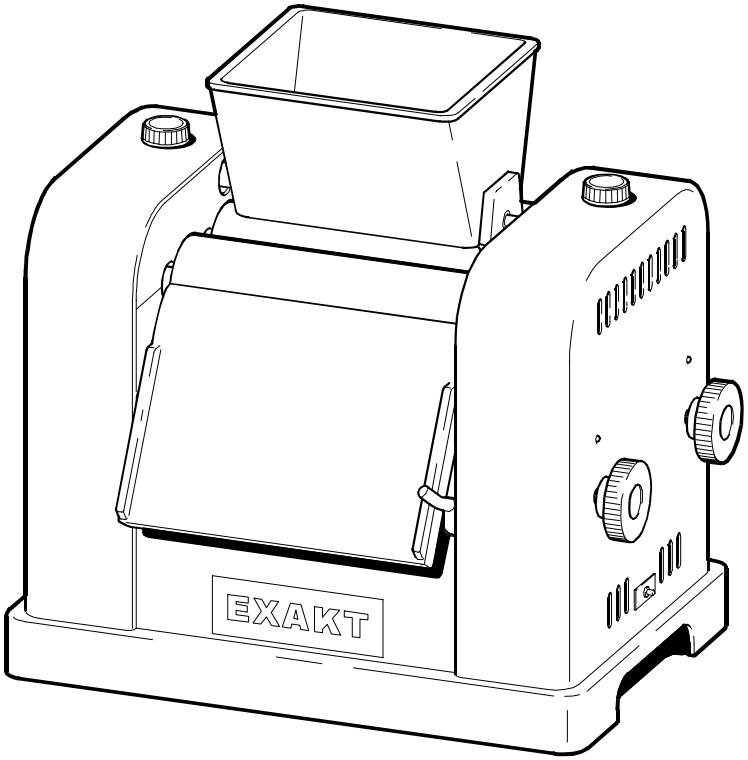
EXAKT

Operating Manual

Three Roll Mill EXAKT 35 / 50

(EXAKT 35 is not available in all countries)



EXAKT Apparatebau GmbH & Co. KG
Robert-Koch-Strasse 5
22851 Norderstedt
Germany

Phone: +49 (0) 40 / 529 560-0, Fax: +49 (0) 40 / 5 24 99 59
email: info@exakt.de, http:\\www.exakt.de

Important!

Read this operating manual prior to setting up the unit!

Contents

2 Contact information

2.1 To contact the manufacturer

EXAKT Apparatebau GmbH & Co. KG
Robert-Koch-Strasse 5
22851 Norderstedt
Germany

Phone: +49 (0) 40 / 529 560 - 0
Fax: +49 (0) 40 / 5 24 99 59

email: info@exakt.de
http:\\www.exakt.de

2.2 To contact your authorised distributor

2.3 Service and spare parts

If you need service or would like to order spare parts, please contact the authorised distributor in your area.

Note

Please use the order form provided in the section *Spare Parts and Accessories* to order spare parts.

3 Safety

3.1 General safety instructions

Anyone in charge of installing, setting-up, operating or maintaining the unit and its components must have read and understood the information in this manual and in particular the section on safety.

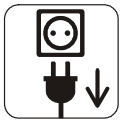
Taking into account the technical qualification of the personnel involved, additional instruction may be necessary to fully convey the safety issues in this manual. It is the responsibility of the employer to insure that all personnel are properly trained.

The following symbols are used in this manual:

Warning – <Personal injury hazard!>

Warning - <Danger of damage to the unit or ist components!>

Warning - <Electrical hazard!>



Caution - <Disconnect the unit from mains supply! Electrical hazard!>

Note

Information or notes appear here.

Warning plates or labels are applied to the unit housing to ensure safer operation.

Observe all safety instructions. Compliance with these instructions is in the interest of personal safety.

Before setting-up the unit, the operator must ensure that all safety-related requirements have been met.

All applicable accident prevention regulations as well as other generally recognised regulations concerning workplace health and safety must be observed.

3.2 Installation site

The unit must be positioned upright.

The installation location must provide firm support for the unit.

Warning – Product or component damage!

Do not place any objects on top of the unit.

- Check the main power cord and plug for signs of damage prior to connecting the unit.

Warning – Danger of damage to the unit due to an incorrect supply voltage!

Only connect the unit to the electrical supply voltage indicated on the unit's rating plate. Only connect it to a properly installed and grounded outlet.

Compare the main power voltage with the unit voltage indicated on the rating plate prior to connecting the unit.

When selecting an installation site, the applicable safety regulations and manufacturer's instructions concerning substances used for or located near the unit must be observed.

3.3 Safety instructions for operation

Avoid any operating practice which:

- endangers the health and safety of the user or third parties,
- presents a danger to the unit or other property,
- impairs the safety and operation of the unit,
- does not comply with the safety instructions.

Servicing and maintenance should only be performed by suitably qualified personnel who are familiar with the unit and who have been trained in its potential hazards.

Warning – Missing safety devices or covers are a personal injury hazard

The unit covers must be closed during system operation and may be opened only to correct malfunctions and for maintenance work.

Missing safety devices and covers must be refitted when work on the unit has been completed.

Warning – Personal injury due to drawing-in hazard!

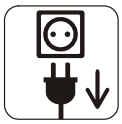
There is an increased danger of injury to persons with long hair or personnel wearing loose clothing, ties, scarves etc.!

Loose clothing should be removed or restricted and long hair confined behind the neck and shoulders with caps or bands when working with the unit.

Warning – Severe pinch point at the rear gap – Personal injury hazard!

When the product is applied to the rollers, there is an increased risk of finger injuries.

- Always use the hopper! Never use your hand to convey product directly to the machine.
- If no hopper is used, the product may only be applied using a suitable tool (e.g. a spatula).
  NOTE: There is a danger to the unit and the operator if the tool is drawn into the gap.

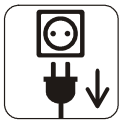


Caution - Disconnect the unit from the main power supply before working on live connections!

Working on live electrical connections increases the risk of electrocution.

Always disconnect the unit from the main power supply when working on or near electrical installations. Disconnect the unit from the electrical supply and ensure that power supply cannot be accidentally restored.

3.4 Safety information for cleaning



Caution - Disconnect the unit from the main power supply prior to cleaning the unit!

Prior to cleaning, unplug the unit from the main power supply.

Accidentally starting the unit during cleaning can lead to serious injuries.

Warning – Personal injury hazard when cleaning the unit while the motor is running!

The risk of injuries is increased when the unit is cleaned while the motor is running.

Only clean the unit when it is switched off.

- Use the attachable hand-wheel to turn the rollers for cleaning.

NOTE: Observe all applicable manufacturers' safety data sheets and disposal information, as well as any applicable local safety regulations when using detergents.

Warning - Do not use explosive or highly flammable detergents!

There is an increased risk of explosion if explosive or highly flammable detergents are used.

3.5 Intended use

The unit is intended solely for the application(s) outlined in the *description* section and only with components supplied and approved by EXAKT.

Using the unit for purposes other than those listed is considered contrary to the intended use. The manufacturer cannot be held liable for damages or injuries resulting from misuse. The risk for uses other than those expressly intended by the manufacturer is born solely by the user / operator.

4 Description / Overview

4.1 Description

The EXAKT 35/50 units are used for the distribution, homogenisation or dispersion of powdered materials in pastes, fluid or semi-fluid dispersants.

The units can be used for processing products from industries such as cosmetics, pigments/colorants, electronics, food, dental products, ceramics, pharmaceuticals, adhesives, lubricants and special products.

Warning – Do not process explosive or highly flammable substances!

There is an increased risk of explosion if explosive or highly flammable substances are processed.

Warning – Danger of overheating during uninterrupted, continuous operation!

The EXAKT 35 is not suitable for continuous operation. Continuous operation leads to overheating of the substances processed.

Formulas may only be processed in small quantities (grams).

- Monitor the unit during processing to detect possible signs of overheating.

4.2 Variations overview

Depending on the application the EXAKT 35/50 units are available with the following main features:

- Variety of roller materials (hard porcelain, aluminium oxide, hard-chrome-plated steel and other special material upon request)
- Various scraper systems (solid plastic for EXAKT 35/50, metal for EXAKT 35/50, universal scraper for EXAKT 50)
- One speed for EXAKT 35/50 or continuously variable speed option for EXAKT 50
- Hoppers made of plastic or stainless steel

5 System diagram

5.1 Operator controls

Note

For information concerning spare part orders see the section *spare parts and accessories*.

