Operating Manual BA 1123/22 E
(Original operating instructions)

Fine Impact Mill

500 UPZ

Basic machine
Standard discharge
Pressureless

Manufacturer's address

HOSOKAWA ALPINE Aktiengesellschaft

Peter-Dörfler-Str. 13–25
D-86199 Augsburg, Germany

Tel.: +49 8 21 59 06-0
Fax: +49 8 21 59 06-457

Keep in a safe place for future reference! 03.12 / WRL

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The following form part of this operating manual:

Spare parts drawing		
Spare parts list		
Supplementary operating manuals for grinding unit, grinding track and/or sieve grate		order-specific
Separate instructions issued by the manufacturer of the auxiliary parts		order-specific
Technical instructions "Narrow-gauge V-belts"	TA 001/1	
Safety interlock	BA 1694/...	order-specific
Electrical circuit diagram		order-specific

1 General Information

1.1 Operating manual

This operating manual contains important information on how to operate the machine in a safe, proper and effective manner. Making yourself conversant with the operating manual will help to avoid safety hazards, reduce repair costs and downtime, and increase the reliability and service life of the machine.

The supplied operating instructions for the auxiliary components must also be observed.

The operating manual must always be available at the site of operations. It must be both complete and fully legible.

The operating manual must be read and applied by every single person charged with working on or at the machine.
These procedures include, for example:

- Operation, including machine set-up, fault elimination during operation, disposal of production waste, disposal of process materials,
- maintenance, servicing and/or
- machine transport.

1.2 Personnel

Use only qualified or trained personnel. Clear-cut responsibility must be delegated for machine operation, machine set-up, maintenance and servicing. All personnel must be conversant with the prevailing standards, directives and accident prevention regulations, with the principle of operation and operating conditions of the machine, and must furthermore be able to recognise and avoid safety hazards.

Work to the electrical equipment:

- only by qualified electricians,
- only when the machine or system is disconnected from the power supply and secured against restarting.

This operating manual is divided into 7 sections.
In the main, the sections are directed at the following user groups:

Sections 1-3: directed at **everyone** who is involved in any way with the machine.

Section 4: transport staff and user

Section 5: operator

Section 6: maintenance personnel

Section 7: servicing personnel (usually the manufacturer's own service technicians)

1.3 Order-specific application

In its function and design, the machine described here is laid out specifically for the **size reduction** of:

Product:

Feed size:

Any other application or the processing of a product(s) other than the one(s) named above contravenes the order-specific application and is thus prohibited.

Observance of the operating manual and adherence to the maintenance requirements also form part of using the machine in an order-specific manner.

It is impossible for the manufacturer to be conversant with all the properties of the product(s) to be processed in the machine. Additional risks and hazards may be caused by certain products. It is therefore the user's responsibility to assess these additional risks if any and to introduce suitable countermeasures.

Without special safety measures, the machine is not suitable for processing potentially explosive and / or flammable products.

Without special safety measures, it is prohibited to process harmful or toxic substances with the machine.

Without special safety measures, it is prohibited to operate the machine in a potentially explosive atmosphere.

HOSOKAWA ALPINE is not liable if arbitrary changes or modifications are made to the machine/system without prior written consent.
This applies in particular to modifications that compromise the safety of the machine.

The manufacturer is also not liable if accessories provided by the user - especially with respect to safety-specific parts - do not conform with the relevant accident prevention regulations or are not installed properly.

The manufacturer is also not liable if the user neglects to carry out maintenance and servicing procedures or if he carries them out improperly. The quality of servicing or repair procedures can only be guaranteed if they are carried out by the manufacturer.

Spare parts must conform with the technical requirements stipulated by the manufacturer. Only the use of original spare parts will guarantee this in every case.

1.4 Order-specific data sheet

Customer: ***Next Generation Recyclingm., AUT***

Order no.: ***R1 203433***

Machine no.: ***R1 203433 / 2000***

Construction year: ***2013***

Grinding elements		**Order no.**
☐ Pin disc grinding unit	$n_{max.}$:	.....
☐ Fan beater grinding unit	$n_{max.}$:	.....
☒ Plate beater grinding unit	$n_{max.}$: ***4 500 min^{-1}***	***400210***
☐ Swing beater grinding unit	$n_{max.}$:	.....
☐ Beater disc grinding unit	$n_{max.}$:	.....
☒ Triangular-ribbed grinding track	Discharge gap: ***7.5 mm***	***187315***
☐ Grinding track; 10°; short	Sieve:	.....
☐ Grinding track; 10°; long	Discharge gap:	.....
☐ Grinding track; 30°; short	Discharge gap:	.....
☐ Grinding track; 30°; long	Discharge gap:	.....
☐ Sieve grate	Sieve:	.....

Drive		
Motor	***55 kW; 3000 min^{-1}; 50 Hz***	***006393***
Belt pulley – motor	***V-belt pulley 4×SPAx280***	***146631***
Belt pulley – mill	***V-belt pulley 4×SPAx280***	***180128***
	V-belt pulley 4×SPAx224	***123077***
	V-belt pulley 4×SPAx200	***123076***
Belts	***V-belts 4×XPA×2800***	***123062***
Speed range	***Ø 280 approx. 3000 min^{-1} (50 Hz)***	
	Ø 224 approx. 3750 min^{-1} (50 Hz)	
	Ø 200 approx. 4200 min^{-1} (50 Hz)	
Frequency converter	.....	.....

Measuring equipment, etc.		
Bearing temp. monitor	.....	.....
Vibration sensor	.....	.....
Speed sensor	.....	.....
Safety interlock	***electro-magnetic interlock***	***088226***
with standstill monitor	.....	.....

Miscellaneous		
Bearing lubricant	***Arcanol Multitop; FAG Ltd.***	***326244***
Sealed design	.....	.....
Rinsing air for connection pipe	.....	.....
Earthing	.....	.....
Magnetic separator	.....	.....
Door assembly	***2×hand wheels***	***026936***

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1.5 Principle of operation

The feed material enters the centre of the mill via the feed chute (I) mounted on the door. The fan effect of the respective beater unit plus centrifugal force serve to convey the feed material outwards into the grinding zone where it is comminuted.

Dependent on the product and desired fineness, the machine can be equipped with a variety of grinding units and grinding tracks/sieves.

The comminuted product exits the mill via the product discharge (II).

Rinsing air for rinsing the bearing is drawn in automatically or is supplied under pressure (operating mode either automatic intake or forced rinsing).

After exiting the mill, the product must be separated from the the air in a downstream device.

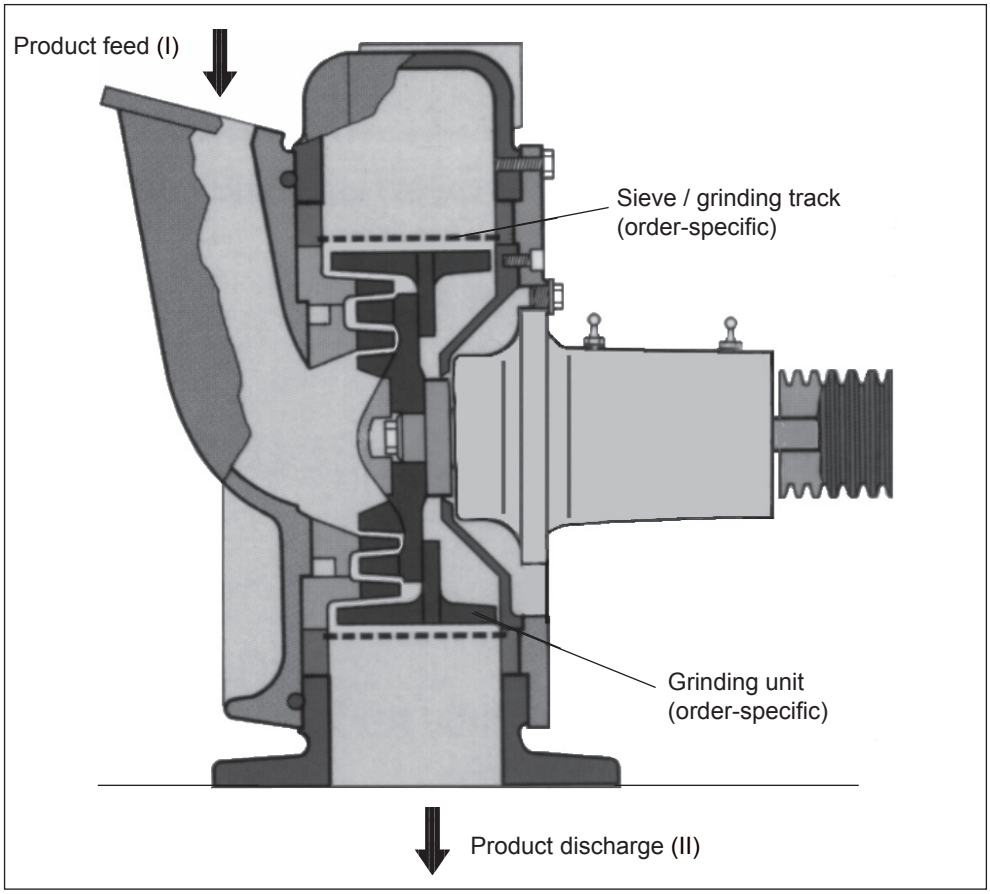


Figure 1.5-1: Principle of operation
(machine shown with beater disc grinding unit and sieve)

1.6 Equipment variants

The mill can be equipped to suit a great variety of materials and fineness requirements by making use of the different grinding units and grinding tracks and by using different speed ranges.
See also the appended grinding unit supplement.

