

Operating manual

Rotary Cone Sample Divider

"laborette 27"



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Fritsch GmbH, Manufacturers of Laboratory Instruments, was certified by the TÜV Zertifizierungsgemeinschaft e.V. on 24th June 1994.



Based on an audit report, Fritsch GmbH has been awarded the certificate of compliance with the requirements of DIN EN ISO 9001.

The enclosed conformity statement lists the directives that the rotary cone sample divider "laborette 27" satisfies in order to qualify for the CE mark.



Device number 27.141.00 / 27.142.00 valid as of serial number 100

Device number 27.1410.00 / 27.1420.00 valid as of serial number 100

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1 General / introduction

1.1 Notes about the operating manual









- The copyright to these technical documents is held by Fritsch GmbH, Manufacturers of Laboratory Instruments.
- These operating instructions are not to be reprinted or copied without the express approval of Fritsch GmbH.
- Read the operating instructions carefully.
- All operators must be familiar with the contents of the operating manual.
- Please follow the notes for your safety..
- Although the rotary cone sample divider was designed from the perspective of user safety, some residual risks could not be eliminated. Follow the advice in this manual to avoid risks to users.
- The symbols in the right hand margin highlight the risks described in the text.
- Some symbols may also be found on the instrument and warn against possible inherent hazards. Warning symbols are surrounded by a triangle.
- This operating manual does not constitute a complete technical description. It describes only the details required for safe operation and maintenance for usage under normal conditions.



Caution!

Follow the operating manual

1.2 Explanation of symbols used on the machine and in the operating manual

<p>Attention! Warning against danger spot Observe operating manual</p>	
<p>Attention! Mains voltage</p>	
<p>Attention! Hazard of explosion</p>	
<p>Attention! Hot surface</p>	
<p>Attention! Inflammable substances</p>	
<p>Wear protective gloves!</p>	
<p>Wear ear protection!</p>	
<p>Wear safety goggles!</p>	

1.3 Brief description of the machine

1.3.1 Fields of application

The "laborette 27" is a rotary cone sample divider for representative division of samples in the laboratory. It divides dry bulk goods or particle suspensions, separating the input quantity into equal parts, whereby each divided portion is representative of the whole sample.

Inorganic or organic samples are prepared for analysis, quality control or material testing in a way that allows analysis of an individual portion to provide reliable information on the physical or chemical properties of the entire original sample.

1.3.2 Method of operation

The "laborette 27" combines two different division principles into one device, making optimal use of the advantages of both:

The material flow passes through a funnel to encounter a cone. An initial division into individual flows takes place through sliding down this surface. This process is referred to as "**coning**" and is particularly effective in dividing larger quantities.

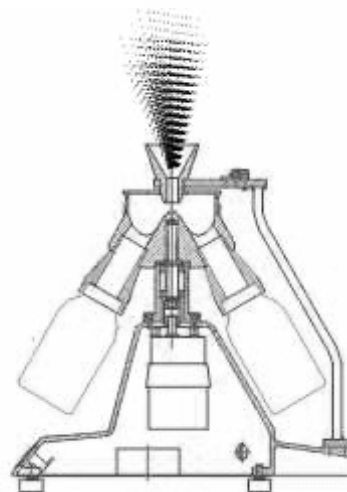
In the "laborette 27", the separated material flows are guided into individual channels at the end of the cone and collected in glass laboratory bottles.

The **turning of the cone** at a relatively high rotational speed prevents inhomogeneities in the material flow or demixing during division, ensuring that the material is equally divided into individual samples despite a preferred direction of deflection. The probability of falling into a specific bottle is identical for all portions of the material flow due to the rotation of the cone.

In addition, the centrifugal force of the rotation accelerates the divided material flow outward so that it flows more easily through the guide channels into the collection bottles. The guide channels intersect each other: the sharp separation lines between them divide the material flow and prevent deposits.

The high rotation speed of the spinning dividing cone yields an extremely high division ratio, i.e. each of the samples consists of a very large number of individual samples. A high division ratio is one of the most important prerequisites for a good, representative sample division.

To simplify the input of material, a feeder can be positioned next to the device. The material is then passed through the V-shaped vibration channel to the input funnel in doses. This is recommended in particular for materials with poor flowing properties (e.g. fine limestone). In general, the quality of the



division can be improved through use of the vibration channel and the resulting evenness of the material supply.

Each of the resulting sample portions can either be divided again or subjected to analysis. If the quantity after division is too small, the contents of multiple sample bottles can also be combined.

