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Operating instructions for sample divider

Type PT 100

Retsch[®]

Notes on the operating instructions

These operating instructions for the laboratory sample divider type PT 100 provide all the necessary information on the topics listed in the table of contents.

They guide the target group(s) defined for the relevant subjects in safe and proper handling of the PT 100. Knowledge of the relevant chapters by the appropriate target group(s) is essential for safe and proper handling.

This technical documentation comprises a reference work and a training guide. The individual chapters are self-contained units.

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

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Safety

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

The PT 100 is a modern, powerful product from Retsch GmbH. It reflects the state of the art. When the machine is handled correctly by persons familiar with this technical documentation, it is completely safe and reliable in operation.

Notes on safety

You, as the operator, are responsible for ensuring that the persons appointed to work with the PT 100:

- have read and understood all the stipulations of the chapter on safety,
- are familiar before commencing work with all instructions and regulations for the relevant target group,
- have access to the technical documentation for this machine at all times and without difficulty.

Ensure that new staff have been familiarised with the rules for safe and proper handling before commencing work on the PT 100 either by oral instruction by a competent person and/or by this technical documentation.

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

Ensure that no unauthorised persons have access to the PT 100.

For your own protection, have your staff confirm that they have been instructed in operation of the PT 100. A draft of an appropriate form can be found at the end of the chapter on safety.



No liability in any form will be accepted for damage or injury resulting from failure to observe the following notes on safety.

Warning symbols

We use the following symbols to warn of:



Personal injury



Damage to property

Repairs

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

In such a case, please inform:

| |
|-----------------------------------|
| The Retsch agency in your country |
| Your supplier |
| Retsch GmbH direct |

Your service address:

| |
|--|
| |
|--|

Confirmation

| |
|--|
| I have read and understood the foreword and the chapter on safety. |
| |
| _____ Signature of the operator |
| _____ Signature of service technician |

Technical data

Target group: Operators

Machine type designation: PT 100

Use for the intended purpose

The PT 100 is suitable for representative division and reduction of flowing bulk materials with an input grain size up to max. 10 mm. The maximum input quantity is 5000 cm³ when the 10x dividing head is used. 10 individual samples can then be fed into glass bottles of 50 cm³ capacity each.

For precise sample division, it is generally recommended to have the sample material fed in evenly and continuously by a feeder of type DR 100.

The PT 100 is not designed as a production machine, but as a laboratory machine intended for 8 hour single shift operation at a continuous duty factor of 30 %.

Should you require any further information, our applications consultancy staff will be pleased to assist.



Do not make any modifications to the machine, and use only spare parts and accessories approved by Retsch.

Conformity with the European Directives as declared by Retsch will otherwise be invalidated.

This will also render all guarantee claims null and void.

Drive

DC motor

Speed of motor

2750 rpm

Speed of dividing head

110 rpm at 50/60 Hz

Rated power

approx. 18 - 28 VA

Voltages and frequencies

The PT 100 automatically recognises the following voltages and adjusts its electronics accordingly.

No settings by the customer are necessary.

100 - 120V 50 / 60Hz and

200 - 240V 50 / 60Hz

Input grain size

max. 10 mm with the large 6x, 8x and 10x dividing heads

max. 5 mm with the small 8x dividing head

Collecting vessels

250 or 500 ml wide neck bottles for
large 6x, 8x and 10x dividing heads

100, 250 or 500ml Schott bottles for
small 8x dividing head

Degree of protection

IP40

Emissions

Noise data:

Noise measurement to DIN 45635-31-01-KL3

Example:

Sound power level $L_{WA} = 51.6$ dB(A)

Workplace related emission level $L_{p\ eq} = 41.1$ dB(A)

Service conditions:

Dividing ratio = 8x dividing head in aluminium

Vessels = 8 glass bottles

Material = quartz sand

The noise level may alter when other materials, e.g. peas, are used.