1.7 Design

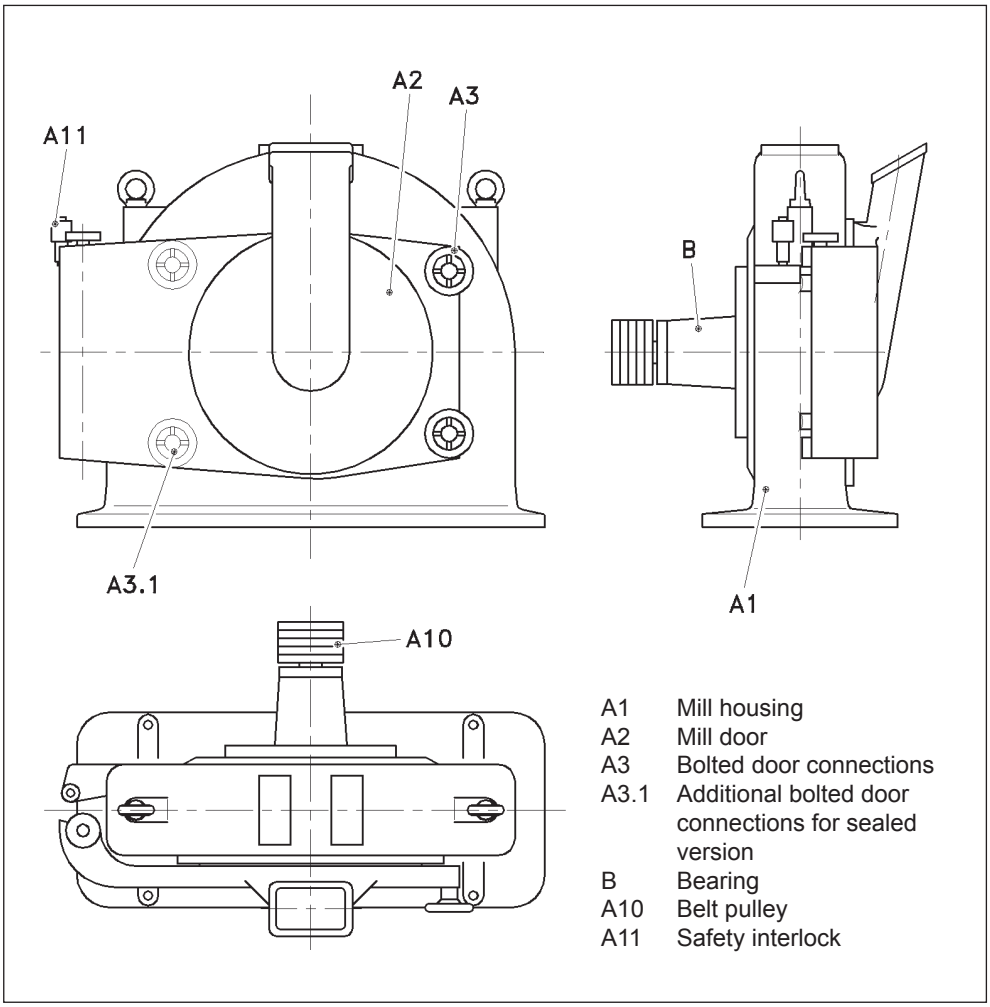


Figure 1.7-1

Design variants (order-specific)

- Sealed version
  - In this case, the machine door is closed by means of four instead of two bolted connections (Section 5.2).
  - The contact surfaces between mill housing and bearing as well as the assembly screws are sealed with liquid sealant.
  - The machine must be assembled using ten instead of four bolts (Sections 3.1 and 4.2).
- Potential equalisation
  Wire bridges between mill housing and mill door.
- The machine has a feed chute equipped with a magnetic separator.

1.8 Safety interlock (order-specific)

The safety interlock comprises:

- A detent pawl with integrated magnetic or pneumatic interlock on the door hinge in combination with an (on-site) control unit and ON-OFF control switch.
- Integrated safety limit switch: the machine cannot be switched on for as long as the mill door is open.
- A standstill monitor. The standstill monitor is a relay whose operating principle bases on the generator effect of motors. The relay is housed in the control cabinet or in a separate switch box.
  The mill door can therefore not be opened until the grinding unit is at a standstill.

2 Safety

2.1 Safety notices

The following symbols and notices are used throughout this operating manual to indicate information of particular importance:



DANGER
indicates imminent danger.
Non-observance can lead to serious or even fatal injuries.



WARNING
indicates a potentially dangerous situation.
Non-observance can lead to serious or even fatal injuries.



CAUTION
indicates a potentially dangerous situation.
Non-observance can lead to light or moderately severe injuries.



NOTICE
indicates a potentially dangerous situation.
Non-observance can lead to machine damage or damage to the environment.

2.2 Directives

The machine's design and equipment conform with the regulations, standards, directives and specifications featured in the Manufacturer's Declaration or the Declaration of Conformity.

Electrical equipment

The electrical equipment of the machine and system components conforms to the VDE standards for plant and processing equipment with nominal voltages of up to 1000 V (low-voltage directive); VDE 0100, 0113 (EN 60204, Part 1), and 0660, in as far as the machine was delivered with complete electrical equipment.

Accessories

Machine and system parts, safety devices, and electrical and measuring equipment which do not form part of the delivery scope must also conform to the EC directives, the relevant accident prevention regulations and the VDE standards.

2.3 Safety equipment

The safety equipment must not under any circumstances be modified, removed or bypassed (e.g. by undertaking changes to the machine itself).

Any defects to the safety equipment must be remedied immediately.

Inspection intervals
- Start of every shift (discontinuous operation)
- Once a week (continuous operation)
- After any maintenance or servicing procedures

Inspection procedures
- Prescribed condition and location
- Secure seating of connections
- Prescribed function

If any safety devices are defective:



WARNING
Rotating machine parts.
Injuries can be caused when touching parts or reaching into the machine.
Do not touch any rotating machine parts.

Device/Measure	Function	Inspection
Safety interlock at mill door in combination with a *standstill monitor* (order-specific).	Prevents the mill door (A2) from being opened whilst the drive is switched on and also while it is *running down.*	Switch on the machine. Interlock OK if the detent lever of the safety interlock is blocked. Inspection as above, albeit in addition: switch the machine off. Interlock OK if the detent lever is blocked while the drive is running down.
Safety limit switch integrated into the safety interlock (order-specific).	Prevents the drive from being switched on if the mill door (A2) is unlocked.	Switch the machine off. Unlock the detent lever but keep the mill door (A2) closed. Interlock OK if the machine cannot be switched on.
Safety guard (belt guard) at drive (order-specific).	Prevents tampering with the drive.	Visual inspection. Installed and securely bolted?

Device/Measure	Function	Inspection
Securely bolted machine parts.	Tools needed to release connections.	Visual inspection. Installed and securely bolted?
EMERGENCY-STOP actuator next to the machine.	Switches off the drive and machine and possibly also other system sections.	Switch on the machine and possibly also other system sections (without product). Actuator OK if the machine and system sections switch off instantly when pressed.

2.4 Safety regulations

Read carefully and proceed accordingly!



DANGER
Incorrect operation or misuse can cause serious or even fatal injuries.

The user is charged with ensuring that the following points are adhered to:

- Operation, maintenance and servicing procedures are only to be carried out by **trained and skilled personnel** who are fully conversant with the safety regulations and the machine's operating instructions.
- All such procedures are to be **supervised by qualified personnel.**
- The qualified personnel must have been both designated and authorised by the user or the **occupational safety delegate.**
- The machine is designed for operation **within a system** and not for operation as a stand-alone machine. For this reason, all connections (electric, product feed and discharge, etc.) must be connected up properly and checked thoroughly prior to commissioning.
- Before **opening** the machine or **removing** any connecting ductings or machine components and before undertaking any **adjustment, maintenance or servicing procedures:**
  - Shut down the system and machine.
  - Switch off the master switch and secure it against unauthorised or unintentional switching on.
  - Wait until the drives have come to a complete standstill.
  - Wait until the fan air has stopped circulating.
  - If applicable, turn off the rinsing air (compressed air).
  - Wait until the dust in the machine and system settles.
- The machine must be equipped with a with a **safety interlock** in combination with a **standstill monitor;** this must be integrated into the electrical interlocking system. Function:
  - The interlock does not enable the door **opening mechanism** until the **drive has been switched off and the grinding unit has come to a standstill.**
  - The machine and system **cannot be switched on** if the **mill door is open**.
- Never carry out **cleaning procedures** if the machine is running.
- It is prohibited to operate the machine if **connections are open**, i.e. if the grinding chamber is accessible.
- Prior to operation, the drive must be equipped with a **belt guard** that conforms to specifications.

- When processing **toxic or harmful substances**, the user must take special safety measures. These can include provision of safety clothing (gloves, face mask, protective overalls) or installation in an enclosed and separate room that may not be entered unless protective clothing is worn.
- Always interrupt the power supply before undertaking any work to the **electrics** and before opening the control cabinet.
- The **warning notices** posted on the machine may neither be removed, painted over nor altered. Replace any damaged or illegible notices immediately.
- The machine must be **completely earthed**. All product-contact machine parts must be connected by means of wire bridges (potential equalisation).
- Only **drive belts** approved for the relevant Ex zone may be used (e.g. belts that have an adequate degree of electrical **leakage resistance** as defined in ISO 1813).

During installation and operation of the machine and auxiliary equipment, the user must pay attention to:

- The recommendations in this operating manual.
- The relevant general accident prevention regulations.
- The relevant local accident prevention regulations.
- The specific directives of the competent industrial trade association and/ or the relevant national directives.

The user is responsible for ensuring that the prescribed accident prevention measures are carried out, the accident prevention regulations are adhered to. and that the safety equipment is installed and in good working order at all times.

It is strictly prohibited to operate the machine until the user has established that

- the machine has been properly assembled and installed
- all safety devices are fitted and fully functional
- Use in EU member countries:
  the entire machine or the system into which the machine is to be configured conforms to the EC machine and plant directive and that a CE conformity declaration to this effect is on hand.

2.5 Noise

The machine belongs in the category of plant equipment whose noise emission generally reaches a level of 85 dB(A) or more (as defined in DIN 45 635).

The noise level generated by the machine is governed by various factors, e.g. type of product, site of machine installation, etc.

It is therefore impossible to quote a generally valid sound pressure level.

When operating the machine within the European Union, the **EC Directive 2003/10/EC** (dangers caused by noise pollution at the workplace) must be observed, and when operating the machine in Germany, the **regulation on noise – BGV B3 – issued by the relevant trade association** must also be observed in addition.

In other countries, the respective national standards and directives must be observed.

If the noise emission exceeds the max. level of 85 dB(A)**,** the directive RL 2003/10/EC dictates a number of **mandatory** measures, among them the **use of suitable ear protectors**.

2.6 Workplace

The product is fed and discharged automatically. No personnel are required during actual operation.
The workplace for the machine or system operating personnel is normally in front of the control panel.
The workplace must be kept clean and uncluttered at all times.

EMERGENCY-STOP actuators

One or more EMERGENCY-STOP actuators must be provided. The actuators must be installed such that they are easy to access. At least one EMERGENCY-STOP actuator must be located next to the machine in a position which permits full view of the opening and closing area.