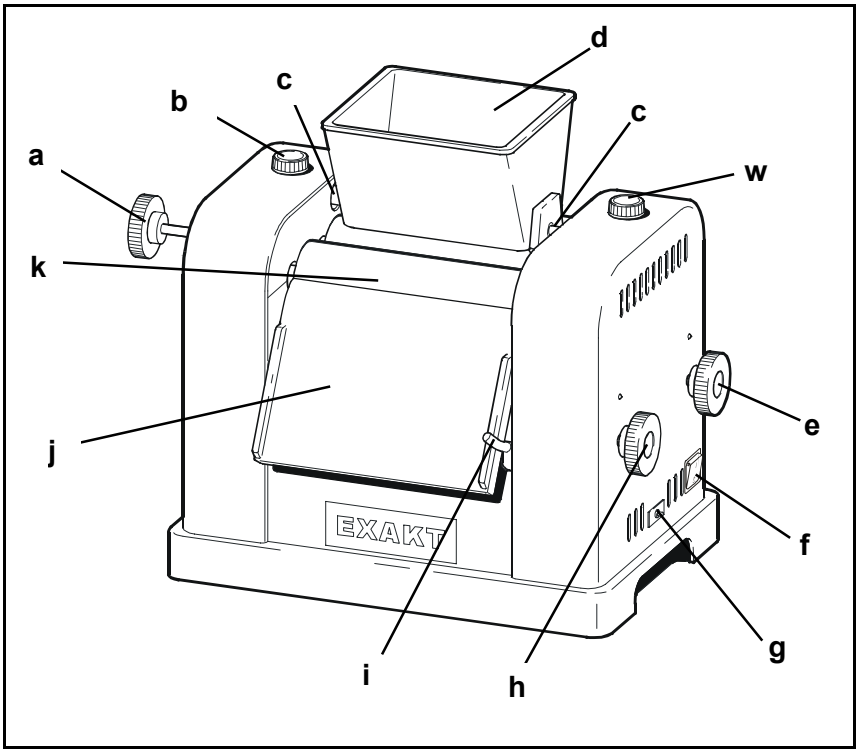


Fig. 1: System diagram

a Attachable hand-wheel for manual roller rotation (e.g. for cleaning)

b Fastening screw for stainless steel hopper (option)

c Plastic guides

d Hopper

e Knob for adjusting rear roller gap

f Main ON/OFF switch (see section 5.4 for information concerning the speed control system EXAKT 50 only)

g Circuit breaker (EXAKT 50 only)

h Knob for adjusting front roller gap

i Release lever for scraper

j Scraper

k Front, centre and rear rollers

5.2 Scraper systems

5.2.1 Plastic scraper

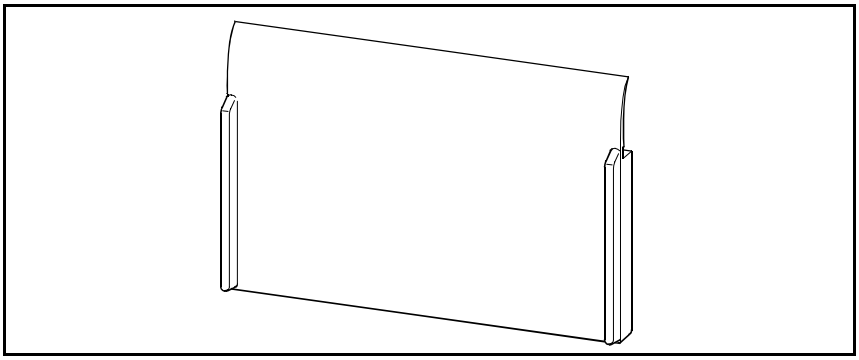


Fig. 2: Plastic scraper

5.2.2 Metal scraper

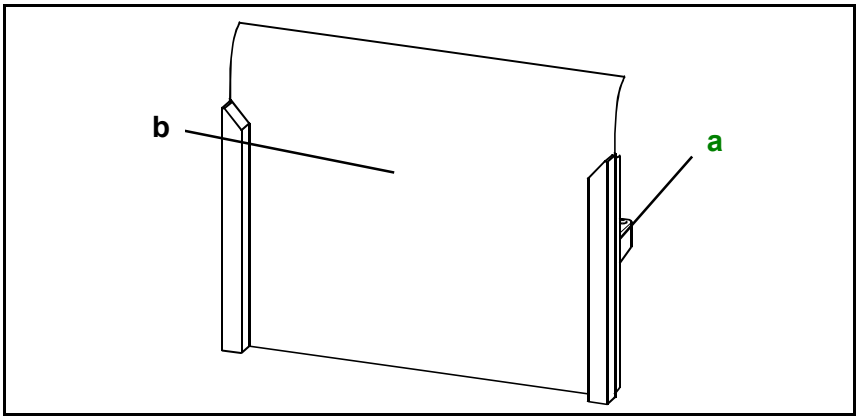


Fig. 3: Metal scraper

a Scraper socket

b Metal scraper plate

5.2.3 Scraper with knife (universal scraper)

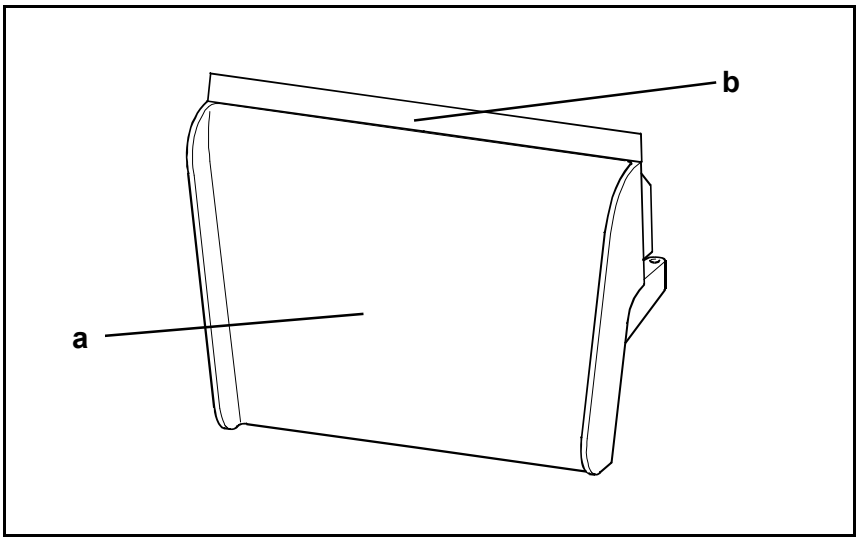


Fig. 4: Scraper with knife (universal scraper)

a Scraper socket and apron (single unit)

b Scraper knife available in metal, ceramics, PVC or fiberglass-reinforced epoxy resin

5.3 Hopper

5.3.1 Plastic hopper

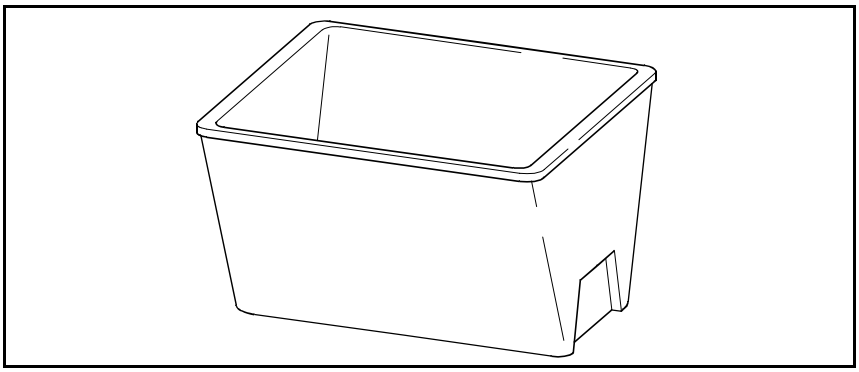


Fig. 5: Plastic hopper

5.3.2 Stainless steel hopper

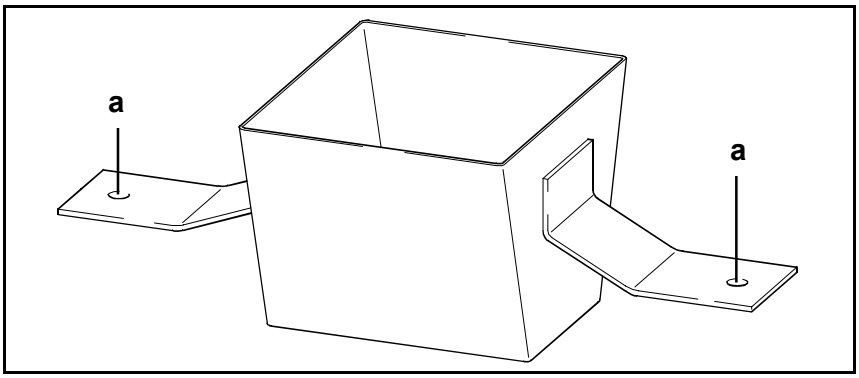


Fig. 6: Stainless steel hopper

a Fastening holes

5.4 Speed control system (optional on EXAKT 50)

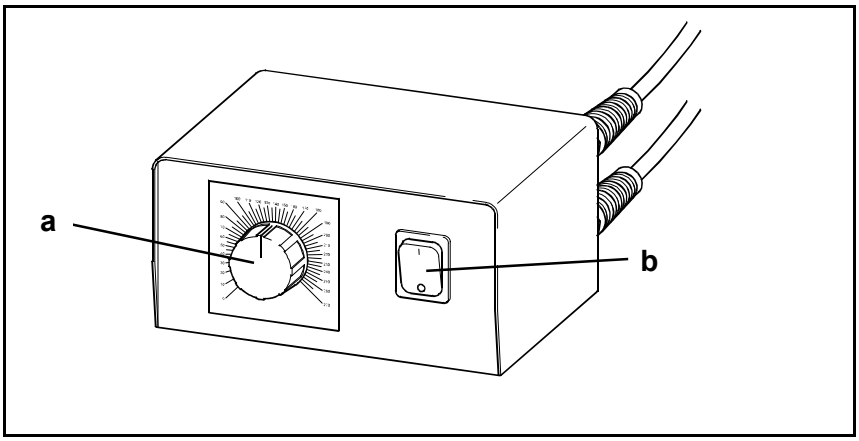


Fig. 7: Speed control system

a Rotary knob for roller speed adjustment

b Main ON/OFF switch

6 Operation

6.1 Connecting the unit

Compare the main power voltage with the unit voltage indicated on the serial/rating plate prior to connecting the unit.

