Operating Instructions for Rotor Beater Mill Type SR 200

Retsch®

Guide to Operating Instructions

The present operating instructions for the rotor beater mill of the type SR 200 give all the information necessary for the areas indicated in the table of contents. They give instructions to the target group(s) defined for the respective areas on how to handle the SR 200 in a safe and proper fashion. Knowledge of the relevant chapters is, for the respective target group(s), a prerequisite for safe and proper handling. The present technical documentation is a work of reference and a training manual. Each of the individual chapters is an independent unit. These operating instructions do not include any repair instructions. In the case of any necessary repairs, please contact your supplier or Retsch GmbH directly.

Safety

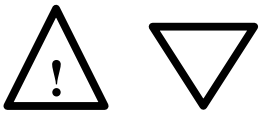
Target group: All persons concerned in any way with the machine.

The SR 200 is a highly modern, efficient product from Retsch GmbH. It is state of the art. If the user handles the machine in a proper fashion and with knowledge of the technical documentation present here, it is completely safe operationally.

Safety instructions
You, as the operator, must ensure that the persons instructed to work with the SR 200:

- have noted and understood all the regulations for the safety area,
- know all instructions for what action to take as well as the regulations of the relevant target groups before work is commenced,
- have access to the technical documentation at all times and without problem,
- that new personnel is familiarised before commencement of work on the SR 200 with the safe and proper handling either by a verbal introduction from a competent person and/or by means of the present technical documentation.
- Improper operation can result in personal injury and damage to property. You are responsible for your own safety and that of your personnel.
- Ensure that no unauthorised persons have access to the SR 200.

For your own protection, make sure that you are given confirmation that your personnel have received instruction in the use of the SR 200. You will find a draft of a related form after the chapter on safety.



We exclude any claims for compensation for material damage and personal injury caused by non-observance of the following safety instructions.

Warning signs
We give warnings using the following symbols:

Personal injury

Material damage

Repairs
These operating instructions do not include any repair instructions. For your own safety, repairs may only be carried out by Retsch GmbH or an authorised agent (service technicians).

Should the need arise, please notify:

the Retsch agency in your country
your supplier
Retsch GmbH directly

Your service address:

_____

_____

_____

_____

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Confirmation

I have noted the foreword and the chapter on safety.

_____
Operator's signature

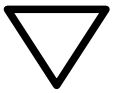
_____
Service technician's signature

Technical Data

Machine type designation: SR 200

Application in the case of proper use

For uses where very frequently different materials have to be ground and it is necessary to open the door to clean the grinding chamber after every grinding operation.
The SR 200 is not designed as a production machine, but as a laboratory unit, meant for 8-hour single-shift operation.
The SR 200 crushes dry, soft to medium-hard materials with a hardness of up to about 4 according to Mohs.



Do not make any modifications to the machine and use only RETSCH approved spares and accessories.
Failure to comply will invalidate the CE declaration and guarantee.

It is especially suitable for the materials listed below:

Chemicals	Fertiliser	Drugs	Dolomite
Flue ash	Fruit	Animal feed	Gypsum
Vegetables	Corn	Spices	Artificial resins
Limestone	Kaolin	Potassium salts	Coal
	Pellets	Plants	Seeds
Salts	Tobacco	Peat	Cellulose

and many other, similar materials.

The achievable end fineness depends on the hold width of the sieve and the crushing properties of the material to be ground. In favourable cases it is possible to achieve finenesses of < 60 µm.

For further information, please contact our application laboratory.

Drive
1-phase AC motor with brake or
Three-phase current motor with brake

Speed
2850min^{-1} at 50Hz
3420min^{-1} at 60Hz

Rated power
1100 Watt

Feed grain size
max. 15mm
With single-piece feed also up to 20mm

Volume of collecting pan
5,000 ml or
30,000ml

Noise data
Noise measurement according to DIN 45635-31-01-KL3
Noise data are dependent on the fracturing properties fo the product beeing ground.
Example:
Sound power level: L_{WA} = 86 dB(A)
Workplace-related emission L_{pAeq} = 81 dB(A)
Operating conditions:
Ring sieve : 0,5mm
Sample material: rye, grain size up to 15 mm
Filling ratio of grinding chamber: feeding quantity each until motor rated power is reached.

