TLS

USER MANUAL

RAPID KÖTHEN SHEET FORMER "RK-C

For the preparation of laboratory sheets of pulp for physical testing

TECHLABSYSTEMS

INDICE

PART 1

General Points

1.1. INTRODUCTION

The objective of this instruction manual is to help and train the personnel who will work with the Rapid Köthen Sheet Former with its correct use, handling, and preservation.

The manual consists of **12 chapters** containing general information on the machine, also a description, and a description of the operation of each of the components.

The chapter on safety includes both the safety of the operator and the machine and the disposable materials used.

These operating instructions:

- Apply to Rapid-Köthen Sheet Formers
- Contains instructions bearing on transport, handling, installation, commissioning, operation, shut down and servicing
- Must be completely read and understood by the operating and servicing personnel before beginning to work with the RK Sheet Former.
- Must be strictly observed
- Must be available at the site of operation of the RK sheet former.
- About the operating and servicing personnel of the Rapid Köthen Sheet Former
- These persons must be trained and authorized for the work to be carried out.
- Work on electrical installations may be carried out by trained and authorized electricians only

1.2. PURPOSE OF THE RAPID KÖTHEN SHEET FORMER

The Rapid Köthen Sheet Former is used to form hand sheets in automatic or manual mode on the former, further to dry the manufactured hand sheets within one or more dryers in short time, where the sheets are pressed and dried in the dryers. Further to get suspension water to analyze the chemical impurities in this water through the circulation system.

The Rapid Köthen Sheet Former is designed for operation with following operation liquids:

- Tap water and deionized water within the pH range of 6,5 to 8,0 pH.
- Is designed for industrial applications
- Is designed for continuous operation

Any unauthorized modifications on the Rapid Köthen Sheet Former are prohibited for safety reasons.

Maintenance and repair work by the operator are only recommended in the scope described in these operating instructions.

Any maintenance and repair work going beyond this may only be conducted by companies authorized by the manufacturer (inquiry with the service department necessary).

1.3. WARNING AND SAFETY INSTRUCTIONS

DANGER:

FAILURE TO FOLLOW THIS WARNING, OR NOT ADHERING TO THE ACCOMPANYING INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

WARNING:

If this warning is not heeded, or if the instructions contained herein are not carried out correctly, it may damage and/or destroy parts of the machine.

This is a warning danger pinch of crushing the hands of the operator

This is a very hot surface hazard warning / information for the operator's hands

NOTE:

This is a warning / information that it is recommended to follow.

This is information that the use of protective gloves is mandatory for the operator

ENVIRONMENT:

This provides descriptions of procedures and of features where the possible impact on the environment of certain actions or choices should be considered; these mainly relate to the products used.

1.4. GENERAL RECOMMENDATIONS AND LIABILITY

Below is a series of general recommendations for the use of the Rapid Köthen Sheet Former RK-C.

Before operating the machine, it is recommended to read this manual and keep a copy for future reference. This manual form part of your testing machine.

The information contained in the manual is general and cannot cover all situations that might arise during the great many operating conditions experienced.

TECHLAB SYSTEMS, S.L. does not accept liability for any damage caused to persons or goods from using the machine for a different use than the one it was designed for, or with different elements or materials than planned, or for making alterations to any part or element on the machine without the express authorisation of the manufacturer.

Any unsuitable use to which the machine is put may be potentially dangerous, in addition to affecting its efficiency and precision, and not comply with the conditions of the guarantee.

ABOUT RESPONSABILITIES!!

TECHLAB SYSTEMS S.L. will only assume responsibility if the machine has been faulty from the outset, but this will be reduced or even cancelled if the user does not follow instructions in the manuals and/or uses non-guaranteed replacement parts.

Finally, it must be noted that whoever changes the application of a machine becomes its manufacturer and assumes responsibility for any consequences arising from this.

1.5. WARRANTY

ABOUT WARRANTY!!

TECHLAB SYSTEMS S.L. only guarantees registered products according to the warranty registration included at the end of this user manual, (Part 11).

1.6. ILLUSTRATIONS

The drawings, diagrams of components and units included in this manual may be represented partially, not to scale and simplified. They are merely for information and have no contractual validity.

1.7. OPERATOR CONDITIONS

1.7.1 Tasks in the paper sheet former machine

The use and maintenance of the machine described in this manual involves the following tasks:

- Preparation of the different paper pulp suspensions.
- Carrying out paper sheet manufacturing tests
- Cleaning of the remains of the tested materials.
- Basic machine maintenance

1.7.2 Knowledge necessary for the use of the Rapid Köthen Sheet Former

The operator or operators assigned to the tasks described in the section above must have, or must acquire, the following knowledge:

- Complete operation of the machine for the manufacture of sheets of paper in the laboratory, by reading and understanding this instruction manual.
- Conditions of use and when not to use the paper sheet former, also described in this instruction manual.
- Methods of handling the paper raw materials to be tested.
- Behavior of raw materials before, during and after tests.
- As a further measure, and after reading and understanding, this instruction manual should be kept in a place where it can be easily found for later reference.
- Know the conditions and test procedures characteristic of your application.

1.8. OUR COORDINATES

Name:	**TECHLAB SYSTEMS, S.L.**
Address:	Txatxamendi 10 Polígono 110 C.P. 20100 LEZO (Guipúzcoa) SPAIN
Telephone:	(+34) 943 470 007
E-mail:	info@techlabsystems.com
Website:	www.techlabsystems.com

1.9. CONTACT FOR AFTER SALES SERVICE

In case the information provided in this manual proves insufficient for a particular problem, please contact our technical service department, which will gladly provide the expert knowledge you need.

- Phone ..... (+34) 943 470 007
- Email ..... service@techlabsystems.com

1.10. COPYRIGHT

The information in this manual may be altered without previous warning, in accordance with our constant striving to find the highest quality

PART 2

Security

2.1. INTRODUCTION

This manual includes some general recommendations, as well as the information necessary to correctly use the Rapid Köthen Paper Sheet Former.

This Paper Sheet Former and all its components have been designed and equipped to guarantee their reliability and long useful life. The correct operation of electrical and electronic components depends on proper use and regular maintenance performed. Follow the instructions specified in this manual to ensure safe and reliable operation.

2.2. GENERAL SAFETY RECOMMENDATIONS

The Rapid Köthen Sheet Former is electrical equipment, therefore, for your safety, follow the advice below:

ATTENTION!!

- Never touch the equipment with wet hands or feet.
- Never touch without wearing shoes.
- Never expose it to rain, moisture, direct sunlight.
- Never allow the use of the test equipment by unqualified personnel.

ATTENTION!!

Read this user manual in its entirety before unpacking, installing, or starting to work with the Rapid Köthen Sheet Former.

WARNING!!

Improper use of the unit can result in serious or even fatal injuries! These operation instructions

- Must have been read completely and understood before beginning any work with the Rapid-Köthen Sheet Former and have to be strictly observed
- Must be available at the operating location.

Incorrect operation can cause wrong measurement results, damage to the device and injury to persons.

This device uses hot water (up to 95°C | appr. 199,4 ± 7 ° F) to dry the freshly formed sheets. Although *TECHLAB SYSTEMS* has provided safety covers on top of the heaters we recommend to put on heat-resistant safety gloves all the time you work with this device.

The manufacturer cannot be held liable for any disadvantage, damage or injury caused by non-observance of this operating manual.

WARNING!!

Before beginning maintenance work on the system, the following requirements must be met:

- Secure against being switched on again.
- Grounded or short circuited
- Work on electrical installations may be carried out by trained and authorized electricians only!
- Replace loose connections, signed or burned cables immediately!
- Do not open the motor terminal box unless absence of electricity has been ensured!

WARNING!!

Danger due to gauge pressure and vacuum,

Danger due to escaping fluid!

Before beginning work on the system:

- Interrupt supply of operation liquid.
- Bleed lines and vacuum pump/compressor (depressurize)

WARNING!!

Danger from rotating external fan of pump unit

Only operate the motor unit from the pump with the fan guard mounted!

It is prohibited to remove the fan guard

WARNING!!

Danger in the form of cuts or cutting off extremities on the impeller of the pump / motor units and containers

- Do not reach into the unit through open connections
- Do not insert objects into the unit through openings!
- Check the lines and containers for sufficient strength!
- Check the connections of the pipe / hose connections for leaks!

WARNING!!

Danger of burns and scalding from hot surfaces on the dryers or the motors.

- Do not touch during operation, use only the handle (black material) and do not touch the metal parts of the dryers.
- The covers of the heater can reach a temperature of approx. +75 ° C outside the covers.
- Do not touch during operation!
- Allow to cool after shutdown

WARNING!!

Danger of squeezing the fingers in the dryers:

- Do not put your fingers into the opened dryers
- With the dryer cover opened, hold the cover strong with one hand when you move some papers into and out of the dryers
- Do not let the dryer cover fall down, shut down the cover very smooth.
- Do not allow to have your fingers in the opened drying cover.

WARNING!!

- Danger zone:
- Heavy dryer covers
- Hazard:
- Squeezing of the fingers possible
- Protective measures:
- Hold the dryer cover strong with one hand!

WARNING!!

- Danger zone:
- Hot dryers
- Hazard:
- Burns / scalding possible
- Protective measures:
- Do not touch! Wear protective gloves!

ATTENTION!!

Only those persons thoroughly familiar with the theory, components and total operation of this equipment should operate the Rapid Köthen Sheet Former.

During the unpacking of the equipment, after installation and during its useful life, the following recommendations regarding its safety are recommended:

After unpacking, make sure that the equipment received is in perfect condition. If in doubt, do not use it and contact your provider immediately.

The electrical installation of the laboratory must comply with the listed specifications.