Connect the unit to the main power supply using a fuse-protected (8-16A) grounded receptacle.

Note

The EXAKT 35/50 units are available with the voltage variations described in the *technical data* section.

6.2 Attaching the plastic guides / Mounting the hopper

Warning – Personal Injury Hazard!

There is an increased risk of injury in the area of the draw-in rollers when replacing the guides while the unit is running.

Switch the unit off and, if necessary, disconnect it from the main power supply prior to working in the area of the draw-in rollers.

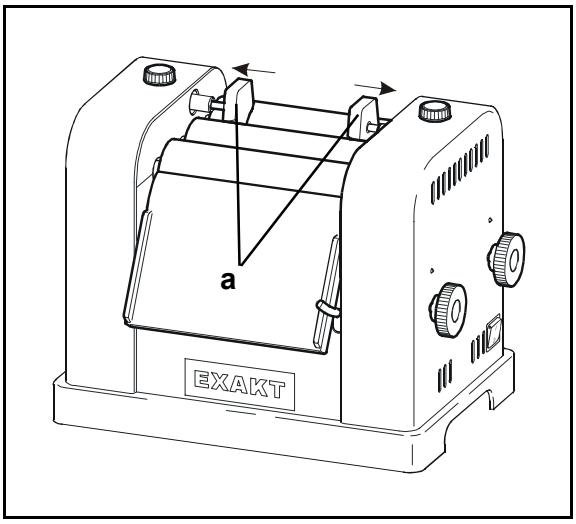


Fig. 8: Mounting the plastic guides

- Gently lift the guide positioning holders and slide the shafts of the guides into (Fig. 8/a) them.
- To remove the guides for cleaning gently lift and pull them to the center of the roller until the shaft is free.

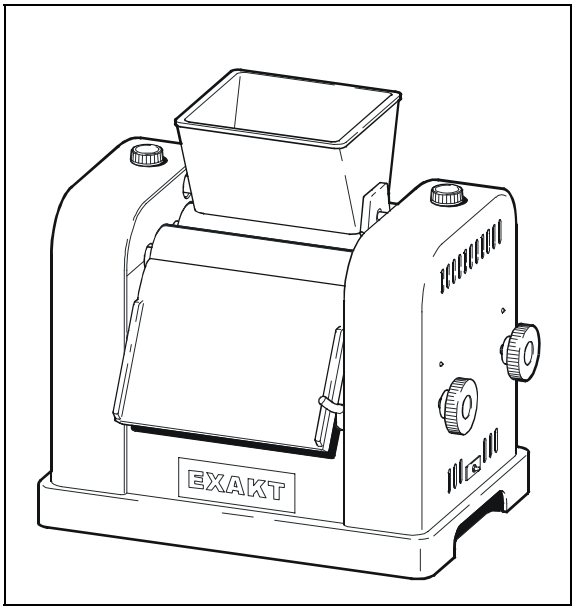


Fig. 9: Mounting the hopper

- Mount the hopper (Fig.9).

6.3 Installing / removing the scraper

The scraper is attached to a levered pin system. This system is spring-tensioned and presses the scraper evenly against the roller.

Warning – Risk of personal injury. The edges of the scraper socket (for one piece scrapers) and scraper knife (for a Universal Scraper) are very sharp.

- When positioning the scraper system against the front roller do not put fingers or other body parts or materials between the edge of the scraper/knife and the roller.
- When handling the scraper system during mounting, removal or cleaning be aware that the scraping edge is very sharp!.

Note

If material builds up around the seating pin (Fig. 10/c), the scraper will not seat properly. Consequently, the product cannot be removed correctly (see also the *maintenance* section).

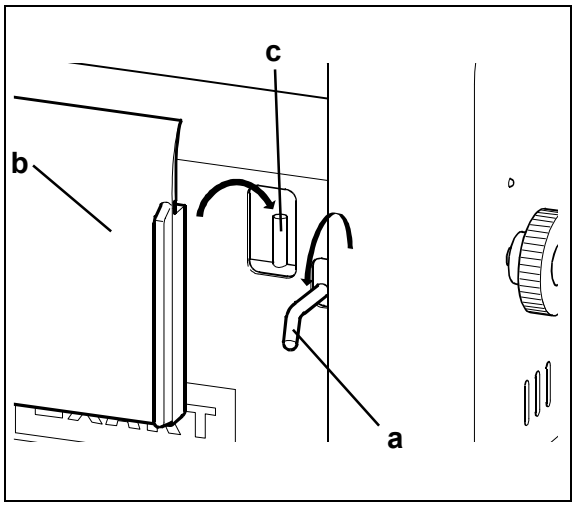


Fig. 10: Scraper swivelling system

- Push the lever down (Fig. 10/a) to expose the pins (Fig. 10/c).
- Seat the scraper (Fig. 10/b) evenly on the two pins (Fig. 10/c).
- Carefully release the lever back into its original position.

Note

The scrapers are designed to be used with specific models and may not be replaced by scrapers for other models.

The product will not be properly removed if scrapers from other models are used.

- When a new scraper is used for the first time, the initial scraping behaviour might not be optimal. However, after a short time the scraper is ground against the roller and adapts to the system improving the scraping behavior.

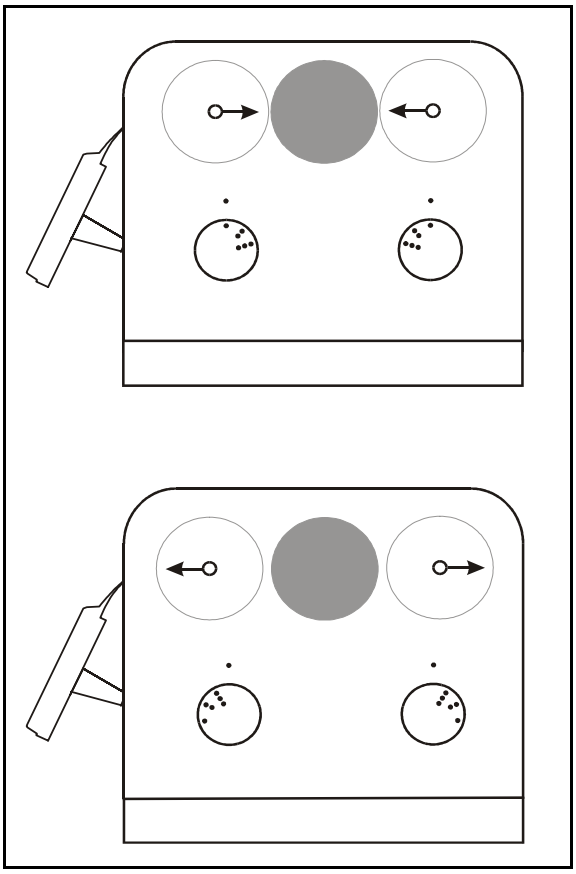
6.4 Adjusting the fineness of dispersion and the material throughput

The roller gap can be adjusted using two hand-wheels located on the right side of the housing.

The uniformity of dispersion and the material throughput are adjusted by varying the roller gap.

Note

- Do not operate the unit without any product. This decreases the life of the scraper.
- Remove the hand-wheel for manual roller rotation switching on the unit.



Position •

Smallest roller gap = finest dispersion = lowest material throughput

Position ••

Medium roller gap = medium dispersion = medium material throughput

Position •••

(The hand-wheel can be rotated beyond the position •••)

Largest roller gap = coarse dispersion = highest material throughput

Fig. 11: Adjusting the fineness of dispersion and the material throughput

Adjusting the material throughput:

- Set the minimum roller gap (position •) for both roller gaps when using the unit for the first time.

Note

Before attempting to process product EXAKT unit, first process a small quantity of Vaseline or similar grease to become familiar with adjusting the material flow.

Note

If the product to be processed is extremely viscous, sticky or poorly pre-mixed a slightly wider roller gap is recommended for the initial run. Subsequent processing runs can be made with a narrower gap to improve fineness of dispersion.

Increasing the material throughput:

- Slightly increase the front roller gap by turning the front hand-wheel.
- Slowly increase the rear roller gap turning the rear hand-wheel until the product flow on the front roller covers the entire width between the guides.

Continue to adjust the roller gaps until the optimum flow is reached.

