

Manual

Feeder DR100



Translation

Retsch[®]

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1 Notes on the Operating Manual

This operating manual is a technical guide on how to operate the device safely and it contains all the information required for the areas specified in the table of contents. This technical documentation is a reference and instruction manual. The individual chapters are complete in themselves.

Familiarity (of the respective target groups defined according to area) with the relevant chapters is a precondition for the safe and appropriate use of the device.

This operating manual does not contain any repair instructions. If faults arise or repairs are necessary, please contact your supplier or get in touch with Retsch GmbH directly.

Application technology information relating to samples to be processed is not included but can be read on the Internet on the respective device's page at www.retsch.com.

Changes

Subject to technical changes.

Copyright

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Infringements will result in damage compensation liability.

1.1 Explanations of the safety warnings

In this Operating Manual we give you the following safety warnings

Serious injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.



WARNING

Type of danger / personal injury

Source of danger

- Possible consequences if the dangers are not observed.
 - **Instructions on how the dangers are to be avoided.**
-

We also use the following signal word box in the text or in the instructions on action to be taken:



WARNING

Moderate or mild injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.



CAUTION

Type of danger / personal injury

Source of danger

- Possible consequences if the dangers are not observed.
 - **Instructions on how the dangers are to be avoided.**
-

We also use the following signal word box in the text or in the instructions on action to be taken:



CAUTION

In the event of possible **property damage** we inform you with the word “Instructions” and the corresponding content.

NOTICE

Nature of the property damage

Source of property damage

- Possible consequences if the instructions are not observed.
 - **Instructions on how the dangers are to be avoided.**
-

We also use the following signal word in the text or in the instructions on action to be taken:

NOTICE

1.2 General safety instructions



CAUTION

Read the Operating Manual

Non-observance of these operating instructions

- The non-observance of these operating instructions can result in personal injuries.

- **Read the operating manual before using the device.**
- **We use the adjacent symbol to draw attention to the necessity of knowing the contents of this operating manual.**



Target group : All persons concerned with the machine in any form

This machine is a modern, high performance product from Retsch GmbH and complies with the state of the art. Operational safety is given if the machine is handled for the intended purpose and attention is given to this technical documentation.

You, as the owner/managing operator of the machine, must ensure that the people entrusted with working on the machine:

- have noted and understood all the regulations regarding safety,
- are familiar before starting work with all the operating instructions and specifications for the target group relevant for them,
- have easy access always to the technical documentation for this machine,
- and that new personnel before starting work on the machine are familiarised with the safe handling of the machine and its use for its intended purpose, either by verbal instructions from a competent person and/or by means of this technical documentation.

Improper operation can result in personal injuries and material damage. You are responsible for your own safety and that of your employees.

Make sure that no unauthorised person has access to the machine.



CAUTION

Changes to the machine

- Changes to the machine may lead to personal injury.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

NOTICE

Changes to the machine

- The conformity declared by Retsch with the European Directives will lose its validity.
- You lose all warranty claims.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

1.3 Repairs

This operating manual does not contain any repair instructions. For your own safety, repairs may only be carried out by Retsch GmbH or an authorized representative or by Retsch service engineers.

In that case please inform:

The Retsch representative in your country
Your supplier
Retsch GmbH directly

Your Service Address:

--

2 Confirmation

This operating manual contains essential instructions for operating and maintaining the device which must be strictly observed. It is essential that they be read by the operator and by the qualified staff responsible for the device before the device is commissioned. This operating manual must be available and accessible at the place of use at all times.

The user of the device herewith confirms to the managing operator (owner) that (s)he has received sufficient instructions about the operation and maintenance of the system. The user has received the operating manual, has read and taken note of its contents and consequently has all the information required for safe operation and is sufficiently familiar with the device.

As the owner/managing operator you should for your own protection have your employees confirm that they have received the instructions about the operation of the machine.

I have read and taken note of the contents of all chapters in this operating manual as well as all safety instructions and warnings.

User

Surname, first name (block letters)

Position in the company

Signature

Service technician or operator

Surname, first name (block letters)

Position in the company

Place, date and signature

3 Transport, scope of delivery, installation

3.1 Packaging

The packaging has been adapted to the mode of transport. It complies with the generally applicable packaging guidelines.

3.2 Transport

NOTICE

Transport

- Mechanical or electronic components may be damaged.
 - **The machine may not be knocked, shaken or thrown during transport.**
-

3.3 Temperature fluctuations and condensed water

NOTICE

Temperature fluctuations

The machine may be subject to strong temperature fluctuations during transport (e.g. aircraft transport)

- The resultant condensed water may damage electronic components.
 - **Protect the machine from condensed water.**
-

3.4 Conditions for the place of installation

NOTICE

Ambient temperature

- Electronic and mechanical components may be damaged and the performance data alter to an unknown extent.
 - **Do not exceed or fall below the permitted temperature range of the machine (5°C to 40°C / ambient temperature).**
-

3.5 Installation of the machine

Installation height: maximum 2000 m above sea level

3.6 Type plate description



Fig. 1: Type plate lettering

- 1 Device designation
- 2 Year of production
- 3 Part number
- 4 Serial number
- 5 Manufacturer's address
- 6 CE marking
- 7 Disposal label
- 8 Bar code
- 9 Power version
- 10 Mains frequency
- 11 Capacity
- 12 Amperage
- 13 Number of fuses
- 14 Fuse type and fuse strength

In the case of questions please provide the device designation (1) or the part number (3) and the serial number (4) of the device.

3.7 Electrical connection

WARNING

When connecting the power cable to the mains supply, use an external fuse that complies with the regulations applicable to the place of installation.

- Please check the type plate for details on the necessary voltage and frequency for the device.
- Make sure the levels agree with the existing mains power supply.
- Use the supplied connection cable to connect the device to the mains power supply.



Fig. 2: Type plate and mains adapter

NOTE

The type plate (**W**) is on the underneath of the device.

3.8 Removing the transport safeguard

A screw to secure the device and protect its mechanical and electronic components against damage during transportation is located underneath the DR 100.

- Remove the transport lock (**TS**) using an SW13 open end wrench.

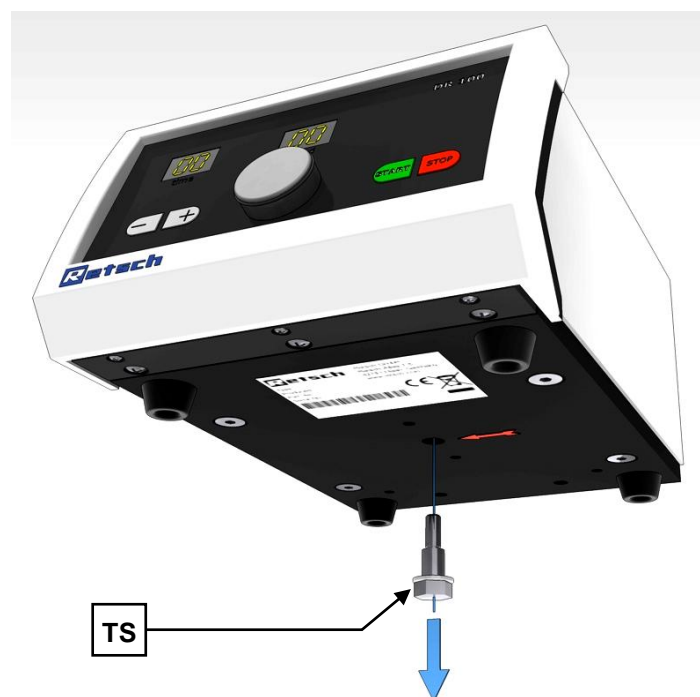


Fig. 3: Removing the transport lock

NOTICE

Transport safeguard

- Components may be damaged.
- **Operate the machine only without the transport safeguard or transport the machine only with transport safeguard.**

3.9 Mounting the support for the vibrating chute

- Check that the dust seals (Fn) are in the correct position before mounting the support.

