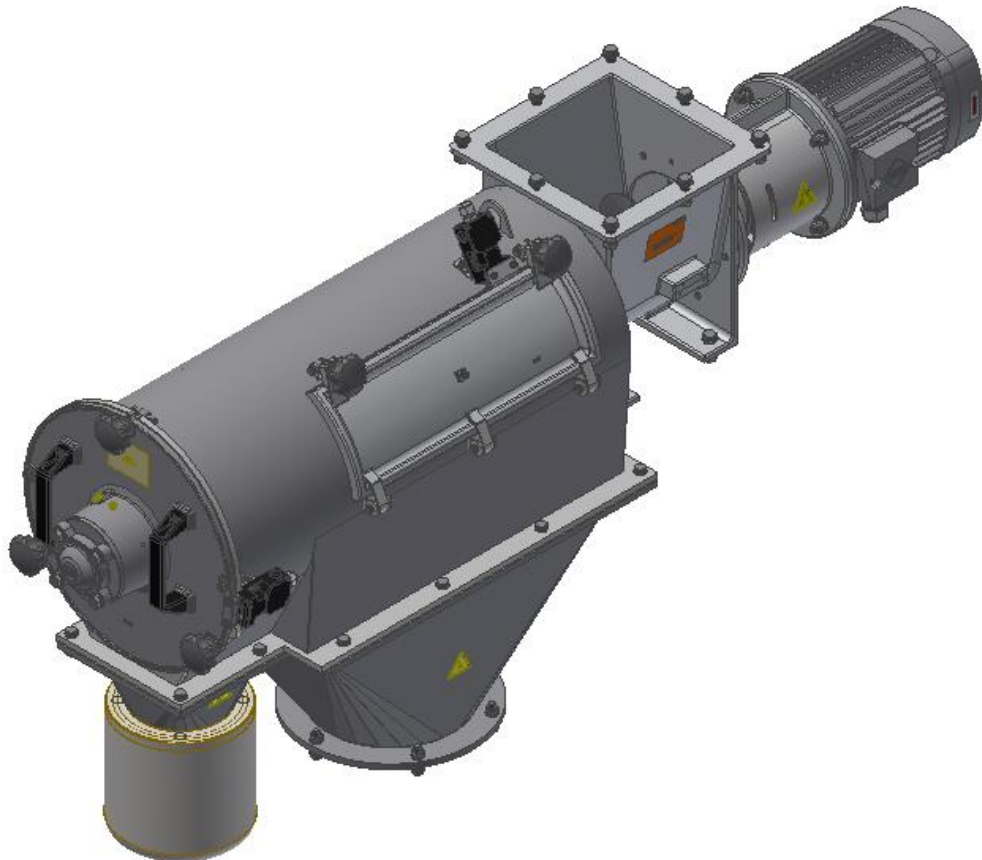


AZO[®] cyclone screener

Operating and installation instructions



Type
E650
design
B1, C1

Translation

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1 Introduction

These operating instructions are intended for specialist personnel only. Definition of specialist personnel → 2.3 "Safety measures (to be implemented by the plant operator)".

After training, cleaning work may be carried by authorized specialist personnel.

1.1 Documentation conventions

Validity of the operating instructions

Applies to machines with the relevant design.

The right to make modifications to the content in the interest of permanent technical development shall remain reserved.

Documentation rights

All rights, particularly the right to reproduce, distribute or translate the documentation remain with the manufacturer.

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DANGER

- indicates that death or serious bodily injury will occur if appropriate precautions are not taken.



WARNING

- indicates that death or serious bodily injury can occur if appropriate precautions are not taken.



CAUTION

- indicates that slight bodily injury can occur if appropriate precautions are not taken.

NOTICE

- indicates that material damage can occur if appropriate precautions are not taken.

advice on how to carry out an operation.



(optional) = not standard version.

2 Safety

2.1 Safety information

The safety instructions are divided into 3 areas.

General safety instructions

General safety information is provided in this chapter and applies to the complete machine and the complete component.

Warning signs

Warning signs are specific action-related or situation-related information which is placed before the corresponding action step or situation-describing chapter of these operating instructions.

Warning signs refer to the care and protective measures which the operator must put in place to avoid residual risks.

Safety labels (optional)

If the hazard poses a high risk to the operator, there are warning signs or symbols directly at a corresponding passage in these operating instructions and at relevant operating positions on the machine/the component.

2.2 Directives and standards

The machine/the component complies with generally accepted engineering practice. European and German regulations were used, see a separate certificate.

2.3 Safety measures (to be implemented by the plant operator)

This **operating instruction** is an integral part of the machine/component.

The operating instructions must be available to the operating personnel at all times.

The operating instructions must be read prior to installation.

The operator must observe the corresponding safety information and information in the operating instructions.

The operating instructions must be kept in a safe place and made available for future use.

The operating company must instruct the operating and maintenance personnel on the safety devices on the machine/component.

The operating instructions are intended for specialist personnel only.

The operations described in these instructions must be carried out by specialist personnel only.



Specialist personnel (qualified personnel)

Skilled personnel are qualified persons who, on account of their training, experience and instruction as well as their knowledge of applicable standards, stipulations, accident prevention regulations and operating conditions, are authorised by the person responsible for the safety of the system, to carry out the necessary tasks while being able to identify and avoid possible hazards (definition of skilled personnel according to EN 60204-1 and IEC 364).

Responsibility of the operating company

The operating company must instruct personnel accordingly and comply with all national regulations and instructions. We recommend that the user has this confirmed in writing. The operating company must make available corresponding documentation to all persons who work on the machine/component.

2.4 Safety consciousness at work

Any working practices that impair safety of the unit/plant must be eliminated. This includes, among others:

- It must not be operated without electromechanical safety device.
- It must not be operated without correctly functioning electrical safety devices;



WARNING

Danger of injury caused by moving or rotating parts!

If the safety devices are removed or not functional, moving or rotating parts on the unit or device can cause severe injury to people.

- ▶ Always check safety devices before operating the unit/plant to ensure they are complete and functional!

- Plant-specific parameters must not be changed without detailed knowledge of the function and construction of the unit/plant.
- Additional or alternative (unlicensed) software must not be used.

Responsibility

The operating company must designate responsibilities for operation, maintenance and cleaning of the unit/system in order to avoid ambiguities occurring with regard to the level of safety to be met.

The defined responsibilities must be upheld by the relevant individuals!

The operating personnel must ensure that only authorised personnel works on the unit/plant.

Responsibility of the operator

The operator must immediately report any changes to the unit/system that make it unsafe to the operating company.

The operating company/operator must ensure that the unit/system is only operated in compliance with regulations and in perfect working order.

Workplace requirements

As part of the risk assessment, the operating company must define personal protection measures such as the requirement that the system operator wears personal protective equipment. The operating company must ensure and check that the working area is kept clean and tidy.

Repair, maintenance, cleaning: the basics

Before starting any work:

- Shut down the unit/plant section.
- Ensure that the unit/plant section cannot be switched on again.
- Disconnect the unit/plant section from the power supply/compressed air supply.

After completing the work:

- Replace the safety devices on the unit/plant section and check function.
- Ensure the unit/plant section is operating in line with regulations.

**WARNING****Risk of injury if safety devices are deactivated**

If safety devices are deactivated for work relating to repair, maintenance or cleaning, there is an increased risk of injury!

- Special care must be taken when working while safety devices are deactivated!
-

Replacing components

Individual components from different units must not be exchanged with one another!

Technical data

The technical data on the type identification plate must not be exceeded.

Cleaning and inspection openings

The following applies to machines with cleaning and inspection openings that are secured by safety switches:

Using the openings more often than 1x every 15 minutes and/or the time the openings are used exceeds 5% of the operating time affects the performance level which will need to be reassessed.

Unauthorised alterations and changes to the unit/plant

Unauthorised conversion or changes to the unit/plant are not permitted for safety reasons.

The unit/system must only be used for the bulk material specified in the order confirmation.

The written approval of the manufacturer is required for other bulk materials.

Notices must not be altered or removed.

Safety devices must not be bypassed or removed during operation of the unit/plant. Tampering with the safety devices can lead to death or severing of body parts.

Safety devices

Hazardous areas of the unit/system where there is a risk of injury are safeguarded by the use of safety devices.

Safety devices must always be fully functions to ensure there is no danger to life or limb.

Safety devices may only be removed once the unit/plant section has been switched off and secured against being switched on without authorisation.

Units with safety devices that have been tampered with or are not functional must not be placed into operation. Without safety shutdown, the units will continue to operate even with the machine enclosure opened. This creates a considerable risk of injury.

The safety devices comply with the latest accident prevention regulations.

Rotating and/or meshing parts

Adequate safeguards against reaching in must be provided for rotating and meshing parts.

Rotating and intermeshing parts must be integrated into the customer provided system such that it is not possible to reach in or for body parts to be dragged in.

Rotating and intermeshing parts must be covered (e.g. with protective hoods).

Explosion protection

When using the unit/system in potentially explosive atmospheres, sources of ignition or naked flames are not permitted in the work area.

With certain products, sources of ignition or naked flames can cause fires, detonations or explosions.

For ex-protected units, the specified maintenance must be carried out with particular care and attention in order to maintain the explosion protection.

2.5 Operating and maintenance personnel



Operating and maintenance staff are qualified persons who are responsible for the transport, installation, operation, setting up, maintenance and cleaning of the device/component as well as for troubleshooting.

The machine/component may only be operated by trained and authorised operators.

Definition of specialist personnel → 2.3 "Safety measures (to be implemented by the plant operator)".

Operating personnel are briefed about safety devices on the machine/system before commissioning.

The operator must be aware that if safety devices are tampered with, in case of an accident, there is a risk of serious or fatal injuries!

Responsibility for operating the machine/component must be clearly specified and met, to prevent any ambiguity regarding responsibility for safety.

When any work is carried out (operation, maintenance, repair, cleaning, etc.) the shutdown procedures given in the operating instructions must be complied with.

The system operator must ensure that only authorised persons work on and with the machine/component.

The operating personnel must not use the machine/component in any way that makes it unsafe.

The operating personnel must immediately report to the system operator any changes to the machine/device that could impair safety.

The system operator must only operate the machine / component when in perfect working order.

2.6 Shutdown procedures

Before cleaning and maintenance work, the following shutdown procedures must be complied with.

Non-compliance with the shutdown procedures will endanger the life and limb of personnel.

- **Disconnect the electrical system:**
 - Turn off main switch.
 - Check that the machine is safely isolated from the power supply
 - Secure the voltage supply to prevent it being switched on again.
- **To shut down pneumatic system:**
 - Close the shut off valve in the supply line and secure it against being switched on again.
 - Disconnect vacuum line (optional).
 - Depressurise lines and hoppers by applying air or venting.
- **Other supply lines (optional):**
 - Switch off and/or close any other supply lines (e.g. water, gas).

2.7 Safety devices



WARNING

Crushing hazard/shear hazard due to moving parts!

Without appropriate safety devices, access in the machine is possible during operation. When reaching into the machine, body parts of the operating personnel could be injured by moving parts.

- ▶ The safety devices must be fully functional at all times!
- ▶ Access to the machine must not be possible during operation!
- ▶ Currently valid regulations regarding safety clearances must be complied with.
- ▶ Only put the machine/the component into operation when all safety devices are fitted correctly!

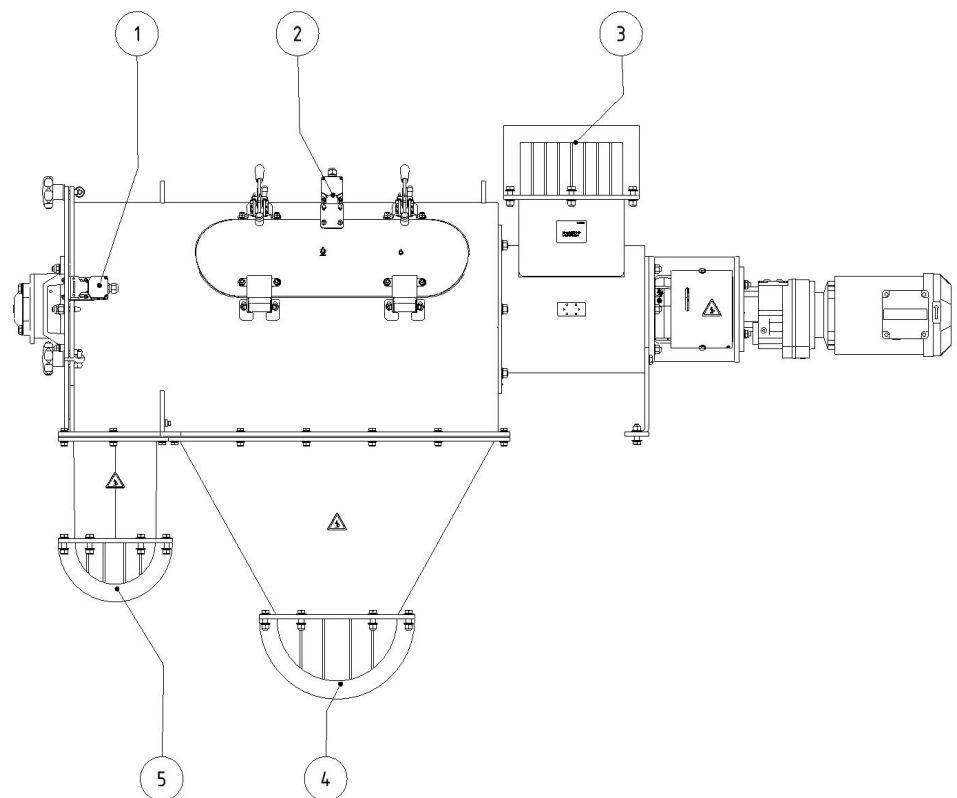


Fig. 2-1 Safety device: screener

Electrical safety device

- (1) Safety switch on the cover housing/screener housing
- (2) Safety switch on screener housing / inspection hatch

Mechanical safety device

- (3) Intermediate flange at the product inlet (optional)
- (4) Intermediate flange at the product outlet (optional)
- (5) Intermediate flange at the coarse-product outlet (optional)

2.7.1 Electrical safety device

The following assemblies are secured with electrical safety devices (safety switches):

- Cover housing with screener housing
- Inspection hatch with screener housing

Electrical connection → 6.2 "Electrical installation".

2.7.2 Mechanical safety device

To avoid injuries to persons, on no account must it be possible to reach into the machine through the product inlet, fine-product outlet or the coarse-product outlet. The protective guards prevent access into the machine and must not be removed.

2.8 Installation in a closed system

The product inlet and product outlet are fitted to the upstream and downstream device in such a way that the connection can only be released with the aid of tools.

2.9 Connection to an open system

The product inlet and product outlet are fitted to the upstream and downstream device in such a way that the connection can only be released with the aid of tools.

An adapter for the product inlet and an intermediate flange for the fine-product and coarse-product outlets are optionally available. These add-on components provide sufficient protection to the rotating components in compliance with EN ISO 13857 and DIN EN 349.

or

Product inlet and product outlet are accessible without the use of tools. The isolating safety device with interlock facility (DIN EN ISO 14119) is equipped with safety switches and must be secured in accordance with DIN EN ISO 13849-1.

Safety-related components of the control must reach a minimum performance level PLr c.

2.10 Openings in upstream and downstream devices

Openings through which it is possible to reach the rotating components must be closed off in such a way that they can only be opened with the aid of tools or must be secured with corresponding safety switches.

3 Use / Construction

3.1 Use

Areas of use

The screener is used for:

- reference screening
- Protective screening
- Fractionating
- Elimination of foreign matter
- Breaking up of agglomerates
- Loosening up product

3.1.1 Proper use

- Screeners with compressed air seal may only be operated if compressed air is supplied to the bearings of the screener during operation.
- Use in potentially explosive area (optional)
 - Only insert correspondingly designed devices.
 - Limits of use for the machine → 4.2 "Limits of use for the machine when used in potentially explosive areas (optional)".
 - Device category, see type plate of the machine and declaration of conformity.
- Corresponding to technical data → 4 "Technical specifications".
- The machine may only be used for the product type(s) specified in the order confirmation. The manufacturer must carry out a new assessment for other products.
- The device should only be used in accordance with current safety regulations.
- Do not make any modifications or conversions. Additional add-on parts require the approval of the manufacturer.
- Observing all information provided in these operating instructions.
- Performing maintenance work.

3.1.2 Improper use

- Working without functioning electrical protection devices.
- Working without mechanical protection devices with the open system.
- Screening without the screen basket and the screener being properly earthed.
- Screening product with an unsuitable or faulty screen fabric.
- Screening product that has not been confirmed in writing by the manufacturer.
- Working in other than the specified speed ranges of rotor.
- Use of the machine without consideration for the permitted dust explosion parameters.
- Operating the machine with a Gas-Ex-Zone indoors.
- Use of the machine
 - outdoors.
 - with liquid, glutinous or solvent-containing products.
 - without securing the access to the danger zone (if necessary!).
- General structural modifications on the complete machine.



3.1.3 External ignition sources

External ignition sources must not be allowed to enter the inside of the screener.
All screener interfaces must be checked for possible entry of ignition sources!

3.2 Layout

3.2.1 Type designation code

Description

e.g.

Screener

E	650	B1	PL	SS	LEB	KKL	US EX
1	2	3	4	5	6	7	8

1 Type code for screener type

E = screener for universal use with two-sided mounted rotor

2 Size

3 Drive version

B1 (direct drive)
C1 (V-belt drive)

4 Bearing design

PL = bearings with air purged shaft seals
SI = shaft seal

5 Safety limit switch version

SS = safety limit switch SCHMERSAL
ELO = safety limit switch ELOBAU
SO = safety switch special version

6 Design of gaskets

SilFr = silicone-free version
LEB = seals that come into direct contact with the product and are approved for foodstuffs

7 Position of inspection hatch




KKL = inspection hatch left hand side (standard)
KKR = inspection hatch right hand side

8 Additional information

US = version for North America (no drive motor)
TF = temperature probe
DRSTF = shock pressure proof
EX = outdoor ATEX (see type identification plate)

3.2.2 Type identification plate

Example

 0588 	
<small>AZO GmbH + Co. KG Rosenberger Str. 28 D-74706 Osterburken www.azo.com</small>	
Typ / Type	(1)
Baujahr / Production year	(2)
Fertigungsnr. / Production no.	(3)
Materialnr. / Material no.	(4)
	(5)
<small>Made in Germany</small>	

- (1) Type designation
- (2) Year of construction (4-digit)
- (3) Production number (6-digit)
- (4) Item number (7-digit)
- (5) Information on ATEX design

3.2.3 Machine layout

Special versions are possible!

See separate technical drawing in the Appendix or in the higher-level system documentation.

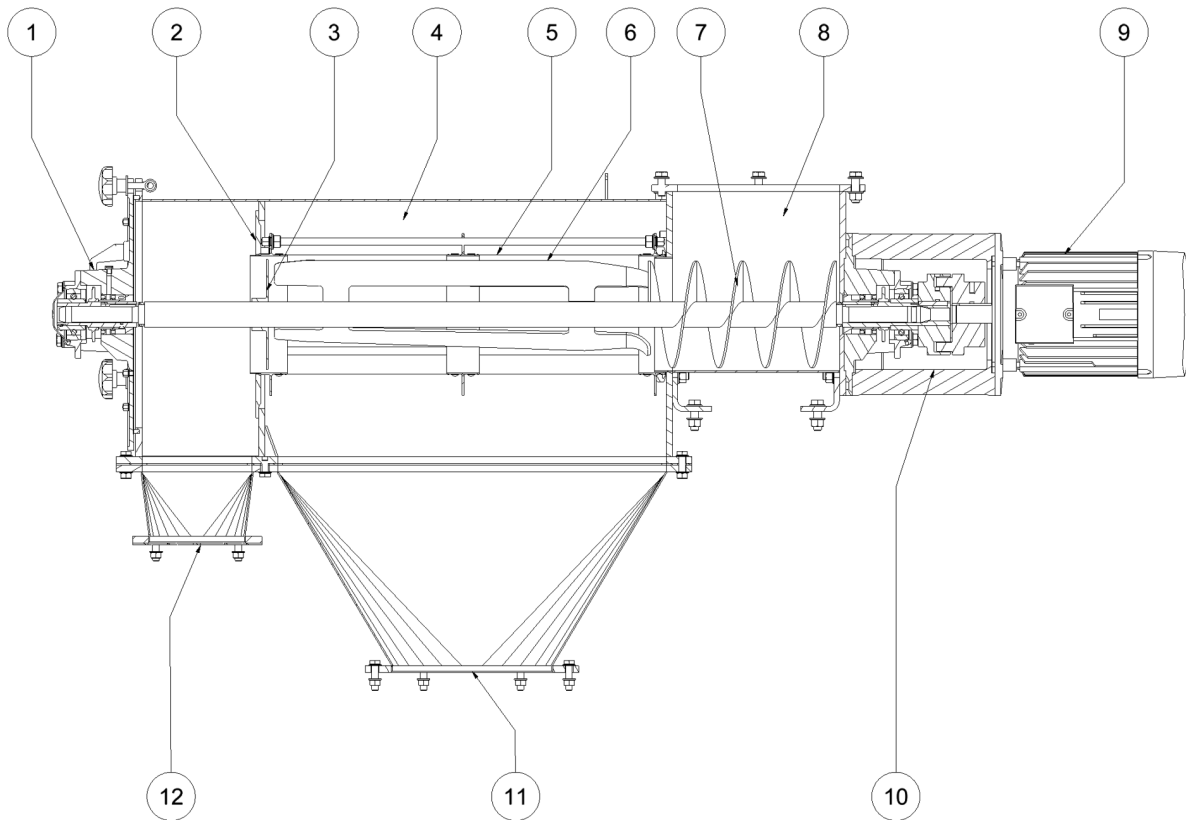


Fig. 3-1 Machine construction: screener E650 B1

- (1) Cover housing with bearing assembly
- (2) Screen retaining cover
- (3) Baffle plate
- (4) Screener housing with inspection hatch
- (5) Screen basket
- (6) Agitator strips (rotor)
- (7) Rotor with transport screw
- (8) Inlet housing
- (9) Drive (motor)
- (10) Clutch housing with drive parts
- (11) Fine-product outlet
- (12) Coarse-product outlet

not illustrated

Coarse product hopper

3.2.4 Versions

Drive

Design B1

The drive unit is connected to the inlet housing, thus extending the screener axis. The rotor is driven via a coupling. The drive unit is connected to the inlet housing, thus extending the screener axis. The rotor is driven via a coupling.