6.5 Speed control system (EXAKT 50 only)

The EXAKT 50 standard version is equipped with a one speed motor

- A special EXAKT 50 version is available with a variable speed control system.

Note

Adjust the distribution fineness and the material throughput as described in section 6.4.

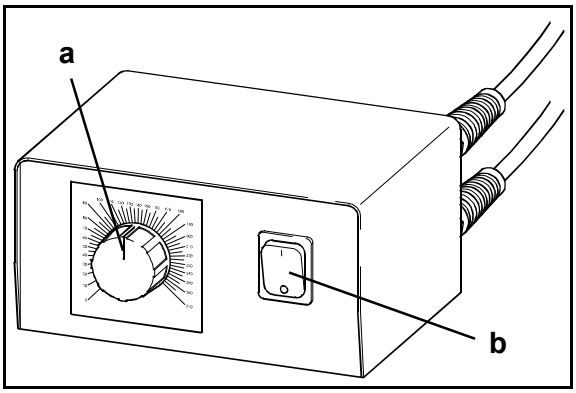


Fig. 12: Continuously variable speed control system

- Before starting, turn the speed to low using the control knob. (Fig. 12/a)
- Switch the unit on using the ON/OFF switch (Fig. 12/b).
- Increase the speed of the rollers by turning the control knob clockwise (Fig. 12/a).

6.6 General Operating Instructions

Warning – Product/Component Damage Hazard!

This section provides general operating instructions and does not contain any safety-relevant information.

Read the entire operating manual prior to setting up and operating the unit!

Note

Before attempting to process product EXAKT unit, first process a small quantity of Vaseline or similar grease to become familiar with adjusting the material flow.

1. Ensure that the unit is installed on a firmly support benchtop.
2. Check the roller surfaces, guides and scrapers for cleanliness prior to use.
3. Compare the main power voltage with the unit voltage indicated on the serial/rating plate prior to connecting the unit.
4. Prepare the product to be processed and keep a spatula ready for feeding the product into the hopper.
5. Remove the hand-wheel for manual roller rotation.
6. Install the plastic guides.
7. Install the hopper.
8. Attach the scraper system.
9. If the unit is equipped with a speed control system adjust the speed to low.

Continued ...

Unit set-up (Fig. 13)

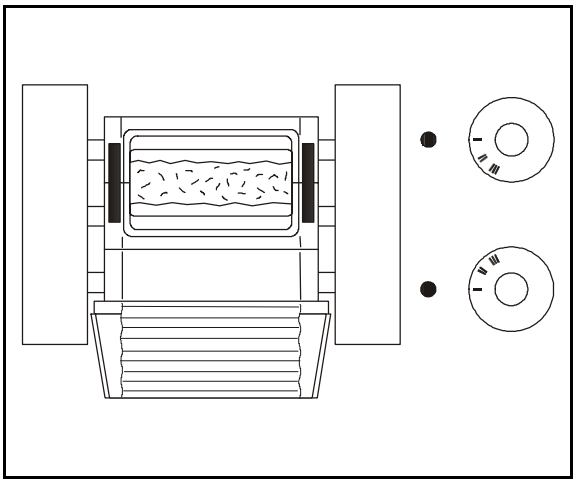


Fig. 13: Roller gap adjustment

10. At first adjust the smallest possible roller gap (position I on both hand-wheels).
11. Allways use a spatula to drop product into the hopper.
12. Switch on the unit – with these gap settings the product should be ground to the maximum fineness (maximum finenss may require more than one grinding.).
13. Continue applying the product using a spatula.

Note

Use a separate spatula for taking the product off the scraper to insure that the finely ground product is not contaminated with yet to be ground product.

Throughput adjustment (Fig. 14+15)

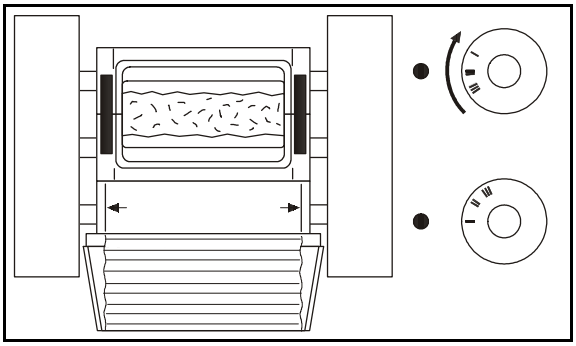


Fig. 14: Roller gap increase

14. The throughput can be increased by **gradually** increasing the rear roller gap as indicated by the arrow (Fig. 14).

Note

If the rear roller gap is increased too much, too much product will be fed to the narrow front roller gap. This causes the product to spread out laterally over the front roller (small arrows in Fig. 14).

Continued ...

If the product spreads out laterally over the front roller:

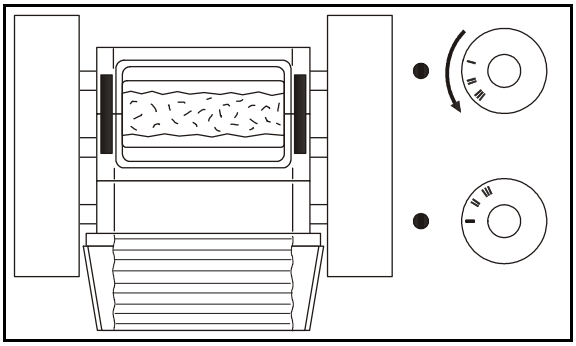


Fig. 15: Roller gap decrease

15. Decrease the rear roller gap as indicated by the arrow (Fig. 15) until the product flow on the front rollers is the same width as the plastic guides.

16. Clean the machine immediately after use and insure that all safety criteria are cleaning are observed.

7 Maintenance

The EXAKT units are highly reliable and require minimal maintenance provided they are operated properly.

To ensure optimal performance, the following maintenance should be performed at regular intervals outlined in the maintenance schedule.

Warning - Read the section on safety before performing any maintenance!

Failure to comply with the information provided in the *safety* section leads to an increased risk of injury.

Maintenance should be performed by qualified personnel who are familiar with the unit and who have been instructed in the potential hazards.

- Disconnect the unit from main power supply prior to performing any maintenance.

Note

The entire system must be kept clean.

7.1 Cleaning schedule

System	Interval	Maintenance work	Section
Guides	after each use and whenever the product is changed	Check the guides for dirt and signs of wear and clean / replace them if necessary.	7.2
Rollers	after each use and whenever the product is changed	Check and clean the rollers.	7.3
Scraper knife	after each use and whenever the product is changed	Check the scraper knife for dirt and signs of wear and clean / replace it if necessary.	7.4
Contact pressure	If the product is not removed uniformly by the scraper system	Check and readjust the contact pressure.	7.4.3

7.2 Checking / cleaning and replacing the guides

Check the guides for dirt and signs of wear after use and whenever the product is changed. Replace them if necessary.

Note

The guides are wear parts are replaced in pairs.

The following are clear signs of wear:

- Frayed or striated surfaces (Fig. 16/a)
- Marks on the roller surface that comes in contact with the guides
- Irregular product flow

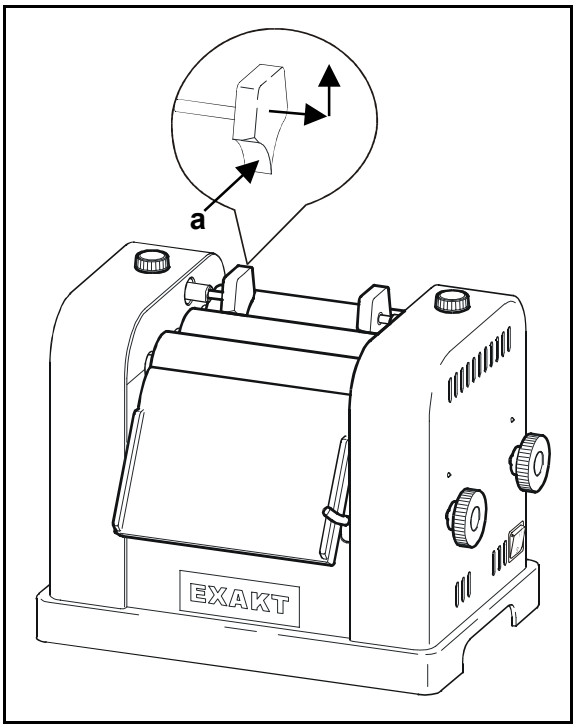


Fig. 16: Guides

- To remove the guides for cleaning lift them up and pull them towards the middle.

  - Clean dirty guides.

  - Replace worn guides with new ones.

7.3 Cleaning the rollers

Clean and check the rollers after use and whenever the product is changed.

Warning – Danger of injury when cleaning rollers with the unit running!

There is an increased risk of injury at the roller gaps when cleaning the rollers with the unit running.

Switch the unit off and, if necessary, disconnect it from main power supply prior to cleaning the rollers with a cloth.

- Use the hand-wheel to manually rotate the rollers.
- When cleaning the rollers hold the cloth so that it cannot be caught between the rollers and be pulled into the gap Getting the cloth caught between the rollers can cause damage to the rollers and/or the gears.

