Operating Instructions, Rotor-Beater Mill Model SR 300

Information on these operating instructions

The present operating instructions for the Model SR 300 rotor-beater mill provide all the necessary information on the topics mentioned in the table of contents.

These instructions will guide the readers to the topics designated for each target group, essential to safe use of the SR 300 in accordance with the purpose for which the unit is intended. Each target group should be fully familiar with the relevant chapters, as this is essential to safe and proper use of the equipment.

The present technical documentation has been designed for use as both a reference source and learning guide. Each chapter represents a self-contained unit.

These operating instructions do not contain any information on repairs. If repairs should ever become necessary, kindly contact your supplier or the Retsch company.

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Safety

Target group: Everyone who deals with the machine in any manner whatsoever.

The SR 300 is a modern, high-performance product manufactured by the Retsch GmbH. It incorporates the latest technology. The SR 300 is entirely safe in operation when used for the intended purpose and in accordance with the present technical documentation.

Safety notes
You, as the owner/operator, must ensure that persons entrusted with the operation of the SR 300:

* have read and understood all the regulations included in the chapter on safety,

* have made themselves familiar, prior to starting work, with all the operating instructions and regulations for the target groups relevant to them,

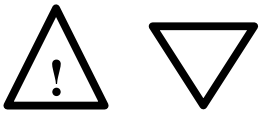
* have complete, immediate and unhindered access to the technical literature for this machine,

* before commencing work, new personnel shall have been made familiar with safe and appropriate use of the SR 300 before starting work with the machine, through instruction by a qualified person and/or with the help of the present technical documentation.

Incorrect operation can result in injuries to persons and damage to property. You bear responsibility for your own safety and for that of your coworkers.

Ensure that no unauthorized persons have access to the SR 300.

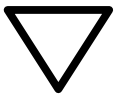
For your own protection, have your co-workers certify in writing the fact that they have received instruction in the operation of the SR 300. A suggestion for a printed form which can be used for this purpose will be found at the end of the chapter on safety.



We reject herewith any and all claims in conjunction with personal injury or property damage resulting from failure to observe the following safety instructions.

Warnings
The following symbols are used to identify specific hazard potentials:

Personal injury



Property damage

Repairs
These operating instructions do not include any repair instructions. In the interest of your own safety, have repairs made only by the Retsch GmbH or an authorized representative (service technician).

In this case, please notify the following:

Local Retsch representative
Your supplier
The Retsch GmbH

Your address for service:

_____

_____

_____

_____

_____

Confirmation

I have familiarized myself with the foreword to the operating instructions and the chapter on safety.

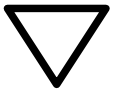
_____
Owner/operator signature

_____
Service technician's signature

Technical specifications

Machine designation: SR 300

Utilization in accordance with the intended purpose
Suitable for applications in which differing product is to be ground and changes in product are frequent and where it is necessary to open the door after each cycle to clean the grinding chamber. The SR 300 is not designed for use as a production machine but rather as a laboratory unit, engineering for 8-hour.



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.

The SR 300 pulverizes dry, soft to medium-hard materials at hardness of up to about 4 on the Mohs scale.

It is suitable in particular for pulverizing the materials listed below:

Chemicals	Coal	Dolomite	Dried fruit
Dried vegetables	Fertilizers	Fly ash	Fodder
Grain	Kaolin	Lime	Peat, dried
Pellets	Pharmaceuticals	Plants	Plaster
Salts	Seed grain	Spices	Synthetic resins
Tobacco			

and for many other materials with similar fracture properties.

The ultimate fineness which can be achieved is dependent on the geometry of the sieve openings and the fracture properties of the product being processed. In the most favorable cases fineness of < 60 µm can be achieved.

Our applications laboratory is always at your service to provide additional information.

Drive
3-phase motor with brakes

Motor rotation speed
2870 r.p.m. at 50 Hz
3440 r.p.m. at 60 Hz

Rotor-beater rotation speed

approx. 8100 r.p.m. at 50 Hz
approx. 9700 r.p.m. at 60 Hz

Rated power
2200 Watts

Feed grain size
max. 15 mm
When feeding individual items, feed grain size may also be up to 20 mm

Collection receptacle volumes
5.000 ml or
30.000 ml

Noise levels
Noise measurement as per DIN 45635-31-01, Class 3
The noise values will also be influenced by the nature of the product being ground.
Example:
Noise level L_{WA} = 101 dB(A)
Emission value for worksite L_{pEq} = 91 dB(A)
Operating parameters:
Feed product: Artificial fertilizer, grain size < 3 mm

Safety class
IP 54

Equipment dimensions

Height	appr. 1183	Width	appr. 560	Depth	appr. 831
With DR 100					
Height	appr. 1443	Width	appr. 560	Depth	appr. 831

Equipment weights

without DR 100/75	approx. 95 kg net
with DR 100/75	approx. 103 kg net

Footprint
831 mm x 560 mm; no safety clearances are required!

