



Operating Instructions for the Cutting Mill Type GRINDOMIX GM 200

Retsch[®]

Notes on the operating instructions

These operating instructions for the laboratory knife mill type GRINDOMIX GM 200 provide all the necessary information on the topics named in the table of contents.

They guide the defined target group(s) for the relevant fields towards safe and correct procedures for handling the GRINDOMIX GM 200. Safe and correct handling is only possible when the relevant target group(s) are familiar with the chapters concerned.

This technical documentation constitutes both a reference work and a tutorial. The individual chapters are self-contained units.

These operating instructions do not contain any instructions for repairs. Should any repairs become necessary, please contact your supplier or contact Retsch GmbH direct.

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Safety

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

The GRINDOMIX GM 200 laboratory knife mill is a highly modern, efficient product from Retsch GmbH. Its engineering is state of the art. When handled correctly by persons familiar with the machine and this technical documentation, the GRINDOMIX GM 200 is perfectly safe and reliable in operation.

Notes on safety

You, as the operator, are responsible for ensuring that the persons appointed to work with the GRINDOMIX GM 200:

- have read and understood all the regulations concerning safety,
- are familiar with all procedures and instructions for their relevant target group before starting work,
- have access to the technical documentation for this machine at any time and without problems.

You should ensure that new personnel are instructed in safe and correct handling either orally by a competent person and/or by this technical documentation before starting work with the GRINDOMIX GM 200.

Incorrect operation can lead to damage or injury. You are responsible for your own safety and that of your staff.

Please ensure that no unauthorised persons have access to the GRINDOMIX GM 200.

For your own protection, have your staff confirm their instruction in the operation of the GRINDOMIX GM 200. You will find an appropriate draft form at the end of the chapter on safety.



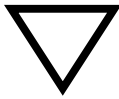
We accept no liability whatsoever for any damage or injury resulting from non-observance of the following notes on safety.

Warning notes

We use the following symbols to warn against:



Personal injury



Damage to property

Repairs

These operating instructions do not contain any instructions on repairs. For your own safety, only have repairs performed by Retsch GmbH or an authorised representative (service technicians).

In such cases, please notify:

The Retsch agency in your country

Your supplier

Retsch GmbH direct

Your service address:

--

Confirmation

I have read and noted the chapters entitled Foreword and Safety.

Operator's signature

Service technician's signature

Technical Data

Target group: Operators

Machine type designation: GRINDOMIX GM 200

Use for the intended purpose

The GRINDOMIX GM 200 laboratory knife mill is suitable for the comminution, homogenisation and mixing of soft to medium-hard, water and grease containing, fibrous and dry materials ready for analysis in a matter of seconds. The GRINDOMIX GM 200 is designed for quantities up to approx. 700 ml, and up to 1000 ml for large volume materials. The input particle size is <30 - 40 mm.

It is particularly designed for the milling of the following materials: Fish, meat, vegetables, cheese, preserves, seeds, bacon, sausage, dry bread and pastry products, all products containing water or rich in fat, fibrous products and similar materials.

The GRINDOMIX GM 200 is not designed as a production machine, but as a laboratory instrument intended for 8 hour single shift operation at a continuous duty factor of 30%.

This machine is not suitable for the mixing and homogenisation of liquids or low viscosity emulsions and suspensions.

For further information, please contact our applications laboratory staff, who will be pleased to help.



Do not modify the machine in any way, and use only spare parts and accessories approved by Retsch.

The conformity with European Directives declared by Retsch will otherwise be invalidated.

Furthermore, this will lead to all warranty claims being rendered null and void.

Description of function

The comminution process in the GRINDOMIX GM 200 takes place by cutting.

The knife blades are straight and arranged at a right angle to the direction of rotation.

The knives are slim, with a cutting edge angle of 15° and a 30° leading facet.

With this cutting edge geometry, the entire momentum resulting from the difference in velocity between the particles of process material and the blades can be used as the cutting force.

The speed is between 2000 and 10000 rpm, and is set and digitally displayed in steps of 500 rpm.

The selected speed is kept constant by a controller during milling.

Interval mode is started by holding the start button depressed. It has proven advantageous to start milling in interval mode for pre-granulation and homogenisation of coarse, tough, fibrous, very soft or highly elastic products.

The milling duration can be set at up to 3 min., and on completion of milling the motor switches off automatically and the housing cover opens.

3 memory locations facilitate the saving and loading of frequently used speed/time combinations at the touch of a button.

The milling result is also influenced by the relationship between the milling chamber volume and the quantity of material to be processed. Various vessel/lid combinations are therefore available to the user:

For the plastic vessels, plastic lids for 500 and 700/1000 ml and a gravity lid are available.

The 700/1000 ml plastic lid is used for large quantities of small grained materials such as seeds, pepper corns and cheese. The input quantity is between 300 and max. 700 ml.

The 500 ml plastic lid is used for smaller quantities of small grained materials such as seeds, pepper corns and cheese. The input quantity is max. 300 ml.

The gravity lid is used for large volume materials and materials containing water, such as lettuce and tomatoes. Under the force of its own weight, the lid automatically adapts to fit the milling chamber volume during the milling operation.

700/1000 ml plastic lids and a separate gravity lid are available for the glass vessels.

Protection systems

The milling chamber of the GRINDOMIX GM 200 is secured by an especially robust housing cover.

The machine can only be started when the cover is closed, and the cover can only be opened when the motor is at a standstill.

In case a fault should occur, there is also an electrical emergency brake which brings the blade to a standstill in a fraction of a second, even from its maximum speed.

Should an overload cause the actual speed to deviate by more than 5 % from the specified speed set, this is indicated by flashing displays.

Drive

Series-wound motor

Motor power

750 watts

Rated voltage

230V 50 Hz ± 0,1Hz
100 - 110V 50 / 60Hz ± 0,1Hz

Speed

Knife speed variable from 2000 to 10000 rpm

Emissions

Noise characteristics:

Noise measurement to DIN 45635-031-01-KL3

The noise levels are also influenced by the properties of the material to be milled.