3 Technical Specifications

3.1 Main dimensions and connections

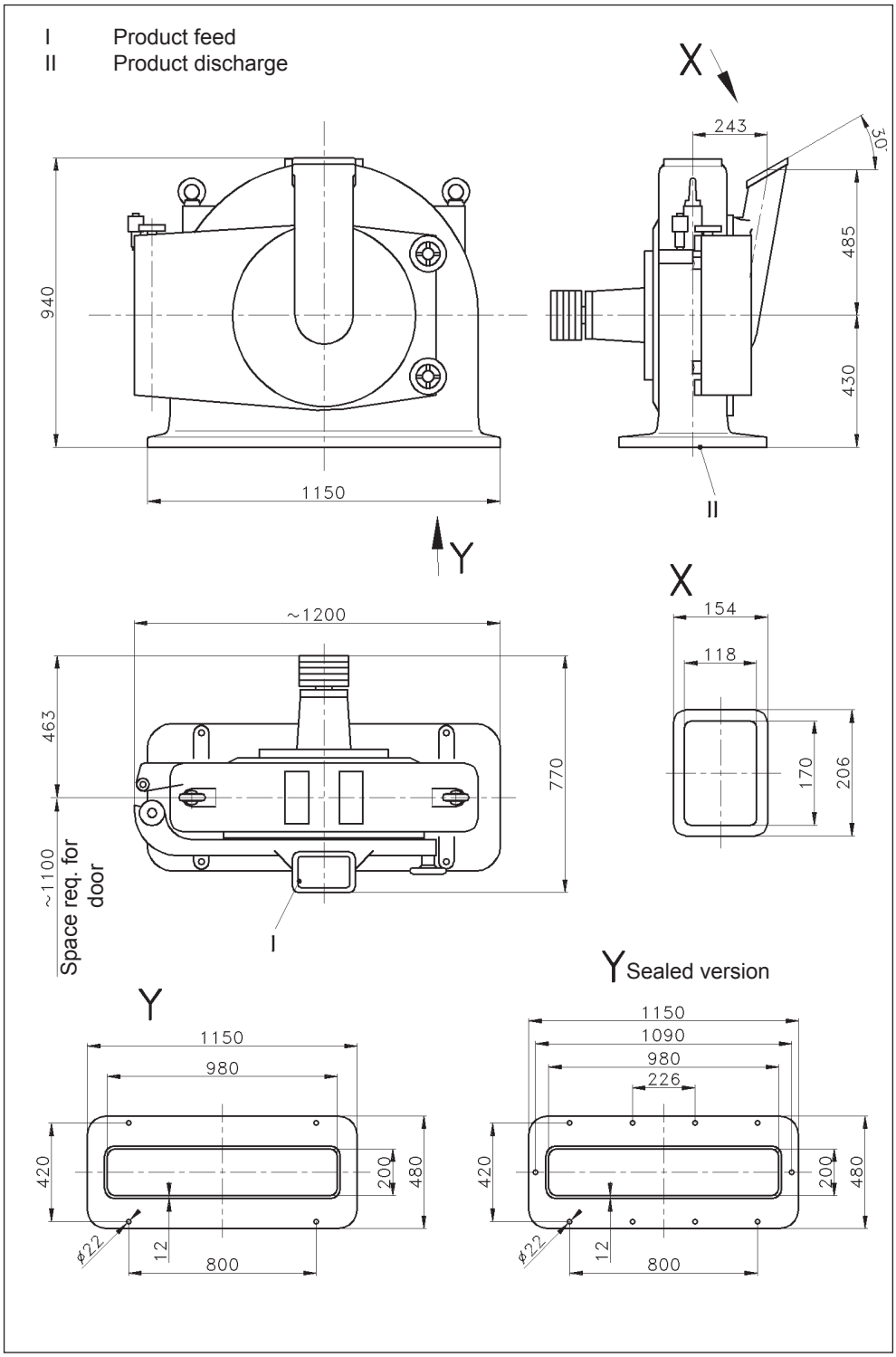


Figure 3.1-1

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Connecting dimensions at bearing

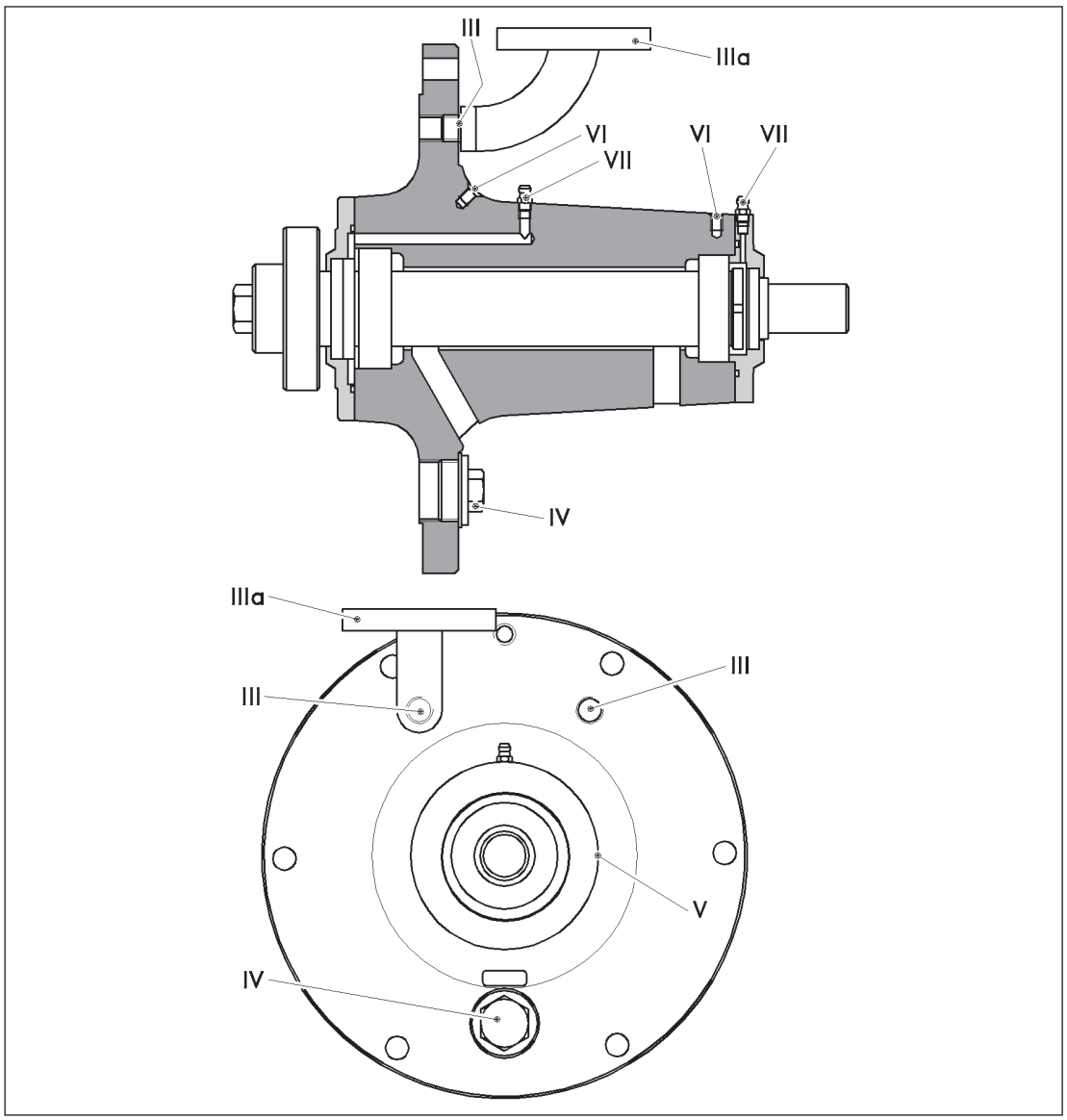


Figure 3.1-2

Table of connections

Connection	X_{ID}	Y	Z	d	Designation
					Bearing rinsing air (Section 4.5):
III	R ½"				forced rinsing or automatic intake (2×)
IIIa	33.7	85	115	4× Ø14	Forced rinsing (DN25/PN10/DIN2576)*
IV	R 1½"				Automatic intake
V	M14×1.5				2 × temperature sensors
VI	M8				2 × vibration sensors
VII	–				2 × lube nipples

* order-specific (Section 1.4)

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3.2 Technical specifications

Installation

Max. permissible ambient temperature	+5 to +40°C
Max. permissible air humidity	90% relative / non-condensing

Installation in an enclosed room or hall

Operation

Max. permissible operating temperature (machine housing)	-20 to +50°C
Max. permissible operating pressure (machine housing)	-0.3 to +0.1 bar (g)

3.3 Speeds

See the data sheet in Section 1.4 for details of order-specific drive equipment.

Drive

The mill speed is dependent on the installed grinding unit.
See the data sheet in Section 1.4 and the appended grinding unit supplement for details of the drive specs.



WARNING

Safety hazard caused by the breakage of rotating parts, e.g. grinding unit, shaft, etc.

- Do not exceed the maximum speed.
- Limit the frequency converter to the max. permissible value.

If using a frequency converter, limit it so that the maximum permissible speed of the installed grinding unit cannot be exceeded!

3.4 Tools

To order, the following tools are delivered:

1 **lifting ring M24** Order no. 008219
to transport the machine

1 **lifting ring M16** Order no. 008217
to transport the bearing (B)

1 **Assembly mandrel** Order no. 123136
to remove and install the grinding units

All other assembly and maintenance procedures can be carried out with standard trade tools.

3.5 Weights

Bearing (B) without belt pulley	approx. 120 kg
Total weight of machine without grinding element, without motor	**approx. 650 kg**

4 Preliminary Procedures

4.1 Transport / machine storage

4.1.1 Transport

When transporting the machine, the 89/655/EEC directive on the use of technical equipment or the corresponding national standards and directives must be observed. Only skilled and qualified personnel with special knowledge of transport operations are permitted to transport the machine.

In Germany, the following must be observed:

- When selecting and using lifting units, slinging aids and transfer equipment, the indicated weight and the accident prevention regulation **"Load suspension units used in hoisting operations"** (VBG 9a).
- When selecting and using handling trucks and trollies for transportation purposes, the indicated weight and the accident prevention regulation **"Handling trucks"** (VBG 12a and 36).



WARNING

The sheer weight of the machine is a safety hazard and can cause serious crushing injuries and cuts.

