Contents:

Introduction

The operating manual contains important instructions, descriptions and tips for operation and safety. It is the basis for safe, economic, and problem-free work.

Personnel must be instructed before the machine is commissioned.

Safety First

Whoever works with or on the machine, transports or sets up the machine, commissions or decommissions the machine, maintains or cleans the machine, is obligated to read and observe these safety instructions, guidelines and precautions.
This will prevent injuries and damage to the machine, material and environment. Furthermore, any claim in accordance with EU machine guideline 2006/42/EG is nullified if the machine is used improperly.

This grinding and polishing machine is for technical reasons equipped with line filters. This filters could cause an incremented spare discharge current. ATM GmbH guarantees that this increased values will not affect the functionality of the machine nor the operator's security.

This operating manual is a component part of the delivered device.

Made in Germany.

EG Conformity Declaration

EU Conformity Declaration (2006/42/EG Appendix II, 2004/108/EG and 2006/95/EG Appendix III) - Machines EMC and low voltage.

We herewith declare that the machine designated below in its concept and design as well as in the construction we have placed in circulation corresponds to the fundamental safety and health requirements of the EU machine guideline, and that it satisfies all relevant norms. This declaration loses its validity if the machine is modified without our consent.

Machine designation:

Grinding and polishing machine

Machine type:

Saphir 560

Machine number:

.....

Year of manufacture:

.....

Applied harmonized norms, in particular:

EN 12100; EN 13218

Manufacturer's address:

GMBH
Emil-Reinert Str. 2
57636 Mammelzen (Germany)

Date, signature (position of the signer):

10.05.2010 (CEO)

Guarantee

The manufacturer assumes neither liability nor guarantee if:

- The instructions contained in the transport, installation and operating manual are not observed.
- The machine, including additional fixtures, is operated improperly and is not properly maintained and repaired.
- Any technical or functional modifications have been made that are not authorized by the manufacturer.

Intended Use

The **Saphir 560** is an electronically controlled grinding and polishing machine that is designed exclusively to execute grinding and polishing work of embedded or non-embedded samples automatically or manually.

This applies as well for all options available for the machine.

If the **Saphir 560** is not used for the intent listed here then no safe operation of the machine can be ensured. This applies as improper use.

The owner/operator of the machine, not the manufacturer, is liable for all personal injuries and property damages that occur from improper use.

The grinding and polishing machine is configured for:

The mechanical preparation of many metallic and non-metallic materials.
The use of all ATM grinding and polishing cloths / papers and foils up to ∅ 300 mm.
ATM GmbH makes no warranty of success if other media are used.

Intended use also includes the reading of this operating manual, as well as compliance with all instructions contained therein – particularly the safety instructions.

Explanation of the safety symbols and "notice" signs used in the manual

The following safety symbols are used in this manual. Primarily these symbols serve to alert the reader to the safety instructions accompanying the symbol.

This symbol indicates that hazards to life and health exist.

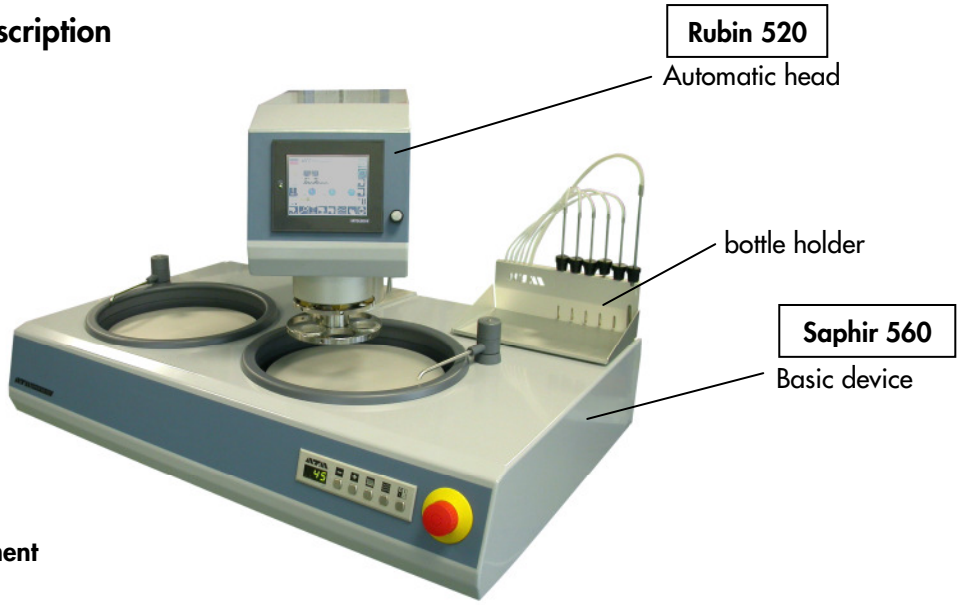
This symbol indicates that hazards exist for machine, material, or environment.

This symbol identifies explanations that contribute to better understanding of the machine processes and is "notice" sign for important information.

This symbol identifies situations that require notification of the authorized service organization.

Table of Contents

1 Product Description



1.1 Machine

1.1.1 Basic equipment

- Automatic water shut-off and basin rinsing
- Variable speed of the work wheel
- Splash protection ring and dust protection lid
- Graphic touch screen for simple operation with sequence and program saving
- Selectable single and central contact pressure

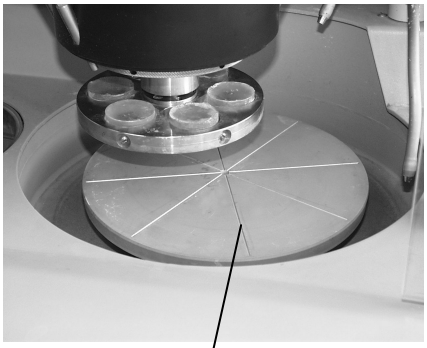
1.1.2 Technical Data

Power connection	230 Volt / 50 Hz 1 Phase
Power connection (option)	110 Volt / 60 Hz 1 Phase
Power supply fusing	16 Ampere
Connected load	1.8 KW
working wheel drive power (each wheel)	0.75 KW
Sample automation drive power	0.15 KW
working wheel	Ø 200 -300 mm
working wheel speed	50-600 RPM
Sample holder clockwise/counter clockwise rotational speed	120 RPM
Single pressure	1-6 samples, Ø 50
Central pressure	according to the sample holder
Sample pressure (single)	5-100N
Sample pressure (central)	20-400N
Noise emission	max. 63 dA when idling
Dimensions (W x D x H)	1020x530-630x660 mm
Total weight	120 kg
Permitted ambient temperature	10-40°C
Input pressure	at least 6.5 bar

1.1.3 Saphir 560 with Vacu-Jet

The Vacu-Jet is an anchoring system for wet grinding paper, polishing cloths and diamond foil, which holds the media in place, non-slip and flat, by generating a vacuum. Thus bonding and clamping wet grinding paper is not required.

The paper can also be simply released, quickly and without damage. Polishing cloths and diamond grinding wheels are attached to a support and thus they can be quickly changed on the Vacu-Jet.



Vacuum suction grills

Position paper

Activate Vacu-Jet

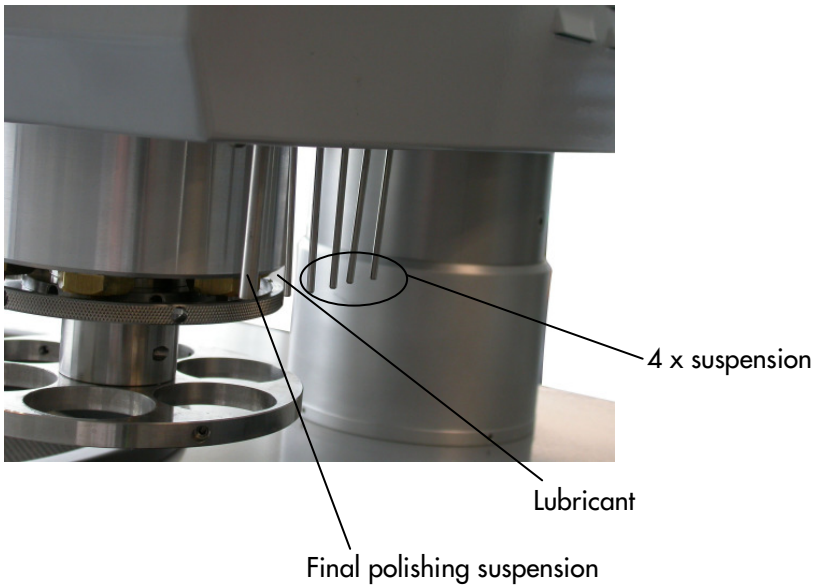
Paper is anchored non-slip and flat

The Vacu-Jet anchoring system is a user-friendly innovation that enables simple, timesaving, material-protecting, and space-saving work when grinding and polishing.

