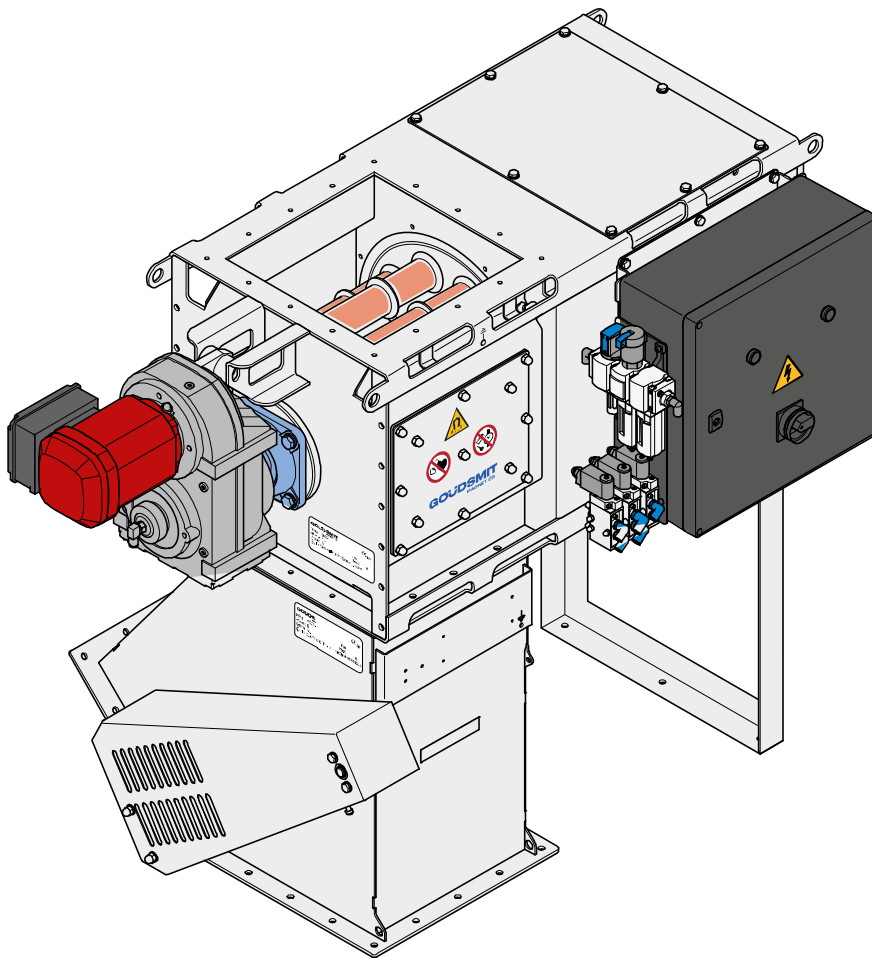


Installation and user manual

Dust-tight rotating Cleanflow magnetic filter - automatic discontinuous cleaning, type SRCD

Permanent magnetic filter for filtering ferrous and weakly magnetic stainless steel particles from dusty and poorly flowing (oily) powders in free-fall transport pipes



The descriptions and pictures in this manual, used for explanation, may differ from the descriptions and pictures of your version. The as-built drawing(s) of the delivered device are attached.

Disclaimer

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Version overview

Version	Date	Description
1.0	07/2024	First version according to CTO

Foreword

This manual contains information for the correct use and maintenance of the device. The manual contains instructions to prevent possible injury and serious damage and ensure safe and trouble-free operation of the device. Please read this manual thoroughly and make sure you have understood everything before using the device.

If you require further information or have any questions, please contact GOUDSMIT Magnetic Systems B.V.. Contact details are listed on the title page of this document. The manual can be ordered in addition, stating the device description and/or the article number, as well as the order number.

In the manual, the SRCD Cleanflow magnetic filter is further referred to as "device".



- This manual and the manufacturer's statement(s) should be regarded as part of the device.
- The paperwork should remain with the device if it is sold.
- The manual must be available to all operating personnel, service technicians, and others working on the device during its lifetime.

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Safety

General safety instructions

- The instructions in this manual must be followed. Failure to comply with them may result in property damage, physical injury or even danger to life.
- The device may only be used for magnetic filtering of small amounts of ferrous contaminants from poorly flowing - like fatty - powders in free-fall transport pipes. Any other use does not comply with the regulations. Any resulting damage is not covered by the manufacturer's warranty.
- Ensure that persons working on the device or in the immediate vicinity wear adequate protective equipment.
- Apply additional safety measures if the device remains easily accessible to persons. If this is not possible, ensure that clear instructions are given on the entire installation in which this device is included.
- The device should only be operated remotely when all covers are in place and moving parts are inaccessible.
- **Trapping hazard!** Do not carry out cleaning or maintenance work inside the unit while it is still in operation, even with the cover plate or inspection doors removed.
- Work on the device should only be done by qualified personnel. Preferably have maintenance on the magnetic bars carried out by GOUDSMIT Magnetic Systems personnel.
- Always observe locally applicable safety and environmental regulations.

Warning pictograms on and around the device

Where necessary, warning pictograms are attached to the device.



Observe the following measures:

- Carefully read the warning pictograms on the device.
- Check regularly that the pictograms on the device are present and clearly legible.
- Keep the pictograms clean.
- Replace unreadable or deleted pictograms for new ones and place them in the same place.

Emergency



Switching off in case of emergency

The device is equipped with a safety switch (main switch) on the control box.

Damage caused by magnetic field

The magnets generate a powerful magnetic field that attracts ferromagnetic parts. This also applies to ferromagnetic material that one carries around, such as house keys, money and tools. Use only non-ferromagnetic tools and workbenches with a wooden worktop and non-ferromagnetic base within the magnetic range.



Strong magnetic field

Injury may occur during work and measurement checks on the magnetic components of the magnetic bars. Prevent fingers from getting between the magnetic components.

Lock Out - Tag Out (LOTO)

Lock Out - Tag Out or LOTO is a safety procedure whereby energy supply of industrial machinery or equipment is cut off during maintenance or repair work. The use of LOTO is intended to protect people from unexpected releases of energy and the dangers of machines in operation. Power sources are often isolated and locked by locks where it is labelled with the name of the worker who placed the lock and the reason for the LOTO.

The employee then has the key to the lock, so only he can remove the lock and start the equipment. This prevents accidental starting of equipment while it is in a dangerous state or while an employee is in direct contact with it.

In the off position, the main switch has 2 holes in its housing intended for LOTO.

Remarks

- Do not use the device if it is damaged.
- Use the device only for the application for which it is designed.
- Check that all protective covers (including all safety circuits) are correctly mounted and installed.
- Ensure that the device is maintained correctly and in accordance with the instructions in this manual.
- Remedy any malfunction before putting the device into operation. If the device is put into operation with the malfunction, after you have carried out a risk assessment, warn the operating and maintenance personnel of the malfunction and the possible risks that may result.

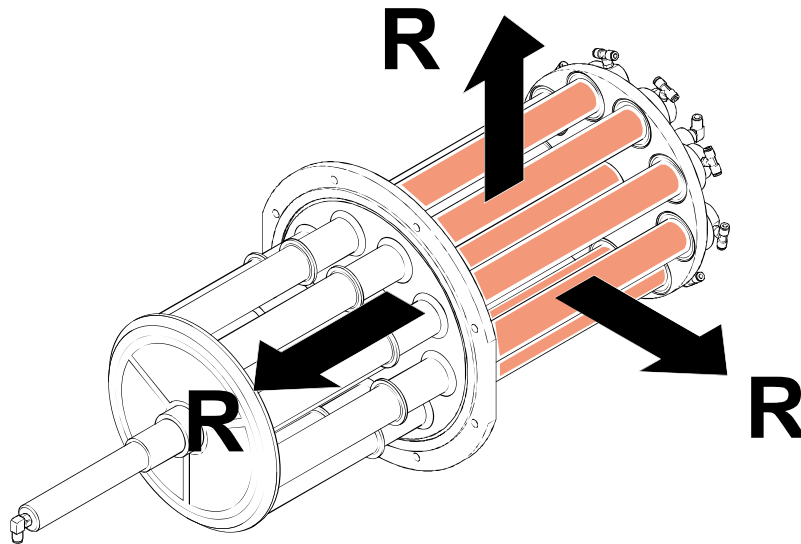
Standards and guidelines

Occupational and public exposure limits for (electro-) magnetic fields

The limit values of magnetic fields are defined according to the EMF Directive 2013/35/EU as follows:

Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from electromagnetic fields.

Observe the following measures regarding exposure to magnetic fields according to EN12198-1 (machine category = 0, no restrictions) of the device:



Danger to life for persons with implanted medical devices

Persons with active implanted medical devices (e.g. pacemaker, defibrillator, insulin pump) must not go within **0.5 metres** of the magnetic bars.



Attraction and projectile danger

Products containing ferromagnetic parts such as tools, keys etc. can be attracted if they come within **10 centimetres** of the magnetic bars.



Pregnant workers and the general public should not come within **4 centimetres** of the magnetic bars.

Occupational exposure limits (general and limb) were not exceeded.

Specifications

Scope

The device can be used for poorly flowing - such as greasy - powders in free-fall transport lines up to 10 metres. The automatic cleaning also makes it suitable for situations where the device is hardly or not accessible for operation and cleaning. (For non-perishable foods only)

Function description

The device is designed for magnetic filtration of small amounts of ferromagnetic contaminants of 30 µm and larger - such as stainless steel wear particles - from dusty, poorly flowing powders. Maximum particle size is 10 mm.

The rotating function of the magnetic rotor and the grit-blasted housing prevent bridging and blockages.

The product must not contain any parts large or heavy enough to cause damage to the magnetic bars.

- ▶ If necessary, install a sieve before the product inlet of the device in your installation.

Flow rate

The advised flow rate of the product material is 1 m/s. Maximum advised flow rate is 2 m/s. A higher flow rate reduces the separation efficiency of ferromagnetic particles from the product material. In addition, the product channel may fill up with product material, causing blockages.