Example 1:

Sound power level $L_{WA} = 79.2$ dB(A)

Workplace related emission level $L_{p,eq} = 66.9$ dB(A)

Service conditions:

Vessel = Glass vessel with gravity lid
Milling unit = Knife in stainless steel
Input material = Tomatoes, quartered, approx. 40 x 25mm
Input quantity = 100g

Example 2:

Sound power level $L_{WA} = 86.2$ dB(A)

Workplace related emission level $L_{p,eq} = 73.9$ dB(A)

Service conditions:

Vessel = Glass vessel with gravity lid
Milling unit = Knife in stainless steel
Input material = Cheese, approx. 20 x 20mm
Input quantity = 100g

IP rating

Milling chamber and keyboard IP42

In the area of the ventilation slots IP20

Dimensions

Height: up to approx. 370mm, Width: 200mm, Depth: 270mm
with cover open

Height: up to approx. 450mm, Width: 200mm, Depth: 400mm

Weight: approx. 7.5 kg without plastic vessel and knife

Installation area required

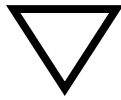
200 mm x 400 mm; no safety clearances are necessary.

Transport and installation

Target group: Operators, carriers

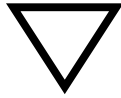
Packaging

The packaging is suitable for the particular means of transport. It complies with the general packaging regulations.



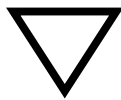
Please keep the packaging for the duration of the guarantee period, as your guarantee claim may be invalidated if there is a complaint and the unit is returned in inadequate packaging.

Transport



The GRINDOMIX GM 200 must not be jarred, shaken or thrown during transport. This could damage the electronic and mechanical components.

Temperature fluctuations



When subjected to major temperature fluctuations (e.g. during air transport) the GRINDOMIX GM 200 is to be protected from condensation. Damage to the electronic components may otherwise result.

Temporary storage

Ensure that the GRINDOMIX GM 200 is stored in a dry place even when storage is temporary.

Scope of supply

- 1 GRINDOMIX GM 200
- 1 plastic vessel
- 1 lid, 1000 ml
- 1 knife cylinder
- 1 instruction manual

Check that the delivery is complete, including any accessories ordered in addition.

Check that the GRINDOMIX GM 200 functions perfectly (see the chapter on operation).

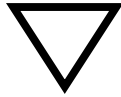


In cases of incomplete delivery and/or transport damage, you must notify the forwarding agent and Retsch GmbH without delay (within 24 hours). It may not be possible to accept subsequent complaints.

Parameters for the installation point

Ambient temperature:

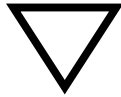
5°C to 40°C



If the ambient temperature is above or below that specified, the electronic and mechanical components may be damaged and performance data change to an unknown extent.

Humidity:

Maximum relative humidity 80% at temperatures up to 31°C, declining in a straight line to 50% relative humidity at 40°C



Higher humidity can cause damage to the electronic and mechanical components, and performance data can change to an unknown extent.

Site altitude:

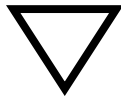
max. 2000 m above sea level

Installation

Always set up the GRINDOMIX GM 200 on a firm and stable base, e.g. a laboratory bench.

Electrical connection

- See the type plate for the voltage and frequency of the GRINDOMIX GM 200.
- Ensure that the values agree with those of the available power supply.
- Connect the GRINDOMIX GM 200 to the power supply using the connecting cable supplied.



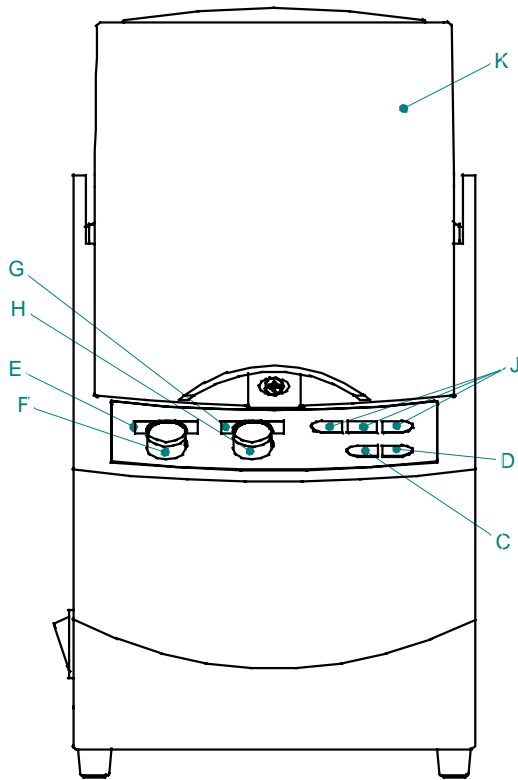
Failure to observe the values on the type plate can lead to damage to electrical and mechanical components.

