrated
o Methanol, up to 30%
- Methyl ethyl ketone
- Methylated spirits
+ Milk of lime
+ Monobromonaphthalene
+ Nickel sulphate
+ Nitric acid, up to 40%
- Nitric acid, over 40%
+ Oxalic acid
- Perchloroethylene
+ Petroleum
+ Petroleum ether
- Phenols
+ Phosphoric acid, up to 50%
- Phosphorus trichloride
- Phosphorus, white
+ Picric acid, 1% in water
+ Potassium bichromate
+ Potassium carbonate
+ Potassium chloride
+ Potassium cyanide
+ Potassium hydroxide solution
+ Potassium nitrate
+ Potassium permanganate
o 2-Propanol
+ Propylene
- Pyridine
- Silicon tetrachloride
+ Silver nitrate
+ Soap solution
+ Soda
+ Sodium bisulphite
+ Sodium carbonate
+ Sodium chlorate
+ Sodium chloride
+ Sodium hydroxide solution, 30%
+ Sodium hypochlorite
+ Sodium sulphate
+ Sodium sulphide
+ Stannous chloride
+ Stearic acid
+ Sulphur
- Sulphur dioxide, liquid
+ Sulphuric acid, up to 30%
o Sulphurous acid, conc.
+ Sulphurous acid, up to 5%
+ Sulphuryl chloride
+ Tartaric acid, up to 50%
- Thionyl chloride
- Toluene
+ Triethylamine

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- Trichloroacetic acid
+ Turpentine
+ Turpentine substitute
+ Urea, up to 20%
- Xylene
+ Zinc sulphate, aqueous
+ Zinc sulphate, solid

b) Branded products
+ CLOPHEN® T 55, A 60
o DEKALIN®
o FRIGEN® A 12 (CF_2Cl_2)
- GLYBAL® A
+ PALATINOL® K
o PALATINOL® 0, BB new
+ SANGAJOL®
+ TERAPIN®
- TETRALIN®

Disinfectants
a) General
- Carbolic acid
+ Chlor. lime paste
+ Hydrogen peroxide, up to 40%
o Hydrogen peroxide, over 40%
- Iodine tincture, 5%
+ Lugol solution
- Methylated spirits
+ Sublimate

b) Branded products
o ÄTHROL® up to 5%
- BAKTOLAN®, conc.
+ BAKTOLAN®, up to 5%
+ CHINOSOL®, up to 1%
+ CHLORAMIN®, solution
- CHLORAMIN®, suspension
+ ELMOCID GAMMA®, up to 2%
- LYSOFORM®
+ MEFAROL®, up to 1%
+ MERCKOJOD®, up to 1%
+ MERFEN®
+ PERHYDROL®
+ PERODIN®
+ SAGROTAN®, up to 2%
o SAGROTAN®, up to 5%
o VALVANOL®, up to 2%
+ ZEPHIROL®, up to 5%

Fertilisers
+ NITROPHOSKA®, various grades

Fats, oils, waxes
+ Animal
+ Mineral
o Silicone oil
+ Vegetable

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Gases and vapours
+ Ammonia
o Bromine vapours, dry
+ Carbon dioxide
+ Carbon monoxide
+ Citygas
o Chlorine vapours, dry
+ Exhaust gases containing HCl
+ Exhaust gases containing HF
+ Exhaust gases containing H_2SO_4
+ Hydrogen sulphide
+ Methane
+ Nitrogen dioxide
+ Nitrogen monoxide
+ Oxygen
+ Ozone
+ Sulphur dioxide, dry

Beverages, etc.
+ Beer, wine
+ Camomile extract
+ Chocolate
+ Fruit juice, milk, coffee
o Spirits, up to 30%
+ Vinegar
+ Water, mineral water

Adhesives and sealants
- Acrylate sealing compound
o All-purpose adhesive
+ Insulating tape
o PATTEX® special-purpose glue
+ PERBUNAN®
o PLEXISOL® adhesive
o PLEXIT®
+ PLEXTOL® adhesive
- Polyurethane sealing compound
+ Sealing strips (EGO-FERM®, TEROSTAT® 81/86)
o Silicone
- Thiokol rubber (one-and-two component)