Use in food streams

As standard, the device comes in stainless steel with a 3 µm grit-blasted finish. It is suitable for normal food contact applications. All contact materials conform to EU Regulation - EC1935/2004. Higher-grade finishes are available for applications with higher requirements. See data sheet for specifications.

Temperatures

The device is equipped with standard neodymium (NdFeB) magnets suitable for the following ambient and product temperatures:

Magnetic quality applied	Ambient temp.	Max. product temp.	Max. product temp. (ATEX)
GSN-42	-5 °C to +40 °C	60°C	40°C
GSN-42SH	-5 °C to +40 °C	100°C	60°C
GSN-52	-5 °C to +40 °C	60°C	40°C

Table 1: Temperatures

The magnet material must be protected from higher temperatures than those shown in table 1, as the magnet permanently loses magnetic strength when exposed to high temperatures.

Free space

Ensure there is sufficient space around the device for operation and inspection and maintenance work.

Connection voltages

- Connection voltage standard motor is 400 V_{DC} , 50 Hz.
- Connection voltage PLC control is 230 V_{DC} , 50 Hz.
- Connection voltage for solenoid valves, rotation and detection sensors is 24 V_{DC} .

Air pressure

- Use an air pressure of approx. 6-10 bar for the pneumatic connection of the air preparation unit.

Air quality



The device is equipped with a single compressed air connection to the pneumatic system as standard. Take into account the difference in air quality of the air nozzle in the product channel and the compressed air used to operate the magnetic bars.

Air flushing (air purity requirements)

During the cleaning cycle, air is blown onto the magnetic bar tubes through an air nozzle in the product channel, between the retainer rings and the seal. This air comes into direct contact with the product and must meet the (food) contact purity class requirements for the specific product being processed. The equipment operator must determine what level of air purity class is required. For high-risk dry food contact, air purity class [1.2.1] according to ISO 8573-1:2010 is usually used in the food industry, but a lower class may be acceptable.

Compressed air

The compressed air used to operate the magnetic bars is not in direct contact with the product. This air may have a lower purity and be supplied separately from the purge air for sealing. Depending on whether the extracted air is released into the food production area or not, this air may be of the quality available in typical compressed air networks [7:7:4]. Where the air is released into the food production area itself, air purity requirements should be determined by the equipment operator.

Warranty

The equipment is guaranteed for 12 months after delivery in accordance with the quotation. The warranty conditions can be requested in writing from GOUDSMIT Magnetic Systems B.V. or downloaded from our website.

The warranty on the device is void if:

- Service and maintenance are not performed according to the instructions and or have been performed by mechanics not specially trained for this purpose. Preferably have maintenance and service carried out by GOUDSMIT Magnetic Systems service technicians.
- Fundamental changes have been made to the device without our written consent.
- Non-original or not -100% interchangeable parts are used.
- Lubricants other than those prescribed are used.
- The device is used improperly, incorrectly, negligently or not in accordance with its nature and/or purpose.

ATEX

Marking

If the equipment is suitable for use in potentially explosive atmospheres (ATEX), an Ex marking will be placed on the nameplate indicating the environment for which the equipment is suitable, the specific equipment category and other criteria the equipment complies with.

Example Ex marking:  II 3D Ex h T120°C Dc Ta = -5°...+40°C

Explanation:

- II : explosion group (I is underground mining, II is other)
- 3 : equipment category (ignition protection level: 1= very high, 2= high, 3= normal)
- D : type ATEX environment D(ust)

Equipment category for dust	3D
Suitable for ATEX zone(s)	22

- h : Type of Ex protection.
h = non-electrical equipment (protection method not specified)
- T120°C : Maximum surface temperature
- Dc : Equipment Protection Level (EPL).

EPL (for dust)	Dc
Suitable for ATEX zone(s)	22

- Ta : Ambient temperature range. Displayed only if the range differs from the standard temperature range for ATEX of -20 ... +40°C.


If the device is externally certified, the ATEX certificate number is added to the nameplate. Next to the CE mark is the identification number of the Notified Body that certified our ATEX quality assurance system.

Description of ATEX options

The ATEX marking is only assigned to the device if the magnetic filter includes a valve box. The magnetic filter itself is not certified.

SRCD - XXXX - XXX - XX - XXX - X - X - X - X - X - X3

The -item in the product code indicates the following ATEX options:

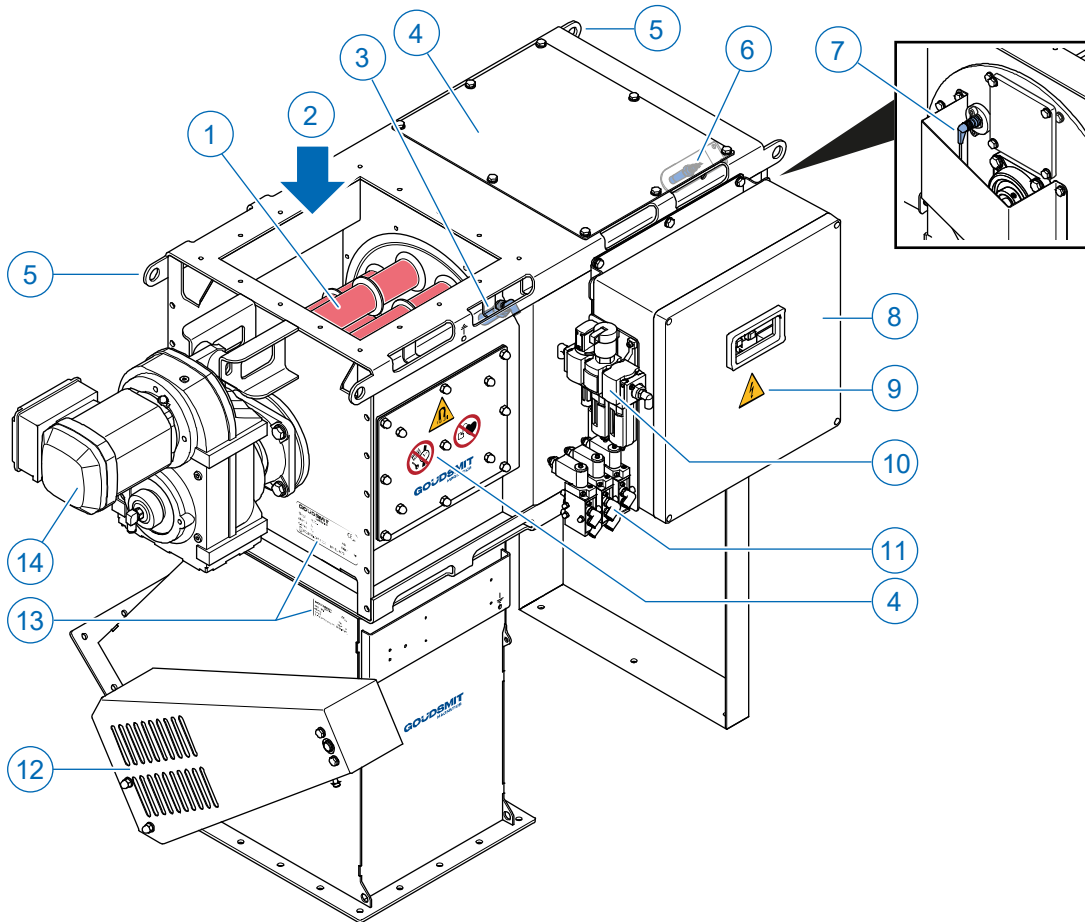
Value	Explanation	Ex marking
NA	No ATEX version	
X3		II 1/3D Ex h T120°C Dc Ta = -5°...+40°C

ATEX measures

- The temperature of the product should not exceed 60°C.
- For ATEX dust environment:
 - The ignition temperature of the dust should exceed 180°C.
 - The smouldering temperature of a dust layer should exceed 195°C.
 - Dust layers thicker than 5 mm should not accumulate on the equipment.
- Ensure that no particles > 10 mm are present in the product stream. These may damage the magnetic bars or cause sparks.
- If necessary, fit a mechanical filter (sieve) for the separation system.
- The free fall height above the device should not exceed 10 metres.
- If the device is placed in storage or left idle for longer periods, make sure it is emptied and cleaned.
- The device must be earthed. The electrical resistance to earth should be less than 1 MΩ. If a gasket is used between the device and the larger installation, provide a means of equalising potential electrostatic charges with a maximum electrical resistance for the installation of 25 Ω. This can be done by applying a braided bonding cable or other means.
- No paint or coatings should be applied to the inner surface of the product channel.
- No insulating paints or coatings with a thickness greater than 2 mm shall be applied to the outside of the device.
- All screw connections inside the device must be secured against loosening.
- Prevent ignition sources such as glowing particles, flames or hot gases from entering the device. Substances susceptible to accumulating an electrical charge can be an ignition source for gases, mists and vapours (e.g. chargeable plastic granules with solvent vapours).

Product information

Overview drawing



- | | | |
|---------------------------------------|--------------------------|---------------------------------------|
| 1. Pneumatic magnetic bar | 6. Proximity sensor | 11. Solenoid valve |
| 2. Product channel | 7. Rotation sensor | 12. Valve box |
| 3. Air nozzle | 8. Control cabinet | 13. Type plate / Identification plate |
| 4. Service chamber / inspection hatch | 9. Warning pictogram | 14. Gear motor |
| 5. Lifting / transport point | 10. Air preparation unit | |

Scope of delivery

Check the shipment immediately on delivery for:

- possible damage and/or shortcomings due to transport. In case of damage, ask the carrier for a transport damage report.
- completeness of delivery.

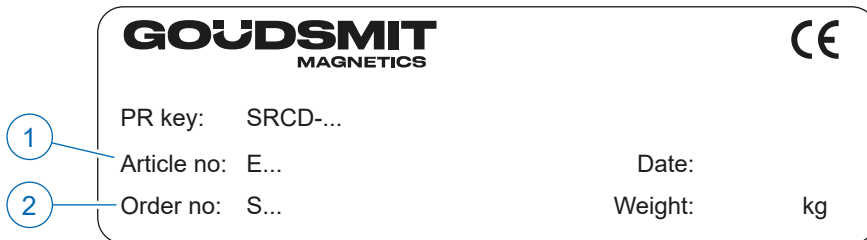


In case of damage or wrong delivery, please contact immediately GOUDSMIT Magnetic Systems. Contact details are listed on the title page of this manual.

