

# Manual

## Rotor Mill Cyclone Mill TWISTER



Translation



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Retsch GmbH  
Rheinische Strasse 36  
D-42781 Haan  
Federal Republic of Germany

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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](http://www.retsch.com).

### Changes

Subject to technical changes.

### Copyright

Disclosure or reproduction of this documentation, use and disclosure of its contents are only permitted with the express permission of Retsch GmbH.

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.**
-

[illegible]

## 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

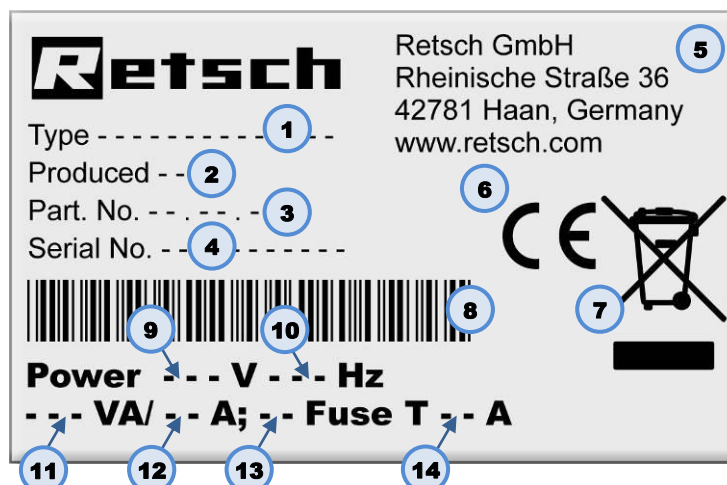


Fig. 1: Type plate lettering

- 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 (2) and the serial number (3) of the device.

### 3.7 Electrical connection

- 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.

#### **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.

## 4 Technical data

### 4.1 Use of the machine for the intended purpose

#### CAUTION

##### **Danger of explosion or fire**

Changing sample properties

- Please note that the properties, and therefore the dangerous nature of your sample, can change during the grinding process.
- **Do not grind any substances in this machine which can cause an explosion or a fire.**

#### CAUTION

##### **Risk of explosion or fire**

- On account of its design, the device is not suitable for use in hazardous (potentially explosive) atmospheres.
- **Do not operate the device in a hazardous atmosphere.**

#### 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:** operators

**Machine type designation:** Cyclone Mill - Twister

This machine is intended for the grinding of animal feed, green feed, cereals and similar dry materials.

The feed size is 10mm.

The device is designed as a laboratory device for 8-hour one-shift operation with a 30% ON duration.

It is not intended for use as production machine.

### 4.2 Working instructions

This device has been developed to prepare samples of animal feed for final NIR analysis. The optimised form of the rotor and of the grinding chamber generates an air current which transports the ground material through the integrated cyclone into the sample vessel. The air current simultaneously prevents the warming of the sample so that moisture losses are avoided. The sieves supplied guarantee optimum particle size distribution. The rotor speed can be adjusted in 3 stages and

can therefore be adjusted to the requirements of the sample. The cleaning requirements are very low in this device because the sample is transported virtually completely from the grinding chamber.

Advantages at a glance:

- Ideal for the grinding of animal feed, green feed and similar materials
- 3 controlled rotor speeds
- Cyclone with 250 ml collecting receptacle for fast collection of samples
- Simple and fast cleaning, no cross-contamination

### 4.3 Protective equipment

The grinding chamber of this device is interlocked with a resistant protective hood with safety switch.

It is only possible to start the device if the protective hood is closed.

The device can only be started if cassette and lid are in place.

### 4.4 Drive output

Universal series motor

### 4.5 Rated power

Motor capacity: approx. 900 watts

### 4.6 Motor rotation speed

The motor speed can be adjusted to three levels:

**LOW:** 10000 revolutions per minute (10 x 1000 rpm)

**MID:** 12000 revolutions per minute (12 x 1000 rpm)

**HIGH:** 14000 revolutions per minute (14 x 1000 rpm)

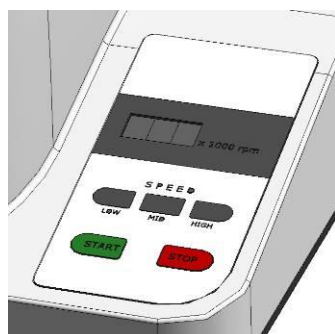


Fig. 2: Setting motor speed

### 4.7 Rated voltage

|                 |              |                   |
|-----------------|--------------|-------------------|
| Rated voltages: | 220V - 240 V | 50/60 Hz (+/- 5%) |
|                 | 100V - 120V  | 50/60 Hz (+/- 5%) |

### 4.8 Emissions



**CAUTION**

**Possibility of acoustic signals not being heard**

Loud grinding noises

- Acoustic alarms and voice communication might not be heard.

- **Consider the volume of the grinding noise in relation to other acoustic signals in the work environment. You may wish to use additional visual signals.**

Noise values: (without sample material)

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

Workplace-related emission value LpAeq

~ 67.5 dB(A) **LOW:** 10000 revolutions per minute

~ 70.0 dB(A) **MID:** 12000 revolutions per minute

~ 73.0 dB(A) **HIGH:** 14000 revolutions per minute

The noise values are also influenced by the properties of the sample medium.

#### 4.9 Degree of protection

- Grinding chamber and keypad - IP 42
- In the area of the ventilation slit - IP 20