Before connecting the Rapid >Köthen Sheet Former to the electrical power supply, make sure that the electrical characteristics of the rear plate correspond to the electrical circuit of the laboratory where the test equipment is to be located.

ATTENTION!!

Never perform maintenance on the equipment while the power is ON.

Always turn off power at it disconnect panel or disconnect the unit from the mains before performing any maintenance or troubleshooting on the system.

WARNING!!

Read and understand the operation manual before use, any doubt about the operation or maintenance of the equipment should be clarified by contacting the Technical Support Department.

WARNING!!

Only use and carry out repair / maintenance by qualified and trained personnel

WARNING!!

Never modify the safety elements of the machine.

WARNING!!

Personnel should not operate the machine affected by any toxic substance.

WARNING!!

Personnel must not operate the machine in a state of fatigue or mental stress.

PART 3

Introduction

The “Rapid-Köthen Sheet Former with white water circulation system” is engineered for the preparation of laboratory sheets of pulp for physical testing according to ISO 5269-2 (“Rapid-Köthen” method).

PART 4

Unpacking - Equipment Dismantling

CAUTIONS!!

For safety purposes, adequate personnel must be present when unpacking and moving this equipment.

Unpack the equipment very carefully. Due to its dimensions and big weight, it is necessary the use of a lift truck or pallet type platform, vertical crane, or the collaboration of two persons.

Move it carefully to its definitive location

4.1. UNPACKING

The Sheet Former will be delivered within a wooden case. In this case there are also some additional spares and wear parts, necessary for the operation of the Rapid Köthen Sheet Former.

For unpacking it is necessary to use a special screwdriver to open the wooden box. The screws are marked with a red color.

1. First screw the top plate from the box, then re-screw the front plate of the box (marked with “FRONT and TOP).

2. Now you can see the Sheet Former with the accessoires in a separate board box on top of the Sheet Former.

3. Take the accessories box out of the wooden box and put it on a separate table for safe storage until it is needed.

4. Unscrew the front and back wooden holder (from left to right) (screws are outside and marked).

5. If this is done, use a forklift to take out the Sheet Former from the box.

6. Unpack the Sheet Former and check if any transport damage has occurred.

7. If transport damage has occurred, immediately inform the carrier and contact TECHLAB SYSTEMS

After unpacking check the unit and its accessories for completeness.

- 1 pc Rapid Köthen Sheet Former
- 1-5 pc Dryer supporting screens
- 1 pc Former supporting screen
- 1 pc Sheet forming screen mounted into a frame
- 1 pc Couch Roll
- 1 pc Rubber plate
- 1 Pack of Carrier boards (1000 pcs)
- 1 Pack of Blotting papers (1000 pcs)
- 1 Set of Gaskets (2 x orange, 1 x beige)
- 1 Set of drainage tubes (1 x 100, 1 x 50, 1 x 90°, 1 x 67°, 1 flexible tubing)
- 3 m Hose ½" for water connection (mounted on the back side of the machine)
- 2 pc Electrical keys
- 1 pc hose 8 mm diameter for instrument air connection (mounted on the back side of the machine)
- 1 pc Allen key 5 mm (for regulation of the water flow to the dryers)
- 1 pc wrench 10 mm (for air outlet of the dryers)
- 1 pc membrane with sieve cloth (spare)
- 1 pc funnel (orange) to fill water into the heater system

Inspect the equipment

Once you have unpacked the equipment, carefully inspect its exterior.

NOTE: In case of shipping damage such as scratches or dents, contact us.

HAZARD TO EQUIPMENT!!

For security purposes, adequate personnel must be present when unpacking and moving this equipment.

4.2. EQUIPMENT DISMANTLING

It is recommended to respect national standards regarding individual selective dismantling of the materials from which the equipment is manufactured.

Obviously, the plastic must be separated from the metal, as well as from any other material that the equipment is made of.

PART 5

Unit Description

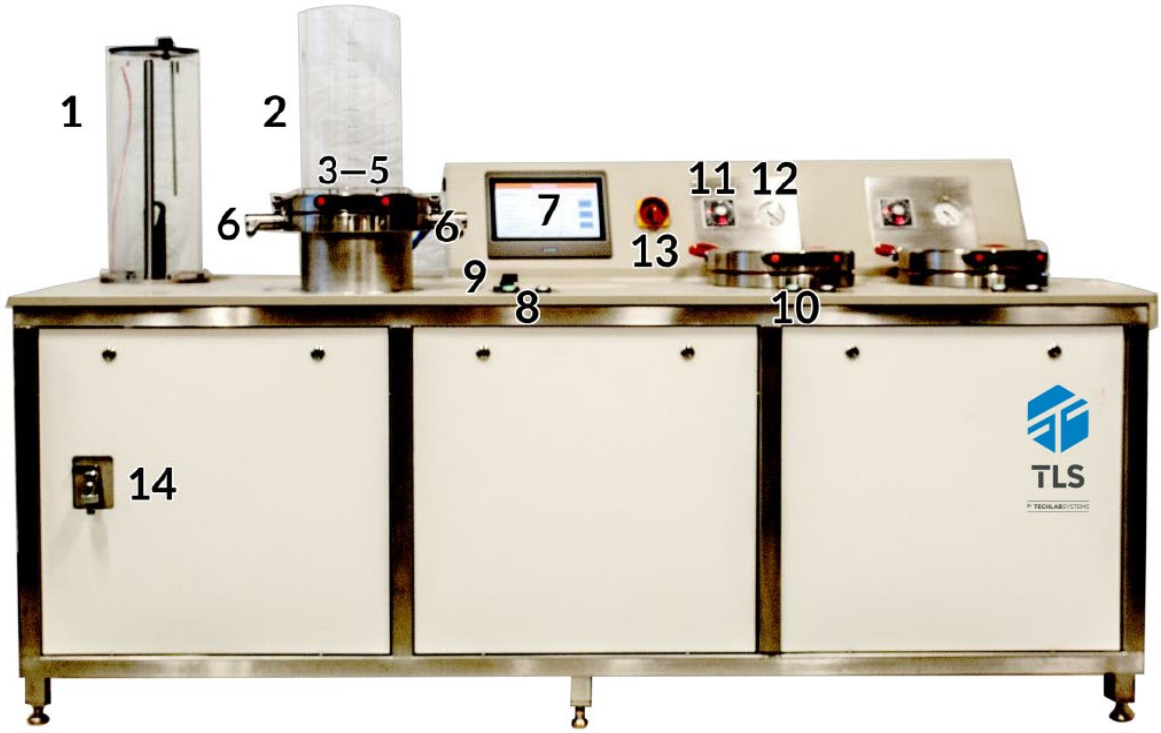


Fig. 1

1. White water column
2. Sheet former column / suspension container
3. Sheet-forming screen
4. Supporting screen
5. Suction chamber
6. Eccentric quick release locks
7. Operating and process control touch screen
8. Start (green) and Stop (red) buttons for automatic cycle
9. Selector switch for manual / automatic sheet forming
10. Dryer start (green) and stop (red) buttons
11. Time indicator and setter
12. Vacuum indicator
13. Main switch. Can be used also for emergency shut down

PART 6

Installation

6.1. LOCATION AND LEVELLING

Place the device on a clean, stable and vibration-free surface. The device itself should be levelled when put onto plain and levelled ground without any elevations or immersions. Nevertheless, verify the levelled position of the sheet-forming screen after setting up the device.

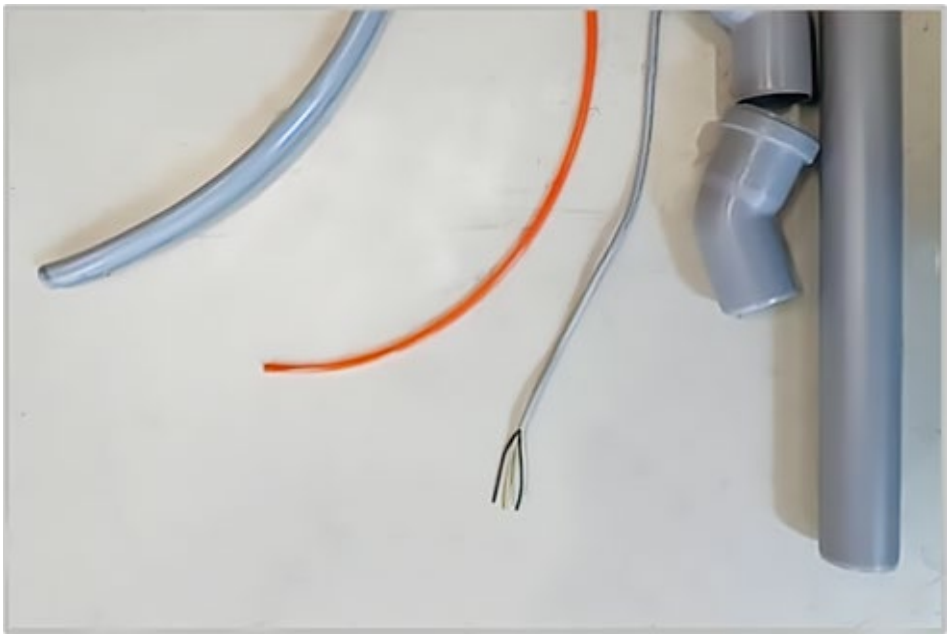
ATTENTION!!

If the sheet-forming screen is not horizontally levelled, the varying flow of the water might result in an uneven moistening, which can influence the accuracy of the formed sheets and thereafter testing performance might be inaccurate.

RECYCLABLE MATERIALS

The shipping materials are recyclable. Save them for later use or dispose of them appropriately.