Type of protection
IP 54

Unit dimensions

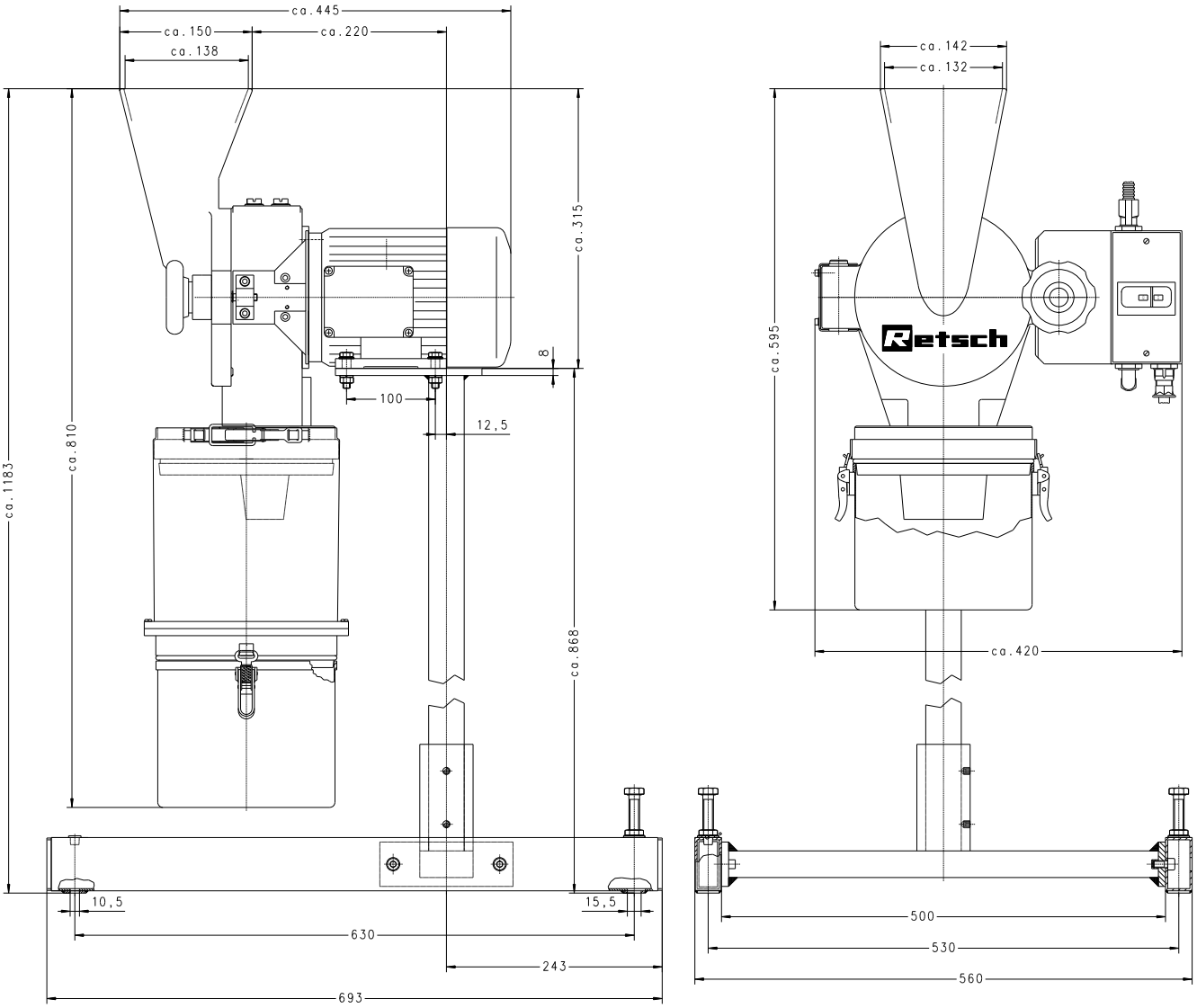
Height approx.560	Width approx.420	Depth approx.445
with underframe		
Height approx..1183	Width approx.560	Depth approx.700
with underframe and DR 100		
Height approx.1443	Width approx.560	Depth approx.700

Unit weights

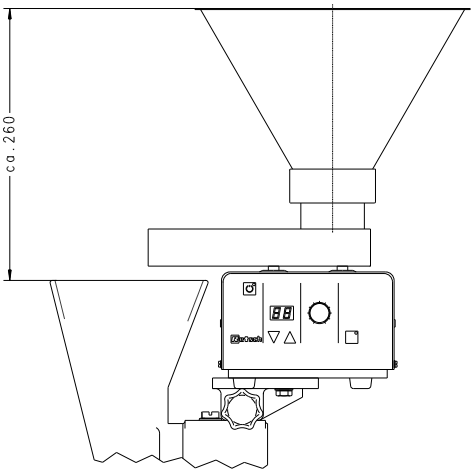
SR 200	net approx. 35kg
with underframe	net approx. 57kg
with underframe and DR 100	net approx. 65kg

Required standing area
(700 mm x 560 mm; no safety distances necessary!)

Dimensions Sheet



with DR 100/75



Transport and setting up

Target group: Operators, Forwarders, Users

Packing
The packing is adjusted to the transport route. It complies with the generally applicable packing regulations.