1.4 Technical data

Dimensions

46 cm x 27 cm x 45 cm (height x width x depth)

Weight

Net 14 kg, gross 17 kg

Division ratio, input quantity, particle size

Division head with division ratio	Maximum input quantity for one pass	Max. permissible particle size
1 : 8	4000 ml	10 mm
1 : 10	2500 ml	10 mm
1 : 30	300 ml	2.5 mm

Voltage

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

Electrical protection

Device fuse in the housing inside the front panel (next to switch)

Replacement: 0.315 A slow-blow fuse 5 x 20 (100 - 120 volts)

0.16 A medium-blow fuse 5 x 20 (200 - 240 volts)

(If necessary, pull out the fuse insert with a screw driver (2-3 mm) and replace the fuse element.)

Materials

The materials that come into contact with the material flow consist of:

food-safe, anodised aluminium,
stainless steel (feeder channel),
polyoxymethylene,
glass

2 Operating safety

2.1 General safety instructions

- Read the operating manual carefully.
- The device may only be used for the purpose described in section 1.3.1 Fields of application.
- We recommend the use of a safety logbook, which has information about all the work (maintenance, repairs...) carried out on the instrument.
- Use original accessories and spare parts only. Failure to adhere to this may jeopardize the protection of the machine.
- Do not continue using damaged accessories.
- All operators must be familiar with the contents of the operating manual.
To this end, it must be ensured that the operating manual is situated with the instrument, among other measures.
- Do not remove the instruction labels
- Do not disable safety devices.
- Independent alterations to the device negate the conformity with European directives declared by Fritsch and void the warranty.
- Care to prevent accidents must be taken during all work.



Follow the operating manual!

2.2 Operators

- The device may only be operated by authorised persons and maintained and repaired by trained experts.
- Persons under the influence of health impairments, medications, drugs, alcohol or excess fatigue may not operate the Rotary Cone Sample Divider.

2.3 Special safety instructions

- Return all covers after maintenance work.
- Do not permanently disable safety devices.
- Check safety devices regularly.
- "Not in use" ⇒ Switch off main switch.
- Only start the sample divider with firmly screwed-on glass bottles or collection containers.
- Only open the rotary cone sample divider after it has come to a complete stop.
- Do not reach into the running device.
- Always wear safety glasses while working.
- Only set up the rotary cone sample divider indoors.
- Ambient temperature 0 - 40°C.
- Set up on a stable work table.
- Danger from electrical voltage:
- Slight risk of crushing injuries from the rotating bottles: Attach the cover.
- Exercise caution when using flammable or toxic substances.



- When using flammable or harmful samples or suspension fluids, always observe the safety regulations (MAK values) and set up the rotary cone sample divider in a ventilated safety zone, if necessary.



3 Installation

3.1 Setting up the sample divider

- Set up the instrument on a stable surface so that it is level.
- Use the rubber feet to compensate for unevenness and make the instrument level.
- Securing to the setup location is not necessary.
- Ensure easy accessibility.



3.2 Setting up the divider core

- Mount the divider core on the drive axle projecting out of the housing.
- Check: The divider core must turn easily by hand on the friction clutch.

→ Before starting the instrument, place the protective tube on the divider core!

3.3 Electrical connection

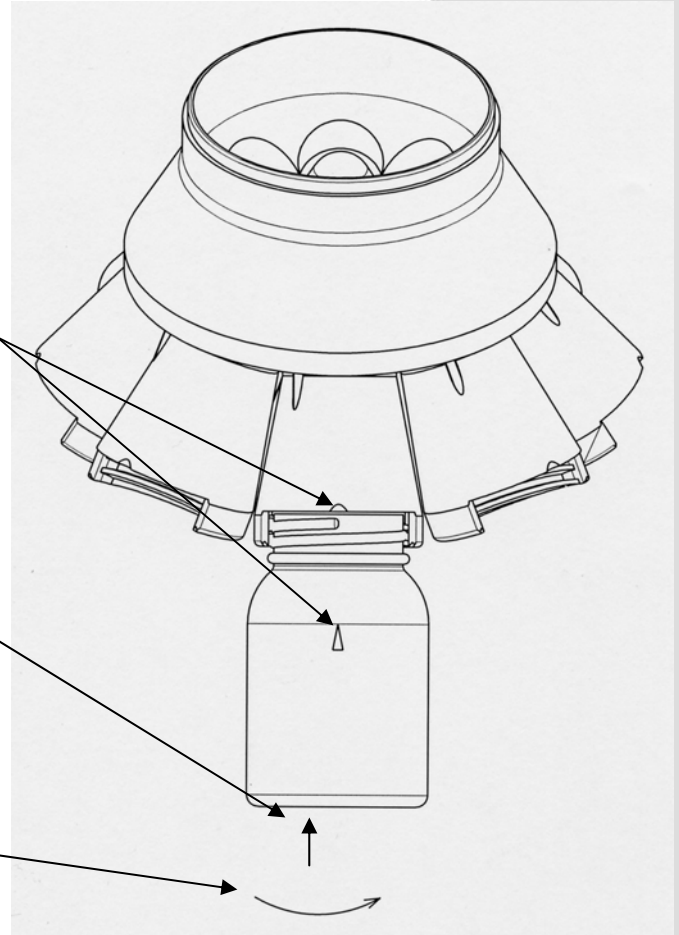
- Check that the voltage and current are correct.
- Before connecting the instrument, check the following:
 - The voltage and current specified on the type plate must match the values of the mains network to which it is connected.