Shipping and installation

Target group: Owners, freight forwarders, operators

Packing

The type of packaging used has been selected in accordance with the shipping mode. It complies with generally accepted packaging guidelines.

Please retain the packaging for the duration of the guarantee period since, in case a claim arises, your guarantee entitlements will be jeopardized if the unit is returned in unsuitable packaging.

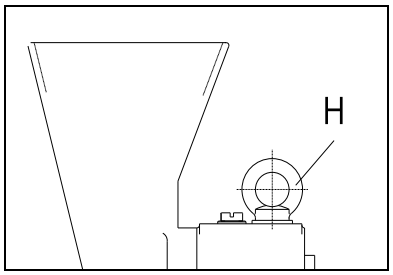


Fig. 1

Shipping

Use the eye bold **H** whenever you are moving the SR 300. **Fig. 1**

The SR 300 may not be subjected to impact or vibration during transportation; it must not be thrown. The electronic and mechanical components could otherwise be damaged.

Temperature fluctuations

In case of wide temperature fluctuations (during shipment by air, for instance) the SR 300 will have to be protected against condensation; the electronic components could otherwise be damaged.

Intermediate storage

Ensure that the SR 300 is also kept in a dry place during intermediate storage.

Requirements for the installation site

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.

Humidity

Maximum relative humidity 80% at temperatures up to 31°C;
linear decline down 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.

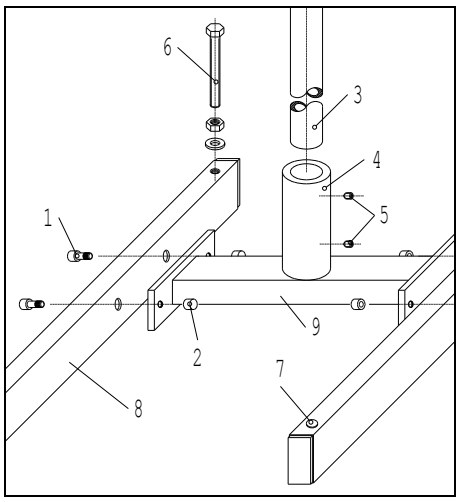


Fig. 2

Installation site – Altitude

max. 2000 m above mean sea level

Setting up the unit

Set up the SR 300 on a solid surface.

In order to bolt the base frame to the floor (maximum 10 mm screw diameter), it will be necessary to remove the two adjusting screws **6** and the plastic caps **7** at the front. **Fig. 2**

Electrical connection

The power connection may be made only by a qualified and licensed electrician.

- The voltage and frequency specifications for the SR 300 will be found on the machine's data plate.
- Ensure that the values shown there correspond to those for the local power supply.
- Use the supplied power cord to connect the SR 300 to the power network.

The line power cord supplied does not have a plug since the design of the plug will depend on the installation location and the regulations applicable in the particular country.

- When connecting the power cord to the line supply, external fusing shall be provided in accordance with local codes.

Failure to observe the values on the data plate can cause damage to either the electrical or the mechanical components or both.
It will be necessary to check the direction of rotation (corresponding to the arrow on the motor housing) before putting the machine into service for the first time. If the rotation direction is reversed, grinding will not be satisfactory and mechanical components could be damaged.