#### 4.10 Dimensions and weight

**Closed:**

Height: 427 mm

Width: 449 mm

Depth : 283 mm

**with hood open:**

Height: 560 mm

Width: 449 mm

Depth : 396 mm

**Weight:** approx. 14 kg

#### 4.11 Required floor space

Width: 449 mm

Depth: 396 mm

## 5 Operating the machine

### 5.1 Views of the Instrument

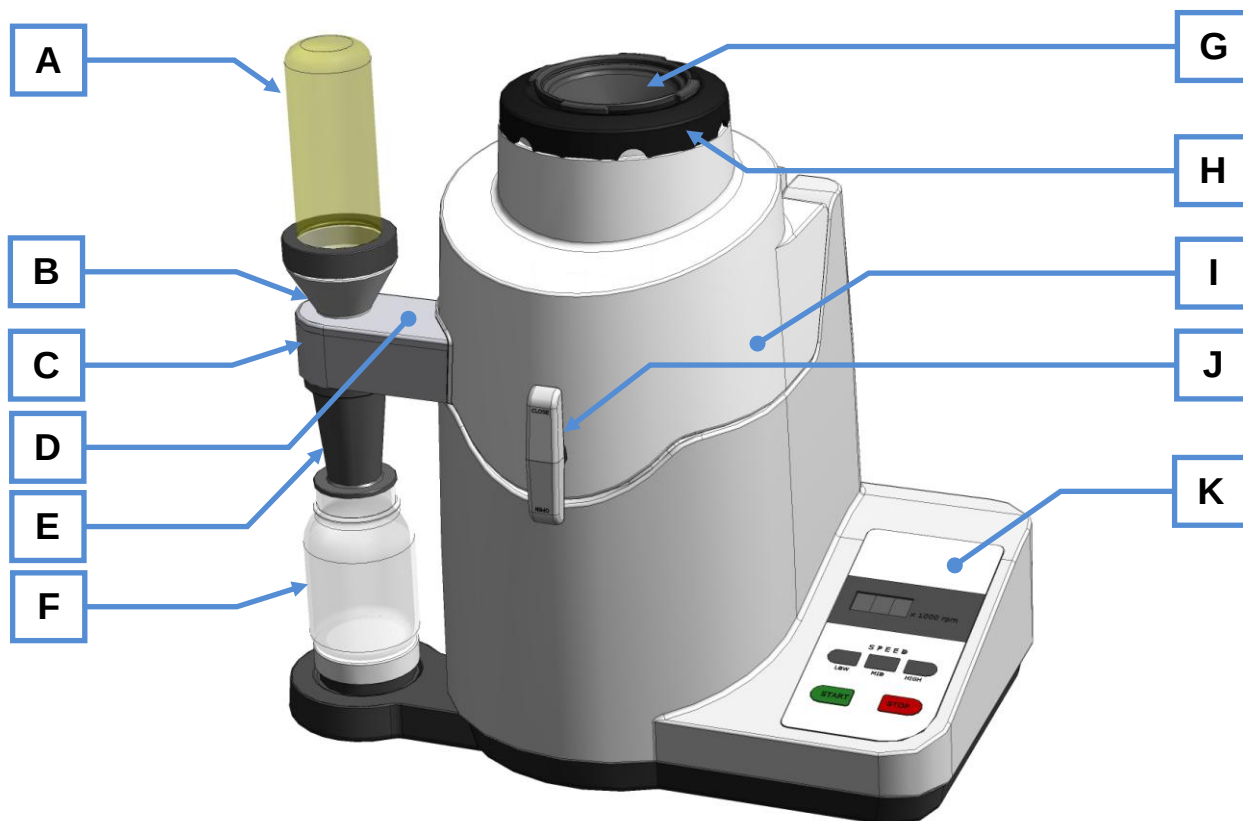


Fig. 3: View from the front – hood closed

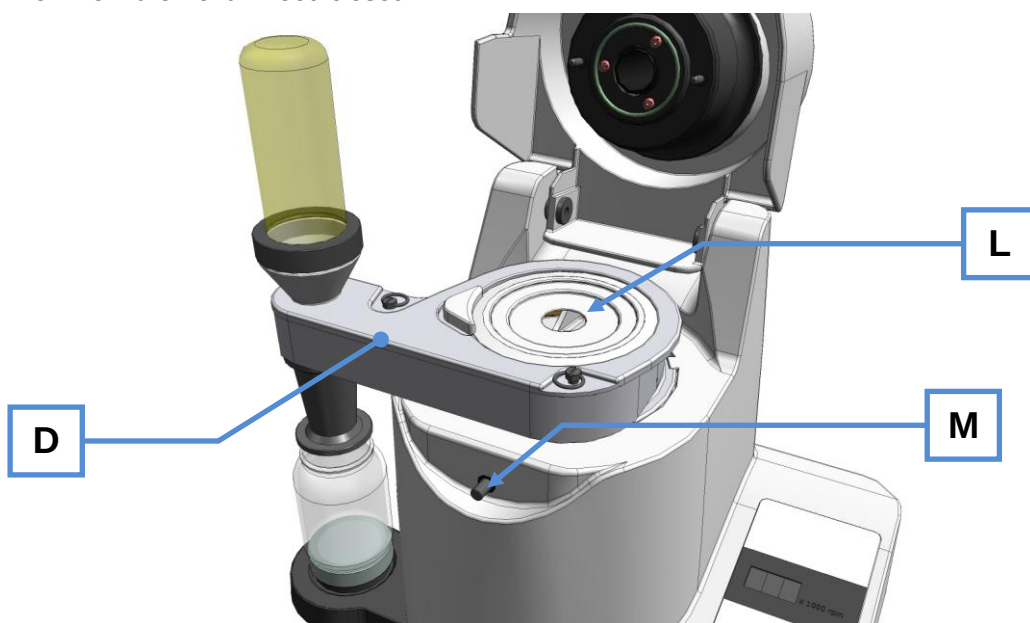


Fig. 4: View from the front – hood open

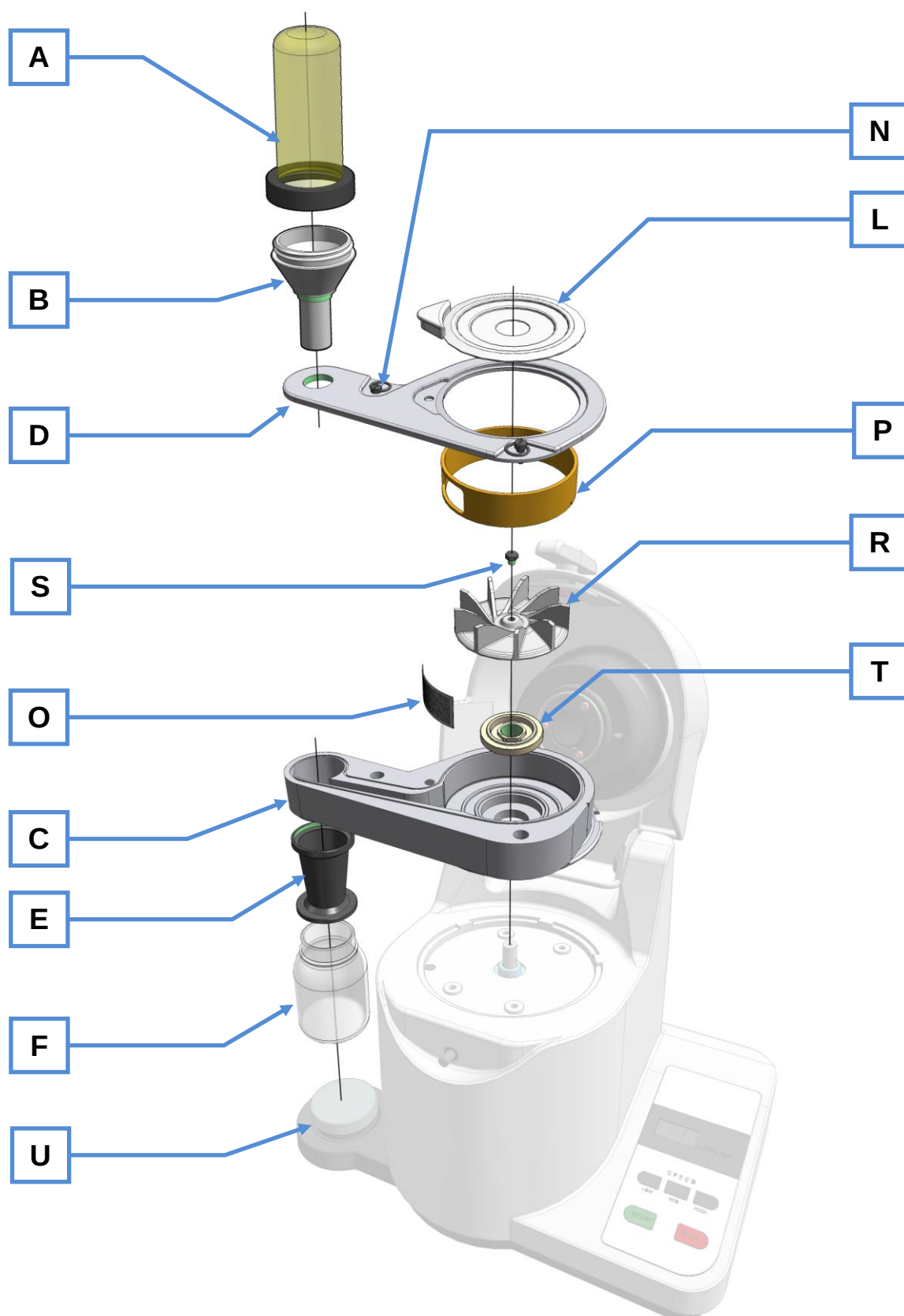


Fig. 5: View from the front – exploded view

## 5.2 Overview table of the parts of the device

| Element | Description                 | Function                                              |
|---------|-----------------------------|-------------------------------------------------------|
| A       | Filter sack for cyclone     | Filters the escaping air                              |
| B       | Immersion tube              | Separates air current from sample material            |
| C       | Cyclone cassette            | Guides the ground sample to the cyclone               |
| D       | Cassette lid                | Closes the cassette                                   |
| E       | Hopper                      | Guides the ground sample to the collecting receptacle |
| F       | Sample vessel               | Collects the ground sample                            |
| G       | Splash-back protection      | Prevents ejection of the sample material              |
| H       | Fill hopper                 | Guides the sample material to the grinding chamber    |
| I       | Grinding chamber hood       | Covers the grinding chamber                           |
| J       | Grinding chamber hood lock  | Locks the grinding chamber                            |
| K       | Operating panel             | START / STOP / speed selection/display                |
| L       | Grinding chamber lid        | Seals the grinding chamber                            |
| M       | Locking bolt                | Locks the grinding chamber hood                       |
| N       | Screw cassette lid          | Secures the cassette lid                              |
| O       | Sieve insert                | Orifice for particle sizes                            |