Equipment dimensions

PT 100 (10x dividing head, large, quick-acting clamp and 500 ml wide neck bottles)

Height: 585 mm, width: 480 mm, depth: 420 mm

with DR 100/40

Height: up to approx. 900 mm, width: 580mm, depth: 420 mm

Weight

PT 100 (10x dividing head, large, in aluminium and quick-acting clamp):
approx. 21 kg

with DR 100/40

Weight: approx. 33.5 kg

Mounting surface required

PT 100 (10x dividing head, quick-acting clamp and 500 ml glass bottles):
480 x 420 mm

with DR 100/40 = 580 x 420 mm

No safety clearances necessary

Transport and installation

Target group: Operators

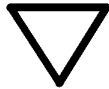
Packaging

The packaging is suitable for the mode of transport selected. It complies with the general packaging regulations.



Please keep the packaging for the duration of the guarantee period, as your guarantee claim will be endangered in the case of a complaint or return of the machine in inadequate packaging.

Temperature fluctuations



If major temperature fluctuations are expected (e.g. during air shipment) the PT 100 is to be protected from condensation. The electronic components may otherwise be damaged.

Transport



The PT 100 must not be thrown, subjected to impact or shock during transport. The electronic and mechanical components may otherwise be damaged.

Handling



After removal of the packaging, the PT 100 may only be moved with the dividing head and DR 100 removed.

Interim storage

Also ensure that the PT 100 is stored in a dry location for interim periods.

Scope of supply

- PT 100
- 1 power cable
- 1 instruction manual

Check the delivery for completeness, including the accessories ordered individually.

Check the perfect function of the PT 100 (see chapter on operation).



On incomplete delivery and / or transport damage, you must notify the forwarding agent and Retsch GmbH immediately (within 24hrs). It may not be possible to take account of later complaints.

Parameters for the installation location

Ambient temperature:

5°C to 40°C



If the ambient temperature falls below or exceeds the limits specified, the electrical and mechanical components may be damaged or the performance data changed to an unknown extent.

Humidity:

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



At higher humidity, the electrical and mechanical components may be damaged and performance data changed to an unknown extent.

Site altitude:

max. 2000 m above sea level

Installation

Set the laboratory sample divider type PT 100 up on a firm and stable base, e.g. a laboratory bench.

Electrical Connection

- Consult the type plate for the voltage and frequency of the PT 100.
- Ensure that the values are in agreement with the mains power supply.
- Connect the PT 100 to the mains using the cable supplied.