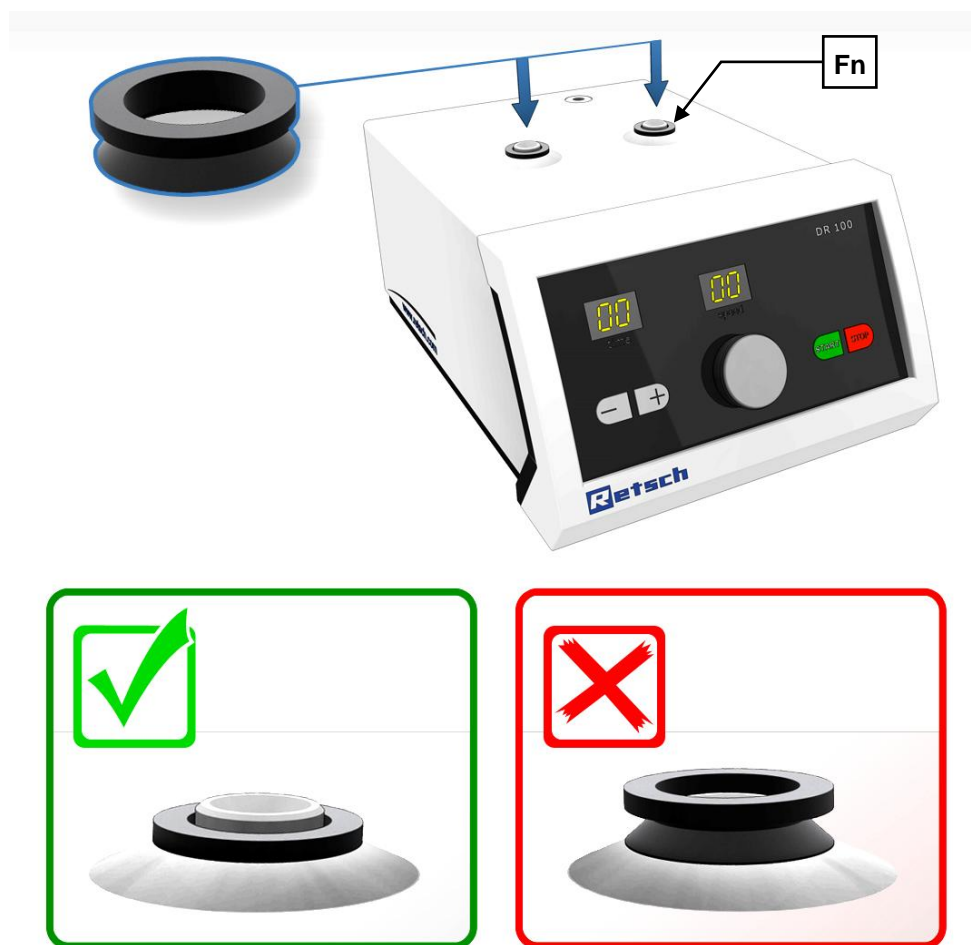


Fig. 4: Correct position of the dust seal

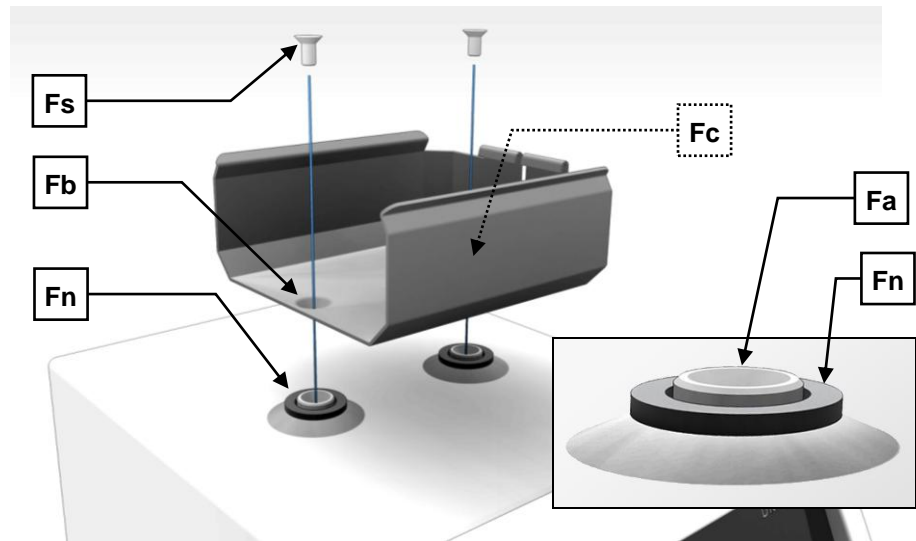


Fig. 5: Mount the vibrating chute support

- Insert the countersunk screws (**Fs**) into the drill holes (**Fb/Fc**) of the support.
- First tighten the screw (**Fc**) using a Phillips screwdriver.
- Then screw the screw (**Fb**) tight.

NOTE

No sufficient transmission of the vibrations will take place without a strong connection between vibrating chute and bolt (**Fa**). The feed cannot be controlled.

- Check that the screws are in the correct position.

3.10 Inserting the vibrating chute

- Clamp the back edge (**Cr**) of the vibrating chute under the lugs (**Fk**) of the holding fixture (**F**).

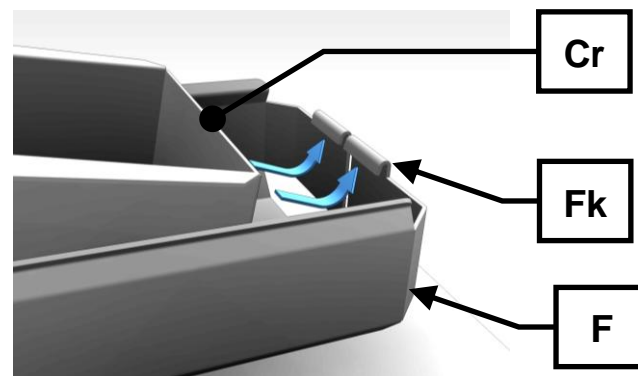


Fig. 6: Inserting the vibrating chute

- Press the vibrating chute (**C**) into the holding fixture (**F**) until it locks in place.