6.2. CONNECTIONS AND HEATER TANK



This are the connection needs:

-We need a water connection for tap water with a ½" tube (5 m delivered with the machine)

- We need a pressed air connection (we use a plastic tubing with 6 mm outside diameter)

- We need an electrical connetion (400V 3 phase with 3 electrical ropes and a cable for the groud plus 0 level (5 cables) Electrical power is max.. 5 KW

Tubes for water drainage: we deliver some tubing materials with a 50 mm outlet dimensions.

If the outlet of the water drainage is not deep enough (max. 200 mm from floor level, than we deliver a pump system for collecting first the water in a basin and pump the water with a small pump to an drainage point. Max. 2 m above floor level).

6.2.1. Water Supply

The device needs a minimum water supply of 200 kPa. Do not exceed water pressure of 500 kPa! Use cold water only. Connect the delivered ½" hose to the magnetic valve and turn on the water supply.

6.2.2. Compressed Air

Connect the device to instrument air of 400—600 kPa. Do not exceed air pressure of 600 kPa! You can find the 6 mm air connection for instrument air at the rear side of the device.

After connecting, check the pressure inside the device (see fig. 2 below). If it is down, you might have to open an outlet valve on your instrument air system or else the connection to the device is not established right

Fig. 2

Take down the left front cover and check the lower manometer for pressure. If there is none, open the valve and let pressure in until it is at 5 bar. If that does not work, check the industrial air source. Still no pressure? Contact TECHLAB SYSTEMS

6.2.3. Drainage

Use either a floor drain underneath the device or a pipe drain with a diameter of at least 50 mm. The pipe drain's position must not exceed 100 mm above floor level. The inclinación should amount to at least 4mm/m.

6.2.4. Electricity

The device comes with an earthed safety plug, 16 A, CEE connector cable. Connect the device to a 1-phase power supply. Please refer to the sticker at the device's power connection for the correct power.

6.2.5. Heater Water Tank

WARNING!!

The heater tank has to be filled with demineralized water to the upper mark. Do not use tap water! This could cause calcification and can damage the tank.

Check the water level regularly. If necessary, fill up with demineralized water. The pipe for filling the heater tank can be found on the front side behind the middle cover. It is marked with a minimum/maximum indicator (red lines; see fig. 3).

Fig. 3

The red lines mark minimum and maximum for the demineralized water.

WARNING!!

Do not operate the device, if any of the connections is not established or connected incorrectly! Danger of inaccurate results, damage to the device and injury to persons.

WARNING!!

Avoid direct contact to the heater plate lid of the dryers and other warm spots! Use heat resistant safety gloves during the whole process of sheet forming and drying!

6.3. FORMER VACUUM

The suction chamber is connected to the vacuum pump. According to ISO 5269-2 the maximum vacuum inside the former column should not exceed 0,27 bar. Therefor the device is equipped with an air gauge which has to be set to —0,27 bar.

1. To adjust this value take off the sheet-forming screen, place a carrier board with a hole on top of the supporting screen and close the former column using the eccentric quick release locks (**Error! Reference source not found.,** 6) and cover it with another piece of carrier board.

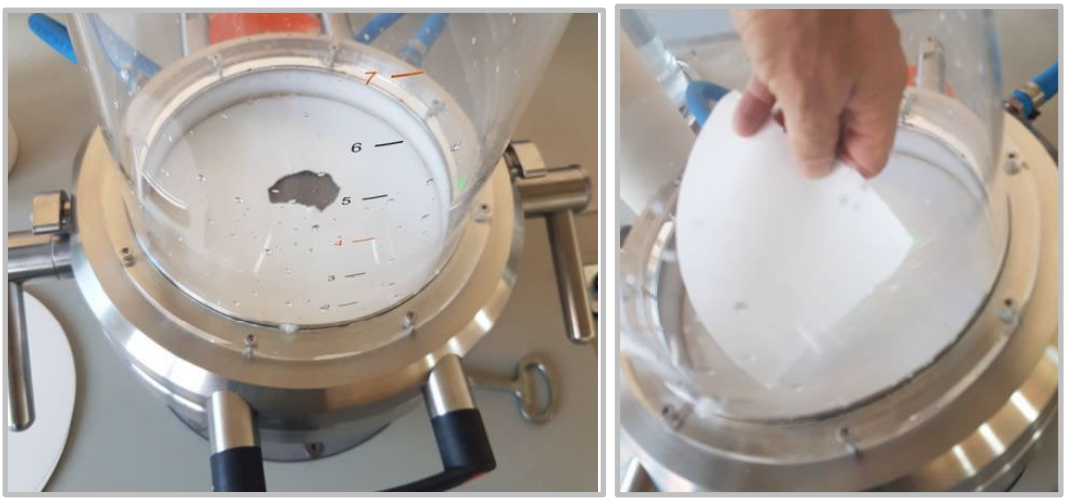


Fig. 4

2. Fill in about 2—3 liters of water into the former column by means of the manual filling function (see 7.2.1 for further information).

Fig. 5

3. Then change the manual operation switch (**Error! Reference source not found**., 9) to position 5 “de-watering”. Push and hold the green start button (**Error! Reference source not found.,** 8) to start the vacuum pump. Check the vacuum indicator inside the device. Rotate the top of the vacuum valve which can be found just behind the indicator, until the indicator displays —0.27 bar (—27 kPa).

Fig. 6

The vacuum indicator behind the left front cover set to appr. —0,27 bar.

4. Turn the manual operation switch back to automatic. Do not open the former column!

5. Take away the piece of blotting paper and allow to drain. Wait until all the water has drained.

6. Open the former column, take out the remaining blotting.

PART 7

Operating

7.1. STARTING THE DEVICE

The device is ready to start, if all of the connections are established correctly.

Make sure that the manual / automatic switch is set to position 1 “Automatic”.

Fig. 7

By turning the main switch to “ON” the device will start up. Now the valves are being supplied with compressed air, water in the water tank starts to heat up and the hot-water-pump starts.

To fill the water container for the first time, the machine has to be in “Freshwater” mode. If the machine is in “Whitewater” mode, it will not fill the column.

Fig. 8

The device is ready for use as soon as the water for the dryer has reached the set temperature (or its offset range; see 8.2.3).

7.2. SHEET FORMING

7.2.1. Manual Sheet Forming Mode

1. Make sure a sheet forming screen is placed correctly on top of the supporting screen.

Fig. 9

2. Close the former column.

3. Tighten the eccentric quick release locks.

4. Set the manual operation switch to “filling” and push the start button. The device now starts to fill the sheet forming tank with water. Once the water level reaches the lower red mark (4 liters) add the prepared suspension (acc. ISO 5269-2:2004(E)).

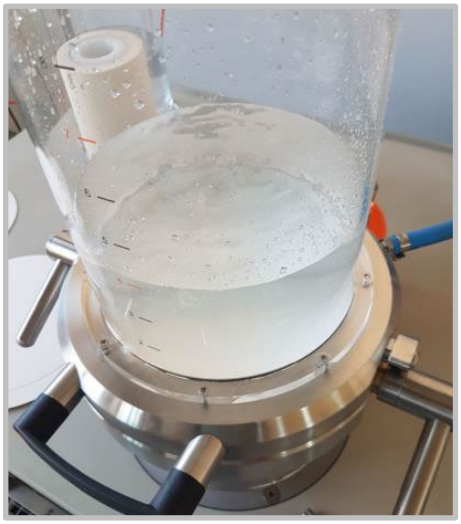


Fig. 10

5. As soon as the suspension mixture reaches the upper red mark (7 liters) turn the manual operation switch to “agitation”. Agitate the suspension for five seconds according to ISO 5269-2:2004(E). Air flow can be adjusted by a regulating valve which is located inside the device.

6. After agitating the suspension turn the manual operation switch to “calming”. Let the suspension calm for five seconds.

7. Dewater the suspension container by turning the manual operation switch to “dewatering” and pushing the Start button.

Fig. 11

Dewatering

8. Within a maximum of two seconds push the start button (Fehler! Verweisquelle konnte nicht gefunden werden., 8) and hold it for activating the vacuum pump in order to dewater the suspension container.

9. Now drain the water from the suction container by turning the manual operation switch to “draining”.

10. As soon as the suction box is empty turn the manual operation switch to “normal”. The sheet is now formed and needs to be taken off the sheet forming screen.

7.2.2. Automatic Sheet Forming Mode

The automatic standard program for forming a sheet according to ISO 5269-2:2004(E) is pre-installed. Customized programs can easily be set up and saved. The following parameters for the sheet forming process can be adjusted:

- Time for filling
- Time of agitation
- Time for calming
- Time of dewatering
- Time of suction
- Time for emptying

1. Choose the desired program of the automatic sheet forming cycle on the display (see 8 for the description of the software).

2. Check if the operation switch is set to “automatic”.

3. Check if the sheet forming screen is set in correctly on top of the supporting screen.

4. Tighten the eccentric quick release locks.

5. Push the green “start” button. The device now starts the sheet forming process with the preset parameters automatically.

6. Once the water level reaches the lower red mark (4 liters), add the prepared suspension (acc. ISO 5269-2:2004(E)).

7. During the whole forming process the start button gives a green flashing signal. Once the green light is illuminated permanently and the red button is flashing the sheet is ready to be transferred to the dryer.

7.2.3. Transfering the Sheet to the Dryer

The whole process of transferring the sheet must not take longer than one minute according to ISO 5269-2:2004(E).

1. Open the former column.

2. Place a carrier board on top of the wet sheet. Be sure to put the smooth side downwards onto the formed sheet and do not press the sheet.

3. Roll the couching roll from left to right and back over the carrier sheet without applying additional pressure for a two seconds period each. After turning around the couch roll by 90° repeat this process from front to back.