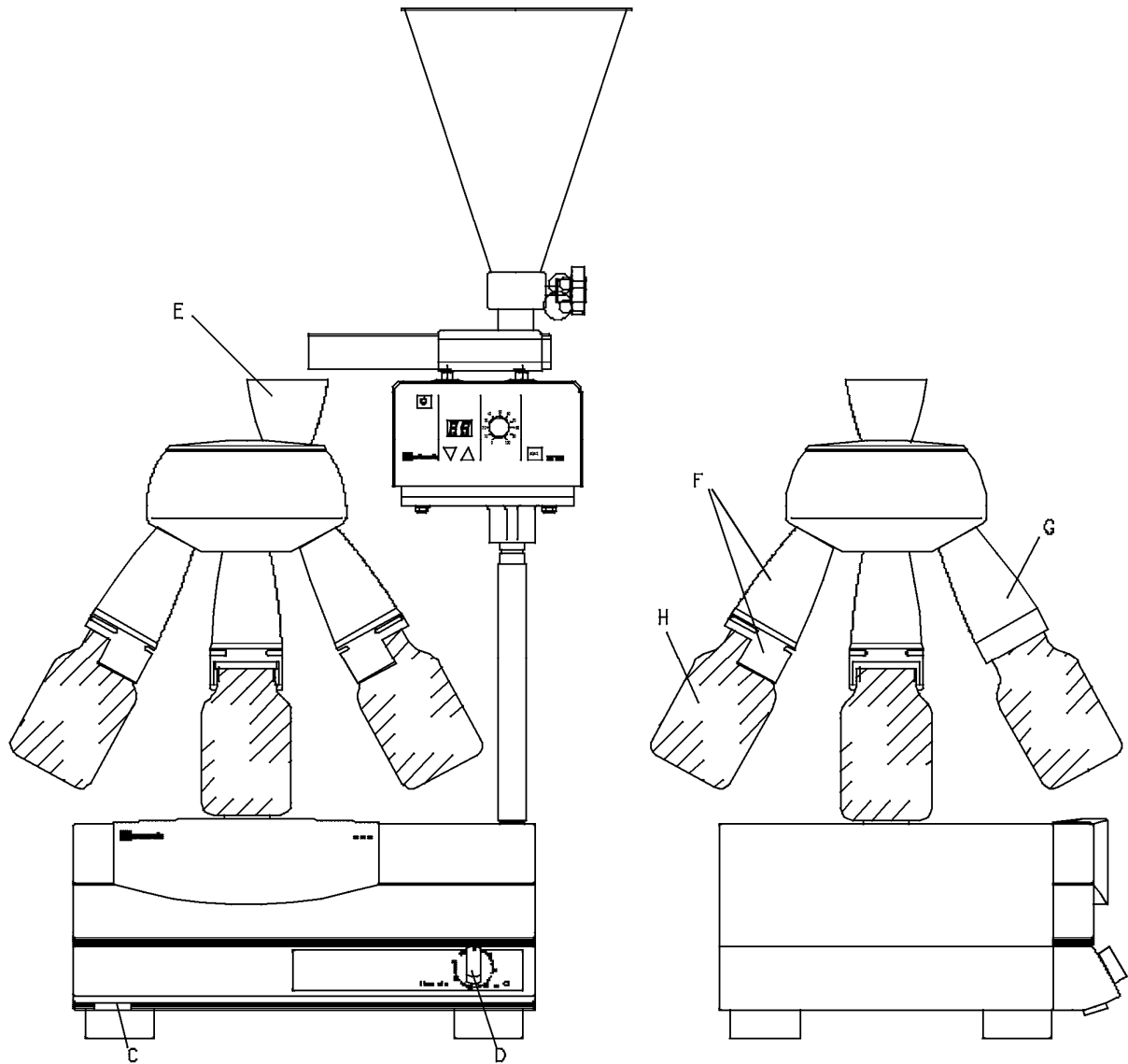


Failure to observe the values on the type plate can result in damage to electrical and mechanical components.

Operation

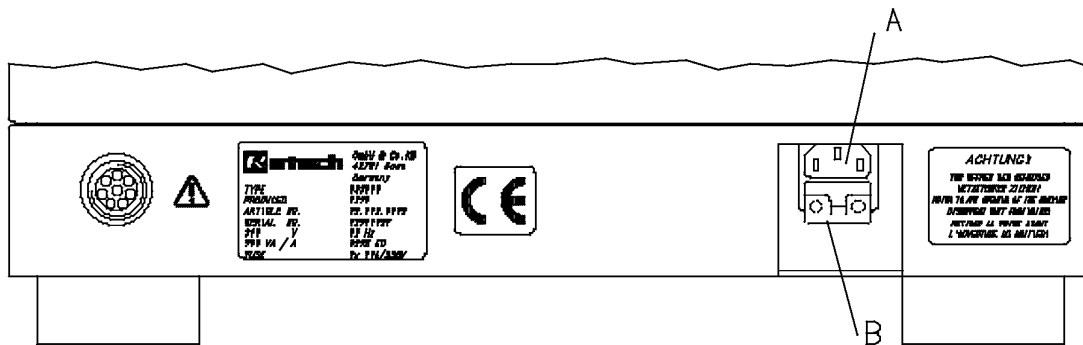
Target group: Operators

Graphical representation of the controls Fig. 1



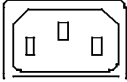
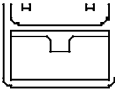

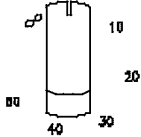
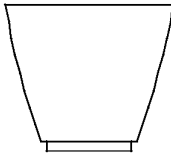
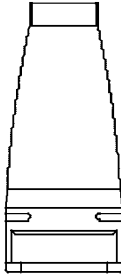
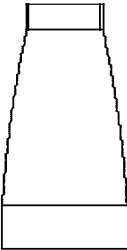
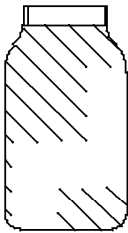
Front view