| P       | Grinding ring               | Grinding sample through friction                      |
| R       | Rotor – (twister rotor)     | Grinds the sample                                     |
| S       | Rotor screw                 | Keeps rotor on axis                                   |
| T       | Shim                        | Secures cassette on the device                        |
| U       | Sample vessel pressure disc | Clamps the sample vessel                              |

## 5.3 Operating elements and displays

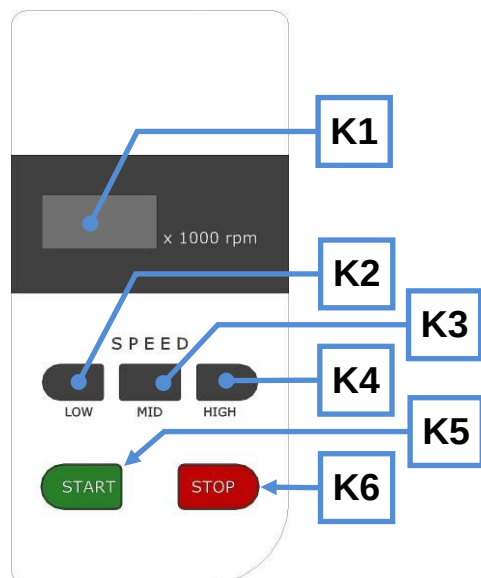


Fig. 6: Operating panel

#### 5.4 Overview Table of the Operating Elements and the Display

| Element | Description  | Function                             |
|---------|--------------|--------------------------------------|
| K1      | Display      | Shows the set speed or fault message |
| K2      | LOW button   | Speed setting – low                  |
| K3      | MID button   | Speed setting – medium               |
| K4      | HIGH button  | Speed setting – high                 |
| K5      | START button | Starts grinding                      |
| K6      | STOP button  | Ends grinding                        |

## 5.5 Operating the Device



### CAUTION

1.V0060

#### Bruising and injury

Danger from becoming caught or wound up

- Long pieces of clothing or hair can become caught in the device.
- **Wear closely fitting work clothes.**
- **Secure long hair with appropriate head covering.**
- **Place the splashback cover on the filling funnel.**



### CAUTION

#### Device falling down

Incorrect assembly or unsuitable workplace

- The appliance is very heavy and can therefore cause serious personal injuries if it falls down.
- **Operate the device only on a sufficiently large, firm, skid-resistant and steady workplace.**
- **Make sure that all equipment feet are steady.**



### CAUTION

#### Damage to hearing

The level of noise can be high depending on the type of material, the knife used, the speed set and the duration of the grinding process.

- Noise that is excessive in terms of level and duration can cause impaired or permanently damaged hearing.
- **Ensure suitable sound-proofing measures or wear hearing protection.**



## 5.6 Switching On and Off

The main switch (V) is located on the reverse side of the device.