4. According to ISO 5269-2:2004(E) remove the sheet-forming screen together with the wet sheet and carrier board from the supporting screen.

5. Flip the sheet-forming screen until slightly inclined horizontally. Strike the edge against the horizontal rubber underlay and release the carrier board together with the formed sheet.

6. Cover the formed sheet with a cover sheet.

7.2.4. Whitewater Mode

In Whitewater Mode the water drained into the lower part of the sheet former will not drain to the drainage but will be held back in the container and then be pumped back into the suspension container for another sheet forming process.

The purpose of this is to check, which and how much of the used chemicals will end up in the paper and which will end up in the water.

If you want to see, at which concentration your chemicals react with the paper or do not anymore react with the paper and dissolve into the waste water, you can form a series of sheets with different concentrations of a special chemical.

1. In the Menue switch to “Whitewater” mode so the RK system will not fill fresh water after every single sheet forming.

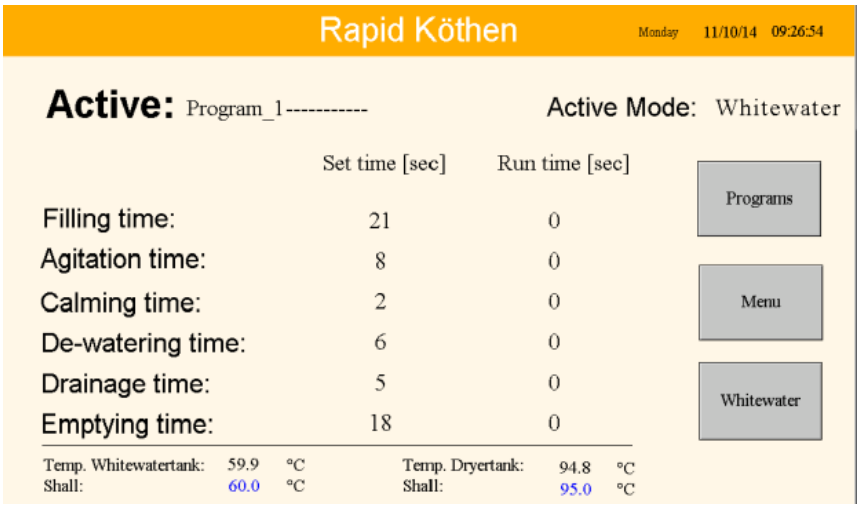


Fig. 12

In the start screen change to whitewater mode by tapping the resp. button on the lower right.

2. Prepare some samples (suspension with concentrations of 1%, 2%, 3%, 4%, 5%, ...) and form a set of 10 sheets from each.

3. After each set of samples open the front tap (Fehler! Verweisquelle konnte nicht gefunden werden., 14) and analyse this waste water. First let 1 liter drain away and then use the 2nd liter for chemical analysis.

4. After every set of 10 sheets fill the container with fresh water.
After some set of samples (e.g. 3%) the concentration of the chemical in the waste water will be higher than in the paper.

Now you know, that 2% works in the paper, 3 % is too much to react with the paperfibers. If you dose 3 or more percent of a special chemical to your suspension you will waste chemicals, because it will not bring anymore effect to your paper.

7.2.5. Drying

1. Check if the heating water temperature is in the range of the set parameters (usually 93 ± 4 ° C | appr. 199,4 ± 7 ° F).

2. Set the timer to 5 to 10 minutes depending on the weight of the formed sheet and open the dryer.

Fig. 13

Each dryer has two displays, the left one is for duration, the right one for pressure. The duration can also be set right here.

3. Place the carrier board, formed sheet and cover sheet on the supporting screen of the dryer.

Fig. 14

4. Close the dryer and push the green start button. The dryer now starts the drying process. The vacuum is supposed to reach —0,90 kPa. You can check the value at the vacuum indicator. If the dryer does not close immediately, press down the cover with the black handle until the vacuum holds the dryer lid down. After the preset time has elapsed the lights start to flash and a peep is sounded. That is when the drying process is finished.

5. Push the red button to stop the drying process. This will also release the vacuum. Now you can open the dryer and separate the formed sheet from the carrier board and cover sheet. A standard sheet (75 g / m^2) shall be ready after 5—6 minutes.

6. After taking out the formed sheet, close the dryer lid so that the temperature in the dryer will not go down.

7. According to ISO 5269-2:2004(E) you need to condition the Rapid-Köthen laboratory sheets in accordance with ISO 187 before testing.

PART 8

Software

8.1. MAIN SCREEN

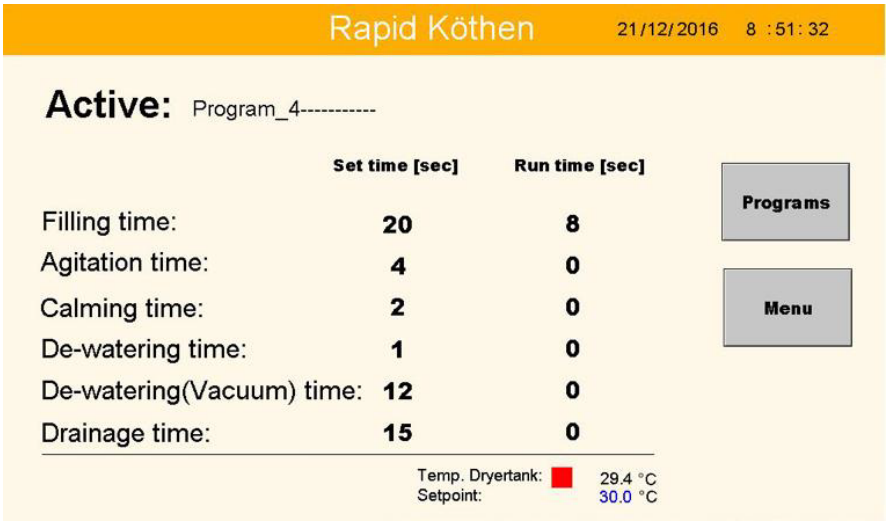


Fig. 15

The main screen displays the currently active program and its parameters.

Active: Displays the name of the active program.

Active Mode: Displays the mode currently active. In this model there are two modes: Whitewater and Freshwater.

Set time: The set time column shows the time set for each part of the forming process.

Run time: Shows the run time of each part during the automatic forming process.

Temp. Whitewater: Shows the actual temperature of the water in the heater tank for the dryers. The “Shall” figures show the set temperatures and can be changed by tapping them. An onscreen keypad will appear.

Temp. Dryer Tank displays the actual temperature of the water in the heater tank for the dryers. The “Shall” figures show the set temperatures and can be changed by tapping them. An onscreen keypad will appear.

Programs Button: displays the Program overview

Menu Button: displays the Menu overview

White-/Freshwater Button changes the active mode to whatever is written on the button.

8.1.1. Programs Overview

Fig. 16

On the Program Overview Screen you can choose one of the four available programs

Program Buttons 1—4 displays the program change screen (fig. 17).

Home Button displays the Main screen (fig. 15).

8.1.2. Program Change Screen

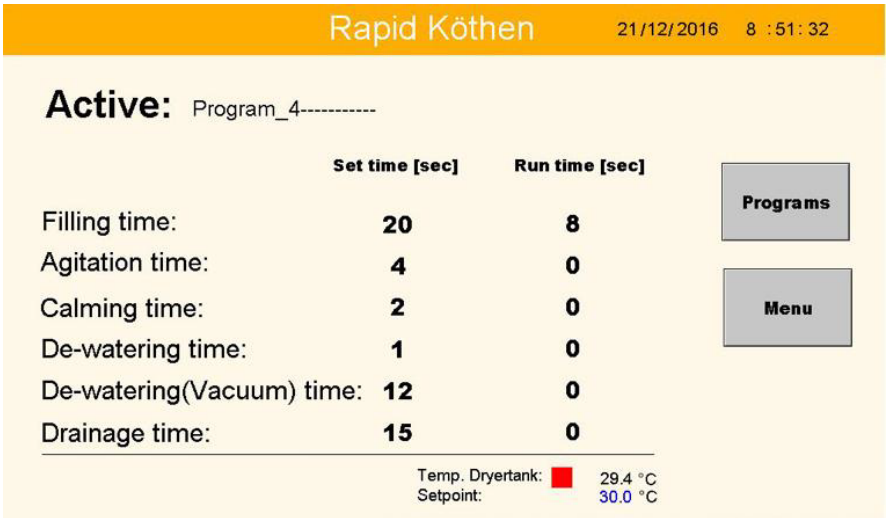


Fig. 17

On the Program Change screen you can also set the timers.

Set time: Tap the timers to display the numeric onscreen keypad in order to type in the required time.

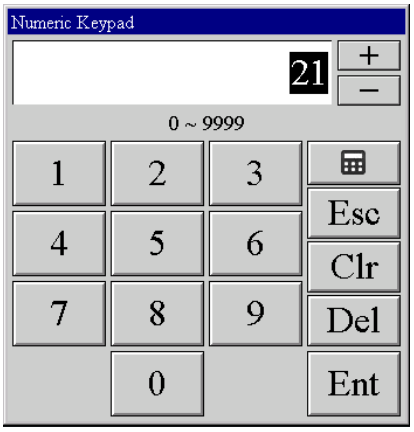


Fig.18

Counting up or down

Calculator

Esc — Closing the Keyboard and finishing the editing process without change

Clr — Clearing whatever entries are there

Del — Deleting the last figure

Ent — "Ent" (for "Enter") to take the current input as a new setting.

Home Button: Tap the name of the Program to call up the keyboard to change its name.

Activate Button: Tap the "Activate" button to set the chosen program to be the active one. An information window will pop up and show you, that the chosen program is now activated (fig. 19).

