

# Operating instructions

## LABORETTE 27

### ROTARY CONE SAMPLE DIVIDER

Valid from serial number 27.1410/01997

Valid from serial number 27.1420/01481



**Read the instructions prior to performing any task!**

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Translation of the original operating instructions



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## Certifications and CE conformity

### Certification

Fritsch GmbH has been certified by the SGS-TÜV Saar GmbH.



An audit certified that Fritsch GmbH conforms to the requirements of the DIN EN ISO 9001:2015.

### CE Conformity

The enclosed Conformity Declaration lists the guidelines the FRITSCH instrument conforms to, to be able to bear the CE mark.



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# 1 Basic structure



- 1 Funnel
- 2 Funnel holder
- 3 Dividing head lid
- 4 Dividing head

- 5 Sample bottles
- 6 Main switch
- 7 Fuse

## **2 Safety information and use**

### **2.1 Requirements for the user**

This operating manual is intended for persons assigned with operating and monitoring the Fritsch LABORETTE 27. The operating manual and especially its safety instructions are to be observed by all persons working on or with this device. In addition, the applicable rules and regulations for accident prevention at the installation site are to be observed. Always keep the operating manual at the installation site of the LABORETTE 27.

People with health problems or under the influence of medication, drugs, alcohol or exhaustion must not operate this device.

The LABORETTE 27 may only be operated by authorised persons and serviced or repaired by trained specialists. All commissioning, maintenance and repair work may only be carried out by technically qualified personnel. Qualified personnel are persons who, because of their education, experience and training as well as their knowledge of relevant standards, regulations, accident prevention guidelines and operating conditions, are authorised by those responsible for the safety of the machine to carry out the required work and are able to recognize and avoid possible hazards as defined for skilled workers in IEC 364.

In order to prevent hazards to users, follow the instructions in this manual.

Malfunctions that impair the safety of persons, the LABORETTE 27 or other material property must be rectified immediately. The following information serves both the personal safety of operating personnel as well as the safety of the products described and any devices connected to them: All maintenance and repair work may only be performed by technically qualified personnel.

This operating manual is not a complete technical description. Only the details required for operation and maintaining usability are described.

Fritsch has prepared and reviewed this operating manual with the greatest care. However, no guarantee is made for its completeness or accuracy.

Subject to technical modifications.

### **2.2 Scope of application**

The LABORETTE 27 is a rotary cone sample divider for representative division of samples in the laboratory. It divides bulk solids and particle suspensions from the original amount filled into equal parts, whereby each partial amount is representative of the entire collective.

Inorganic and organic samples are prepared for analysis, quality control or material testing in such a way that after the analysis of a single shot, reliable statements can be made about the physical and chemical properties of the entire collective.

### 2.2.1 Operating principle

In the LABORETTE 27, two different division principles are combined in one device such that the advantages of both can be optimally used:

The commodity stream - guided by a funnel - impacts on a cone. By sliding off its lateral surface, an initial division into individual streams takes place. This process is known as "coning" and is successfully used mainly when dividing large quantities.

In the case of the LABORETTE 27, the fanned out commodity stream is led into individual channels at the lower end of the cone surface and collected in glass laboratory bottles.

The relatively high rotational speed of the cone prevents inhomogeneity in the commodity stream and demixing during apportionment. Through rotation of the cone, the probability of falling into a certain bottle is equal for all components of the commodity stream.

Additionally, the divided commodity stream is accelerated outwards through the centrifugal force of rotation and flows more easily through the guide channels into the collection bottles. The guide channels interpenetrate. The commodity stream is divided up and deposits are reduced through the sharp lines of separation between the channels.

The high rotational speed of the turning dividing cone leads to an extremely high division ratio, i.e. each sample consists of a very large number of single shots. A high division ratio is, however, one of the most important prerequisites for a good, representative sample division.

### 2.3 Obligations of the operator

Before using the LABORETTE 27, this manual is to be carefully read and understood. The use of the LABORETTE 27 requires technical knowledge; only commercial use is permitted.

The operating personnel must be familiar with the content of the operating manual. For this reason, it is very important that these persons actually receive the present operating manual. Ensure that the operating manual is always near the device.

The LABORETTE 27 may exclusively be used within the scope of applications set down in this manual and within the framework of guidelines put forth in this manual. In case of non-compliance or improper use, the customer assumes full liability for the functional capability of the LABORETTE 27 and for any damage or injury arising from failure to fulfil this obligation.