Type plate / identification data

On the standard equipment (magnetic filter with valve box) are the type plates with identification data as shown below. The identification data is important for maintenance and ordering spare parts for the device.

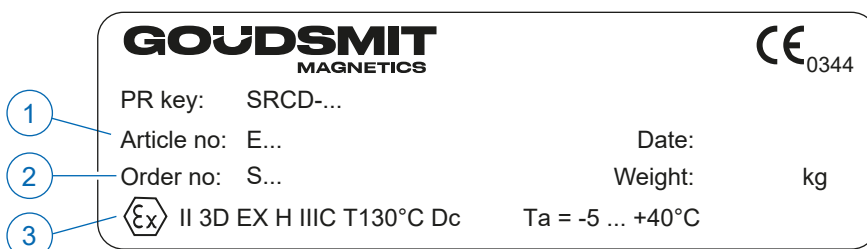
- ▶ Always keep identification data clean and legible.



SRCD (with or without valve box)

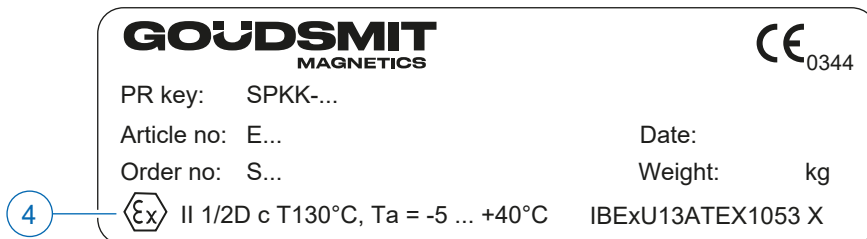
1. Article number
2. Order number

Type plate standard version (without ATEX)



SRCD

1. Article number
2. Order number
3. ATEX marking assembly (only valid with flap box)



Valve box

4. ATEX marking

Type plate ATEX version



Always provide the article [1] and order number [2] when ordering spare parts, service or in case of a malfunction.

Transport and installation

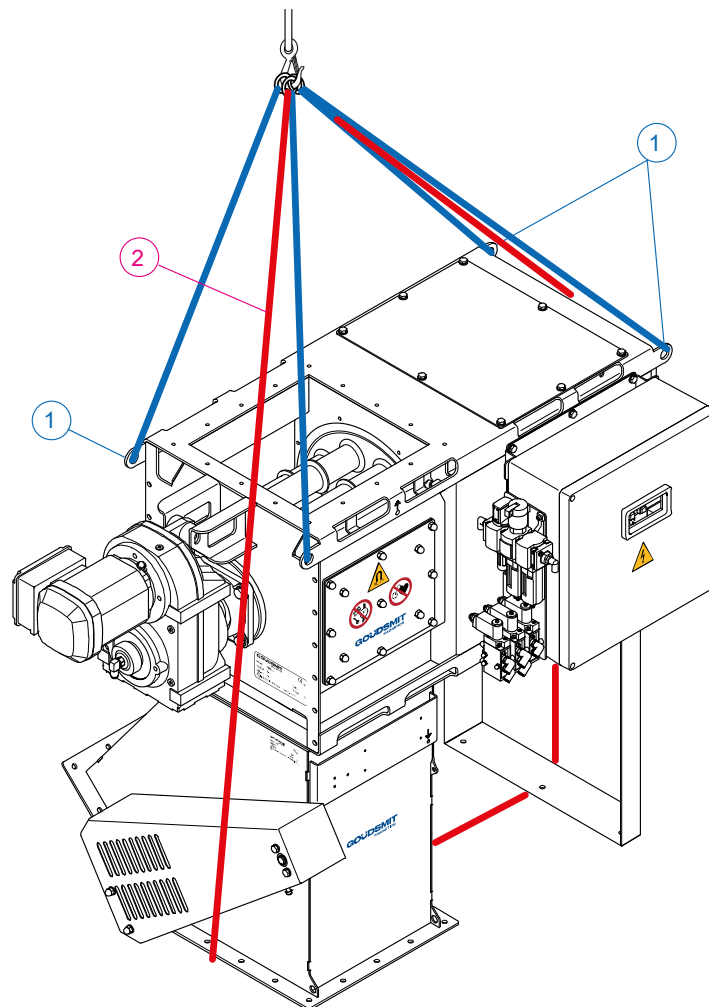
Transport



Note

A permanent magnetic force is present on the device.
Before transporting, observe the safety instructions in chapter "[Safety](#)".

- ▶ If the device is delivered in parts (magnetic filter, valve box and/or adapters), first assemble all parts together. The valve box can be mounted in 4 directions. For adapters with an outlet for round product ducts, consider ASME/ANSI or EN1092-1 flanges.



- ▶ Use the transport points [1] to move the device. If necessary, use an additional lifting strap [2] for support.
- ▶ Avoid any impact during transport to avoid damage, especially to the magnetic bars. If the tubes are damaged, the magnetic packages cannot move in the tubes or move badly.

Installation of the device



Take the following precautions:

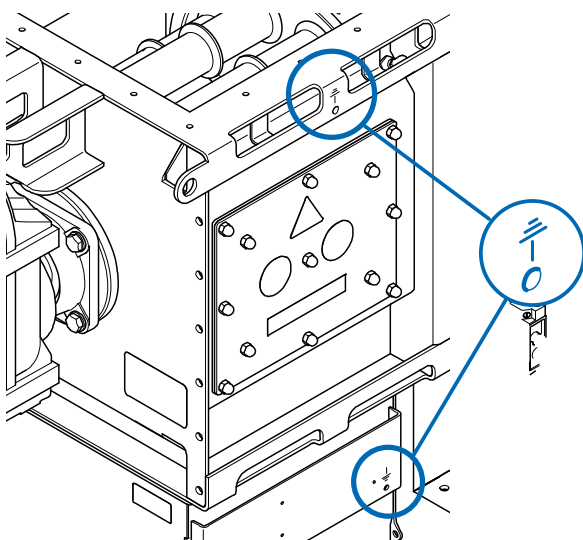
- Only allow qualified personnel to work on the device.
- Make sure there is enough free space around the installation to accommodate the device in the installation/product channel.
- Magnetic force is permanently present on the magnetic rotor. See chapter "[Safety](#)" for precautions to be taken when working on the device.

Observe the following measures to avoid problems during installation:

- ▶ Preferably install the device in a product channel. The product channel should be strong enough to support the weight of the device and the raw product inside it.
- ▶ Do not install the device directly under a silo or hopper with a valve above the device. This prevents falling movement of the product material, resulting in too much product material above the device at the opening. Make sure there is a straight piece of product channel of at least 0.5 metres above and below the device.
- ▶ Install the device free of mechanical stress at the correct working height for operating personnel. Mechanical stress on the device may cause distortion and other malfunctions.
- ▶ Use a lifting/hoisting device that supports the weight of the device.
Note: The centre of gravity of the device is not in the middle.
- ▶ Connect the same outlet diameter of the product channel at the bottom of the device. A smaller diameter (constriction) in the product duct directly under the device may cause accumulation of product material, which may eventually lead to malfunctions or damage.
- ▶ Connect a discharge duct to the ferrous outlet (ferrous discharge opening) of the valve box for further drainage or make other arrangements so that it is no longer freely accessible.
- ▶ After installation and before commissioning, the device should be cleaned thoroughly (see section "[Cleaning instructions](#)").

The best separation result is obtained when the product material flows through the device at low speed.

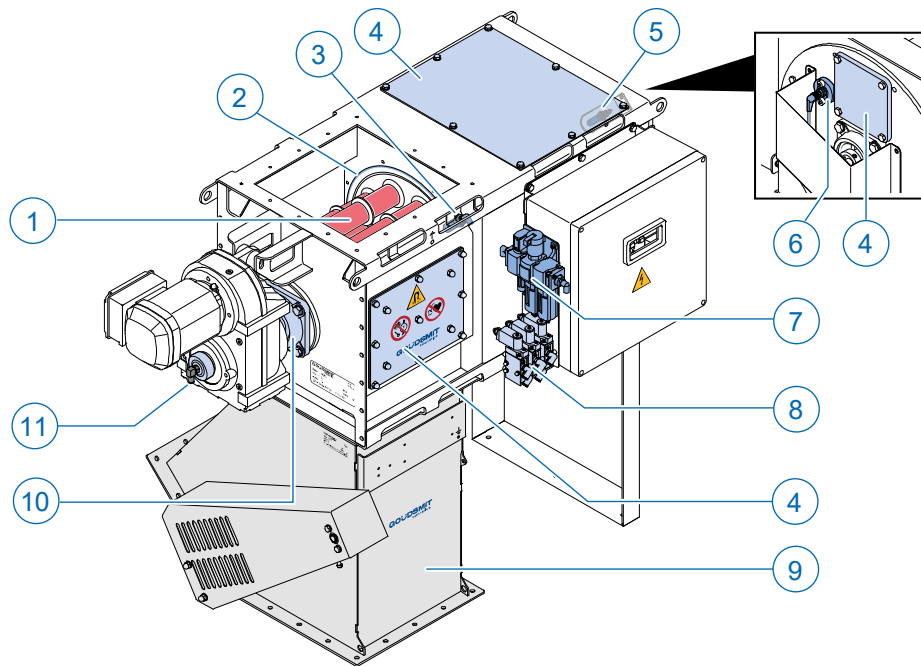
Preventing electrostatic charges (earthing)



To prevent electrostatic charges, provision must be made to prevent potential differences between the installation and the device.

This can be done by installing a connecting cable to the installation. Provisions are provided on the device to realise earthing (see drawing).

Construction



The device has a magnetic rotor with pneumatically operated magnetic bars [1] for filtering ferrous contamination from a product stream.