Operation

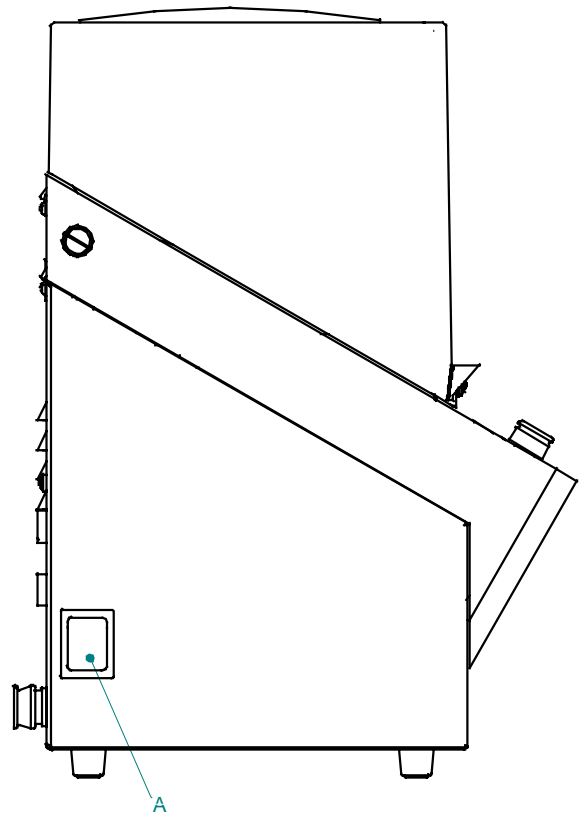
Target group: Operators

Controls and operation

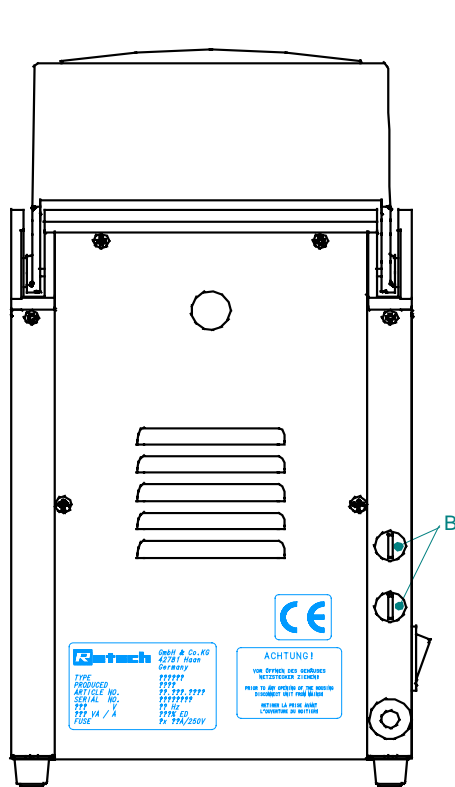
Graphical display of the controls:



Front view



Side view



Rear view

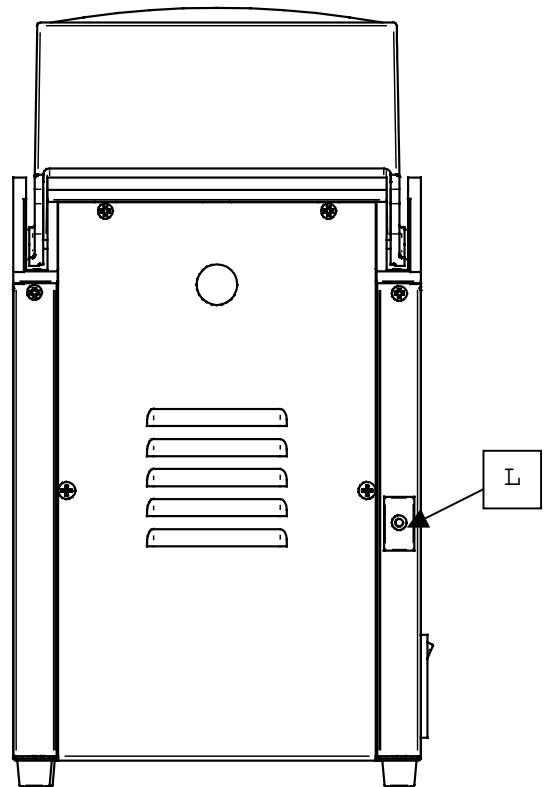
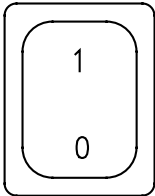
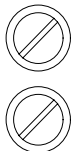

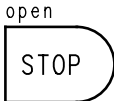
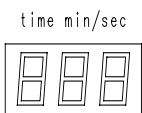

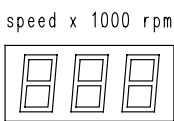

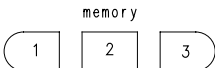



Table of controls

Item	Element	Illustration	Function
A	Main switch		Connects the GRINDOMIX GM 200 to and isolates it from the mains
B	Fuse holder		Contains two glass fuses (See type plate for further details)
C	START button		Starts the milling process Switches interval mode on
D	STOP button		Stops the milling process Opens the cover
E	Display of machine running time		Displays the selected machine running time of 1 sec - 3 min
F	Knob for time setting		Allows the desired machine running time to be set.
G	Speed display		Displays the selected speed of 2000 - 10000 rpm
H	Knob for speed setting		Allows the desired speed to be set
J	Memory function		Allows up to three time and speed combinations to be saved and loaded
K	Housing cover	not shown	Screens the milling chamber off
L	Overload protection switch		If the motor is overloaded, cuts the GM 100's power off If pressed, restores the connection to the power supply after the motor has cooled down

Operating the GRINDOMIX GM 200

Target group: Operators

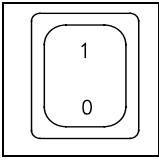


Fig.1

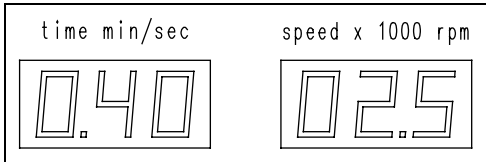


Fig.2

Switching ON and OFF

The main switch **A** is located at the bottom left side of the GRINDOMIX GM 200. **Fig.1**

- Turn on the main switch.
- The **time** display indicates the last milling duration used.
- The **speed** display shows the last speed used.

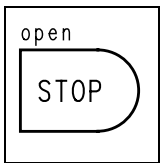


Fig.3

Opening the cover

- Press STOP button **D** briefly. **Fig.3**

The cover is released and springs open.