Please keep the packing for the whole of the guarantee period. If, in the case of a complaint, the unit is returned in inadequate packing, your guarantee rights may be jeopardised.

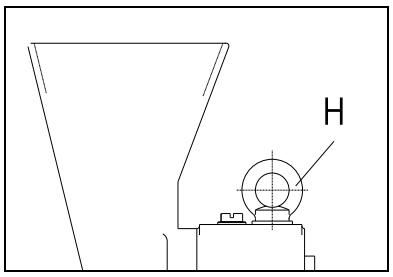


Fig.1

Transport
To transport the SR 200 use the ring bolt **H**. **Fig.1**

The SR 200 may not be subjected to shocks, shaken or thrown during transport. Otherwise the electrical and mechanical components may be damaged.

Temperature fluctuations

In the case of major temperature fluctuations (e.g. with transportation by air), the SR 200 must be protected against condensation. Otherwise the electrical components may be damaged.

Intermediate storage
Ensure that the SR 200 is also kept dry when subject to intermediate storage.

Parameters for setting-up location

Ambient temperature
The ambient temperature should be between 5°C and 40°C.

When the ambient temperature exceeds or falls below that specified, the electronic and mechanical components may be damaged, and performance data changed to an unknown extent.

Relative humidity
Maximum relative humidity 80 % at temperatures of 31°C, falling in a linear fashion to 50 % relative humidity at 40°C.

At higher humidity, the electronic and mechanical components may be damaged, and performance data changed to an unknown extent.

Setting-up altitude
max. 2000 m above sea level

Setting up with underframe

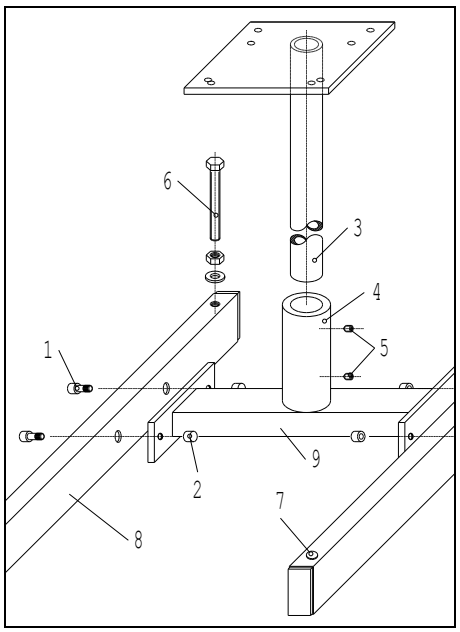


Fig.2

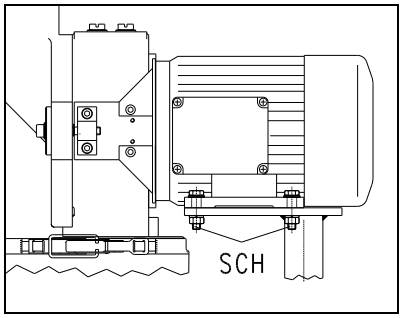


Fig.3

We recommend that the SR 200 be mounted on an underframe, which can be supplied as an accessory. **Fig.2**

Mounting:

* Connect centre cross-piece **9** base side pieces **8** using the cylinder-head screws **1**
* Push covering caps **2** onto the projecting thread
* Place stand tube **3** in the sleeve **4** and fasten tight with the headless screws **5**
* If necessary, the underframe can be aligned using the cylinder-head screws **6**

So as to be able to fasten the underframe with screws, maximum diam. 10mm possible, to the ground, the two setting screws **6** and the front plastic caps **7** must be removed.

* Place SR 200 on the underframe **Fig.3**
* To fasten hexagon-head bolts **SCH** M8x35 supplied with the underframe, use spring washers and hexagon nuts

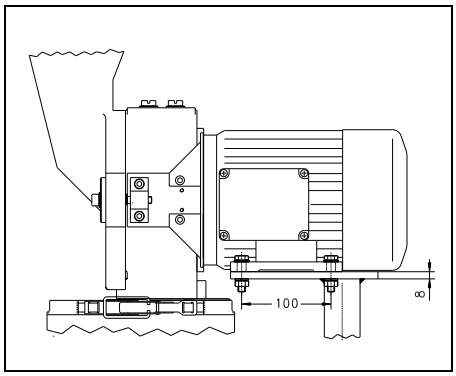


Fig.4

Setting up on the laboratory table

You can also mount the SR 200 on your laboratory table. **Fig.4**

* Measure thickness of laboratory table. The thickness should not be less than 30mm to ensure that safe working with the SR 200 is not adversely affected.
* Use screws with a max. diam. of 8mm and a length of laboratory table thickness + 25mm
* Stand the SR 200 on the table
* Draw holes for the table using the holes present in the motor of the SR 200

The distance from the holes to the front edge of the table must be such that it is possible without difficulty to mount and dismount the collecting pan or the filter hose.