Cosmetics, etc.
- Camphor
+ DIPLONA® hair oil
+ Face tonic
+ Glycerine
+ Hair setting lotion (PRIMAWELL®)
- Nail varnishes
- Nail varnish removers
+ Ointments
+ Peat water
+ POLYCOLOR®
+ Seawater
+ Soaps
o Sprays

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Plastics
+ Foam plastics
- Foam plastics, plasticised
+ Polyamide
+ Polyethylene
+ PVC
- PVC, plasticised
+ Rubber
- Rubber, plasticised

Foods and spices
+ Aniseed, bay leaf, nutmeg
- Cloves
+ Common salt
+ Honey, pure
+ Ice cream
+ Meat, fish
+ Pepper, cinnamon, onions
+ Pickles

Cleaning agents
a) General
Acids, see under chemicals
- Alcohol, concentrated
o Alcohol, up to 30%
Alkalis, see under chemicals
+ Ammonia solution
- Benzine, mixture, containing aromatics
+ Benzine, non-aromatic
+ Bleach
- Carbon tetrachloride
- Methylated spirits
- Perchloroethylene
+ Petroleum
+ Petroleum ether
+ Soap solution
+ Soda water
- Stain remover
- Trichloroethylene
+ Turpentine
+ Turpentine substitute

b) Branded products
+ AJAX®
+ ANTISTATISCHER KUNSTSTOFFREINIGER UND PFLEGER
+ BFK® cleanser
o BOLIMENT®
+ BÖTTCHERIN®
+ BURMAT®
+ BURNUS®
+ CILLIT-GRÜN®
+ DOR®
+ DOSYL®
+ DOSYLAN®
+ FAKO® Polish
+ FAKO® Polishing Paste
+ FEWA®

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+ FRAPPIN®
+ FÜLLBOX®
+ LAVAPLEX®
+ NULL-NULL®
+ PERSIL®
+ PLEXIKLAR®
+ PRIL®
+ REI®
+ SEIFIX®
- SIDOLIN®
- SPECTROL®
+ SPÜLI®
+ WC-00®

c) Cleaning agents for pipes and tanks
+ CALGONIT® D, DA, S
+ NEOMOSCAN® M, M powder
+ Niroklar GR liquid
+ Niroklar GR powder
+ P3
o P3 basic cleaner
+ P 3-dix

Pesticides
- Sprays (applied directly)
o Sprays (applied in the air)
o Pesticides in aqueous solutions
+ NEXION® stable spray
+ RABOND® stable spray

Protective coatings (strippable)
+ DIEGEL® liquid film 23922
+ KOPPERSCHMIDT® covering paste
o SPRAYLAT

Other substances
+ Urine
- Fuel for petrol engines
o Fuel for diesel engines

The symbols signify:

+ = resistant
o = conditionally resistant
– = not resistant

Note:
The commercial products mentioned in columns b), and especially those marked ®, have been tested on our products just once.
Different results may be obtained if manufacturers change their formulations.

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Our technical advice on the uses of our materials is given without obligation. The buyer is responsible for the application and processing of our products and is also liable for observing any third-party rights. Technical data concerning our products are typical values. Subject to alteration.

® = registered trademark

PLEXIGLAS = registered trademark of Röhm GmbH, Darmstadt

Important notice
This is an international English-language information prepared for several markets.
It is essential that the selection of particular materials and their methods of use conform with the requirements of national and local Building Regulations.
The availability of any particular product should be checked with your supplier.

Material Safety Data Sheet according to 91/155/EEC - ISO 11014-1

Incidur

1. Identification of the product and of the company

Identification of the product:

Incidur

disinfectant for inventary of op-tracts
Medical Devices CE 0297 class IIa

Company/undertaking identification:
Ecolab Deutschland GmbH, Postfach 130406,
40554 Düsseldorf, Tel.: 0211/9893-0

The Henkel information service also provides an around-the-clock telephone service on telephone No. ++49-(0)211/797-3350 for exceptional cases.