By using the LABORETTE 27 the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the LABORETTE 27.



Neither compliance with this manual nor the conditions and methods used during installation, operation, use and maintenance of the LABOR-ETTE 27 can be monitored by Fritsch GmbH. Improper execution of the installation can result in property damage and thus endanger persons. Therefore, we assume absolutely no responsibility or liability for loss, damage or costs that result from errors at installation, improper operation or improper use or improper maintenance or are in any way connected to these.

The applicable accident prevention guidelines must be complied with.

Generally applicable legal and other obligatory regulations regarding environmental protection must be observed.

## 2.4 Information on hazards and symbols used in this manual

### Safety information

Safety information in this manual is designated by symbols. Safety information is introduced by keywords that express the extent of the hazard.

**DANGER!**

This symbol and keyword combination points out a directly hazardous situation that can result in death or serious injury if not avoided.

**WARNING!**

This symbol and keyword combination points out a possibly hazardous situation that can result in death or serious injury if not avoided.

**CAUTION!**

This symbol and keyword combination points out a possibly hazardous situation that can result in slight or minor injury if not avoided.

**NOTICE!**

This symbol and keyword combination points out a possibly hazardous situation that can result in property damage if not avoided.

**ENVIRONMENT!**

This symbol and keyword combination points out a possibly hazardous situation that can result in environmental damage if not avoided.

## Safety information and use

### Special safety information

To call attention to specific hazards, the following symbols are used in the safety information:



#### **DANGER!**

This symbol and keyword combination points out a directly hazardous situation due to electrical current. Ignoring information with this designation will result in serious or fatal injury.



#### **DANGER!**

This symbol and keyword combination designates contents and instructions for proper use of the machine in explosive areas or with explosive substances. Ignoring information with this designation will result in serious or fatal injury.



#### **DANGER!**

This symbol and keyword combination designates contents and instructions for proper use of the machine with combustible substances. Ignoring information with this designation will result in serious or fatal injury.



#### **WARNING!**

This symbol and keyword combination points out a directly hazardous situation due to movable parts. Ignoring information with this designation can result in hand injuries.



#### **WARNING!**

This symbol and keyword combination points out a directly hazardous situation due to hot surfaces. Ignoring information with this designation can result in serious burn injuries due to skin contact with hot surfaces.

### Safety information in the procedure instructions


Safety information can refer to specific, individual procedure instructions. Such safety information is embedded in the procedure instructions so that the text can be read without interruption as the procedure is being carried out. The keywords described above are used.

**Safety information and use**

Example:

1. ➔ Loosen screw.

2. ➔




**CAUTION!**  
Risk of entrapment at the lid.

Close the lid carefully.

3. ➔ Tighten screw.

**Tips and recommendations**



*This symbol emphasises useful tips and recommendations as well as information for efficient operation without malfunction.*

**Further designations**

To emphasise procedure instructions, results, lists, references and other elements, the following designations are used in this manual:

Designation	Explanation
➔ 1., 2., 3. ...	Step-by-step procedure instructions
⇒	Results of steps in the procedure
↗	References to sections in this manual and relevant documentation
■	Lists without a specific order
[Button]	Operating elements (e.g. push button, switch), display elements (e.g. signal lamps)
'Display'	Screen elements (e.g. buttons, function key assignment)

**2.5 Device safety information**

**Please observe!**

- Only use original accessories and original spare parts. Failure to observe this instruction can compromise the safety of the machine.
- Accident-proof conduct is to be strictly followed during all work.
- Comply with all currently applicable national and international accident prevention guidelines.

## Safety information and use



### CAUTION!

#### Wear hearing protection!

If a noise level of 85 dB(A) is reached or exceeded, ear protection should be worn to prevent hearing damage.



### WARNING!

The maximum accepted concentration (MAC) levels of the relevant safety guidelines must be observed; if necessary, ventilation must be provided or the machine must be operated under an extractor hood.



### DANGER!

#### Explosion hazard!

- When dividing oxidizable substances, e.g. metals or coal, there is a risk of spontaneous combustion (dust explosion) if the share of fine particles exceeds a certain percentage. When dividing these kinds of substances, special safety measures must be taken and the work must be supervised from a specialist.
- The LABORETTE 27 is not explosion protected and is not designed to divide explosive materials.

- Do not remove the information signs.



### NOTICE!

Immediately replace damaged or illegible information signs.