- Switch on the main switch.

The last used speed appears in the SPEED display.

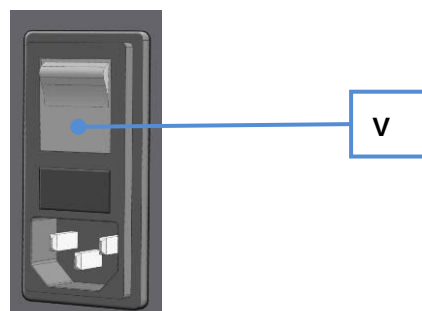


Fig. 7: Main switch

## 5.7 Opening and closing of the grinding chamber



### CAUTION

2.V0061

#### Bruising and injuries

Danger due to rotating rotor

- The rotation of the rotor can cause injuries. Sample material can be ejected out.
- **Wait until the motor has come to a standstill before opening the lid.**



### CAUTION

#### Crushed or bruised fingers

Falling grinding chamber protective hood

- The protective hood of the grinding chamber can cause crushed or bruised fingers if it falls down.
- **Hold the flap tight when closing.**

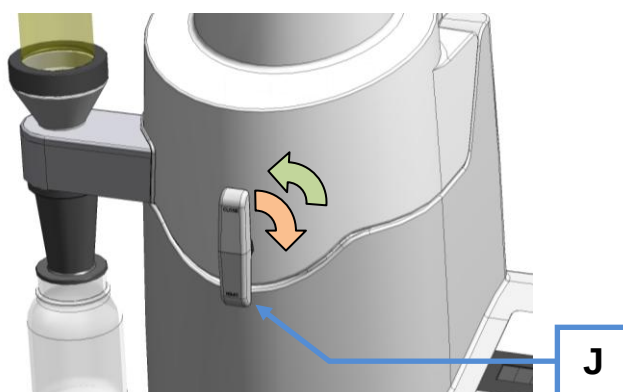


Fig. 8: Opening and closing the grinding chamber

- To lock the grinding chamber, twist the lock of the grinding chamber hood (**J**) by one quarter rotation in a clockwise direction.
- To open the grinding chamber, twist the lock of the grinding chamber hood (**J**) by one quarter rotation in an anti-clockwise direction.

## 5.8 Setting the Speed

The speed can be set to three preset speeds.

- Press the LOW button (**K2**) for a speed of the rotor of 10000 revolutions per minute.
- Press the MID button (**K3**) for a speed of the rotor of 12000 revolutions per minute.
- Press the HIGH button (**K4**) for a speed of the rotor of 14000 revolutions per minute.

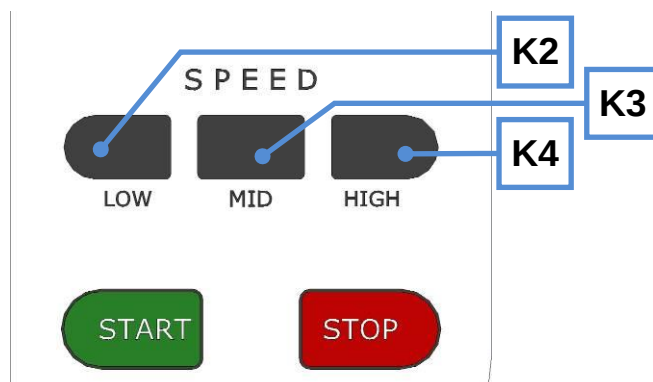


Fig. 9: Setting the speed

LOW – 10000 revolutions per minute

HIGH – 12000 revolutions per minute

MID – 14000 revolutions per minute

## 5.9 Starting the grinding process



Fig. 10: Starting the device

Press the START button to begin grinding at the default speed.

### NOTICE

The lid of the grinding chamber (L) must be placed on before closing the grinding chamber hood. The device gets blocked when started without lid and the rotor can get damaged.

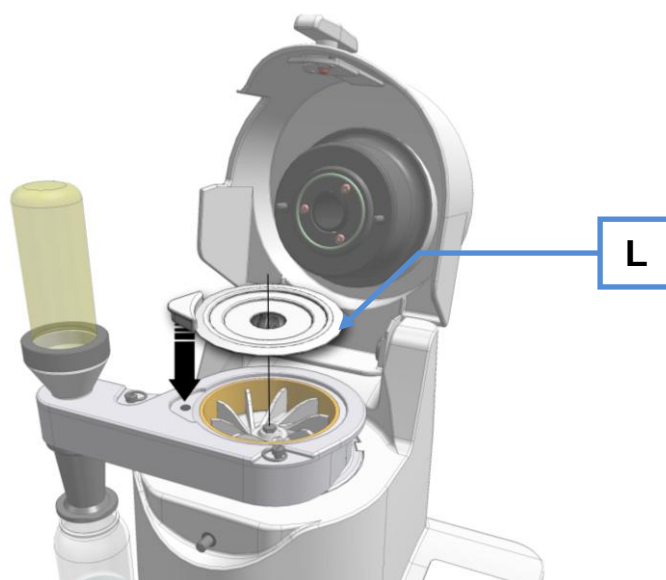


Fig. 11: Insert the grinding chamber lid

## 5.10 Stopping the grinding process



Fig. 12: Stopping the device

Press the STOP button to stop grinding.

## 5.11 Mounting the Feed Hopper

### CAUTION

3.V0059

#### **Danger of injury to eyes and skin**

Flying sample material

- Sample material can be flung out if the device is incorrectly equipped or filled.
- **Always wear goggles when handling the device.**
- **Place the splashback protection on the filling funnel depending on sample material.**

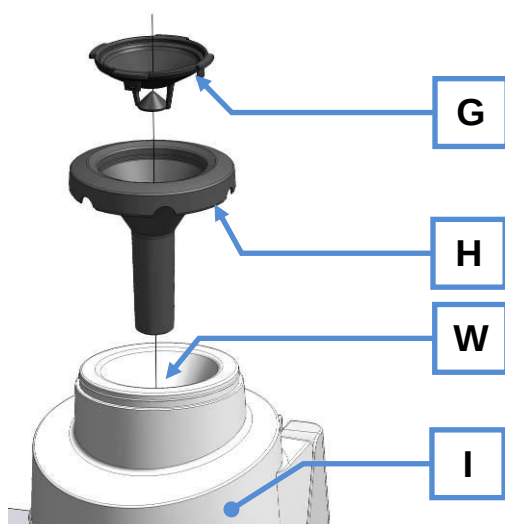


Fig. 13: Assembly of the filling funnel

- Position the filling funnel (**H**) in the opening (**W**) of the grinding chamber hood (**I**) until it locks in.
- Depending on sample material, position the splashback protection (**G**) on the filling funnel (**H**) until it locks in.