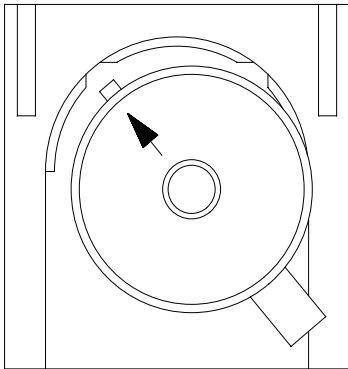


Fig.4.1

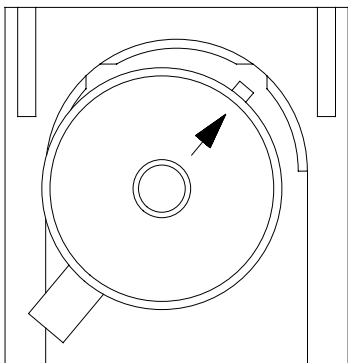


Fig.4.2

Inserting the vessel

- Open the cover.
- Insert the vessel.

Ensure that the vessel is correctly positioned when inserted. Use the left or right guide slot. **Fig.4.1 and 4.2**

Using Grinding Containers with Different Materials.

The material properties specified here primarily relate to products from the targeted market of foodstuffs or animal feed because the Grindomix should be classified in its main application.

Grinding Cup – Plastic Container (PP)

suited for: material consistency soft, medium-hard, elastic, containing water, fatty and oily.

not suited for: material consistency hard, hard to brittle such as cereals, pressed parts and pellets, gelatine candies. Increased abrasion in the plastic container.



Warning!

The plastic container and the plastic covers are only resistant to cleaning in a dishwasher.

If using a dishwasher, ensure the correct positioning!

Never place close to the heating helix, otherwise deformation might occur which could prevent further use with the GM .

Sterilising and heating in an autoclave is not possible!

Grinding Cup – Glass Container (Borosilicate Glass 3.3)

suited for: material consistency soft, medium-hard, elastic, containing water, fatty and oily.

not suited for: material consistency hard, hard to brittle such as cereals, pressed parts and pellets, gelatine candies. Glass containers may break.

Grinding Cup – Stainless Steel Containers (1.4435 x2CrNiMo 18-14-3)

suited for: material consistency soft, medium-hard, elastic, containing water, fatty and oily, hard to medium hard such as cereals, furthermore for deep-frozen foods, chewable candy, hard cheese and sausage products,



Caution!

It is not allowed to grind with liquid nitrogen (fl. N₂) or dry ice (CO₂) in any GM option. There is danger resulting from grinding tools or the glass or plastic container becoming brittle or breaking.

Lid and vessel combinations

The various lid/vessel combinations allow the machine to be adapted for various functions.

The 1000 ml lid

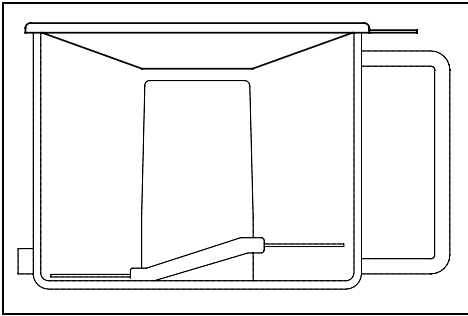


Fig.5

The 1000 ml lid is used for large quantities of small grained materials such as seeds, pepper corns and cheese, etc.

The input quantity is between 300 and max. 700 ml. **Fig.5**, see also the chapter Notes on operation.

The lid is clamped onto the lip of the vessel, and can be released with the tab.

Note:

The 1000 ml lid can be used with both plastic and glass vessels.

The 500 ml lid

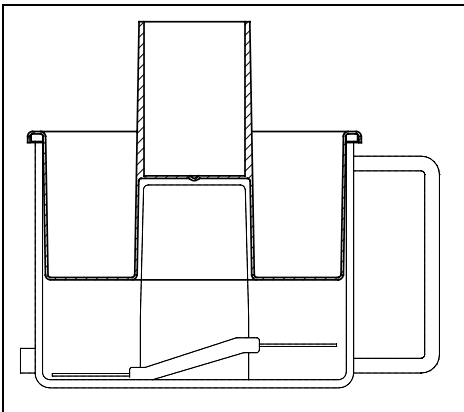


Fig.6

The 500 ml lid is used for smaller quantities of small grained materials such as seeds, pepper corns and cheese, etc.

The input quantity is max. 300 ml. **Fig.6**, depending on the material to be processed. See also the chapter on Notes on operation.

The 500 ml lid is merely laid on the vessel with its edge on the top of the vessel. During milling, the 500 ml lid is held down by the cover.

Note:

The 500 ml lid can only be used with plastic vessels.

The gravity lid

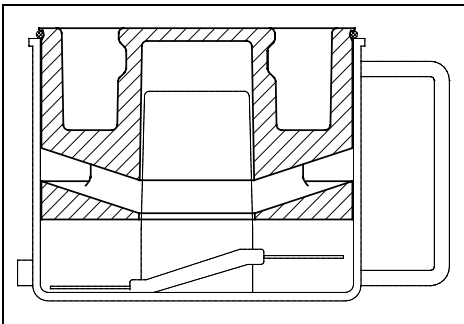


Fig.7

The gravity lid allows the vessel volume to be adjusted precisely to suit the input quantity. It simply moves with the material during milling, and thus optimises the milling chamber volume.

It is used for materials containing water, such as potatoes, paprika, lettuce or tomatoes. **Fig.7**, see also Notes on operation.

The input quantity is max. 300 ml.

Note:

There are two gravity lids, one for the glass vessel and one for the plastic vessel.

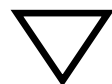


Caution! Ensure that the input quantity does not exceed the maximum of 300 ml.
If the recommended input quantities are exceeded with materials containing water, the vessel may overflow during the milling process.

Loading the machine

Filling the vessel in the machine

- Insert the vessel.
- Fit the knife cylinder, sliding it up to the stop.
- Pour in the material to be processed.
- Fit the lid.
- Close the cover and ensure that its interlock pin engages.



The cover must engage securely with the interlock pin, so that the motor can start and no emergency braking operation is triggered off during milling.