Design C1

The motor is located beneath the inlet housing. The rotor is driven by a V-belt. The overall length of the screener is thus shortened.

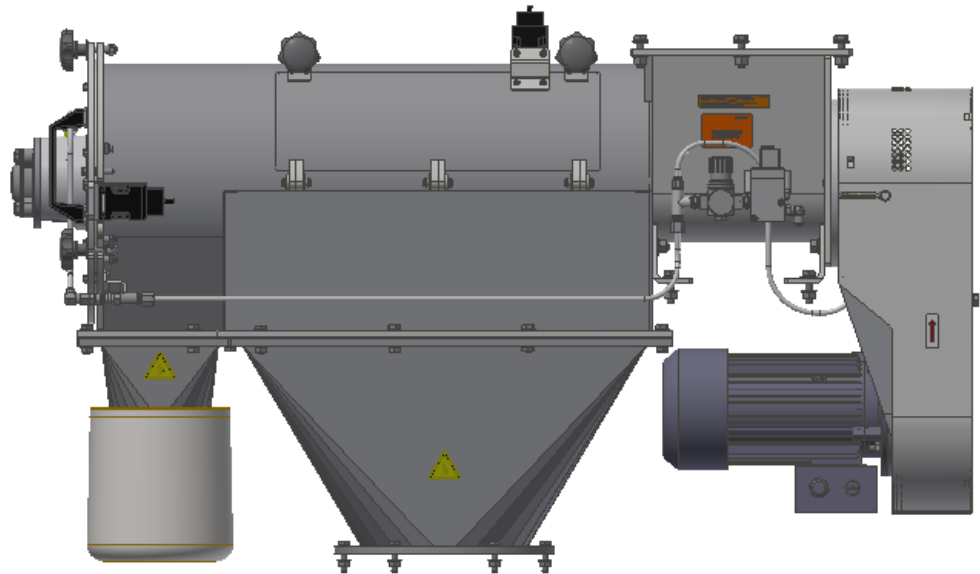


Fig. 3-2 Example: screener E650 C1

Screener housing

Screen housing with filter nozzle (optional)

The screen housing is equipped with a filter nozzle. A filter or extractor unit is mounted on the filter nozzle. The air can escape via the filter nozzle during product infeed.

Seals on the bearings**Shaft seal gasket**

The bearings at the cover housing and suction casing are sealed against the product with shaft seals.

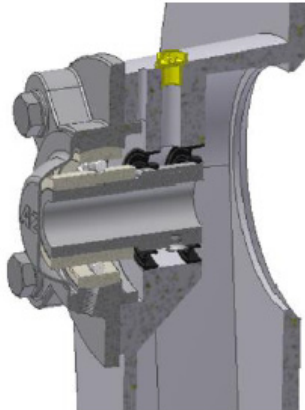


Fig. 3-3 Shaft seal gasket (cover side)

Bearings with air purged shaft seals

With abrasive¹ products, the seals of the bearings can be designed for operation with compressed-air flushing

NOTICE

- ▶ Compressed-air flushing of the bearings increases the sealing effect of the bearing and minimizes the accumulation of heat.
- ▶ Compressed-air flushing must always be activated during operation!

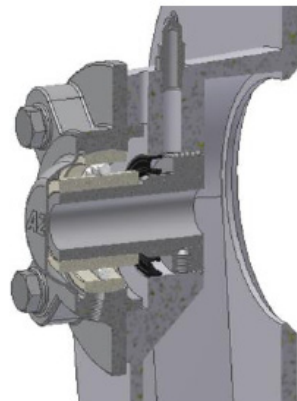


Fig. 3-4 Compressed air seal (cover side)

¹ Products that cause abrasion

Bearing temperature control (optional)

A bearing temperature control is required if the minimum ignition temperature of the product to be screened < 300 [°C].

One temperature probe is installed respectively at both bearing points of the rotor so that the bearing temperature there can be monitored.

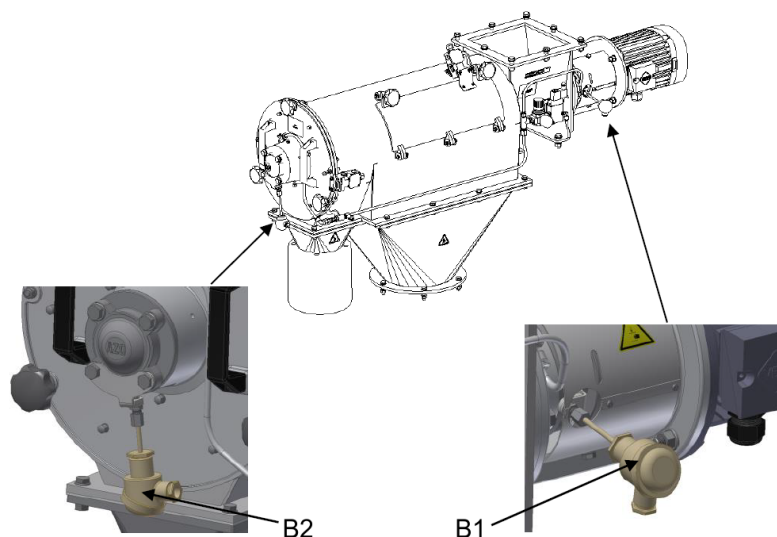


Fig. 3-5 Bearing temperature control at both bearing points on the rotor (example of the screener E650 B1)

(B1) Temperature probe - bearing in coupling housing

(B2) Temperature probe - bearing in coupling housing

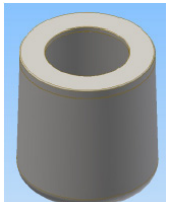

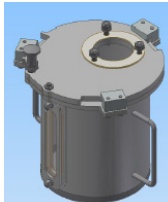

Product inlet / product outlet

The coarse product outlet and product inlet are adapted to the requirements of the customer.

Coarse product hopper (optional)






The coarse product hopper is adapted to the requirements of the customer.

The following coarse product hoppers are available as standard variants:

Coarse product bag	PVC hopper	Bayonet joint	Clamping ring lock
			
Air-permeable bag	transparent, not approved for foodstuffs	easy, fast installation	with an integral bayonet joint; recommended for use in pneumatic conveying systems

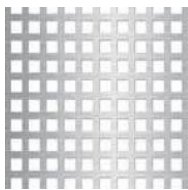
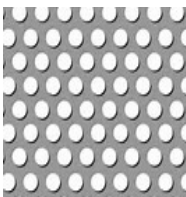
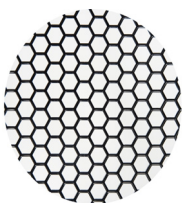
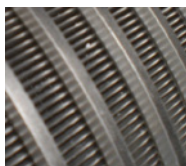
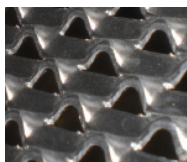
Screen basket

Screener tube (Screen fabric)




Nylon fabric	Carbon mesh	Stainless steel wire mesh
<p>flexible screen fabric (self-cleaning effect)</p>   <p>Food-safe grade (labelled in red)</p>  <p>Industrial grade (labelled in black)</p>	<p>flexible screen fabric (self-cleaning effect)</p>  <p>electrically conductive</p>	<p>rigid screen fabric</p>  <p>electrically conductive reduced screen output when compared to nylon fabric and carbon fabric</p> <p><i>Not allowed for the food and pharmacy sector (risk due to wire breakage)!</i></p>

Screening cylinder (perforated plate)

Various perforations are available for the screening cylinder.

Square perforation	Round perforation	Honeycomb perforation	Wedge-wire screen	Grate plate screen
				

Baffle plate

Default	Metal reinforcements	Polyamide core
 <p>one-piece baffle plate</p>	 <p>(optional) reinforced baffle plate with metal reinforcements. The earthing of metal plates must always be ensured using an earth strap!</p>	 <p>(optional) reinforced baffle plate with polyamide core.</p>

Materials

Screeners are available in normal steel or stainless steel. If necessary, individual components are made of cast aluminium.

Sealing material

There are two main types of seals for the screener:

- seals that come into direct contact with the product and are approved for foodstuffs
- Silicone-free seals

Extractor for bearing cover (optional)

To make screen removal easier.

The bearing cover can be removed from the rotor without great effort and once removed swung to the left or to the right.

Not available for screeners in normal steel design for the sizes 240 and 360!

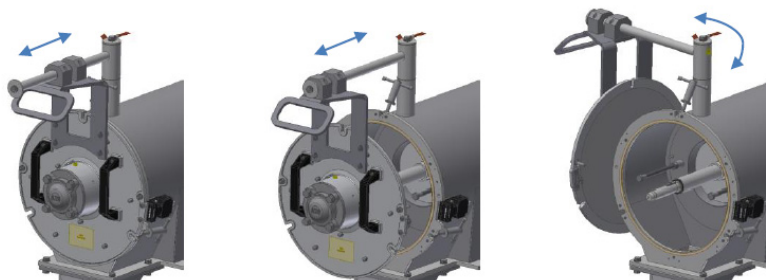


Fig. 3-6 Extractor for bearing cover

Shock pressure proof version (optional)

The machine can be designed to withstand explosion shock pressure for a reduced explosion pressure (previously $p_{red} \ 1$ [bar]) in conjunction with explosion pressure relief.

Pressure relief is provided by rupture discs with a quench pipe (or Q pipe) arranged on the rupture discs. The quench pipe allows pressure to be relieved into the room.

As an alternative, instead of the quench pipe a relief duct can be installed behind the rupture disc to direct the flames and pressure outside in the event of an explosion.

NOTICE

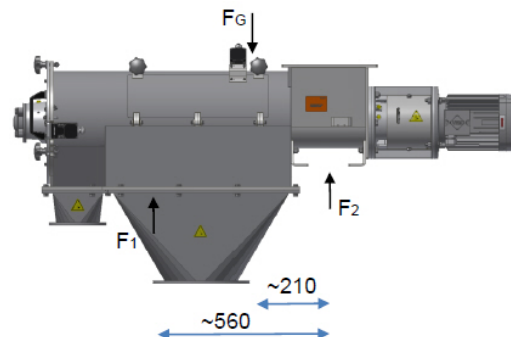
- ▶ The longer the relief duct is, the larger the pressure relief area needs to be.
 - ▶ The rupturing pressure of the rupture discs must be at least 200 [mbar].
 - ▶ The size of the pressure relief area required must be determined through calculation. To do this, you need to know the following dust explosion parameters of the products being processed:
Maximum explosion pressure p_{max}
KST-value¹ or dust classification
 - ▶ Flameproof rotary valves that can withstand explosion shock pressure must be provided at the product inlet and fine-product outlet for decoupling; these then shut down in response to a signal if the rupture disc ruptures in the event of an explosion.
 - ▶ For more information see separate operating instructions for the screener with shock pressure proof design.
-

¹ The KST value is specific to the dust and the test method used and is derived from the volume dependence of the maximum rate of pressure rise.

4 Technical specifications

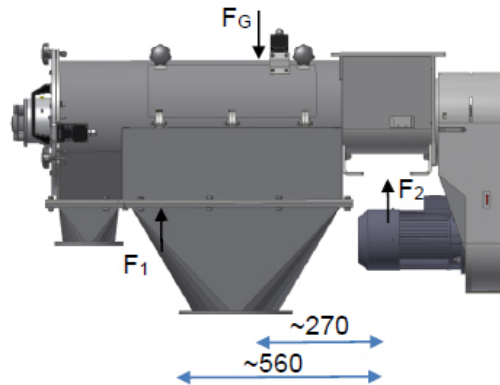
Screener

Type:	E650
Design:	B1 (direct drive) C1 (V-belt drive)
Empty weight _(screener) :	approx. 170 [kg]
Volume:	approx. 155.0 [litres]
Weight _(rotor) :	approx. 16.5 [kg]
Pressure range:	0.5 up to 1.5 [bar] (absolute)
Product temperature:	max. +40 [°C]
Screen output:	dependent on product (e.g. product properties and grain size distribution)
Ambient temperature:	max. 0 [°C] to +40 [°C]
Storage location temperature:	max. +5 [°C] to +40 [°C]
Installation position:	horizontal, see installation drawing
Permitted loads on the product outlet flanges:	max. 400 [N]
Permitted static loads on the product inlet flange:	max. 5000 [N]
Load specifications (without product):	Design B1



F_1 approx. 645 [N]
 F_2 approx. 1075 [N]
 F_G approx. 1720 [N]

Design C1



F_1 approx. 820 [N]

F_2 approx. 880 [N]

F_G approx. 1700 [N]

Noise level: <64 [dB(A)] (idle noise level)

As installation situations and service conditions may vary, noise emissions must be measured at the place of installation.

Readings must be taken at the operating personnel workstations.

If there is no permanent workstation or no workstation at all, the noise emission must be evaluated for a person assumed to be working at or near the machine.

The plant operator must measure the equivalent continuous sound level after commissioning.

The use of personal protection equipment may be made compulsory based on the measurement results.

Screen basket

Length of the screen basket:	ca. 650 [mm]
Screen basket design:	see order confirmation (e.g. screen basket, with flexible screen fabric, screen cylinder)
Flexible screen fabric:	See order confirmation (e.g. plastic mesh, carbon mesh)
Screen cylinder (optional):	See order confirmation (e.g. honeycomb perforation, slotted screen)
Mesh size/perforation:	See order confirmation (corresponding to the product to be screened)

Washing temperature/dryer temperature for a flexible screen fabric

Cleaning agents:	commercially available mild detergent (approx. 3 [g/l])
Washing temperature:	max. 40 [°C]
Dryer temperature when an industrial dryer is used:	max. 30 [°C]
Cleaning instructions:	→ 9.4.3 "Cleaning flexible screen fabric"

Drive (Motor)

Data:	see type identification plate for drive, separate manufacturer's documentation and chapter 6.2
Rotor speed at 50 Hz (60 Hz) mains frequency:	approx. 750 [rpm] (900 [rpm]) The maximum speed of the rotor corresponds to the speed for 60 [Hz]!

Lubricant

Bushings, shafts and shaft seals

Quality:	WHITE GREASE (Food grade lubricant)
Manufacturer:	Company Chesterton
Lubricant code:	NLGI 2 in accordance with DIN 51818
Information about lubricant	see chapter 9.3 ff

Electrical safety device (safety switch)

Data:	see type plate and manufacturer's separate documentation <i>Integrate a safety switch into the electrical safety circuit!</i> (Observe performance level. According to DIN EN ISO 13849-1 at least PLr c.)
-------	--

Bearing temperature control (optional)

Operating temperature of the bearing:	from 50° [C] to 70° [C]
Temperature probe	See type identification plate and manufacturer's operating instructions.
Upper set point (OFF):	100 °[C]
Evaluation unit (optional, may be provided by customer):	See type identification plate and manufacturer's operating instructions.

4 | Technical specifications

Compressed air for air purged bearing (optional)

Connection:	Hose Ø8x6 [mm] external tolerance
Setting on the pressure air control:	approx. 2 [bar]
Air volume at each bearing point:	125 [standard litres/minute]
Compressed air quality:	See following table.

Compressed air purity (AZO requirements)

AZO requires the following **classes** (as per ISO 8573-1:2010) with regard to the compressed air purity

Application	Solid particles	Water		Oil
		Ambient temperature > 3 [°C] ≤ 3 [°C] *a)		
Food / pharmaceuticals	2	2 *b) 3 *c)	2	1
Chemicals / plastics	3	3 *b) 4 *c)	2	1

^{*a)} Relevant for all elements outside, e.g. silo with attachments

^{*b)} Relevant for filter purging; as well as air that enters the system for technical reasons (e.g. pneumatic discharge aid, air purged bearing)

^{*c)} Relevant for conveying air

Tab. 4-1 Compressed air purity (AZO requirements)

Compressed air purity (overview: Purity classes as per ISO 8573-1:2010)

Class	Solid particles				Water		Oil
	Maximum number of particles per m ²			Mass per unit volume	Pressure dew point	Liquid	Total oil content (liquid, aerosol, and mist)
	0.1- 0.5 µm	0.5 - 1 µm	1 - 5 µm	mg/m ³	°C	g/m ³	mg/m ³
0	Requirements stipulated by the operating company more stringent than Class 1						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -70	-	0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40	-	0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -20	-	1
4	-		≤ 10,000	-	≤ +3	-	5
5	-	-	≤ 100,000	-	≤ +7	-	-
6	-	-	-	≤ 5	≤ +10	-	-
7	-	-	-	5 – 10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 – 5	-
9	-	-	-	-	-	5 – 10	-
X	-	-	-	> 10	-	> 10	> 5

Source: Standard ISO 8573-1:2010

Tab. 4-2 Compressed air purity (overview: Purity classes as per ISO 8573-1:2010)

Control system (optional)

Type: see order confirmation
Other data: see separate operating instructions for the control or customer-specific system description

Product



Observe the safety data sheets and the specified hazard information!

The use of personal protection equipment may be made compulsory based on the measured data!

The regulation and supervision for wearing personal protective equipment is the responsibility of the operator.

4.1 Type approval in accordance with ATEX

The type approval for the machine in accordance with ATEX for use in a dust-explosive and gas-explosive area on the basis of the Directive 2014/34/EU is available.

Device category dependent on use, see type plate of the machine and declaration of conformity.

4.2 Limits of use for the machine when used in potentially explosive areas (optional)

Limit values for the safety characteristics of the products (in accordance with VDI 2263, Sheet 1)

Characteristic	Limit value	Reason
Combustion factor	≤ 5	Reference to extreme ignition properties
Deflagration capability	none	dust with deflagration capabilities must not be used
Exothermic decomposition	> 250 [°C]	Safety clearance of 100 [°C]
Glowing temperature	≥ 210 [°C]	Limiting the surface temperature to 135 [°C]
Solvent content	0%	no combustible solvents must be used (avoidance of easily combustible hybrid mixtures)
Minimum ignition energy (dusts) ^a	≥ 3 [mJ]	no easily combustible substances must be used
Ignition temperature	≥ 210 [°C]	Limiting the surface temperature to 135 [°C]
	< 300 [°C]	Processing of products with an ignition temperature of less than 300 [°C] is only permitted if a bearing temperature control system is installed.
Dust explosion class	St 1 and ST 2	Class 3 dust is often highly combustible, processing only after consultation.
Circumferential velocity of rotor	≤ 10 [m/s]	---

a. The screener must be shock pressure proof (special design, if necessary with pressure relief facilities) for dusts with a minimum ignition energy < 3 [mJ]

Tab. 4-3 Limit values for the characteristics of the products

4.3 Dimension sheet

See separate technical drawing in the Appendix or in the higher-level system documentation.

5 Transport / Packaging

5.1 Transport

Dispatch

AZO systems are carefully inspected for sound condition before despatch and packed according to the transport conditions. Damage to the individual packages during delivery to the customer, however, cannot be excluded generally.

Inspection on arrival

Check the delivered goods against the delivery note to ensure that it is complete!

Complaints

Immediately upon receipt of the goods, check the delivery for transport damage. If the delivery has been damaged in transport:

- Identify the extent of damage (e.g. on the transport documents/the delivery note/special protocols/photos)
- Immediately contact the carrier responsible for the last stage of the transport!
- Report transport damage to the manufacturer.
- Retain the packaging (used for verification or to return the goods)!

Transportation to place of installation



DANGER

Serious injuries/danger of death caused by suspended load during transport!

Suspended loads can fall down if transported incorrectly or due to swinging out strongly.

Falling loads can result in serious injuries and even result in death!

- ▶ Use suitable and approved lifting gear and slinging gear with sufficient load bearing capacity for transport.
- ▶ Never stand under a suspended load and in the swing range.
- ▶ Avoid strong swinging of the load caused during transport.
- ▶ Only move the load under supervision.
- ▶ Place the load down if leaving the workstation.
- ▶ The operating personnel of the lifting gear must be authorized to do so.
- ▶ Wear suitable protective equipment.

- Transport with forklift/pallet truck
 1. Place the machine horizontally (product inlet up/product outlet down) on a suitable euro pallet so that it is stable.
 2. Where required, underpin and secure the machine.
 3. Drive with the forks of the lifting gear centrally under the euro pallet.
 4. Carefully lift the load. The machine must not tip over!
 5. Transport the machine to the installation location as close as possible over the ground.

- Transportation with lifting gear
 1. Screw two suitable eyebolts diagonally on the product inlet flange of the machine.
 2. Check that lifting eye bolt for firm seating The eyebolts must not come loose during transport!
 3. Put the lifting hook of the lifting gear in the eyebolt.
 4. Carefully lift the load. The machine must not tip over!
 5. Transport the machine to the installation location as close as possible to the ground.
 6. Remove the eyebolts before installation.

5.2 Packaging



DANGER

Danger of explosion due to static charge!

The discharge of a statically charged packaging film can result in an explosion in potentially explosive areas.

- ▶ Always unpack or pack the machine outside the Ex-Zone.
- ▶ Never take packaging into an Ex-Zone.