## 5.12 Cyclone assembly

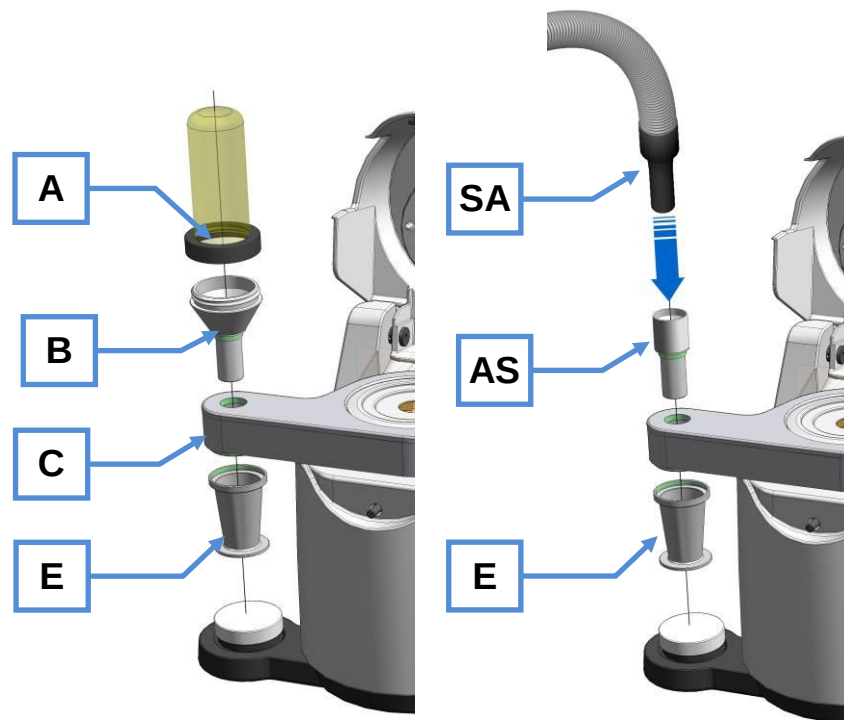


Fig. 14: Cyclone assembly with filter bag / extraction

#### 5.12.1 Cyclone assembly with filter bag

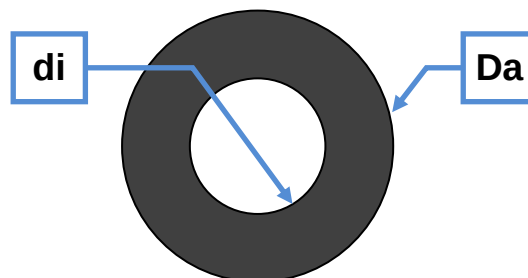
- Screw the hopper (E) into the cyclone cassette (C) from below.
- Screw the immersion tube (B) into the cyclone cassette (C) from above.
- Screw the filter bag (A) onto the hopper (B).

#### 5.12.2 Cyclone assembly with extraction

- Screw the hopper (E) into the cyclone cassette (C) from below.
- Place the immersion tube (AS) into the cyclone cassette (C) from above.
- Insert the extraction device (SA) in the immersion tube (AS).

Inner diameter of the immersion tube (AS): 31.2mm [di]

Outer diameter of the immersion tube (AS): 36mm [Da]



### 5.13 Removing and inserting the rotor



#### CAUTION

4.V0058

#### Danger of injuries caused by cuts

Sharp cutters of the rotor and sharp edged sieve

- The sharp edges of the rotor and sieve may lead to hands being cut.
- **Use protective gloves when replacing the rotor or sieve and when cleaning the grinding chamber.**



#### CAUTION

5.V0054

#### Contusions and bruising

Moving parts – receptacle and rotor

- The receptacle and rotor may fall down after removal and cause injury.
- **Be careful and put the parts down safely.**
- **Do not place any objects on the device.**

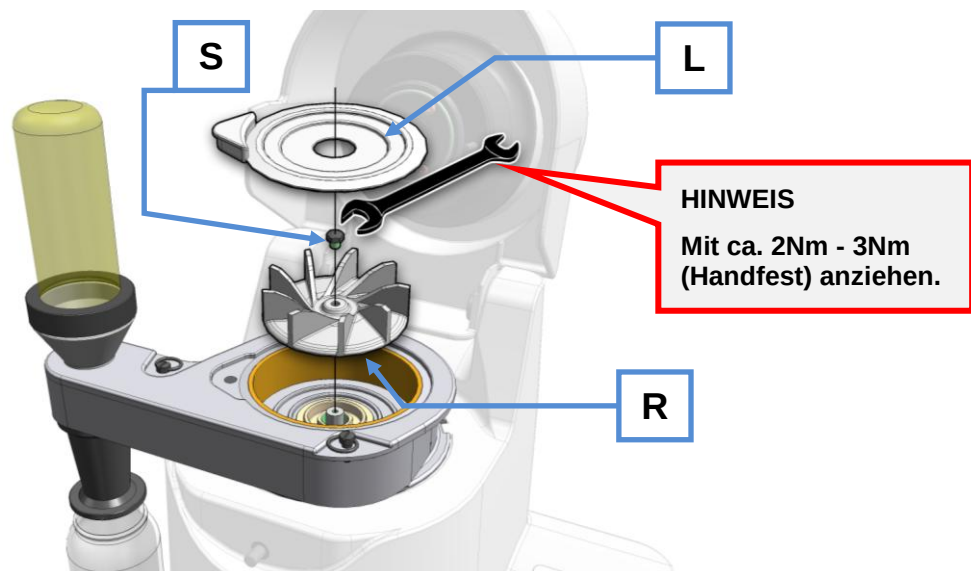


Fig. 15: Replacing the rotor

- Remove the grinding chamber cover (L).
- Unscrew the rotor screw (S).
- Remove the rotor (R).