Caution! Always insert the knife cylinder **before** feeding the process material in, as otherwise process material may be deposited between the knife cylinder and the vessel.

Filling the vessel outside the machine

The vessel can also be filled before it is inserted in the machine. You can thus easily work with several vessels – without stopping to clean them. Vessels can only be loaded outside the machine when the 500 ml and 1000 ml lids are used. The gravity lid is not suitable for this purpose.

The sequence is then:

- Fit the knife cylinder into the vessel.
- Feed in the process material.
- Fit the lid.
- Insert the vessel in the GRINDOMIX GM 200, holding the lid down at the centre (absolutely necessary with the 500 ml lid) so that the knife cylinder definitely reaches its limit position. **Fig.8 and Fig.9**
- Close the cover so that the interlock pin engages.

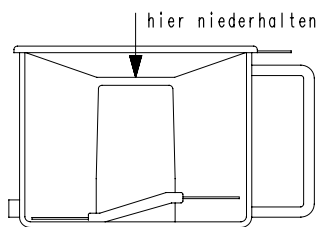


Fig. 8 with 1000 ml lid

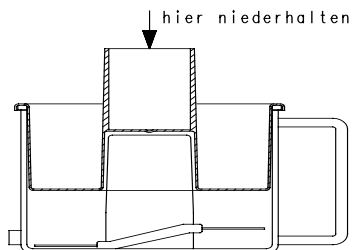
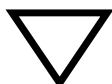


Fig. 9 with 500 ml lid



We recommend you to hold the lid down at the centre (absolutely necessary with the 500 ml lid) so that the knife cylinder definitely reaches its limit position. **Fig. 8 and 9**

The cover must engage securely with the interlock pin, so that the motor can start and no emergency braking operation is triggered off during milling.

When filling the vessel outside the machine, do not use the gravity lid, as it cannot hold the knife down when the vessel is inserted in the machine.

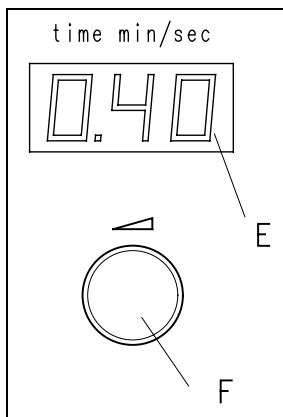


Fig.10

Setting the time

When the machine is switched on, display **E** shows the last time set.

Select a time between 1 second and 3 minutes: Fig.10

- Turn knob **F** anti-clockwise: the time can be reduced to 1 sec.
- Turn knob **F** clockwise: the time can be increased to 3 min.

The time is freely selectable between 1 sec. and 3 min.

Turning speed

- Slow turning = steps of 1 sec.
- Up to 10 sec. in 1 sec. steps only
- Fast turning = steps of 30 sec. (from 10 sec. onwards)

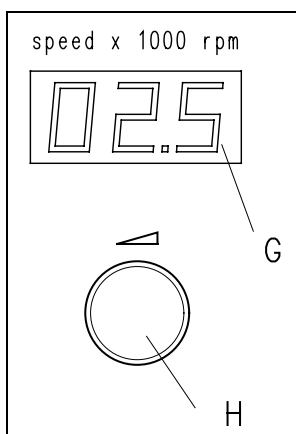


Fig.11

Setting the speed

When the machine is switched on, display **G** shows the last speed set.

Set the speed between 2000 and 10000 rpm: Fig.11

- Turn knob **H** anti-clockwise: the speed can be reduced to 2000 rpm.
- Turn knob **H** clockwise: the speed can be increased to 10000 rpm.

The speed is freely selectable between 2000 and 10000 rpm.

Turning speed

- Steps of 500 rpm.



Fig.12

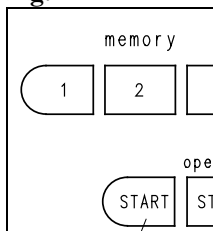


Fig.12a

Interval mode

The interval mode is advantageous for coarse input material of 30 - 40mm in size, large volume sample material such as lettuce, sample material containing water such as tomatoes, coarse, tough fibrous material like salami, and very soft or tough and elastic sample material like cheese.

The interval mode is activated with the **START** button **C** and remains active as long as the **START** button **C** is held depressed, up to a maximum of the set milling duration.

If the set speed is >4000 rpm, the machine runs at the set speed in the first interval. All further intervals are run at 4000 rpm.

If the set speed is <4000 rpm, all intervals are run at the set speed.

If interval operation is supposed to be maintained during the entire period of grinding, it can be permanently switched on by simultaneously pressing the buttons **START** + memory 1.

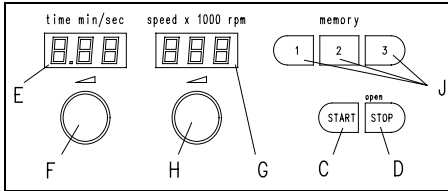


Fig.13

Memory buttons

The GRINDOMIX GM 200 has three memory buttons **J**, which can be used to save parameter combinations of time and speed. **Fig.13**

- Turn the main switch on.
- Displays **E** and **G** indicate the last parameters set.
- Set the time with knob **F**.
- Set the frequency with knob **H**.
- Hold one of the three memory buttons **J** depressed. After 1.5 seconds, displays **E** and **G** flash.
- When the displays stop flashing, the parameters are stored under the memory key which was pressed.

Loading a program

- Press the corresponding memory button **J**, **Fig.13**, briefly. The saved parameters then appear on displays **E** and **G**.
- Start the GRINDOMIX GM 200.

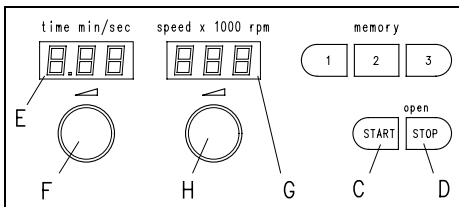


Fig.14

Starting - Interrupting - Stopping

Starting: Fig. 14

- Press the START button **C**.

