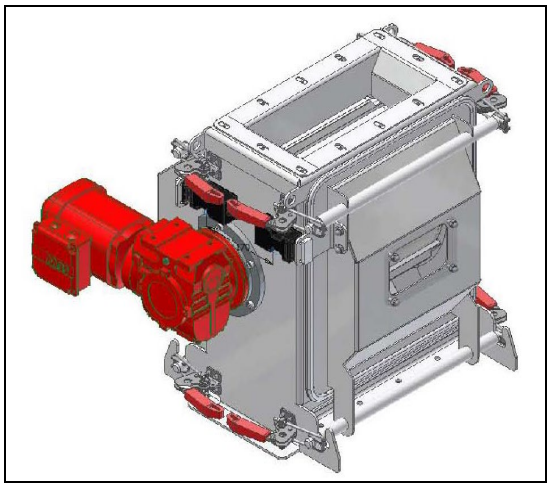
GOUDSMIT MAGNETICS

Assembly instructions and user manual

Magnetic drum separator in housing, series RDxx… / SxTK…

Fe separator with permanent magnet

Suited for separation of ferromagnetic (Fe) parts out of powders and granulates.



The descriptions and pictures in this manual, used for explanation, may differ from your machine.
We have enclosed the as-built drawing of the delivered machine.

GOUDSMIT Magnetic Systems B.V.
P.O. Box 18 5580 AA Waalre
Petunialaan 19 5582 HA Waalre
The Netherlands
Tel. (+31) (0)40 221.32.83
Internet www.goudsmitmagnets.com
E-mail info@goudsmitmagnets.com

CE

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Revision history

Version	Date	Description
1.2	05-2000	First version of the English version of the user manual.
2.0	01-2004	Complete renewed version of the manual.
2.1	12-2006	Revisions page added. Atex remarks added.
3.0	10-2009	Specification sheet and declaration by the manufacturer separated from manual
3.1	01-2012	Food grade Neoflux® drum magnet type added.
3.2	06-2014	Description ATEX ambient temperature Ta added
3.3	10-2019	New Logo + small tekst changes
3.4	03-2021	Safety, installation and operating instructions extended. Cleaning instructions added.

Introduction

Read this manual and make sure that you fully understand its contents before commissioning and operating the machine.

If you have any queries or require further explanation regarding any subject related to the machine, please do not hesitate to contact **GOUDSMIT Magnetic Systems B.V.**

All technical information contained in this manual, together with any relevant drawings and technical descriptions we supply, remain our property. It may not be duplicated or disclosed without our prior written permission.

The user manual can be ordered together with the device description and/or the article number as well as the order number.

- This manual and the declaration by the manufacturer are part of the machine.
- They must remain with the machine, even if it is sold.
- The manual must be made available to all operators, service technicians, and others who work with the machine throughout its life cycle.

Table of contents

General

This manual contains information for the correct operation and maintenance of your device. It also contains instructions for avoiding possible injury and serious damage and it allows a safe and as trouble-free functioning of the product as possible. Read this manual thoroughly before putting the device into operation, familiarise yourself with the operation and control of the device and follow all instructions precisely.

- *The data published in this manual is based on the available information at the time of delivery. This is issued subject to later amendment.*
- *We retain the right to amend or modify the construction and/or model of our products at any time whatsoever without any obligation to modify any previously supplied products accordingly.*

Ferromagnetism

The working principle of the device rests on (Ferro)magnetism.

Ferromagnetism is the basic mechanism by which certain materials such as iron cobalt and nickel can get magnetized when exposed to an externally applied magnetic field. Materials that remain magnetized after the external magnetic field is removed, are called permanent magnets. Most magnetic materials lose their magnetism after the external magnetic field is removed. Most alloys of iron, cobalt and nickel are magnetic. However, some stainless steel alloys like AISI304 or AISI316 are only slightly magnetic.

Because in most cases it will be Fe parts that will be Ferro-magnetically influenced, we will use the term ‘Fe’ in this user manual when we mean ferromagnetic material

Conditions of supply and guarantee

The conditions of supply are the **"General Conditions for the supply and erection of mechanical, electrical and electronic products" (SE01)**, published by ***Orgalime***, in Brussels.
These conditions can also- if desired – be requested by writing to Goudsmit Magnetic Systems B.V., as also mentioned in our written quotation.

The guarantee prescriptions are mentioned in these conditions.

The guarantee on your equipment will be void if:

- Service and maintenance are not performed in accordance with the instruction manual or by servicemen who are not especially trained to do the work. We strongly recommend that specific magnetic service and maintenance be carried out by Goudsmit personnel).
- Modifications are made to the equipment without our prior written permission.
- Non-original parts or non 100% exchangeable parts are used.
- Lubrication products other than those prescribed are used.
- The equipment is used injudiciously, incorrectly, negligently or not in accordance with its intent and/or purpose (see chapter "Intended use / user instructions").

All parts that are subject to wear are excluded from the guarantee.

Remaining remarks / warnings

- Use the device only for the application for which it has been designed (see chapter *"Intended use / user instructions"*).
- Use the device only when it is in technically perfect condition, and ensure that all protective hoods or inspection covers, including all safety circuits, have been fitted and installed in the correct manner.
- Ensure that device maintenance is appropriate and in accordance with the instructions provided in this user manual.
- Any eventual faults, in particular those that may influence safety, should be attended to immediately and remedied before renewed operation. Should you, after estimating the risks of an unsolved fault, still think it is safe to keep the device into operation, then warn the operators and maintenance staff of these faults and the danger(s) caused by these faults.