- Unauthorised alteration of the LABORETTE 27 will void Fritsch's declaration of conformity to European directives and void the guarantee.
- Only use the LABORETTE 27 when it is in proper working order, as intended and in a safety- and hazard-conscious manner adhering to the operating manual. In particular, immediately rectify any malfunctions that could pose a safety hazard.
- If, after reading the operating manual, there are still questions or problems, please do not hesitate to contact our specialised personnel.

## 2.6 Hazardous points

- Only operate the rotary cone sample divider with firmly screwed in bottles or collection vessels!
- Only empty the rotary cone sample divider after it has come to a complete standstill!
- Do not reach into the device when it is running!
- Crushing hazard at the rotating bottles! To avoid this hazard, use the Perspex protective device (Order no.: 27.1500.17)

## 2.7 Electrical safety

### General information

The main switch (6) separates the device from the mains on two poles.

## Technical data

### 3 Technical data

#### 3.1 Dimensions

460 x 270 x 450 mm (height x width x depth)

#### 3.2 Weight

Net: 14 kg

Gross: 17 kg

#### 3.3 Voltage

- 230 V/1~ single-phase, 50 - 60 Hz, 90 W
- 115 V/1~ single-phase, 50 - 60 Hz, 90 W

#### 3.4 Electrical fuses

The device fuse is in the housing inside the front panel (next to the main switch).

Replacement:

0.315 At 5 x 20 (100 - 200 V)

0.16 At 5 x 20 (200 - 240 V)

(If necessary, pull the fuse holder out using a 2-3 mm screwdriver to replace the fuse element.)

#### 3.5 Technical design

Depending on the technical design, device parts that come into contact with the commodity stream consist of:

- food-safe, anodised aluminium
- polyoxymethylene (POM)
- polytetrafluoroethylene (PTFE)
- glass

#### 3.6 Speed

Constant, pre-set rotational speed of 100 rpm.

## 4 Installation

### 4.1 Transport

- The device is packaged in a cardboard box. This is additionally packaged in a wooden case with the accessories and any other devices, depending on the scope of the order.

**WARNING!**

Improper lifting can lead to personal injury or property damage. The machine is only to be lifted with suitable equipment and by qualified personnel.

The guarantee excludes all claims for damage due to improper transport.

### 4.2 Unpacking

- It is best to open the wooden case by pulling out the metal clips with pliers.
- Carefully open the cardboard box with a knife (do not cut too deep, as otherwise the contents could become damaged) and remove the packaging material.
- Check the device for possible damage in transit.
- Compare the contents of the delivery with your order.

### 4.3 Setting up

- Place the rotary cone sample divider on a flat, stable surface.
- Adjust the rubber feet for levelling and to compensate for uneven surfaces.
- It does not have to be fastened to the surface.
- Ensure that the rotary cone sample divider is easily accessible.

#### 4.3.1 Fitting the dividing head



- Place the dividing head onto the drive shaft protruding from the housing.
- Checking: The dividing head must turn freely on the friction clutch by hand.

### 4.4 Electrical connection



*Disconnect the supply voltage prior to maintenance or cleaning work.*

*Observe the accident prevention and safety regulations which apply to the specific application cases.*

*Before the initial start-up it should be checked whether the nominal voltage of the device corresponds to the local mains voltage.*

*Protective conductor connections must be checked for perfect working order before the initial start-up.*

*Connections may be established only by authorised personnel.*



*The LABORETTE 27 is constructed according to the state of the art and in accordance with the EC machinery directive and recognized safety rules. However, the life and limb of the user or third parties may still be endangered or the device or other material assets impaired when using the device.*



## 5 Initial start-up

After the rotary cone sample divider has been set up as described in [Chapter 4 'Installation' on page 15](#) and the mains plug has been plugged into the mains socket, the device is ready for operation.

### 5.1 Switching on



Switch main switch to I. The rotary cone sample divider starts up.

The device will reach the pre-set rotational speed of 100 rpm after approx. 10 seconds.

### 5.2 Switching off

Switch main switch to 0. The rotary cone sample divider stops turning after a few seconds.

## Using the device

### 6 Using the device

#### 6.1 General preparations

##### 6.1.1 Screwing the glass laboratory bottles onto the 1:8 or 1:10 dividing head



1. ➤ Align the mark on the glass bottle with the mark on the bottle holder.
2. ➤ Press the bottle into the recess in the bottle holder.
3. ➤ Screw the bottle firmly into the holder with approx. 1/4 turn in the direction of the arrow.