- Make use of protective equipment (helmet, gloves, safety shoes, etc.).
- Never stand under suspended loads.

Observe the following prior to and during transport

– Before transporting the machine with a handling truck, fasten it securely to a pallet to prevent it tipping over!

– Disconnect all connections (electric, pneumatic, etc.) prior to transport.

– Remove or secure any loose parts prior to transport.

– Machine transport only permitted if the machine is closed and securely bolted.

– If using lifting gear to transport the machine, make proper and simultaneous use of the lifting lugs located on top of the machine housing as shown in the diagram (Figure 4.1-1).

– The centre of gravity varies dependent on the design. Establish the exact centre of gravity during transport (Figure 4.1-1).

– Min. load-bearing capacity of handling equipment: 700 kg.

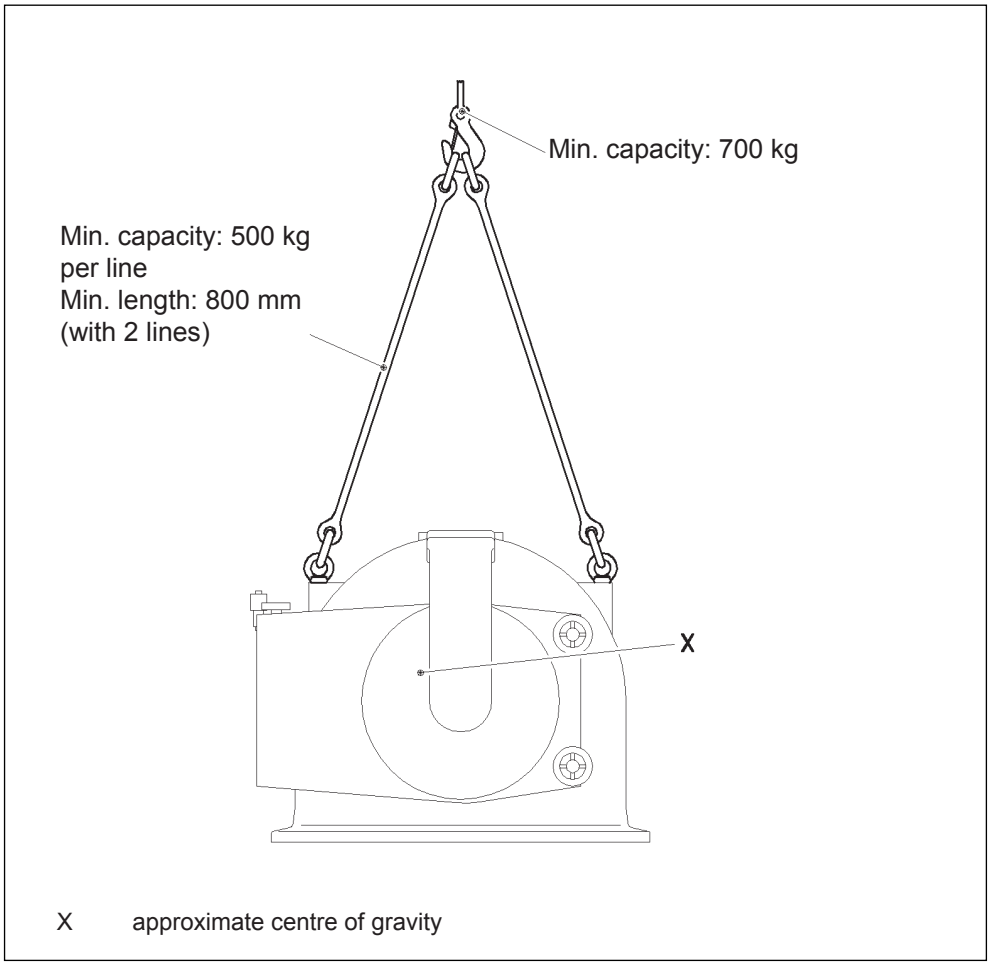


Figure 4.1-1: Machine transport with lifting equipment

4.1.2 Machine storage

Observe the following if storing the machine for any length of time before use:

– Make sure that the machine is adequately protected against environmental influences and the weather. We advise storing the machine in a dry warehouse or similar.

– Cover the machine with a tarpaulin to protect it against dirt.

– Water and any condensation must be able to run off freely.

– Protect polished parts against corrosion. Check the corrosion protection regularly and renew if necessary.

– Store electrical components in a dry area that is protected against aggressive atmospheres, direct sunlight, and extremes in temperature.

– If the storage period exceeds 3 months, slacken off the drive belts.

– Turn the beater unit over a few times by hand every 2 - 3 weeks.

4.2 Installation

Installation only on foundations of sufficient stability such as platform floors, bunkers or intermediate floors, etc., in accordance with the local conditions and the project drawing.

Make sure that the machine foundation or substructure is sufficiently stable!

Ensure that sufficient space is available for assembly work, for attaching accessories and ductings and to open the door!

Align the machine with a spirit level and fasten securely to the floor or substructure with anchor bolts.

Install accessories – such as feed unit, product bin and filter, etc. – in accordance with the drawings.

4.3 Drive

Pin and bolt the motor slide base to the respective substructure.

Position the motor on the motor slide base and fit the belts. Make sure that the belt pulleys are in perfect alignment and that the belt tension is correct.

When tensioning the V-belts, pay attention to the appended instructions **"Narrow-gauge V-belts" TA 001/1.**

Then install a belt guard that conforms with the EC Directives!

4.4 Speeds and rotational direction

The mill speed is determined by HOSOKAWA ALPINE on the basis of trials or experience. Speed as per the information in Section 1.4 and on the nameplate.

It is not permitted to increase the speed to a level above that quoted for the respective grinding unit.

See the respective grinding unit supplement for details of the rotational direction.

4.5 Rinsing air at the bearing

The method of supplying the rinsing air is dictated by the system configuration, the ambient conditions (dust loading factor) and above all by the type and hazard class of the material being processed.

An incorrect, unprofessional or insufficient supply of rinsing air can cause damage to the bearing unit (B) and the grinding unit.

A decision on which rinsing method to use (automatic intake or forced rinsing) should always be made in consultation with HOSOKAWA ALPINE in each individual case.

4.5.1 Automatic intake

The mill usually operates in automatic intake mode, i.e. the machine draws in the rinsing air automatically from the ambient air. To ensure adequate rinsing in automatic intake mode, an underpressure of between 5 and 10 mbar must be available at the rinsing gap (a).

NOTICE

Rinsing air drawn in from the ambient air:

- Remove the red locking screw (IV).
- In addition, it may be necessary to open the connections (III and IIIa).

4.5.2 Forced rinsing

e.g. in inert-gas or circuit-gas mode.

The rinsing gas or air is supplied via one of the two connections (III). To order, one of the connections (III) is fitted with an elbow equipped with connecting flange (IIIa). In this case, the connections that are not needed (III, IV) must then be sealed off with a screw plug.

Rinsing air pressure approx. 0.1 - 0.2 bar (g) at site of operations

Rinsing air flow rate approx. 30 - 50 Nm^3/h

Dependent on the machine and system, the rinsing air pressure and flow rate can deviate from the above values. Set these two parameters to the de-facto required values during commissioning.

NOTICE

- Tramp material ingress into the bearing can cause serious damage to the bearing!
- Always turn on the rinsing air before switching on the mill!

A5	Insert
B	Bearing
a	Rinsing gap
III	Rinsing air connection
IIIa	Rinsing air connection with elbow and flange
IV	Rinsing air inlet (automatic intake)

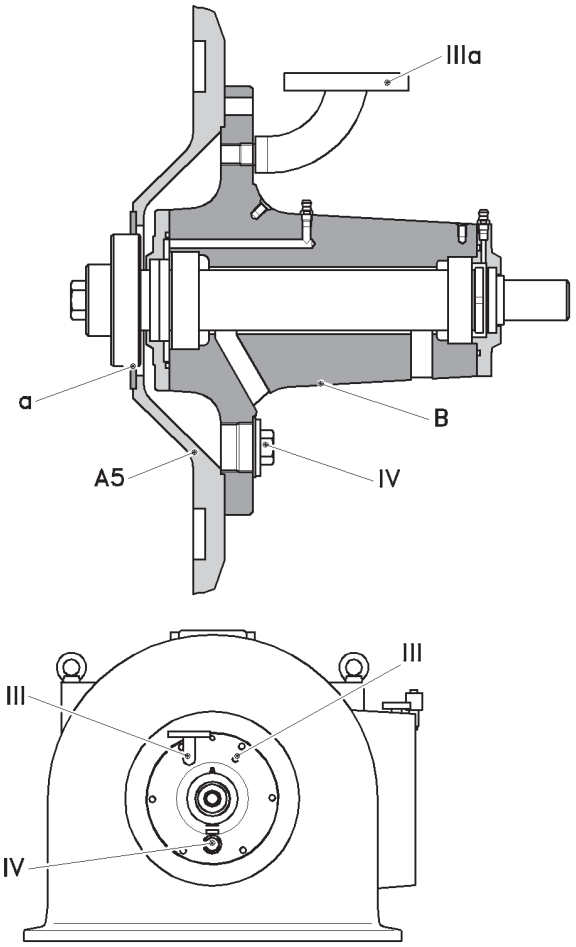


Figure 4.5-1

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4.6 Electrical connection

The electrical connection is to be carried out in accordance with the appended (order-specific) or on-site circuit diagrams.

The electrical connection is to be carried out on site by a qualified electrician. The electrical equipment and design thereof must correspond to the VDE standards 0100, 0113 (EN 60204, Part 1), and 0660 and to the relevant general and local regulations. Pay attention to the direction of rotation (Section 4.4)!

When carrying out electrical work, pay attention to the accident prevention regulation **"Electrical Plant and Production Equipment" (VBG 4)** and/or to the relevant national standards and directives!

4.7 Decommissioning, disposal

Remove all power supply connections prior to decommissioning the system. Release the bolted connections slowly to ensure that any residual pressure in the system components can subside.

Dispose of the system components in accordance with the local regulations (see also the operating manuals for the auxiliary parts). Pay attention to any special regulations regarding the disposal of contaminated components (caused by processing toxic substances) and the disposal of lubricating grease in the bearings, etc.

5 Operation

5.1 Preliminary procedures

Pay attention to the safety regulations in Section 2.4!

Prerequisites for optimum operation are correct assembly of the system in accordance with the design drawing as well as proper and professional assembly and installation of the components, ductings, the control and measuring instrumentation and the filter hoses.
The machine equipment is dictated by the problem specification.