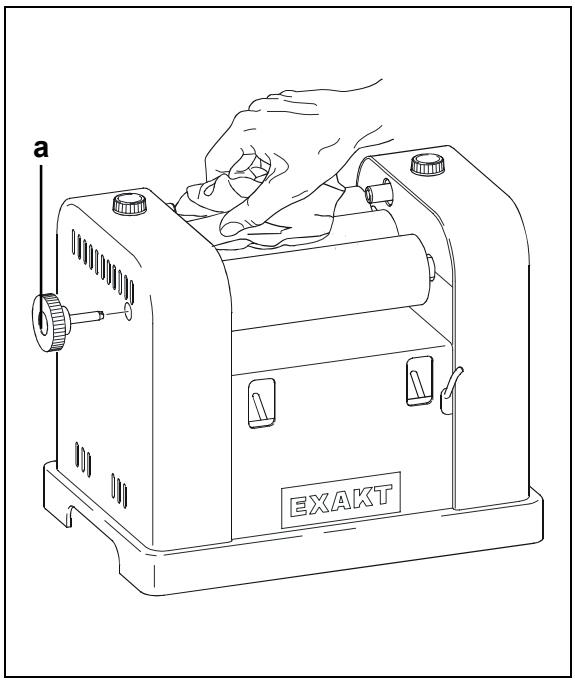


Fig. 17: Cleaning the rollers

To clean the rollers:

- Remove the guides and the scraper.
- Attach the hand-wheel to the unit (Fig. 17/a) for manual roller rotation.
- Clean the rollers using a clean cloth and detergent or suitable solvent.
- Remove the hand-wheel (Fig. 17/a) after cleaning.
- Do not spray the unit with or immerse it in water, solvent or other liquid.

7.4 Checking / cleaning and replacing the scraper system

If the scraper system is worn or dirty, the product will not be properly removed from the roller.

Check the scraper system for dirt and signs of wear after use and whenever the product is changed:

- Clean the dirty scraper system.
- Replace any worn scraper parts (scraper knife).

7.4.1 Replacing / installing the scraper knife made of metal / PVC / epoxy resin (EXAKT 50 only)

The following section is a description of the steps necessary for replacing / installing the scraper knife made of metal / PVC / epoxy resin for the universal scraper system.

Warning – Risk of severe damage to the rollers from sharp, serrated edges on the scraper knife!

Sharp, serrated edges on the scraper knife may scratch the roller surface.

De-burr and smooth the scraper knife prior to installation using a file or grindstone.

Note

The front edge of new scraper knives is already sharpened at the factory and the knives can be installed in any position. There is no “front” or back” the knife.

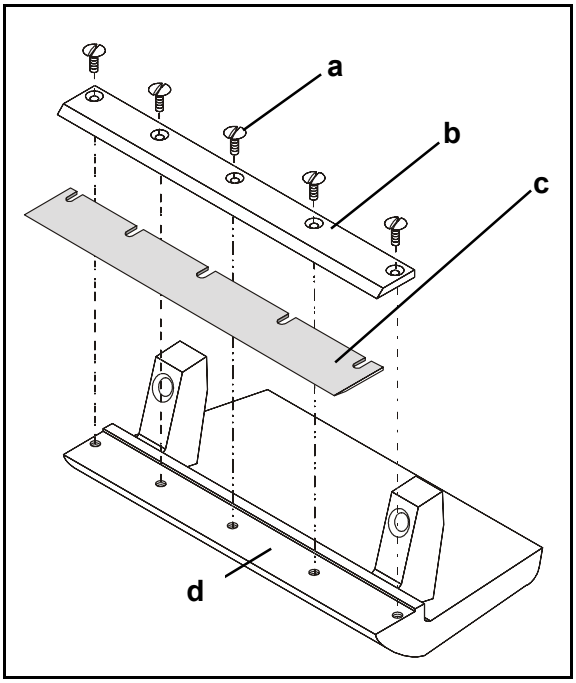


Fig. 18: Replacing the scraper knife

- Loosen and remove the fastening screws (Fig. 18/a).
- Remove the pressure plate (Fig. 18/b).
- Remove the scraper knife to be replaced (Fig. 18/c).
- Clean the scraper socket (Fig. 18/d) and the pressure plate (Fig. 18/b).
- Insert the new scraper knife.
- Refit the pressure plate (Fig. 18/b).
- Slightly tighten the fastening screws (Fig. 18/a) (make sure that the knife can still be moved by hand).

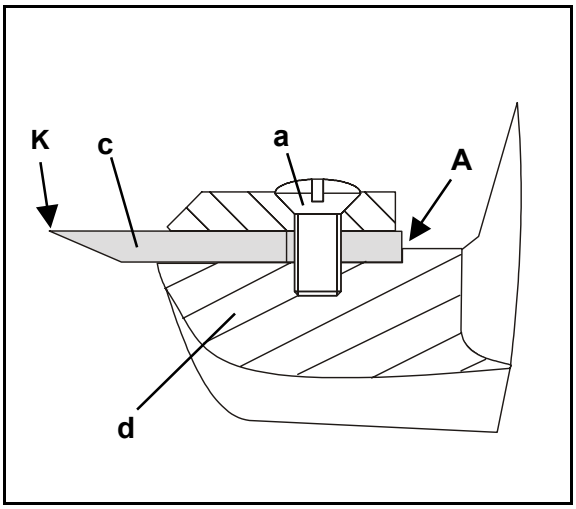


Fig. 19: Fastening the scraper knife

- Push the scraper knife (Fig. 19/c) against the rear stop (Fig. 19/A).
- Align the scraper knife (Fig. 19/c) on the scraper socket (Fig. 19/d).
- Carefully tighten the fastening screws (Fig. 19/a).

Note

With use, the edge of the scraper knife is ground away. If scraping performance deteriorates the knife can be reversed in the scraper socket. As the knife is ground against the roller it will be sharpened and once again conform to the front roller (Fig. 19/K).

7.4.2 Replacing / installing the ceramic knife (EXAKT 50 only)

Warning – Severe risk of damage to the ceramic knife!

Ceramic materials are very prone to breaking. There is an increased risk of breakage during replacement or installation of a ceramic knife.

Do not subject the ceramic knife to shocks and make sure that it does not get jammed during replacement / installation. To prevent breakage perform each step with extreme care.

- Clean the coated (taped) contact surfaces thoroughly prior to installing the new ceramic knife.
- The contact surfaces must be free of dust, debris or surface irregularities.
- Only use the ceramic knife with the original EXAKT spacer plate (these components are perfectly adapted to each other!). A new spacer plate is provided with each knife

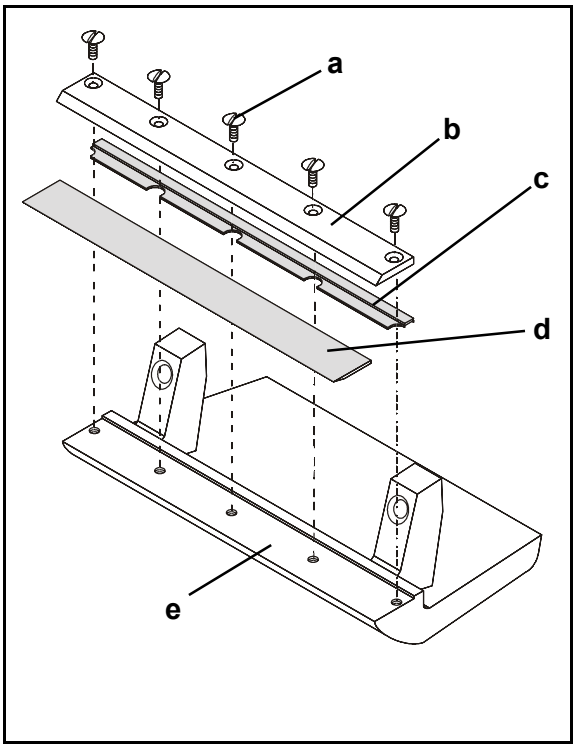


Fig. 20: Replacing the ceramic knife

- Loosen the fastening screws (Fig. 20/a).
- Remove the pressure plate (Fig. 20/b).
- Remove the spacer plate (Fig. 20/c) and the scraper knife (Fig. 20/d).
- Clean the coated (taped) contact surfaces on the pressure plate (Fig. 20/b) and on the scraper socket (Fig. 20/c).
- If necessary, apply a piece of clean tape over the taped surfaces.
- Place the spacer plate (Fig. 20/c) on the contact surface.
- Refit the pressure plate (Fig. 20/b).
- Refit the fastening screws (Fig. 20/a) and tighten them by one thread turn

Continued …

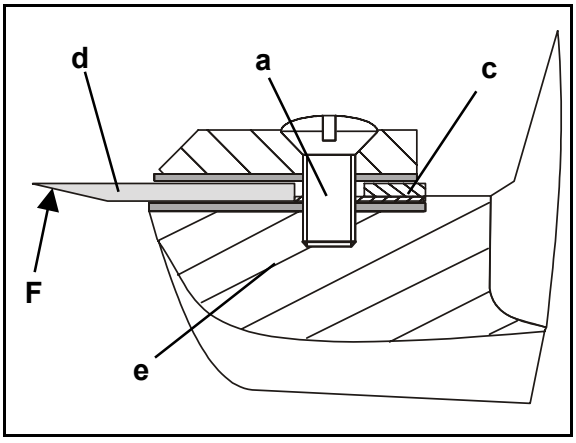


Fig. 21: Fastening the ceramic knife

- Insert the ceramic knife (Fig. 21/d).
- Make sure that the chamfer (Fig. 21/F) is positioned correctly.
- Lightly tighten the fastening screws (Fig. 21/a) (make sure that the knife can still be moved by hand).
- Push the ceramic knife (Fig. 21/d) against the spacer plate (Fig. 21/c).
- Align the ceramic knife on the scraper socket (Fig. 21/e).
- Carefully tighten the fastening screws (Fig. 21/a) until the knife can no longer be moved by hand.