The magnetic bars are pneumatically operated cylinders with a magnetic package on the piston rod. Externally, the bars have a thin-walled stainless steel tube with retainer rings. During a cleaning cycle, the retainer rings ensure a more even distribution of captured iron particles over the bar length, preventing collection/accumulation at one end, which would cause a worse falling process.

The air supply for operation of the magnetic bars is fed centrally through the shaft by means of 2 bearing rotating air passages [11]. The air passages in the rotor shaft are protected from external influences by the housing.

The magnet rotor is mounted on a shaft and fixed with 2 flange bearings [10] on the housing.

One or two rotor seals [2] are fitted between the product channel and the service area, for dust-tight separation of the two channels.

An air nozzle [3] is mounted in the product channel. During the cleaning cycle, the air nozzle blows as much of the product material off the magnetic bars as possible to prevent material bridging and possible wear on the seals.

In the service chamber are a rotation sensor [6] that checks if the rotor is rotating correctly and a proximity sensor [6] that checks if all magnetic bars are completely out of the product channel and in the service chamber.

Mounted on the casing is a plate with solenoid valves [8] to control the solenoid bars, the valve box air cylinder and the air nozzle.

The air preparation unit [7] is also mounted on this. The conditioned air then goes to the solenoid valves and then to the magnetic bars, the air nozzle and air cylinders.

The enclosure is fitted with several inspection/service hatches [4], all secured with bolts to prevent unauthorised opening.

A valve box [9] is mounted under the device for separation of filtered ferrous particles. During the de-ironing cycle, the valve goes into the de-ironing position and ferrous particles are directed to the ferrous discharge. The sensors monitor which position the valve is in.

Magnetic bars and magnetic bar tubes

The magnetic rotor consists of fragile stainless steel magnetic bar tubes (extractor tubes) in which the magnetic bars move back and forth. Due to the thin wall thickness of the tubes, an excellent ferrous

separation result is achieved. However, larger, heavier iron and/or other particles in the product stream can cause dents in the fragile magnetic bar tubes.

Ensure that heavy or non-magnetic parts are filtered out of the product stream in advance. As a preventive measure, install a mechanical sieve before the device.

Once there are dents in the magnetic bar tubes, the magnetic bars may be difficult to move in the tubes or get out of the tubes. Always replace damaged magnetic bar tubes immediately to prevent further damage to the magnetic bars.

If the magnetic bars jam in the magnetic bar tubes, this should be rectified immediately. Have the magnetic bar tubes replaced or overhauled. If failure persists, we recommend ordering a new rotor to prevent further damage to the rotor.

Damage to the magnetic bar tubes and/or damage caused by damaged magnetic bar tubes are not covered by the warranty.

Wear on adhesion

Due to the low speed of the magnetic bars and the relatively small number of movements, the pneumatic components in the bars are subjected to very little stress. Nevertheless, normal wear can always occur.

Coating the magnetic bar tubes with tungsten carbide, for example, can reduce wear caused by an abrasive product. For more information, contact GOUDSMIT Magnetic Systems.

Over time - depending on the application and conditions - the pneumatic parts may get stuck in the magnetic bars. This requires more air pressure to move the magnetic bars. In that case, have the magnetic bars overhauled. The overhaul includes replacing the pneumatic parts and possibly cleaning the inside of the magnetic bar.

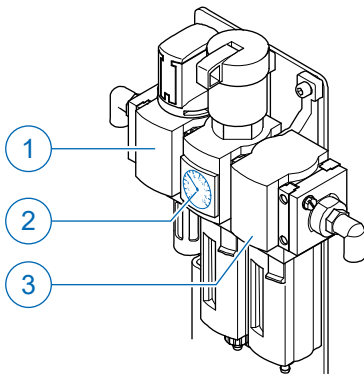
Air supply connection

The air supply (6 - 10 bar) is connected to the on/off valve of the air preparation unit. The pressure reducing valve reduces the air pressure to 4 - 6 bar. This is the working pressure to the 5/2 solenoid valves.

Over time, the pneumatic components in the magnetic bars may show wear, depending on conditions. As a result, the magnetic bars may require more air pressure to move the magnets in the tubes. If more than 6 till 7 bar is required, then it is advisable to overhaul your magnetic bars. Preferably have the overhaul done by GOUDSMIT Magnetic Systems.

Air preparation unit

The air preparation unit controls the valve of the valve box, the movements of the magnetic bars and the air nozzle. The air preparation unit consists as standard of:



[1] On/off valve, lockable with pilot lock (vented when closed)

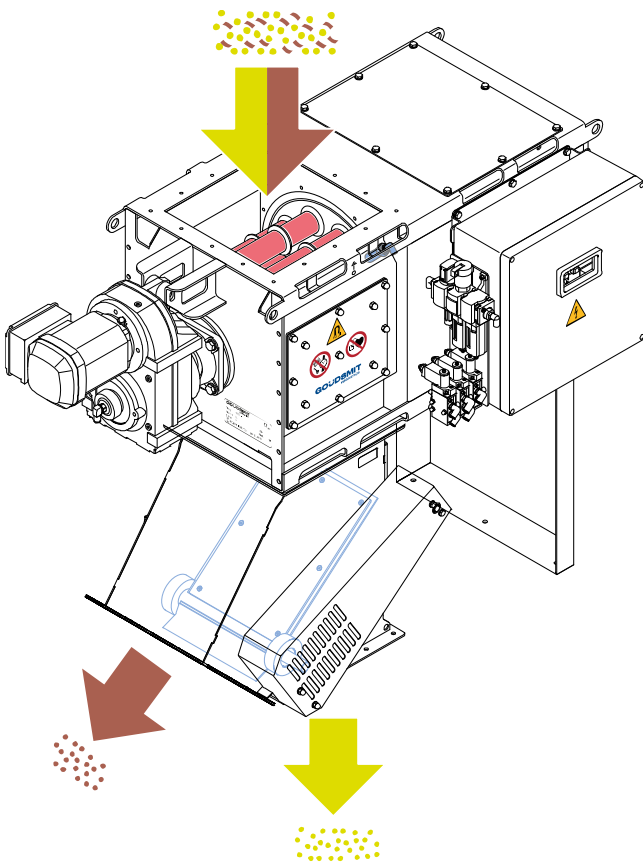
[2] Control valve / pressure gauge / standard filter

[3] Fine filter / microfilter

Optionally, an oil dispenser can be added.

- Close/open the supply air with the on/off valve of the air preparation unit.
- The conditioned supply air is already connected to the 5/2 solenoid valves of the fine filter.
- Make sure the air pressure remains below 6 bar. If the magnetic bars are functioning normally, the magnetic packages will move effortlessly in the tubes (at 4 bar normal pressure), but they will not move all at once because of the 'slip-stick' effect of the bars.
- Over time, depending on the application and conditions, the pneumatic components in the magnetic bars may wear out. This means more compressed air is needed to move the bars. If more than 6 bar of pressure is required, the magnetic bars need to be overhauled.
- Overhaul magnetic bars: Replace the sealing parts of the magnetic bars and clean the bars on the inside if necessary. See also chapter "[Maintenance and inspection](#)".

Working principle



The magnetic rotor with multiple pneumatically operated neodymium magnetic bars sits in the middle of the product stream.

Each magnetic bar has a magnet pack that moves pneumatically in a closed tube. The magnets attract passing ferromagnetic contaminants from the product stream. The captured particles stick to the magnets while the purified product continues to flow.

During a cleaning cycle, air pressure causes the magnets to move out of the product channel. The moving magnets pull the captured ferrous particles along with them over the tube surface. Halfway the tube length, the ferrous particles are stopped by the housing side plate. As soon as the magnets are far enough into the service chamber, the captured ferrous particles will fall into the product channel, after which the valve box ensures further discharge.

Cleaning cycle / removal of ferrous particles

- ▶ Stop the product stream.
- ▶ Give a start signal to the magnet's control unit.
 - Now first the valve in the valve box is automatically switched to iron discharge position.
 - Then the magnets inside the pneumatic tubes are moved automatically out of the product channel. At the same time, the air nozzle starts to pulse over the magnetic bars.

The captured metal particles want to 'travel' with the magnets, but are held by the retainer rings on the magnetic bar tubes and therefore remain in the product channel. As soon as the magnets are out of reach (in the service chamber), the captured particles automatically drop off of the tubes, into the valve box, where they are discharged further.
 - After at least one full rotation, the magnets in the pneumatic tubes are automatically moved back into the product channel.
 - Once the magnets have returned in the product channel, the valve is also automatically returned to its production position. (This removes the captured ferrous particles from the product channel).
 - When the magnets and valve are back in production position, the controller will give a 'ready for production' signal.
- ▶ Production can now be safely restarted.



If necessary, install a proprietary extraction system (e.g. a vacuum system) at the ferrous outlet of the valve box for better removal of ferrous particles.

PLC control – Siemens LOGO!

The LOGO! is a simple PLC module from Siemens. The LOGO! programme activates, among other things, the air blower and solenoid valves that control the movements of the valve switch and solenoid bars. The unit consists of a Siemens LOGO! with power supply unit (Siemens Power 1.3) in a plastic Legrand cabinet.

The programme is defined in the LOGO! and the supplied MicroSD card.

The parameters of the PLC programme of the Siemens LOGO! can be changed.



We recommend not carrying out modifications to the LOGO! programme yourself, but having this done by GOUDSMIT Magnetic Systems. Damage to the device due to incorrect modifications in the PLC programme is excluded from warranty.