NOTICE

- ▶ The packaging serves as protection for transportation. Storage in places where the machine is exposed to weather and mechanical damage is not permitted!
- ▶ Disposal of the packing material must be environmentally safe and carried out in accordance with the local disposal regulations!

The machine is packed with a plastic film:

Type:	Polyethylene (PE)
Starch:	0.2 [mm]
UV resistance:	not UV-stable
Disposal:	The plastic film is groundwater neutral, recyclable and burns at the garbage incineration plant without forming pollutants

5.3 Returns

All units and parts returned to the manufacturer for repair must be completely emptied and cleaned before dispatch.

Use the original packing material for returns if possible.

Electronic components should always be transported in antistatic packaging.

If you have any questions about packing or about making equipment safe for transport, please contact AZO GmbH+Co. KG.

5.4 Storage location conditions

Store the equipment in a closed, dry room, at 5-40 [°C].

6 Installation / Commissioning

6.1 Mechanical installation



WARNING

Heavy load

- ▶ During installation and removal always ensure safe footing!
Where necessary, erect secure platforms and scaffoldings to ensure safety.
- ▶ Use lifting gear designed to correspond to the weight of the components.

Required space

See dimension sheet.

To stop the motor overheating, ensure that there is an uninterrupted flow of cool air to the motor.

Installation position

Installation position → 4 "Technical specifications".

Mounting

NOTICE

- ▶ Each screener is equipped with fixed mounting elements on the housing.
- ▶ It is only permitted to install the screener using these mounting elements! Mounting points on the screener, see dimension sheet
- ▶ The minimum requirements relating to the foundation must be observed during installation.
- ▶ The mounting structure must be designed to take up the weight and the dynamic load of the screener. The structural engineer must additionally take the static safety factors into account → 4 "Technical specifications"!
- ▶ Attach the screener to a suitably stable component that it is safely isolated from the power supply.
- ▶ Transverse forces are not permitted

Product inlet

- The product inlet comes with a flange depending on version.
- The flange joint on the product inlet may be loaded (statically) in an axial direction with max. 5000 [N].
- Higher loads on the product inlet must be neutralized and absorbed by a frame.

Fine-product outlet

- Depending on the version, the fine product outlet is equipped with a flange.
- The flange joint on the fine-product outlet may be loaded (statically) in an axial direction with max. 400 [N].
- Higher loads on the fine-product outlet must be neutralized and absorbed by a frame.

Coarse-product outlet

- Secure coarse product container to coarse-product outlet.

6.1.1 Installation in a closed system

When installing the screener in a closed system, ensure you observe → 2.8 "Installation in a closed system"!

6.1.2 Connection to an open system



WARNING

Crushing hazard/shear hazard due to rotating components!

When operating the machine with an open product inlet and /or fine-product outlet, the machine is not protected against being able to reach inside it. The operating personnel can reach into the machine unhindered and reach rotating components. This poses the risk that limbs can be crushed or severed.

- ▶ Do not operate the device without safety devices!
- ▶ Before removing the safety devices, switch off the machine and relieve the pressure!
- ▶ Ensure that it cannot be switched on again by anyone not authorised to do so!
- ▶ Only switch on the machine when all safety devices are fitted correctly!

If installed in an open system, i.e. with an open product inlet and/or fine-product outlet, observe → 2.9 "Connection to an open system".

If quick release fastening elements are used,¹ (optional) the product inlet and fine-product outlet must be safeguarded using electrical and/or mechanical safety devices.

¹ Removal/installation is possible without the use of tools

6.2 Electrical installation

The connection data given on the type plate must agree with the customer provided connection data.

Further electrical connection must be executed in accordance with the wiring diagrams.

The electrical lines and the electrical connection only may be routed by specialist personnel! **Definition of specialist personnel** → 2.3 "Safety measures (to be implemented by the plant operator)"

When choosing and laying the electric cables, the requirements that ensure safe operation and protection in case of a fault must be taken into account. The relevant national regulations for this must be taken into account and implemented (e.g. in Europe DIN EN 60204-1).

Electrical safety devices (safety switch)



WARNING

Crushing hazard/shear hazard due to moving parts!

Without appropriate safety devices, access in the machine is possible during operation. When reaching into the machine, body parts of the operating personnel could be injured by moving parts.

- ▶ The safety devices must be fully functional at all times!
- ▶ Access to the machine must not be possible during operation!
- ▶ Currently valid regulations regarding safety clearances must be complied with.
- ▶ Only put the machine/the component into operation when all safety devices are fitted correctly!

In accordance with European Standard (DIN EN ISO 13849-1) safety components in the control must achieve performance level PLr c.

Connection

- Electro-mechanical safety device:
Connect the safety switch with a sliding bow in series to the contactor coil.
- Electronic safety device (optional):
The sensor(s) is(are) connected to a control unit. Connect contact of control unit in series to the contactor coil.

Function

- The inspection hatch and cover/screener housing are each protected by a safety device. See chapter 2.7.1 .
- The machine must shut down when the corresponding cover is opened. The machine must be safely isolated from the power supply, depressurised and vented.

Drive (motor)

Connection

- Do not connect the motor before the electrical and/or mechanical safety devices have been connected and installed correctly.
- Switch in the motor circuit breaker.
- The motor must be connected according to the type plate and/or the wiring plans.
- The specifications on the type identification plate must not be exceeded.



The speed is defined by the motor. It is not possible to change the speed on standard machines! Only change the speed after consulting the machine manufacturer!

Control system (optional)

See separate Controller Operating Instructions

Safety switches have priority over the starting functions.

Connect isolating safety devices with interlock function, that can be opened without the use of tools, in the control system in such a way that the drive and the compressed air supply are shut down.

**WARNING****Explosion hazard due to a potentially ignitable dust-air mixture**

With the machine filled and open, the spread of a potentially ignitable dust-air mixture is exacerbated by an active compressed air supply system.

- To prevent it spreading in the outside area, connect the control system in such a way that the drive and compressed air supply system are shut down.
-

6.2.1 Wiring diagram

Electrical components

Position of the electric components for the standard screener type E ..., A ..., M ..., example of size E650 B1:

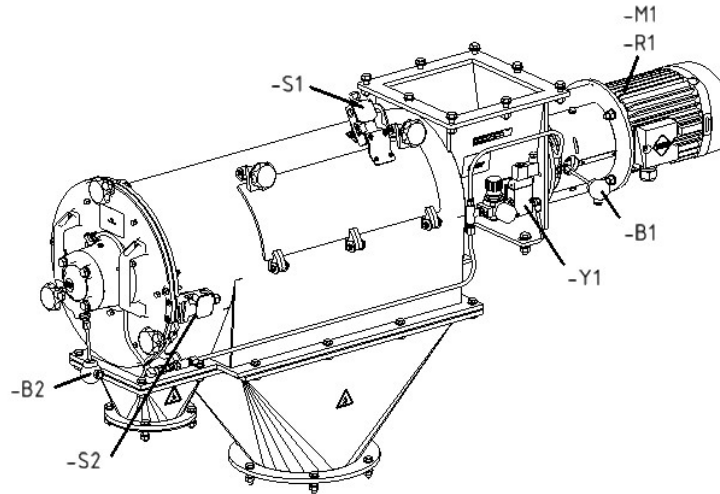


Fig. 6-1 E / A / M screener

- (-M1) Screener drive
- (-R1) Thermal sensor, screen motor (optional)
- (-S1) Safety limit switch, inspection hatch
- (-S2) Safety limit switch, bearing cover
- (-B1) Bearing temperature probe, coupling housing (optional)
- (-B2) Bearing temperature probe, cover housing (optional)
- (-Y1) Valve, air purged bearing (optional)

Functional description

Home position, screener - rest condition:

- (-M1) Screener drive switched off
- (-S1) "Inspection hatch" safety switch closed
- (-S2) "Bearing cover" safety switch closed
- (-Y1) Air purged bearing valve currentless

Starting the screening operation:

- 1) (-Y1) Activate air purged bearing valve (optional) -> Product-side seals are flushed with compressed air
- 2) (-M1) Start screener drive -> Rotor starts to rotate
- 3) Add the product by metering it -> the rotating rotor conveys and mixes the product to be screened

The steps 1) and 2) can also be operated at the same time

Stopping screening operation:

- 1) Interrupt product feed -> The screener "runs empty"
- 2) (-M1) Stop screener drive -> The rotor remains stationary
- 3) (-Y1) Disconnect air purged bearing valve (optional) from power supply -> Product-side seals are no longer flushed

The steps 2) and 3) can also be operated at the same time

Electrical components for the control system (PLC)

1x Input, three phase motor (-M1) [load current]

1x Input, thermal sensor, screen motor (-R1) [temperature probe] (optional)

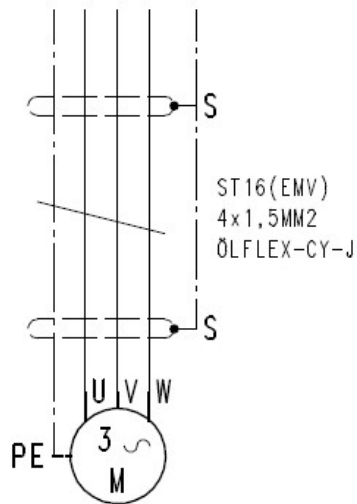
1x Input, safety switch (S1) [inspection hatch]

1x Input, safety switch (-S2) [bearing cover]

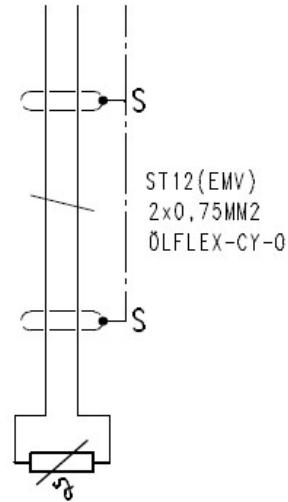
1x Output, air purged bearing valve (-Y1) (optional)

6.2.1.1 Use in atmospheres that are not potentially explosive (outside)

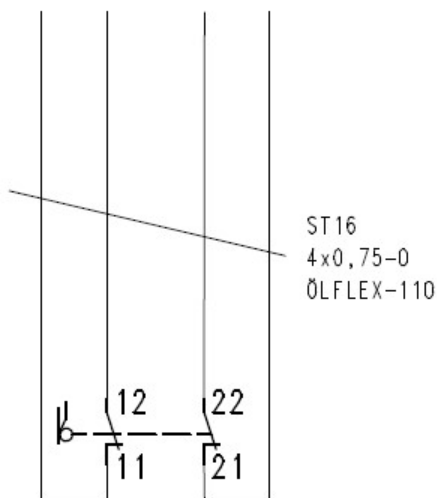
Example of a wiring diagram



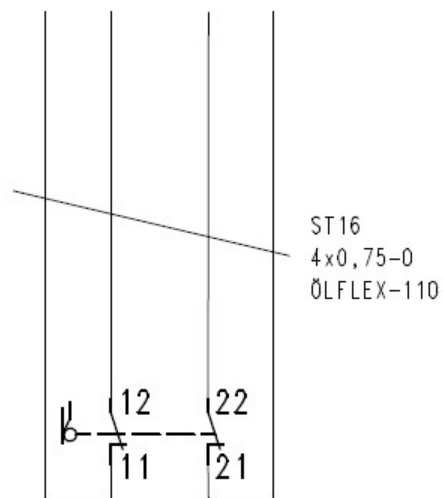
-M1 Screener drive



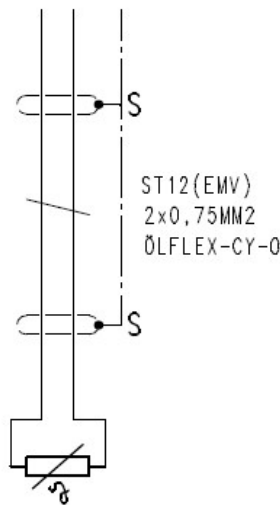
-R1 Thermal sensor, screen motor (optional)



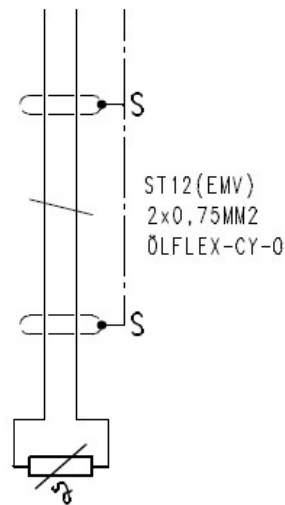
-S1 Safety limit switch, inspection hatch



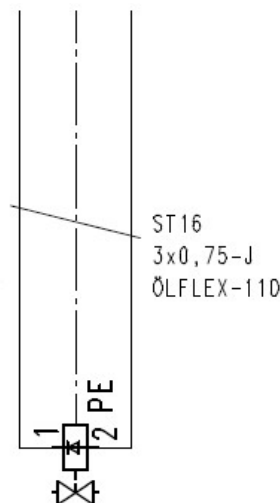
-S2 Safety limit switch, bearing cover



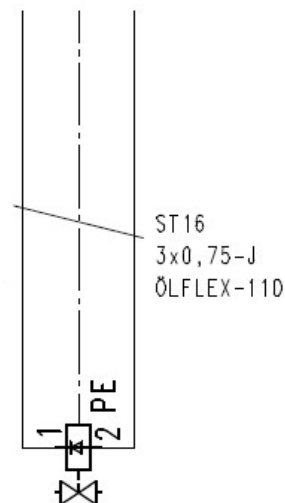
-B1 Bearing temperature probe, coupling housing (optional)



-B2 Bearing temperature probe, cover housing (optional)



-Y1 Valve, air purged bearing (optional)



-Y2 Valve, rapper (optional)

Tab. 6-1 Wiring diagram: Use in atmospheres that are not potentially explosive

CAUTION

Integrate safety switch into safety circuit.

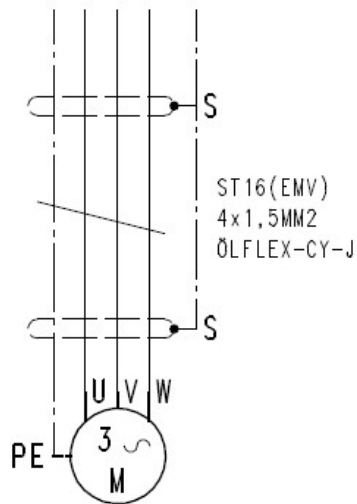
- ▶ Observe performance level!
- ▶ According to DIN EN ISO 13849-1 at least performance level PLc.

The screener drive may only run provided both safety limit switches are closed and the bearing temperature control (temperature probe –B1 and –B2), where installed, does not report any increased bearing temperature.

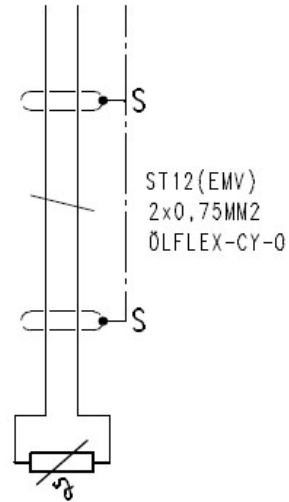
Standard version safety limit switch (-S1 and -S2) : 2xNC (non-ATEX)

6.2.1.2 Use in potentially explosive atmospheres (outside)

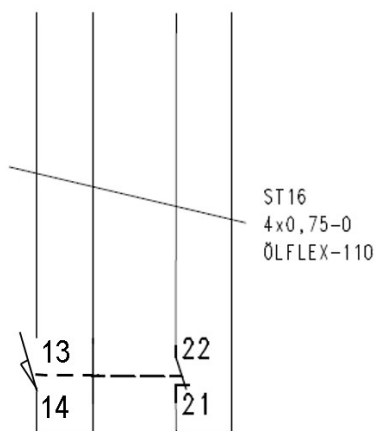
Example of a wiring diagram for use in zone 1/21 and zone 2/22



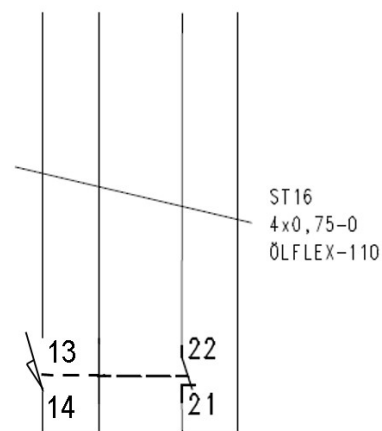
-M1 Screener drive



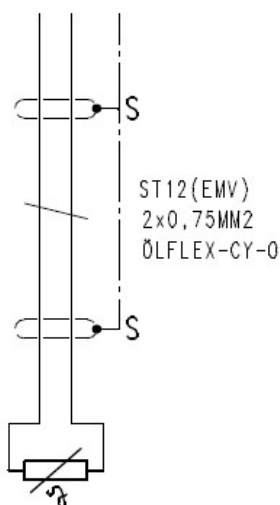
-R1 Thermal sensor, screen motor (optional)



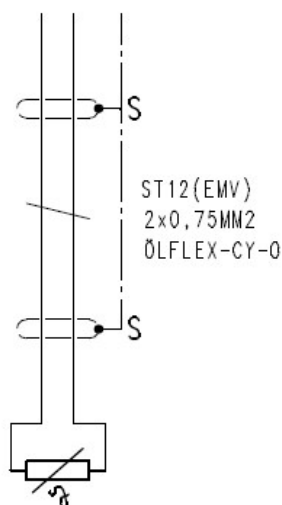
-S1 Safety limit switch, inspection hatch



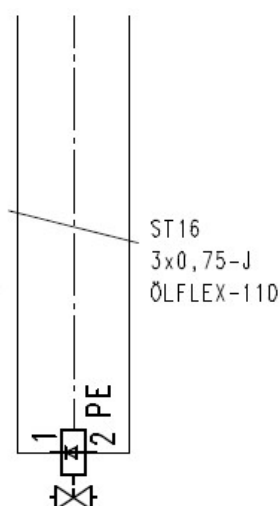
-S2 Safety limit switch, bearing cover



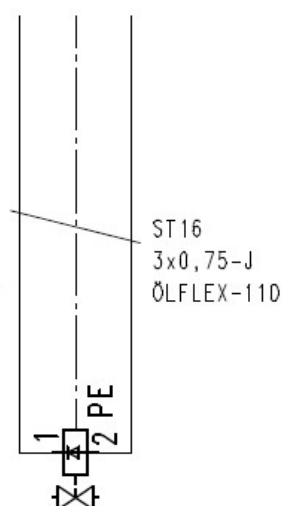
-B1 Bearing temperature probe, coupling housing (optional)



-B2 Bearing temperature probe, cover housing (optional)



-Y1 Valve, air purged bearing (optional)



-Y2 Valve, rapper (optional)

Tab. 6-2 Wiring diagram: Use in potentially explosive atmospheres

CAUTION

Integrate safety switch into safety circuit.

- ▶ Observe performance level!
- ▶ According to DIN EN ISO 13849-1 at least performance level PLc.

The screener drive may only run provided both safety limit switches are closed and the bearing temperature control (temperature probe –B1 and –B2), where installed, does not report any increased bearing temperature.

Standard version safety limit switch (–S1 and –S2): 1xNC / 1xNO (ATEX zone 22)

6.3 Bearing temperature control

Processing of products with an ignition temperature of less than 300 [°C] is only permitted if a bearing temperature control system is installed.

The bearings on the drive side (screw) and the cover side (rotor) are each fitted with a temperature probe.

If deployed in a zone, the analysis must be carried out by a suitable device (optional). Analysis of the frequency converter is not permitted!



WARNING

Explosion hazard if an unsuitable evaluating unit is used!

Under certain circumstances, a dust explosion can occur if an unsuitable evaluating unit is used.

- ▶ The drive must be monitored via a suitable evaluating unit and be switched off when the upper switch point is reached.
- ▶ Shutdown must take place in agreement with the technical data of the drive unit and of the resistance thermometer.

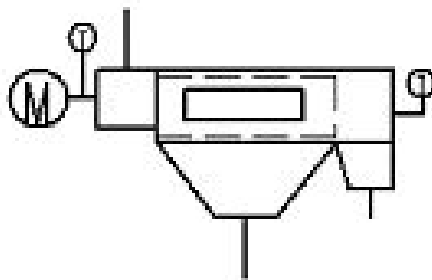


Fig. 6-2 Screener, Type E650

(M) Motor

(T) Temperature probe

NOTICE

The following conditions must be met when the switch off point is reached:

- ▶ The machine must shut down.
- ▶ The operating personnel must be informed.
- ▶ Machine does not start automatically if the switch off temperature does not reach the lower limit (upper set point, → 4 "Technical specifications").

6.4 Compressed air installation for bearing purging

Compressed air installation provided by the customer

- Water separator with automatic drain (customer provided)
 - Only required if there is no oil and water-free compressed air available.
 - Connection to compressor min. R1/2".
- Pressure switch (customer provided)
 - Stops the machine switching on if the compressed air is not up to pressure.
 - Switches the machine off if the compressed air is not up to pressure.
- Locking coupling (optional)
 - For isolating the compressed air installation from the compressed air network during maintenance work.
 - Connection → 4 "Technical specifications".

Compressed air installation on the machine (opt.)

- Solenoid valve
 - Required network supply and connection → 4 "Technical specifications".
 - Connect the solenoid valve so that the bearings with air purged shaft seals are activated when the machine is switched on.
- Pressure air control set at factory.
- Throttle valve(s) set at factory.
- Compressed air and air volume for each machine → 4 "Technical specifications".