2. Composition/information on ingredients

Declaration according recommendation 89/542/EEC:
5 - 15 %: anionic surfactants,
below 5 %: nonionic surfactants,

Further ingredients: Antimicrobical agents, cleaning booster, complexing agent, dyestuff, purfum

Declaration of ingredients:

8,8%	Glyoxal	
	Symbol:	Xn
	R-Phrases:	20-36/38-40-43
4,5%	Glutaraldehyd	
	Symbol:	T/N
	R-Phrases:	23/25-34-42/43-50
1 - 5%	nonionic surfactant	
	Symbol:	Xn
	R-Phrases:	22-36
5 -15%	anionic surfactant	
	Symbol:	Xi
	R-Phrases:	36/38

3. Hazards identification of the product

Xn Harmful
R 20/22: Harmful by inhalation and if swallowed
R 37/38: Irritating to respiratory system and skin
R 40: Possible risks of irreversible effects
R 41: Risk of serious damage to eyes
R 42/43: May cause sensitization by inhalation and skin contact

Please, pay attention to:
In Germany this product is subject to the Pharmaceutical Directive (Arzneimittelgesetz), and to the Medical devices Directive (Medizinproduktegesetz), see chapter 15 "National regulations".

4. First aid measures

after inhalation:
Fresh air, consult doctor if complaint persist.

after skin contact:
Rinse with running water and soap. Skin care. Remove contaminated clothes.

after eye contact:
Immediately flush eyes with copious amounts of running water (for 10 minutes), see an oculist.

after ingestion:
Rinse out mouth, drink 1-2 glasses of water, seek medical advice.

5. Fire-fighting measures

Suitable extinguishing media:
suitable for all regular extinguishing materials

Extinguishing media which must not be used for safety reasons:
none known

Special exposure hazards arising from the product itself, from combustion products or from resulting gases:
none known

Special protective equipment for firefighters:
Wear self-contained breathing apparatus.

6. Accidental release measures

Personal precautions:
Avoid contact with skin and eyes.
Ensure adequate ventilation.

Environmental precautions:
Do not allow large amounts to be released into the sewer system.

Methods of cleaning up/of removing:
Remove mechanically wash away residue with plenty of water;

Other indications:
Dilute small quantities with large amount of water and rinse.

7. Handling and storage

Handling:
no special measures required

Storage:
Store only in the original container.
Do not store at temperatures above 25 'C;

Storage Class: VCI-storage class: 10 (BRD)

8. Exposure controls / personal protection

Information on the system design:
No special measures required

Components with specific control parameters:
Glutaral
CAS-Nr.: 111-30-8
MAK: 0.1 ppm (0.4 mg/m3)

Personal protection:
The German accident prevention regulations (UVV) for health service and welfare (VBG 103 and GUV 8.1) specify in their Art. 7 the protective clothing to be worn for cleaning and disinfection measures.
Respiratory protection: when processing large amounts
Hand protection: protective gloves made of rubber
Eye protection: protective goggles

9. Physical and chemical properties

Physical state:	liquid
Colour:	green
Odour:	aldehyde-like
pH:	(undiluted) (20'C) ca. 4,5
Cloudpoint:	< 0 'C
Clarification point:	> 0 'C
Flash point:	>100'C DIN 51758/TSO 2719 (Pensky-Martens)
Relative density:	(20'C) 1,09 g/cm3
Solubility:	(20'C) soluble in water
Viscosity:	(20'C) ca. 15 mPa.s Höppler

10. Stability and reactivity

Conditions to avoid:
No decomposition if used according to specifications

Materials to avoid:
none known if used for its intended purpose

Hazardous decomposition products:
none if used for intended purpose none known

11. Toxicological information

Possible risks of irreversible effects

Inhalation:
Harmful by inhalation
Irritating to respiratory system

Ingestion:
Harmful if swallowed

Skin contact:
The product is irritant to skin and mucous membranes.

May cause sensitization by inhalation.
May cause sensitization by skin contact

Eye contact:
Risk of serious damage to eyes

12. Ecological information

Persistence and degradability:
This product contains surfactants which are at least 90 % biodegradable by reference to the German regulation June 4, 1986.