Electrical connection

The electrical connection may only be made by an electrician.

* The voltage and frequency of the SR 200 can be found on the nameplate.
* Ensure that the values agree with the applicable power supply.
* Connect the SR 200 to the power supply using the connection cable supplied.

The power cable supplied does not have a plug because the type of plug depends on the setting-up location and the relevant regulations in the country concerned

* When connecting the power cable to the power supply, provide an external fuse in accordance with the regulations of the setting-up location.

If the values on the nameplate are not observed, electronic and mechanical components may be damaged.
Before operating for the first time, the direction of rotation must be checked, see rotation arrow on the motor. If the direction of rotation is incorrect the grinding will be inadequate and mechanical parts may be damaged.

Operation

Target group: Users

Operating elements and operation
Graphic view of the operating elements:

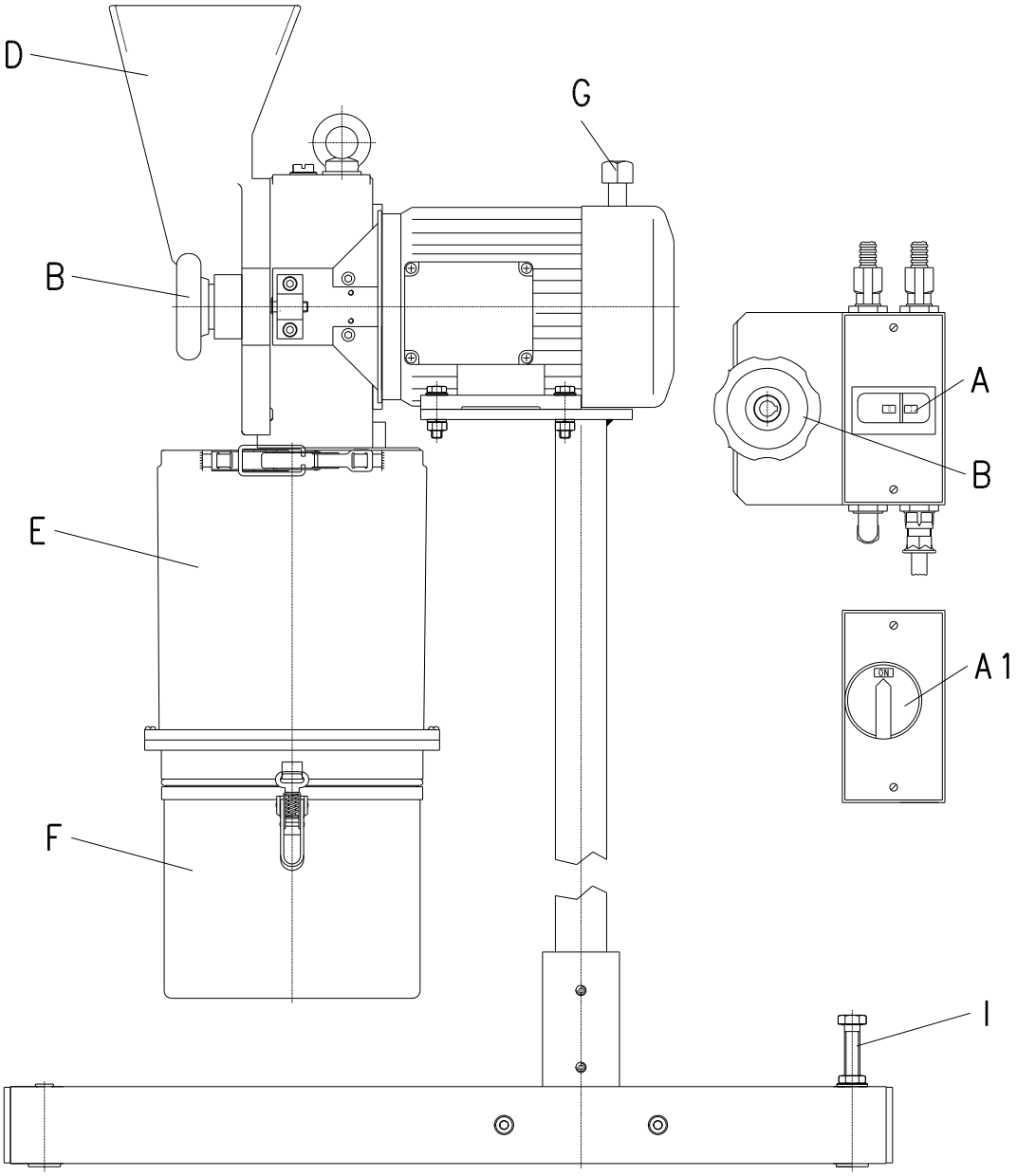
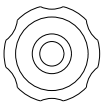
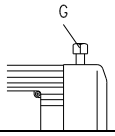
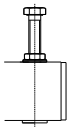