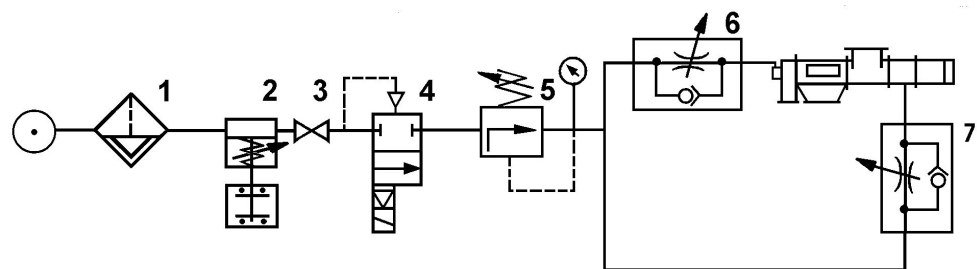


Fig. 6-3 Compressed air installation

- (1) Water separator (customer provided)
- (2) Pressure switch (customer provided)
- (3) Locking coupling (optional)
- (4) Solenoid valve
- (5) Pressure air control
- (6) Throttle valve (not with screener type C...)
- (7) Throttle valve (not with screener type FA...)

Subsequent installation of compressed air system

When subsequently installing the compressed air installation, the compressed air can only be adjusted by means of throttle valve(s) provided by the screener manufacturer. Proceed as follows:

- Open solenoid valve.
- Set the pressure air control (setting on the pressure air control → 4 "Technical specifications").
- Screw the throttle valve(s) into the bearing point(s), close it/them completely and then open it/them again until the required air volume flows at each bearing point. Measure the flow rate using a flowmeter.
Air volume at each bearing point → 4 "Technical specifications".
- Secure throttle valve(s) with sealing compound.

6.5 Earthing

Spark discharge is avoided by permanently earthing all conductive parts. Earthing of all conductive components is therefore essential.



DANGER

Electric shock / danger of explosion

If the devices are not correctly earthed, parts can be live.
Static charge can ignite potentially explosive atmospheres.

► Earth the machine correctly!



Screener

There is a marked central earthing connection on each screener. Earthing of the machine can be guaranteed by a conductive connection with the downstream system.

1. Attach one end of the earthing lead to the earth terminal.
2. Guide the other end of the earthing lead to an equipotential bonding point.
3. Additionally connect the screener electrically conductive to the upstream and downstream device.



Fig. 6-4 Cutout: Example of marked central earthing connection

Screen basket



DANGER

Danger of explosion!

Static charges can cause a potentially explosive atmosphere to ignite.

► Carefully earth screener and screen basket!

If the screeners are painted, an earthing terminal is mounted on the screener inspection hatch. Direct contact with the screen basket is made by means of a grounding strap → Fig. 6-5 "Earthing, standard screen basket (2-part, three screen rings)".

1. Secure one end of the earthing lead to the terminal (flexible grounding cable min. 10 [mm²], provided by customer).
2. Guide the other end of the earthing lead to an equipotential bonding point.

**Three-part screen basket (four screen rings)**

As part of the procedure to subsequently convert the screen basket into a three-part screen basket, an additional grounding strap must be installed to the right or left of the grounding strap already fitted in the area of the inspection hatch. Conductive contact must always be ensured between one of the middle screen rings and one of the grounding straps → Fig. 6-6 "Earthing, special screen basket (3-part, four screen rings)".

Screen cylinder without middle screen ring

The grounding strap installed at the inspection hatch must be widened (90 [mm]) when a screen cylinder without a middle screen ring is used → Fig. 6-7 "Earthing, screen cylinder without middle screen ring".

If screen basket earthing has not yet been implemented, contact the screener manufacturer.

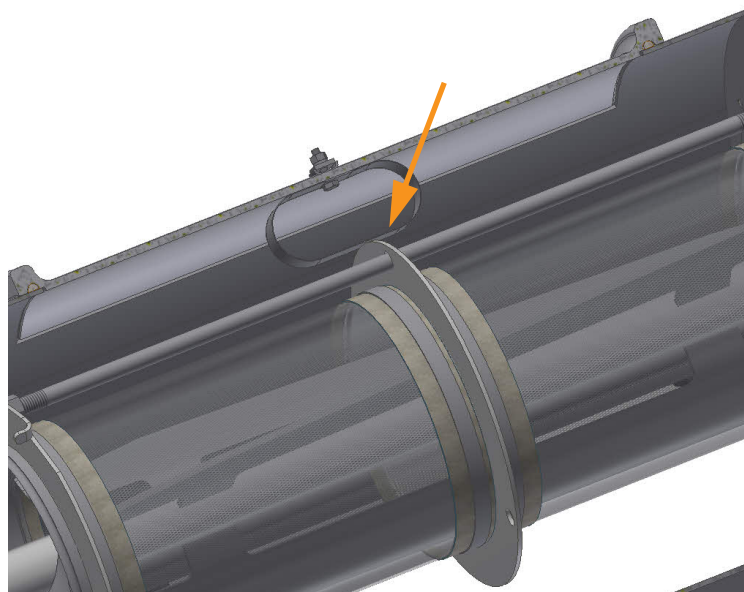


Fig. 6-5 Earthing, standard screen basket (2-part, three screen rings)

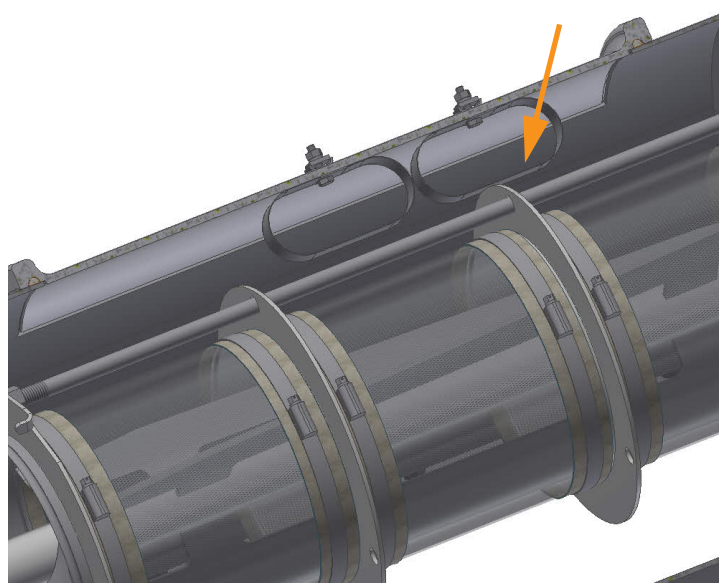


Fig. 6-6 Earthing, special screen basket (3-part, four screen rings)

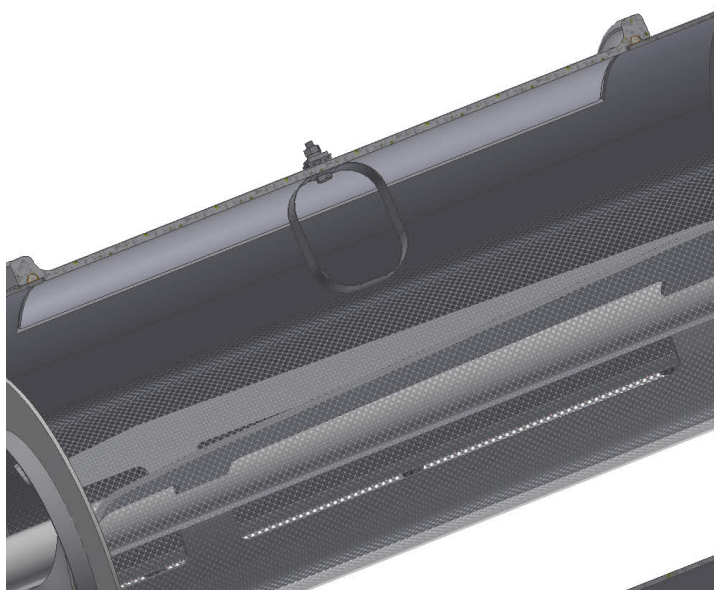


Fig. 6-7 Earthing, screen cylinder without middle screen ring

Drive (motor)

The motor is earthed via the connection cable.



On units with an additional earth connection, it is necessary to check at this earth connection whether an adequate earth connection has already been established by mounting the unit on the AZO component (leakage resistance $\leq 10 \Omega$).

If the value $> 10 \Omega$, a corresponding earth connection / a corresponding equipotential bonding point must be established.

Reinforced baffle plate with metal reinforcement (optional)

Earthing of metal plates must always be ensured!

The baffle plate is earthed by means of a grounding strap.

Regularly check earthing.

Earthing interval

As part of the initial installation procedure, earthing is to be verified in accordance with the earthing protocol for all screener components as well as for the screen basket or replacement screen basket. Additionally, routine measurements must be carried out annually.



According to the German BGR¹ a component is earthed when its resistance is less than 10^6 [Ω].

When disassembling a conductive component (e.g. replacing the screen fabric), ensure correct earthing on reinstallation. See also chapter 9.2.15

The reference point for all measurements is the central earthing connection.

Other check points are:

- Screening basket (all screening rings)
- Rotor/screw shaft
- Screener housing/inspection hatch on painted machines
- Product inlet
- Bearing housing
- Coupling housing
- Drive (motor)
- Motor cover, drive end (optional)
- Compressed air fittings (optional)
- Frame (optional)

6.6 Use in pneumatic conveying systems



Special versions of screeners are available for use in delivery.

The screener should be installed near the product transfer because of the low delivery speed.

6.7 Commissioning

Observe device-specific safety information in the individual chapters.

The connection data given on the type identification plate must agree with the customer provided connections.

Coordinate the machine commissioning with the commissioning of the entire system.

Depending on the conveyed product and medium, observe the corresponding safety data sheets and the information provided on potential hazards!

Electrical safety devices

Check operation of the safety switches with the rotor removed.

The inspection hatch and cover/screener housing are each protected by a safety device.

When the cover in question is opened, the machine must shut down, i.e. the machine must be isolated from the power supply and depressurised.

¹ (Rules of the Employer's Liability Insurance Association)

Motor (drive)

Note the direction of rotation shown by the arrow. Switch the phases around if necessary.

**DANGER****Electric shock**

When working on the electrical system, components and electrical cables can be live.

- Before working on the electrical system, switch off the main switch and ensure that it cannot be switched again by unauthorized persons.
-

Screen output

Find out the maximum screen output when commissioning the machine. At the same time, adjust the supplying dosing element so that overfilling of the screener is excluded.

Take into account the specification (e.g. maximum speed) regarding dust explosion protection!

**Compressed air installation (optional)**

If the machine is designed with a compressed air seal, this seal must always be flushed with compressed air during operation of the machine.

Bearing temperature control (optional)

Ensure that you analyse the bearing temperature control system.

Conditions when the switch off point is reached → 6.3 "Bearing temperature control".

6.8 Converting the machine from shaft seal to pneumatic seal or replacing complete pneumatic seal

Mechanical installation

Replace the old cover bearing assemblies (version SI) on the cover side and drive side of the screener by the new bearing assemblies (version PL).

- Removing/installing the complete bearing assembly
Cover side: → 9.2.7 "Replacing bearing (cover side)"
Drive side: → 9.2.6 "Replacing shaft seals (drive side)"
- Earthing: → 6.5 "Earthing"
- Compressed air installation: → 6.4 "Compressed air installation for bearing purging"



Before commissioning the screener with product, "run in" the screener without product and screen basket → "Start-up without product".

Start-up without product



WARNING

Filtered product contamination by abrasion from bearing assembly on cover side.

When operating the screener with completely new bearing assembly, abrasion occurs in the bearing assembly during the initial commissioning.

- ▶ Before feeding in product after completely replacing bearings with air purged shaft seals, the new cover bearing assembly must first be allowed to "run in" without product infeed and screen basket.
- ▶ After running in the machine, remove, disassemble and clean the cover bearing assembly.
- ▶ The machine may be operated with product only after it has been "run in" and the bearing assembly on the cover side cleaned.

- Allow bearing assembly to run in.
After correctly assembling the new bearing assemblies on the cover side and drive side of the screener, the screener should be run without product and screen basket for approx. 30 minutes.
If at the end of the running in period a noticeable noise can still be heard extend the running-in period by a further 30 minutes. Repeat this procedure until noticeable running noise can no longer be heard.
- After successfully running in the machine, remove and dismantle the bearing assembly on the cover side. Removal of complete bearing assembly → 9.2.7 "Replacing bearing (cover side)"
- Clean all parts of the cover bearing assembly → 9.4.2 "Cleaning the screener".
- Install bearing assembly on cover side. Installation of complete bearing assembly → 9.2.7 "Replacing bearing (cover side)"
- Start-up with product → 6.7 "Commissioning"

7 Function

7.1 Procedure

The dosed product is fed via a product inlet into the inlet housing.

The transport screw of the rotor transports the product from the inlet housing to the screener housing.

In the screener housing, the fines of the product are gently swirled through the screen by fluidizing bars and discharged out of the fin-product outlet. The components that are larger than the mesh size of the screen are routed past the baffle plate to the coarse-product outlet.

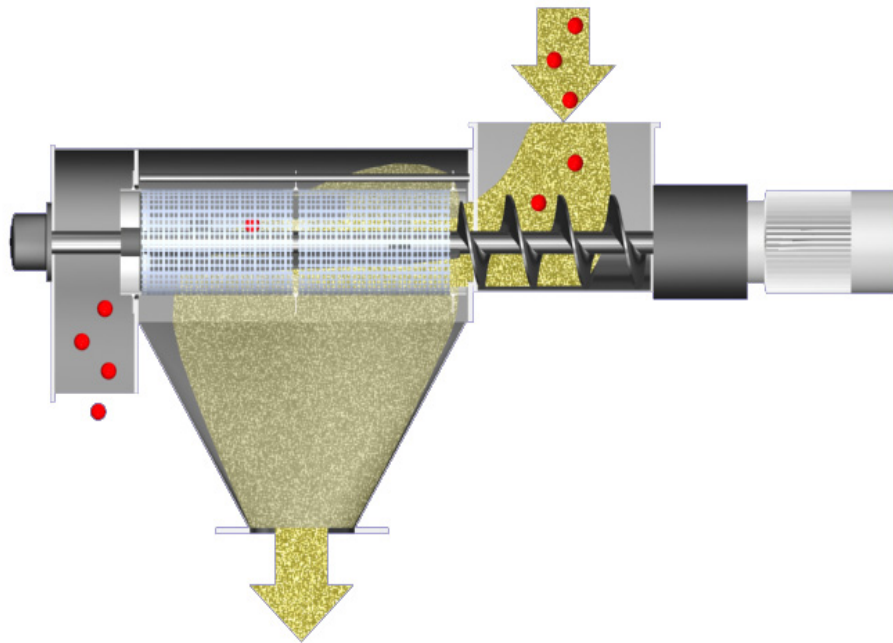


Fig. 7-1 Functional diagram of E-screener

7.2 Function of individual components

Electrical safety device (safety switch)

The electrical safety device switches off the device when opening the corresponding cover and this prevents injuries due to rotating components.

Drive (Motor)

The drive unit turns the rotor with the transport screw and agitator strips at a constant speed.

Rotor with transport screw and agitator strips

The transport screw of the rotor transports the product to be screened from the inlet housing to the screener housing.

The agitator strips carefully pass the product through the screen and transport the coarse product in the direction of the coarse-product outlet.

Baffle plate

Slows down the flow of coarse material before it flows passed the baffle plate into the coarse product outlet.

Reduces the discharge of fine product from the coarse-product outlet.

Screen basket

A screen basket frame with a flexible screen fabric or a screen cylinder made of perforated plate is available as a screen basket.

Flexible screen fabric

The screen fabric holds the coarse product back depending on mesh size.

The screen fabric is fastened to support rings, can vibrate freely and primarily cleans itself in this way.

Flexible screen fabrics can absorb slight knocks and are therefore largely unaffected by smaller foreign particles.



Screen fabric made of nylon that is suitable for food is marked with an orange label.

Screen fabric made of carbon is not approved for screening food!

We accept no liability for any consequential damage (e.g. metal parts in product from defective screen fabric) when wire mesh screen fabrics are used in connection with foodstuffs.

Screen cylinder (optional)

Instead of using the screen frame with a flexible screen fabric, the product can also be screened using a screen cylinder.

Product inlet

The product passes through the product inlet into the screener. The supply from the primary system must be metered out.

Fine-product outlet

The screened products reaches the next system through the fine-product outlet.

Coarse product outlet/coarse product hopper (optional)

The coarse material of the product is separated out of the unit at the coarse material outlet.

The coarse material can be collected in the coarse-product container provided.



In production areas where approval for foodstuffs is required, the collected product may only be put into screener circulation if the coarse product hopper has approval for food-stuffs!

Air purged bearing (optional)

When the screener is designed with a compressed air seal, an air purged bearing device is connected to the bearing points of the rotor.

The air purged bearing is supplied with compressed air and strengthens the sealing effect at the bearing to the product chamber. In addition, the accumulation of heat by the motor and bearing is minimized.

NOTICE

- Screeners with compressed air seal may only be operated if compressed air is supplied to the bearings of the screener during operation.

Bearing temperature control (optional)

One temperature sensor is installed respectively at both bearing points of the rotor so that the bearing temperature there can be monitored.

Extractor for bearing cover (optional)

To make removal of the screen basket easier.

See chapter 3.2.4 .

8 Operation

Requirements for operating

The following conditions must be met before working with the system:

- Device must be completely installed
- Correct commissioning of the device and the control system
- Product is made available

The operating personnel must also ensure that the above points are in order!

Operator/operating personnel

Operation only by instructed personnel.

Personal protective equipment

The operator:

- must inform the operator(s) about possible health hazards regarding the product to be discharged.
- must make available as required legally prescribed personal protection equipment (protective mask, protective clothing, etc.).
- must inform themselves of any applicable national, legally required regulations and monitor compliance.

Control system (optional)

See separate Controller Operating Instructions

Feeding/switching off screener

Switch on the machine first for feeding.



Some products tend to shoot straight through the machine when starting up the machine and when filling an empty inlet housing.

To prevent the product from shooting through, add the product to be screened to the machine *evenly* (e.g. with screw conveyors, strand conveyors, etc.)!

Impulse-type supplying of the product can lead to the overfilling of the screen basket. An overfilling of the screen basket can lead to a high level of fine product in the coarse product

When using it with a pneumatic conveying system, keep the speed of conveying as low as possible in the area of the machine (dependent on product, wire cross-section, product load).

To reduce the speed of conveying, e.g. increase the diameter of the conveying line upstream of the machine or fit a connecting piece (e.g. baffle plate) upstream of the product inlet of the machine.

First stop the product feeding when shutting down the machine.

Coarse product hopper (optional)

If the coarse product is not automatically guided away, regularly check the fill level in the coarse product hopper and empty when required.

To empty the coarse product hopper, the engine must be turned off and depressurized.

Restart after safety stop

After a safety stop, when restarting the machine, the product must be delivered out of the machine *without adding any more*. Once the machine is empty, add the product again by metering it into the machine.

8.1 System failure

Electric energy supply failure

The machine becomes stationary.

The product is no longer screened.

There is a risk that the machine is overfilled and that the screen will tear.

1. Stop product feed immediately.
2. Check the downstream process.
3. Inspect the machine and clean it if necessary.
4. Check the screen for damage and clean it if necessary.
Replace damaged screen.
5. Check for deposits at the product inlet, and dismantle and clean it if necessary.

Pneumatic energy supply failure

The machine gets overloaded and becomes stationary.

1. Stop product feed immediately.
2. Check the downstream process.
3. Check the bearing for product ingress, dismantle and clean if necessary.

9 Maintenance / Cleaning



WARNING

Danger of accidents caused by untrained personnel!

The chapter on Maintenance is intended for specialist personnel only. The operations described in this chapter must be carried out by specialist personnel only.

- ▶ All operations must only be carried out by trained individuals.
- ▶ Keep unqualified individuals away from the work areas.

Skilled personnel

A person with specialist training, knowledge and experience as well as knowledge of the relevant standards which will allow them to assess the work assigned to them and to recognize potential hazards. (Definition adapted from EN 60204-1)

Before cleaning, repair and maintenance work:

- Secure platforms and scaffoldings must be erected on the device/machine to ensure safety.
- Use lifting gear designed to correspond to the weight of spare parts must be used.
- The centre of gravity of the parts to be replaced must be taken into account.
- Observe the product safety data sheets and the specified hazard information. The use of personal protection equipment may be made compulsory based on the measured data!
- The following shutdown procedures must be complied with.

Shutdown procedures:

- Disconnect system electrical power
 - Turn off main switch.
 - Check whether the system is disconnected from the power supply.
 - Ensure that the main switch cannot be switched on again.
 - Put an information sign on the main switch.
- Compressed air supply (optional)
 - Close the shut off valve in the supply line and secure it against being switched on again.
 - Put the machine into a depressurized state (vent the supply line).
 - Disconnect vacuum line (optional).
 - Switch off/close any other supply lines (e.g. water, gas, etc.).

After cleaning, repair and maintenance work:

- All components/safety devices must be reinstalled in the correct position before the machine is started up.
- that the earth connection where the work has been carried out is tightly secured and uninterrupted.

**WARNING****Risk of injury due to rotor shaft slowing to a stop!**

When a screen basket is not fitted or fitted incorrectly as well as with large mesh sizes, the rotor shaft can be accessed if the machine is open.

- ▶ Caution: the rotor shaft may still be turning when opening the machine.
 - ▶ Carry out work on the engine only after standstill of the rotor shaft.
-

**WARNING****heavy load due to weight of the components themselves!**

In view of their weight, special procedures are required when removing/installing individual components.