Warning – Risk of damage to the ceramic knife when making contact with the roller!

There is an increased risk of breaking a ceramic knife when putting a used ceramic knife with a serrated or jagged edge against the roller.

To remove the serrations on the knife-edge, place the knife carefully against the roller with the unit running. This grinds off any surface irregularities.

- When putting the ceramic knife against the roller, make sure that is has been installed straight.
- When installing a scraper socket containing a ceramic knife on the unit be careful not to let the socket release too quickly and force the knife against the roller. Gently let the socket release back to it's operating position so that the knife gently comes in contact with the roller.

7.4.3 Adjusting the contact pressure of the scraper system

The contact pressure of the scraper system is controlled by an adjustable tension spring. The contact pressure is adjusted with a tensioning nut (see Fig. 22/a).

Note

Insufficient contact pressure causes poor product scraping. Excessive contact pressure increases wear of the scraper knife.

On new units, the contact pressure is optimally adjusted for the most common products. If adjustment for your product is necessary adjust the contact pressure so that it is as low as possible.

Note

Indications of insufficient contact pressure are mentioned in the *troubleshooting* section.

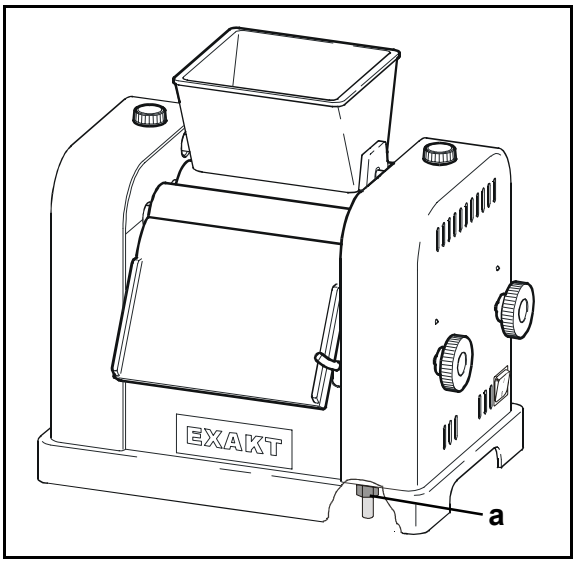


Fig. 22: Adjusting the contact pressure

To adjust the contact pressure:

- Increase contact pressure: Turn the tensioning nut (Fig. 22/a) clockwise.
- Decrease contact pressure: Turn the tensioning nut (Fig. 22/a) counterclockwise.

8 Troubleshooting

Description	Cause	Remedy
Rollers do not turn	Power supply interrupted	Plug unit into power supply or check breakers
	Defective drive belt	Contact Service
	Defective reducing gear	Contact Service
	Foreign matter between the rollers	Remove foreign matter
	Circuit breaker (only EXAKT 50) has tripped	Wait for at least one minute and then depress the circuit breaker (Fig. 1/g)
	Faulty ON/OFF switch	Contact Service
	Motor overheated (EXAKT 35 only)	Wait one hour and switch the unit on again
Diminishing product fineness	Rollers damaged	Contact Service
	Incorrect roller gap adjustment	Contact Service
Product is not scraped properly	Scraper knife worn	Turn the scraper knife around or replace it. See section 7.4
	Insufficient contact pressure of scraper system	Increase the contact pressure, see section 7.4.3
Product is removed on one side only	Scraper system not straight (flush with roller or is installed incorrectly	Re-install the scraper system correctly
	Scraper pins or socket are dirty	Clean the scraper holder and install the scraper system correctly. See section 6.3
	Roller alignment not parallel	Contact Service
Product flows under the guides	Worn or dirty guides	Clean or replace the guides. See section 7.2

9 Technical Specifications

9.1 General Information

	Unit	EXAKT 35	EXAKT 50
Length	mm	250	320
Depth (with scraper system)	mm	190	280
Height (with hopper)	mm	240	320
Weight	kg	6.5	12
Capacity	l/h	Only a few grams	< 7
Connection voltage	V/Hz		230/50
Other available voltages		*	*
Drive motor			
Standard with one speed	W	70	120
Option with one speed (not available in all countries)	W	--	180
Option with speed control system	W	--	80

-- = not available

* see section 9.2

9.2 Voltages other than 230V / 50Hz

Unit type / motor power in W	Voltage (V)	Frequency (Hz)
EXAKT 35 / 70	100 - 110	50
EXAKT 50 / 80	100 - 110	60
EXAKT 50 / 120	220	60
	240	50
EXAKT 50 / 180	220	60

9.3 Roller and scraper system data

	Unit	EXAKT 35	EXAKT 50
Roller diameter	mm	35	50
Roller length	mm	100	150
Roller / speed ratio	n1 : n2 : n3	2.9 : 1.7 : 1	3.3 : 1.8 : 1
Maximum useable working width	mm	70	120
Roller materials			
Hard porcelain		X	X
Aluminium oxide (99.7% Al_2O_3)		--	X
Hardened steel rollers with hard-chromium-plated surface		X	X
Scraper systems			
Plastic scraper		X	X
Scraper with socket and steel scraper plate		X	X
Universal scraper with exchangeable knives		--	X
Scraper knife materials			
Plastic (PVC, glass fibre-reinforced epoxy resin)		--	X
Surface-coated steel (chromium-plated / nickel-plated)		--	X
Ceramic /Al_2O_3		--	X

X = can be used

-- = cannot be used

* chromium-plated version cannot be used in conjunction with steel rollers

Warning – Danger of equipment damage due to incompatible roller/scraper materials!

Specific scraper (knife) materials are incompatible with certain roller materials.

See section 10.6 for information on acceptable combinations of rollers and scraper knives.

10 Spare parts and auxiliary equipment

10.1 Ordering Spare Parts

Use this section as a fax form to order spare parts. Enter all necessary information into the tables below (pages 37-43), indicate the quantities of product in the columns provided and fax or mail a copy of the appropriate sheets to your local distributor.

	Sender	Local Distributor	
Company			
Name, first name			
Street			
City			
Phone			
Fax			
Unit name		Type	
Serial number		Date of purchase	