Operation

Target group: Operators

Operating elements and their use
Schematic view of the operating elements:

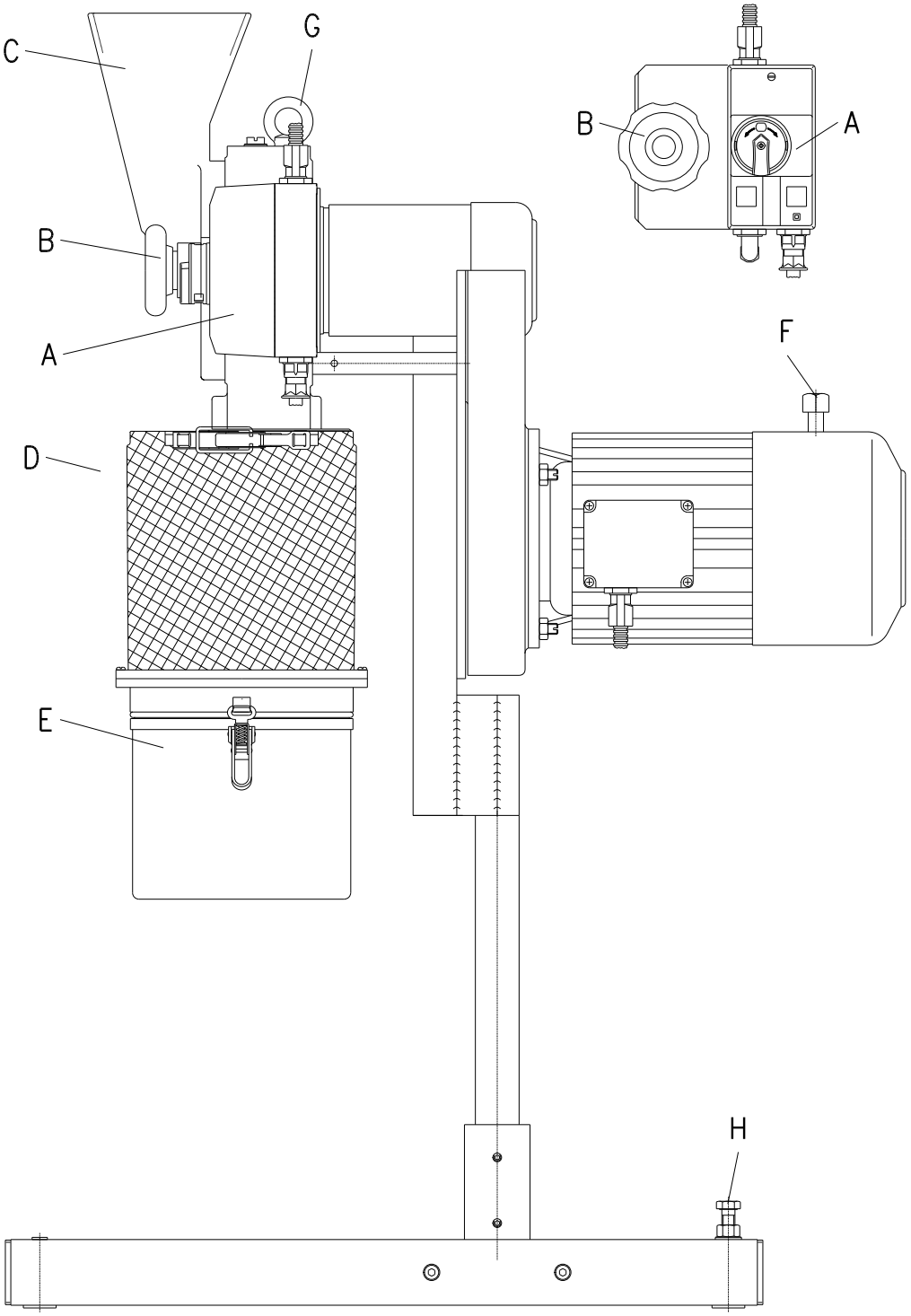
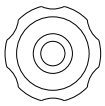
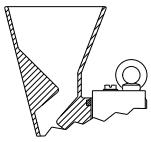
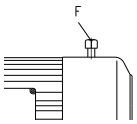
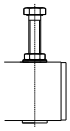


Fig. 3

Operating elements and their functions

Survey of the operating controls

Item	Element	Illustration	Function
A	Main switch with rotary knob		Isolates and connects the SR 300 from and with the power supply **ON** = SR 300 is switched on **OFF** = SR 300 is switched off
B	Door closure		Opens and closes the door for the SR 300, tightens the door gasket. Press and turn to right = locks the door Press and turn to left = opens the door
C	Feed hopper on the door		Serves to feed material but not to keep a reserve of product to be pulverized. Positively prevents product from being ejected from the hopper.
D	Filter bag	Previous page	Increases throughput performance and ensures separation of solids in the air stream.
E	Collection receptacle, 5 liters	Previous page	Accepts the pulverized material.
F	Motor brake release lever		When the SR 300 is at a standstill and this lever is pressed backwards the motor brake is released, allowing the rotor-beater to be turned by hand for cleaning purposes.
G	Shipping screw		Used to lift and move the SR 300 with hoist tackle. It is removed as soon as any Retsch feeder unit is attached.
H	Adjustment screws at base frame		Compensate for uneven floors by leveling the SR 300 base frame. When unscrewed entirely the opening is clear, allowing the base frame to be anchored to the floor with 10 mm diam. bolts.