Side view



Rear view

Overview table for Fig. 1

| Item | Component | Illustration | Function |
|------|---|---|---|
| A | Power socket |  | Accommodates the power cable |
| B | Fuse drawer |  | Contains two glass fuses |
| C | Main ON / OFF switch |  | Switches the PT 100 on and off |
| D | Control knob for running time and continuous operation |  | Sets the dividing time to 0 - 60 min. or to ∞ (infinity). |
| E | Dividing head hopper |  | Serves as mounting for a feed hopper available as an accessory, or guides the sample material from the feeder into the dividing tubes. |
| F | Adapter tube with quick-acting clamp |  | Mounting for the glass bottle |
| G | Adapter tube with thread |  | Mounting for the glass bottle |
| H | Wide neck bottle (glass) or Schott bottle (glass) |  | Collects the sample material. There are wide neck bottles with 250 or 500 ml capacity for large 6x, 8x and 10x dividing heads, with screw or snap-action caps, and there are Schott bottles with 100, 250 or 500 ml capacity for the small 8x dividing head with quick-acting clamp |

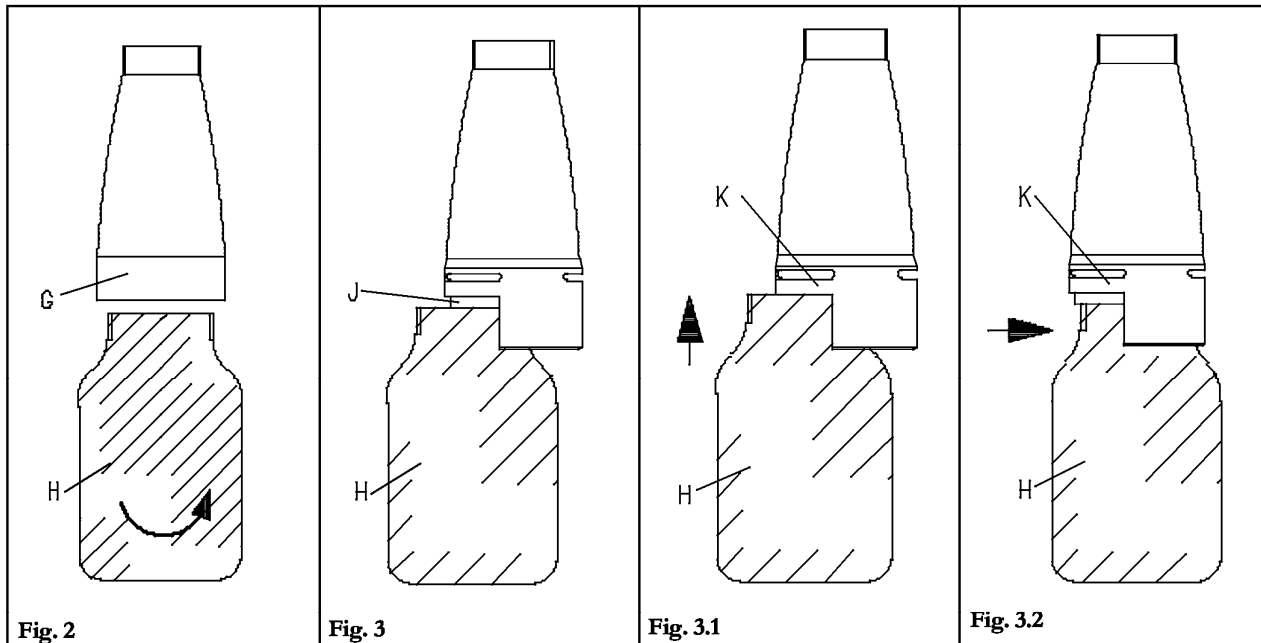


Fig. 2

Fig. 3

Fig. 3.1

Fig. 3.2

Inserting the glass bottles into the adapter tube with thread

Ensure that **all** dividing tubes are fitted with the selected glass bottles.

- Apply the glass bottle **H** to the adapter tube **G** and screw tight in the clockwise direction. **Fig. 2**

Inserting the glass bottles into the quick-acting clamp

Ensure that **all** dividing tubes are fitted with the selected glass bottles.

- Apply the glass bottle **H** to the pressure washer **J**. **Fig. 3**
- Press the pressure washer **J** upwards with the glass bottle **H**. **Fig. 3.1**
- Slide the glass bottle to the rear into the mounting **K** and lower it, thus locking it in position. **Fig. 3.2**



Ensure that the glass bottles are fitted properly in their mountings.

The glass bottles can be ejected from the dividing head by centrifugal force.



Fit glass bottles to **all** dividing tubes.