1.1.4 Options

1.1.4.1 Dosing system

The microprocessor-controlled dosing system is integrated in the device.



The dosing system for applying diamond suspensions and lubricants is equipped with:

- programmable dosing interval.
- adjustable dosing time (pump time),
- three separate units 1 x lubricant, 4 x suspension and 1 x final polishing suspension
- exact drop dosing (uncontrolled dripping is prevented by suctioning back the residual liquid)

The dosing system is programmed via the controller and offers a uniform and automated processing sequence of the polishing process with six connections for suspension vessels or lubricants. (In this regard, please note the extensive ATM offering of diamond suspensions).

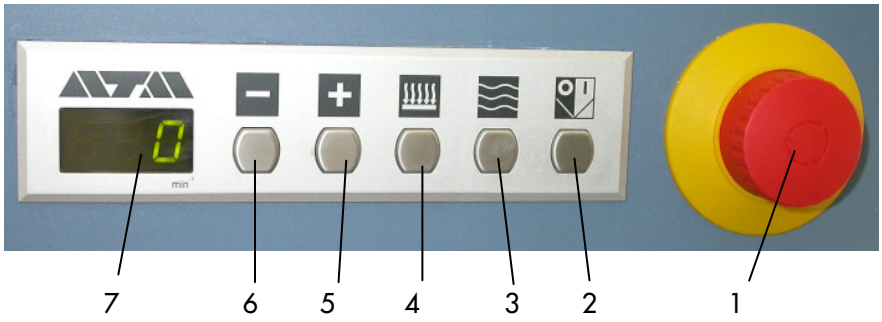
1.1.4.2 Sedimentation container

The movable aluminium sedimentation container for the settling of grinding abrasion consists of a two-chamber system with overflow. An inlet sieve is hooked into the first chamber to collect larger grinding residues.

2 Operation

Caution: Before starting to work, you must know the general safety instructions in chapter 5!

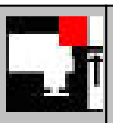
2.1 Control elements



1) **Emergency stop:** with the emergency push-button you can stop the machine from each operating condition (in case of danger)

2)  Program sequence Start / Stop

- Automatic operation is started with this button when the automatic head is in the working area and at the working height.



This symbol appears on the display when automatic operation is started and the automatic head is in the top position. The automatic head must be moved down so that the automatic mode starts in order to start the grinding process.

- If the automatic head is outside the working area, the grinding disc is activated with this button and grinding can be done manually.

3)  Water ON / OFF (manual operation)

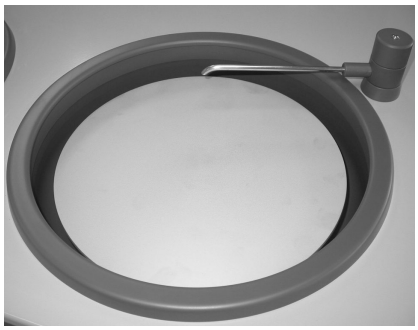
4)  Vacu-Jet ON /OFF (only at Saphir 560 with Vacu-Jet)

- Vacu-Jet only can start in case of " Vacu-Jet level ok"
- Vacu-Jet only can switch on/off with speed "0"
- Vacu-Jet pump always runs for 5 min. by activate the machine

5 + 6) with  and  adjust RPM.
Increase or decrease the speed by touching briefly.
If the button is depressed for two seconds then the RPS increase or decrease to the next specified RPM level.
RPM levels: 50; 150; 300; 600 RPM

7) Display for current speed

Automatic function



If the working wheel is first switched on, and then the water is switched on, the device will also switch off the water when switching off the working wheel. When the working wheel starts again, then the water will switch on again.

To deactivate this automatic function,
the water must be first switched off and then
working wheel must be switched off.

The water jet strength is adjusted manually with the turn knob, just like with a normal rinsing tap.

To clean the basin and the working wheel the rinsing tap can be pulled out.

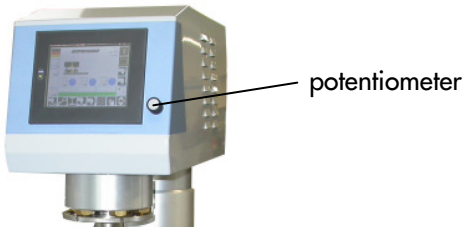
2.2 Operating the controller

Fundamentals

The display is fitted with a touch screen (touch sensitive screen surface). Touching an icon or a numeric value will select the symbol or numeric value and highlight it in yellow.

15 seconds before the program ends, you will hear a signal.

Setting numeric values:
Select the numeric field you want to set (becomes yellow or blinks)
Adjust numeric value by turning the potentiometer.
Touch the pad again to confirm the selected value

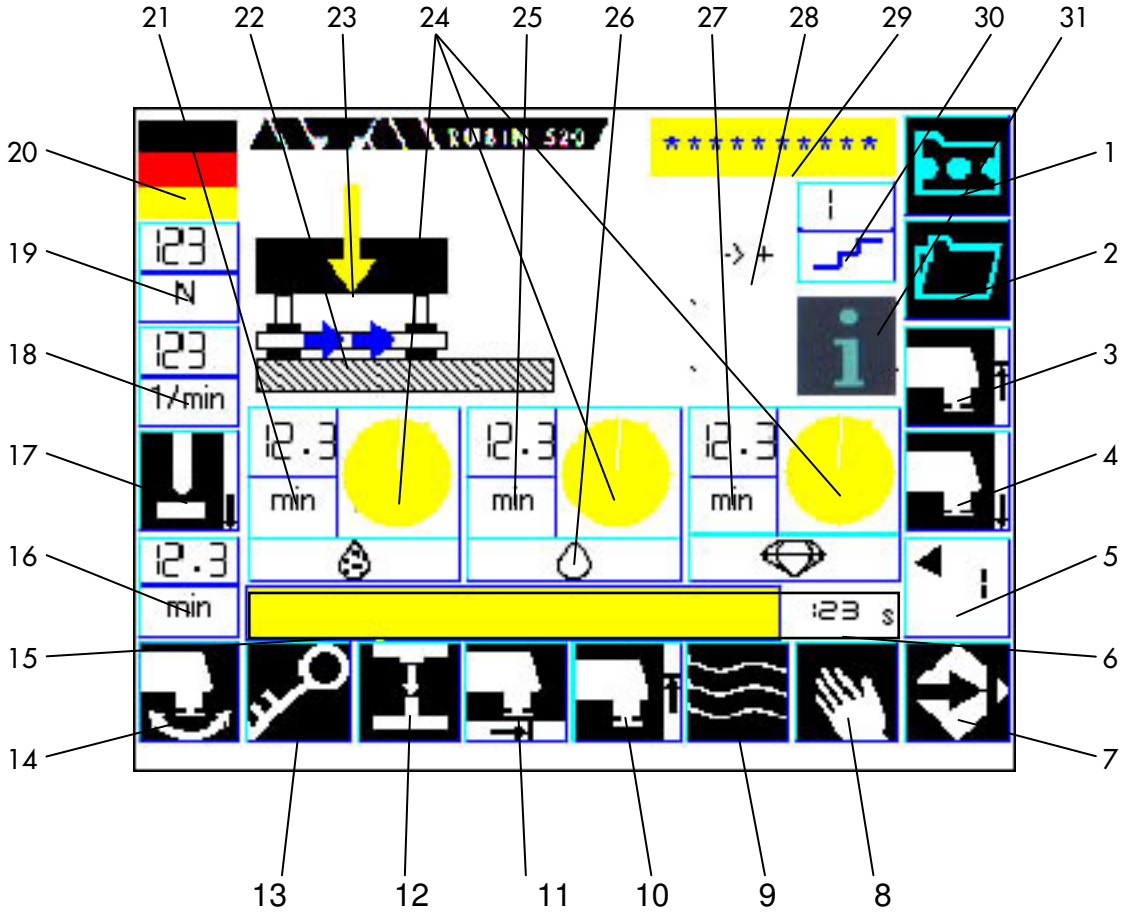


Dosing process
The dosing process consists of:

- dosing time — the liquid is pumped onto the work wheel.
- Suction time — The liquid is suctioned back to prevent uncontrolled liquid application.
- Interval time — Time between the liquid applications.