If any changes need to be made to the LOGO!-control programme, please contact GOUDSMIT Magnetic Systems with the request and we will ensure that a MicroSD card with the correct LOGO!-programme is sent to you. The new programme can then be loaded as follows:

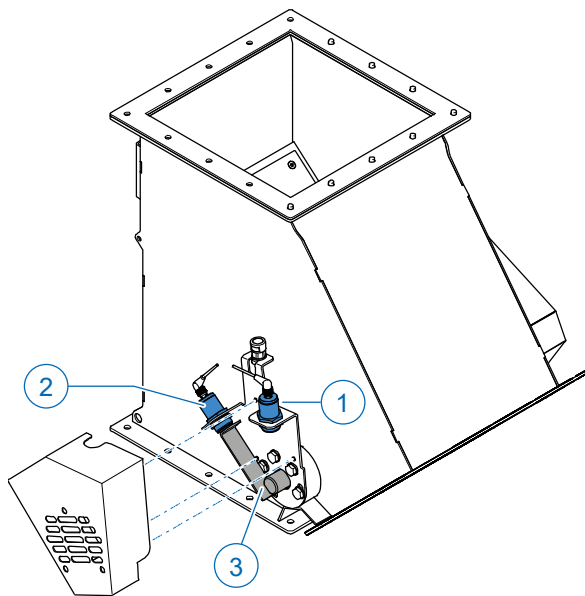
- ▶ Switch off the power to the LOGO!.
- ▶ Remove the old MicroSD card.
- ▶ Insert the new pre-programmed MicroSD card.
- ▶ Switch on the power to the LOGO! The new programme now loads itself automatically.

If - against our advice - you want to change the parameters of the LOGO! independently, please contact the GOUDSMIT Magnetic Systems service department for more information.

Automatic cleaning cycle with LOGO! PLC-programme

Procedure:

- ▶ Stop the product stream.
- ▶ Start the ferrous discharge cycle with a pulse signal on LOGO! input **i8** (see electrical diagram).
- ▶ The flap of the flap box is moved from the production position (**i1**) to the ferrous discharge position (**i2**) by an air cylinder.



[1] Sensor 1 - Production position

[2] Sensor 2 - Ferrous discharge position

[3] Metal plate for sensor activation

- ▶ When the valve is fully in the ferrous discharge position, the magnetic bars in the stainless steel tubes are pneumatically pushed out of the product channel.

- ▶ The ferrous particles - captured during production - move away with the magnets to the service chamber, but are stopped by the housing side plate, causing the ferrous particles to drop off when the magnets are no longer in the product channel.
- ▶ For a number of rotations, each bar receives an air pulse that makes the ferrous particles drop off even better, after which they are discharged through the valve box.
- ▶ The magnets are then pneumatically pushed back into the product channel.
- ▶ The valve box flap is moved back from the ferrous discharge position (i2) to the production position (i1).
- ▶ The product stream can be restarted when the signal "IN PROCESS" is given by the control unit (output Q6 of LOGO! "high").

Alarm / signalling

The controller generates an alarm signal "high" at output Q4 of the LOGO! if one of the following alarm situations occurs. In doing so, the alarm message appears on the LOGO's display:

FAILURE FLAP IN	Flap of flap box does not return to production position fast enough or at all.
FAILURE FLAP OUT	Flap of flap box does not go to ferrous discharge position fast enough or at all.
FAILURE MAGNETS IN	(One or more) magnetic bars come in production position to slow or not at all.
FAILURE MOTOR STOP	Motor not turning.
FAILURE MAGNETS OUT	(One or more) magnetic bars come in ferrous discharge position to slow or not at all.
FAILURE NO START	Ferrous discharge cycle does not start after given start signal.

The ferrous discharge cycle of the device is not continuous. This means that there are no magnets in the product channel during this cycle. During the ferrous discharge cycle, the product flow must be interrupted, as no ferrous particles can be captured during this phase.

Benefits interim cleaning:

- Hardly any or no product loss during the cleaning cycle;
- Improved hygiene properties for use in the food industry (such as FDA / HACCP / EHEDG).

Disadvantage interim cleaning: Product stream should be interrupted during the cleaning and ferrous discharge cycle.

Maintenance and inspection



Clamping/crushing hazard

Due to the very high magnetic forces on the magnetic bars, replacement of magnetic bars and/or magnetic packages is extremely dangerous. This replacement may ONLY be carried out by suitably qualified personnel or preferably by GOUDSMIT Magnetic Systems mechanics. If the replacement is nevertheless carried out by non-qualified personnel, the warranty will be voided.

GOUDSMIT Magnetic Systems assumes no liability for any consequential damage to persons and/or materials in the event of failure to comply with this prohibition.



Careful

- Perform all work on the device while the product stream is stopped.
- Be careful with tools. The magnetic force is permanent.

Magnetic systems not only attract ferromagnetic particles, but a small part of your product also "sticks" to the magnets. Regularly remove all captured particles on the magnets.

- ▶ Always inform operating personnel of scheduled inspections, maintenance, repairs or in case of malfunctions.
- ▶ Check regularly that all warning pictograms are in the right place on the device. If the warning pictograms are lost or damaged, immediately apply new ones in the original place.
- ▶ Make sure the outside of the device is clean. Remove dust, dirt and parts on the device that do not belong there.

Maintenance frequency

Action	Daily	Monthly	6 months	Annual	5 years
Clean magnetic bar tubes (cleaning cycle) (→ "Cleaning cycle / removal of ferrous particles")	min. 2x ¹⁾				
Clean magnetic bar tubes (manual) (→ "Cleaning instructions")	●				
Lubricate bearings (see "Bearing systems")		●			
Check / replace magnetic bar tubes for wear (→ "Magnetic bar tube replacement")		●			
Check/maintain gearmotor (→ "Gearmotor")			●		
Measure magnetic bars for flux density (→ "Flux density measurement of the magnetic bars")			●		
Replace seal ring (→ "Replacing the seal ring").				●	
Replace oil seal with bearings (→ "Replace oil seal and bearings")					●

Table: Maintenance table

¹⁾ The frequency of the cleaning process depends on the capacity of your product stream and the amount of contamination.



GOUDSMIT Magnetic Systems offers an annual inspection including sealing ring replacement and an inspection report with certificate for the magnets.

Cleaning instructions

The cleaning and disinfection methods and agents used for cleaning must be adapted to the specific type of contamination occurring (carbohydrates, proteins, fats, etc.) and the degree of cleanliness required for your application. Thus, the type of product being processed largely determines which combination of cleaning agents are suitable. Consult your cleaning product supplier to select the right cleaning products for your specific situation.

The appliance is made of stainless steel 1.4301/SAE 304L and 1.4404/SAE 316L. Check with your cleaning agent supplier if they are suitable for the material of the chosen seals (Silicone, NBR or VITON).

Wet or dry cleaning

If the use of liquids is not permitted in your facility, use decontamination wipes suitable for contact with the processed product if necessary.

The frequency of cleaning depends on the degree of cleanliness required for the processed product. In applications where sensitive food products are processed, the cleaning frequency should be increased. Conduct a hygiene risk assessment to determine the requirements in your case.

Bearing systems

To determine bearing replacement intervals, combine your own experience with bearings in similar applications with the recommended and estimated intervals. If necessary, contact GOUDSMIT Magnetic Systems for advice.

Lubrication instructions

The bearing systems used by GOUDSMIT Magnetic Systems all contain grease-lubricated bearings that are protected against dirt and moisture. Use only **SKF LGMT2 grease** to lubricate the bearings.

Bearings require more frequent maintenance, if they are used in dusty and humid environments, at high temperatures or they have a service life longer than the grease life.

- ▶ Check regularly if the bearings make more noise or get hotter than usual. If this is the case, investigate what the cause is and solve the problem. For (re)lubrication, see table below. If the bearings still remain too noisy or too hot afterwards, renew the entire grease or have the bearings replaced by a GOUDSMIT Magnetic Systems service technician.
- ▶ For replacement intervals, combine experience data from bearings in similar applications with the recommended and estimated interval periods indicated in the bearing manufacturer's tables.
- ▶ The table below gives a rough indication of the lubrication intervals to be observed.

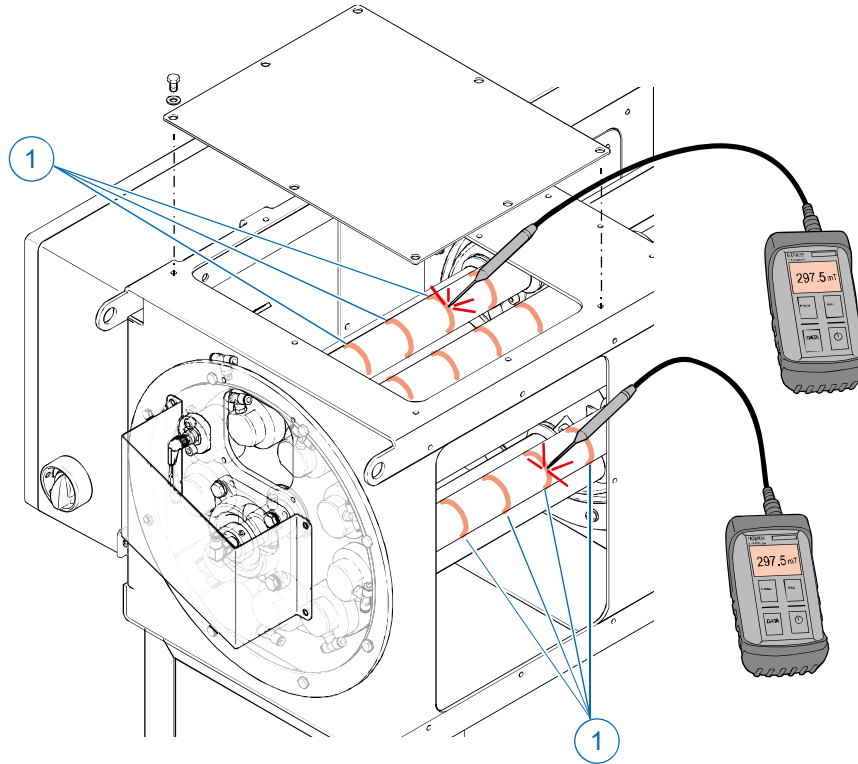
Operating temperature bearings		Lubrication interval at ambient condition		
Celsius [°C]	Fahrenheit [°F]	Clean	Dirt	Very dirty / very damp
50	122	3 years	6 months	3 months
70	158	1 year	2 months	1 month
100	212	3 months	2 weeks	1 week
120	248	6 weeks	1 week	3 days
150	302	2 weeks	3 days	daily

Table Lubrication intervals

- ▶ For more detailed intervals, combine your own experience data from similar applications with the recommendations and estimated interval periods in the bearing manufacturer's maintenance tables and formulas.