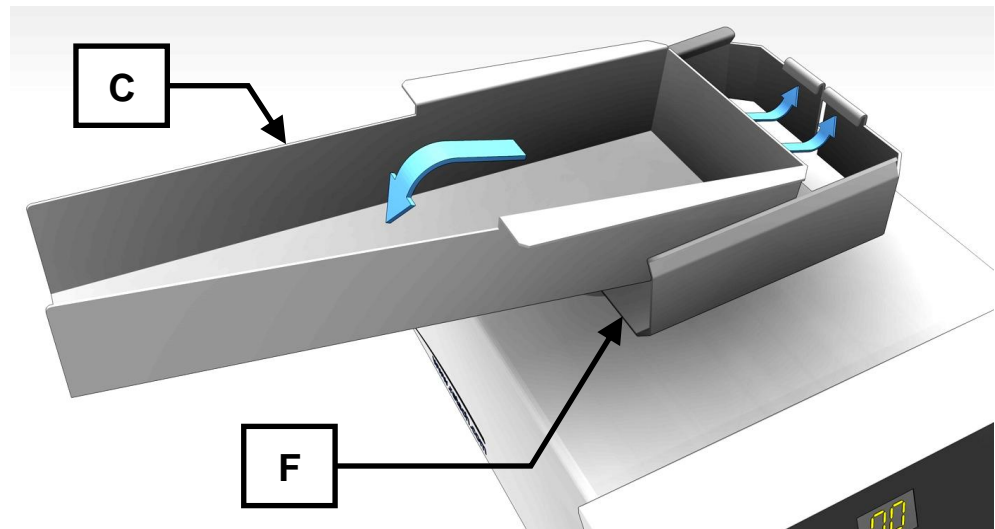


Fig. 7: Locking the vibrating chute in place

3.11 Mounting the hopper support rod

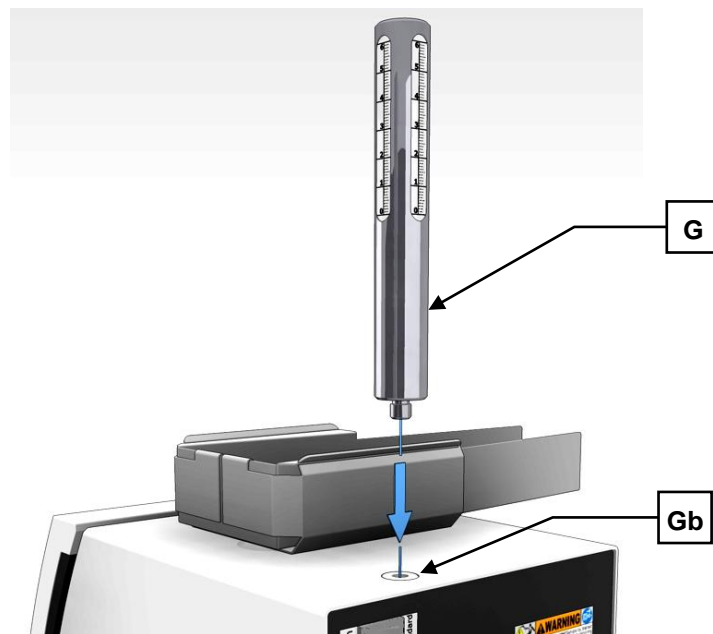


Fig. 8: Mounting the hopper support rod

- Screw the hopper support rod (G) into the threaded hole (Gb) on the housing.

3.12 Mounting the hopper support

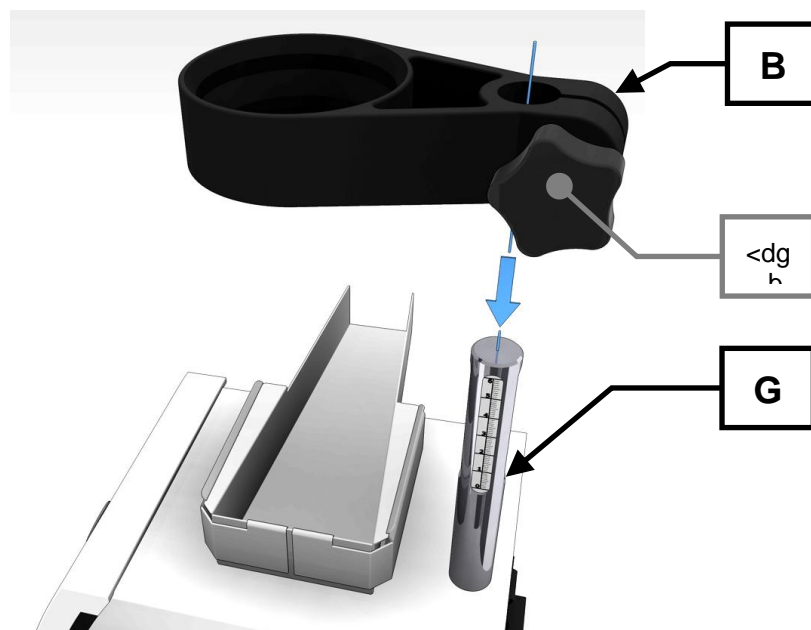


Fig. 9: Mounting the hopper support

- Loosen the locking screw (E).
- Place the hopper support (B) on the rod (G).
- Screw the locking screw (E) tight.

By twisting and sliding vertically, the hopper support makes it possible to place the feed hopper in the correct position.

3.13 Inserting the hopper

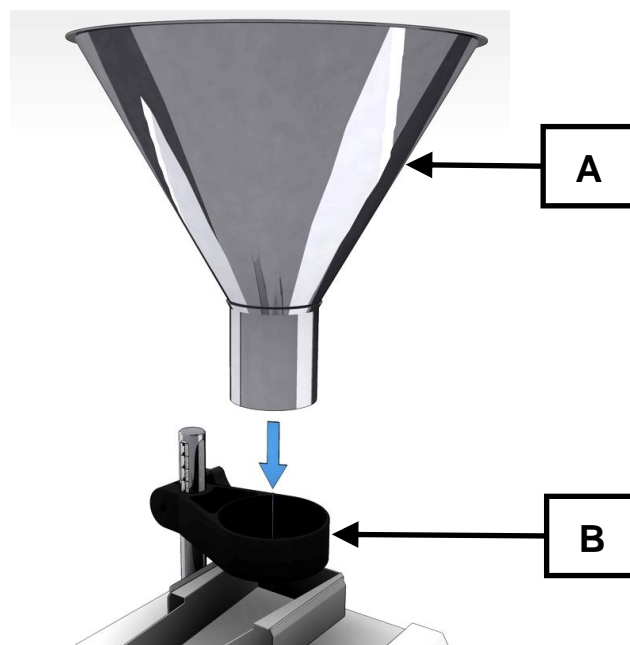


Fig. 10: Inserting the hopper

Insert the hopper (A) in the support (B).

4 Technical data

4.1 Use of the machine for the intended purpose



CAUTION

Danger of personal injury

Dangerous nature of the sample

- Depending on the dangerous nature of your sample, take the necessary measures to rule out any danger to persons.
- **Observe the safety guidelines and datasheets of your sample material.**



Target group: Operating company, operator

Machine model designation: DR 100

This device has not been designed as production machine and for continuous operation, but rather as laboratory equipment, intended for 8-hour shift operation.

The DR 100 is suitable for feeding pourable, free-flowing solids from the corresponding feed hoppers with the following feed particle size:

DR 100/15 $\leq 2\text{mm}$

DR 100/40 $\leq 6\text{mm}$

DR 100/75 $\leq 12\text{mm}$

4.2 Working instructions

Use Retsch feed devices, Model DR 100, for the constant feeding and conveying of pourable bulk materials and powders. The DR 100 is diverse and can be used effectively, whether used directly with Retsch grinding devices or for simple feeding of scales, for mixing and stirring processes or for measurement devices.

The sample material gets to the vibrating chute via the feed hopper. An electromagnetic directional throw vibrator causes this to vibrate at 50 or 60 Hz, and as a result generates a constant transport of material. The vibration intensity and thus the feed speed are infinitely adjustable.

The feed duration can be preselected and is displayed digitally. During **Standard** operation the DR 100 is actuated directly by the downstream devices depending on load.

Parts coming into contact with the product are made from stainless steel.

Features:

- Constant feeding and conveying of pourable bulk materials up to 12mm particle size and of fine powders
- Timed operation of between 1 and 99 min. or continuous operation can be preselected
- Vibration intensity can be digitally infinitely selected
- Height-adjustable hopper
- Parts coming into contact with product made from stainless steel

- Can be switched to external and standard operation in conjunction with Retsch devices

4.3 Sample quantity

Model	Hopper volume
DR100/15	2.65 dm ³
DR100/40	2.65 dm ³
DR100/75	3.50 dm ³

4.4 Conveying quantity

Model	Set layer height	Conveying quantity
DR 100/15	8 mm	Approx. 0.5 dm ³ /min
DR 100/40	30 mm	Approx. 5.0 dm ³ /min
DR 100/75	35 mm	Approx. 5.0 dm ³ /min

Conveying medium: Quartz sand at maximum vibration intensity
(non-binding reference values)

4.5 Number of vibrations

- 3000 vibrations at 50Hz
- 3600 vibrations at 60Hz

4.6 Rated power

- 24 Watt

4.7 Emissions

Noise values:

Noise measurement in accordance with DIN 45635-031-01-KL3

The noise values are dependent on the set vibration intensity.