If bottles are missing, sample material is scattered in the vicinity of the machine. Loss of material.

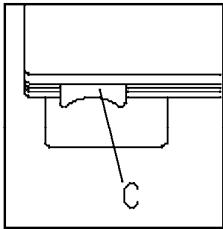


Fig. 4

Switching on and off

On/off switch **C** is located on the left hand side of the PT 100 below the control panel. **Fig. 4**

- Press on/off switch **C**.

When the PT 100 has been switched on with the main switch **C**, the electronics checks what mains voltage is applied. It recognises the voltage ranges 100-120V or 200-240V.

Only after this check (duration approx. 3 sec.) can the PT 100 be started with knob **D**.

If you do not wait for 3 sec. After switching the machine on with on/off switch **C**, you cannot start the PT 100 with knob **D**.
The electronics have not been able to verify the mains voltage.

Only connect the PT 100 to mains with a voltage of 100-120V or 200-240V, as it is not designed for other voltages.
Electronic components can be damaged.

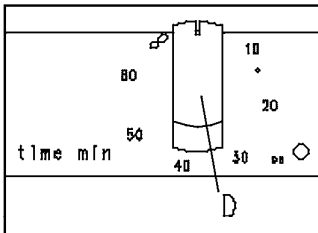


Fig. 5

Starting and setting the time

Switch the PT 100 on and wait 3 sec.

- Turn knob **D** clockwise to set the desired running time, 1 to 60 minutes, or turn it anti-clockwise to ∞ for continuous operation. **Fig. 5**. The green LED lights up.

For running times < 10 min., first set the clock to 30 min. and then turn it back, as otherwise the mechanical time clock will not time the operation properly.

Throughout sample division, the speed is kept constant within the specified tolerance.

Stopping/interrupting the dividing process with the ON/OFF switch

- Press on/off switch **C**. **Fig. 4**

The dividing process is stopped, but the time clock continues to run for the remaining period.

with the time clock

- Set control knob **D** to **I** by turning it clockwise or anti-clockwise. The dividing process is stopped. **Fig. 5**

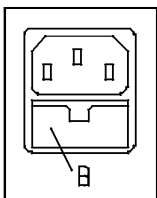


Fig. 6

Replacing the mains fuses

Fuses required
2 glass fuses T 0.315 A (5x20mm)

Replacement: **Fig. 6**

- Disconnect the mains plug
- Withdraw fuse holder **B**
- Replace the fuses
- Insert the fuse holder

The fuses inside the machine may only be replaced by after sales service personnel!

Assembly of the feeder unit type DR100/40

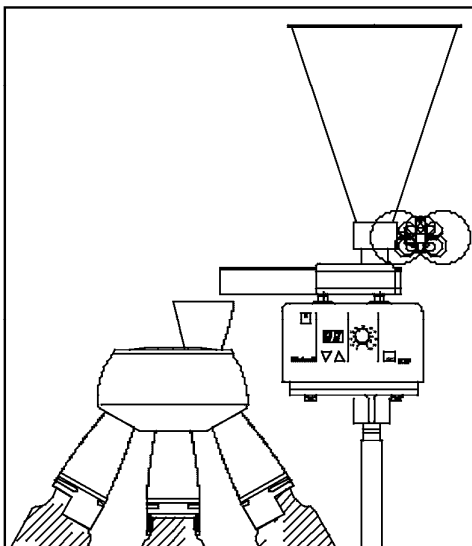


Fig. 7

Target group: Trained installation staff

For precise sample division, it is generally recommended to have the sample material fed in evenly by a feeder unit.

The feeder unit type DR 100/40, Fig. 7, is suitable for that purpose.

For preparation of the feeder unit, you also require the operating instructions for the DR100/40.

The connection between the PT 100 and the DR 100 is established by an interface cable which is supplied with the DR 100. See next page.

You require two power sockets with the **same phase position** for the PT 100 and DR 100, providing the correct voltage and frequency. See the type plates on the machines. Multiple distributor sockets to which both units can be connected are suitable.