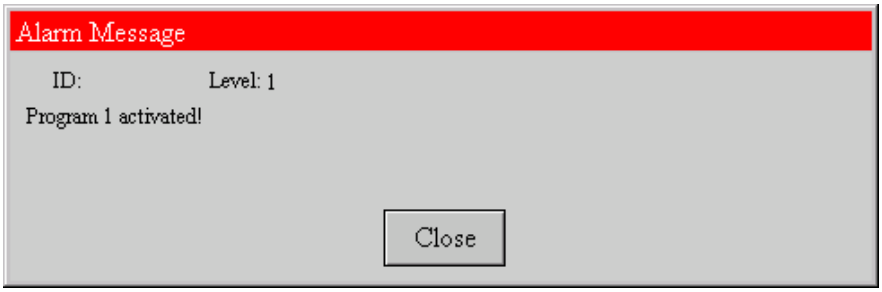


Fig.19

Close to close this little dialogue

8.2. MENU OVERVIEW SCREEN

In this menu you have access to many of the device properties.

- Valves: see 8.2.1 (page: 25)
- Inputs: see 8.2.2 (page 26)
- Pumps: see 8.2.2 (page 26)
- Heatings: see 8.2.3 (page 27)
- Alarms: see 8.2.4 (page 28)
- Statistics: see 8.2.5 (page 28)
- Properties: see 8.2.6 (page 29)
- Vacuum: see 8.2.7 (page 29)

Home Button displays the Main screen (8.1).

Programs displays the programs overview screen (8.1.1).

8.2.1. Valves

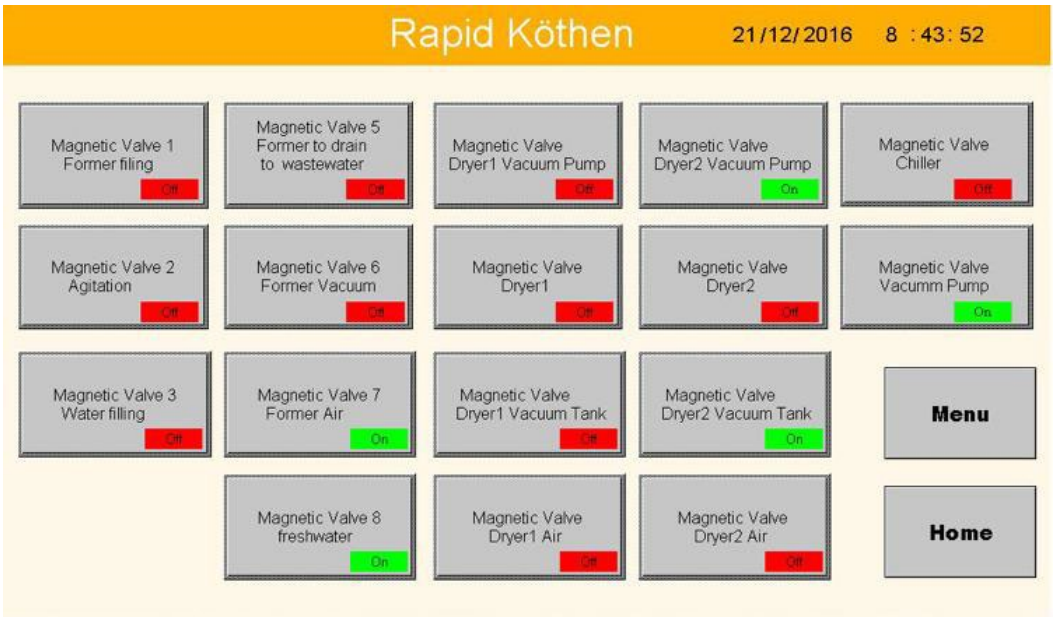


Fig.20

On the valves screen each of the valves can be turned on or off manually. This is mainly used for service reasons.

Home Button displays the Main screen (8.1).

Menu Button displays the Menu overview screen (8.2).

8.2.2. Inputs

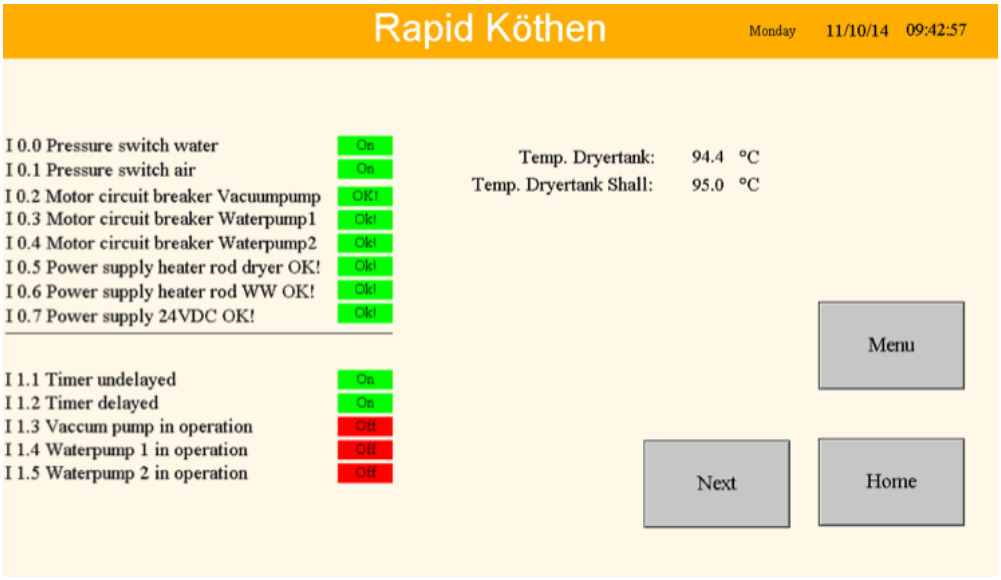


Fig.21

The Rapid-Köthen is equipped with a Siemens "Simatic 7–1200" control system. On the inputs screen each of the in-/outputs can be checked up on their status without opening the electric cabinet. This is mainly needed for service reasons.

The on-/off sign displays the status of each in-/output.

The OK!-sign shows which of the circuit breakers are working. Should one of these signs show "not-OK", you have to check, why the circuit breaker got activated. Please ask a service technician for help.

Home Button displays the Main screen (8.1).

Menu Button displays the Menu overview screen (8.2).

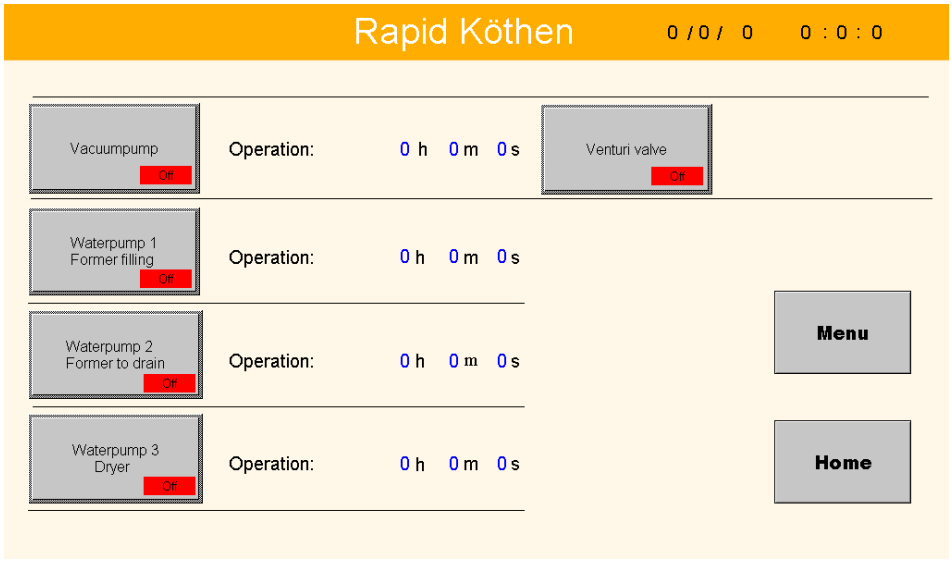


Fig.22

Pumps

The Rapid-Köthen is equipped with five pumps. On this screen (fig. 22) each pump can be turned on. This is important to check the function of each pump.

The timer beside each pump shows the full operation time of it.

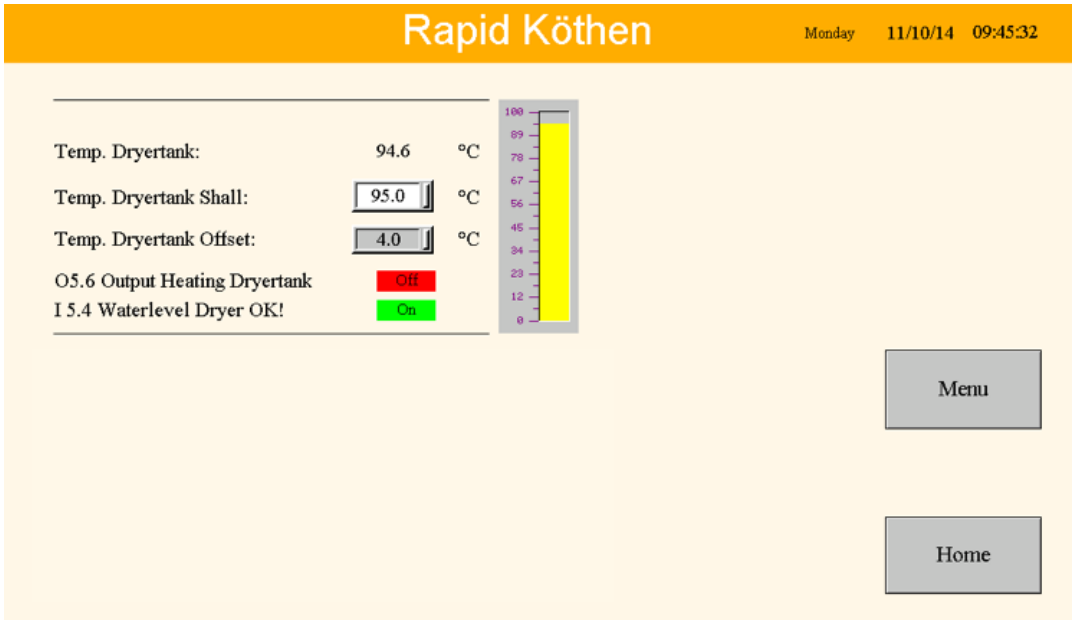
Please only turn on the pumps manually, when instructed to do so by a service technician.