Working area:

The machine automatically recognises when the automatic head is in the working area. Working area means the area where the automatic head can work on the grinding discs. The automatic head only starts if it is in the working area. If the working head is not in this area, i.e. outside the working area, only the grinding discs start up when the machine is started and the samples can be machined manually. The usual swivel position of the automatic head for manual operation is between both the grinding discs.



1) Save program: Set numbers (0-49) and 2 seconds to confirm (signal)

2) Call-up program: Set the appropriate program number and hold 2 seconds to confirm.

3) Raise automatic head manually
   - Pressing briefly Head moves up
   - hold two seconds: Head travels on its own to the upper end point.

4) Lower automatic head manually

5) Select diamond suspension 1-4 press again to go to next suspension

6) 1234 s Program sequence time countdown in seconds

7) Program interruption:
   - Program sequence is interrupted
   - through renewed activation the program continues to run

8) Manual operation - see under 2.2.1

9) Water ON / OFF (turn knob on the rinsing tap must be opened)
In the case of pre-selection, water will switch to automatic mode.
(see automatic mode above)

10) Memory function for vertical head movement in this work step.
- hold two seconds (signal): The icon field turns yellow and is activated

At each subsequent lowering of the head via button 4 it will be stopped at this point.

11) Memory function for swivel movement in this work step.
el. stop for automatic head swing left / right

- Move Automatic head all the way up with key 3
- Activate key 14 and hold
- Swing automatic head manually to the desired position
- Hold key 11 for two seconds (signal). The symbol field turns yellow and is activated

At each subsequent swinging of the head it will be stopped automatically at this point.

12) Tension / release sample holder

First grip sample holder firmly with the hand then release!!

13) Service settings - see under 2.2.3

14) Hand brake - swing automatic head
must be held while the head is swung to release the brake.
In the upper-most position the automatic head remains released until swinging into the memory position, or until it is activated again.

Do not exceed the electrical locks when moving the automatic head!

15) graphic display of the program sequence time

16) Processing time in this work step (28)

17) Manually lower the pistons (single and central). Allows an optimal height adjustment of the automatic head.

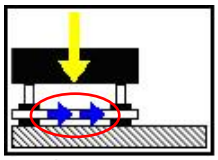
18) working wheel speed: Can also be set on the key board with − and +

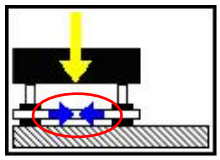
19) Enter pressure in Newton
(it will be automatically converted and displayed when selecting single pressure or central pressure (21).
Initial pressure - see service settings under 2.2.2

20)  Country of origin: no setting possibilities

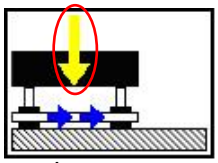
21) End polishing suspension interval time (dosing suction time - see under 2.2.2)

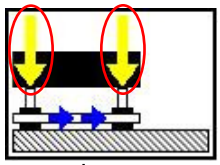
22) Sample holder left right movement (switching by jogging the arrows)


synchronous operation


Reverse rotation

23) single central contact pressure (switching through tipping the arrows) (Shift the adjusting ring - see 2.2.3)

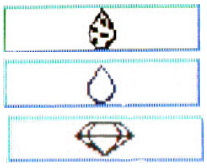

Single pressure


Central pressure

24)  manual dosing: During the program run you can also dose by touching the time display, this resets the interval time.

25) Lubricant interval time: Adjust time until the next lubricant application

26) Activate dosing


Final polishing suspension
Lubricant
Suspension (select 1-4)

27) Lubricant interval time: Adjust time until the next suspension application

28) Select program number (0-49) activate by pressing (1), select program by pressing (2)

29) indicatin, aktual loadet program.

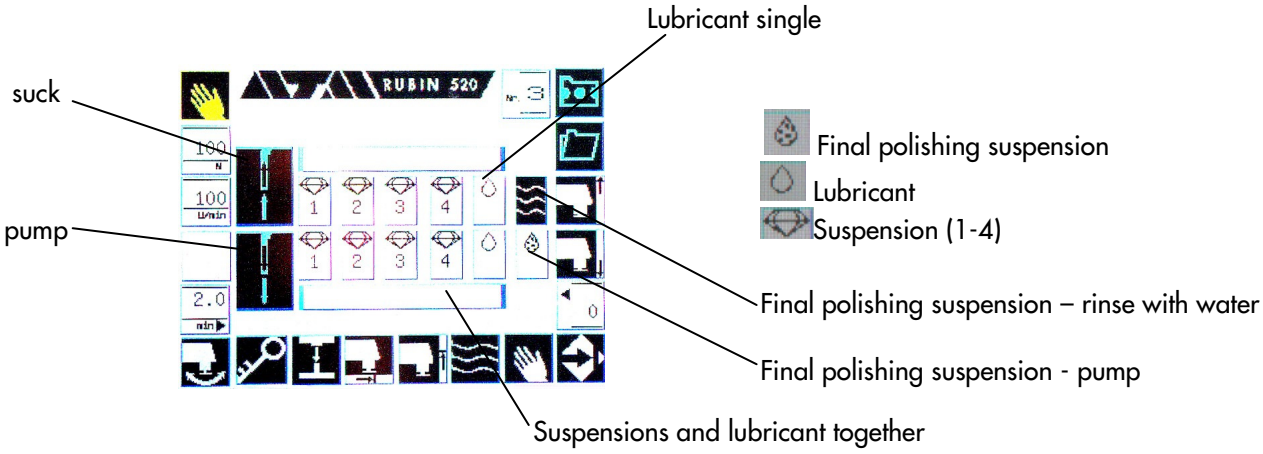
30) work steps

- after completing a work step the program will switch to the next one automatically work steps with a time setting of 0 seconds will be skipped.
- the work step specified in 28 is the last one (and will not be continued automatically)

31) Notes menu:
Pressing this symbol opens a submenu where notes can be entered and saved.

2.2.1 Manual operation

By activating (8) the following menu opens.
The pumps can be individually or collectively activated manually for cleaning the dosing system.



If you use EPOSIL M suspension: You must flush with water before the crystallization process to prevent the pipes from clogging up!