### 5.14 Replacing the friction insert

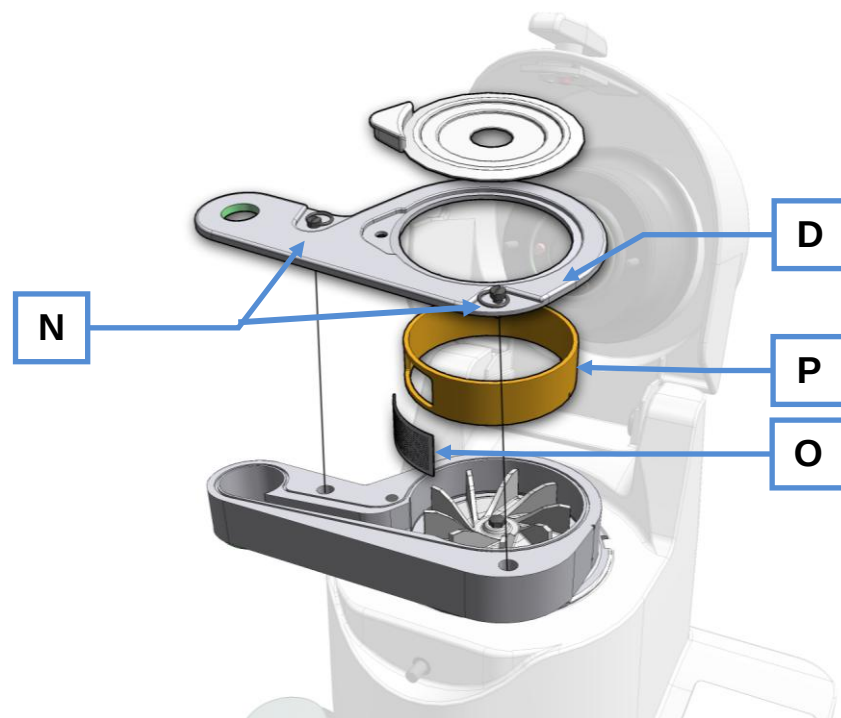


Fig. 16: Replacing the friction insert

- Remove the cassette cover (D) by unscrewing the two screws (N).
- Remove the sieve insert (O) and friction insert (P).

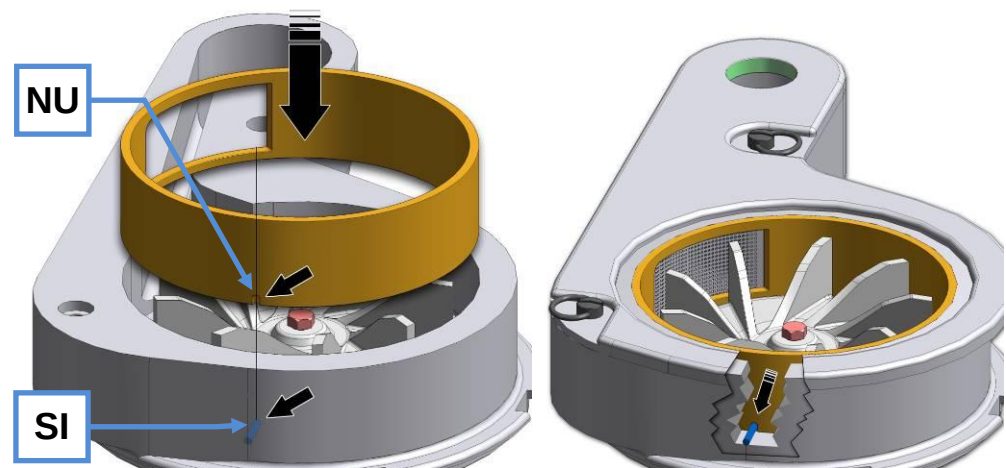


Fig. 17: Inserting the friction insert

- Pay attention to the position of the friction insert when inserting.
- Align the groove (NU) on the pin (SI).