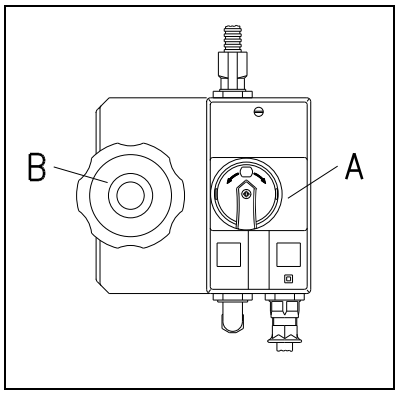


Fig. 4

Opening and closing the mill housing

Open the housing only with the SR 300 switched off.

- Turn the main switch **A** to its **OFF** position. **Fig. 4**
- Press the handwheel **B** and turn it to the left.
- Handwheel will catch in the end position; the door can now be opened.
- Close in reverse order.

Close the door only if the contact surfaces are absolutely free of pulverized product and other foreign objects. **Mechanical components and the gasket could otherwise be damaged.**
Do not open the SR 300 with the motor running. **When pulverizing product which is toxic or otherwise hazardous to health there is a danger of inhaling harmful dusts.**
Do not open the SR 300 and release the motor brakes simultaneously. **Injury hazard resulting from rotor-beater not being held by the brake.**

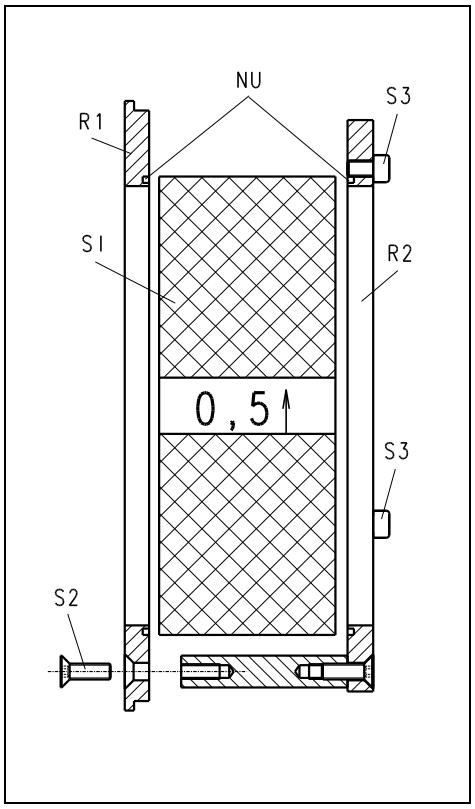


Fig. 5

Insert 360° sieve frame with ring sieve

Available as accessories are chrome-plated, stainless steel frames and ring sieves in a choice of sizes, with Conidur or round holes. **Fig. 5**

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

- Unscrew the screws **S2**.
- Remove the ring **R1** and insert the ring sieve **SI** in the groove **NU** of ring **R2**; when using a sieve with Conidur perforations pay attention to the arrow, corresponding to the rotor's direction of rotation.
- Carefully position the ring **R1** until the sieve **SI** slides into the groove **NU**.
- Screw down the screws **S2** and tighten them securely.
- Open the door.
- Insert the sieve frame with the ring sieve; ring **R1** is to the front, ring **R2** to the rear.
- The screw heads **S3** at the ring **R2** must seat in the holes in the mill housing.
- Close the door.

Check to ensure that a collection receptacle is in place.

- Start the SR 300.