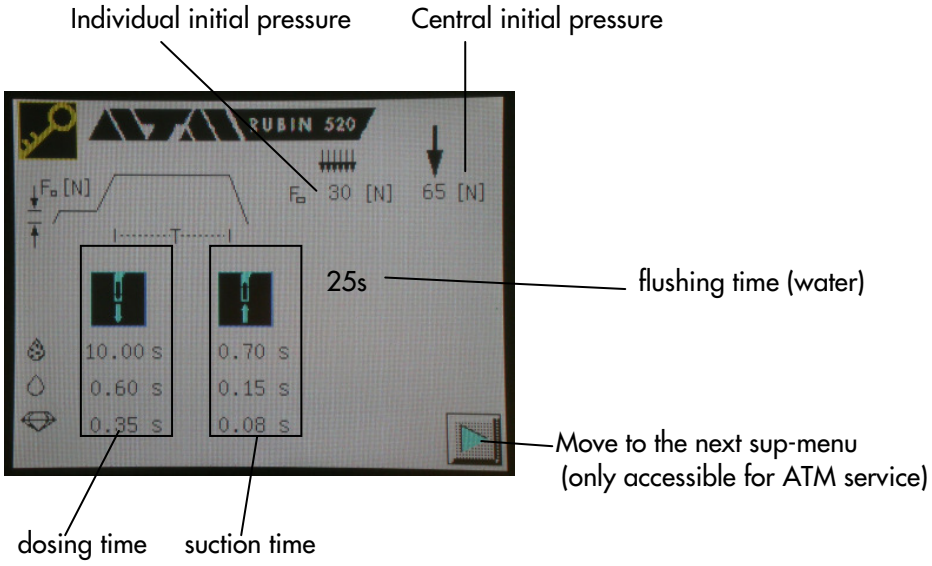
I

2.2.2 Service settings

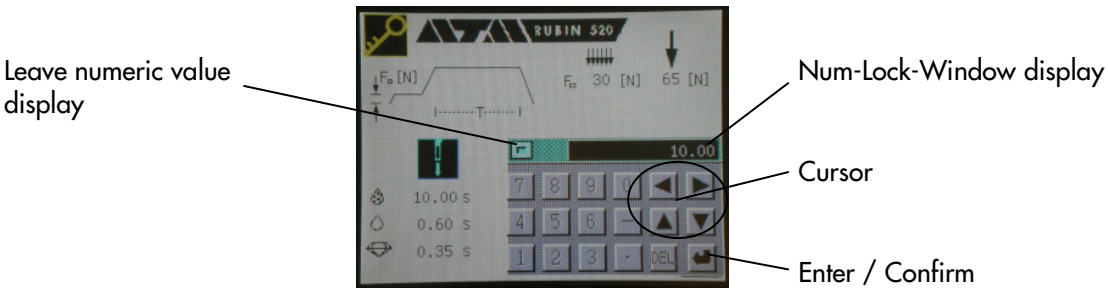
By activating  (13) the following sub-menu opens.

Setting possibilities:

- Start pressure — to avoid tilting the sample, or damages when positioning, the pressure set in control panel 19 is dissipated only after discharge of the initial pressure.
- Dosing time — time in which the liquid is pumped onto the working wheel
- Suction time — time in which the liquid is sucked back to prevent an uncontrolled liquid application.

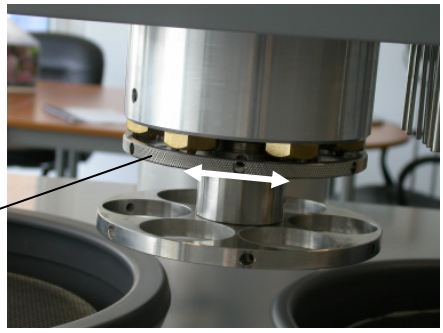


Numeric values are entered in this submenu via a num-lock window.



2.2.3 Single pressure – central pressure

If single pressure / central pressure is selected (22), then the adjusting ring must be turned 30° until it clicks into place.



2.2.4 Programming example

Key no.	Programming step	Set value example
27	Set program number	12
28	Set work step for grinding	1
22	Single pressure (shift adjustment ring)	
21	Synchronous or reverse rotation	
19	Contact pressure	25 N
18	Speed	150 RPM
16	Processing time	1 Min
9	Water ON	
25	Deactivate lubricant and suspension	
4	Move to work height	
17	Optimize distance (3 and 4)	
10	Activate memory function	

- automatic program sequence with operating element key 2 start or continue to further program the next work step.

Key no.	Programming step	Set value example
28	Work step	2
16	Processing time	5 Min
9	Water OFF	
24	Lubricant	1.3 Min
26	Suspension	1.5 Min
5	Select suspension bottle	3
25	Activate lubricant and suspension	

- Start automatic program sequence with operating element 2.

3 Maintenance and Care

Before starting with the maintenance and cleaning work the General Safety Instructions in chapter 5 must be known!

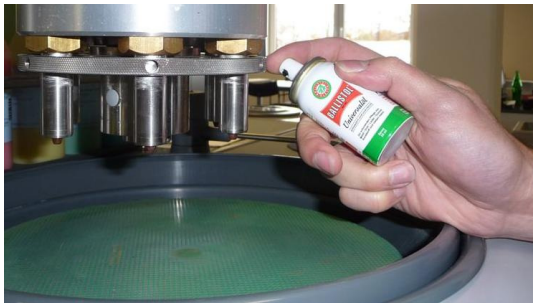
3.1 Maintenance

For the most part the Saphir 560 is maintenance-free if the machine is thoroughly cleaned at least once a week.

Every six months the support wheel should be loosened at the 4 hexagonal screws, and the grinding abrasion under the wheel should be removed.

The water container of the Vacu-Jet system (only at Saphir 560 with Vacu-Jet) must be emptied resp. pumped out when the level reaches maximum fill height, see chapter 4, Malfunctions and Measures.

To preserve smooth-running single pressure pistons, we recommend regular oiling. Activate single pressure mode (pistons come out) and clean the pistons with a soft and fluff-free cloth from oil residues. Keep a distance of 5-10 cm and spray on some universal oil (order no. 95003345). Afterwards deactivate single pressure mode (pistons retract).



3.2 Care

The service life of the device increases with proper care!

- Under no circumstances should you clean the device with compressed air or with high-pressure cleaners (steam jet). Shavings and abrasions can get into guides, spindle bearings and seals, and can damage these components.
- Prevent the inner casing from water.
- Wipe off the exterior of the casing and the work surface using a wet, lint-free, cloth and an off-the-shelf, non-alkaline, cleaner.

4 Malfunctions and Measures

Before starting of maintenance the General Safety Instructions in chapter 5 must be known!

Resolve a malfunction only if you have the specified qualifications.

ATM service must be contacted for measures with this symbol ✆ . (phone no.: see chapter 7.1). Please have the machine number at hand.

4.1 Empty Vacu-Jet (only at Saphir 560 with Vacu-Jet)

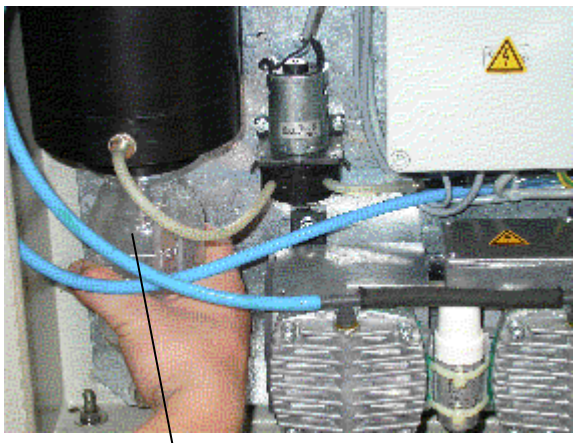
The suctioned water is captured in a glass container when vacuuming the grinding and polishing media through the Vacu-Jet system. When the container is full the fault message :"E005" appears on the screen for Vacu-Jet level.

In case of trouble with the Vacu-Jet level the drive stops and the Vacu-Jet pump stop automatically goes out.
The Vacu-Jet pump runs on and on until level switch notify ok, additionally it runs 5 min. more.

empty the container manual

Before you can empty the container, you must pump off some water at least to the top edge of the container.