- ▶ The operating company must ensure safe working procedures for lifting, carrying, holding and setting down heavy components.
 - ▶ The physical ability and health of the personnel must be taken into account when assigning tasks.
 - ▶ Employ suitable measures to avoid dangerous manual handling of loads (e.g. work carried out by 2 persons and/or with suitable lifting gear).
 - ▶ Comply with national regulations on lifting loads.
-

**CAUTION****Risk of injury due to components with sharp edges!**

After longer periods of operation, the screw blades and fluidizing bars can have sharp edges due to wear.

- ▶ Wear suitable gloves as protection!
-

**CAUTION****Risk of burns/hot surface!**

High surface temperatures can occur on the drive unit.
Contact with the surfaces can cause burn injuries.

- ▶ Avoid contact with the hot surface or wear suitable gloves!
-

9.1 Maintenance schedule

Component	Maintenance intervals (*)							Task	Chapter	Spare part (optional)	Special means (optional)
	T	W	Z	M	V	H	Others				
Screen basket	•						and with every cleaning as well as for an insufficient screen result	Checking screen basket Removing screen basket Removing screen fabric Installing new screen fabric Installing screen basket	9.2.1	Screen fabric, or screen cylinder	---
Coarse product hopper (optional)	•							Checking the fill level of coarse product hopper (optionally)	9.2.4	---	---
Baffle plate							1,000 [Bh] and each time the screen basket is dismantled	Checking baffle plate Replacing baffle plate	9.2.3	Baffle plate	---
Control flap, product inlet, product outlet, Cover housing, etc.					•			Checking for tightness	9.2.4	Gasket	---
Shaft seals (cover side)							• and if damaged or when changing the bearings	Removing/installing bearing (cover side)	9.2.7	Shaft seals	---
Shaft seals (drive side)							• and if damaged or when changing the bearings	Removing/installing bearing (drive side)	9.2.8	Shaft seals	---
Bearing (cover side)							annually or if damaged and the end of the working life is reached	Removing cover housing Removing bearing assembly Installing bearing assembly Installing cover housing	9.2.7	Bearing, shaft seals (always replace shaft seals at the same time as changing the bearings!)	---

9 | Maintenance / Cleaning

Component	Maintenance intervals (*)							Task	Chapter	Spare part (optional)	Special means (optional)
	T	W	Z	M	V	H	Others				
Bearing (drive side)							annually or if damaged and the end of the working life is reached	Remove screen basket Remove rotor To remove motor: direct drive, type B1 To remove motor: direct drive, type C1 Removing bearing assembly B1, C1 Installing the bearing assembly/motor (drive side) Installing motor Install rotor Install screen basket	9.2.8	Bearing, shaft seals (always replace shaft seals at the same time as changing the bearings)	---
Bushings and shaft seals							<ul style="list-style-type: none"> or after every bearing replacement/ shaft seal replacement 	Lubricating the bushings and shaft seals	9.2.9	---	Lubricant (see Technical Data)
Mounting for rotor, rotor, screw blades, agitator strips							<ul style="list-style-type: none"> or after 2,500 [Bh] and with maintenance tasks as well as after longer periods of operation with abrasive products 	Mounting for rotor Checking rotor for imbalance, damage, deformation and burr formation Remove rotor Installing rotor	9.2.10	Rotor	Hexagonal wrench (width across flats 6), right angle grinder, belt sander
Drive (motor)							5,000 [Bh] and at least once a year as required or according to the operation manual of the drive (motor)	Optical visual inspection	9.2.11	---	Suitable industrial vacuum cleaner



9 | Maintenance / Cleaning

Component	Maintenance intervals (*)							Task	Chapter	Spare part (optional)	Special means (optional)
	T	W	Z	M	V	H	Others				
Drive (motor)							when the end of the working life is reached	To replace drive unit, type B1	9.2.11	Drive	---
Drive (motor)							when the end of the working life is reached	To replace drive unit, type C1	9.2.11	Drive	Suitable torque wrench
Attachments (e.g. electrical components)							according to the manufacturer specifications, at least once a year	see separate manufacturer's operating instructions.	9.2.14	---	as specified by the manufacturer
Machine/device							annually and after dismantling the machine / device	Check earthing by measuring (report)	9.2.15	---	suitable, electric measuring device

(*) T=daily, W=weekly, Z=every two weeks, M=monthly, V=every three months, H=every six months, Others: [Bh]= operating hours

9.2 Maintenance jobs

9.2.1 Checking/replacing screen fabric

Component	Screen basket
Interval	daily and with every cleaning as well as for an insufficient screen result
Spare part (optional)	Screen fabric, or screen cylinder
Special means (optional)	---
Task	<p>Checking screen basket</p> <hr/> <p> In the case of a screen break, coarse product and/or foreign matter can pass through the screen unhindered. The safety function is not longer guaranteed!</p> <hr/> <ol style="list-style-type: none"> 1. Open inspection hatch. The machine must shut down using the safety device! 2. After the machine comes to a standstill, check the screen basket by turning the whole circumference. 3. If necessary, loosen the fastening elements on the cover housing/screener housing. 4. Remove foreign matter from the screen. 5. If damaged, replace the screen fabric/screen cylinder (→ "Removing screen basket"). 6. After checking the undamaged screen basket, turn it back into its home position again. The rod with the contact spring and the seam of the screen fabric below it is located at the top and right of the stop (viewed from cover end). <hr/> <p> This reduces the accumulation of product on the seam of the screen fabric.</p> <hr/> <ol style="list-style-type: none"> 7. Retighten the previously loosened fastening elements on the cover housing/screener housing.

Task***Removing screen basket***

1. Switch off device.
2. Disconnect the compressed air supply if the version of the screener has the compressed air seal (optional).
3. Open the inspection hatch, this makes the inside of the screen housing more accessible.
4. Release fastening elements on cover housing.
5. Remove the cover housing with bearing assembly.
6. Remove screen retainer cover.
7. Pull the screen basket out of the screener housing.

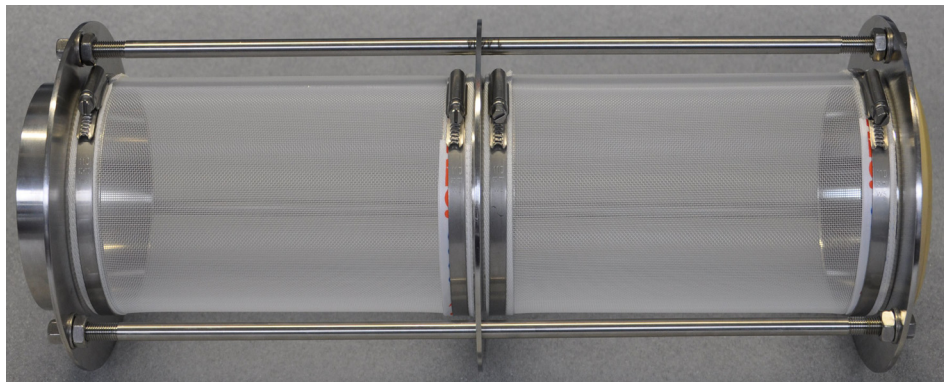


Fig. 9-1 Complete screen basket

Task***Removing screen fabric***

1. Loosen hose clamps on the screening tube.

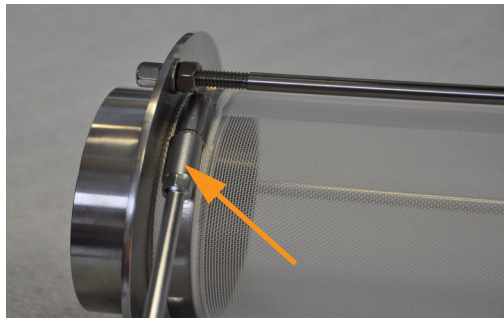


Fig. 9-2 Crop of how screen fabric is fastened

2. Remove screen fabric.

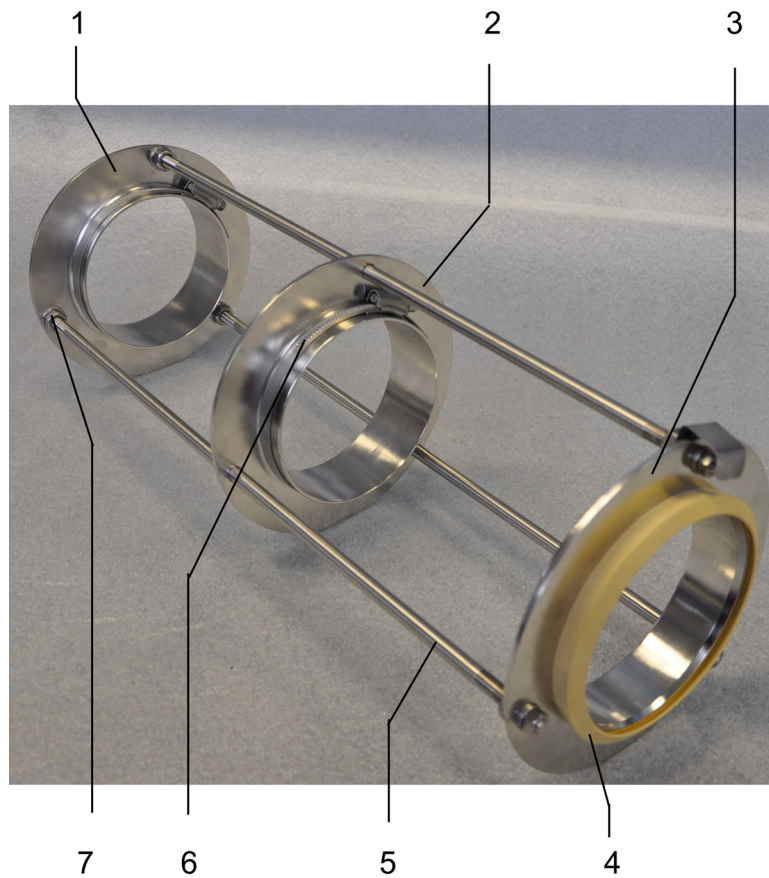


Fig. 9-3 Screen basket frame without screen fabric

- (1) Support ring, front
- (2) Support ring, middle
- (3) Support ring, rear
- (4) Gasket (optional)
- (5) Screen rod
- (6) Hose clip
- (7) Nuts

- Turn back the nut on every screen rod of the front support ring.

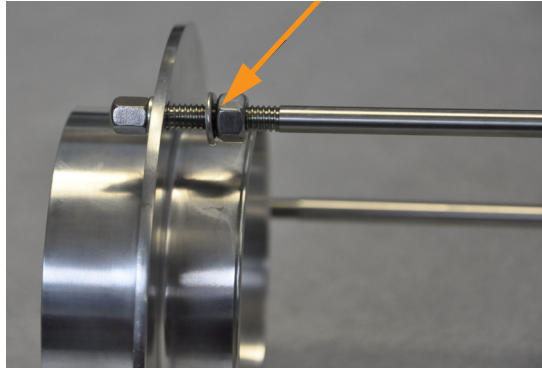


Fig. 9-4 Undo nuts

Task



Installing new screen fabric

Install joint of longitudinal seam in direction of machine rotation.

The arrow on the screening tube must point in the rotational direction of the rotor.

- Fit new screening tube onto front support ring.

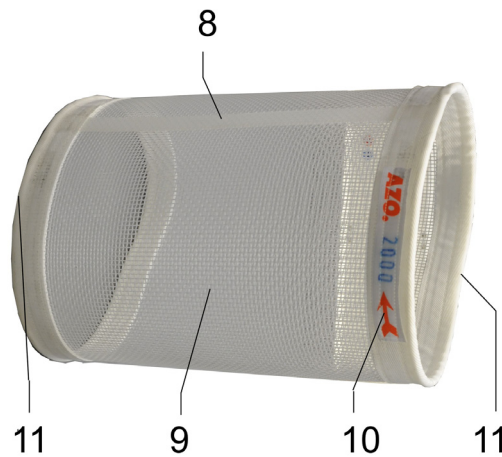


Fig. 9-5 Screen fabric

- 8 Joint of longitudinal seam
- 9 Screener tube
- 10 Arrow (direction of rotor rotation)
- 11 Sewn-in string

2. Place the longitudinal seam of the new screening tube under a screen rod.
Version with a contact spring for screen frame grounding: place the longitudinal seam of the new screening tube under the rod with the contact spring.

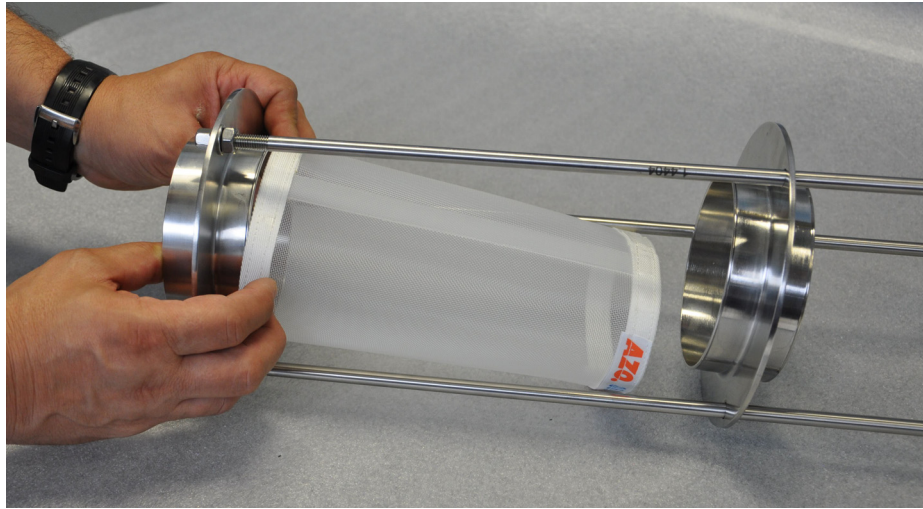


Fig. 9-6 Fitting screen fabric onto front support ring

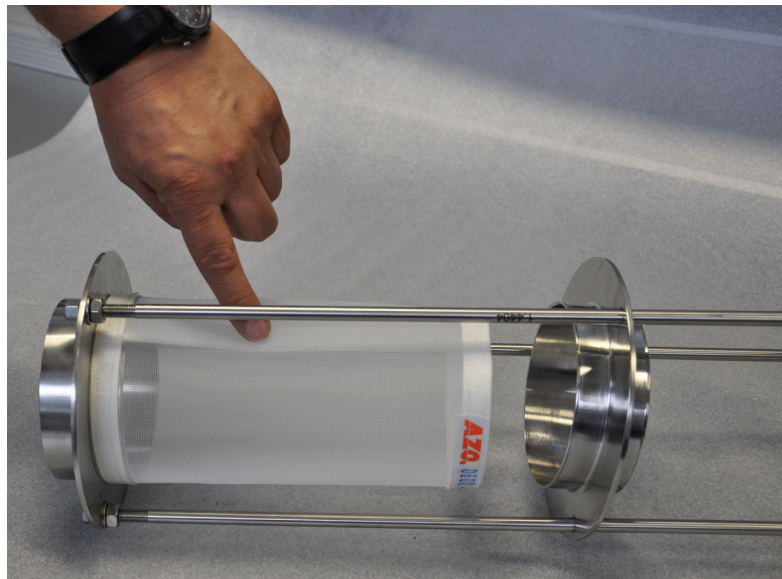


Fig. 9-7 Position of the longitudinal under a screen rod

3. Secure correctly fitted screening tube with hose clamp on support ring. Tighten hose clamp with suitable tool.



In flexible fabrics, a cord is sewn into the edge of the screen fabric. So that the screen fabric does not slip off the support ring, the cord of the screening tube must lie behind the hose clamp during installation.

The screening tube must lie flush on the inside of the support ring!

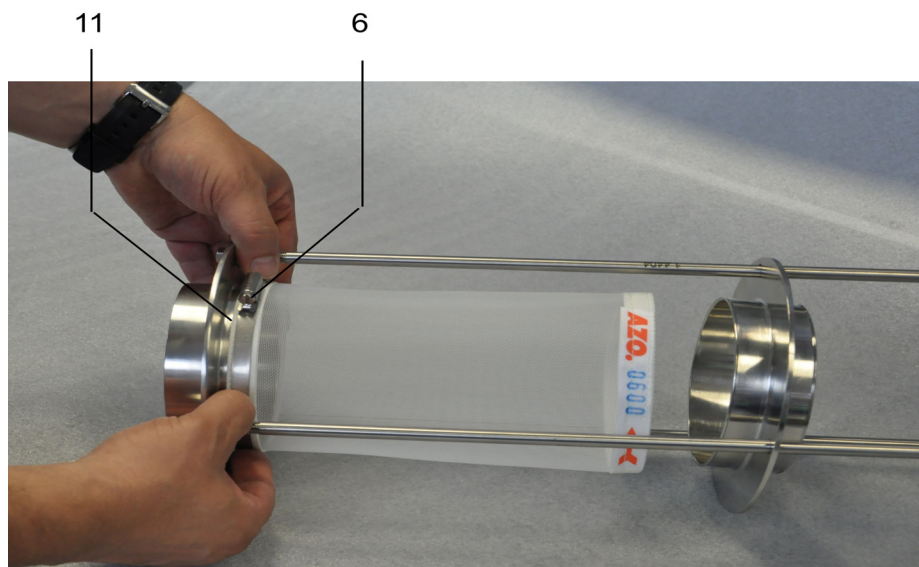


Fig. 9-8 Securing screening tube with hose clamp

6 Hose clamp

11 Sewn-in string

4. Fasten the screening tube on the middle support ring as previously described.
5. The second screening tube is fitted in the same way as the first.

6. Retighten the nuts to stretch the flexible screen fabric. Do not stretch the screen fabric too tightly, → Fig. 9-10 "To check screen fabric"!

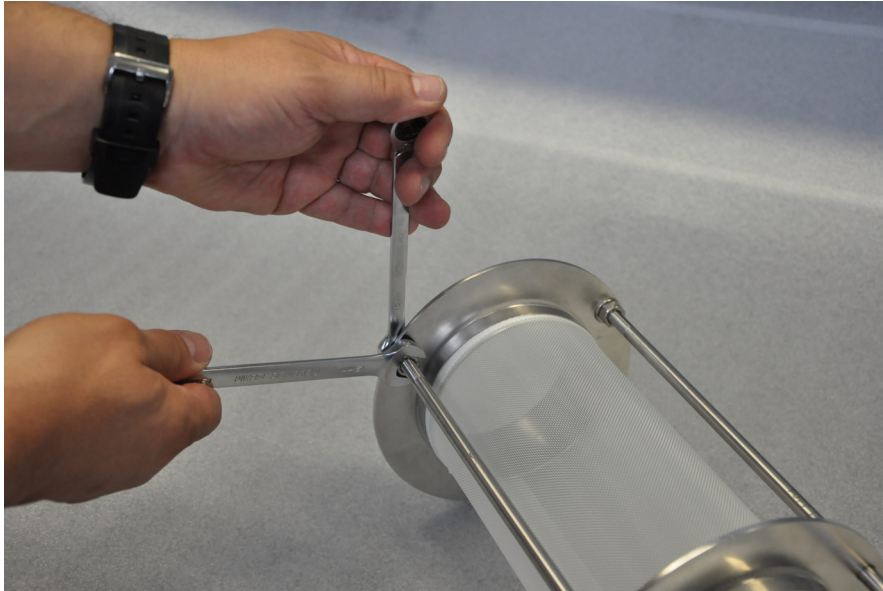



Fig. 9-9 Stretching flexible screen fabric


7. Check screen fabric manually.
 - a) When pressed lightly with the fingers, the flexible mesh should give by approx. 2-3 [mm].
 - b) Do not over-tension mesh otherwise the mesh could tear!
 - c) If a screen becomes clogged with material, slacken off the fabric by loosening the hose clamps. Retighten hose clamps.



Fig. 9-10 To check screen fabric

Task	Installing screen basket
	<ol style="list-style-type: none"> 1. The screen basket is installed in reverse order of removal → "Removing screen basket". 2. Push the complete screen basket, with the contact spring (optional) facing to the front, over the rotor and behind the centring ring into the screener housing.
	Do not forget the seal on the screen basket during installation.
	<ol style="list-style-type: none"> 3. The rod with the contact spring and the seam of the screen fabric below it is located at the top and right of the stop (viewed from cover end). 4. For earthing, see chapter 6.5 .

9.2.2 Checking coarse product hopper (optional)

Component	Coarse product hopper (optional)
Interval	daily
Spare part (optional)	---
Special means (optional)	---
Task	Checking the fill level of coarse product hopper (optionally)
	<ol style="list-style-type: none"> 1. Make a visual inspection. 2. If necessary, empty full coarse product hopper.
	<p>The screener must be turned off and pressureless to empty the coarse product hopper! In production areas where approval for foodstuffs is required, the collected product may only be put into product circulation if the coarse product hopper has approval for foodstuffs!</p>
	<ol style="list-style-type: none"> 3. Fit emptied coarse product hopper again properly.

9.2.3 Checking/replacing baffle plate

Component	Baffle plate
Interval	1,000 [Bh] and each time the screen basket is dismantled
Spare part (optional)	Baffle plate
Special means (optional)	---
Task	Checking baffle plate
	<ol style="list-style-type: none"> 1. Remove screen basket → 9.2.1 "Checking/replacing screen fabric". 2. Check baffle plate for damage and wear (visual inspection!). 3. Replace the baffle plate if damaged or worn → "Replacing baffle plate". 4. Reassemble in reversed order.

Task

Replacing baffle plate

1. Remove rotor.
Removing rotor → 9.2.5 "Replacing shaft seals (cover side)".
2. Pull baffle plate off the rotor end.
3. Push the new baffle plate onto the rotor end. Ensure the feather key is positioned correctly.
4. In case of baffle plates with metal reinforcements, earthing of the screwed-on metal plates must always be ensured (contact of grounding strap to the rotor).