Emission at a distance of 1m: from 36 to 42 dB(A)

4.8 Dimensions and weight

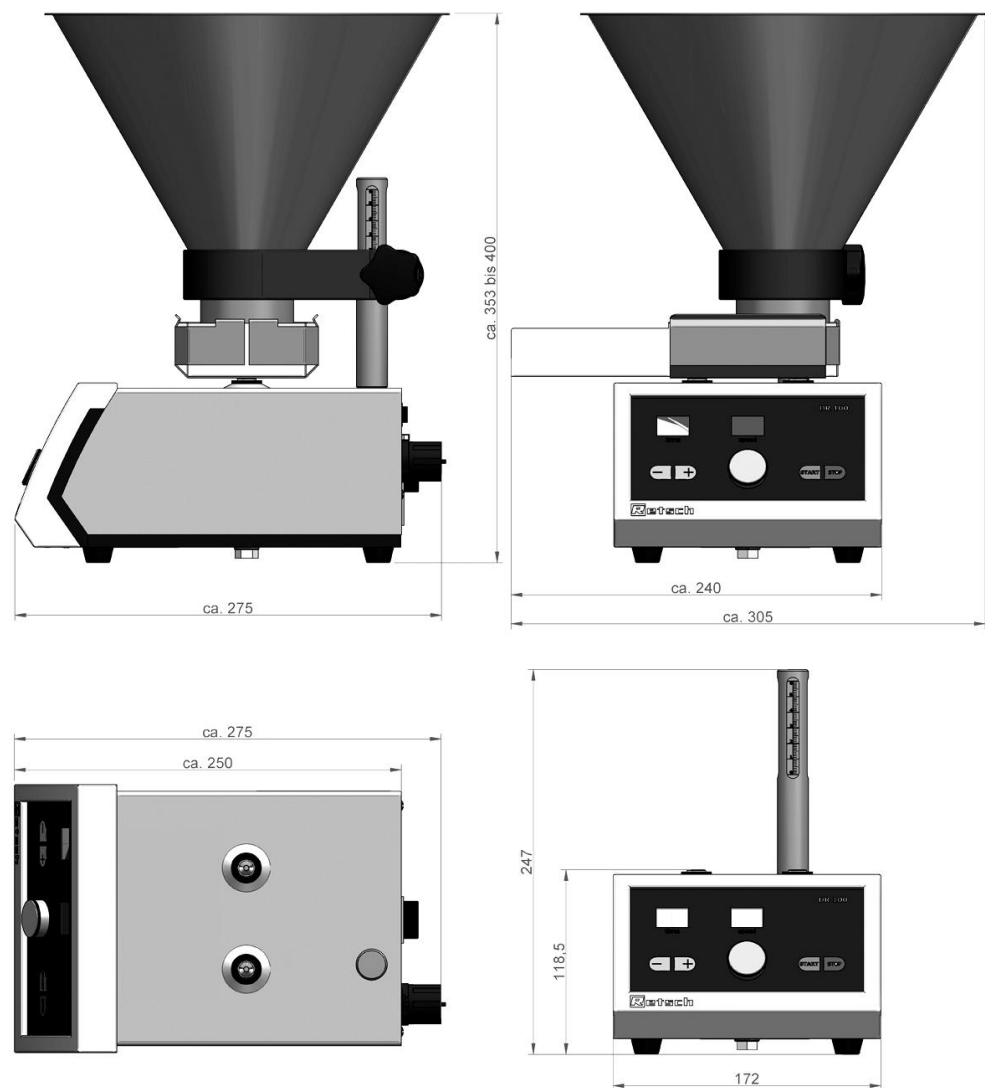


Fig. 11: Dimensions of the device

Weight without support and without hopper: approx. 9.7kg

Weight including hopper and hopper support: approx. 12kg

4.9 Required floor space

275 mm x 305 mm; no safety distances necessary

5 Operating the machine

5.1 Views of the Instrument

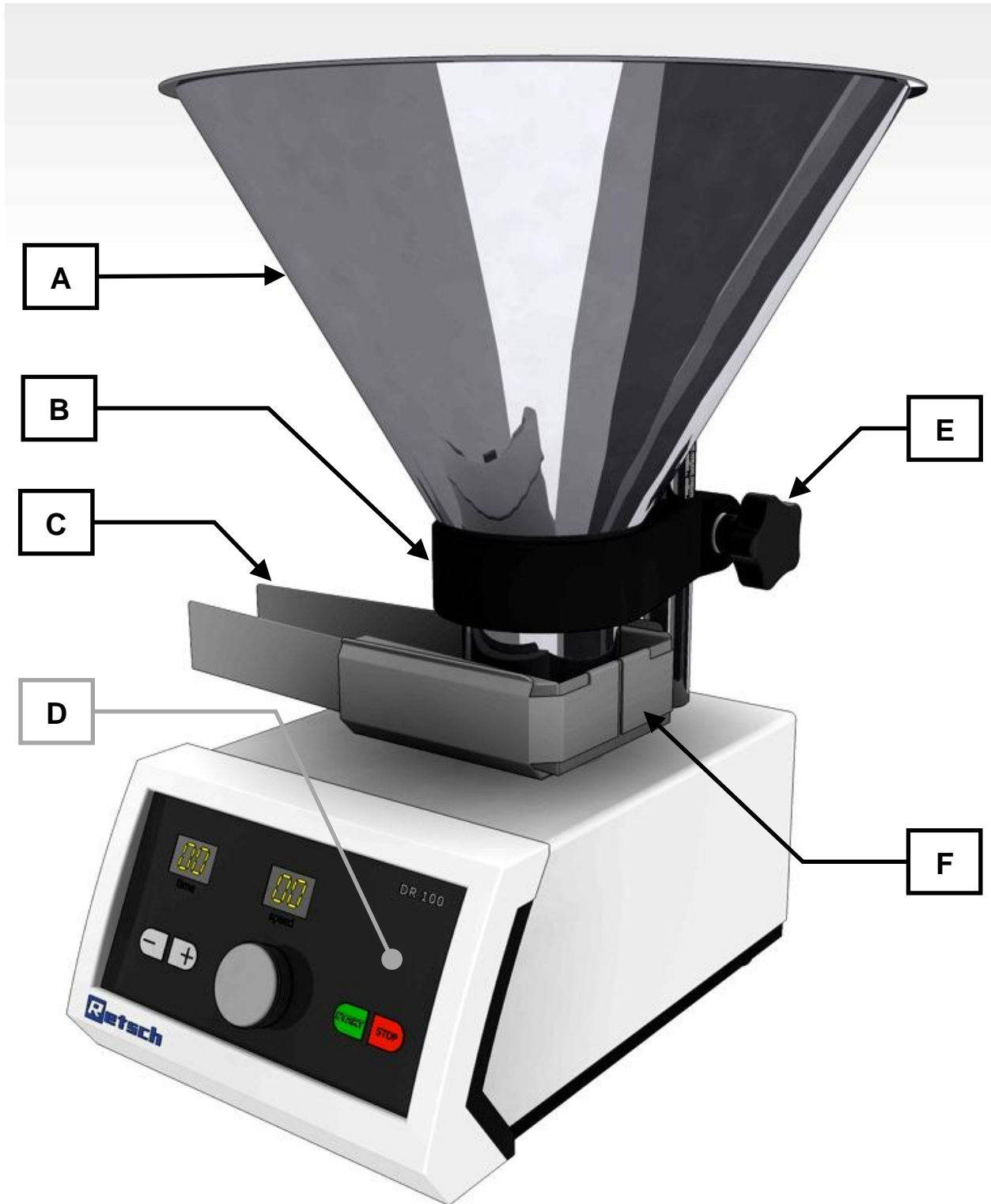


Fig. 12: General view of the device and of individual parts

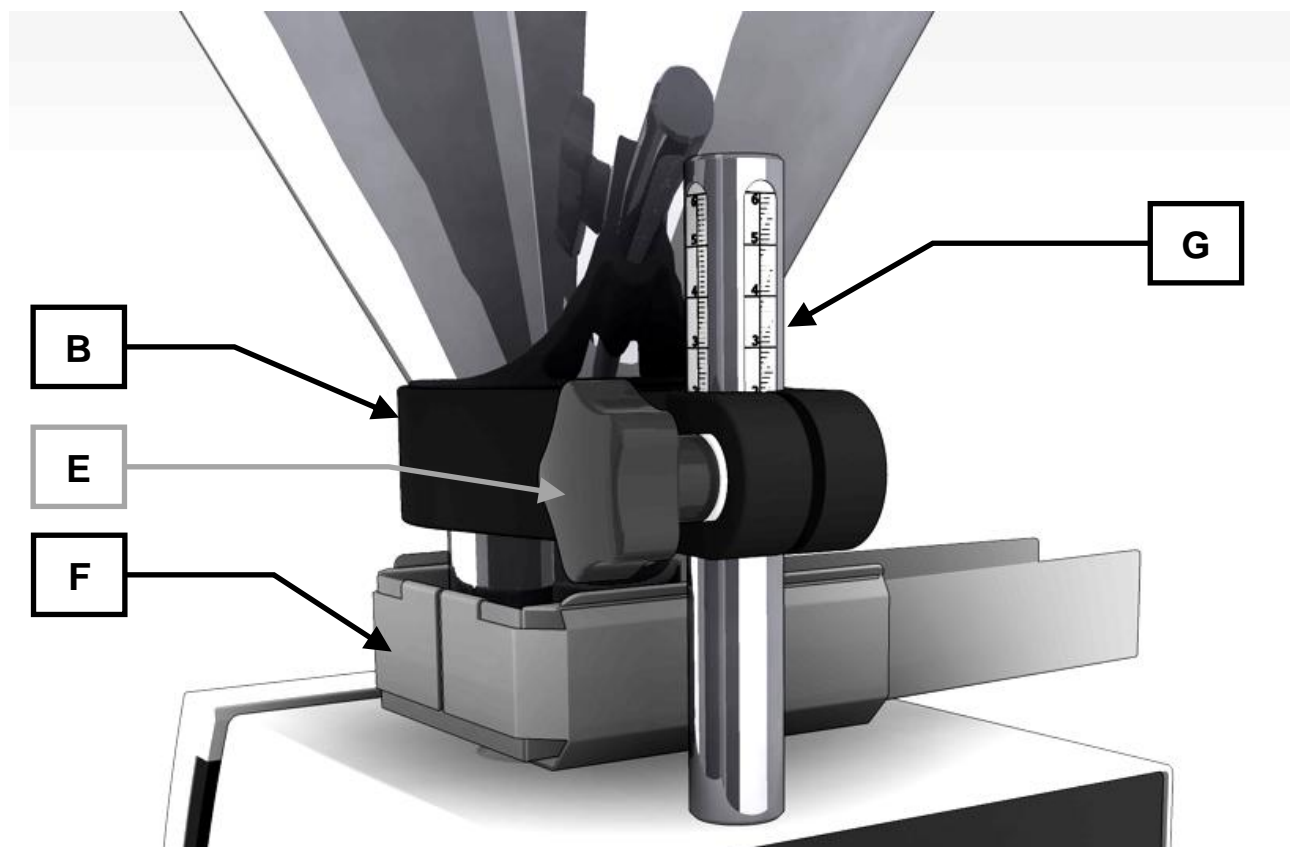


Fig. 13: Rear view of the hopper support



Fig. 14: Back of the device – Power connection and interface

5.2 Overview table of the parts of the device

Element	Description	Function
A	Feed hopper	Serves as storage vessel, accommodates the feed material to be conveyed via the vibrating chute (C)
B	Hopper support	Is connected to the stand rod (G), supports the feed hopper (A) and permits its height to be adjusted
C	Vibrating chute	Conveys feed material at a feed speed set using the element L
D	Control unit	START / STOP, setting of parameters