- Turn on Vacu-Jet (exhaust pump is running)
- Don't put water on the working wheel
- When you can see the fill level:
- Turn off electricity
- Open Vacu-Jet cabinet
- Unscrew the glass container by turning to the left
- Empty container
- Screw on the glass container by turning to the right
- Close door



Glass container

4.2 Errors, causes, and their resolution

Malfunction	Cause	Measure
No device function at all	The main switch is off	Turn on the main switch
	Power plug not connected	Check the connection
	Machine damage	
Working wheel does not start	drive motor defective	
	Drive belt defective	Replace drive belt
No water supply	Main tap not opened	Open the main tap
	Electric valve defective	
Work wheel does not run flat	Dirt between the working wheel and support wheel	Clean or replace if necessary
Automatic head does not swing, or swings only with difficulty	Input pressure too low	Set the minimum pressure to 6.5 bar

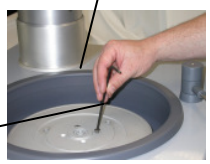
4.3 Malfunction messages on the display

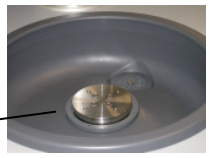
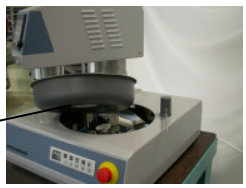
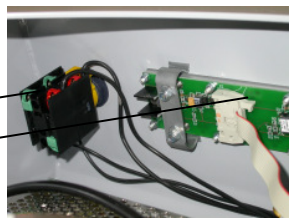
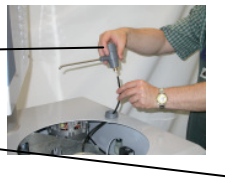
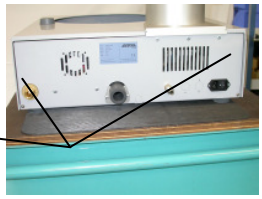
Error no.	Malfunction message	Cause	Measure
E004	Sample motor Malfunction	Overload	Let the device cool down
		Motor defective	
E002	Grinding wheel motor Malfunction left	Overload	Let the device cool down
		Motor defective	
E003	Grinding wheel motor Malfunction right	Overload	Let the device cool down
		Motor defective	
E005	Vacu-Jet water container	Water container full	Pump off resp. empty - see above
E001	Input pressure not in order.	Air pressure too low	Set the minimum pressure to 6.5 bar
E006	Height adjustment drive blocked	Automatic head touches working wheel	Move head up manually
E007	Automatic head out of swivel range	Head is overwinded	Turn back manually

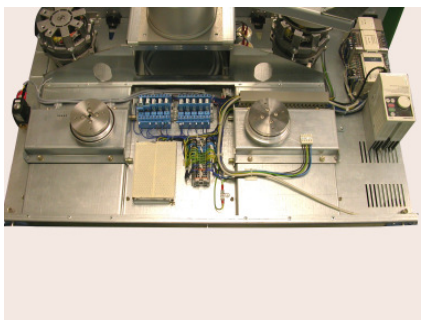
4.4 Assembly instructions for the cabinet

- move up the automatic head
- Swivel head to one side
- switch off machine
- pull out the main plug
- take out the working wheel
- loosen the carrier wheel (4x M6)
- take out the carrier wheel
- take out the protection ring
- unscrew the plastic ring with the hook-wrench (wrench is included)
- take out the plastic bowl and the drain tube
- (don't lose the o-ring under the bottom of the bowl)
- move the emergency stop button slightly left and pull out
- push apart terminals of keyboard plug (upper terminal up, lower terminal down) take off earth cable
- pull out tap and remove the tube
- remove 2x M4 screws on the back
- remove cabinet in front direction

protection ring

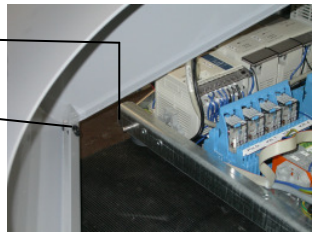








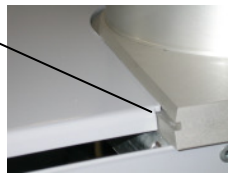
All machine modules are easily accessible and clearly arranged.

Cabinet installation

- unscrew outlet neck with fixture (2x M4)



- insert cabinet from front,
  insert the two pegs in
  the rubber sleeve
  move cabinet into guiding slot
- unscrew 2x M4 on back
- put in emergency stop and move it slightly right



- put in plug for key pad and close the clips
- put in earth cable
- connect tap with tube, put in tap
- put in plastic bowl (control seat of o-ring)
- put in outlet neck and screw on fixture
- screw on plastic ring hand-tight by hook-wrench
- put in carrier wheel and screw on
- put on protection ring
- put on working wheel
- perform a check of all functions and a safety test (emergency stop)

5 General Safety Instructions

ATM machines and devices are built in accordance with EG Machine guideline 98/37/EU in accordance with the latest state of the technology and they ensure the highest degree of safety.

This safety can however only be attained in operational practice if all measures required for safety are in place. It is the proper obligation of the owner/operator of the machine to plan these measures and monitor their execution.

In addition the following must be complied with:
- the work protection law with its legal ordinances
- the EU direction for usage of means for work (AMBR)
- the Accident Prevention guidelines BGV or
- the national operating and testing guidelines.

5.1 Basic safety measures

5.1.1 Ensure that information is available

This operating manual should always be kept complete and in legible condition at the device. It must be ensured that all persons who must be active on the machine can consult the operating manual at any time. Supplemental corporate instructions in the sense of the German Occupational Safety Law and the German Work Material Use Ordinance should be provided along with this operating manual.

All safety warning signs and operating signs on the machine must be maintained in a legible condition. Damaged or illegible signs must be replaced immediately.

5.1.2 Before starting

Familiarize yourself sufficiently with

- the control elements of the machine
- the machine equipment
- the manner in which the machine works
- the immediate vicinity of the machine
- emergency measures

Check the machine for visible damage before starting the machine.
Deficiencies that are noted must be resolved immediately or supervisory personnel must be notified of these deficiencies.
The machine may only be operated in a problem-free, functional, condition.

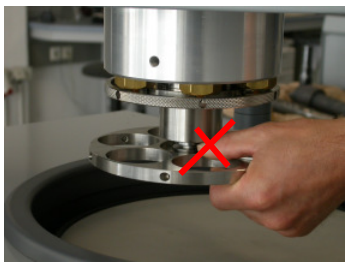
5.1.3 After Work

- The water supply has to be turned off after working with the machine.

5.1.4 In Normal Operation

Any intervention in the running machine movements is prohibited, either manually or via auxiliary material.





Processed samples can be sharp-edged. Do not touch the grinding surface during the grinding process!

Avoid getting suspensions, polishing, cleaning and operating materials in the eyes or in open wounds. (Observe manufacturer's information and the instructions on safety data sheets)

A rinsing device for eyes must be in the direct vicinity of the machine as a special preventative measure for the suspensions, cleaning substances and operating materials used.

When operating the machine and handling operating materials dust or vapors can escape. Ensure adequate ventilation.

Exercise particular caution when using lightly flammable liquids (such as ethanol).
- Keep ignition sources away from the machine
- Do not smoke
- Sufficient ventilation

5.2 Safety - service, maintenance and care

First switch off the central power supply with the main switch and unplug the main plug.

Replace all machine parts that are not in perfect condition.

Only use the original replacement parts that are listed in our replacement part list.

Please note that we do not approve parts and special equipment, which we have not supplied, for use on the machine.

Only authorized specialists may execute repair work – the Accident Prevention Guidelines must be observed.

Welding work is forbidden on the machine because this can destroy electronic components.

5.3 Safety when working on electrical fittings

Work on live machine parts, or lines, is forbidden.

Unplug the main plug before opening the housing lid.

Only trained electricians are allowed to work on the electrical equipment of the machine!

Never clean electrical equipment with water or similar liquids.

Check electrical fixtures regularly: Tighten loose connections – damaged lines or cable must be replaced immediately.

Additionally the Accident Prevention Guidelines BGV A2 (or the respective national guidelines for electrical devices and devices) must be observed!

5.4 Environmental protection

Pay attention to waste avoidance and proper recycling or disposal in all work on and with the machine.

All substances used – oils, lubricants, cleaning agents etc. may not contaminate the soil or reach waterways. They must be handled professionally and disposed of in an environmentally responsible manner.

Comply with the instructions on the respective storage containers and safety data sheets.

End of life return
The device supplied to you by ATM is affected by the European Guideline 2002/96/EG and corresponding adoptions to national law of EU countries (in Germany: ElektroG). Therefore it is possible to return the device at the end of its life for an environmentally sound disposal.