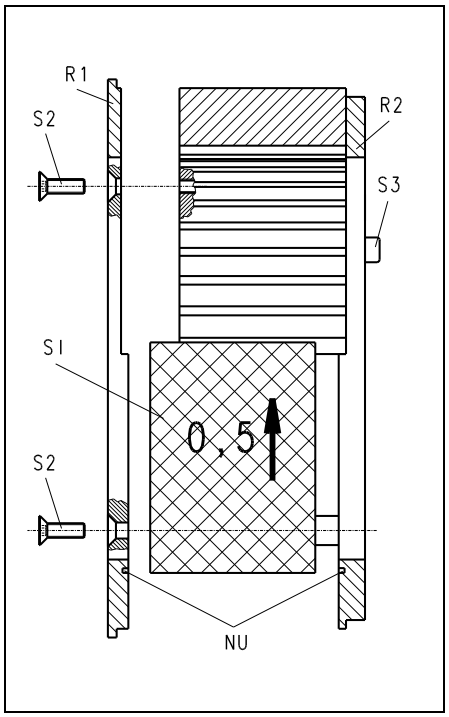


Fig. 6

Insert 180° grinding insert with frame and sieve insert

Available as accessories are stainless steel grinding sets, with a frame and sieve inserts, in a choice of sizes, with Conidur or round perforations. **Fig. 6**

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

- Unscrew the screws **S2**.
- Remove the ring **R1** and insert the ring sieve **SI** in the groove **NU** of ring **R2.**
- Carefully position the ring **R1** until the sieve **SI** slides into the groove **NU**.
- Screw down the screws **S2** and tighten them securely.
- Open the door.
- Insert the sieve frame with the ring sieve; ring **R1** is to the front, ring **R2** to the rear.
- The screw heads **S3** at the ring **R2** must seat in the holes in the mill housing.
- Close the door.

Check to ensure that a collection receptacle is in place.

- Start the SR 300.

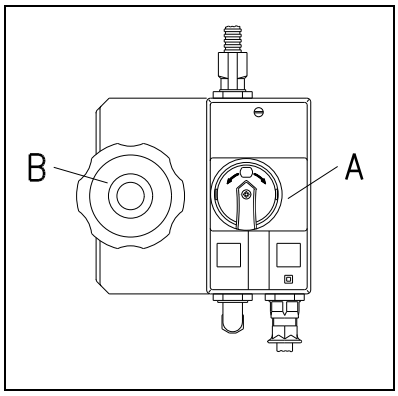


Fig. 7

Starting or stopping the SR 300

Die SR 300 is started and stopped with the main switch **A**. **Fig. 7**

- Insert the sieve frame with the ring sieve or grinding set with sieve insert.
- Close the door.
- Attach the collection receptacle.

Starting
Turn the knob at switch **A** to "ON".

Stopping
Turn the knob at switch **A** to "OFF".

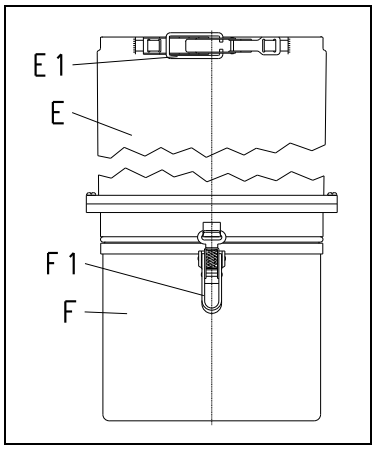


Fig. 8

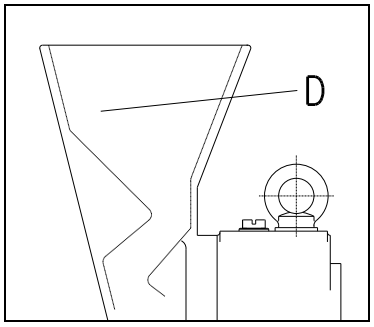


Fig. 9

Filter bag and collection receptacle

By using a cloth filter bag or a Conidur filter (optional accessory), attached between the SR 300 and the collection receptacle, the air stream generated by the rotor-beater as it turns will be deflected and routed downward to the material discharge. In addition, it increases material throughput and ensures the separation of the fines in the air stream. **Fig. 8**

- Slide the filter bag **E** over the flange, holding the clamping ring at an angle.
- Tighten the clip **E1**.
- Mount the collection receptacle **F**.
- Tighten the clips **F1**.

If the receiver is installed without a filter bag then it will be necessary to expect dust to be discharged from the feed hopper **D**; therefore never use the SR 300 without the filter bag or Conidur filter being installed.

Feed the product to be pulverized

Maximum feed grain size should not exceed 15 mm.
To allow for batch-wise or continuous operation the SR 300 can be retrofitted with a 30-liter plastic collection receptacle and a Model DR 100/75 feeder (optional accessories).