Fig.5

Operating elements and their function

Overview of operating elements

Item	Element	Figure	Function
A	Power switch with ON/OFF button		Isolates and connects the SR 200 from/with the power supply **I** depressed = SR 200 is switched on **0** depressed = SR 200 is switched off
A1	Power switch with knob		Isolates and connects the SR 200 from/with the power supply **ON** = SR 200 is switched on **OFF** = SR 200 is switched off
B	Door lock		Opens and closes the door of the SR 200, clamps the door seal Depressed and turned clockwise = locks the door Depressed and turned anticlockwise = opens the door
D	Feed funnel at door		Takes the material to be crushed, but is not used to store this material. Reliably prevents the material to be crushed from splashing back.
E	Filter hose	Page 15	Prevents build-up of the air pressure generated by the rotating rotor and thus accelerates material throughput.
F	5l collecting pan	Page 15	Takes the crushed material.
G	Release lever for motor brake		When pressed to the rear, facilitates release of the motor brake and thus makes it possible to rotate the rotor manually for cleaning purposes.
H	Transport screw		Prevents damage to mechanical and electrical components during transport.
I	Setting screws on underframe		Make it possible to align the underframe when the floor is not even. When screwed out, they expose the openings with which it is possible to fasten the underframe to the floor, diam. 10mm

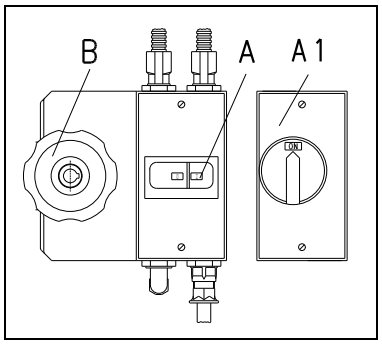


Fig.6

Opening and closing of mill housing

Only open when the SR 200 is switched off.

* Press button **0** on power switch **A** or, with **A1**, turn to **OFF** position **Fig.6**
* Press hand wheel **B** and turn in anticlockwise direction
* Hand wheel locks into end position
* the door can be opened
* close in reverse order

Only close the door when the contact surfaces are absolutely free of material to be crushed or other contaminants. **Mechanical components and the seal may be damaged.**
Do not open the SR 200 when motor is running. **When crushing toxic or otherwise health-endangering materials, there is a danger that health-hazardous dust may be inhaled.**
Do not open the SR 200 and release the motor brake at the same time. **Danger of injury from unbraked rotor.**

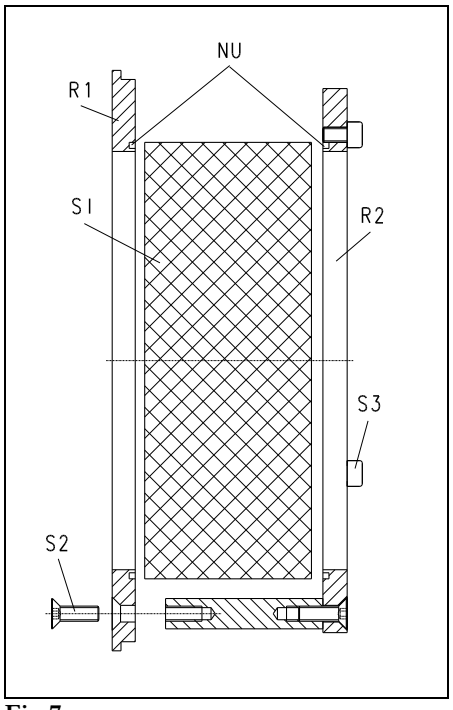


Fig.7

Insert sieve frame 360° with ring sieve

A selection of sieve frames which are chromium-plated, of stainless steel and ring sieves of stainless steel with Conidur or round perforations are available as accessories. **Fig.7**

Conidur	0.08/0.12/0.20/0.25/0.50/ 0.75/1.0/1.25/1.5/2.0mm
Round hole	3.0/4.0/5.0/6.0/8.0/10.0mm

* Undo screws **S2**
* Remove ring **R1** and insert sieve **SI** in the groove **NU** of the ring **R2**
* Carefully mount the ring **R1** until the sieve **SI** slides in the groove **NU**
* Turn in screws **S2** and tighten well
* Open door
* Insert sieve frame with ring sieve, ring **R1** is to the front and ring **R2** to the rear
* Screw heads **S3** on the ring **R2** belong to the holes of the mill housing
* Close door

Ensure that a collecting pan is mounted.