E	Locking screw, hopper support	Anchoring the hopper support
F	Vibrating chute support	Supports the vibrating chute
G	Stand rod	Supports the hopper support (B) and permits adjustment of the hopper support
H	Operating mode selector switch	To switch between standard and external operating modes
I	Interface	To connect external equipment
J	Mains switch	Disconnects and connects the DR 100 from/to the mains
K	Fuse drawer and fuse insert	Accommodates two glass fuses
L	Power plug connection	Accommodates the power cable

5.3 Operating elements and displays

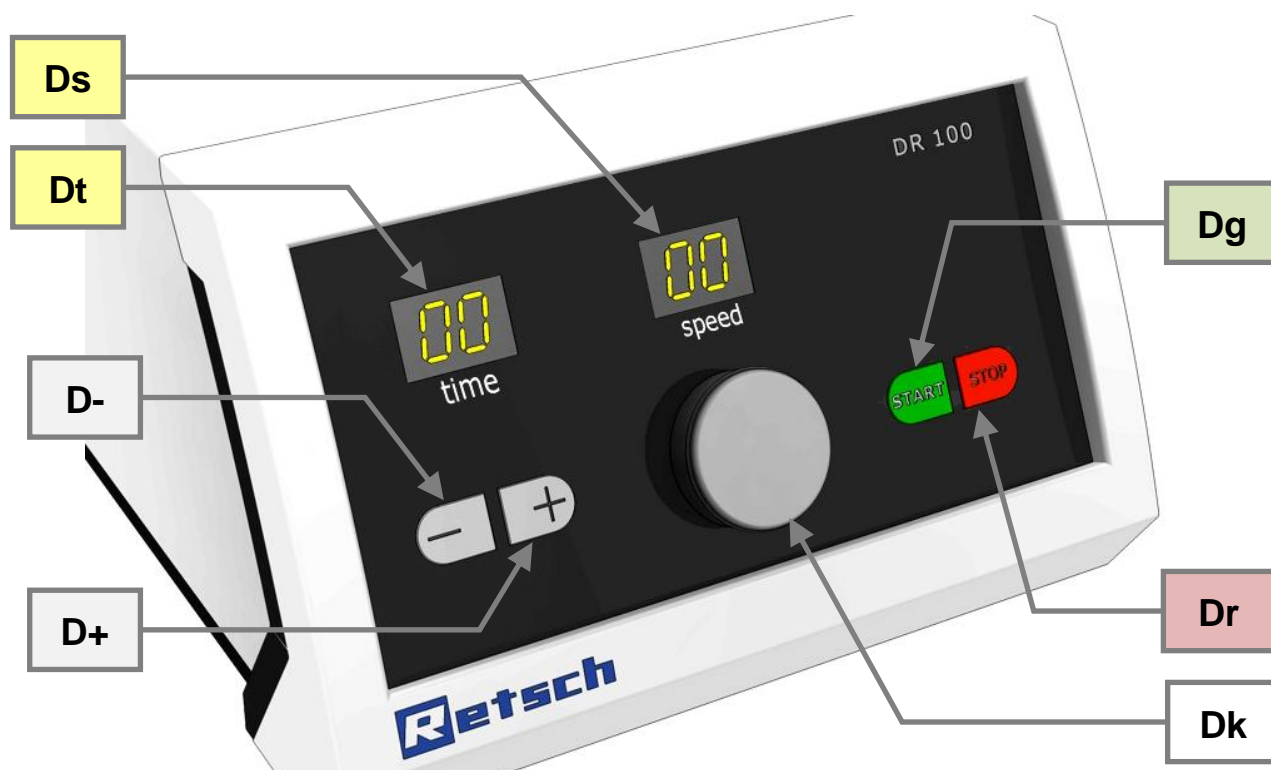


Fig. 15: Control panel

5.4 Overview Table of the Operating Elements and the Display

Element	Description	Function
Dt	Display time	To display the set operating time and error messages
Ds	Display speed	To display vibration intensity or feed speed
D-	- button	To shorten the operating time
D+	+ button	To extend the operating time
Dg	START button	To start the device
Dr	STOP button	To stop/pause the device
Dk	Knob	To set the vibration intensity or feed speed

5.5 Switching On and Off

- Actuate the main switch (**J**) on the back of the device.