During the milling period, the speed is kept constant within a specified tolerance.

Interrupting: Fig.14

- Press the STOP button **D**.

The milling process is interrupted and can be resumed for the remaining running time by pressing the START button **C** again.

Stopping: Fig.14

- Press the STOP button **D** twice.

The milling process is stopped, the cover springs open and the original machine running time is displayed.

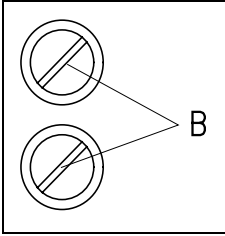


Fig.10

Replacing fuses

[This is] only possible with machine up to the change symbol “B” behind the serial number of the machine's nameplate. Refer to the chapter on “Setting Back the Overload Fuse” from symbol “B”

Two glass fuses are required:

T 4 A (6.3x32mm) for 230V -50Hz

T 8 A (6.3x32mm) for 100/110V -50/60Hz

Replacement: Fig.10

- Disconnect the mains plug.
- Push in fuse holder **B** with a screwdriver and turn it ¼ turn in the anti-clockwise direction.
- Draw out the fuse holder.
- Replace the fuses.
- Slide the fuse holder back in.
- Lock the fuse holder.

Setting Back the Overload Fuse

This is only possible with machines with a „C“ behind the serial number of the machine nameplate.

Figure 10a

There is the overload protective switch on the right-hand side of the rear wall.

If the machine overloads, this disconnects the GM from the power supply. You may re-connect the GM with the power supply by pressing the switch after a period of cooling off. This can be ascertained empirically.

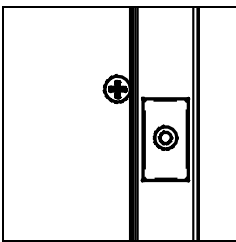


Fig.10a

Notes on Operation

Target group: Operators

General

The GRINDOMIX GM 200 laboratory knife mill is a highly modern, powerful product from Retsch GmbH.

With its broad selection of accessories, the GRINDOMIX GM 200 is a machine with a variety of applications, predominantly in the foodstuffs sector.

The GRINDOMIX GM 200 is suitable for preparation of products with a high water, oil and fat content, which can also be soft, tough and fibrous. Materials, then, such as are to be found in foodstuffs laboratories and have to be prepared there for a wide range of different analysis processes.

The aim of all comminution tests is to reduce the size of an input material to such an extent that it is suitable for analysis. Analysis fineness and homogeneity are of paramount importance. In the preparation of laboratory samples, more material is always milled than is actually necessary for the analysis. The final product therefore has to exhibit a degree of homogeneity which permits random, but nevertheless representative, sampling.

Notes on sample milling

Almost any material-specific degree of fineness can be achieved by setting various milling parameters and by the combination of particular vessels and lids.

All the milling parameters listed in the following tables are guideline values only. Depending on the product properties and the corresponding analysis requirements, the milling duration and speed in particular will have to be determined by experimentation.

Doubling the input quantity also necessitates a doubling of the milling duration for many products, if the same degree of homogenisation is to be achieved. An increase in the speed with double the input quantity is not, however, to be recommended.

Products with a high water content, predominantly fruit and vegetables, deep-frozen products and packaged meals, preserves up to 300 ml

For these products, the glass or plastic vessel is to be used with a corresponding gravity lid.

The gravity lid has the function of adapting the milling chamber volume to correspond to the varying sample volume during the milling process. The input volume must not exceed 300 ml. The sample material is to be cut in advance to a size of around 30 mm and fed into the mill vessel. Then set the gravity lid on the sample material in the vessel.

When the mill is started, the milling chamber volume required changes as a result of circulation effects and of the centrifugal forces acting on liquefied process material. The gravity lid moves with the material and thus constantly optimises the milling chamber.

This only functions, however, with products with a high water content.



When the gravity lid is used, we recommend that the max. input volume be determined on the basis of the input material.



If the input volume is > 300 ml, sample liquid can emerge from the mill vessel.

If the input volume is > 300 ml, the amount of input material either has to be reduced, or multiple milling operations performed.

Sample material	Sample quantity	Particle size	Speed	Time
Potatoes	200 g	20-30 mm	7000 rpm	20 sec.
Tomatoes	250 g	30 mm	8000 rpm	10 sec.
Cucumbers	200 g	30 mm	8000 rpm	15 sec.
Apples	200 g	30 mm	7000 rpm	15 sec.
Mandarin oranges	180 g	up to 30 mm	8000 rpm	10 sec.
Mushrooms	230 g	up to 30 mm	8000 rpm	20 sec.
Greens	300 g	up to 20 mm	8000 rpm	30 sec.
Peas and carrots	265 ml	up to 15 mm	10 000 rpm	15 sec.
Stew	200 ml	up to 20 mm	10 000 rpm	20 sec.
Canned pet food	350 g	as contents	10 000 rpm	20 sec.

**Products with a high fat content,
predominantly meat and fish**

Tough, fibrous, heterogeneous products such as meat and sausages, fish and other marine products should be prepared in the glass or plastic vessel with a simple lid (1000 ml). Cut the sample material to a size of around 10 - 20 mm in advance, and feed it into the vessel. Fit the lid and press it onto the lip of the vessel.

If the input volume exceeds 300 ml, always start the machine in interval mode, i.e. hold the start button down for 10 - 15 secs., or an overload may occur and the fuses will blow.

Sample material	Sample quantity	Particle size	Speed	Time
Salami	120 g	10 mm	6000 rpm	20 sec.
Meat chop without bone	100 g	10 - 15 mm	6000 rpm	20 sec.
Smoked bacon	100 g	15 mm	7000 rpm	15 sec.
Tuna fish	100 g	as contents	7000 rpm	20 sec.
Rollmops	150 g	as contents	7000 rpm	20 sec.