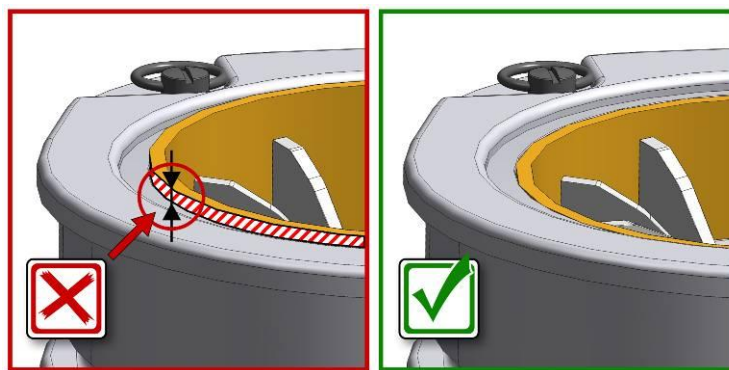


Fig. 18: Correct insertion of the friction insert

### 5.15 Dismantle the cyclone cassette

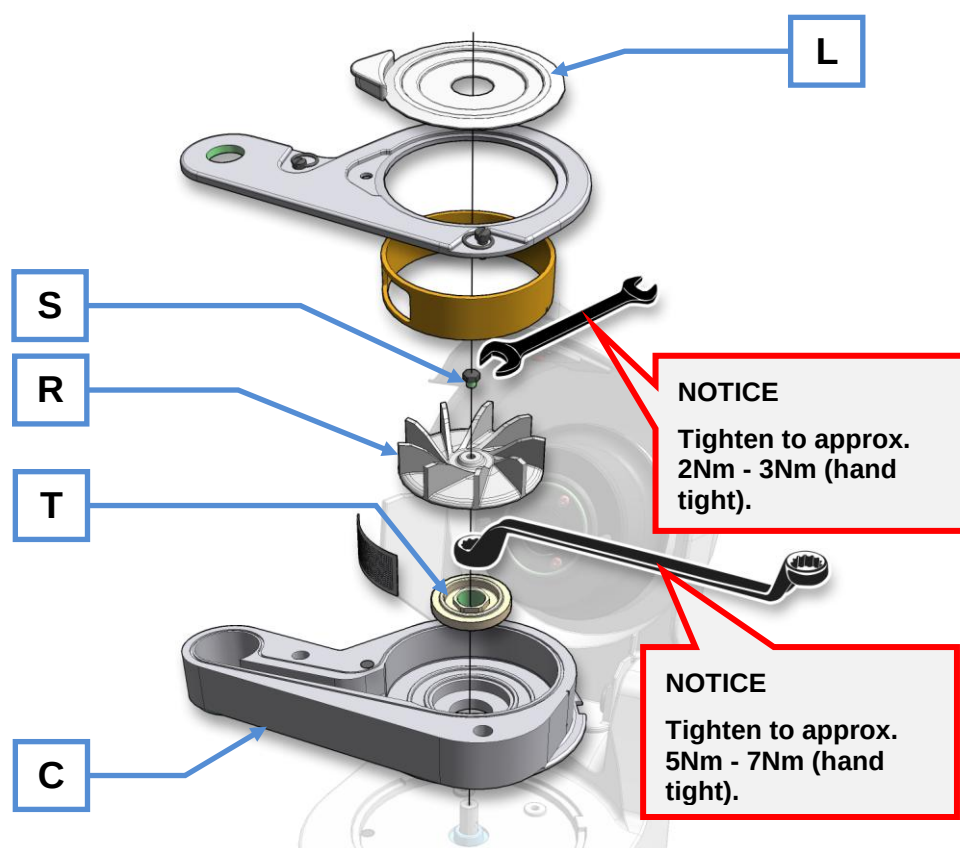


Fig. 19: Disassembling the cyclone cassette

- Remove the grinding chamber cover (**L**).
- Unscrew the rotor screw (**S**).
- Remove the rotor (**R**).
- Loosen the shim (**T**) using the double end ring spanner supplied.
- When assembling the cyclone cassette, tighten the shim (**T**) hand tight (5Nm-7Nm).

### 5.16 Replacing the machine fuses

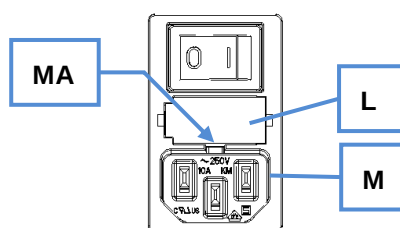


Fig. 1: Replacing the device fuse

The following glass fuses are required:

220V - 240V → 2 x TT6,3 A

100V - 120V → 2 x TT12,5 A

- Pull the plug out of the device socket (**M**).
- Push in the side catch (**MA**). This unlocks the fuse holder (**L**) which can then be pulled out.
- Always replace both fuses.
- Slide the fuse holder (**L**) in until it engages.

### 5.17 Resetting the overload protection

The overload protection switch (**K**) is situated on the rear panel.

This overload protection switch disconnects the device from the power supply if the machine is overloaded.

- After allowing the device to cool down it can be used with the power supply again by pressing the overload protection switch (**K**).

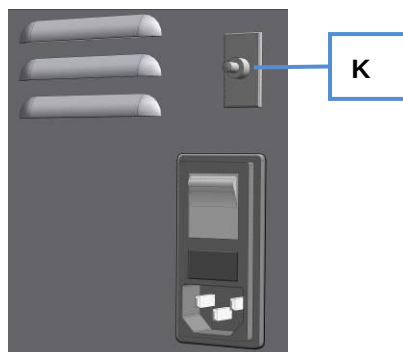


Fig. 20: Overload protection switch

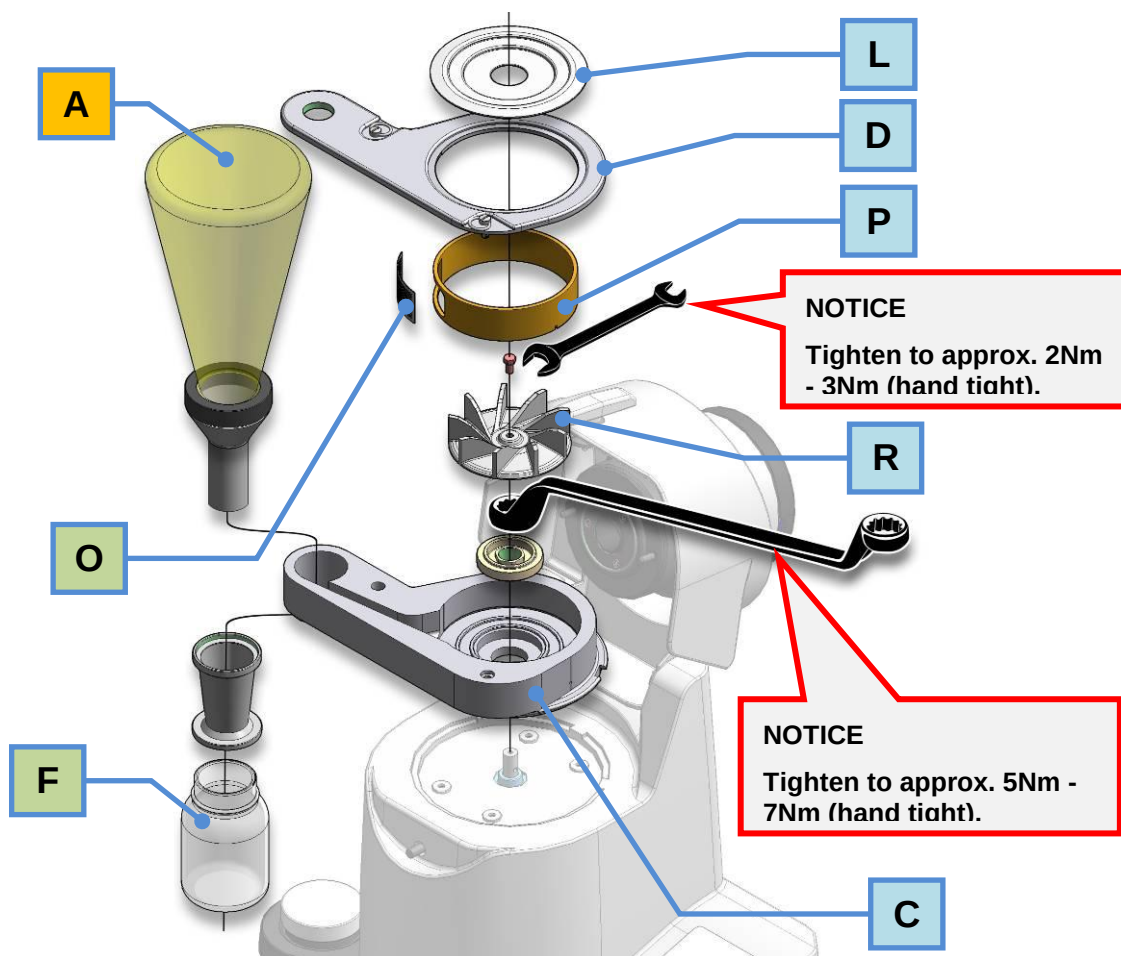
## 6 Cleaning and service

### 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.**

With regular cleaning this device is largely maintenance-free.