- Close and switch on the SR 300.
- Slowly pour product into the feeder hopper **D**. **Fig. 9**

A baffle incorporated into the feeder hopper **D** keeps product from being ejected from the unit. **Fig. 9**

Feed product slowly and continuously, and only with the SR 300 running. **Overly large product grains or excessive product volumes can force the SR 300 to stop; mechanical components could be damaged.**
During pulverization dust-like product can exit from the feeder hopper, filter bag or Conidur filter. When dealing with products which are toxic or otherwise harmful to health, utilize either an extractor hood or personal safety equipment. **Hazard due to inhaling dusts which are dangerous to health.**
Some products form an explosive mix with air after pulverization. Check the properties of the product being processed. **Explosion hazard.**

Mounting a feeder unit

When feeding larger quantities it is generally advisable to use an automatic feeder unit to meter the product uniformly. This largely avoids unnecessary loading of the grinding components and reduces heat of friction which could otherwise arise. The Model DR 100/75 feeder (optional accessory) is suitable for attaining uniform material feed. **Fig. 13**

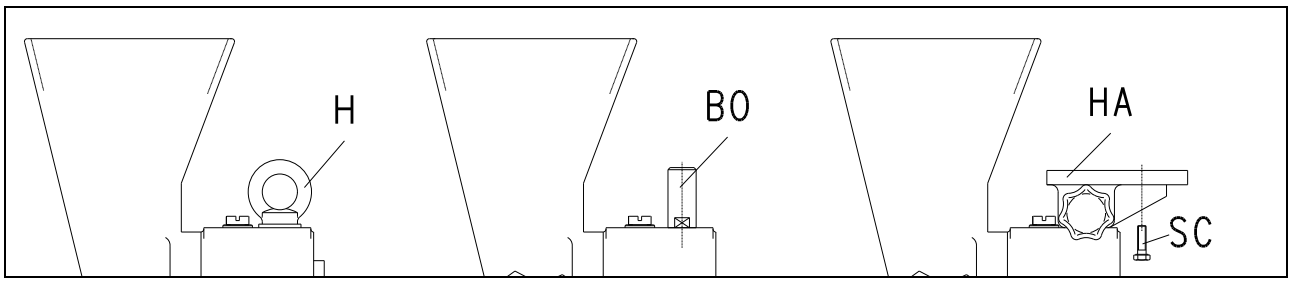


Fig. 10 **Fig. 11** **Fig. 12**

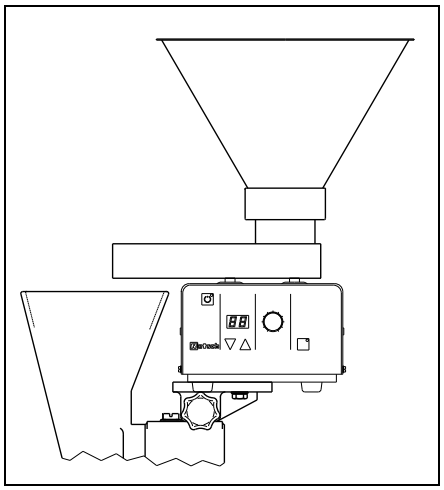


Fig. 13

Prepare the DR 100/75 for use as the feeder, following the operating instructions provided with that unit.

Assembly :

- Unscrew the eye bolt **H**.
- Screw in the pin **BO**.
- Attach the DR 100/75 to the holder **HA**, tightening down the two screws **SC** only slightly.
- Slide the holder **HA** with the DR 100/75 onto the pin **BO**.
- Tighten down the knurled screw.
- Align the DR 100/75.
- Tighten down the two hex-head bolts **SC** securely.
- Connect the DR 100/75 power cord at a grounded power socket.
- Please refer to the data plate for the voltage and frequency specifications for the DR 100/75.

▽

Be absolutely sure to observe the values on the data plate.
Failure to match the values specified on the data plate can result in damage to electronic and mechanical components.

Instructions for use

Target group: Laboratory personnel

General

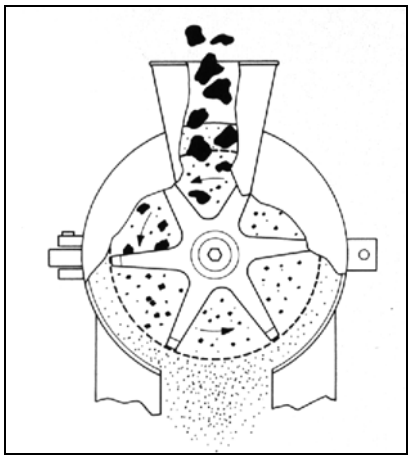
The SR 300 is a modern, high-performance product manufactured by the Retsch GmbH.
A broad selection of accessories makes the SR 300 rotor-beater grinding mill a versatile device suitable for a wide range of applications, principally in chemicals and pharmaceuticals, in mineralogy and biology, etc., and in industrial and research laboratories.
The SR 300 is used primarily for preliminary and final pulverization of dry, soft to medium-hard materials of up to about 4 on the Mohs hardness scale.