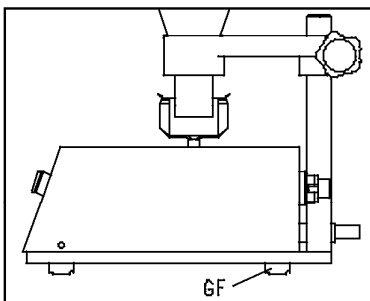


Fig. 8

Installation process: Fig. 8 and Fig. 9

Mounting HT is completely pre-assembled to stand rod ST.

- Unscrew the two rear rubber feet GF on the DR 100.
- Release the thumb screw KN and remove mounting HT from stand rod ST.
- Connect the DR 100 and the mounting HT with hexagon screws and washers SCH.
- Remove the plastic screw KS1.
- Screw the stand rod ST onto the housing.
- Fit the mounting HT and set the swivel distance.
- For this purpose, release threaded pin GS in lock disk RS.
- Set the swivel distance in such a way that the feeder channel is over the centre of the feed hopper at the anti-clockwise limit position.
- At the clockwise limit position, mounting HT is swung clear.
- Retighten threaded pin GS in lock disk RS.
- Align the channel from the DR 100 over the PT 100's feed hopper.
- The thumb screw KN at the rear of mounting HT is used to lock the DR 100 in position.

See the DR 100 operating instructions for further operation of the DR 100.

The DR 100 can be swung through 60° by releasing the thumb screw KN. The feed hopper with dividing head are then accessible before and after the dividing process.

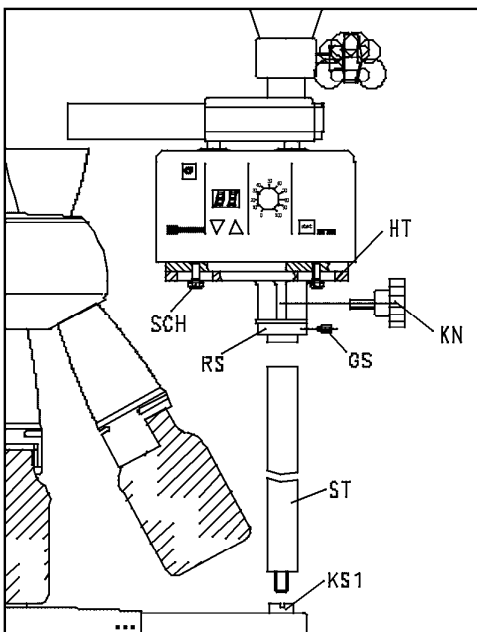


Fig. 9



The PT 100 and DR 100 must be suitable for the same electrical mains supply. See type plate.

On failure to comply with the ratings on the type plates of the PT 100 and DR 100, electronic and mechanical components can be damaged.



The mains power supply for connection of the PT 100 and DR 100 must have the same phase angle. Use a multiple distributor socket.

Communication between the two machines will not otherwise function adequately.

Establishing the interface connection

Consult the operating instructions for the PT 100 and the DR 100.

Use the interface cable supplied with the DR 100 upgrade set for the PT 100.

- Connect the interface **S** in the PT 100 with the interface **F** in the DR 100. **Fig. 10**

If you now turn the PT 100 on and wait for a short handshake routine to be completed (duration approx. 2 sec.), you can then set the feed speed at the DR 100.

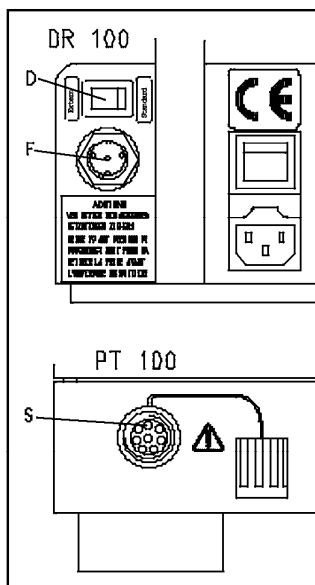


Fig. 10

Starting the PT 100 with the DR 100/40

- Fit glass bottles to all sample outlets on the PT 100.
- Set switch **D** on the rear of the DR 100 to "external". **Fig. 11**
- Set the potentiometer on the DR 100 to the desired feed speed (dependent on the material to be divided). **Fig. 12**
- Fill the DR 100's feed hopper.
- Set the feed material height (gap width between the feed hopper outlet and the base of the plug-in channel).