If the input volume of tough, fibrous products is > 300 ml, the machine may be overloaded and the fuses blow. Therefore start the GRINDOMIX GM 200 in interval mode first.

Products of very soft and/or tough and elastic consistency

Dairy products, in this case predominantly cheeses, with different fat contents and strengths, and tough and elastic fruits, are processed with a plastic vessel and a simple lid (1000 ml). While the fruit can be put into the vessel whole, cheese, e.g. camembert, has to be chopped into eighths.

For products with a tough and elastic consistency, the GRINDOMIX GM 200 **must always** be started in interval mode. Hold the start button down for 10 - 15 secs.

The milling duration is the fundamental factor determining the degree of fineness. If no experience has been gained, start with a short time setting, e.g. 10 sec., and approach the desired degree of fineness step by step.

Sample material	Sample quantity	Particle size	Speed	Time
Camembert	200 g	30 mm	5000 rpm	30 sec.
Gouda	100 g	10 - 15 mm	5000 rpm	10 sec.
Parmesan	175 g	10 mm	5000 rpm	20 sec.
Figs	100 g	30 - 35 mm	8000 rpm	15 sec.
Dried fruits	100 g	20 - 30 mm	7000 rpm	10 sec.
Chocolate bars (Mars)	100 g	30 mm	6000 rpm	15 sec.



When products with a tough and elastic consistency are processed, the fuses can blow. Therefore **always** start the GRINDOMIX GM 200 in interval mode first.

Products in the form of pourable grains

All cereals, seeds, mixed feed and pellets are preferably to be granulated gently in a steel vessel with a simple lid (1000 ml).

Grains containing grease and oil, e.g. cocoa beans, oil seeds and nuts, can be processed into paste by increasing the milling duration accordingly.

Sample material	Sample quantity	Particle size	Speed	Time
Corn	120 g	5 - 7 mm	6000 rpm	20 sec.
Feed pellets	200 g	5 - 10 mm	6000 rpm	20 sec.
Pepper corns	100 g	5 mm	7000 rpm	30 sec.
Cocoa beans	80 g	20 mm	5000 rpm	25 sec.
Peanuts	120 g	10 mm	6000 rpm	30 sec.

The 500 ml lid can be used with all the above products if the input quantity is small.

General

Target group: Operators

Accessories

<ul style="list-style-type: none">• Glass vessel, 1000ml, borosilicate glass 3.3	Transparent, smooth surface, high quality material.
<ul style="list-style-type: none">• 500ml lid in plastic	Used for max. 300 ml, e.g. seeds, pepper corns, cheese etc.
<ul style="list-style-type: none">• Gravity lid for the standard plastic vessel	Infinitely variable milling chamber from approx. 0.4 to 1 litre, automatic adjustment to the varying milling chamber volume at different stages of the milling process.
<ul style="list-style-type: none">• Gravity lid for the glass vessel	Infinitely variable milling chamber from approx. 0.4 to 1 litre, automatic adjustment to the varying milling chamber volume at different stages of the milling process.
<ul style="list-style-type: none">• Scraper	For easier removal of pasty samples.



Cleaning

Do not clean the GRINDOMIX GM 200 under running water.

Danger of fatality from electric shock.

Use a moist cloth only.

Use no solvents.

The ingress protection rating of the GRINDOMIX GM 200 is:

IP42 in the milling chamber and keyboard.

IP30 in the area of the ventilation slots.

Cleaning of the milling tools, vessel and lid

The milling tools, vessels and the various lids are dishwasher-proof.

The glass vessel can be sterilised.

The knife cylinder can be sterilised up to 130°C.

Maintenance

The GRINDOMIX GM 200 is maintenance-free.

When used in accordance with the manufacturer's instructions the machine requires no maintenance or adjustment.

Necessary safety tests

Check the cover interlock monthly for correct function:

- Close the cover:

The cover must close in response to a light pressure, and the interlock pin spring into the interlocked position immediately. It must not be possible to open the cover manually.

- Open the cover:

A short press on the STOP button must be sufficient to release the interlock pin and allow the cover to spring open.



Warning!

The plastic container and the plastic covers are only resistant to cleaning in a dishwasher.

If using a dishwasher, ensure the correct positioning!

Never place close to the heating helix, otherwise deformation might occur which could prevent further use with the GM .

Sterilising and heating in an autoclave is not possible!



Caution!

Do not unscrew the cover because doing so will alter the limit switch setting!

If the limit switch setting is altered, follow the instructions in "How to set the limit switch in the Grindomix" to re-establish the required device setting.

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Dissemination or duplication of this documentation, utilisation and dissemination of its contents will only be permitted with the express approval of Retsch GmbH. Contraventions will give rise to liability for damages.

Modifications

The right is reserved to modify any specification without notice.

Fault display

The GRINDOMIX GM 200 is equipped with an error display. In the case of a fault, various fault codes are issued on the speed display or by flashing sequences of the time and speed displays.

Fault code (flashing sequence)	Cause	Remedy
F02	Motor switched off due to overload.	Restart the milling process with a smaller quantity of input material.
F06	Motor overheated.	Allow the motor to cool down and restart.
Both displays flash continuously	The cover is still open.	Close the cover.
	Minor motor overload with speed deviation >5%.	Restart the milling process with a slightly smaller quantity of input material.



Other flashing sequences indicate an electrical fault, and these codes are primarily intended to facilitate the work of service personnel. We recommend you to contact our after sales service staff.