Ultimate fineness

The ultimate fineness which can be achieved is dependent on the size of the sieve openings and the fracture characteristics of the pulverization product. In favorable cases fineness of < 60 µm can be attained.

Operating principle for the SR 300

Pulverization in the SR 300 rotor-beater mill is effected by impact, rebound and shear action.
Once it has been introduced into the feed hopper, the product passes into the grinding chamber where the size reduction process takes place between the rotor-beater, the grinding insert and the sieve. **See also the operating schematic.**
Once the product has achieved the appropriate ultimate fineness it passes through the sieve and into the collection receptacle.
Using a cloth filter bag or a Conidur filter (optional accessory) mounted between the SR 300 and the collection receptacle, the air stream generated by the rotor-beater as it turns will be deflected and routed downward toward the material discharge. In addition it will increase the material throughput rate and ensures that the solids portion in the air stream will be separated out.



Operating schematic

General

Cleaning

SR 300

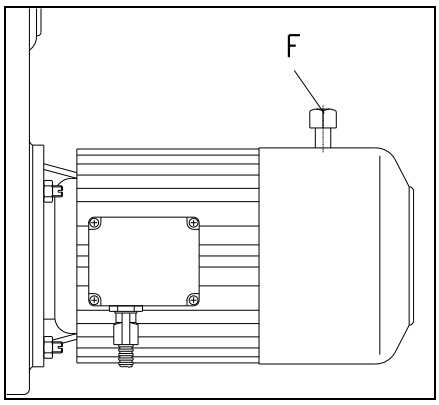


Fig. 14

The grinding chamber in the SR 300 can be cleaned with a brush and, if necessary, an industrial vacuum cleaner and compressed air.

The motor brake can be released to facilitate cleaning the SR 300 grinding chamber; use lever **F** (**Fig. 14**) to do so. The rotor-beater can now be turned easily, thus simplifying 0cleaning.

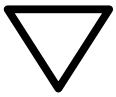
The SR 300 is engineered to IP 54 safety standards.

Never clean the SR 300 with running water.

Hazard of fatal electrical shock.

Sieves, grinding inserts and rotors

Once they have been removed from the SR 300, these items can be cleaned under running water or in an ultrasonic bath.



Dry all wet parts thoroughly after cleaning.

Rust can form on wet components.

Maintenance

The SR 300 is largely maintenance-free.

Required inspections

The limit switches and the motor brakes are to be checked twice a year for proper operation.

Limit switch on the left, at the door hinge

- The limit switch must shut down the motor at a maximum opening gap of 3 mm.

Limit switch on the right, at the quick-acting catch

- The motor brakes must engage when the hand wheel is turned by a maximum of 45°.

Motor brakes

- Start the SR 300.
- Stop the SR 300.
- Use a stopwatch to time the braking period.
- If the braking period should exceed 1.5 seconds, then contact the authorized service technicians.

Accessories

- Collection receptacle, 30 liters
- Filter bag for the 30-liter collection receptacle
- Stand for the DR 100/75 feeder
- DR 100/75 automatic feeder unit
- Ring filter with Conidur plate for the 5-liter collection receptacle
- Dust filter with clamping rings, for ring filter
- Grime collector tray, plastic
- Sieve frame, 360°, made of chrome-plated steel
- Sieve frame, 360°, made of stainless steel
- Grinding insert, 180°, made of stainless steel
- Ring sieve, 360°, Conidur, from 0.08 to 2.0 mm
- Ring sieve, 360°, round holes, from 3.0 to 10 mm
- Sieve inserts, 180°, Conidur, from 0.08 to 2.0 mm
- Sieve inserts, 180°, round holes, from 3.0 to 10 mm

Modifications

Subject to technical modification without prior notice.

CERTIFICATE OF CE-CONFORMITY

Translation

ROTOR BEATER MILL

SR 300

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 300 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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