In case of disposal the following regulations apply:
1. The device may not reach regular unsorted industrial waste.
2. The device is (concerning to the WEEE) for industrial usage only. It is not allowed to dispose it the same way as an electronic consumer device (e. g. standard PC, washing machine etc), by taking it to the local collecting points.
Please contact ATM or your local sales agency for any disposal matters.

The WEEE symbol (crossed out trash can with underline) on your device indicates a generally WEEE relevant device with special regulations for disposal. In some EU countries (e. g. Germany) this symbol is not obligatory for industrial devices. However, ATM applies this symbol the same way in all European countries. This symbol does NOT indicate a disposal at local collecting points!

If you agreed with your local sales agency or ATM to dispose the device yourself, please ensure a proper disposal in agreement with the WEEE regulations. Please inform your local sales agency or ATM after the process has been completed and provide the recycling data unless you reported the information to your local waste management authorities yourself.

Please also dispose spare parts and accumulators (if applicable) according to the legal regulations in case you do not return them to ATM.

5.5 Changes to the machine

ATM GmbH, Mammelzen, must approve planned changes in writing.

Only ATM GmbH may execute all interventions and changes to the operating parameters of the frequency converter.

5.6 Operating personnel requirements

Only personnel that have been trained to operate the machine and who are authorized to do so should operate the machine. These individuals must be familiar with the operating manual and act accordingly.

5.7 Safety when transporting, setting up, commissioning and decommissioning

The general Accident Prevention Guidelines (BGV A1 or the respective national guidelines) must be complied with when transporting the machine.

Comply with the transport instructions on the packaging

The machine may only be lifted on the machine base.

Ensure that the machine is not jolted as this can damage electronic components.

All machine components – cable, hoses, and pipelines – must be routed in such a manner that they do not become stumbling hazards!

Check the electrical connection and water connection before starting for the first time.

6 Transport and Setup

Before starting with the transport and setup of the machine, the General Safety instructions in chapter 5 must known!

6.1 Transport

For the most part the device is secured against transport damages. However as electronic components can be damaged through transport, the instructions attached to the crating must be strictly observed.

UP – do not tip

Caution - fragile

keep dry

The machine may only be lifted together with the pallet.
Storage conditions: Store in a dry location at an ambient temperature between 10-40°C

6.2 Delivery Condition

Inspect the packaging material for external damages before opening the transport packaging. The freight forwarder making the delivery or our service hotline must be notified immediately of any damages.

Use the delivery note to verify that all accessories are present.

6.3 Technical Prerequisites

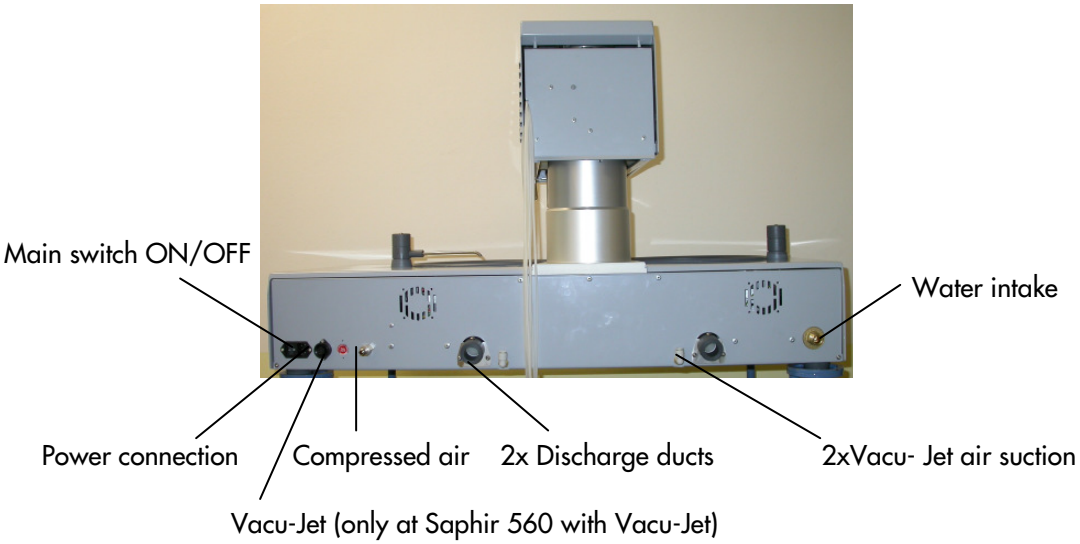
A few prerequisites must be satisfied before the Saphir 560 can be setup.

Please ensure that:

- The available power sources are adequate in Ampere and Volt. (See the machine's name plate.)
- The space required for the machine is sufficient
- The substructure is stable and even.
- Water connection and drainage are present.
- An eye rinsing device is within reach in case of emergency
- A compressed air connection with air filter (5 µm max.) and water separator is present. The treated air (at least 6.5 bar) may **not** have oil added.

6.4 Setting up and connecting the device

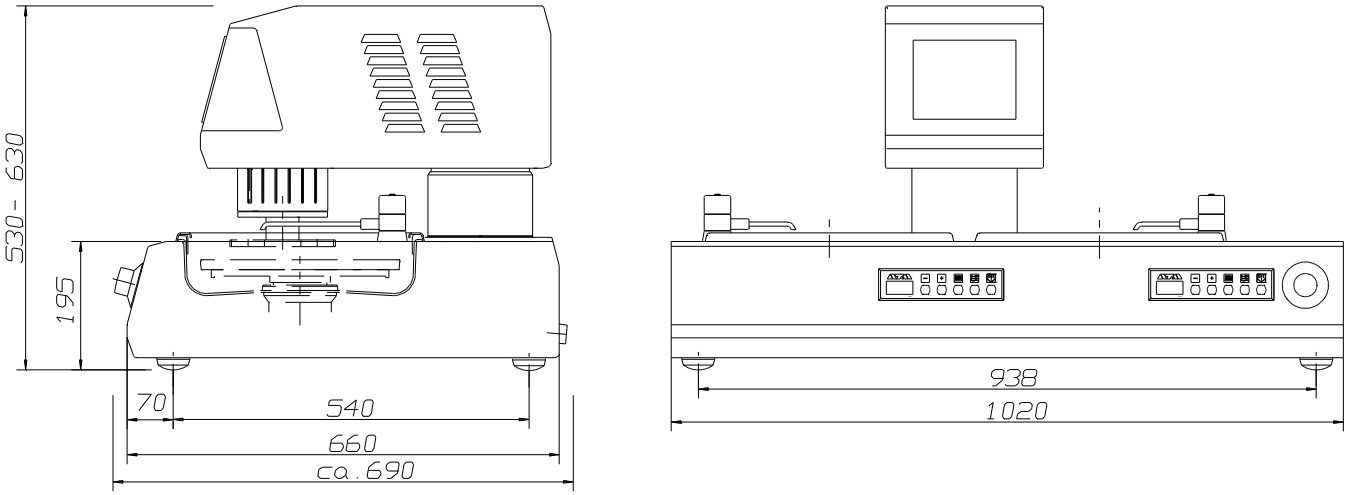
The connections



- Plug the power cable into an appropriate outlet (see Technical Data)
- Connect compressed air
- Connect water feed connection (½" thread) to the water supply.
- Connect the drain ducts of the machine (Ø 40) to the drainpipe or to a hose with consistent slope.
  The wastewater must be captured in a suitable container and disposed of in accordance with the specifications on the safety data sheets of the liquids used.
  Small amounts of wastewater from the grinding and polishing station can be introduced into the standard drainage system after consultation with the responsible government agency and with due consideration of the local and government agency guidelines.

  Grinding abrasion should be channeled through a sedimentation basin. (Order number: A5800051 two-chamber system 45-litres laboratory system)

After proper connection the Saphir 560 is ready for operation.



7 Additional Information

7.1 ATM contacts and customer service

Do you have any questions or enquiries? We would be pleased to help you.
For further information please contact our local representative.

7.2 Internet

Visit us on the Internet at:

http://www.atm-m.com

Here you will find current information about our entire product line.

7.3 Accessories, devices and consumables

We would like to provide a few suggestions as to how you can obtain even more benefit from your Saphir 560 with the following information.