The setting for the gap between the plug-in channel and the feed hopper is dependent on the maximum grain size of the input material. It should be approx. 3 times as large as the maximum grain size.

- Switch on and start the PT 100.
- Press the ON/OFF switch **E** on the DR 100. **Fig. 13**

The DR 100 only starts when the PT 100 has reached its rated speed.

The DR 100 is automatically switched off if the rated speed of the PT 100 varies too greatly or drops.

If this fluctuation is only brief, < 5 s, the DR 100 switches on again when the rated speed has been reached again, and the feed process is continued.

As soon as you stop the PT 100, the DR 100 is also stopped and there is no further feed of sample material.

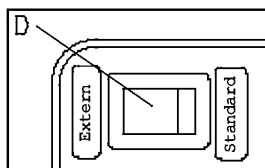


Fig. 11

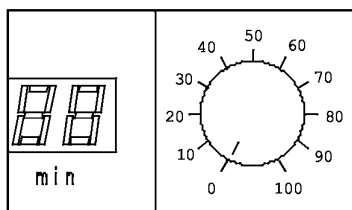


Fig. 12

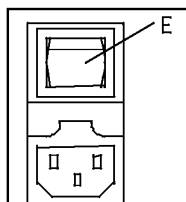


Fig. 13

Notes on application

Target group: Operators

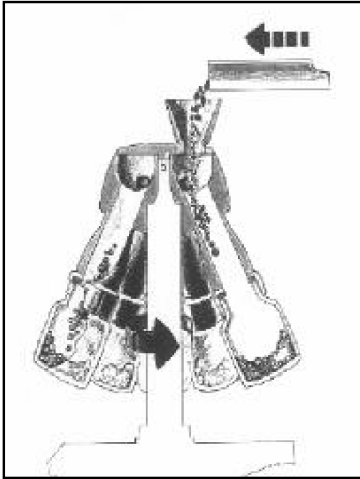


Fig. 14

General

The PT 100 is a highly modern, powerful product from F. Kurt Retsch GmbH & Co. KG.

With its large range of accessories, the laboratory sample divider of type PT 100 is a laboratory machine with a variety of applications, e.g. in the chemical and pharmaceutical fields, in mineralogy and biology, in the foodstuffs and feedstuffs industries.

It is used in research and development laboratories, in quality assurance, in pilot plant and for sample reduction from production processes; in short wherever representative sampling of flowing bulk materials, powders, grains and granulates is required.

As even a feed of the sample material is an essential condition for representative sample division with partial quantities of equal quality.

For precise sample division, it is generally recommended that the sample material be evenly and continuously fed to the sample divider by a feeder unit of type DR 100/40.

See schematic diagram. Fig. 14

Accessories

- Dividing head K10-T6-S-Al-h
- Dividing head K10-T8-S-Al-h
- Dividing head K10-T10-S-Al-h
- Dividing head K10-T6-G-Al-h
- Dividing head K10-T8-G-Al-h
- Dividing head K10-T10-G-Al-h
- Matching wide neck bottles 250 ml and 500 ml

- Dividing head K5-T8-S-Al-h
- Matching Schott bottles 100, 250 and 500 ml

- Feed hopper $V = 2.8 \text{ dm}^3$
- Feeder unit DR 100/40 with stand

Legend to dividing head specifications:

K = max. input grain size

T = Number of dividing tubes

S = Quick-acting clamp

G = Threaded adapter tubes

Al = Aluminium

h = Hard anodised

Cleaning

The PT 100 laboratory sample divider is designed in such a way that all parts in contact with the material can be easily removed without tools.

These parts are:

- the dividing head
- wide neck and Schott bottles
- the feed hopper and plug-in channel on the DR 100/40

These parts, when removed from the machine, can thus be cleaned in a water bath, under running water or in a dishwasher.



Do not clean the PT 100 under running water.

Lethal hazard from electric shock

Only use a moistened cloth.

Never use solvents.

The degree of protection of the PT 100 is IP40

Maintenance

The PT 100 is extensively maintenance-free.

When used correctly, no maintenance or setting work is required.

Copyright

This documentation may only be duplicated or passed on to third parties, its contents passed on or otherwise used with the express approval of F.

Kurt Retsch GmbH & Co. KG.

Violators will be liable for damages.

Modifications

We reserve the right to make technical modifications without notice.