Flux density measurement of the magnetic bars

The magnetic bars should be measured periodically for magnetic flux density to check that the magnetic force has not decreased. Measure the poles of the magnetic bars with a suitable Gaussmeter/teslameter on the surface of the magnetic bar tubes (unit is tesla, gauss, kA/m or oersted). GOUDSMIT Magnetic Systems performs magnetic measurements on site if required. Proceed as follows for a flux density measurement:



- ▶ Stop the product stream.
- ▶ Run a cleaning cycle.
- ▶ Switch off the power to the device.
- ▶ Unmount the service hatch.
- ▶ Clean the magnetic bar tube with a soft, clean cloth and - if necessary - with a suitable cleaning fluid.
- ▶ Move the Gaussmeter/teslameter along the poles [1] of the magnetic bar tube. Record the highest value measured.

The measured values can fluctuate due to several factors, including the position (angle) of the probe on the magnetic bar tube, the thickness of the probe and the reproducibility of the measurement.

- ▶ Record the highest value measured. Using the corresponding data sheet, check whether the measured values are within the allowed value of the peak value.

With the exception of the front and rear pole, all poles must have a value within 10% of the highest measured value.

- ▶ Manually rotate the rotor to the next solenoid bar.
- ▶ Clean the magnetic bar tube and measure the poles with the Gaussmeter/teslameter. Record the highest value measured.
- ▶ Do this operation for each magnetic bar.
- ▶ Mount the service hatch.
- ▶ Switch the power back on.
- ▶ Production can now be safely restarted.

Gearmotor



Interrupt the motor's power supply and ensure that it cannot be switched on without your knowledge. Wait for the motor to cool down.

Check regularly if the motor produces more noise or generates more heat than normal. If so, investigate the cause and fix the problem as soon as possible to prevent (further) damage.

The table below gives the general inspection and maintenance intervals as an indication of the necessary inspection and maintenance work.

Gearbox	
Interval	To do
Every 3,000 operating hours, at least every 6 months.	<ul style="list-style-type: none"> ▶ Check the oil and oil level. ▶ Visually check the seals for leaks. ▶ For geared motors with a torque arm: Check the rubber buffer and replace if necessary.
Depending on operating conditions (see chart below), at least every 3 years.	<ul style="list-style-type: none"> ▶ Change the oil. ▶ Change the grease in the frictionless roller bearings (recommended). ▶ Replace the oil seal (do not fit it in the same track).
Depending on oil temperature.	<ul style="list-style-type: none"> ▶ Replace the oil seal (do not fit it in the same track).
Depending on operating conditions (see chart below), at least every 5 years.	<ul style="list-style-type: none"> ▶ Change the synthetic oil. ▶ Change the grease in the frictionless roller bearings (recommended). ▶ Replace the oil seal (do not fit it in the same track).
Depending on oil temperature.	<ul style="list-style-type: none"> ▶ Replace the oil seal (do not fit it in the same track).
Some gearmotors (such as the SEW R07, R17, R27, F27 and Spiroplan®) are lubricated for life and therefore maintenance-free.	
Various (depending on external factors).	<ul style="list-style-type: none"> ▶ Update or renew the surface/rust-resistant coating.
Motor	
Every 10,000 operating hours.	<p>Inspect the engine:</p> <ul style="list-style-type: none"> - check the ball bearings and replace them if necessary; - replace the oil seal; - clean the cooling air vents.
	<p>[1] Operating hours</p> <p>[2] Exposure temperature of oil bath. Average value per oil type at 70 °C.</p> <p>[3] Most of our geared motors use 0.4 litres of type CLP PG NSF H1 Klubersynth UH1 6-460 oil.</p> <p>The refreshment interval depends on the temperature.</p>

Table: General inspection and maintenance intervals for the gearmotor

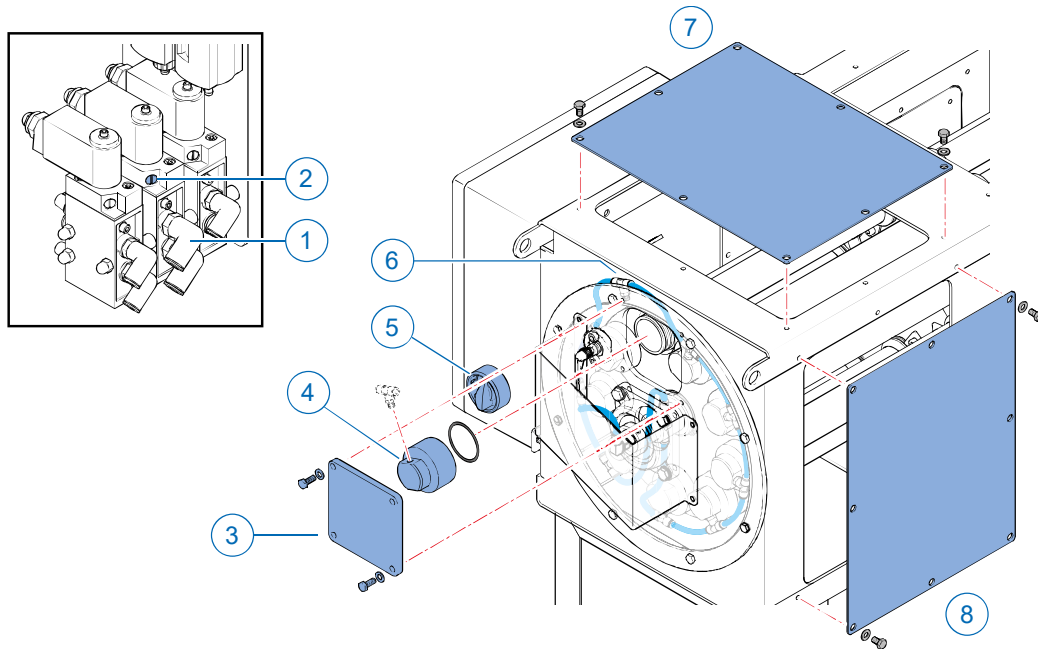


When changing oil, use **CLP PG NSF H1 KLUBERSYNTH UH1 6-460** which is approved for incidental contact in the food and pharmaceutical industries.

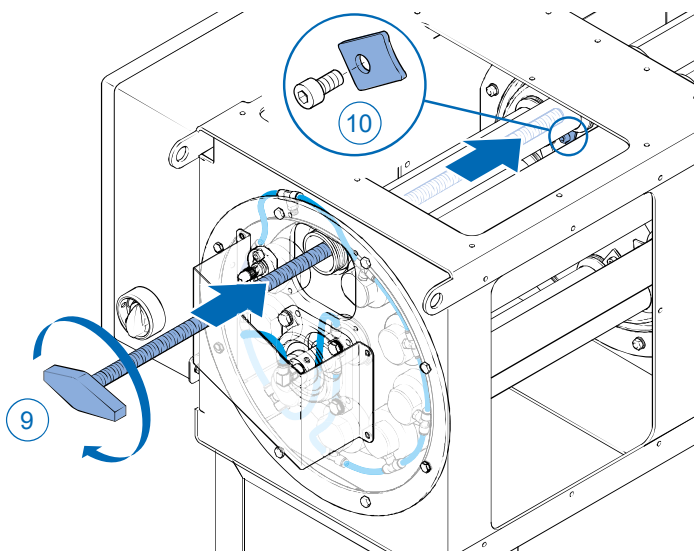
Caution! CLP PG NSF H1 KLUBERSYNTH UH1 6-460 cannot be mixed with other mineral or synthetic oils.

Magnetic bar tube replacement

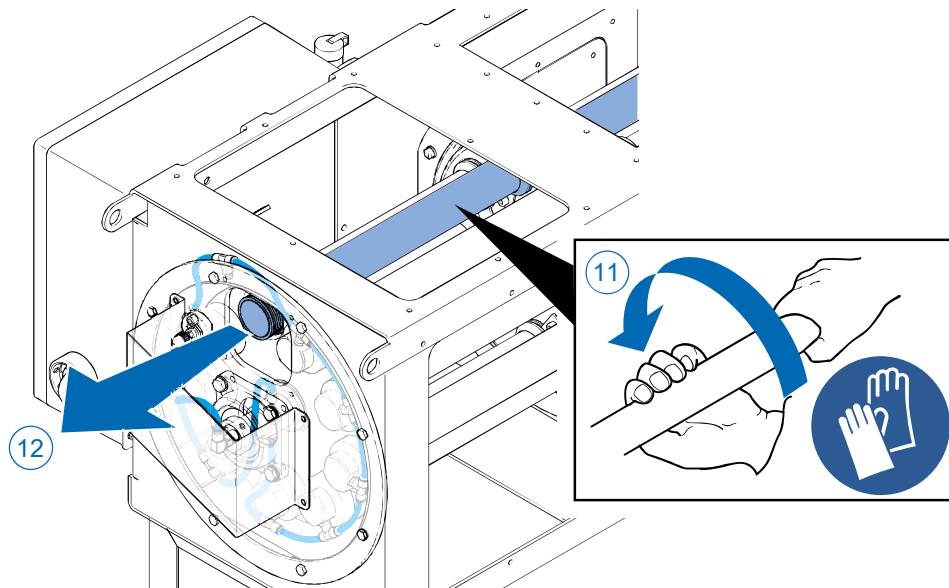
- ▶ Stop the product stream.
- ▶ Run a cleaning cycle.
- ▶ Switch off the power to the device using the main switch [5] on the control box.
- ▶ Pneumatically move the magnetic bars via the screw [2] on the solenoid valve [1] to the service chamber.



- ▶ Remove the rear service hatch [3] and the other service hatches [7+8].
- ▶ Manually or electrically rotate the magnet rotor until the desired magnetic bar tube is in front of the service hatch [3].
- ▶ Disconnect the air coupling [6] on the end cap [4] of the magnetic bar tube.
- ▶ Remove the end cap [4].