Safety regulations (Table)

for the GRINDOMIX GM 200 from the individual chapters

Subject	Action	Hazard
Safety	Failure to observe the notes on safety can lead to damage to property and personal injury.	We accept no liability whatsoever for any damage or injury resulting from non-observance of the notes on safety.
Use for the intended purpose	Do not modify the machine in any way, and use only spare parts and accessories approved by Retsch.	The conformity with European Directives declared by Retsch will otherwise be invalidated. Furthermore, this will lead to all warranty claims being rendered null and void.
Packaging	Please keep the packaging for the duration of the guarantee period.	Your guarantee claim may be invalidated if there is a complaint and the unit is returned in inadequate packaging.
Temperature fluctuations	When subjected to major temperature fluctuations, the GRINDOMIX GM 200 is to be protected from condensation.	Damage to the electronic components may otherwise result.
Transport	The GRINDOMIX GM 200 must not be jarred, shaken or thrown during transport.	This could damage the electronic and mechanical components.
Scope of supply	In cases of incomplete delivery and/or transport damage, you must notify the forwarding agent and Retsch GmbH without delay (within 24 hours).	It may not be possible to accept subsequent complaints.
Ambient temperature	Not below 5°C. Not above 40°C.	Electronic and mechanical components may be damaged and performance data change to an unknown extent.
Humidity	Maximum relative humidity 80% at temperatures up to 31°C, declining in a straight line to 50% relative humidity at 40°C.	Higher humidity can cause damage to the electronic and mechanical components, and performance data can change to an unknown extent.
Electrical connection	Mains power differs from the values on the type plate.	Electrical and mechanical components may be damaged.
Handling the gravity lid	Recommended input quantities or max. input volume of 300 ml exceeded.	If the recommended input quantities are exceeded with materials containing water, the vessel may overflow during the milling process.
Filling the vessel in the machine	The cover must engage securely with the interlock pin.	The motor cannot otherwise start or an emergency braking operation may be triggered off during milling.
	Caution! Always insert the knife cylinder before feeding the process material in.	Otherwise process material may be deposited between the knife cylinder and the vessel.
Filling the vessel outside the machine	Hold the lid down at the centre when inserting the vessel into the machine (absolutely necessary with the 500 ml lid).	The knife cylinder must definitely reach its limit position.
	The cover must engage securely with the interlock pin.	The motor cannot otherwise start or an emergency braking operation may be triggered off during milling.
	When filling the vessel outside the machine, do not use the gravity lid.	It cannot hold the knife down when the vessel is inserted in the machine.

Safety regulations (Table 2)

for the GRINDOMIX GM 200 from the individual chapters

Subject	Action	Hazard
Notes on sample milling	If the input volume is > 300 ml, sample liquid can emerge from the mill vessel(concerns the gravity lid).	The amount of input material either has to be reduced, or multiple milling operations performed.
	If the input volume of tough, fibrous products is > 300 ml, the machine may be overloaded and the fuses blow.	Therefore start the GRINDOMIX GM 200 in interval mode first.
	When products with a tough and elastic consistency are processed, the fuses can blow.	Therefore always start the GRINDOMIX GM 200 in interval mode first.
Cleaning	Do not clean the GRINDOMIX GM 200 under running water. Use a moist cloth only. Use no solvents.	Danger of fatality from electric shock.
Necessary safety tests	In the case of malfunction, do not continue to operate the machine.	Contact our after sales service staff!
Fault display	Fault code displays which are not listed.	Contact our after sales service staff.

Warranty conditions

1. In the case of justified complaints, we will repair or replace the defective parts at no charge.

The purchaser shall only be entitled to withdraw from the contract or reduce the purchase price when, at our decision, repair is impractical or impossible or replacements cannot be supplied or cannot be supplied in due time, or when a reasonable period of grace of at least six weeks set by the customer has expired without result due to circumstances within our control.

Should the attempt to repair or replace defective parts finally fail, the customer may at his option require a reduction of the purchase price or withdraw from the contract. Further claims, in particular such for damages not suffered by the object itself, such as loss of production, shall be excluded unless caused by intent or negligence on our part. We pass on the liability of the manufacturer(s) for bought-in products.

2. We shall bear the direct costs of repair or replacement on condition that the complaint has proven to be justified. This also applies to the costs of shipment and reasonable costs for dismantling and installation. The customer shall however be obliged to bear the costs of providing his own fitters and ancillary personnel at site. Should our customer operate abroad, we shall in contrast be entitled to bear the costs of rectification, and in particular transport, travel and material costs, ex-German border.

3. The warranty term for newly manufactured goods is two years, for used it is one year.

The guarantee refers to deployment in a laboratory in 1-shift operation. In case of multi-shift operation or other areas of application, the guarantee term is shortened accordingly.

No warranty is given for parts subject to wear and tear.

4. We warrant that our goods are free of manufacturing defects. The suitability, classification and function of our goods shall be exclusively determined by the specifications in the acknowledgement of order, even if these deviate from the order. In such cases, the customer shall have the option of drawing our attention to any deviations from the order within two weeks of receipt of our acknowledgement, and reaching agreement with us. Should no objection be raised to the specifications in the acknowledgement of order, these shall be deemed accepted.

In the lack of any agreement to the contrary, we shall accept no liability for the suitability of the object supplied for the purpose intended by the customer. The same shall apply to performance data expected by the customer, unless we have been able to perform appropriate, realistic laboratory trials in advance and declared the corresponding performance data to be firm and binding in writing in our acknowledgement of order.

5. Our warranty shall also become null and void if persons other than those appointed by ourselves perform repairs or other work on or modifications to goods we have supplied or use unsuitable accessories, provided that there is a causal relationship between such actions and the defects which appear. For the rest, our warranty is dependent on compliance with our operating instructions.
6. If the goods are installed in other systems or production facilities by the customer without our prior approval, or connected to, linked with or processed on such systems or production facilities, our warranty is exclusively limited to the parts we have supplied.
7. Repair or replacement of defective parts shall be effected at our option either at the point of installation of the object purchased, or at our corporate location. When repairs take place at the point of installation, the customer is to afford our representative unimpeded access for as long as required to the object purchased. The customer may for the rest only require the performance of the warranty work during normal local business hours. Should warranty work be performed at the customer's request outside our normal business hours, the customer is to pay the additional costs. Should he require further special work over and above the warranty work, these costs are also to be borne on the basis of our current prices.