7.3.1 Grinding and polishing media

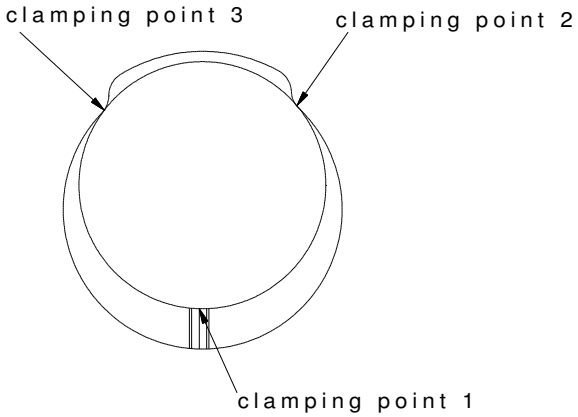
Diamond grinding foils, Zirconium-corundum grinding paper, silicon-carbide wet grinding paper, diamond suspensions, diamond pastes, diamond sprays, lubricant, alumina, fine polishing suspensions, polishing cloths
and other accessories with order numbers and prices can be found in our catalogue.

7.3.2 Sample holder and accessories

ATM offers a full line of standard sample holders and special dimensions for single pressure and central pressure. For more in this regard please request our catalogue.

7.3.2.1 Three-point clamping central pressure

Three-point clamping prevents tilting of the sample and ensures optimal clamping.



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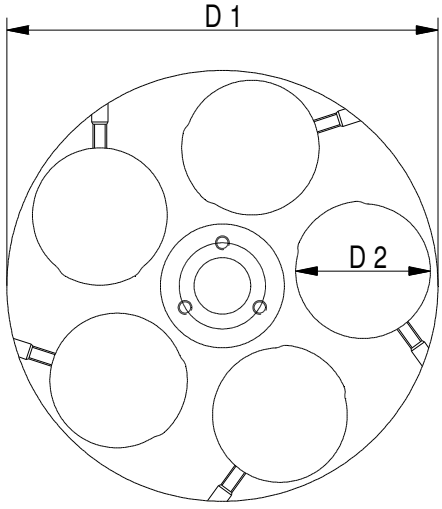
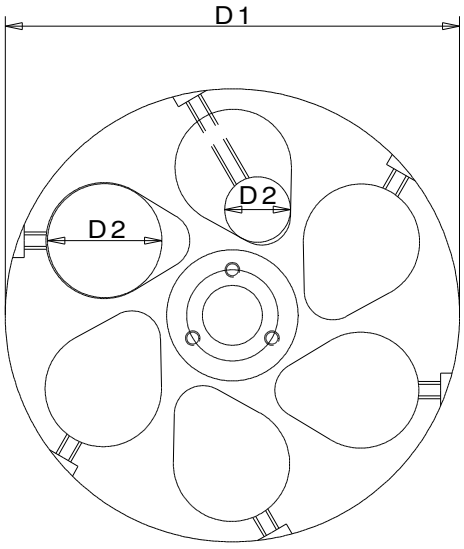
Stainless steel sample holder.

Item no.	Samples	D1	D2
Z5400156	5	160	50
Z5400157	6	160	40
Z5400158	6	160	38
Z5400159	9	160	32
Z5400160	9	160	30
Z5400161	12	160	25



7.3.2.2 Teardrop form central pressure

The teardrop form as sample holder covers multiple diameters concurrently and has the advantages of three-point clamping

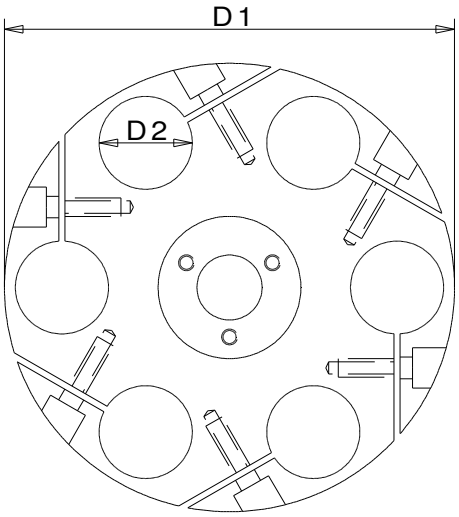


Aluminium sample holder.

item no.	samples	D1	D2
Z5400081	6	160	20-40
Z5400187	12	184	18-32

7.3.2.3 Slotted form central pressure

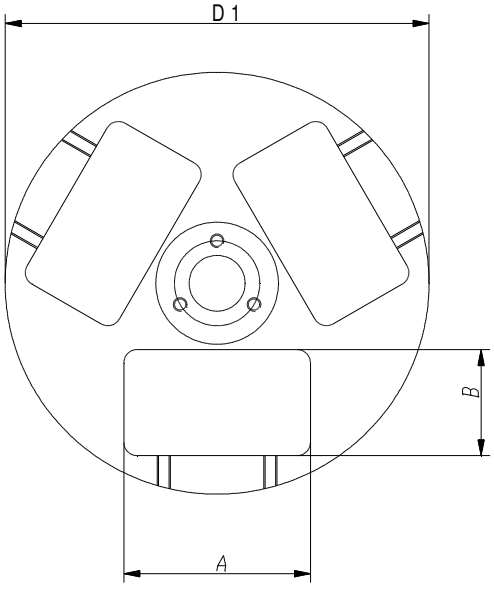
For the slotted form sample the sample tensioned in circumference.



Aluminium sample holder

Item no.	Samples	D1	D2
Z5400136	6	145	30
Z5400165	6	145	40
Z5400199	9	160	30

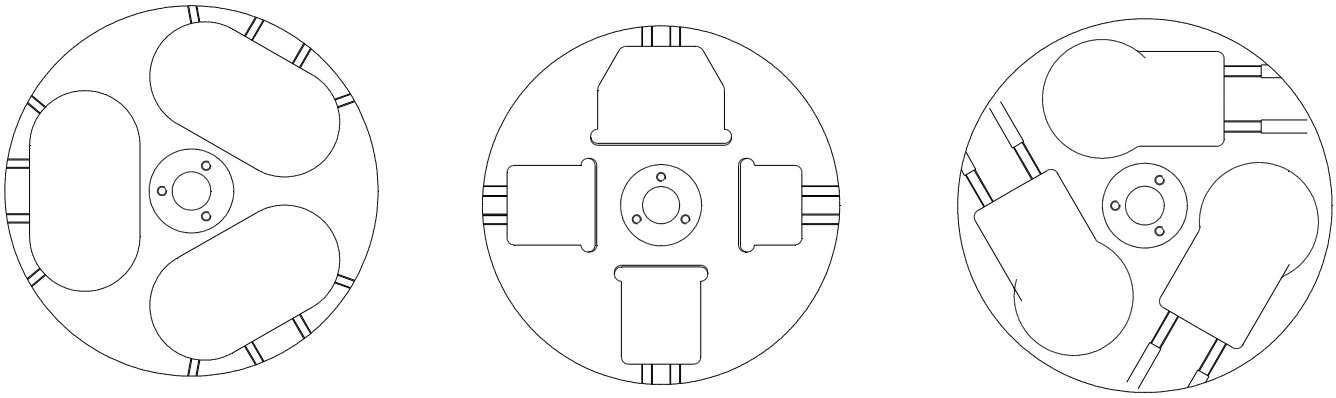
7.3.2.4 Rectangular sample holder with central pressure



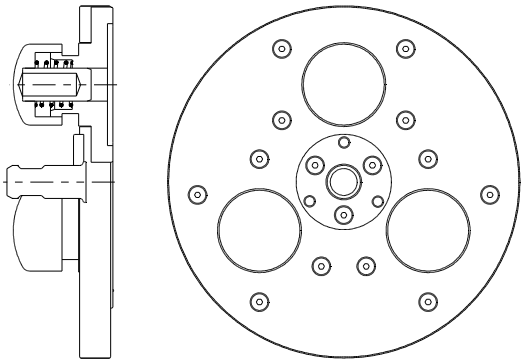
Item no	Samples	D1	A x B
Z5400206	2	184	85x45
Z5400167	3	160	80x40
Z5400170	3	160	40x70
Z5400207	3	184	65x35
Z5400189	4	218	50x71
Z5400148	6	160	25x34