Do not make any changes to the problem specification (throughput, speed, fineness) or the type of feed product without consulting HOSOKAWA ALPINE beforehand.

- Check the safety equipment for function (see Section 2.3).
- Check the type and condition (wear) of the mill equipment (Section 6.3). If necessary, exchange components as per Section 7.
- With the mill door open, turn the grinding unit over by hand and check for freedom of movement.



CAUTION
Serious cuts and crushing injuries can be caused by the sharp edges of the grinding unit and by the flywheel effect.

  - Wear heavy-duty protective gloves!

- Check all bolted and flanged connections for function and leaks.
- Make sure the rinsing air is available.

Additional checks at first commissioning or after maintenance and/or servicing procedures:

- Cleaning: Remove any preserving film from the inside of the machine with a washing solution (see also Section 6.2). Contact HOSOKAWA ALPINE for details of the preserving film used.
  Then dry the machine thoroughly.
- Check the system set-up.
- Check the electrical and pneumatic connections.
  Pay attention to the direction of rotation (see the appended grinding unit supplement).
- Check the belt tension and make sure the belt guard is properly installed.
- Carry out a trial run with the mill in idling mode for at least 10 – 20 minutes.
  – Check for vibrations or scraping noises!
  – Check the bearing temperature.

5.2 Mill door – opening and closing

Opening the door

- Switch off the mill (Section 5.6).



WARNING

The rotating machine parts (grinding unit, drive) can cause serious injuries when opening or reaching into the machine.

- Make sure that the mill and system are shut down and secured against restarting.
- Never open the mill until all drives have come to a complete standstill.

Ejecting product. Injuries possible if product is inhaled or gets into the eyes.

- Make sure that the product feed and the air supply (including the rinsing air) are turned off.
- Wait until the dust has settled in the mill.

Serious crushing injuries possible if the mill tips over

- Make sure the mill is securely bolted to the floor!

- Wait until the drive comes to a standstill.
  The "Running down" lamp illuminates to indicate that the drive is running down after motor has been switched off (control lamp on control panel).
- Turn the key switch on the control panel to "Open".
- Push the "unlock" button on the control panel. The safety interlock now enables the detent lever (A11.1).
- Shift the detent lever (A11.1) off to the side into its "unlocked" position.
- Switch off the master switch and secure it against unauthorised or unintentional switching on.
- Remove the connecting ducting to the product inlet (I).
- Unscrew and if necessary flip back the bolted connections (A3) on the mill door.
- Open the mill door (A2).

Closing the door

- Check the inside of the mill for tramp material (screws, etc.).
- Clean the door seals and seating surfaces.
- Close the mill door (A2). Engage and tighten the bolted connections (A3) on the mill door.
- Replace the connecting ducting at the product inlet (I).
- Return the detent lever (A11.1) of the safety interlock (A11) to its "lokked" position. The locking pin engages.
- Switch on the master switch.
- Turn the key switch on the control panel to "Operation".
- Start up the mill as described in Section 5.4.

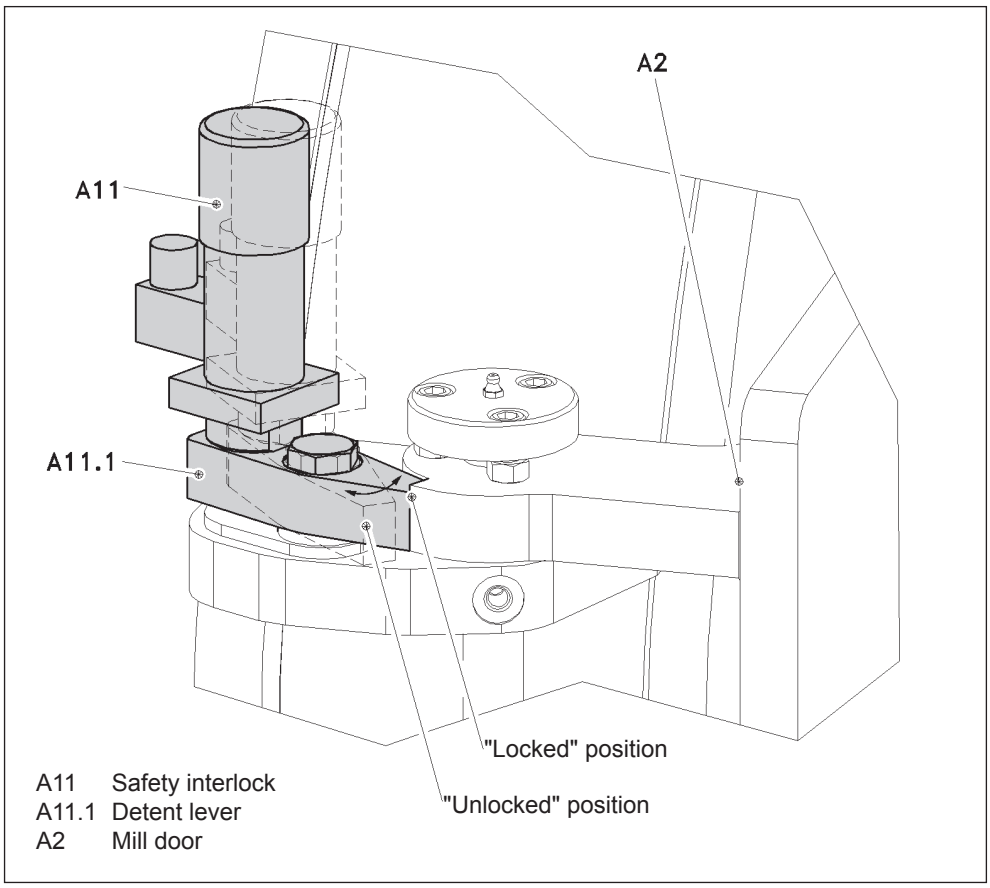


Figure 5.2-1

5.3 Selecting the grinding elements

In selecting the type of mill equipment that will ensure optimum performance, it is advisable to make use of HOSOKAWA ALPINE's long years of experience. Be sure to contact HOSOKWA ALPINE above all if your problem specification changes or if you wish to process a different product.

It is not permitted to equip the mill with a different grinding unit without contacting HOSOKAWA ALPINE first. (Order-specific application!)

5.4 Start-up

The connecting ductings (product inlet and outlet) must be fitted.



WARNING

Rotating machine parts and ejecting product are safety hazards!

- Do not start up the machine unless it is completely closed and securely bolted.

The start-up sequence is perforce more of a general nature and can naturally vary dependent on the system configuration.

Switch-on sequence

- If using suction mode, switch on the fan.
- If applicable, switch on the rinsing (compressed) air.
- Switch on the mill and let the motor run up to power.
- After full speed has been reached, start the product feed and gradually increase the feed rate to the maximum permissible value. Observe the ammeter!

5.5 Operation

Make sure the feed product is free from tramp material – destruction of the grinding elements is otherwise possible!



NOTICE

- Feed the product as uniformly as possible – employ a suitable metering device!
- Monitor and control the feed rate by means of the ammeter. Too high a feed rate can lead to blockages.

If necessary, install metal separators, coarse material separators and magnets, etc.

Overload



NOTICE

- In the case of overload (blocking, stalling), stop the machine immediately.
- Pay attention to the safety regulations in Section 2.4!

- Open the mill door (A2) (Section 5.2).
- Clear out the feed chute and grinding chamber.
- Investigate the cause of the overload and remedy.
- Check the grinding unit for ease of movement and repair if damaged.
- Close the mill door (A2) (Section 5.2).

5.6 Shut-down

The shut-down sequence described here is perforce more of a general nature and can naturally vary from system to system.

Shut-down sequence

- Stop the product feed.
- Let the mill run on until all the material in the mill has been ground. The current consumption sinks to idling value (approx. 40%).
- Switch off the drive; wait until the grinding unit comes to a standstill.
- If applicable, turn off the rinsing (compressed) air.
- If using suction mode, switch off the fan.

6 Maintenance

Pay attention to the safety regulations in Section 2.4!



WARNING

The rotating machine parts (grinding unit, drive) can cause serious injuries when opening or reaching into the machine.

- Make sure that the mill and system are shut down and secured against restarting.
- Never open the mill until all drives have come to a complete standstill.

Ejecting product. Injuries possible if product is inhaled or gets into the eyes.

- Make sure that the product feed and the air supply (including the rinsing air) are turned off.
- Wait until the dust has settled in the mill.

Serious crushing injuries possible if the mill tips over

- Make sure the mill is securely bolted to the floor!

6.1 Lubrication

Used lubricants must be disposed of in a responsible manner.

6.1.1 Mill bearing

Lube points	one lube nipple (VII) (DIN 71 412) per anti-friction bearing, protect the lube nipples with dust caps.
Lube intervals	about every 200 – 250 operating hours
Quantity	several strokes with the grease gun
Lubricant	see the order-specific data sheet in Section 1.4.
Attention	Lubricate **slowly** with the shaft rotating. It is not uncommon for the bearing temperature to rise temporarily, but it should sink back down to normal values again afterwards.
Grease discharge	Excess grease leaks out underneath the bearing. Remove the excess grease regularly and dispose of properly.



NOTICE

Unsuitable lubricants can lead to failure of the complete lubricating system and thus to serious machine damage. Use only recommended lubricants or ones of proven equivalent quality.

6.1.2 Points to be lubricated occasionally

- The door hinges via the lubrication nipples
- The joints and threads of the bolted door connections.

Use standard trade grease.

6.1.3 Motor

Maintenance and lubrication in accordance with the manufacturer's instructions.

6.2 Cleaning

Pay attention to the safety regulations in Section 2.4!

The method and frequency of cleaning depend on the type of product being processed.

Remove dust deposits from the mill and bearing unit regularly. If the heat from the bearings is unable to dissipate because of dust, the bearings can overheat and ultimately fail.

When cleaning the grinding unit:



CAUTION

Serious cuts and crushing injuries can be caused by the sharp edges of the grinding unit and by the flywheel effect.

- Wear heavy-duty protective gloves!
- Mind the flywheel effect of the grinding unit.

All cleaning materials (product residues, cleaning cloths, dirty water, etc.) must be disposed of in a responsible and environmentally-compatible manner.



NOTICE

- Automatic rinsing
  It is essential that no product residues penetrate the rinsing gap (a) – see Fig. 4.5-1. If necessary, seal off with masking tape or the like.
- Forced rinsing
  Rinsing air must be supplied during cleaning to protect the bearing unit.