5.6 Setting the operating time

5.6.1 Continuous operation

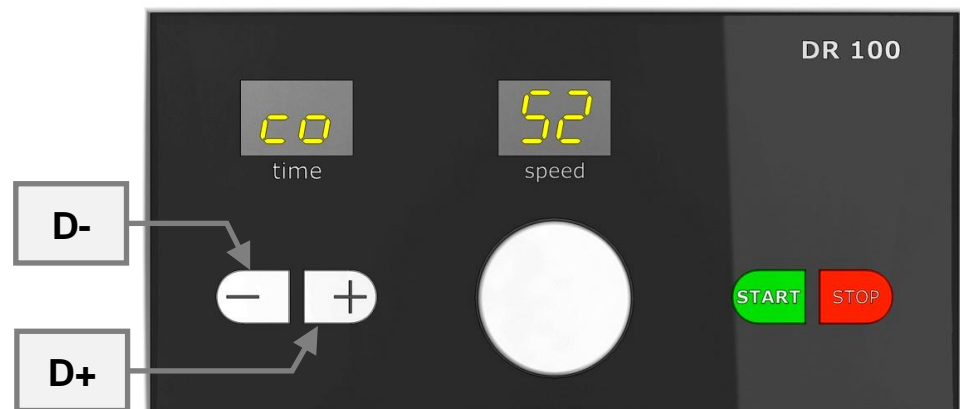


Fig. 16: Setting the operating time

- Press the (**D-**) or (**D+**) button until “co” appears on the display on falling below the setting of 1 or exceeding the setting of 99 minutes.
[co - continuous]
- co – 01 – 02 – 03 ... 77 – 89 – 99 – co

The DR 100 is operational for continuous operation.

5.6.2 Setting the time

In addition to continuous operation, a feed time of between 1 and 99 minutes can also be set. “co” appears in the **time** display on falling below the setting of 1 or exceeding the setting of 99 minutes.

- Press the (**D-**) button to shorten the feed time.
- Press the (**D-**) button to extend the feed time.
- The feed time is shown in minutes in the **time** display.

5.7 Setting the feed speed

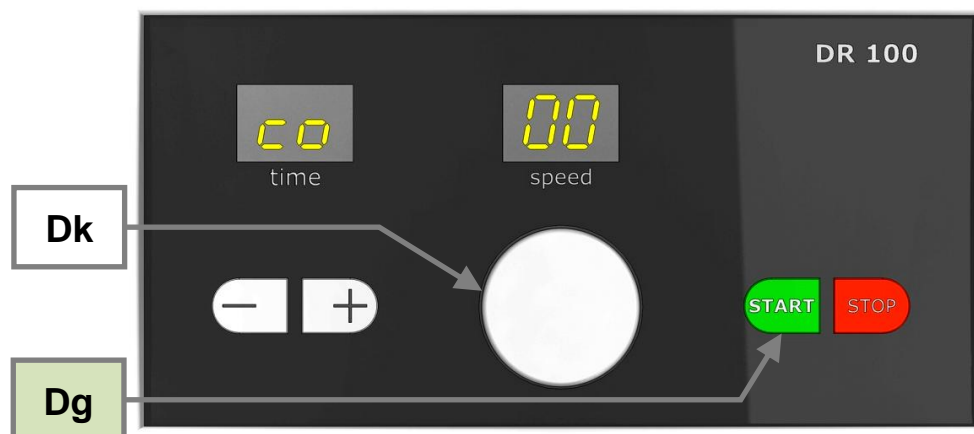


Fig. 17: Setting the feed speed

- Turn the knob (**Dk**) anticlockwise until the **speed** "00" can be seen.
- Press the START button (**Dg**).
- The vibrating chute vibrates gently.
- Turn the knob (**Dk**) clockwise until reaching the desired feed speed.

The device conveys the feed material placed on it into the receiving vessel or device you have provided.

The feed speed is determined by the change in the power supply on the installed directional throw vibrator of the DR 100 (phase angle control).

The setting is made using the knob (**Dk**)

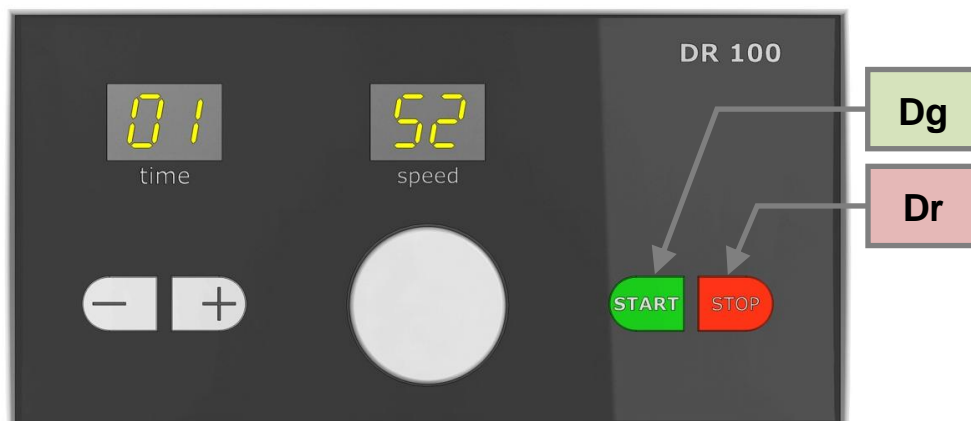
- Turning to the right increases the speed
- Turning to the left decreases the speed

NOTE

The message in the **speed** display is only intended as setting aid and is not reproducible because:

- The supply voltage is usually not stable
- The output of the directional throw vibrator changes according to operating duration due to heating or cooling.

5.8 Starting, Interrupting, Stopping



5.8.1 Interrupt (pause)

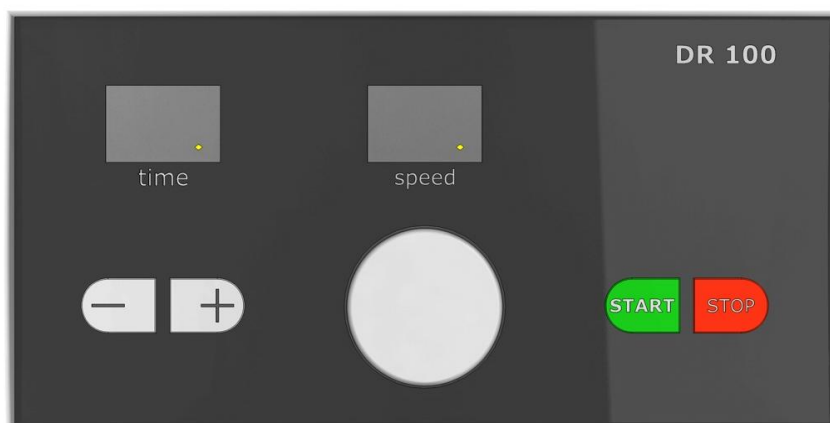
- Press the **STOP** button (**Dr**).
- The feed is interrupted and the current values continue to be shown in the display.
- Pressing the STOP button again cancels the feed.

5.8.2 Continue

- Press the **START** button (**Dg**).
- The feeding of the sample continues until the set operating time has expired.

5.8.3 Cancel

- Press the **STOP** button (**Dr**) the first time.
- The feed is interrupted and the current values continue to be shown in the display.
- Press the **STOP** button (**Dr**) a second time.
- The expired operating time is deleted. A dot is shown in both displays.
- Press the **START** button (**Dg**).
- The values set for the last feed will be displayed.