The on-/off sign shows the current status of the pump.

Home Button displays the Main screen (8.1)

Menu Button displays the Menu overview screen (8.2).

8.2.3. Heating



The heatings screen shows the current temperature of the heater.

There are two options for the heating module:

Shall temperature: The shall temperature shows the temperature that the heating element will heat the fluid up to. Tap the button to change the temperature.

Offset: The offset describes the temperature at which the modules connected to the specific temperature are able to work. For instance the dryers are connected to the dryer tank. So the dryers can only be started, if they are within the dryer temperature's offset. These parameters can be set in the service menu only.

Example:

The "Temp. Dryertank Shall" is set to 93 ° C.

The "Temp. Dryertank Offset" is set to 4 ° C.

So the dryer can only be started, if the temperature of the water inside the dryer tank is between 89 and 97 ° C (= 93 ± 4° C)

8.2.4. Alarms

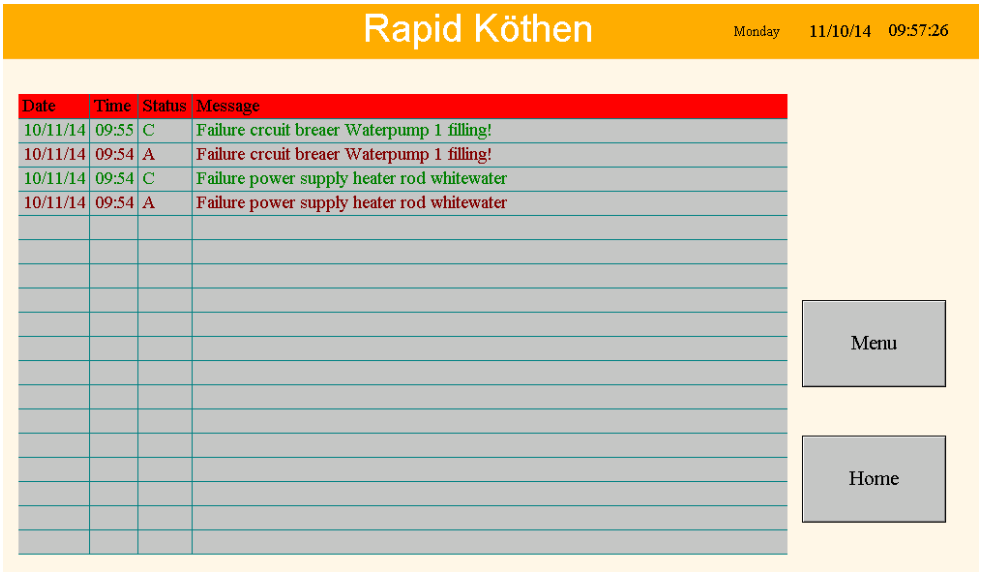


Fig.24

The alarms screen displays a log of all the alarms that have occurred recently. It helps finding problems in the device.

Please open this screen and call and service technician for help, if the device displays an error.

Home Button displays the Main screen (8.1).

Menu Button displays the Menu overview screen (8.2).

8.2.5. Statistics

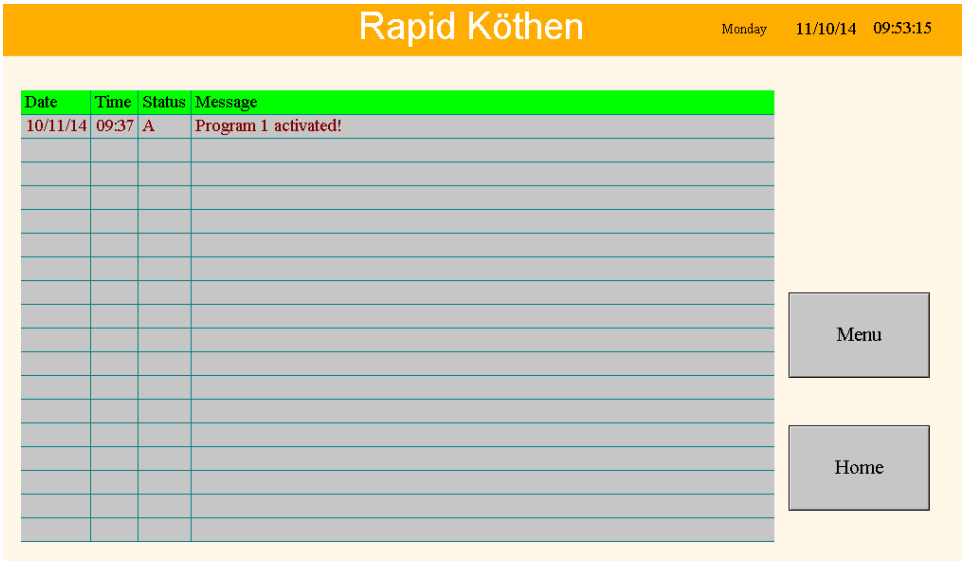


Fig.25

This screen displays an account of the program changes performed.

Home Button displays the Main screen (8.1).

Menu Button displays the Menu overview screen (8.2).

8.2.6. Properties

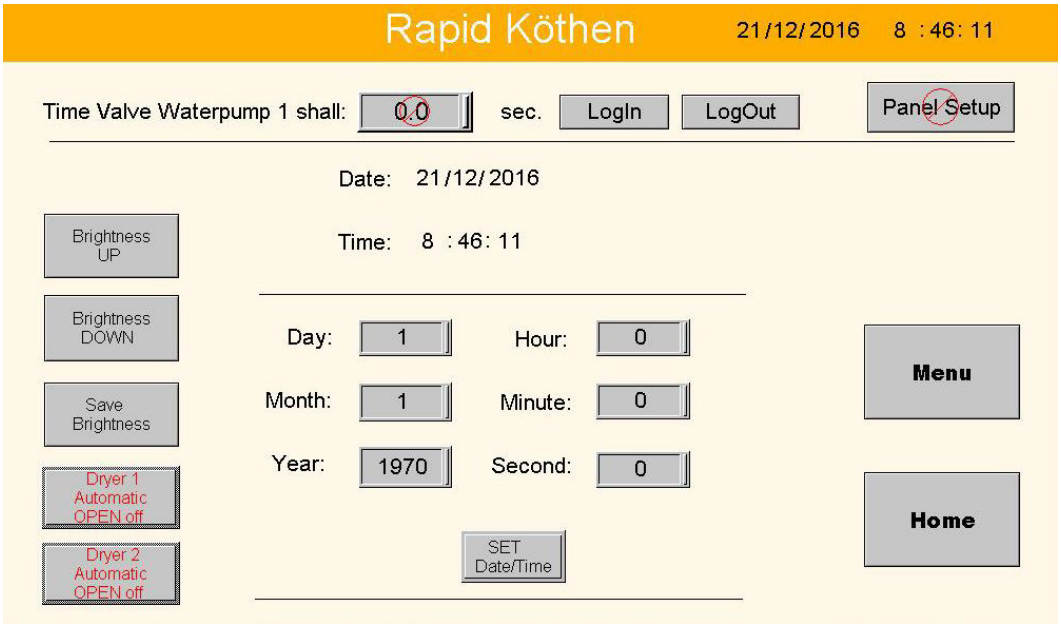


Fig.26

On the properties screen the brightness and the date/time can be set.

For setting an appropriate brightness repeatedly tap and hold the “Brightness UP” or “Brightness DOWN” buttons until the brightness meets your requirements. Push the “Save brightness” button to save it as standard. Otherwise the brightness will be set back at the next system start.

For setting the date/time tap the specific button and type in the actual date/time. Tap the “SET Date/Time” button afterwards to save it.

Home Button displays the Main screen (8.1).

Menu Button displays the Menu overview screen (8.2).