6.2.1 Dry cleaning

- Open the mill door (A2) as described in Section 5.2.
- Cleaning the inside of the mill with a brush or broom is usually sufficient, although an industrial vacuum cleaner is naturally more efficient.



NOTICE
Never use compressed air for cleaning – dust or dirt might get blown into the bearing.

- For a more thorough cleaning, remove the complete grinding unit including grinding track or sieve grate. See the appended grinding unit supplement for details.
- Close the mill door (A2) (Section 5.2).

6.2.2 Wet cleaning

Only necessary in special cases.

Make sure no water gets into the suction line! The water used for cleaning must be able to drain off freely directly under the mill.

- Dry-clean the mill first (Section 6.2.1).
- Spray out the open mill with water.



NOTICE
Because of the sensitivity of the anti-friction bearings, do not use any high-pressure cleaners!

- Close the mill door (A2) (Section 5.2).
- Run the completely assembled and closed mill for a few minutes in idling mode to dry it.

6.3 Regular inspections – wear control

Pay attention to the safety regulations in Section 2.4!

6.3.1 Inspection procedures

Interval	Measure / Comments
Section 2.3	Check the safety equipment, see Section 2.3.
Section 6.1	Check the lubrication system, see Section 6.1.
Section 6.3.2	Check the mill for wear, see Section 6.3.2.
As necessary	Check the inside of the mill for deposits and caking formation, etc., clean if necessary.
	Check the mill, especially bearings and motors, for serious dust deposits and clean if necessary.
Every 3 months	Check all moving mill parts for function.
	Check the bolted connections, especially those of the rotating grinding unit; tighten if necessary.
	Check the measuring equipment for perfect function.
	Check all visible seals for damage and function.
	Check the belt tension and tighten if necessary; see the appended technical instructions.
	Check the condition of the belts: visual inspection for rents, torn-out parts or other damage; exchange if necessary.
	Check the anti-friction bearings (B8, B15): Check the bearing temperature during continuous operation, check for unusual noises and abnormal bearing play.
Every 15 000 operating hours, but at the latest every 3 years	Exchange the anti-friction bearings (B8, B15).

6.3.2 Wear control



WARNING

Injuries possible if the machine ruptures and parts catapult out.

- Always exchange wear parts promptly and professionally.

Inspection intervals

The wall thickness of the components that are subject to wear must be chekked regularly.
The user must determine the **inspection intervals** and the **inspection procedures** and carry out the inspections as a function of the product such that the wall thickness never wears down to below the minimum value. The point where wear is worst is always decisive.

Maximum permissible wear rates

- **Grinding units and grinding tracks/sieve:** see the operating instructions for the respective grinding unit.
- **Mill housing (A1):** max. 1 mm.
- **Mill door (A2) and feed chute (A4):** max. 1 mm.
- All **other machine components:** max. 1 mm.

If in doubt, contact HOSOKAWA ALPINE's Customer Service Department.

Uneven machine running is an indication of irregular wear patterns on the rotating parts.

This type of imbalance places disproportionately high loads on the anti-friction bearings and ultimately causes a drastic reduction to their life. We therefore strongly recommend installation of a vibration monitor at the bearing.

6.4 Spare parts

Use only those spare parts specified in the appended spare parts list. With the exception of standard parts, all spare parts must be ordered from HOSOKAWA ALPINE!

Use of non-Alpine spare parts can lead to damage or defects which are not covered by our warranty.

It is advisable to use your own experience to build up a stock of the most frequently required spare parts.

When ordering spare parts, please specify:

Order number	as per appended spare parts list
Machine model	as per nameplate
Machine number	as per nameplate

6.5 Troubleshooting

Fault	Possible Cause(s)	Correction
Mill automatically switches off because the bearing housing heats up to >100°C, usually accompanied by vibrations, ragged running and loud rolling noises.	Anti-friction bearings have become defective as a result of damaged seals (e.g. if the rinsing air is insufficient) or because of insufficent lubrication.	Exchange the anti-friction bearings and shaft lip seals. It may be necessary to increase the rinsing air pressure. Observe the relubrication intervals and amounts.
Motor circuit breaker or PTC sensor shuts the drive down. Motor stops during operation. Motor will not start.	Motor overloaded due to excessive current loading: • Amount of product in mill too high • Moist feed product • Too frequent Start-Stop	Open the mill door. Check amount of product or deposits in mill. If necessary, clean the mill. Check the drive for freedom of movement. Let the motor cool down. Restart the drive.
	Tramp material (e.g. screw) in grinding chamber.	Open the mill door. Remove tramp material. Establish damage (check particularly the grinding unit); exchange damaged parts. Check the drive for freedom of movement. Let the motor cool down. Restart the drive.
	Motor insufficiently cooled	Check the cooling system. The fan wheel must not be blokked. Let the motor cool down. Restore freedom of movement. Restart the motor.
	Safety fuses blown	Exchange the fuses. If this occurs again: check freedom of movement, drive, motor, voltage supply, elec. connection, etc. thoroughly.
	Defect in drive motor	Check the voltage supply and elec. connection. Start the motor without load and check the drive. Exchange the drive if necessary.
Mill vibrates violently.	Defective bearing unit.	Open the mill door. Remove the grinding unit. Remove and exchange the bearing. Assembly in reverse sequence. Check the drive for freedom of movement.
	Irregular wear patterns on rotating grinding unit (imbalance).	Open the mill door and exchange the worn parts.

Fault	Possible Cause(s)	Correction
	Product deposits on rotating grinding elements (imbalance).	Open the mill. Check the amount of product or deposits in the mill. Clean the mill if necessary. Check the drive for freedom of movement Restart the drive.
Product throughput declines gradually or fines shift into the coarse.	Grinding element (e.g. pin disc grinding unit, grinding track or sieve) worn.	Open the mill. Establish degree of wear (check especially the grinding unit). Exchange worn parts. Check the drive for freedom of movement Restart the drive.
	Air flow rate through mill decreases: • Supply ducting or feed chute is partially blocked – e.g. by product. • Ducting between mill and filter is partially blocked – e.g. by product.	Measure the air flow rate. If too low: Open the mill. Check for and clean out any product deposits in the ducting.
Mill housing becomes hot and current loading of mill motor increases.	Air flow rate through mill too low: • Ducting is blocked. • Fan has failed.	Measure the air flow rate. If too low: Open the mill. Check for and clean out any product deposits in the ductings. Check the fan and restart it.
Product leaks out of the mill.	Door seal is defective.	Open the mill door. Exchange the door seal.

In view of the different products and operating conditions, this summary is perforce of a generalised nature.

If the same defect occurs repeatedly, it is advisable to contact HOSOKAWA ALPINE for assistance.

7 Servicing

Pay attention to the safety regulations in Section 2.4!



WARNING

The rotating machine parts (grinding unit, drive) can cause serious injuries when opening or reaching into the machine.

- Make sure that the mill and system are shut down and secured against restarting.
- Never open the mill until all drives have come to a complete standstill.

Ejecting product. Injuries possible if product is inhaled or gets into the eyes.

- Make sure that the product feed and the air supply (including the rinsing air) are turned off.
- Wait until the dust has settled in the mill.

Serious crushing injuries possible if the mill tips over

- Make sure the mill is securely bolted to the floor!

Never carry out servicing procedures personally unless adequate expertise (skilled personnel) and facilities (tools, workshop) are available.

Professional servicing or repair procedures can only be guaranteed if they are carried out by the manufacturer.

Worn parts (Section 6.3) must be exchanged promptly.

General tips

Clean all parts thoroughly prior to installation!
Check the parts for serviceability and exchange if necessary.

If exchanging the anti-friction bearings, always exchange them in sets.
Pay attention during installation to the instructions issued by the manufacturer of the anti-friction bearings.

7.1 Belt drive

Removal

- Shut the mill down as described in Section 5.6.



WARNING

The rotating parts (belt drive) can cause serious injuries when opening or reaching into the mill.

- Switch off the master switch and secure against unauthorised and unintentional restarting.
- Wait until the drive comes to a complete standstill.

- Remove the belt guard.
- Loosen the assembly screws on the motor base plate.
- Shift the motor by means of the tensioning bolts towards the mill axis until the drive belt can be pulled over the edge of the belt pulley without using force.

Fitting and tensioning

- Lay the drive belt loosely on the belt pulley and tension by means of the tensioning bolts in accordance with the appended technical instructions.
- Tighten the assembly screws on the motor base plate
- Replace the belt guard.

7.2 Bearing unit – removal & installation

Removal

- Open the mill door (A2) as described in Section 5.2.
- Remove the belts as described in Section 7.1.
- Remove the grinding unit (see appended operating manual supplements).
- Remove all order-specific connections such as rinsing air, speed, temperature and vibration sensors.
- Insert the supplied M16 lifting ring into the bearing housing (B1).
- Attach suitable lifting gear to the lifting ring and pull the lines taut to secure the bearing (B) in position.
- Undo the assembly screws (A9) on the bearing unit and use the lifting gear to hoist the complete bearing unit (B) out of the mill housing (A1).

Installation

- Apply a light coat of liquid sealant to the respective screws at the joint between the mill housing and the bearing.
- Use lifting gear to hoist the complete bearing (B) unit into the mill housing (A1) and secure in place with the screws (A9). Remove the lifting unit.
- Check the bearing for freedom of movement.
- Replace all order-specific connections such as rinsing air, speed, temperature and vibration sensors.
- Install the grinding unit as described in the appended operating manual supplement.
- Close the mill door (see Section 5.2).
- Fit and tension the drive belts and replace the belt guard (Section 7.1).
- With the machine running, use a grease gun to lubricate the bearing unit (B) through the lubrication nipples (B18) until clean grease discharges. Remove the discharged grease (Section 6.1).
  Increase the speed of the machine gradually. It may be necessary to introduce intervals between the running-up stages to allow the bearing to cool down.

If using a pin disc grinding unit:



NOTICE

Damage to the pin disc grinding unit.

If exchanging the shaft (B2) or the entire bearing unit, check the pin spacing and adjust if necessary.
See the appended operating manual supplement.