10.2 EXAKT 35 spare parts

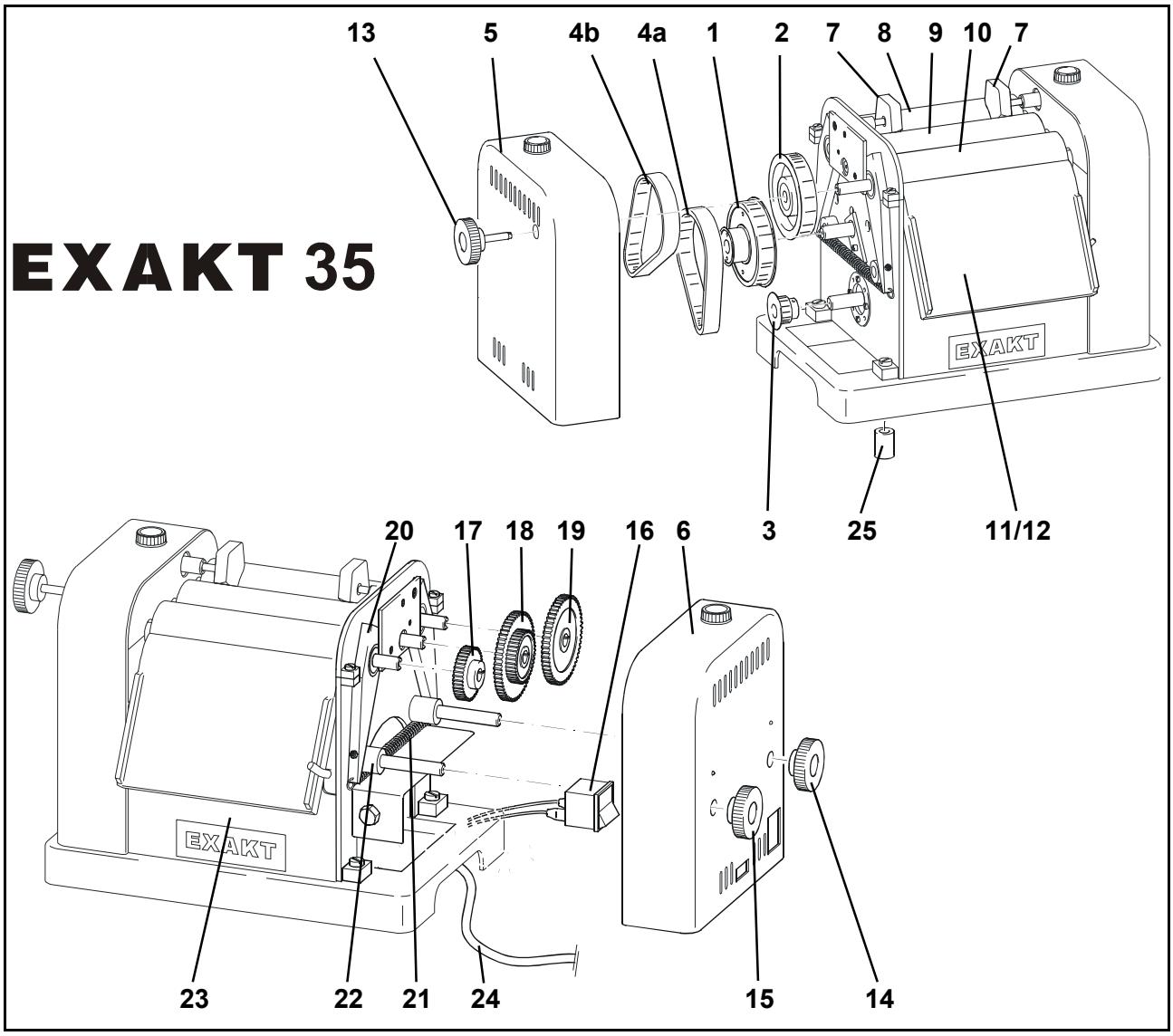


Fig. 23: EXAKT 35

Item	Part no.	Description	Quantity
1	10500	Reducing gear	
2	10510	Adjustable pulley	
3	10520	Drive pulley	
4a/4b	10570	V-belt step 1+2	
5	10600	Cover, left side	
6	10610	Cover, right side	
7	10300	Plastic guide (1 unit)	
8	Material specific part no.	Rear roller	

Spare parts and auxiliary equipment

Item	Part no.	Description	Quantity
9	Material specific part no.	Centre roller	
10	Material specific part no.	Front roller	
11/12	Style specific part no.	Scraper system, see section 10.3	
13	10690	Hand-wheel for manual roller rotation	
14	10680	Rotary knob III – II – I (rear roller gap)	
15	10670	Rotary knob I – II – III (front roller gap)	
16	10700	Main ON/OFF switch	
17	10470	Gear, front roller (single)	
18	10480	Gear, centre roller (double)	
19	10490	Gear rear roller (single)	
20		Bearing lever	
21		Tensioning spring	
22		Eccentric	
23		Motor cover (middle mud-guard)	
24		Main power cable with plug	
25	10660	Buffer	
	19650	Adhesive warning labels (1 Set)	

10.3 EXAKT 35 scraper systems

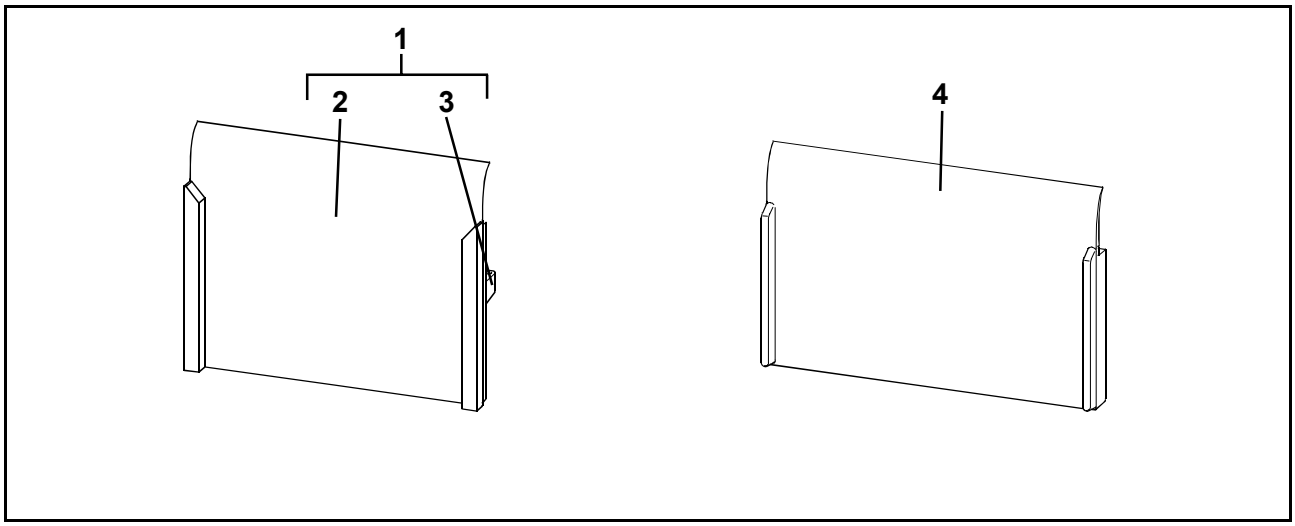


Fig. 24: EXAKT 35 scraper systems

Item	Part no.	Description	Quantity
Variation (or Style) 1			
1	10330	Metal scraper, complete	
2	10350	Metal scraper plate	
3	10340	Scraper socket	
Variation (or Style) 2			
4	10360	Plastic scraper	

10.4 EXAKT 50 spare parts

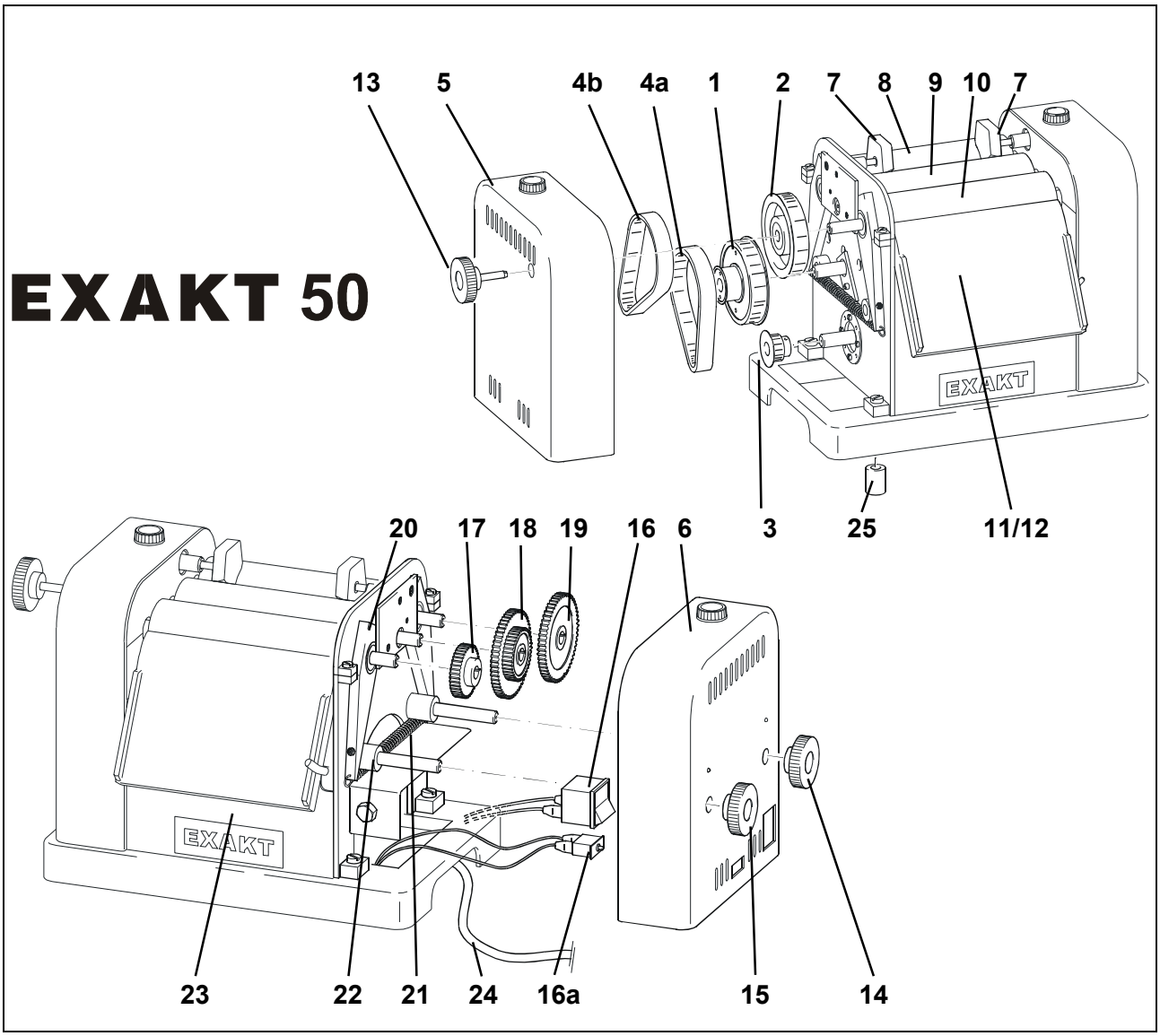


Fig. 25: EXAKT 50

Item	Part no.	Description	Quantity
Version 1: V-belt – drive (only 180 W motor)			
1	11500	Reducing gear (V-belt)	
2	11510	Adjustable pulley (V-belt)	
3	11520	Drive pulley (V-belt)	
4a/4b	11570	V-belt step 1+2	