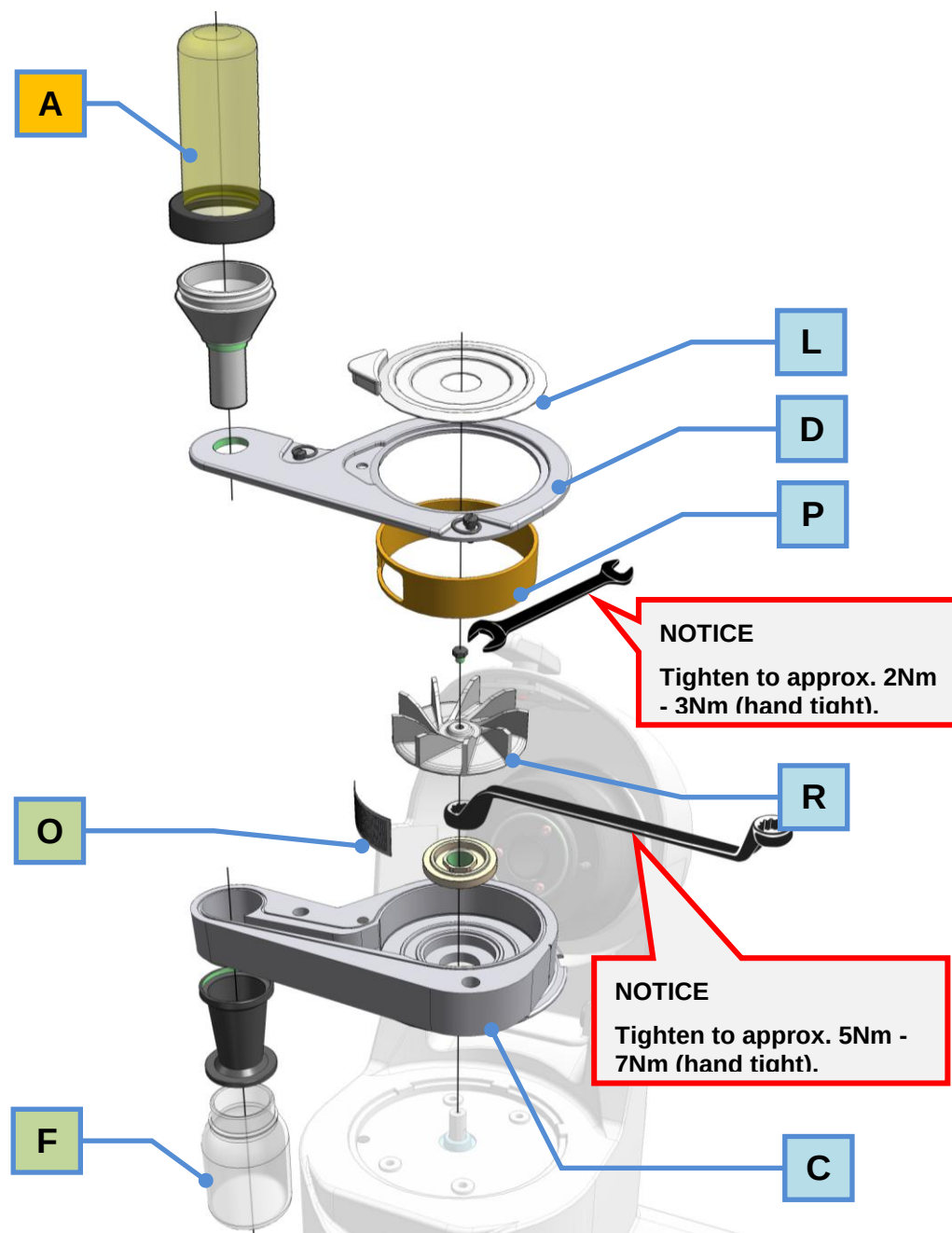


Fig. 21: Disassembling for cleaning

| Element   | Cleaning                                                                                                     |
|-----------|--------------------------------------------------------------------------------------------------------------|
| A         | Blow out, shake off or vacuum under air exhaust using compressed air while dry                               |
| L,D,P,R,C | Blow clean under air exhaust using compressed air or wipe with a damp cloth (do not clean in the dishwasher) |
| F         | Dishwasher                                                                                                   |
| O         | Dishwasher, ultrasonic bath                                                                                  |

## 7 Fault messages

|                |                                                                                   |                                                                                                                                                                  |
|----------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F01            | Motor does not run                                                                |                                                                                                                                                                  |
| F02            | Motor switched off because of excessive load                                      | Restart grinding process with less feed quantity.                                                                                                                |
| F03            | Motor speed too low/high                                                          |                                                                                                                                                                  |
| F04            | Hood open                                                                         |                                                                                                                                                                  |
| F05            | Braking time too high                                                             |                                                                                                                                                                  |
| F06            | Motor overheated                                                                  | Allow the motor to cool down and restart.                                                                                                                        |
| F07            | Hood monitoring faulty                                                            | Check the error message:<br>Press the START button with the hood open.<br>The "speed" segment display flashes uniformly.<br>Close the hood to correct the fault. |
| F08            | Overspeed caused by hardware                                                      |                                                                                                                                                                  |
| Display blinkt | Grinding chamber hood is not closed or grinding chamber cover has not been fitted |                                                                                                                                                                  |

## 8 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:

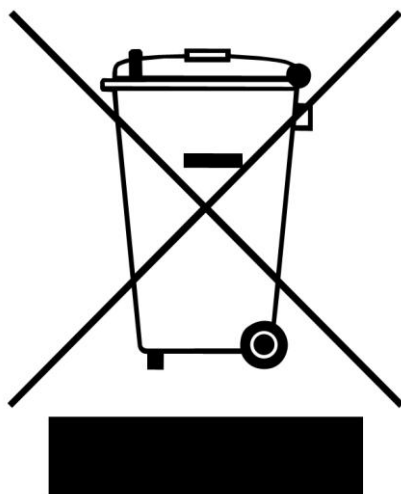


Fig. 22: Disposal label

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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