Alternative method:

- Turn off the mains switch (**J**) on the back.
- The feed is cancelled and the previously expired operating time is deleted. When switching back on the set operating time will be displayed.

5.9 Setting the layer height

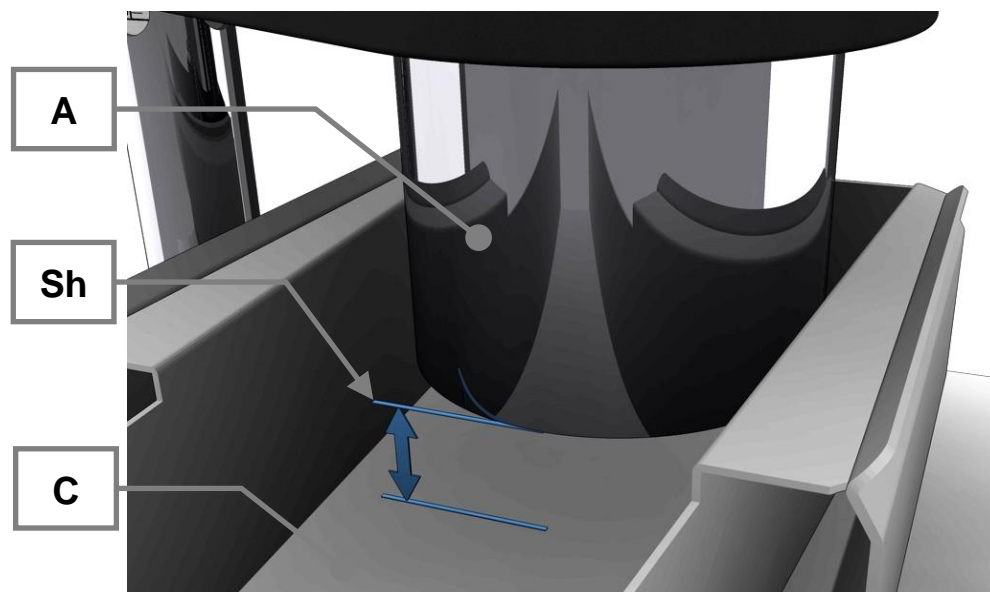


Fig. 18: Layer height

By twisting and sliding vertically, the hopper support makes it possible to place the feed hopper in the correct position.

- Unscrew the fixing screw on the hopper support (E).

Set the desired layer height (Sh) between the bottom edge of the feed hopper (A) and the base of the vibrating chute (C).

- To do this slide the hopper holder upwards or downwards as required.
- Tighten the locking screw on the hopper support (E).

NOTE

The layer height between the bottom edge of the feed hopper and the base of the vibrating chute depends on the particle size of the feed material to be used.

The layer height should be at least 3 x greater than the maximum particle size of the feed material.

The scale of the stand bar (G) is only intended as orientation aid for the set layer height. It is not possible to directly read off the actual layer height set.

5.10 Creating interface connection

5.10.1 Interface to the ZM200



Fig. 19: Connecting the interface

The device can be connected to the RETSCH ZM200 interface (Z) using the interface (I). The appropriate interface cable (Ik) should be used for this.

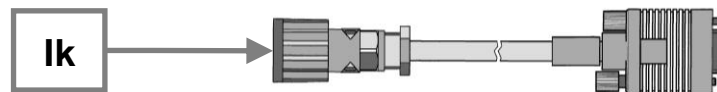


Fig. 20: Interface cable ZM200

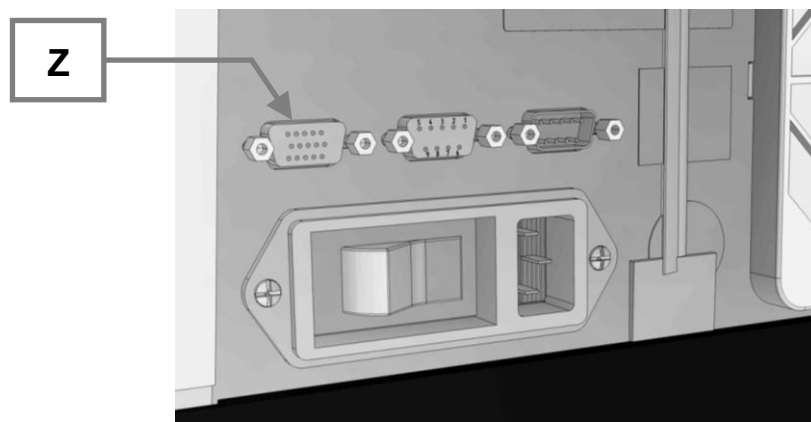


Fig. 21: Interface on the ZM200

An overload to the ZM200 can be prevented by using the interface. As soon as an overload to the ZM200 is indicated, the ZM200 automatically reduces the feed speed of the DR 100.

- Connect both devices to the electricity supply.
- Connect interface (I) to the DR100 using interface (Z) on the ZM200.
- Set the operating mode selector switch (H) to **standard**.

NOTE

Set the DR100 feed speed to a low level when starting the ZM200. Otherwise the ZM200 will be overloaded on starting and will no longer be able to reduce the feed.

This may then result in damage to the mechanical components.

- Using the knob (**Dk**), set the feed speed to a low level.
- Fill the feed hopper (**A**) with material.
- Check the position of the DR100 via the sample inlet on the ZM200.
- Start the ZM200.

Communication takes place between the ZM200 and DR 100, and this can take a few seconds:

The DR 100 conveys the feed product to the ZM200.

- Slowly turn the knob (**Dk**) higher until the desired feed speed has been reached.

As soon as an overload to the ZM200 is indicated, the ZM200 automatically reduces the feed speed of the DR 100.

5.10.2 Interface to the PT100 / PT200

The device can be connected to the Retsch devices PT100 and PT200 using the interface (**I**). The appropriate interface cable (**Im**) should be used for this.

- Set the operating mode selector switch (**H**) to **Standard**.