* Start the SR 200

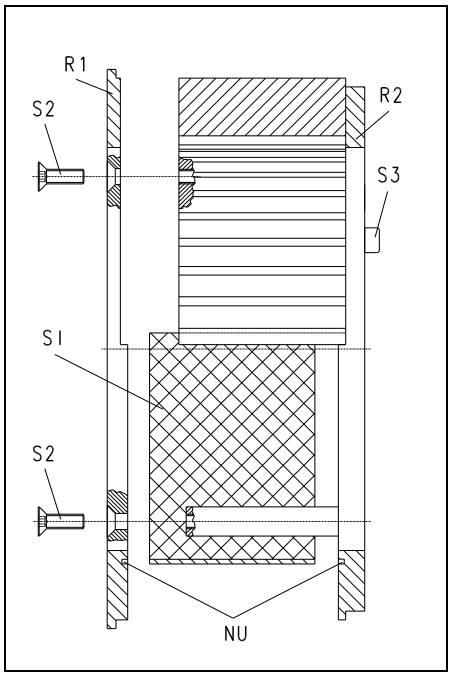


Fig.8

Insert grinding insert 180° with frame and sieve insert

A selection of grinding inserts with frames and sieve inserts of stainless steel with Conidur or round perforations are available as accessories. **Fig.8**

Conidur	0.08/0.12/0.20/0.25/0.50/ 0.75/1.0/1.25/1.5/2.0mm
Round hole	3.0/4.0/5.0/6.0/8.0/10.0mm

* Undo screws **S2**
* Remove ring **R1** and insert sieve **SI** in the groove **NU** of the ring **R2**
* Carefully mount the ring **R1** until the sieve **SI** slides in the groove **NU**
* Turn in screws **S2** and tighten well
* Open door
* Insert sieve frame with ring sieve, ring **R1** is to the front and ring **R2** to the rear
* Insert sieve frame with ring sieve, ring **R1** is to the front and ring **R2** to the rear
* Screw heads **S3** on the ring **R2** belong to the holes of the mill housing
* Close door

Ensure that a collecting pan is mounted.

* Start the SR 200

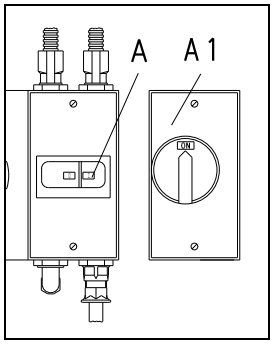


Fig.9

Start or stop the SR 200

The SR 200 is started or stopped at the power switch **A** or **A1**. **Fig.9**

* Insert sieve frame or grinding insert
* Close door
* Mount collecting pan

Start

* Press button ● "I" on switch **A** or turn knob on switch **A1** to ● "ON"

Stop

* Press button ●"0" on switch **A** or turn knob on switch **A1** ● "OFF"

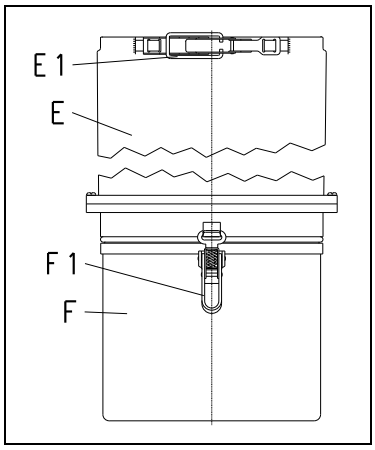


Fig.10

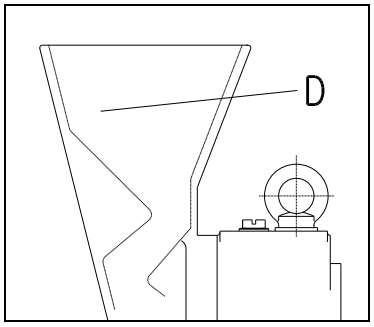


Fig.11

Filter hose and collecting pan

With the use of a cloth filter hose or a Conidur filter, available as an accessory, between the SR 200 and the collecting pan, the air stream caused by the rotating rotor is taken off and conveyed downward to the material discharge. Furthermore, it accelerates the material throughput and ensures a gentle crushing process. **Fig.10**

* Push filter hose **E** over the flange while holding the clamping clip at an angle.
* Clamp the lock **E1**
* Hang in the collecting pan **F**
* Clamp the locks **F1**

If the collecting pan is mounted without a filter hose, it can be expected that dust will escape from the feed funnel **D**, and so you should never operate the SR 200 without a filter hose or Conidur filter.