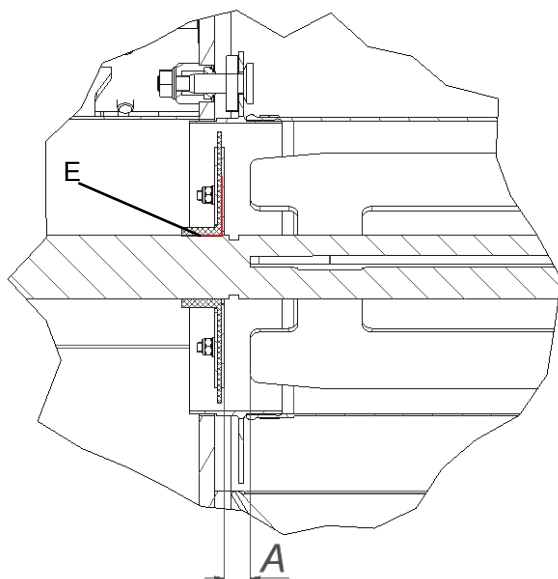


Fig. 9-11 Example: Detail - installation position of baffle plate

A = 10 [mm] (distance to the agitator strips)

E = Grounding strap

5. Install rotor → 9.2.5 "Replacing shaft seals (cover side)".
6. Install screen basket → 9.2.1 "Checking/replacing screen fabric".

9.2.4 Checking sealing points

Component Control flap, product inlet, product outlet,

Interval quarterly

Spare part (optional) Gasket

Special means (optional) ---

Task

Checking for tightness

1. Visually inspect connection points (control flap, product inlet, product outlet, cover housing, etc.)
2. If necessary, renew defective seals at connection points and/or tighten bolted connections.

9.2.5 Replacing shaft seals (cover side)

Component	Shaft seals (cover side)
Interval	half-yearly and if damaged or when changing the bearings
Spare part (optional)	Shaft seals
Special means (optional)	---
Task	<i>Removing/installing bearing (cover side)</i>
	1. See chapter 9.2.7 .

9.2.6 Replacing shaft seals (drive side)

Component	Shaft seals (drive side)
Interval	half-yearly and if damaged or when changing the bearings
Spare part (optional)	Shaft seals
Special means (optional)	---
Task	<i>Removing/installing bearing (drive side)</i>
	1. See chapter 9.2.8 .

9.2.7 Replacing bearing (cover side)

Component	Bearing (cover side)
Interval	annually or if damaged and the end of the working life is reached
Spare part (optional)	Bearing, shaft seals (always replace shaft seals at the same time as changing the bearings!)
Special means (optional)	---
Task	<i>Removing cover housing</i>



The inside of the screen housing is more easily accessed after opening the inspection hatch.

1. Disconnect the compressed air supply if version with compressed air seal is used (optional).

2. Remove the fastening elements from the cover housing/screener housing.

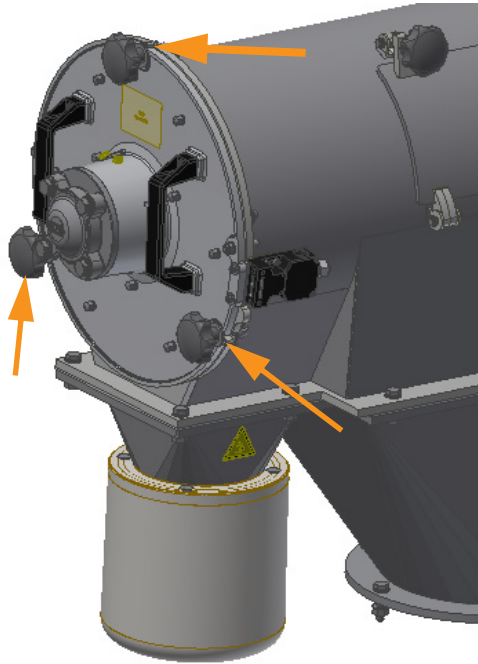


Fig. 9-12 Opening the fastening element of the cover housing

3. Remove the complete cover housing with bearing assembly.

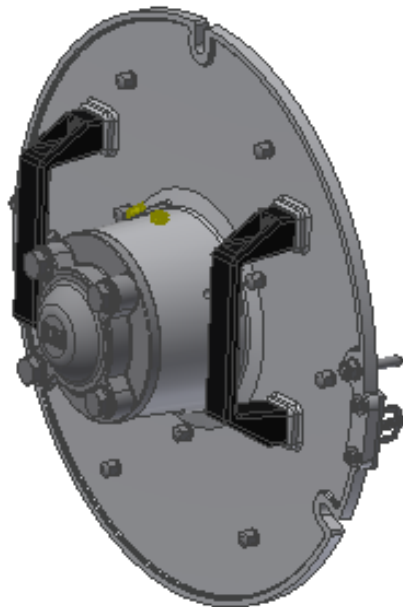


Fig. 9-13 Cover housing, complete

Task***Removing bearing assembly***

1. Remove the two bolts for fastening the safety cover.

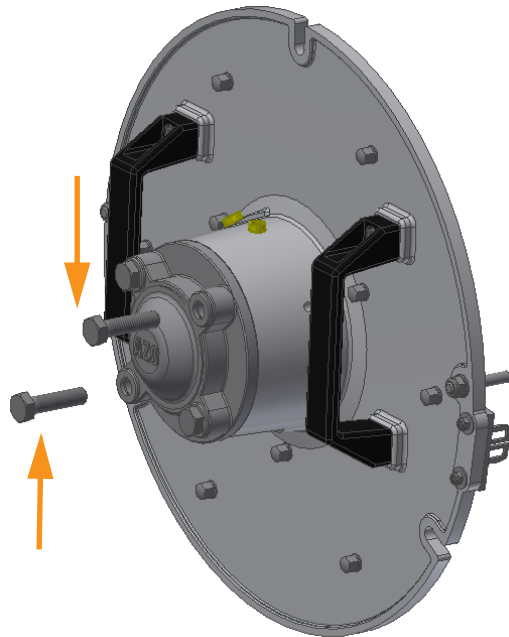


Fig. 9-14 Cover housing: Removing bolts for fastening safety cover

2. Remove the protective cover.

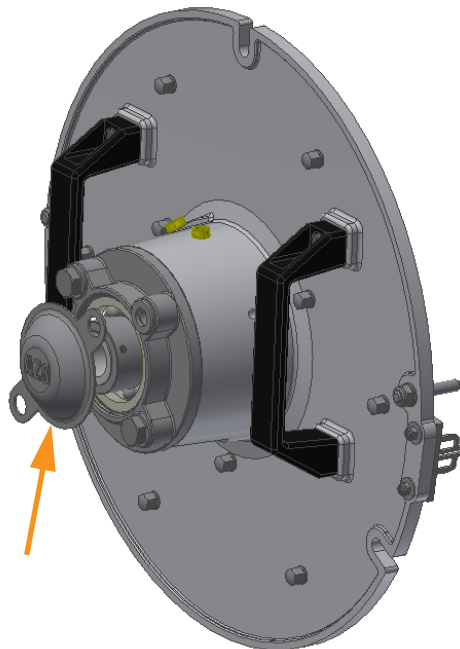


Fig. 9-15 Cover housing: Removing safety cover

3. Remove the setscrews on the bushing.

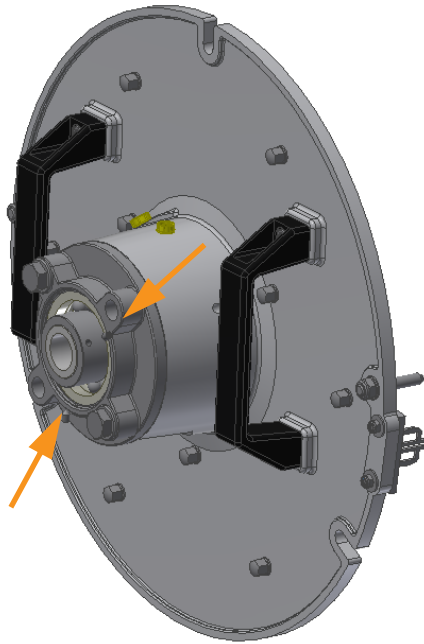


Fig. 9-16 Cover housing: Setscrews at bushing removed

4. Push bushing (6, Fig. 9-18) out of bearing.
5. Remove ejection plate (2, Fig. 9-18) from housing cover(accessed from below through opening in bearing housing).
6. Remove the two remaining bolts on the bearing/cover housing.

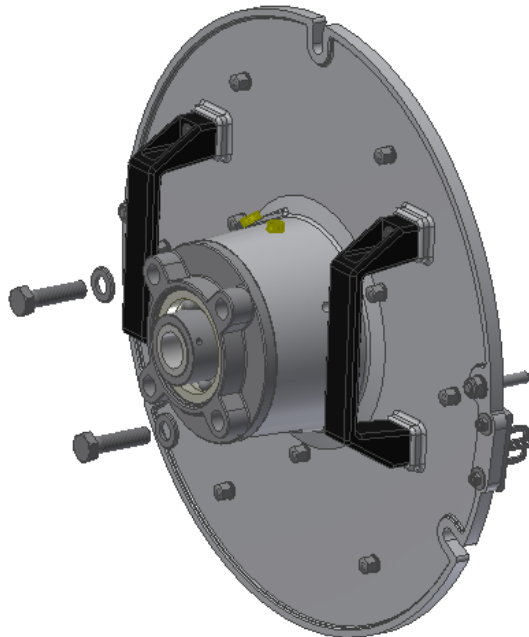


Fig. 9-17 Cover housing: Removing bolts on bearing

7. Remove the bearing (1, Fig. 9-18) from the cover housing.
8. Remove the shaft seals (3, 4, Fig. 9-18) out of the bearing housing.
9. Replace the bearing and the shaft seals. Clean the remaining parts, → 9.4 "Cleaning"

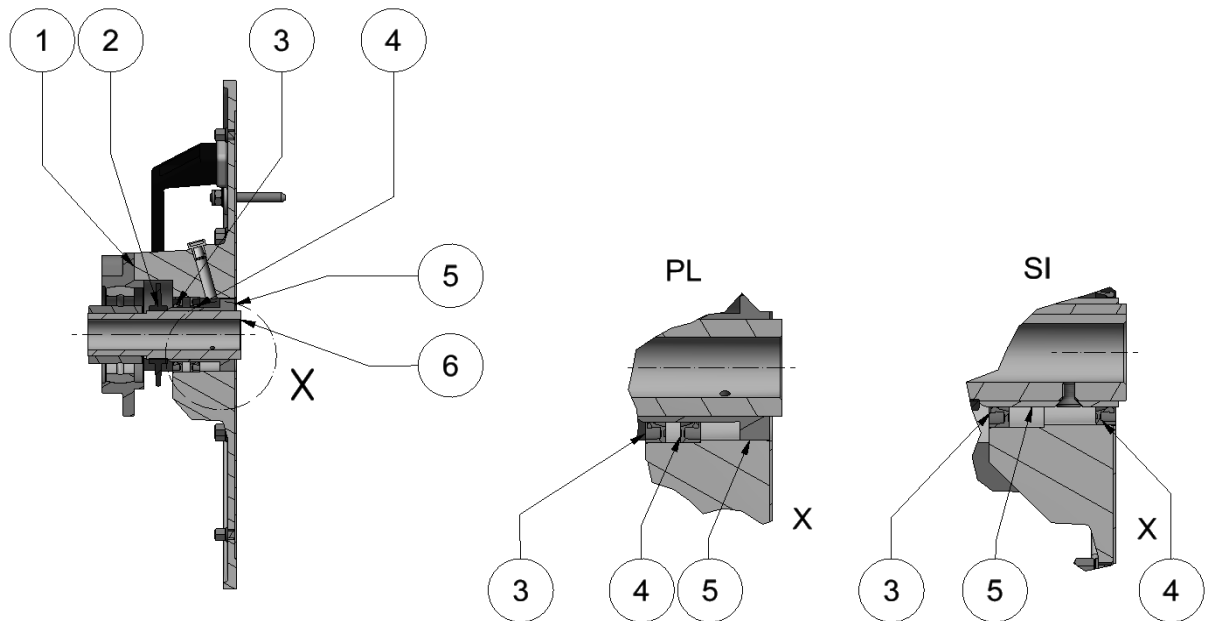


Fig. 9-18 Cover housing: Removing bushing, ejector plate, shaft seal

- (1) Bearings
- (2) Slide ejector plate
- (3) Shaft seal
- (4) Shaft seal
- (5) Threaded bushing (only PL version, with compressed air seal); bushing (only SI version, shaft seal)
- (6) Bushing

Task

Installing bearing assembly

1. Reassemble in reversed order.
2. Press the shaft seal into the bearing housing. Make sure the shaft seals are fitted in the correct position, see detail X in Fig. 9-18 .
3. Fill gap with lubricant between the sealing lips of the shaft seal, 9.3 ff.

4. Fasten the bearing diagonally to the bearing housing with two bolts.

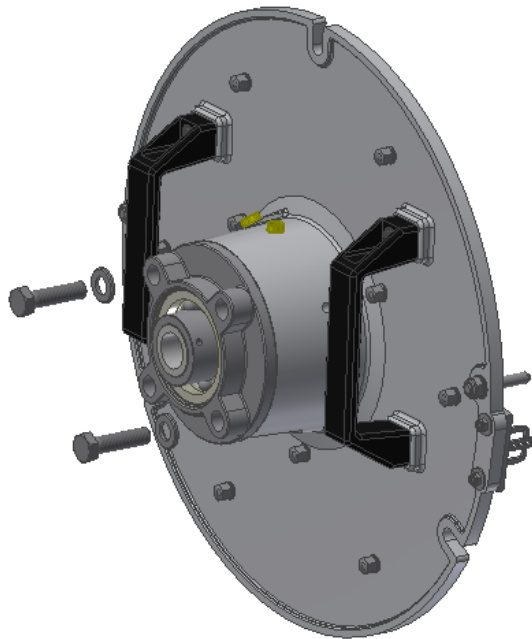


Fig. 9-19 Cover housing: Installing bolts on bearing

5. Push complete bushing into bearing housing.

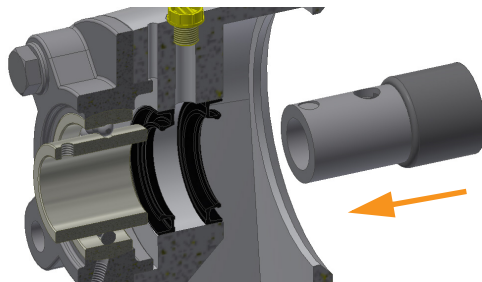


Fig. 9-20 Cover housing: Installing the bushing

Task***Installing cover housing***

1. Fasten the entire cover housing with the fastening elements (3 pcs) to the screener housing.
2. Then, correct the position of the bushing to the rotor.
To do this, slide bushing up against stop on rotor.

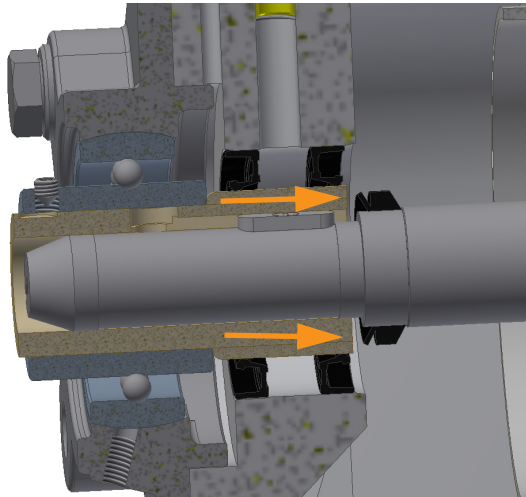


Fig. 9-21 Push bushing up against rotor stop (similar to illustration)

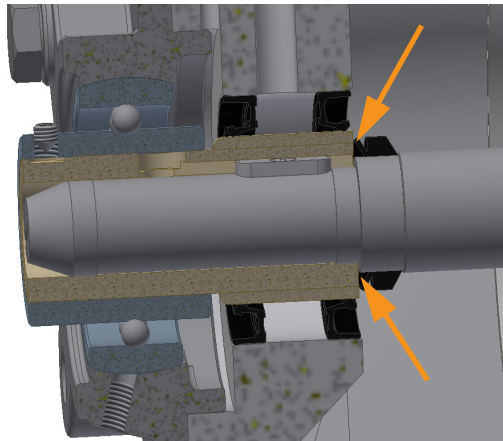


Fig. 9-22 Bushing is up against the rotor stop (similar to illustration)

3. To fix the position of the bushing, tighten the setscrews (2 pcs) .

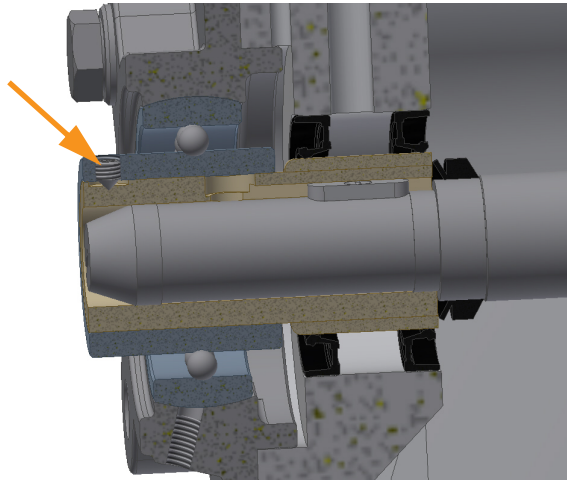


Fig. 9-23 Fixing the position of the bushing (similar to illustration)

4. Fasten the safety cover with two bolts and washers on the bearing housing.

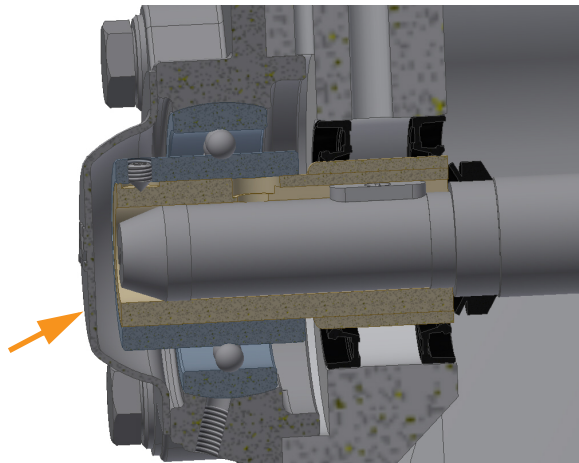


Fig. 9-24 Installing protective cover on bearing housing (similar to illustration)



After correctly setting the bushing, the axial seat of the rotor must be ensured, i.e. the rotor must no longer be movable axially.

9.2.8 Replacing bearing (drive side)

Component	Bearing (drive side)
Interval	annually or if damaged and the end of the working life is reached
Spare part (optional)	Bearing, shaft seals (always replace shaft seals at the same time as changing the bearings)
Special means (optional)	---
Task	Remove screen basket 1. Remove screen basket, see chapter 9.2.1 .
Task	Remove rotor 1. Remove rotor, see chapter 9.2.10 .
Task	To remove motor: direct drive, type B1 1. Remove bolts on protective plate/bearing housing. 2. Remove the nuts (4x) on bearing housing/motor.

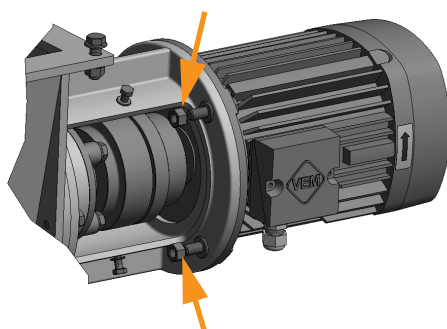


Fig. 9-25 Bearing housing (drive side): Remove fastening element on bearing housing/motor.

3. Remove the motor with coupling half from the bearing housing.

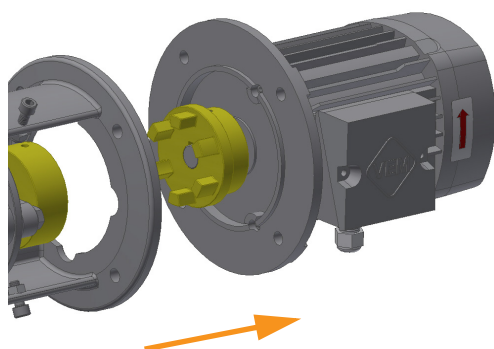


Fig. 9-26 Bearing housing (drive side): Pulling off motor from bearing housing

4. Disassemble and remove clutch housing.
5. For further disassembly of bearing assembly see → "Removing bearing assembly B1, C1"

Task***To remove motor: direct drive, type C1***

1. Undo bolt on protective plate.

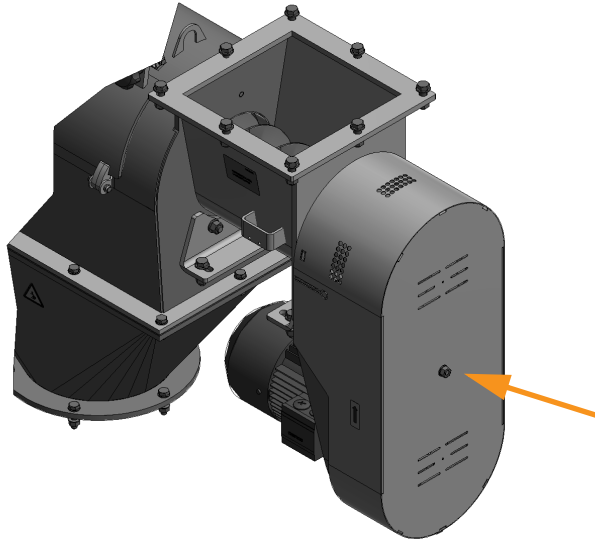


Fig. 9-27 Bearing housing (drive side): Remove bolts on protective plate.