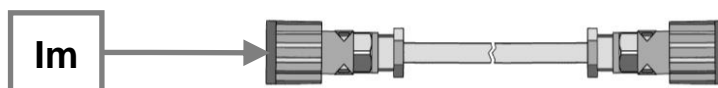


Fig. 22: Interface cable PT100 / PT200

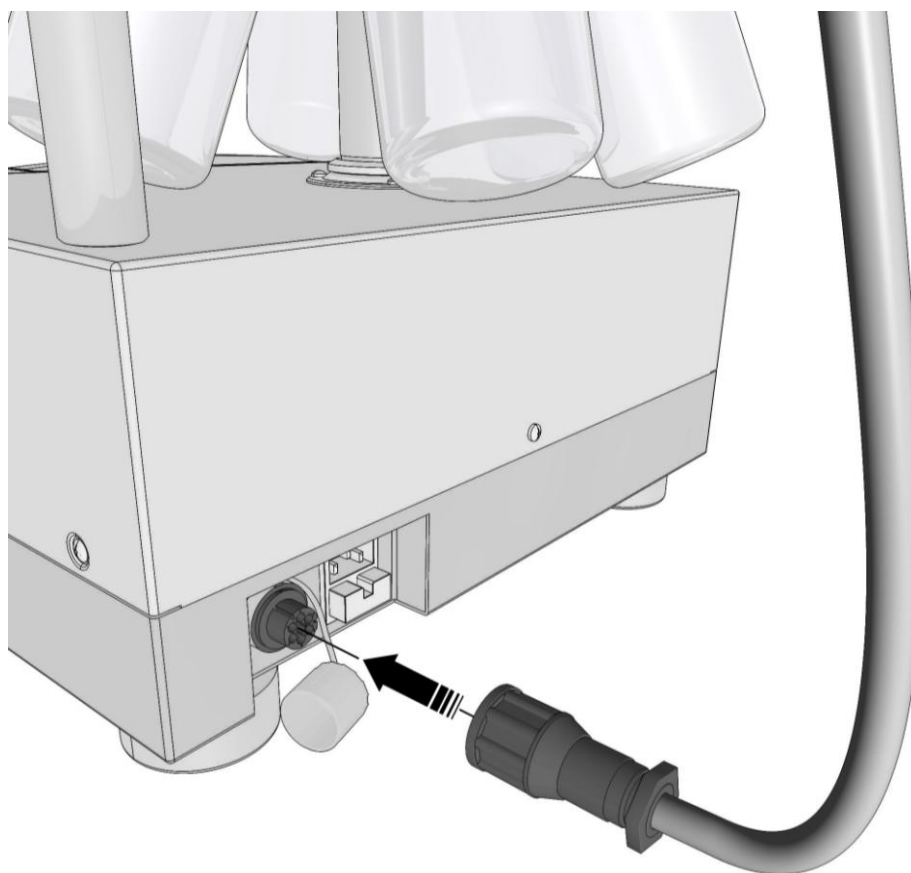


Fig. 23: Interface on the PT100

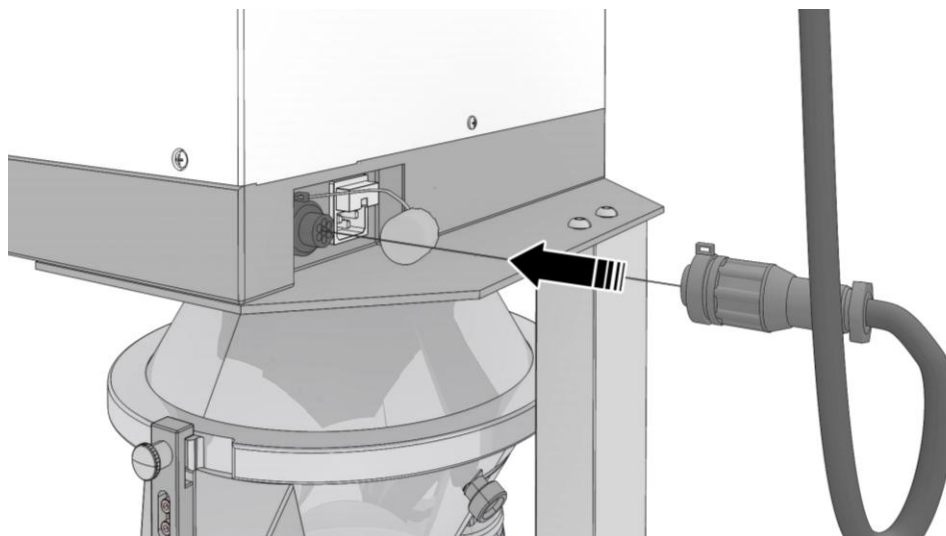


Fig. 24: Interface on the PT200

5.11 Standard operating mode

- Set the operating mode selector switch (**H**) on the back of the device to **standard**.
- Switch the device on at the mains switch (**J**).

The DR 100 is in stand-by mode.

- You can see the previous values set for feed in the **time** and **speed** display.
- All functions on the keyboard are enabled.

NOTE

If the DR100 is connected to a ZM200 via the interface (**I**), only the vibration intensity can be adjusted using the knob (**Dk**).

5.12 External operating mode



Fig. 25:

- Set the operating mode selector switch (**H**) on the back of the device to **external**.

Only the adjustment of the feed speed is available in this mode.

5.13 Replacing the machine fuses

WARNING

1.W00014

Mortal danger from electric shock

Exposed power contacts

- When replacing fuses on the cutout or fuse adapter you may come into contact with live contacts. An electric shock can lead to burns and to cardiac arrhythmias or to respiratory arrest and cardiac arrest.
- **Remove the mains cable before replacing fuses.**

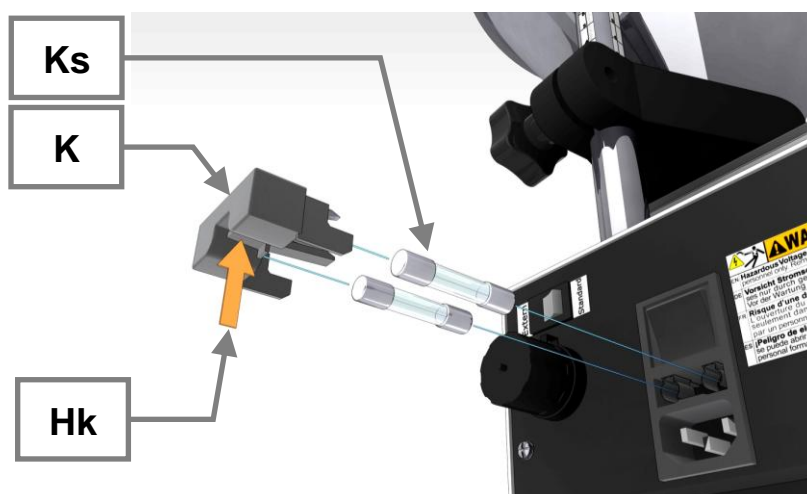


Fig. 26: Replacing fuses

The DR 100 is protected by two T2A/250V glass fuses.

- Turn the device off at the mains.
- Remove the mains cable on the DR100.
- Press the lever (**Hk**) upwards and pull out the drawer (**K**) on the back of the device.
- Replace the fuses (**Ks**).
- Insert the drawer (**K**) again with the new fuses.
- Reconnect the power.

6 Cleaning and service

6.1 Cleaning

WARNING

Risk of a fatal electric shock

- An electric shock can cause injuries in the form of burns and cardiac arrhythmia, respiratory arrest or cardiac arrest.
- **Do not clean the blender under running water. Use only a cloth dampened with water.**
- **Disconnect the power supply plug before cleaning the blender.**

NOTICE

2.H0006

Defective components due to liquids

Penetration of liquids into the inside of the device

- Components are damaged and the function of the device is no longer ensured.
 - **Clean the device under running water. Only use a moist cloth**
-

NOTICE

Damage to the machine through solvents

- Solvents may damage plastic parts and the paint finish.
 - **It is not allowed to use solvents.**
-

6.2 Service

The DR100 is maintenance-free.

No further maintenance and adjustment work is necessary if used as intended.

7 Disposal

Please observe the respective statutory requirements with respect to disposal.

Information on disposal of electrical and electronic machines in the European Community.

Within the European Community the disposal of electrically operated devices is regulated by national provisions that are based on the EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Accordingly, all machines supplied after 13.08.2005 in the business-to-business area to which this product is classified, may no longer be disposed of with municipal or household waste. To document this they have the following label:

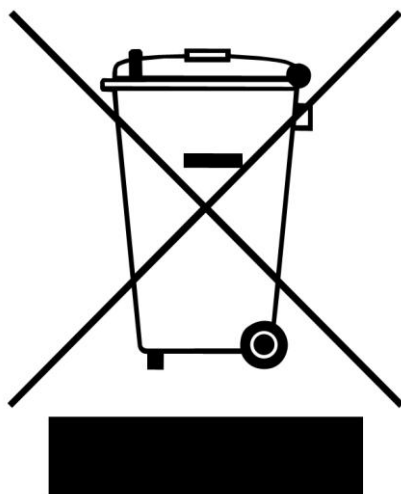


Fig. 27: Disposal label

Since the disposal regulations within the EU may differ from country to country we would request you to consult your supplier.

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VIBRATORY FEEDER

DR 100**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:
EN 55011:2009+A1:2010, Group 1, Class B Radio disturbance characteristics - Limits and methods of measurement
EN 61000-3-2:2006+A1:2009+A2:2009
EN 61000-3-3:2008
EN 61326-1:2006

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 Vibratory Feeder Type DR 100 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 2012



Dr.-Ing. Frank Janetta
Manager Development





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