*After completion of the sample division, unscrew and remove the glass bottles in the reverse order.*



*The sample bottles are screwed into the holders as for a normal screw thread!*

##### 6.1.2 Division ratios

Dividing head with division ratio	Maximum fill quantity for one cycle	Maximum permitted particle size	Partial amount per bottle
1 : 8	4000 ml	10 mm	12.5 %
1 : 10	2500 ml	10 mm	10 %
1 : 30	300 ml	2.5 mm	3.3 %

### 6.1.2.1 Division in the ratio 1 : 8



- Screw eight glass laboratory bottles into the dividing head (eight 250 mL or 500 mL bottles with GL55 glass screw thread, depending on sample quantity).
- Place the lid on the dividing head.
- Insert a suitable funnel.



*Insert a funnel suitable for the sample. The diameter of the funnel neck should be at least twice the particle size of the sample.*

### 6.1.2.2 Division in the ratio 1 : 10



- Screw 10 glass laboratory bottles into the dividing head (10 250 mL bottles with GL55 glass screw thread, depending on sample quantity).
- Place the lid on the dividing head.
- Insert a suitable funnel.
- 500 mL glass bottles cannot be used.

### 6.1.2.3 Division in the ratio 1 : 30



- Screw three sample bottles into the dividing head (three 15 mL, 20 mL or 30 mL bottles, depending on sample quantity).
- Insert and lock in place three collection pans (pull pin down, insert pan and release pin) (see [Chapter 6.4 'Taking samples'](#) on page 22).
- The collection pans collect from 9 sample channels each with approx. 30 % of the fill amount.
- Place the lid on the dividing head.
- Insert a suitable funnel.

## Using the device

### 6.1.3 Setting up the "LABORETTE 24" sample feeder

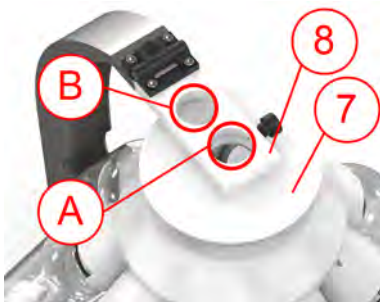


- Place the feeder with V channel onto the stand such that the rubber feet are located in the recesses (1) of the base plate provided for them.
- Adjust the height of the stand (4) such that the feeder is located just a few millimetres over the funnel and can be swung horizontally in and out. To do this, release the stand by loosening the bolt (3).
- Position the feeder and the stand so that the material stream is fed into the centre of the funnel (2).
- Adjust the quantity of material flowing from the funnel into the feed channel by adjusting the height of the funnel on the support column (5).
- Connect the control device (6)

### 6.2 Dividing solid materials



*Start feeding the material only when the rotary cone sample divider is switched on!*



- Hinge the funnel holder (8) upwards
- Place the lid (7) on the dividing head.
- Insert the funnel in position A (for solid materials).
- Switch the rotary cone sample divider on.  
(Final rotational speed of 100 rpm after approx. 10 seconds)
- Manual feed:
  - Feed the sample slowly and evenly into the funnel.
- Material feed using the "LABORETTE 24" vibratory feeder:
  - Fill sample into the funnel of the feeder
  - Adjust the feed rate (speed of material flow) on the control device (6).

### 6.2.1 Example of highly adhesive powder



Powder with a high static charge or which is strongly adhesive should be fed through position B on the LABORETTE 27. (See [Chapter 6.3](#) 'Dividing suspensions and highly adhesive materials' on page 21!)

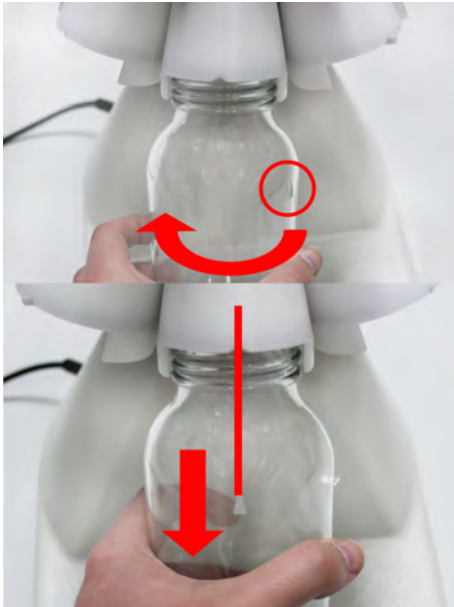
### 6.3 Dividing suspensions and highly adhesive materials