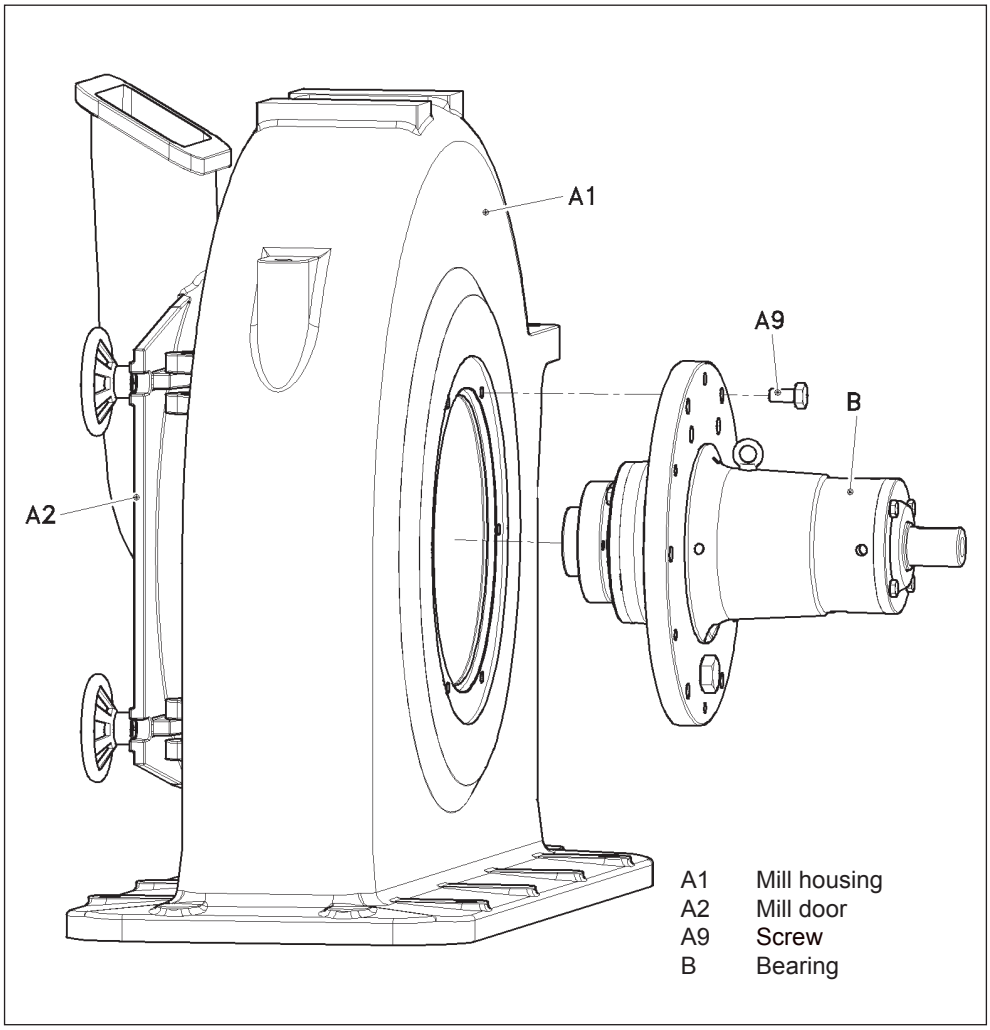


Figure 7.2.1

7.3 Bearing unit – dismantling & assembly

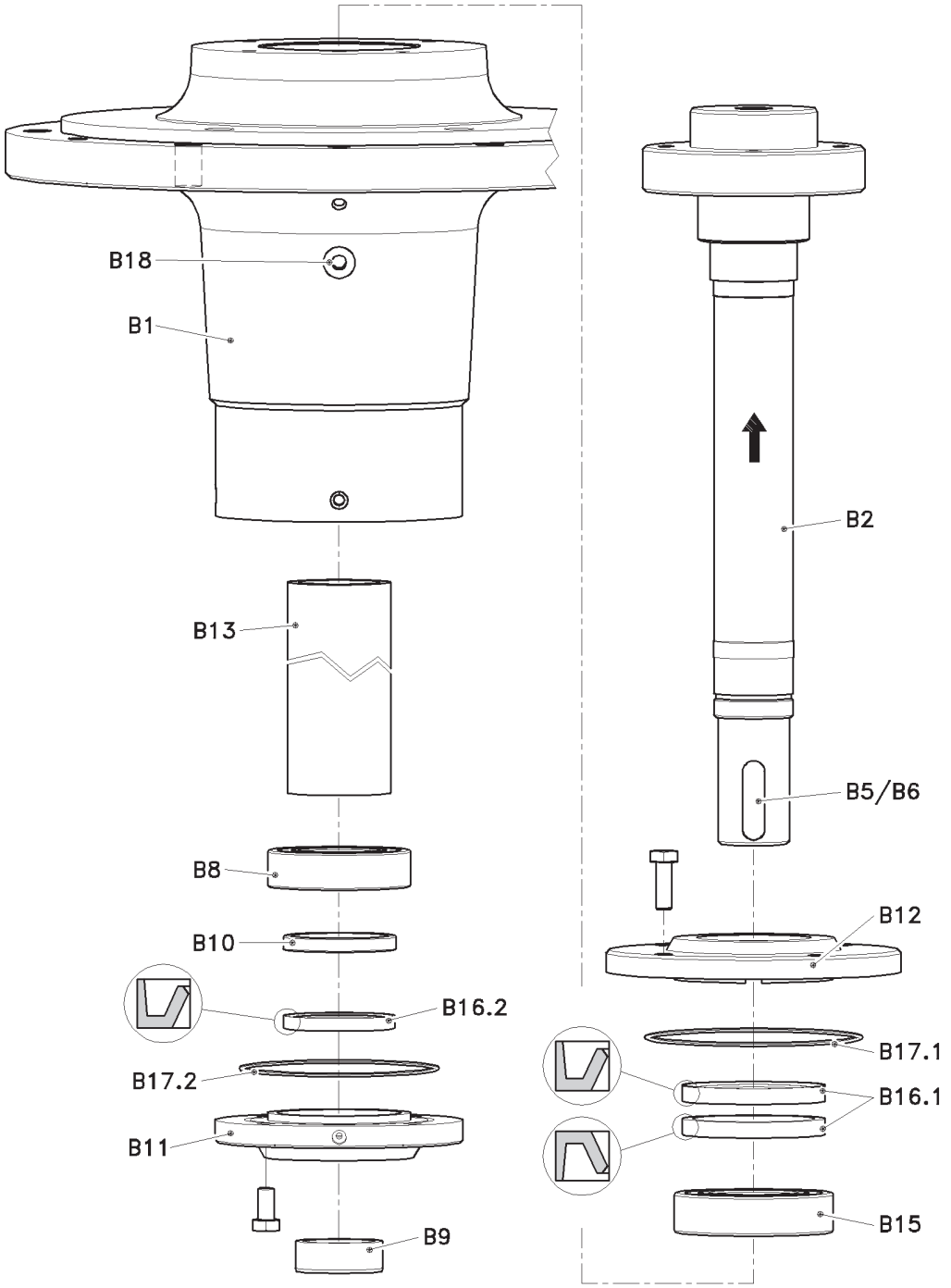
Dismantling

- Remove the bearing unit (B) as described in Section 7.2.
- Undo the clamping screws of the belt pulley's Taper-Lock connection and remove the pulley (B5).
- Remove the feather key (B6) from the shaft groove.
- Remove the spacer ring (B9).
- Remove the bearing cover (B11).
- Undo the self-locking shaft nut (B10) with suitable tools and remove.
- Use a wooden drift or plastic mallet to tap the shaft (B2) out of the bearing housing (B1) in the direction of the arrow.
- Unscrew and remove the bearing cover (B12) from the bearing housing (B1).
- Pull or tap the inner race of the anti-friction bearing (B15) out of the housing (B1).
- Remove the spacer (B13) and anti-friction bearings (B8, B15) from the bearing housing (B1).

Assembly

- Clean all parts carefully.
  Use new round seals (B17.1, B17.2) and shaft lip seals (B16.1, B16.2).
- Insert the shaft lip seals (B16.1, B16.2) into the bearing covers (B12, B11). Make sure the sealing lips point in the right direction (see Figure 7.3-1). Dirt can otherwise penetrate the bearing and cause damage.
- For assembly purposes, the anti-friction bearing (B15) consists of three component parts.
  From the grinding unit side, tap lightly around the periphery of the outer race with the rolling elements of the anti-friction bearing (B15) and drive the bearing into the bearing housing (B1) home to the stop.
- Fill the anti-friction bearing (B15) to about 30% with bearing grease (Section 6.1).
- Push the bearing cover (B12) with inserted shaft lip seal (B16.1) and round seal (B17.1) carefully over the shaft (B2) to the collar.
- Position the inner race of the bearing (B15) on the shaft (B2) and tap it home to the stop.
- Thus prepared, push the subassembly into the bearing housing (B1) from the grinding unit side and bolt the bearing cover (B12) to the bearing housing (B1).
- Insert the bearing ring of the anti-friction bearing (B15) and push the spacer (B13) on to the stop.