4 Sample division

4.1 General preparations

4.1.1 Screwing on the glass laboratory bottles

1. Align the marking on the bottle surface with the marking on the bottle holder.
2. Slide the bottle into the groove in the bottle holder.
3. Firmly screw in the bottle with approximately a 1/4 turn in the direction indicated by the arrow.



4.1.2 Division in a ratio of 1 : 8

- Screw 8 glass laboratory bottles into the divider core (depending on the sample quantity, use 8 bottles of 250 ml or 500 ml).
- Place the cover on the divider core.
- Insert the matching funnel.

4.1.3 Division in a ratio of 1 : 10

- Screw 10 glass laboratory bottles into the divider core. (depending on the sample quantity, use 10 bottles of 250 ml).
- Place the cover on the divider core.
- Insert the matching funnel.
- 500 ml bottles cannot be used.

4.1.4 Division in a ratio of 1 : 30

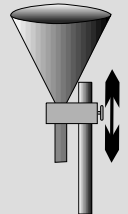
- Screw 3 glass laboratory bottles into the divider core.

(depending on the sample quantity, use 3 bottles of 15 ml, 20 ml or 30 ml).

- Insert 3 collection trays and lock them into place (pull pin down, insert tray and release pin).
- Place the cover on the divider core.
- Insert the matching funnel.

4.1.5 Setting up the feeder channel "laborette 24"

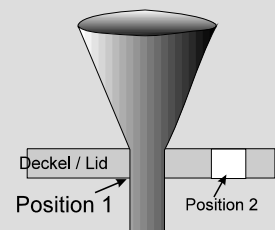
- Set the feeder with V channel on its frame so that the material flow is directed as closely to the middle of the funnel as possible.
- Adapt the quantity of the material flow from the funnel to the feeder channel by adjusting its height on the sample division support column.



Caution: Only begin feeding material after the sample divider has been switched on.

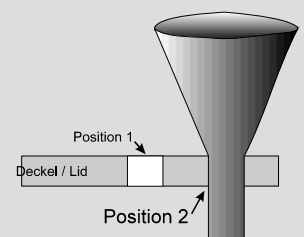
4.2 Division of solids

- Use the funnel in **position 1** (for solids).
- Switch on the sample divider.
(Wait for the final speed of approx. 100 rpm)
- **Feeding by hand:**
 - Pour the sample evenly into the funnel.
- **Feeding material with the vibratory feeder "laborette 24":**
 - Pour the sample into the funnel of the feeder.
 - Set the feeding quantity (speed of the material flow) on the rotating knob of the control device. (For rough setting, see section 3.1.4)



4.3 Division of suspensions

- Use the funnel in **position 2** (for suspensions).
- Switch on the sample divider.
(Wait for the final speed of approx. 100 rpm)
- Pour the sample evenly into the funnel.



4.4 Sample removal

- Switch off the instrument after the division is complete.
- Unscrew the glass bottles - remove the sample portions.
- **Also for division in a ratio of 1 : 30:**
 - Remove the 3 collection trays and empty them (pull pin down, remove tray).

5 Cleaning

- For cleaning, remove the divider core from the driving axle, if necessary (the slide disk is bonded to the divider core).
- Keep the driving axle of the geared motor free of dust - lubricate with machine oil once per month.
- Put the divider core into place without applying force.

5.1 Normal cleaning

- Vacuum out the funnel, divider core and sample bottles with a vacuum cleaner.

5.2 Deep cleaning

- Wash out the funnel, divider core and sample bottles under flowing water and using a soft bottle brush.

5.3 Drying

- Rinse the funnel, divider core and sample bottles with alcohol (ethyl alcohol) after wet cleaning and allow to air dry.

6 Maintenance

- Clean the sample divider regularly.
- Lubricate the driving axle with machine oil once per month.
- The ball bearings have permanent lubrication.
- Otherwise, the instrument requires no maintenance.

7 Warranty

The warranty card enclosed with the device upon delivery must be completely filled out and returned to the delivering factory so that the warranty can enter into effect.

The company Fritsch GmbH, Idar-Oberstein and its "Technical Application Laboratory" or the respective national sales representatives would be happy to provide advice and assistance.

Indication of the serial number imprinted on the type plate is required with any questions.