2. Remove the protective plate from the bearing housing.
3. Undo nuts (1, four pcs.) on motor (2).
4. Undo clamping screw (3).
5. Raise motor (2).
6. Remove V-belt (4).

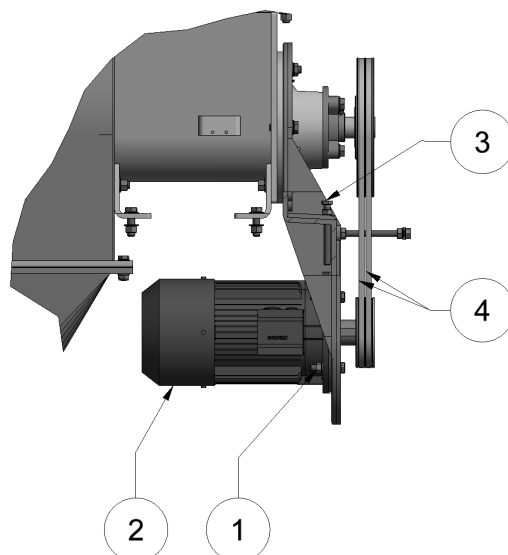
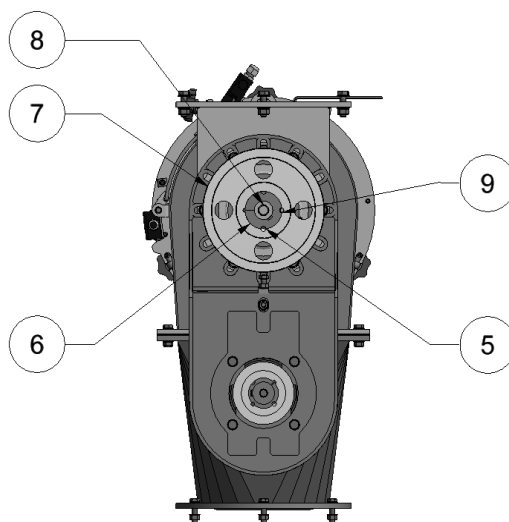


Fig. 9-28 Bearing housing (drive side): Remove V-belt

- (1) Nuts
- (2) Motor
- (3) Clamping screw
- (4) V-belt

7. Remove clamping bush (top).
 - a) Undo all screws (5) on clamping bush (7) (one or two screws depending on size of bush).
 - b) Grease bolt (5) (white grease).
 - c) Screw bolt (5) into forcing hole (6) until clamping bush (7) detaches out of the hub on shaft (9) and the V-belt pulley (8) moves freely on the shaft (9).
 - d) Remove clamping push (7) and V-belt pulley (8) from shaft (9).



- (5) Screw (or set screw)
- (6) Forcing hole
- (7) Clamping bush
- (8) V-belt pulley
- (9) Shaft

8. Disassemble and remove mounting bracket..
9. For further disassembly of bearing assembly see → "Removing bearing assembly B1, C1"

Task**Removing bearing assembly B1, C1**

1. Remove the setscrew from the second coupling half.

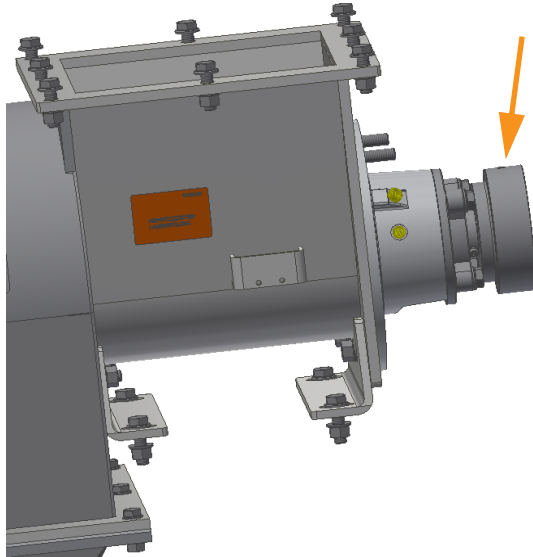


Fig. 9-29 Bearing housing (drive side): Setscrew on coupling half.

2. Remove the second coupling half from the bushing.
3. Undo the mounting elements on the inlet housing/bearing housing.
4. Detach the complete bearing assembly from the inlet housing.
5. Remove feather key on bushing.
6. Remove the setscrew from the bearing housing/bushing.

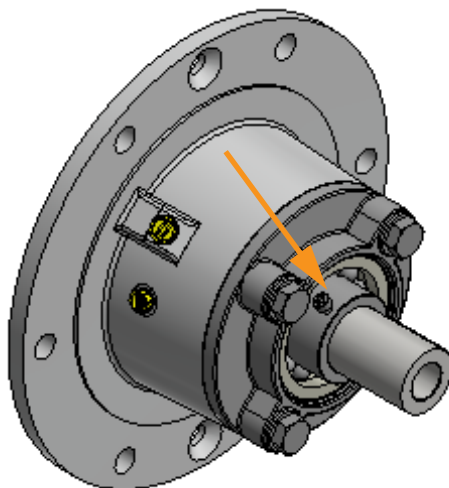


Fig. 9-30 Complete bearing assembly (drive side)

7. Slide the bushing (6) from the bearing side towards the product chamber out of the bearing housing.
8. Remove ejection plate (2) (accessed from below through opening in bearing housing)
9. Remove the fastening screws (4 pcs) from the bearing/bearing housing.
10. Remove bearing (1) from the bearing housing.
11. Remove the shaft seals (3, 4) out of the bearing housing.
12. Replace the bearing and the shaft seals. Clean the remaining parts, → 9.4 "Cleaning".

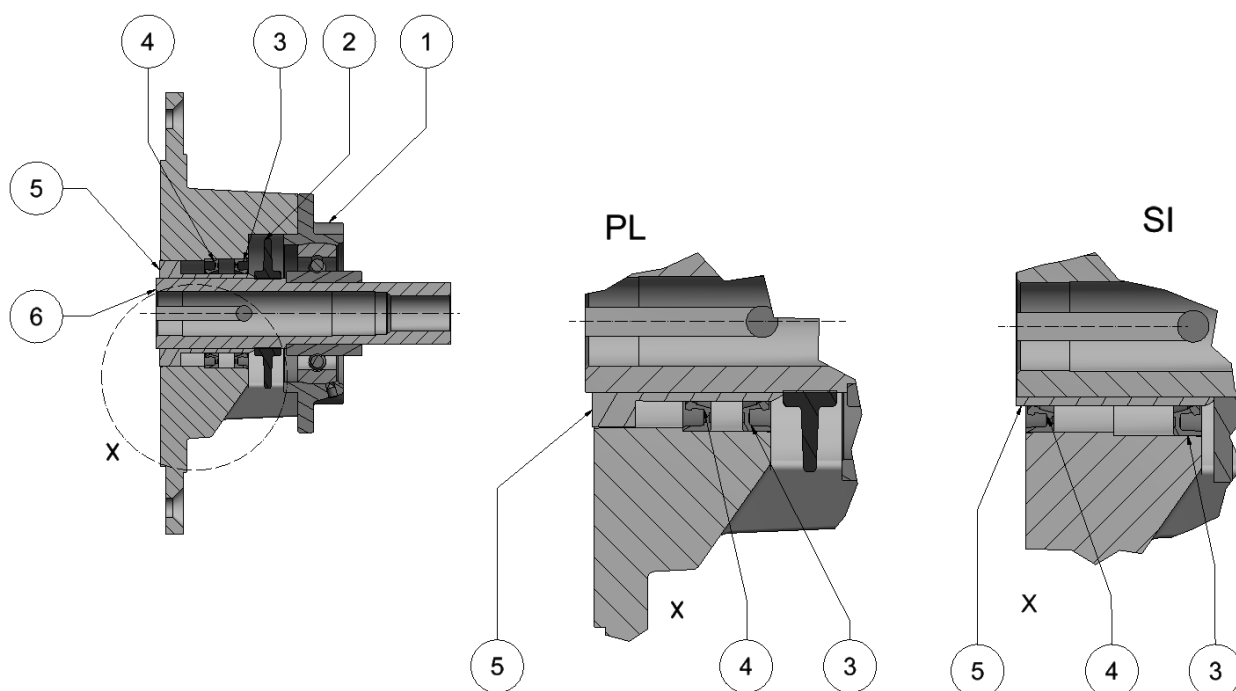


Fig. 9-31 Cover bearing assembly (drive side)

- (1) Bearings
- (2) Slide ejection plate
- (3) Shaft seal
- (4) Shaft seal
- (5) Threaded bushing (only PL version, with compressed air seal); bushing (only SI version, shaft seal)
- (6) Bushing

Task	<i>Installing the bearing assembly/motor (drive side)</i>
	<ol style="list-style-type: none"> 1. Type B1 and C1 is reassembled in the reversed order of removal. 2. Press shaft seal into bearing housing. Make sure the shaft seal is positioned correctly. 3. Fill gap with lubricant between the sealing lips of the shaft seal, 9.3 ff.
Task	<i>Installing motor</i>
	<ol style="list-style-type: none"> 1. The motor for type B1 and C1 is installed in the reverse order of removal. <ul style="list-style-type: none"> → "To remove motor: direct drive, type B1" → "To remove motor: direct drive, type C1"
Task	<i>Install rotor</i>
	<ol style="list-style-type: none"> 1. Rotor installation for type B1 and C1 9.2.10
Task	<i>Install screen basket</i>
	<ol style="list-style-type: none"> 1. Screen basket installation for type B1 and C1 9.2.1

9.2.9 Lubricating the bushings and shaft seals

Component	Bushings and shaft seals
Interval	half-yearly or after every bearing replacement/shaft seal replacement
Spare part (optional)	---
Special means (optional)	Lubricant (see Technical Data)
Task	<i>Lubricating the bushings and shaft seals</i>
	<ol style="list-style-type: none"> 1. Removing/installing the bearings, 9.2.5 .

9.2.10 Checking/replacing rotational components

Component	Mounting for rotor, rotor, screw blades, agitator strips
Interval	half-yearly or after 2,500 [Bh] and with maintenance tasks as well as after longer periods of operation with abrasive products
Spare part (optional)	Rotor
Special means (optional)	Hexagonal wrench (width across flats 6), right angle grinder, belt sander
Task	<i>Mounting for rotor</i>
	<ol style="list-style-type: none"> 1. Check that rotor is correctly mounted.

Task

Checking rotor for imbalance, damage, deformation and burr formation

1. Check rotor for concentricity. Strong vibrations and running noises indicate an imbalance of the rotor. Immediately contact the manufacturer if an imbalance is found!
2. Visually inspect the rotor/screw plates for damage or deformations which can cause sparking or hot surfaces.
3. Remove any burrs on the screw blades and agitator strips with a suitable aid. Remove the rotor → "Remove rotor".
4. If necessary, replace the damaged rotor.

Task

Remove rotor

1. First remove the screen basket → 9.2.1 "Checking/replacing screen fabric".
2. After removal of the screen basket, remove the rotor fuse.
 - a) There is a marking on the front side of the rotor shaft! Turn the rotor by hand so that the marking points vertically and below.
 - b) Loosen the cheese head screw with hexagon socket to the point that the complete rotor can be removed from the screener (approx. 2 turns).

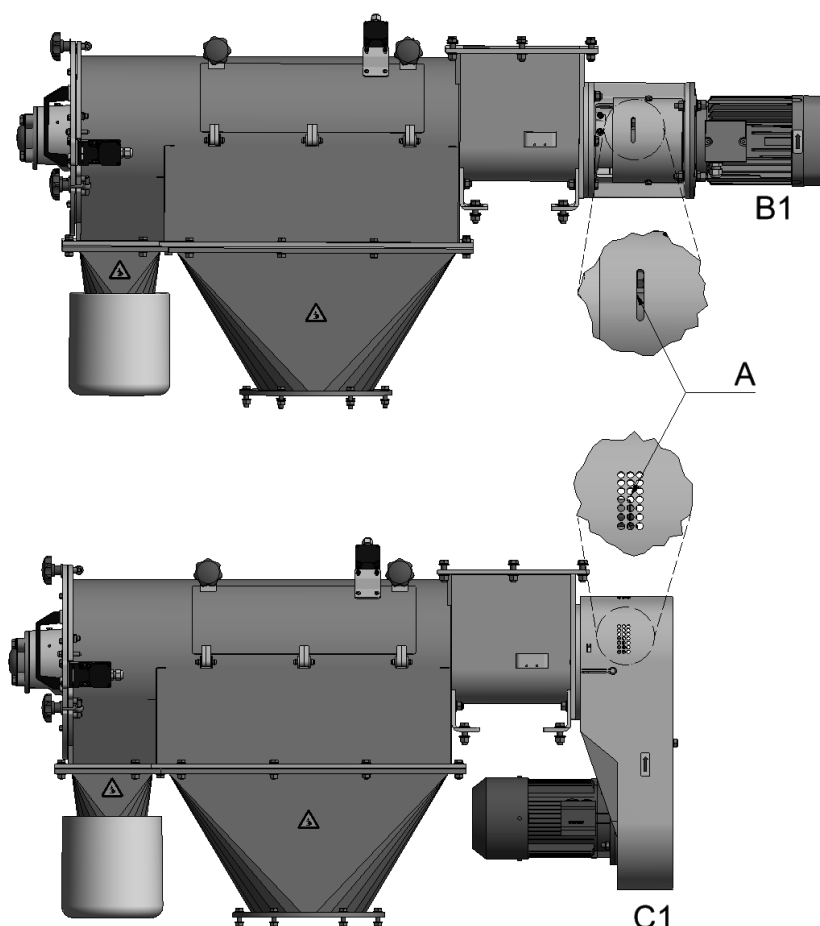


Fig. 9-32 Rotor fuse, drive side (cheese head screw with hexagon socket behind protective plate) / Design B1 and C1

Detail A

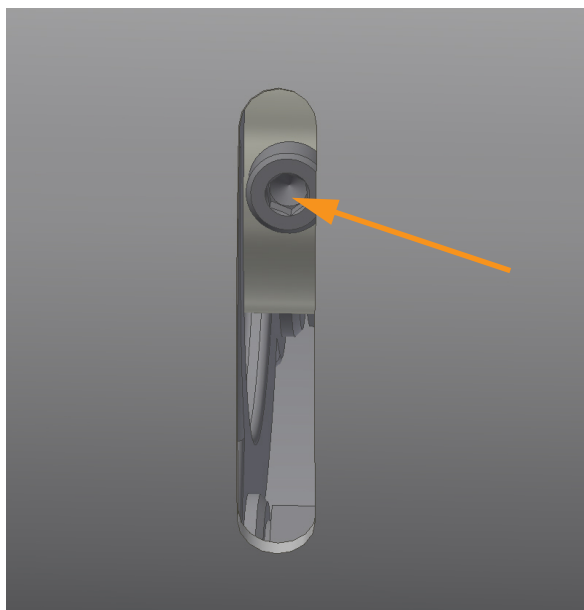


Fig. 9-33 Rotor fuse, drive side: Detail - cheese head screw with hexagon socket

Task

Installing rotor

1. Reassemble in reversed order to rotor disassembly.
2. Keep rotor ends and bushings clean and lightly grease before assembling. See 4 (Lubricants) and 9.3 ff.
3. If necessary, remove cheese head screw with hexagon socket.
4. During installation, pay attention to the correct position of the parallel key on the rotor to the bushing in the bearing assembly.
5. Tighten → Fig. 9-33 "Rotor fuse, drive side: Detail - cheese head screw with hexagon socket" hexagon socket head cap screw.
6. Install screen basket → 9.2.1 "Checking/replacing screen fabric".

9.2.11 Check drive unit

Component	Drive (motor)
Interval	5,000 [Bh] and at least once a year as required or according to the operation manual of the drive (motor)
Spare part (optional)	---
Special means (optional)	Suitable industrial vacuum cleaner
Task	Optical visual inspection <ol style="list-style-type: none">1. Check the drive for dust deposits.2. If necessary, suction ventilation grille and cooling fins with a suitable industrial vacuum cleaner.

9.2.12 Replace drive unit - direct drive, type B1

Component	Drive (motor)
Interval	when the end of the working life is reached
Spare part (optional)	Drive
Special means (optional)	---
Task	To replace drive unit, type B1

1. Remove bolts on protective plate/bearing housing.

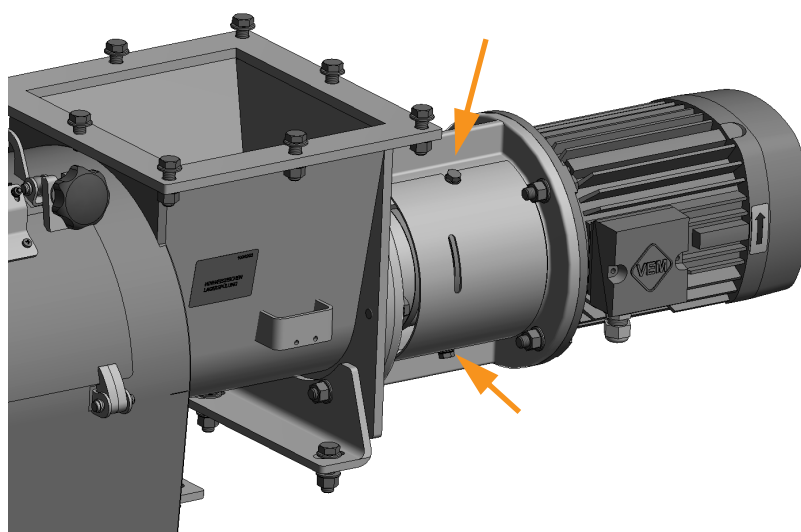


Fig. 9-34 Bearing housing (drive side): Remove bolts on protective plate.

2. Remove the protective plate from the bearing housing.

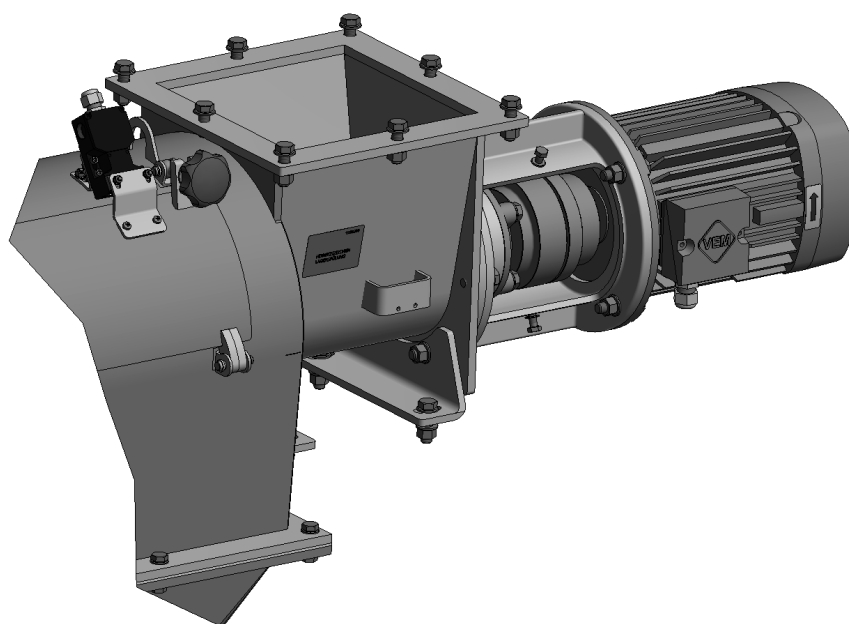


Fig. 9-35 Bearing housing (drive side): Bearing housing without protective plate

3. Remove the nuts (4x) on bearing housing/motor.

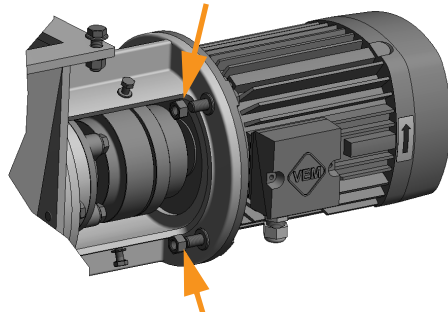


Fig. 9-36 Bearing housing (drive side): Remove fastening element on bearing housing/motor.

4. Remove the motor with coupling half from the bearing housing.

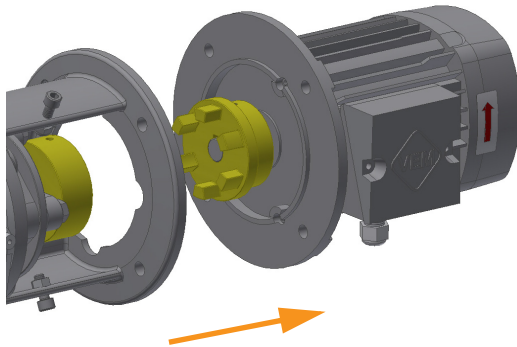


Fig. 9-37 Bearing housing (drive side): Pulling off motor from bearing housing

5. Remove coupling half from motor shaft.

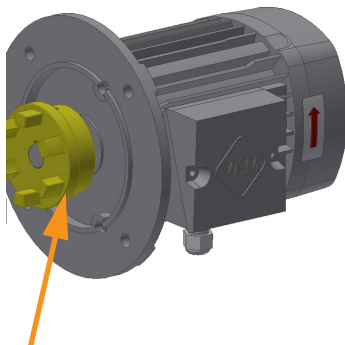


Fig. 9-38 Bearing housing (drive side): Pulling off motor from bearing housing

6. Reassemble in reversed order.



Maintain spacing between the coupling halves. See the separate manufacturer's documentation in the annex or in the general documentation.