8.2.7. Vacuum

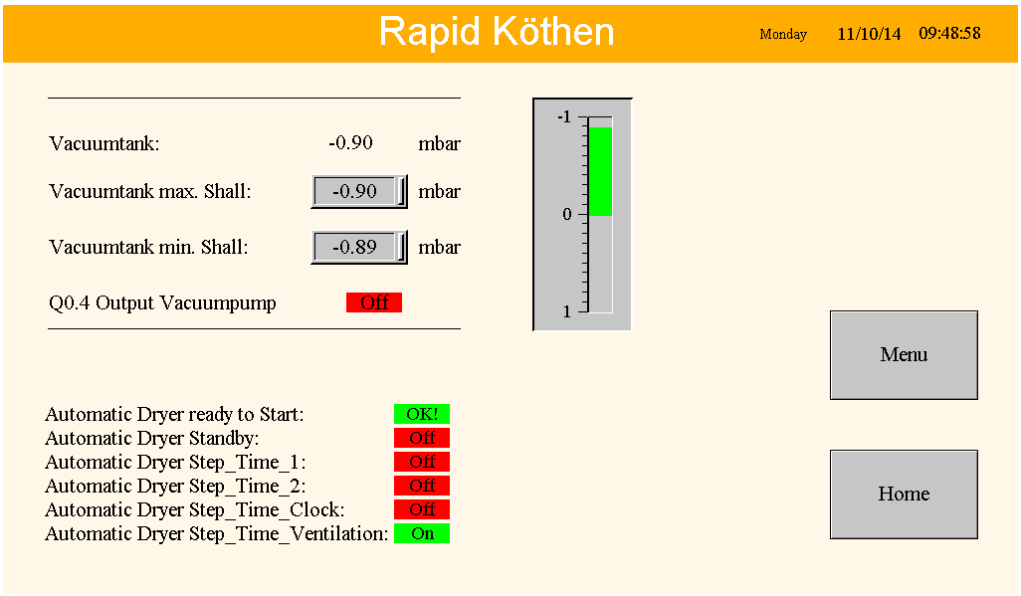


Fig.27

On the Vacuum screen all the parameters for the built in vacuum tank can be set.

Each dryer has an own tank and each of these tanks can be set separately. There are two options for the dryer tanks:

Vacuum Tank Max. Shall: This option displays the maximum vacuum a tank should be emptied to.

Vacuum Tank Min. Shall: This option shows the value, where the vacuum pump starts to empty the tank until it reaches the max. value.

These parameters can be changed in the service menu only.

Remember to always enter "—0" before each value, since the indicator calculates the vacuum from the ambient pressure down (e.g. —0.92)

8.2.8. Alarm List

Message	Meaning	Solution
Failure water pressure!	There is no or too little water pressure on the water supply.	· Check the water pressure of the water supply · Check if the water supply is turned on
Failure air pressure!	There is no or too little compressed air pressure on the compressed air supply.	· Check the pressure of the compressed air supply · Check if the com-pressed air supply is turned on
Failure circuit breaker vacuum pump!	The vacuum pump's circuit breaker in the electric cabinet has tripped. This may turn up in case the vacuum pump gets too hot or the rotor of the vacuum pump is blocked.	· Check the cooling fan of the vacuum pump for its function. If the fan is blocked, remove the dirt and let the vacuum pump cool down. · If the problem turns up again or the rotor is blocked, please contact the supplier's support technician. Do not turn on the pump, if the rotor is blocked since this might damage the pump severely.
Failure power supply heater rod dryer!	The heater rod's circuit breaker in the electric cabinet has tripped. This may happen in case the heater rod pulls too much ampere.	The heater rod needs to be changed. Please contact the supplier's support technician.

Message	Meaning	Solution
Failure power supply 24V/DC	Power supply 24V DC fuse has blown.	Inside the device there is a control cabinet with four lights on. None may be red. If one or more are red, push this red button. If that doesn't help, please contact the supplier's support technician
Failure_Temp_Dryer_not OK!!	The temperature inside the heating tank is not within the limits of the offset. If off-set is set too tight, change the offset to an appropriate value. (we suggests to have the offset at a value of 4 ° C).	· Wait for the temperature to reach the set temperature. · If the temperature inside the tank rises too slowly, please contact your supplier's service technician. It might be a sign for a need of cleaning the heater tank circuit.
Waterlevel Watertank not OK!	The waterlevel in the dryer tank is too low.	· Open the front cover of the device and open the white silicone water tank tube just behind the door. · Fill in demineralized water until the failure notice disappears. Fill in some extra to prevent having to refill it within short time.

PART 9

Operating

9.1. SHEET FORMING

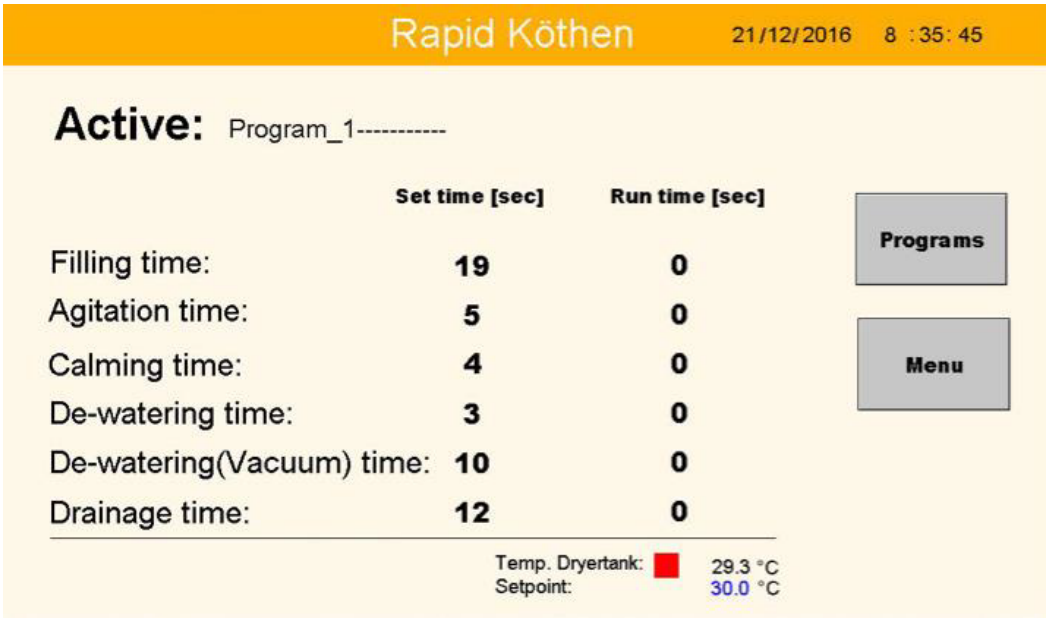


Fig.28

The desired parameters are set via the chosen program which is displayed as “Active” above.

1. If the multi-position switch is turned to 1 pushing the green button will start the automatic mode.

2. The water from the container is pumped into the former column. At the same time the valve permitting fresh water to be pumped into the container is being opened. The container is emptied for as long as the time for this is set. Fresh water comes in until the sensor on top of the container shuts it off.

3. Now the steps are performed: Agitating, calming, dewatering, vacuum suction and draining (as far as the required components are included).

4. In the end, the green buttons stops blinking and show a permanent green light indicating, that the device is ready for another formation process.

The water container is being automatically refilled. The process can only start, when the water level has reached the upper sensor.

PART 10

Maintenance

The personnel responsible for operating and maintaining the equipment must obey all safety warnings and follow all safety procedures established in this manual and safety established in this manual.

10.1. WATER SUPPLY FILTER

The water supply filter needs to be flushed once every month. Depending on the water quality the filter must be cleaned more or less often.

Fig.29

1. Ensure water inflow

2. Turn the blue button on top of the water filter clockwise and let some water rinse through.

3. Turn the blue button counterclockwise until the filter is closed again.

4. Check the function of the filter.

10.2. HEATING WATER FOR DRYERS

The heating water container is free of maintenance as long as it is filled up with demineralized water. Refill the container with demineralized water if necessary. Check regularly, if the container for demineralized water needs to be refilled

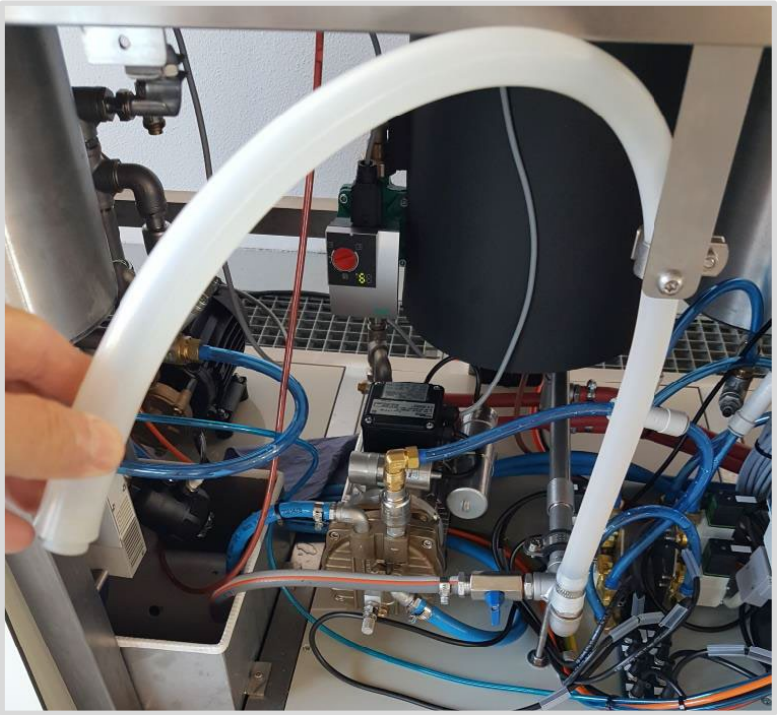


Fig.30

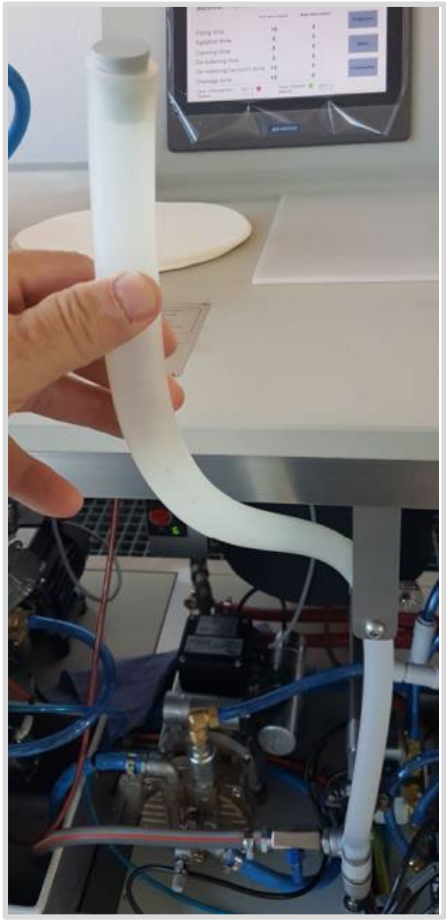


Fig.31

10.3. HEATER FOR PROCESS WATER

Depending on the calcium carbonate content of your process water it might be necessary to decalcify the heater coil at times.