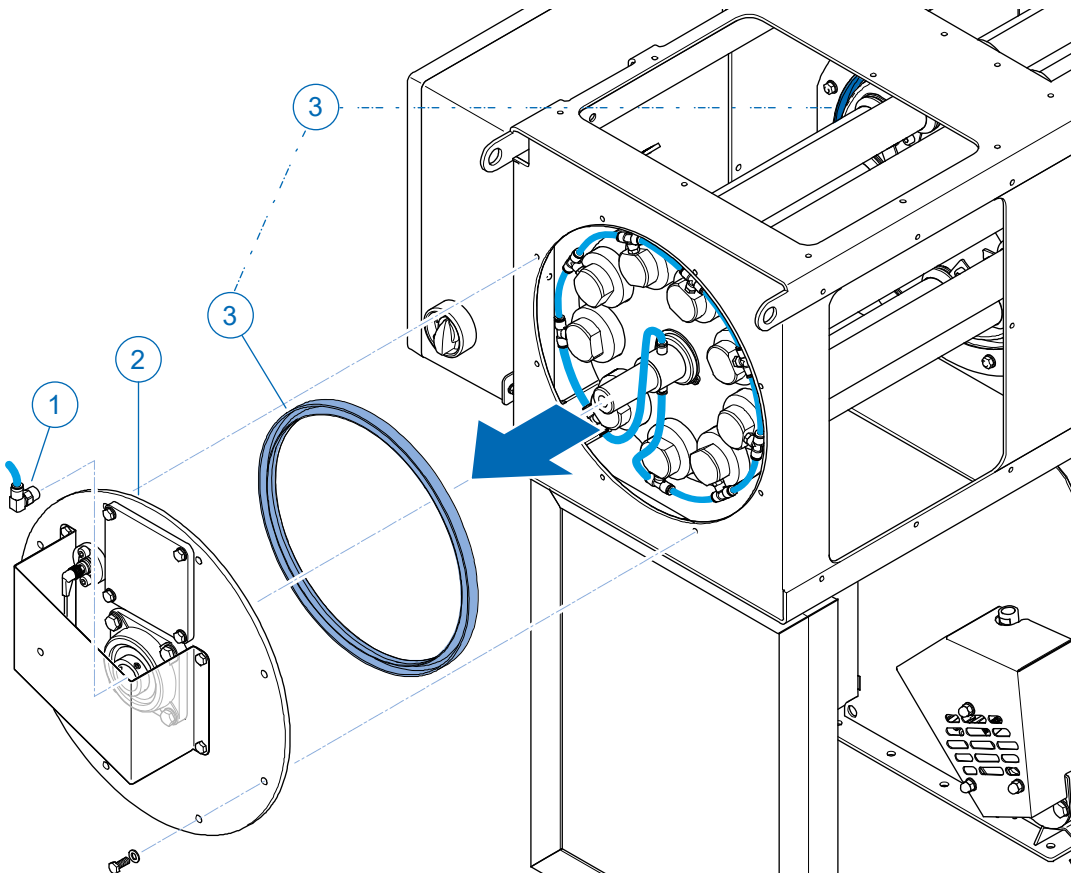
- ▶ Insert a long threaded rod M6 [9] into the tube and screw the threaded rod into the magnetic bar.
- ▶ Pull the magnetic bar out of the tube and deposit it on a clean wooden or plastic deposit.
- ▶ Dismantle the locking plate [10].



- ▶ Use both hands (use gloves) to unscrew the tube from the rotor disc [11].
- ▶ Remove the old tube via the service hatch [12] and insert a new tube with the locking plate [10] back into the rotor disc.
- ▶ Place the magnetic bar, end cap (with seal) and air coupling back on the magnetic bar tube.
- ▶ Rotate the magnet rotor to replace the next tube.
- ▶ Repeat all previous operations for each magnetic bar tube to be replaced.
- ▶ Before commissioning, check that the screw on the solenoid valve used is back in the correct position, otherwise the device will not start.
- ▶ Switch the power back on.
- ▶ Production can now be safely restarted.

Replacing the seal ring

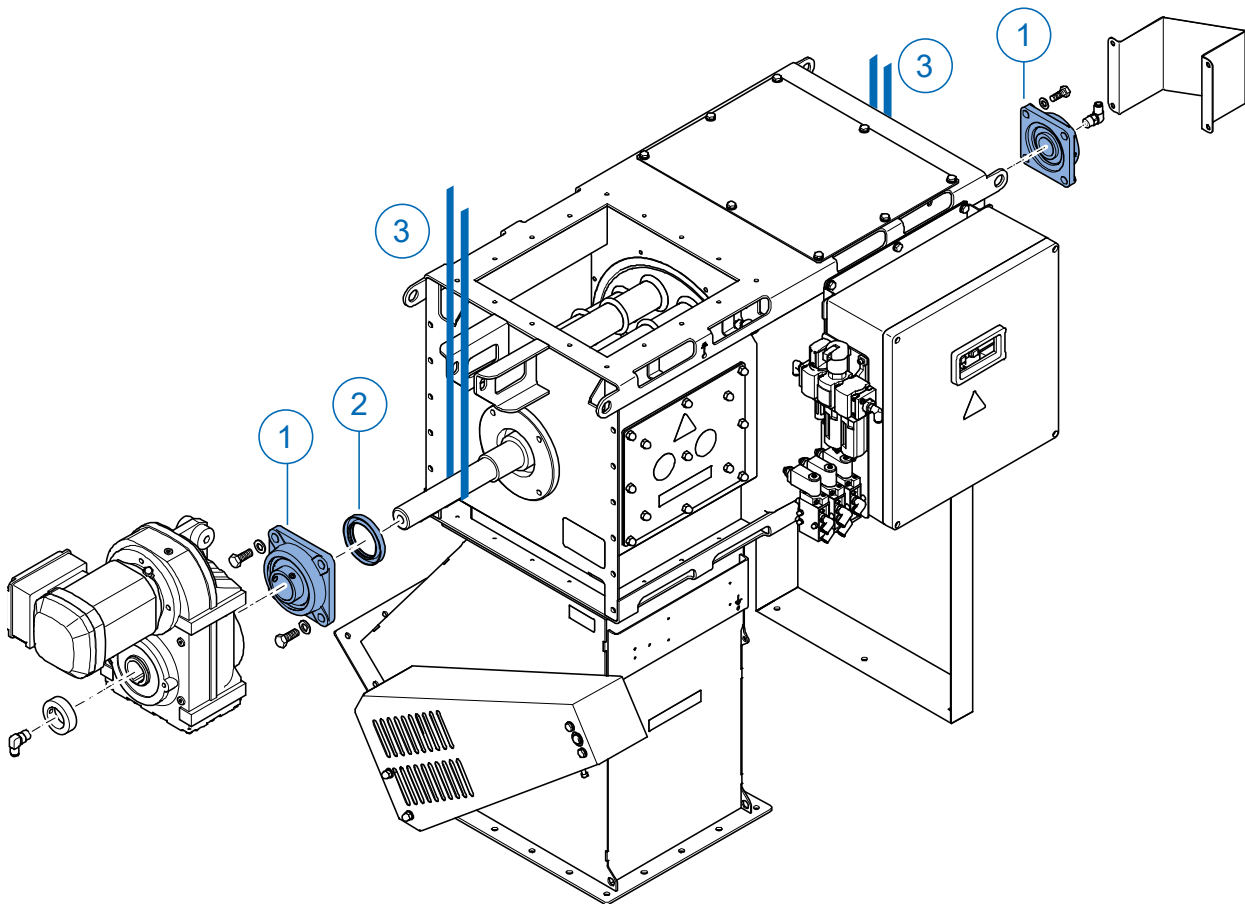
We recommend replacing the seal ring every year or more often, depending on wear. Proceed as follows:



- ▶ Stop the product flow.
- ▶ Run a cleaning cycle.
- ▶ Switch off the power to the device.
- ▶ Loosen the air coupling [1] on the rotor shaft.
- ▶ Loosen the locking screw of the bearing.
- ▶ Dismantle the large disc on the service chamber [2]. Support the loosely hanging rotor shaft.
- ▶ Remove the old seal ring [3]. Clean the groove with a clean cloth.
- ▶ Fit a new seal ring.
- ▶ Reinstall everything in reverse order.
- ▶ Switch the power back on.
- ▶ Production can now be safely restarted.

Replace oil seal and bearings

We recommend replacing the oil seal with both bearings every 5 years or more often, depending on wear. Proceed as follows:

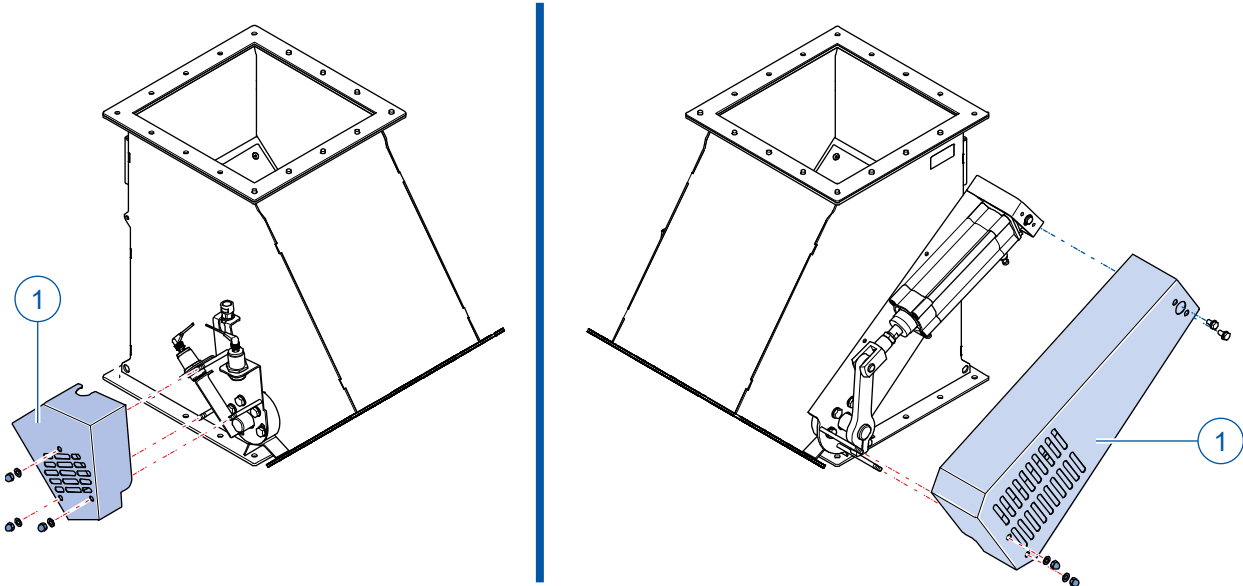


- ▶ Stop the product flow.
- ▶ Run a cleaning cycle.
- ▶ Switch off the power to the device.
- ▶ Dismantle the magnet rotor with end disc and air coupling.
- ▶ Use a support for the loose rotor shaft, e.g. lifting straps [3].
- ▶ On the other side, dismantle the cover with air coupling.
- ▶ Replace both bearings [1] and the oil seal [2].
- ▶ Reassemble all parts in reverse order.
- ▶ Switch the power back on.
- ▶ Production can now be safely restarted.