9.2.13 Replacing drive unit - V-belt drive, type C1

Component	Drive (motor)
Interval	when the end of the working life is reached
Spare part (optional)	Drive
Special means (optional)	Suitable torque wrench
Task	<i>To replace drive unit, type C1</i> 1. Undo bolt on protective plate.

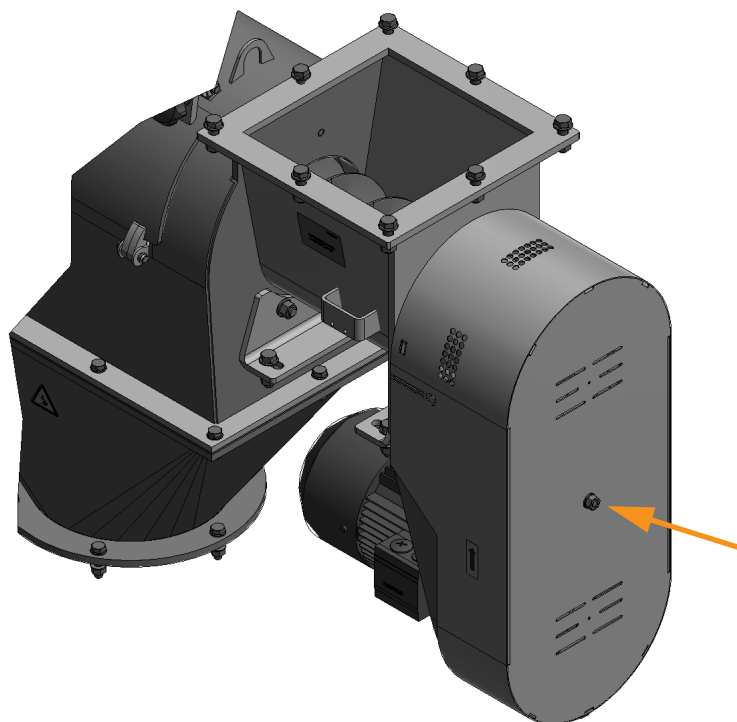


Fig. 9-39 Bearing housing (drive side): Remove bolts on protective plate.

2. Remove the protective plate from the bearing housing.

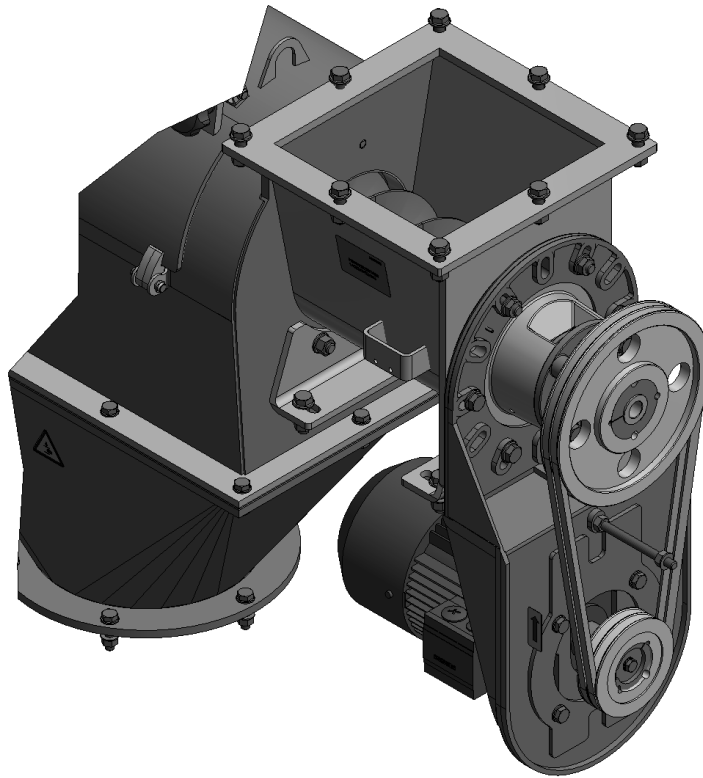


Fig. 9-40 Bearing housing (drive side): Bearing housing without protective plate

3. Undo clamping screw (3).
4. Undo nuts (1, four pcs.) on motor (2).
5. Raise motor (2).
6. Remove V-belt (4).

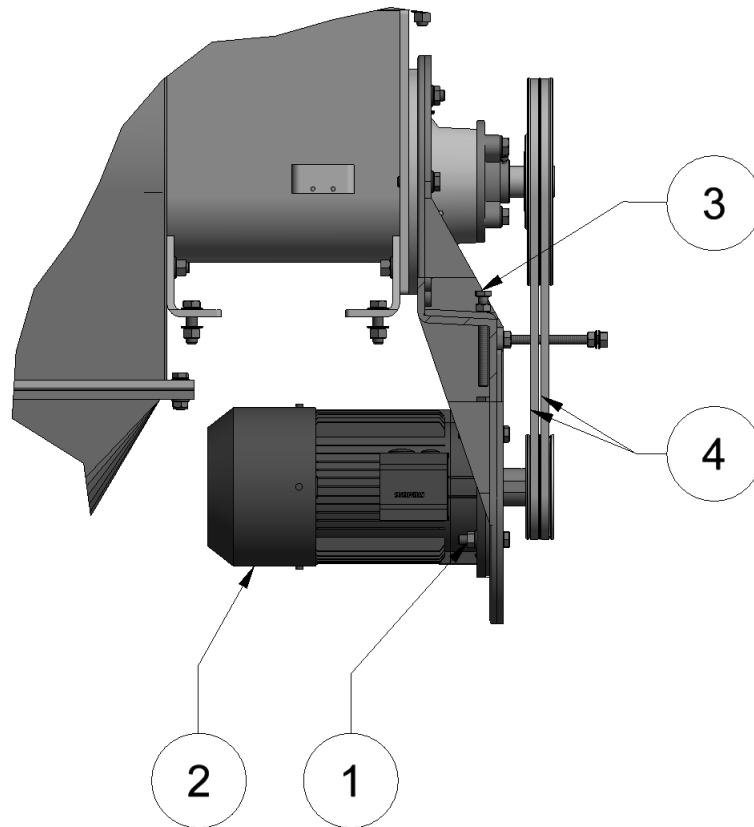


Fig. 9-41 Bearing housing (drive side): Remove V-belt

- (1) Nuts
- (2) Motor
- (3) Clamping screw
- (4) V-belt

7. Remove clamping bush (bottom).
 - a) Undo all screws (5) on clamping bush (7) (one or two screws depending on size of bush).
 - b) Grease bolt (5) (white grease).
 - c) Screw bolt (5) into forcing hole (6) until clamping bush (7) detaches out of the hub on shaft (9) and the V-belt pulley (8) moves freely on the shaft (9).
 - d) Remove clamping bush (7) and V-belt pulley (8) from shaft (9).

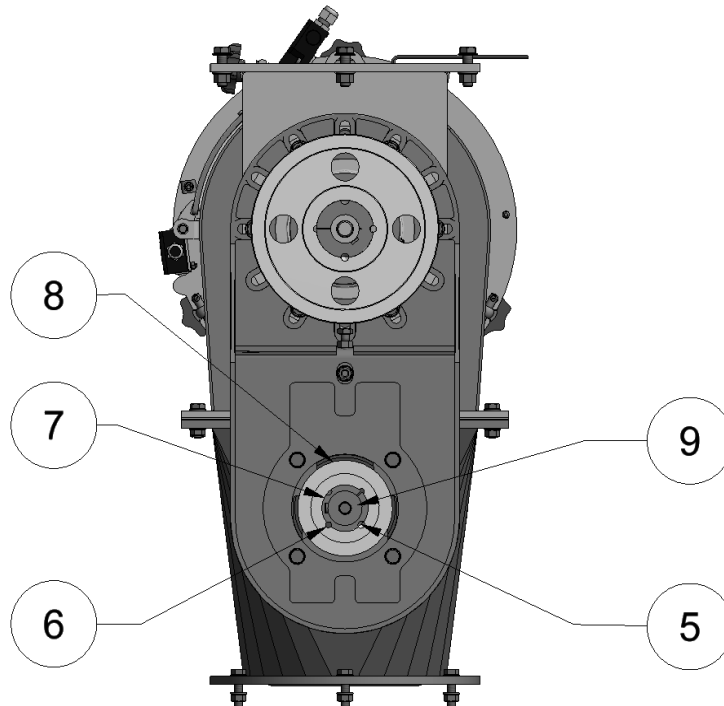


Fig. 9-42 Bearing housing (drive side): Remove V-belt - drive without protective plate

- (5) Screw (or set screw)
 - (6) Forcing hole
 - (7) Clamping bush
 - (8) V-belt pulley
 - (9) Shaft
8. Remove nuts (1) and detach motor (2) → Fig. 9-41 "Bearing housing (drive side): Remove V-belt".
 9. Reassemble in reversed order.

10. For installation of clamping bush see:

- a) → Fig. 9-41 "Bearing housing (drive side): Remove V-belt"
- b) Clean all surfaces and holes of the clamping bush, shaft and V-belt pulley.
- c) Fit clamping bush (7) in the hub. Align all connection holes (the half threaded holes must aligned with the half, plain holes).
- d) Lightly grease bolt (5) (white grease) and screw in. Do not tighten bolt (5).
- e) Slide V-belt pulley (8) together with clamping bush (7) to the required position on the shaft (9).
- f) Tighten bolt. Tightening torque 20 [Nm].



After a short operating period (1/2 to 1 hour), check the tightening torque and retighten bolts if necessary.

11. Observe the following points when installing the V-belt:

- a) Fit V-belt without using force (damage).
- b) The position of the motor determines the required spacing between the upper and lower V-belt pulley and thus the pretension of the V-belt. To subsequently tension the fitted V-belt, tighten tensioning screw (3, Fig. 9-41) so that the tensioning screw forces the motor downward, i.e. increasing the axial spacing between the upper and lower V-belt pulley. If the V-belt is overtensioned, release the tensioning screw or correct the position of the motor.

9.2.14 Servicing attachments

Component	Attachments (e.g. electrical components)
Interval	according to the manufacturer specifications, at least once a year
Spare part (optional)	---
Special means (optional)	as specified by the manufacturer
Task	see separate manufacturer's operating instructions.

9.2.15 Verify earthing

Component	Machine/device
Interval	annually and after dismantling the machine / device
Spare part (optional)	---
Special means (optional)	suitable, electric measuring device
Task	Check earthing by measuring (report) → 6.5 "Earthing" (Earthing).

9.3 Lubrication

9.3.1 Lubricant



WARNING

Possibility of contact with lubricant/product!

During machine production and product processing, products may occasionally have technically unavoidable contact with lubricant, even unintentionally.

- ▶ Only use lubricants that are "Food Grade Lubricants" (= suitable for use in food) in accordance with the technical data (Lubricants) and/or the lubricant label (optional)!
- ▶ We warn against mixing different greases. The lubricant could break down.

9.3.2 Using "Food Grade Lubricants"

Always store special lubricants, such as "Food Grade Lubricants" only in closed, dry rooms.

Clean dirty lubricant containers before removing them so that no dirt is transferred to the lubricant when withdrawing the lubricant.



If a cleaner must be used when cleaning the lubricant container, use exclusively environmentally safe cleaners.

Remove remnants of cleaner after cleaning.

Use only clean implements that are in perfect working order when filling lubrication equipment.

Carefully reseal lubricant containers after removing the lubricant.

The same care regarding cleanness and cleaning must be practiced at the lubrication points on the machine.

9.3.3 Lubricating bearings and seals

Lubricate the bushings and shaft seals of the bearings after every bearing replacement and shaft seal replacement

Apply lubricant between the rotary shaft seals when assembling the bearing.

See chapter 9.3.1 for lubrication



9.4 Cleaning

Only trained and instructed personnel are permitted to carry out the cleaning work.

9.4.1 Cleaning intervals

The operating company defines the cleaning intervals.

The cleaning intervals will depend on the requirements involved in the specific application.

If the product has a tendency to stick, clean more regularly!

Comply with legal requirements!

Inside

Product-dependent and at product change.

Outside

Regularly and before visible dust deposits form on the machine.

9.4.2 Cleaning the screener

NOTICE

- ▶ Machine/device only suitable for dry cleaning.
- ▶ Machine/device not suitable for wet cleaning, steam cleaning or sterilization!

For dry cleaning we recommend:

- Brushes with natural or plastic bristles;
- Textile materials made from natural and chemical fibres;
- Synthetic fleeces or grinding tools;
- a suitable industrial vacuum cleaner

After dry cleaning, stubborn dirt can be removed with wet wipes (e.g. alcohol or an appropriate substitute).



Only restart the machine/device when it is completely dry. Moist conditions and residual moisture promote bacterial growth.

9.4.3 Cleaning flexible screen fabric

Flexible screen fabric

Washing and drying



The following information on washing a flexible screen fabric is only a recommendation. It is outside of our responsibility if you decide to use it.

- Do not clean with chemicals!
- Don't iron!
- Improper mechanical handling of the screen fabric results in surface damage.

Washing by hand

In the case water-soluble, easily removed dirt, washing by hand is recommended. Place the screen fabric in a large washing bath of cold water and stir the washing bath as required.

Soaking it longer intensifies the washing result.

Washing in the washing machine (optional)

Only use drum washing machines if the soiling is stubborn.

In order to not damage the surface of the screen fabric, provide sufficient protection (e.g. by covering in oversized bags made of very open fabric).

If necessary, use a commercially available gentle washing powder and the water bath at maximum 40 [C]°.

Drying

When drying it in the air or when using an industrial vacuum cleaner (optional), stretch the screen fabric on a suitable device to prevent shrinking of the screen fabric.

The drying temperature must be considerably lower than the temperature resistance of the screen fabric.

Cleaning agents:	commercially available mild detergent (approx. 3 [g/l])
Washing temperature:	max. 40 [°C]
Dryer temperature when an industrial dryer is used:	max. 30 [°C]

Tab. 9-1 Flexible screen fabric (washing, drying)

Reuse of the screen fabric

Before reinstalling, visually check the screen fabric for damage.



DANGER

Foreign matter in the screened product/final product!

Screen fabrics are wearing parts. If the screen fabric reaches its wear limit, components intended to be screened out as well as components of the screen fabric can mix with the screened product.

The operator must ensure,

- ▶ that the screen fabric is checked every time it is cleaned, and nevertheless at least once a day!
- ▶ that screening is not continued if the screen breaks!
- ▶ that a faulty screen fabric is replaced immediately!
- ▶ that only undamaged screen fabric is used for screening!
- ▶ that after a screen breaks, the screened product is separated from residues.
We do not assume any liability for possible damage due to residues which are not removed after a screen breaks!

9.4.4 Cleaning the screen cylinder

Screen cylinder

As part of the daily inspection, decide whether the screen cylinder needs to be cleaned.



DANGER

Danger / risk of fatal injury!

Inappropriate mechanical handling of the screen cylinder may cause surface damage. Do not clean screen cylinder with mechanical blows. This could damage the screen cylinder. Continued use of the defective screen cylinder could allow foreign objects to get into the screened product or final product.

- ▶ Do not subject the screen cylinder to mechanical blows.
 - ▶ Replace the defective screen cylinder immediately
-

Remove screen cylinder from screener

Remove seal (optional) before cleaning the screen cylinder.

Dry cleaning

Clean the screen cylinder with a brush or a suitable industrial vacuum cleaner.

Wet cleaning

Preferably use brush and water.

If necessary, use a chlorine-free cleaning solution with a pH-value 6 to 9 on 1.4301 or AISI 304 (A2) and a low-chlorine solution on 1.4401, 1.4404 and 1.4571 or AISI 316 (A4)!

Waste water must drain off unhindered and be appropriately disposed of. Inappropriate disposal of dirty water can cause environmental damage.

The washed screen cylinder should be dried in air or in a drying booth.

Assembly

Fit seal (optional) before installing the screen cylinder.

10 Troubleshooting

Fault	Possible cause	Possible remedy
Device inoperative	No power supply.	Check power supply and cables, restore power supply.
	Openings not closed. Safety switch does not switch on/off.	Close the openings correctly.
	Motor circuit breaker triggered by overload.	Allow motor to cool down, rectify cause of fault, switch motor circuit breaker on again.
	Motor and/or motor circuit breaker defective.	Replace motor and/or protective motor switch.
	Electrical safety device not activated or defective.	Check that position of contact bow or sensor (optional) is correct. Replace safety device if necessary.
	Rotor/screw blocked by foreign matter.	Remove foreign matter out of the inlet area/inlet housing. Visual inspection of rotor, the screw and housing for damage. Check the mount of the rotor for damage and if necessary replace defective fastening elements.
Motor circuit breaker shuts down drive	Only for bearings with air purged shaft seals: The pressure monitor (provided by customer) shuts down the device when the pressure is too low.	Re-establish compressed air supply.
	Drive overheats due to insufficient cooling.	Ensure sufficient aeration of the drive.
	Rotor/screw rotating in the wrong direction.	Reverse the direction of rotation (swap over phases). The screw must convey the product to be screened in the direction of the screen basket (pay attention to the arrow on the drive).
Increased power intake on motor	Rotor blocked by foreign objects (e.g. packaging materials or product-atypical components).	Remove the product from the screen area. Visual inspection of rotor and housing for damage.
	Rotor and/or screw runs with difficulty because of faulty bearing parts.	Check the shaft seals in the bearing assembly and replace the shaft seals. Replace the corresponding bearing assembly or corresponding drive if bearings are damaged. Contact the manufacturer of the screener!
Installing the rotor is difficult	Rotor damaged (e.g. scoring, shaft distorted).	Replace rotor. Contact screener manufacturer.

Fault	Possible cause	Possible remedy
Increased imbalance/volume of the machine during operation	Foreign objects within the screen basket/the machine	Remove the product and foreign objects from the screen area and the machine. Visually inspect rotor, screen basket and housing for damage. Check rotor mounting for damage and replace if necessary. Replace defective screen fabric.
	Rotor/screw does not run true	Check rotor/screw for warping. If damaged, contact the screener manufacturer as soon as possible. If imbalance occurs due to caking of the product, clean the rotor/screw and remove caked on product.
	Rotor/screw is hitting the housing or screen basket	Remove the product from the screen area. Visual inspection of rotor, housing and screen basket for damage. Remove any burrs on the rotor/screw and housing with a suitable aid. Replace defective screen fabric.
Fine material content in coarse material too high	There is already product in the inlet housing before starting up the screener	First switch on the screener.
	Excessive dosing	Dose less product to the screener
	Use in pneumatic conveying system: Coarse product outlet not closed off air-tight!	Close off coarse product outlet air-tight.
	Screen fabric clogged with product	Clean/wash screen fabric. Allow screen fabric to dry out completely before screening.
	Baffle plate defective or not fitted	Check baffle plate and replace if necessary.
Screen output too low	Screen fabric too taut and therefore clogs with product	Loosen screen fabric, if necessary clean it.
	Defective or missing seal on screen basket (option)	Check the screen basket to ensure the seal on screen basket (optional) is present and replace damaged gasket.
Grease in screened goods	Shaft seal (bearing assembly) defective.	Replace the shaft seal.
Flexible screen fabric clogged with product	Flexible screen fabric stretched too taut (self-cleaning effect reduced)	Loosen screen fabric, if necessary clean it.
Product discharge from protective cover/bearing	Rotor seal (V-ring) defective	Remove cover housing and replace rotor seal (V-ring) on rotor shaft.

Fault	Possible cause	Possible remedy
from opening in cover housing	Shaft seals in cover bearing assembly defective	Replace shaft seals (cover side).
from coupling housing	Shaft seals in bearing assembly (drive side) defective	Replace shaft seals (drive side).
from sealing points (e.g. inspection hatch, product inlet, product outlet, etc.)	Seals at corresponding sealing point defective	Replace defective seal.
Design C1		
V-belt broken	Drive blocked	Rectify cause and replace V-belt.
Unusual wear on sides of V-belt	Pretension too low	Check pretension and readjust if necessary
	Worn pulley grooves	Replace V-belt pulleys
	V-belt pulleys not flush	Align V-belt pulleys
Belt substructure broken and cracked (embrittlement)	Subject to excess heat	Remove heat source, shield off; improve air circulation
V-belt twisting	V-belt pulleys not flush	Align V-belt pulleys
	Pretension too low	Retension V-belt
Excess vibration	Pretension too low	Correct pretension
Loud running noise	V-belt pulleys not flush	Align V-belt pulleys
	Pretension too low or too high	Correct pretension

Tab. 10-1 Troubleshooting



Please do not hesitate to contact our Service Department should you have any further questions.

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11 Appendix

11.1 Spare parts

To order replacement parts, please use the article numbers from the specific spare parts catalogue attached or using your personal login details in the [electronic spare parts catalogue](#)

11.2 Machine disposal



Inappropriate disposal of materials can harm the environment!

At the end of the machine's working life, it can be scrapped. For this purpose,

- Remove dangerous product remains from the machine properly, e.g. by cleaning the machine and disposing of it in an environmentally safe way.
- Before beginning the dismantling work, always adhere to the shutdown procedure (see chapter → 9 "Maintenance / Cleaning").
Dismantling may only be carried out by specialist personnel (see chapter → 2.3 "Safety measures (to be implemented by the plant operator)" *Definition of specialist personnel*).
- Dismantle the machine into its components and separate it according to material classes so that differentiated disposal is possible.
- The individual material classes are to be disposed of in accordance with national regulations, guidelines and laws of the country of destination.
- Electronic waste, electronic components, lubricants and other auxiliary materials are subject to hazardous waste treatment and only may be disposed of by approved specialist companies.

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