Feed material to be crushed

The maximum feed grain size should not exceed 15mm.
For batch or continuous operation, the SR 200 can be retrofitted with a 30l plastic collecting receptacle and a feed device of the type DR 100/75, which are available as accessories.

* Close the SR 200 and switch on
* Slowly feed the material to be crushed into the feed funnel **D** **Fig.11**

The rebound safeguard installed in the feed funnel **D** prevents the feed material from bouncing back. **Fig.11**

▽	Only feed the material to be crushed into the feed funnel slowly and continuously with the SR 200 running. **The material to be crushed or excessive feed quantity can bring the SR 200 to a standstill and this may damage mechanical components.**
!	During crushing, material in dust form may escape from the feed funnel. In the case of toxic or otherwise health-hazardous materials, use an extraction device. **Danger from inhalation of health-hazardous dust.**
!	Many materials form explosive air mixtures. Check the properties of the material you are crushing. **Explosion hazard!**

Assembly of feed device

When feeding larger quantities, it is advisable in general to feed the material to be crushed evenly using a feed device. This largely prevents any unnecessary load on the grinding tools and reduces possible friction heat. An appropriate means of ensuring even material feed is use of the feed device of the type DR 100/75, which is available as an accessory. **Fig.15**

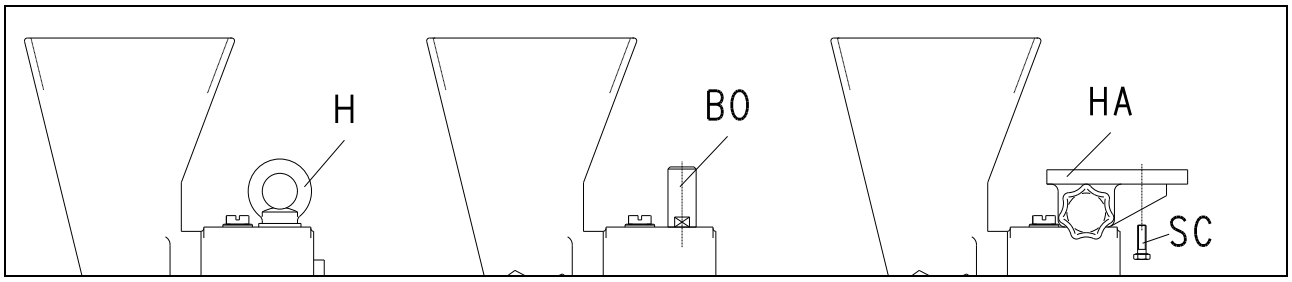


Fig.12 **Fig.13** **Fig. 14**

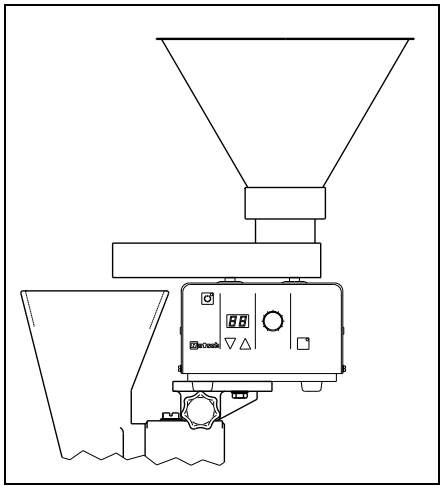


Fig.15

Prepare the DR 100/75 for feed operation in accordance with its operating instructions.

Assembly :

* Undo ring screw **H**, **Fig.12**
* Turn in bolts **BO**, **Fig.13**
* Push on fixture **HA** with tommy screw, **Fig. 14**
* Tighten tommy screw
* Mount DR 100/75 and align
* Fasten with the two hexagon-head screws **SC** M6x20 DIN933, **Fig. 14**
* Insert power cable of the DR 100/75 in a socket with earthing
* You will find the voltage and frequency of the DR100/75 on the nameplate

If the values on the nameplate are not observed, electronic and mechanical components may be damaged.

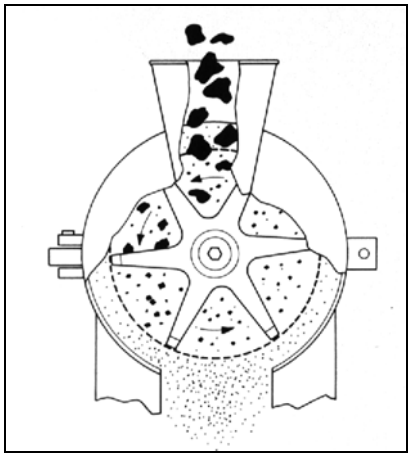
Working Instructions

Target group: Laboratory personnel

General
The SR 200 is highly modern, high-performance product from Retsch GmbH.
In view of the wide range of accessories available, the SR 200 rotor beater mill is a unit with many varied uses in the chemical and pharmaceutical sectors, mineralogy and biology etc. in industrial and research laboratories.
The SR 200 is used mainly for precrushing and fine crushing of dry, soft to medium-hard materials with a hardness of up to approximately 4 according to Mohs.