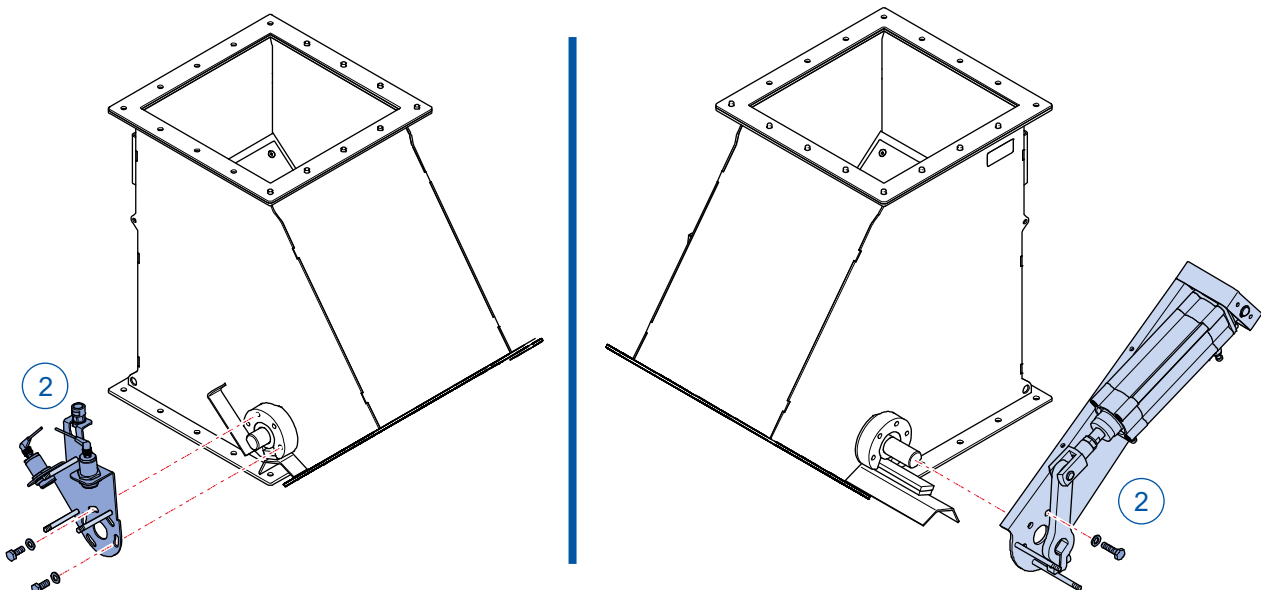
Replacing the plate seal in the flap box

Due to normal wear and tear, the plate seal in the valve box may need to be replaced. GOUDSMIT Magnetic Systems can replace the plate seal for you. If you decide to perform this maintenance yourself, make sure it is carried out by qualified personnel.

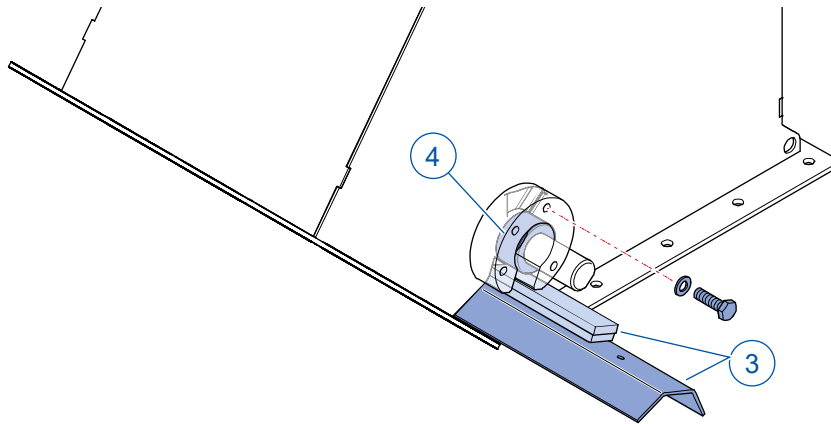
It may be necessary to dismantle the valve box from the duct assembly if you do not have access to both sides or the space between ferrous outlet and product outlet.



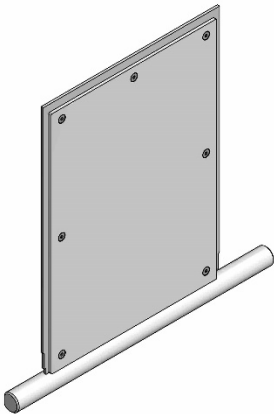
- ▶ Remove both covers on either side of the flap box [1].



- ▶ On both sides, remove the assembly [2] connected to the shaft of the flap box.
- ▶ In the space between the ferrous outlet and the product outlet, remove the screws holding the angled plate in place.



- ▶ Slide away the profile including strip with corresponding seal [3].
- ▶ Remove the bearing bush with shaft seal [4] on both sides outwards along the shaft. There is a space underneath through which the bearing bush can be removed, but do not damage it.



- ▶ Take out the complete flap downwards.
- ▶ Loosen the screws and remove the plate seal between the 2 metal plates.
- ▶ Install a new plate seal.
- ▶ Make sure the plate seal is not too tight in the flap and check the size.
- ▶ Reassemble all parts in reverse order.



GOUDSMIT Magnetic Systems accepts no liability for damage caused by incorrect replacement of the plate seal and the flap assembly.

Preferably have the replacement of the plate seal done by GOUDSMIT Magnetic Systems service technicians.

Faults

Use the table below to look up faults, determine the possible cause and find the remedy. In case of a fault, which is not listed in the table, contact GOUDSMIT Magnetic Systems customer service.

Failure	Possible cause	Remedy
Magnet does not separate ferromagnetic particles or does so poorly.	Magnetic bars are too saturated.	Clean the magnetic bars once by applying higher air pressure and clean the bars at shorter intervals in the future.
	Unattached objects are not magnetic.	Check whether the particles to be separated are magnetic using a permanent magnet.
	Iron particles near the magnets reduce the de-ironing capacity.	Check the magnetic behaviour of the installed parts near the magnets by holding an iron part near the magnets. If any parts react to the magnet, replace them with non-magnetic parts, such as stainless steel.
Poorly moving or non-moving magnetic bars (magnet packages in the tubes).	The air supply is not connected.	Connect the air supply.
	One or more magnetic bar tubes have dents.	Find the cause and fix it. Send the magnetic bar tubes to GOUDSMIT Magnetic Systems for overhaul.
	Air supply fittings are broken or loose.	Renew the couplings or retighten.
	The seal of the pneumatic magnetic bar is defective.	Have the magnetic bar(s) replaced or overhauled.
Motor makes more noise than normal or has higher rated current [A].	Motor failure.	Repair or replace the motor.
	An object is stuck between the rotor and housing.	Remove the object from the system and replace the seal ring if necessary.
Rotor does not rotate.	Electrical connection is not properly done.	Check and repair the electrical connection.
	Pneumatic control or solenoid valve is inactive.	Check the air supply. Turn the screw on the solenoid valve back to its original (vertical) position.
Flap of flap box "leaks".	Dents in the magnetic bar tubes.	Find the cause and take it away. Have the magnetic bar(s) replaced.
	Plate seal is worn out.	Have the plate seal replaced.
Magnetic filter "leaks".	Seal between product channel and service chamber is defective.	Have the seal repaired by qualified personnel.
Valve moves poorly or not at all.	There is an object stuck between flap and flap box.	Remove the object and have the flexible plate replaced if necessary.
	Air pressure is too low.	Set the air pressure higher (max 6 bar).
	Air coupling is loose.	Tighten the air coupling again.
	Plate seal is worn out or damaged.	Have the plate seal replaced.
	Valve box cylinder(s) defective.	Repair or replace cylinder(s).

Service, storage and dismantling

Customer service

Please have the following information to hand when contacting customer service:

- Type plate data (complete).
- Type and extent of the problem.
- Time when the problem occurred and any accompanying circumstances.
- Presumed cause.

Spare parts

Due to the robust construction and quality of GOUDSMIT Magnetic Systems' products, the device has high operational reliability.

Spare parts are usually parts subject to wear and tear, including:

- seal ring;
- plate seal flap box;
- seals magnetic bars;
- oil seal;
- bearings;
- (gear)motor.

We recommend keeping 1 or more pneumatic magnetic bars in stock as a reserve.

Apply oil directly if an oil sprayer (option) is fitted instead of the lifetime grease on the inside of the magnetic bars.

- When ordering, please quote the item and order number located on the type plate.
- For more information, contact us by phone on +31 (0)40 22 13 283 or check our website.

Disposal

The device must be disposed of at the end of its technical lifetime, correctly and in accordance with locally applicable regulations.