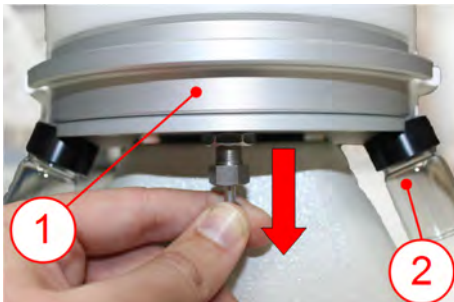
- Remove the lid and place the funnel in position B (for eccentric division). (See [Chapter 6.2](#) 'Dividing solid materials' on page 20)
- Switch the rotary cone sample divider on.  
(Final rotational speed of 100 rpm after approx. 10 seconds)
- Feed the powder slowly and evenly into the funnel.
- Dispense the suspension sample through a separating funnel, for example, or feed it slowly and evenly by hand from a vessel.

Using the device

6.4 Taking samples



- After completion of the division, switch the device off.
- Unscrew the glass bottles and remove the divided samples.



- 1 Collection pan
  - 2 Sample bottles
- Additionally for division in the ratio 1 : 30:
    - Unscrew the sample bottles and remove the divided samples.
    - Remove and empty the three collection pans (pull the pin downwards, pull the pan out).

## 7 Cleaning

**DANGER!****Mains voltage!**

- Before beginning with cleaning work, disconnect the mains plug and protect the device against being unintentionally switched back on!
- Do not allow any liquids to flow into the device.
- Indicate cleaning work with warning signs.
- Put safety equipment back into operation after cleaning work.



*When cleaning the entire device, adhere to the guidelines of the Accident Prevention Regulation (BGV A3) - especially if the device has been set up in a dusty environment or if processing grinding stock that produces dust.*

- If necessary, lift the dividing head from the drive shaft (sliding disc is glued to the dividing head).
- Keep the motor drive shaft dust-free
- Do not use force when fitting the dividing head.
- Remove material from the funnel, dividing head and sample bottles using a vacuum cleaner.
- After wet cleaning, rinse the funnel, dividing head and sample bottles with alcohol (ethanol) and air dry.

## 8 Maintenance



### DANGER!

#### Mains voltage

- Before beginning with maintenance work, unplug the mains plug and protect the device against being unintentionally switched back on again!
- Indicate maintenance work with warning signs.
- Maintenance work may only be performed by specialised personnel.
- Put safety equipment back into operation after maintenance or repair work.



*We recommend keeping a safety logbook ↪ Chapter 12 'Safety logbook' on page 30, where all work (maintenance, repairs.....) performed on the device is entered.*



*The most important element of maintenance is regular cleaning!*

- Moisten the drive shaft monthly with machine oil
- The ball bearings are permanently lubricated and are therefore maintenance-free



## 9 Disposal

It is hereby confirmed that FRITSCH has implemented the directive 2002/95/EC of the European Parliament and Council from 27th January 2003 for the limitation of the use of certain dangerous substances in electrical and electronic devices.

FRITSCH has registered the following categories according to the German electrical and electronic equipment act, section 6, paragraph 1, clause 1 and section 17, paragraphs 1 and 2:

**Mills and devices for the preparation of samples have been registered under category 6 for electrical and electronic tools (except for large stationary industrial tools).**

**Analytical devices have been registered under category 9, monitoring and control instruments.**

It has been accepted that FRITSCH is operating only in the business-to-business area. The German registration number for FRITSCH is WEEE reg. no. DE 60198769

### **FRITSCH WEEE coverage**

Since the registration of FRITSCH is classified for bilateral transactions, no legal recycling or disposal process is described. FRITSCH is not obliged to take back used FRITSCH devices.

FRITSCH declares it is prepared to take back used FRITSCH devices for recycling or disposal free of charge whenever a new device is purchased. The used FRITSCH device must be delivered free of charge to a FRITSCH establishment.

In all other cases FRITSCH takes back used FRITSCH devices for recycling or disposal only against payment.

## 10 Guarantee terms

### Guarantee period

As manufacturer, FRITSCH GmbH provides – above and beyond any guarantee claims against the seller – a guaranty valid for the duration of two years from the date of issue of the guarantee certificate supplied with the device.

Within this guarantee period, we shall remedy all deficiencies due to material or manufacturing defects free of charge. Rectification may take the form of either repair or replacement of the device, at our sole discretion. The guarantee may be redeemed in all countries in which this FRITSCH device is sold with our authorisation.