Item	Part no.	Description	Quantity
Version 2: Cog belt - drive			
1	11530	Reducing gear (cog belt)	
2	11540	Adjustable pulley (cog belt)	
3	11550	Drive pulley (cog belt)	
4a	11580	Cog belt, step 1	
4b	11590	Cog belt, step 2	
5	11600	Cover, left side	
6	11610	Cover, right side	
7	11300	Plastic guide (1 unit)	
8	Material specific part no.	Rear roller	
9	Material specific part no.	Centre roller	
10	Material specific part no.	Front roller	
11/12	--	Scraper system, see section 10.5	
13	11690	Hand-wheel for manual roller rotation	
14	11680	Rotary knob III – II – I (rear roller gap)	
15	11670	Rotary knob I – II – III (front roller gap)	
16	11700	Main ON/OFF switch	
16a	11720	ETA circuit breaker	
17	11470	Gear, front roller (single)	
18	11480	Gear, centre roller (double)	
19	11490	Gear, rear roller (single)	
20		Bearing lever	
21		Tensioning spring	
22		Eccentric	
23		Motor cover (middle mud-guard)	
24		Main power cord with plug	
25	11660	Buffer	
	19650	Adhesive warning labels (1 set)	

10.5 EXAKT 50 scraper systems

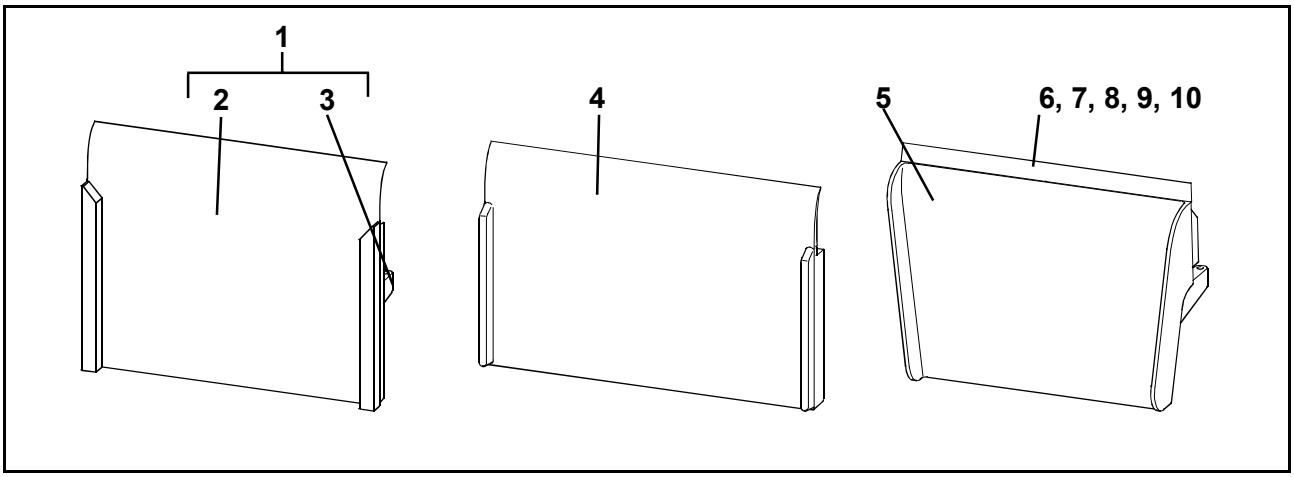


Fig. 26: EXAKT 50 scraper systems

Item	Part no.	Description	Quantity
Variation (version or style) 1			
1	11330	Metal scraper, complete	
2	11350	Metal scraper plate	
3	11340	Scraper socket	
Variation (version or style) 2			
4	11360	Plastic scraper	
Variation (version or style) 3			
5	11370	Universal scraper socket (complete)	
6	11290	Scraper knife, yellow, Fiberglas reinforced epoxy resin	
7	11310	Scraper knife, red, PVC-NL	
8	11280	Scraper knife, metal, nickel-plated	
9	11380	Scraper knife, metal, hard-chromium-plated (cannot be used in conjunction with steel rollers)	
10	11390	Scraper knife, ceramic, Al_2O_3	

Warning – Danger of equipment damage due to incompatible roller/scraper materials!

Specific scraper (knife) materials are incompatible with certain roller materials.

See section 10.6 for information on acceptable combinations of rollers and scraper knives.

10.6 Possible combinations of rollers and scraper knives on the EXAKT 50

Scraper knife	Roller types		
	Steel	Hard porcelain (P7-8)	Al_2O_3 (P9)
11280 (Nickel Plated Metal)	X	X	X
11290 (Fiberglas reinforced epoxy)	--	X	X
11310 (PVC/NL Plastic)	--	X	X
11380 (Chromium Plated Metal)	--	X	X
11390 (Aluminum Oxide Ceramic)	--	--	X

11 Index

12 Appendix

12.1 Terms of Manufacturer's Warranty

The Manufacturer's Warranty is rendered void in the event of improper use including but not limited to:

- Failure to comply with the safety and operational instructions described in this operating manual.
- Use of the unit by unqualified personnel.
- Unauthorised alterations to the unit and/or its components.

The manufacturer cannot be held liable for resulting damages.

Warning – The unauthorised use of non-EXAKT parts and consumable items voids the Manufacturer's Warranty against defects in materials and workmanship.

The unauthorised use of any parts or consumables will render the warranty null and void.

Only use original component parts and consumables or spare parts and consumables purchased through an approved EXAKT distributor or specifically authorised in writing by EXAKT.

12.2 Declaration of conformity

EC Declaration of Conformity

In accordance with: EC Machinery Directive (89/37/EWG)
EC Low-Voltage Directive (73/23/EWG)
EMC Directive (89/336/EWG)

We hereby declare: EXAKT-Apparatebau GmbH & Co. KG
Robert-Koch-Str. 5, 22851 Norderstedt

that the machine described below complies with the relevant fundamental safety and health requirements of the EC directive due to its design and construction and in the version put on the market by us.

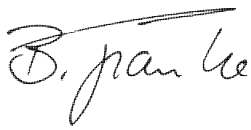
This declaration shall be invalidated if the machine is altered without prior consultation with us.

Machine name: EXAKT Three roll mill, model 35 and model 50

Applied harmonised standards: EN 60 335-1
EN 60 204-1
EN 50082-2 (for EXAKT 50 with speed control system)

The product complies with the requirements of the German law on machinery safety (Gerätesicherheitsgesetz).

Signature of manufacturer:



Information concerning the undersigned: Peter Geiger, Managing Director; Bernd Franke, Managing Director

12.3 Circuit diagram of speed control system

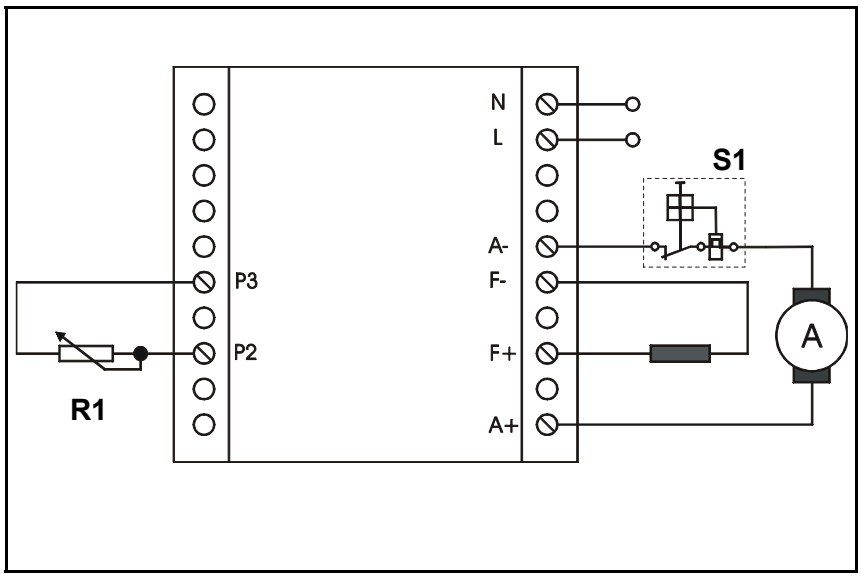


Fig. 27: Speed control system

Name		100-110 V	230-240 V
Fuse		F 4 A	F 4 A
ETA circuit breaker	**S1**	1.5 A	1.0 A
Potentiometer for speed adjustment	**R1**	1 MΩ	1 MΩ