7.3.2.5 Special sample holder

Examples of special sample holders:

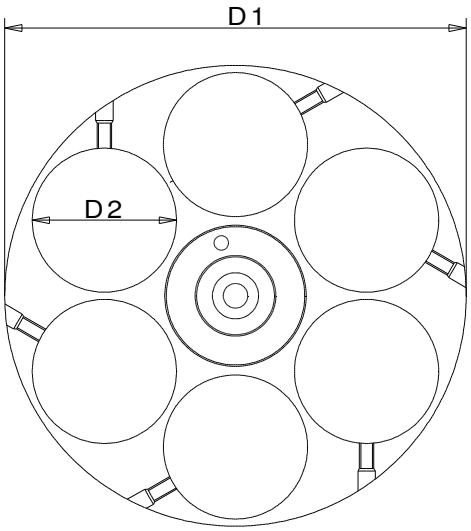


Example special sample holder for thin-section samples



Other special sample holders available on request

7.3.2.6 Single pressure

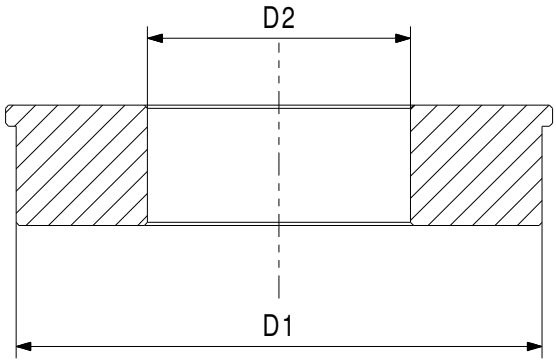


Stainless steel sample holders.

Item no.	Samples	D1	D2
Z5400087	6	160	50

For the single pressure each sample is pressed with a stamp. The appropriate spacer ring must be used to tension other sample diameters.

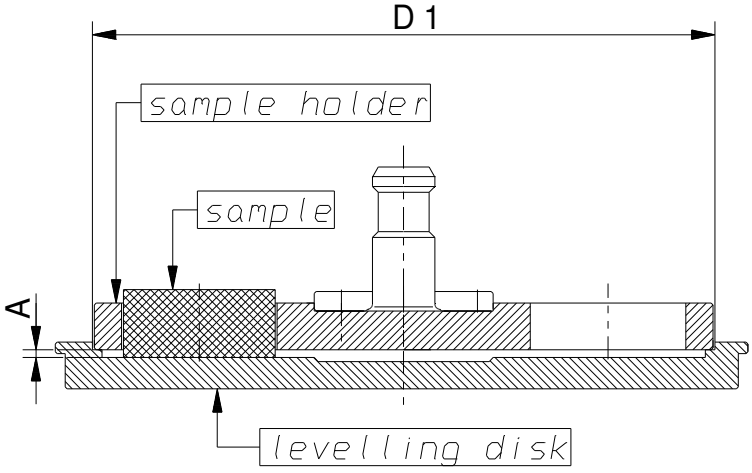
7.3.2.7 Spacer rings for single pressure sample holdes



Aluminium spacer rings

Item no.	Set	D1	D2
05400086	6	50	25
05400085	6	50	30
05400084	6	50	32 1 1/4"
05400083	6	50	38 1 ½"
05400082	6	50	40

7.3.2.8 Levelling disks for central pressure

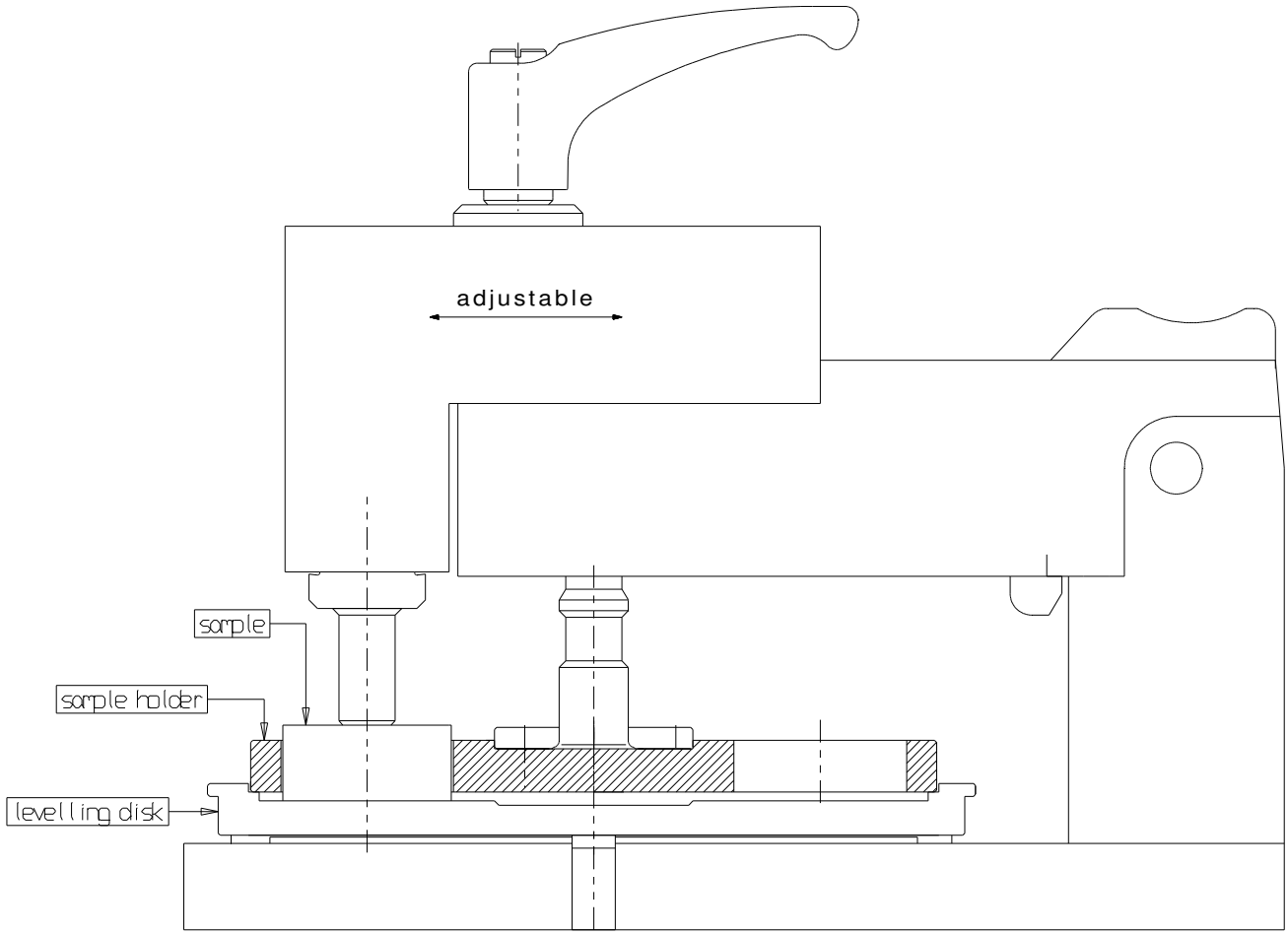


Item no.	D1	A
05400114	160	2
05400201	160	3
05400205	160	10
05400188	184	2
05400194	203	2
05400204	203	10
05400192	217	2

Other levelling disks are available on request.

7.3.2.9 Levelling device

The sample holder is uniformly pressed onto the levelling wheel with the levelling device and each individual sample is pneumatically pressed. In this regard the samples must be anchored in the sample holder.
Aligning the samples with the levelling device sets them at the same level.



7.4 Replacement parts and parts subject to wear

Part lists of individual assemblies and electrical diagrams are available on request.

Replacement parts and parts subject to wear can be ordered if the machine number is specified.