### Conditions for claims against the guarantee

This guarantee is subject to the condition that the device is operated according to the instructions for use / operating manual and its intended use.

Claims against the guarantee must include presentation of the original receipt, stating the date of purchase and name of the dealer, together with the complete device type and serial number.

**For this guarantee to take effect, the answer card entitled "Securing of Guarantee" (enclosed with the device) must be properly filled out and despatched without delay after receipt of the device and be received by us within three weeks or alternatively, online registration must be carried out with the above-mentioned information.**

### Reasons for loss of the guarantee

#### The guarantee will not be granted in cases where:

- Damage has arisen due to normal wear and tear, especially for wear parts, such as: Crushing jaws, support walls, grinding bowls, grinding balls, sieve plates, brush strips, grinding sets, grinding disks, rotors, sieve rings, pin inserts, conversion kits, sieve inserts, bottom sieves, grinding inserts, cutting tools, sieve cassettes, sieve and measuring cell glasses.
- Repairs, adaptations or modifications were made to the device by unauthorized persons or companies.
- The device was not used in a laboratory environment and/or has been used in continuous operation.
- Damage is present due to external factors (lightning, water, fire or similar) or improper handling.
- Damage is present that only insubstantially affects the value or proper functioning of the device.
- The device type or serial number on the device has been changed, deleted, removed or in any other way rendered illegible
- The above-mentioned documents have been changed in any way or rendered illegible.

**Costs not covered by the guarantee**

This guarantee excludes any costs for transport, packaging or travel that accrue in the event the product must be sent to us or in the event that one of our specialist technicians is required to come to your site. Any servicing done by persons not authorised by us and any use of parts that are not original FRITSCH accessories and spare parts will void the guarantee.

**Further information about the guarantee**

The guarantee period will neither extend nor will a new period of guarantee begin in the event that a claim is placed against the guarantee.

Please provide a detailed description of the type of error or the complaint. If no error description is enclosed, we shall interpret the shipment as an assignment to remedy all recognisable errors or faults, including those not covered by the guarantee. Errors or faults not covered by the guarantee shall in this case be rectified at cost.

We recommend reading the operating manual before contacting us or your dealer, in order to avoid unnecessary inconvenience.

Ownership of defective parts is transferred to us with the delivery of the replacement part; the defective part shall be returned to us at buyer's expense.

**NOTICE!**

Please note that in the event that the device must be returned, the device must be shipped in the original Fritsch packaging. Fritsch GmbH denies all liability for any damage due to improper packaging (packaging not from Fritsch).

Any enquiries must include a reference to the serial number imprinted on the type plate.

## 11 Exclusion of liability

Before using the product, be sure to have read and understood this operating manual.

The use of the product requires technical knowledge; only commercial use is permitted.

The product may be used exclusively within the scope of applications set down in this operating manual and within the framework of guidelines put forth in this operating manual and must be subject to regular maintenance. In case of non-compliance, improper use or improper maintenance, the customer assumes full liability for the functional capability of the product and for damage or injury arising from violating these obligations.

The contents of this operating manual are subject in entirety to copyright law. This operating manual and its contents may not be copied, further distributed or stored in any form, in part or in whole, without the prior written consent of Fritsch.

This operating manual has been prepared to the best of our knowledge and checked for accuracy at the time of printing. FRITSCH GMBH assumes no guarantee or liability whatsoever for the accuracy or completeness of the contents of this operating manual, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, unless liability is expressly prescribed by applicable laws or jurisprudence.

FRITSCH GMBH expressly reserves the right to modify and/or update this operating manual without prior notice. The same applies to modifications and improvements to the products described in this operating manual. It is the responsibility of the user to ensure that they have the current version of this operating manual. For more information, please contact your local FRITSCH GMBH distributor or Fritsch GmbH, Industriestr. 8, D-55473 Idar-Oberstein.

Not all parts shown here are necessarily installed in the product. The buyer is not entitled to delivery of these parts. If interested, please contact your local FRITSCH GMBH distributor or Fritsch GmbH, Industriestr. 8, D-55743 Idar-Oberstein.

FRITSCH GMBH takes the greatest care to ensure that the quality, reliability and safety of your products are continuously improved and adapted to the state of the art. The supplied products as well as this operating manual conform to the current state of the art when they leave the sphere of influence of FRITSCH GMBH.

By using the product the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the product.

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**Safety logbook****12 Safety logbook**

Date	Maintenance / Repair	Name	Signature

Date	Maintenance / Repair	Name	Signature

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