Troubleshooting list

| Fault or error code | Cause | Remedy |
|--|--|---|
| Control lamp does not light up | No mains power | Check external fuse |
| | Fuses in the appliance plug or main ON/OFF switch are defective | Withdraw fuse drawer and check fuses. See page 13 |
| | Fuses F1 - F4, T160mA, on the power pack are defective | Service personnel |
| | Controller is defective | Service personnel |
| Dividing tube does not turn, although the control lamp lights up | Motor is defective | Service personnel |
| Control lamp flashes 1x | Dividing head fails to reach rated speed in the running-up phase of 20 sec. Dividing head falls below rated speed for more than 5 sec. after the 20 sec. running-up period Dividing head exceeds rated speed | 1. Restart |
| Control lamp flashes 2x | | 2. Service personnel |
| Control lamp flashes 3x | | 3. Restart |
| | | 4. Service personnel |
| | | 5. Restart |
| | | 6. Service personnel |

Safety regulations (Table)

for the PT 100 from the individual chapters

| Subject | Action | Hazard |
|---|--|--|
| Safety | Personal injury and damage to property caused by failure to observe the notes on safety. | No liability will be accepted whatsoever. |
| Use for the intended purpose | Do not make any modifications to the machine, and use only spare parts and accessories approved by Retsch. | Conformity with the European Directives as declared by Retsch will otherwise be invalidated. This will also render all guarantee claims null and void. |
| Packaging | Please keep the packaging for the duration of the guarantee period. | Your guarantee claim will be endangered in the case of a complaint or return of the machine in inadequate packaging. |
| Temperature fluctuations | If temperature fluctuations are expected, protect the PT 100 from condensation. | Electronic components may otherwise be damaged. |
| Transport | The PT 100 must not be thrown, subjected to impact or shock during transport. | The electronic and mechanical components may otherwise be damaged. |
| Handling | After removal of the packaging, the PT 100 may only be moved with the dividing head and DR 100 removed. | Risk of stumbling due to impeded vision. |
| Scope of supply | On incomplete delivery and / or transport damage, you must notify the forwarding agent and Retsch GmbH immediately (within 24hrs). | It may not be possible to take account of later complaints. |
| Ambient temperature | Falls below 5°C Rises above 40°C | Electrical and mechanical components may be damaged. Performance data change to an unknown extent. |
| Humidity | Rises above 80% at temperatures up to 31°C | Electrical and mechanical components may be damaged. Performance data change to an unknown extent. |
| Electrical connection | Mains power supply differs from the ratings on the type plate. | Electronic components may be damaged. |
| Inserting the glass bottles | Ensure that the glass bottles are fitted properly in their mountings. | The glass bottles can be ejected by centrifugal force. |
| Switching on and off | If you do not wait for 3 sec. After switching the machine on with on/off switch C, you cannot start the PT 100 with knob D. | The electronics have not been able to verify the mains voltage. |
| | Only connect the PT 100 to mains with a voltage of 100-120V or 200-240V, as it is not designed for other voltages. | Electronic components can be damaged. |
| Assembly of the feeder type DR 100 | The PT 100 and DR 100 must be suitable for the same electrical mains supply. See type plate. | On failure to comply with the ratings on the type plates of the PT 100 and DR 100, electronic and mechanical components can be damaged. |
| | The mains power supply for connection of the PT 100 and DR 100 must have the same phase angle. Use a multiple distributor socket. | Communication between the two machines will not otherwise function adequately. |
| Cleaning | Do not clean the PT 100 under running water. Only use a moistened cloth. Never use solvents. | Lethal hazard from electric shock. |

Warranty conditions

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

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

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

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

3. Our warranty shall in principle expire after six months. No warranty is issued for parts subject to wear.

Should the user complete and return the guarantee card supplied with the goods to us within two weeks of purchase of the machine, our warranty period is extended to two years, with a six month period for electrical parts and no warranty for parts subject to wear. The warranty period shall start on the date on which the guarantee card is returned, or on commissioning of the equipment when the guarantee card indicates that commissioning will be performed at a later date. Commissioning must take place within six months of purchase of the equipment.

The guarantee covers service in a laboratory in single shift operation. The guarantee period shall be shortened accordingly for multiple shift operation or other areas of service.

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

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

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

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