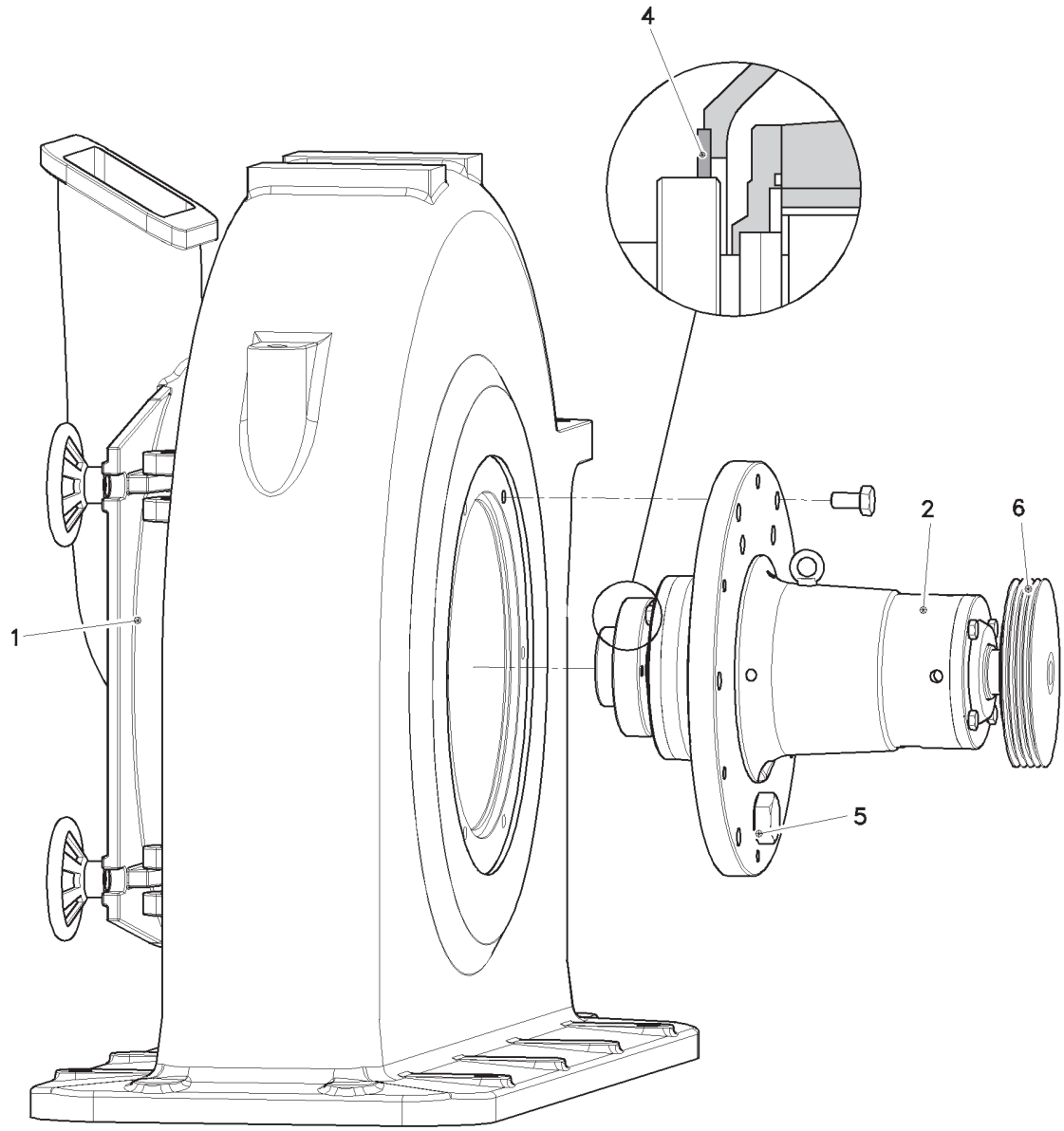
- Insert the outer race with the rolling elements of the anti-friction bearing (B8) into the bearing housing (B1).
  Avoid skewing!
- Fill the anti-friction bearing (B8) to about 30% with bearing grease (Section 6.1).
- Tap the inner race of the bearing (B8) onto the shaft (B2) to the stop.
- Locate the shaft nut (B10) on the shaft and tighten.
  Because material fatigue caused by repeated loosening and tightening might be present, always check the shaft nut (B10) for wear and exchange if necessary.
- Push the spacer ring (B9) onto the shaft (B2).
- To protect the shaft lip seal (B16.2), push the bearing cover (B11) on carefully and then bolt to the bearing housing (B1).
- Apply an anti-seize agent, e.g. Molykote paste, to the contact surfaces of the belt pulley to prevent frictional corrosion.
  Insert the feather key (B6) and then the Taper-Lock belt pulley (B5) with the bush wide open; make sure the pulley does not jam!
  Tighten the tensioning screws uniformly crosswise to prevent distortion.



B1	Bearing housing	B12	Bearing cover
B2	Shaft	B13	Spacer
B5	Belt pulley	B15	Anti-friction bearing
B6	Feather key	B16.1	Shaft lip seal
B8	Anti-friction bearing	B16.2	Shaft lip seal
B9	Spacer ring	B17.1	Round sealing ring
B10	Shaft nut	B17.2	Round sealing ring
B11	Bearing cover	B18	Lubrication nipple

Figure 7.3-1

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Bei Bestellung von Ersatzteilen
Maschinentyp, Maschinen-Nummer und Bestell-Nummer angeben.

When ordering spare parts please specify
machine type, serial number and order number.

Si vous commandez des pièces de rechange, veuillez bien indiquer
le type de machine, le numéro de série ainsi que, le numéro de la commande.

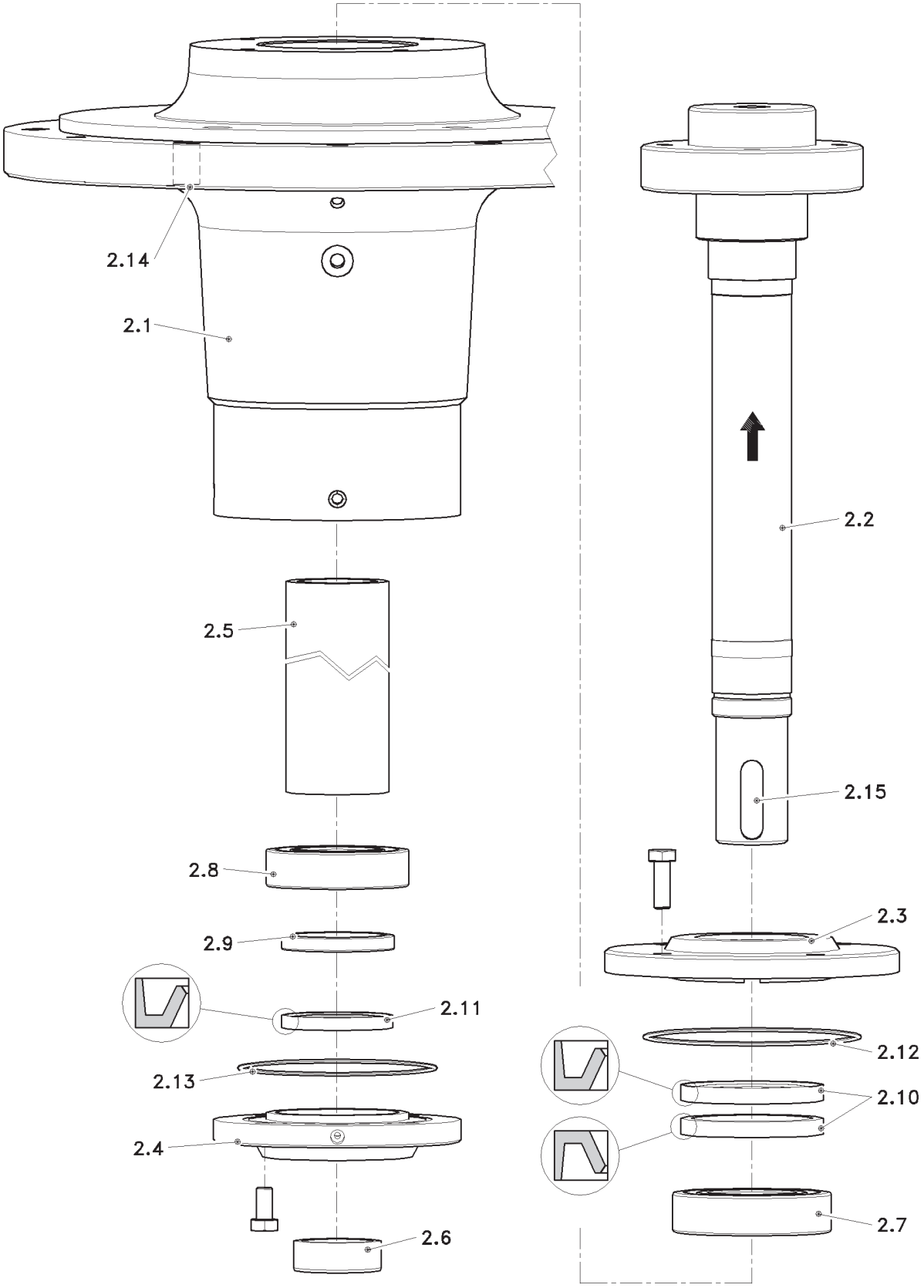
Ersatzteilzeichnung
Spare parts drawing
Voir schéma des pièces de rechange

EZ 1123 - 22

HOSOKAWA ALPINE Aktiengesellschaft

Blatt-Nr. 1

Blattzahl 2



Bei Bestellung von Ersatzteilen
Maschinentyp, Maschinen-Nummer und Bestell-Nummer angeben.

When ordering spare parts please specify
machine type, serial number and order number.

Si vous commandez des pièces de rechange, veuillez bien indiquer
le type de machine, le numéro de série ainsi que, le numéro de la commande.

Ersatzteilzeichnung
Spare parts drawing
Voir schéma des pièces de rechange

EZ 1123 - 22

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Blatt-Nr. 2

Blattzahl 2

Item	Order-No.	Additional information	Standard p.	Material	Quant.
1	115414	Profil seal 8x1850		NR/Mogu	1
2	**122948**	**Bearing unit -complete**		St	**1**
2.1	122949	Bearing housing			1
2.2	122951	Mill shaft		C45N	1
2.3	122953	Bearing cover		H II	1
	008822	Cheese-head screw M10x20	DIN 6912	8.8	4
2.4	122955	Bearing cover		H II	1
	008526	Hexagon head screw M10x30	ISO 4017	8.8 ZNn	4
2.5	122957	Distance tube		St	1
2.6	122958	Distance bushing		St	1
2.7	194256	Cylindrical roller bearing NUP 2211	DIN 5412		1
2.8	194257	Cylindrical roller bearing NU 2210	DIN 5412		1
2.9	123147	Nut type GUK 50x1.5		St	1
2.10	116022	Shaft sealing ring PS-Seal 70x90x10		PTFE	2
2.11	131902	Shaft sealing ring A 55x70x8	DIN 3760	NB	1
2.12	009339	Round sealing ring 130x3		72 NBR	1
2.13	131637	Round sealing ring 98x3		72 NBR	1
2.14	007486	Screw plug R ½	DIN 910	5.8	2
	007557	Sealing ring C 21x26x2	DIN 7603	Cu(KFC)	2
2.15	009553	Feather key A 14x9x50	DIN 6885	C 45 K	1
3	008556	Hexagon head screw M16x50	ISO 4017	8.8 Zn	6
4	123134	Cover disc		St	1
	008714	Countersunk screw M5x12	ISO 2009	4.8 Zn	6
5	007490	Screw plug R 1 1/2"	DIN 910	5.8	1
	007563	Sealing ring C 48x55x2.5	DIN 7603	Cu	1
6	123062	Narrow-gauge V-belt SPAx2800			4

Fine Impact Mill
500 UPZ
Basic machine / steel

Spare parts list
EL 1123-22.02

See Spare parts drawing
EZ 1123-22

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