Therefor fill in some citric acid solution (2 %) into the whitewater tank and let it settle. Then open the side tab and rinse the water into a container. Clean the whitewater tank with fresh water afterwards.

Fig.32

10.4. HOSES

Inspect all hoses on a regular basis. Replace the hoses, if any cracks or signs of abrasion appear. In order to guarantee function replace all hoses at intervals of 1—2 years.

10.5. VALVES

The valves are supposed to be free of maintenance. Nevertheless, check the function of the valves and remove any stains of fibers or fillers if necessary.

10.6. SEALS

The seals on the former and dryer should be replaced regularly. Also check the edges of the formed sheets on a regular basis. If the edges show some irregularities, it could mean, that the sheet-size seal is damaged. Exchange the seal in this case (spare seals are delivered with the RK Sheet Former).

10.7. AUTOMATIC VENTILATION OF SINGLE DRYERS

In the Submenu “Properties” ...

Fig.33

... **you will find buttons (Dryer Automatic OPEN).**

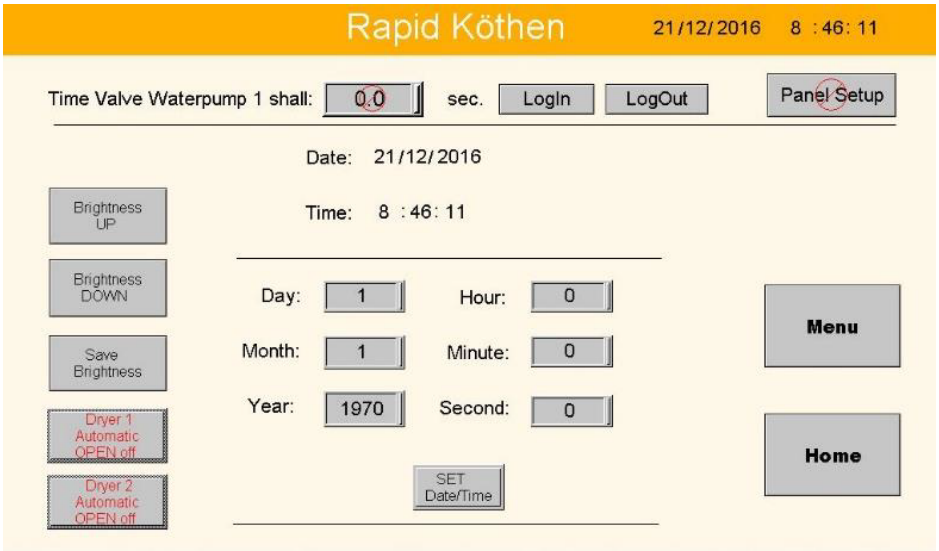


Fig.34

1. Tapping these buttons you can choose to automatically ventilate the dryers. Switch that process off by another tap on the same button.

2. If the automatic ventilation of the dryers is switched on, they will be opened for the pre-set time on the dryer clock. On starting that process a short tone is sounded and soon after that the ventilation system switches on (open the dryers).

3. If the automatic ventilation is switched off, after the pre-set time, a short tone will be sounded. The dryer can now be ventilated manually by pushing the red button (**Error! Reference source not found.**, 11).

10.8. WEAR PARTS AND EXTENSIONS

The following wear parts can be ordered at TECHLAB SYSTEMS:

- Set of sealing
- Nickel sieves for the former
- Pack (1000 pcs) of carrier boards
- Pack (1000 pcs) of cover sheets

PART 11

Technical Specifications - Available Models

11.1. RAPID KÖTHEN WITH AUTOMATIC FORMER

- Top-quality standards
- Built into a sturdy stainless-steel frame
- Former column made from stainless steel
- Built-in water-resistant touch screen control panel
- Fully automatic sheet forming
- Additional 6-position switch to change to manual sheet forming at any time

11.2. RAPID KÖTHEN WITH AUTOMATIC FORMER AND WHITE-WATER RECIRCULATION SYSTEM

- Top-quality standards
- Built into a sturdy stainless-steel frame
- Former column made from stainless steel
- Built-in water-resistant touch screen control panel
- Fully automatic sheet forming
- Additional 6-position switch to change to manual sheet forming at any time
- White-water tank for saving the water used for sheet forming
- White-water heated tank up to 60°C
- Switchable water-source: tab-water or white-water
- Tap on the side to take out the white-water for chemical analysis

11.3. CONNECTIONS

- Electricity: 400 V, 50Hz (other voltages possible)
- Air: 400–600kPa
- Water: Tap water connection is required
- Drainage: Ø 50mm drainage pipe

11.4. SPECIFICATIONS FOR DRYERS

- Dryers are made of stainless steel
- Heated by a heating water circulation system
- Membrane exchangeable
- Dryer water circulation of 3–6 l/min according to standards
- Dryer water temperature (93–97°C according standard): adjustable up to 97°C
- Amount of hand sheets that can be done within one hour (depending on user and grammage):

1 Dryer:	up to 10 Sheets/Hour
2 Dryers:	up to 20 Sheets/Hour
3 Dryers:	up to 30 Sheets/Hour
4 Dryers:	up to 40 Sheets/Hour
5 Dryers:	up to 50 Sheets/Hour

11.5. MODELS, SIZES AND WEIGHTS

Model	Control System	Number of dryers	Dimensions Net W x D x H (mm)	Weight Net (Kg)
RK-0A	A	0	1200 × 760 × 1377	195
RK-1A	A	1	1333 × 760 × 1377	275
RK-2A	A	2	1722 × 760 × 1377	355
RK-3A	A	3	2111 × 760 × 1377	435
RK-4A	A	4	2500 × 760 × 1377	515
RK-5A	A	5	2899 × 760 × 1377	595
RK-0C	C	0	1600 × 760 × 1377	275
RK-1C	C	1	1722 × 760 × 1377	355
RK-2C	C	2	2111 × 760 × 1377	435
RK-3C	C	3	2500 × 760 × 1377	515
RK-4C	C	4	2899 × 760 × 1377	595
RK-5C	C	5	3288 × 760 × 1377	675

Control System: **A** = Automatic, **C** = "Circulation" also automatic but including white water system.

Customised devices, devices with transport ability or devices without dryers are available upon request.

PART 12

Warranty

12.1. WARRANTY TERMS

For additional warranty information, please call or write to the following:

TECHLAB SYSTEMS S.L.
Txatxamendi, 10
Polígono 110
20100 Lezo - SPAIN
Phone: +34 943 470 007

This warranty is subject to the following conditions and is exclusive and in lieu of all other warranties whether written, oral or implied, and is in effect for a period of one year from date of shipment.

· TECHLAB SYSTEMS S.L, will replace faulty/defective parts **free of charge**, at any time our technicians deem it necessary, **labour hours are also free of charge**, but **NOT freight charges (shipment of parts) or travel and maintenance costs of our technicians**, in the event that on-site assistance is needed, and will be paid by the customer.

· We warrant components purchased from outside vendors, and incorporate in our product, to the extent of the manufacturers' warranty. Abuse of components will void the warranty. The original manufacturers' warranty shall be considered void if this equipment is modified, altered, transferred or in any way subjected to changes from the original construction.

· Removal of any protective guards or personal safety devices shall cause this warranty to be null and void.

· Claims for defective components will only be taken into account when there is evidence of correct use of the equipment following all operational recommendations and maintenance procedures, when there is a problem, all communications between the client and our After-Sales Technical Service will be confirmed in writing, as well as if the date is urgently brought forward and the end customer himself carries out the commissioning of any equipment without the presence "on site" of an Engineer of the Technical After-Sales Service of TECHLAB SYSTEMS, the guarantee will only be valid if there is a written authorization from the TECHLAB SYSTEMS Technical After-Sales Service to carry out said commissioning by the client.

· The testing machines that require it must be returned in conditions at expenses paid by the client to our facilities and in no case will we be responsible for damages caused during shipment.

· Of the damages produced during the shipment, the transport company that made the delivery must be informed IMMEDIATELY and as well as TECHLAB SYSTEMS S.L. **within 14 days of receipt of the test equipment at your facilities.**

· Under no circumstances will TECHLAB SYSTEMS S.L. be responsible for damage due to improper handling or damage sustained during installation.

12.2. WARRANTY REGISTRATION

IMPORTANT: PLEASE FILL THIS CARD OUT WITHIN **TEN (10) DAYS** OF RECEIPT OF EQUIPMENT TO VALIDATE WARRANTY.

- MODEL.....
- SERIAL NUMBER.....
- COMPANY.....
- CUSTODIAN/USER OF EQUIP.....
- ADDRESS.....
- CITY.....
- STATE.....
- ZIP.....
- PHONE.....
- E-MAIL.....
- TODAY'S DATE: .....

Please send an e-mail to service@techlabsystems.com

Service Department

TECHLAB SYSTEMS S.L.
Txatxamendi, 10
Polígono 110
20100 Lezo – SPAIN
Phone: +34 943 470 007

Thank you for your purchase!