End fineness
the achievable end fineness depends on the hole width of the sieve and the crushing properties of the material. In favourable cases it is possible to achieve finenesses of < 60 µm.

The SR 200's mode of working
Material is crushed in the SR 200 rotor beater mill by impact, bouncing and shearing action.
After the material has been fed into the feed funnel, it passes into the grinding chamber, where the crushing process takes place between the rotor, the grinding insert and the sieve. **see also general sketch**
As soon as the material has reached the relevant end fineness, it passes the sieve and into the collecting pan.
The use of a cloth filter hose or a Conidur filter, available as an accessory, which can be fixed between the SR 200 and the collecting pan, prevents build-up of the air stream generated by the rotating rotor and partly accelerates the material throughput. This ensures a gentle crushing process.



General sketch

General

Cleaning

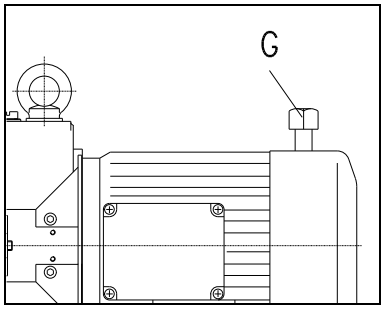


Fig.16

SR 200

The SR 200 can be cleaned with brushes, paintbrushes and possibly an industrial vacuum cleaner, as well as compressed air.

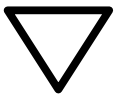
To clean the grinding chamber on the SR 200 the motor brake can be released at the lever **G** (**Fig.16**). the rotor is now easy to turn and this facilitates cleaning.

The SR 200's type of protection is IP54.

Do not clean the SR 200 under running water.
Danger of fatal electric shock

Sieves, grinding inserts and rotor

Can be cleaned under running water once they have been removed from the SR 200.



Dry all wet parts well after cleaning.
Flash rust or deposited rust may form.

Maintenance

The SR 200 largely maintenance-free.

Necessary inspections

Every six months the limit switches and the motor brake must be checked with regard to their serviceability.

Limit switch to the left on the door hinge

* With an opening gap of 3mm max, the limit switch must shut down the motor

Limit switch to the right on the quick-acting closure

* When the handwheel is turned a maximum of 45°, the motor brake must be activated.

Motor brake

* Start the SR 200
* Stop the SR 200
* Measure the braking time using a stopwatch
* Should the braking time exceed 0.5 seconds, contact the service technicians

Accessories

* Underframe
* 30l collecting pan
* Filter hose for 30l vessel
* Stand for feed device DR 100/75
* Feed device DR 100/75
* Ring filter with Conidur plate for 5l vessel
* Dust filter with clamping rings for ring filter
* Dirt collection tray of plastic
* 360° sieve frame of chromium-plated steel
* 360° sieve frame of stainless steel
* 180° grinding insert of stainless steel
* 360° ring sieves, Conidur from 0.08 to 2.0 mm
* 360° ring sieves, round hole from 3.0 to 10 mm
* 180° sieve inserts, Conidur from 0.08 to 2.0 mm
* 180° sieve inserts, round hole from 3.0 to 10mm

Changes
We reserve the right to make technical changes.

CERTIFICATE OF CE-CONFORMITY

Translation

ROTOR BEATER MILL

SR 200

Certificate of CE-Conformity according to:

EC Mechanical Engineering Directive 2006/42/EC

Applied harmonized standards, in particular:

DIN EN ISO 12100	Security of machines

EC Directive Electromagnetic Compatibility 2004/108/EC

Applied standards, in particular:

DIN EN 50081	Generic standard interference emission - living areas - in conjunction with EN 55022 and EN 60555
DIN EN 50082	Generic standard interference resistance - living areas

Additional applied standards, in particular

DIN EN 61010	Safety prescriptions concerning measuring-, operating-, controlling- and laboratory equipment

Authorized person for the compilation of technical documents:
J. Bunke (technical documentation)

The following records are held by Retsch GmbH in the form of Technical Documentation:
Detailed records of engineering development, construction plans, study (analysis) of the measures required for conformity assurance, analysis of the residual risks involved and operating instructions in due form according to the approved regulations for preparation of user information data.

The CE-conformity of the Retsch Rotor Beater Mill Type SR 200 is assured herewith.

In case of a modification to the machine not previously agreed with us as well as the use of not licensed spare parts and accessories this certificate will lose its validity.

Retsch GmbH

Haan, January 2010

Dr. Stefan Mähler
Manager technical services

CE

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