13. Disposal considerations

Waste key number according to (LAGA) (Länderarbeitsgemeinschaft Abfall)(Germany): 53507
EWC-Code: 070601
special waste incineration with the approval of the responsible local authority;

14. Transport information

Not a hazardous material according to RID/ADR, GGVS/ GGVE, ADNR, IMDG, ICAO-TI/IATA-DGR.

15. Regulatory information

Classification and labelling according to GefStoffV:

Symbols of danger:
Xn Harmful

Ingredients:
Glutaral (Glutaraldehyd), Glyoxal

R-phrases:
R 20/22: Harmful by inhalation and if swallowed
R 37/38: Irritating to respiratory system and skin
R 40: Possible risks of irreversible effects
R 41: Risk of serious damage to eyes
R 42/43: May cause sensitization by inhalation and skin contact

S-phrases:
S 23: Do not breathe spray
S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S 28: After contact with skin, wash immediately with plenty of water
S 37/39: Wear suitable gloves and eye/face protection
S 2: Keep out of reach of children

National prescriptions:

Not a combustible liquid according to the regulations governing combustible liquids (VbF) in Germany.

WGK = 2, wassergefährdendes Produkt
WGK = 2 water-endangering product (manufacturer classification in conformity with the German VwVwS of May 17, 1999).

According to §2, para. 2 of the Hazardous Material Directive ("GefStoffV") of 01.11.93, the third section of the Hazardous Material Directive (identification and material safety data sheet) is not required for components or preparations listed in §2, para. 1 of the Chemicals Directive ("ChemG") of 25.07.94; these are:
-pharmaceuticals according to §2, para. 1 of the Pharm aceutical Directive of 24.08.76 (pharmaceuticals for h uman contact, i.e. all hand- and skin disinfectants.)
- other pharmaceuticals given to consumers in specific packing (e.g. pharmaceuticals without direct human co ntact as e.g. surface disinfectants)
- medical products according to §3, no.1, 2, 6, 7 and of the Medical Product Directive of 02.08.94 as e.g. disinfectants for medical instruments.
Although there is no requirement by law to identify or create material safety data sheets for pharmaceuticals or medicals products we have decided to do so in accordance with the Hazardous Material Directive.

16. Other information

This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

Declaration of Decontamination / Return Declaration

Following declarations serve for keeping safety and health of our employees. Fill in the forms and attach them when returning freeze dryers, centrifuges, spare parts and accessories. Please understand that we cannot carry out any work before we have the declarations. (We recommend to make several copies of this page.)

!!!! Attention – This form must be glued on outside of the packing !!!!

Return declaration

	YES	NO
Decontamination declaration inside :		
Unit / component contaminated :		
Unit / component unused (new) :		

!!!! Attention – This form must be glued on outside of the packing !!!!

Declaration of Contamination of Freeze Dryers, Vacuum-Concentrators, Centrifuges, Accessories and Vacuum Pumps

This declaration may only be filled in and signed by authorised staff.

Repair Order dtd. : _____

Order No. : _____

Type of unit : _____ Serial No. : _____

Type of unit : _____ Serial No. : _____

Type of unit : _____ Serial No. : _____

Type of unit : _____ Serial No. : _____

Accessories : _____

_____

Is the equipment free from harmful substances ? YES **O** NO **O**

If not, which substances have come into contact with the equipment?

Name of the substances : _____

_____

Remarks (e.g. to be touched with gloves only) : _____

_____

General characteristics of the substances :

Corrosive	**O**	Explosive	**O**
Biologically hazardous	**O**	Radioactive	**O**
Toxic	**O**		

In combination with which substances may hazardous mixtures develop?

Name of the substances : _____

_____

Has the equipment been cleaned before shipment? YES **O** NO **O**

Is the equipment decontaminated and not harmful to health? YES **O** NO **O**

Prior to repair, radioactively contaminated components must be decontaminated according to the valid regulations for radiation protection.

Legally Binding Declaration

I / we hereby declare that the information on this declaration are correct and complete.

Company / Institute : _____

Street : _____

Postcode, City : _____

Tel. : _____ FAX : _____

Name : _____

Date : _____ Stamp :

Signature : _____ _____