Delivery

General

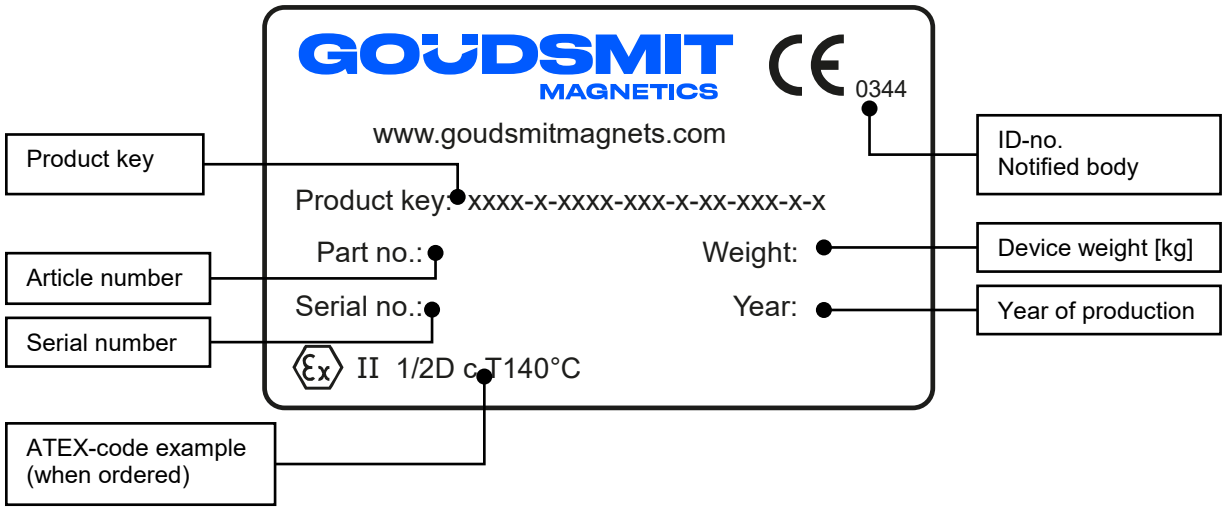
Check the shipment immediately on delivery for:

- Possible damage and/or shortcomings as a result of transport. If so, ask the transporter to draw up a transport damage report.
- Completeness of the delivery/deliveries, the absence of anything (additionally) ordered.

Always immediately contact **GOUDSMIT magnetic systems** in the event of any damage and/or mistaken delivery.

Identification plate

On the device you will find an identification plate as pictured below. **Information on this plate is of great importance in case of service**. That is why we advise to maintain this plate on the device at all times. Ensure that it is always legible by cleaning regularly.



Don't forget to make note of the Serial Number and the Article number in case of breakdown(s) and or delivery of spare parts.
If your identification plate is damaged, contact us and we will send a new one as soon as possible.

ATEX Markings (if applicable)

When the equipment is suitable for use in potentially explosive atmospheres (ATEX) the type plate will feature an Ex Marking specifying the specific device category and other criteria that the equipment satisfies.

- Code example:  II 1/2D c T140°C Da/Db
- Explanation:

II ➔ explosion group (I is underground mining, II is other)

1/2D ➔ Equipment Category (Ignition protection level: 1 = very high, 2 = high, 3 = normal)

Equipment category	1D	2D	3D
Suited for ATEX zone(s)	20 (21, & 22)	21 (22)	22

1D = inside device / 2D = outside device

c ➔ Type of Ex protection

c = constructional safety

t = protection by enclosure

h = non-electrical equipment (protection method not specified further)

T140°C ➔ Maximum surface temperature

Da/Db ➔ Equipment Protection Level (EPL).

EPL	Da	Db	Dc
Suited for ATEX zone(s)	20 (21, & 22)	21 (22)	22

Da = inside device / Db = outside device

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

In case the equipment contains no ‘own ignition sources’ and therefore is not under scope of the ATEX Directive, then the equipment will not get an EX marking and will be supplied with a Statement of Exclusion, in which this is stated and also the EX zones are listed in which it can be safely used.

ATEX explosive zone measures

- If the device has been ordered for use in a potentially explosive area, make sure that no higher surface temperature arises then permitted by ATEX.

  The ATEX marking on the Goudsmit identification plate only applies to the product produced by Goudsmit Magnetic Systems B.V.

  Make sure no particles > 10 mm are present in the product flow.
  These can damage the magnet or extractor bars or cause impact sparks.
  If necessary install a mechanical filter (sieve) before the separating equipment!

- The ATEX certified magnetic device requires additional purchase parts to be certified to the ATEX Directive. This includes control units, connection box(es), switch(es), sensor(s) and pneumatic parts, etc. Make sure that these are fitted by qualified personnel!
- If the device is placed in storage or has a longer standstill, make sure the device is emptied and cleaned.
- The device must be grounded, if a gasket is used between the device and the larger installation. Attach a metal strip between the housing of the device and the installation, to make sure the device is grounded.
- All screw connections inside the device must be secured against loosening.

  The ATEX purchase parts are provided with their own ATEX markings.

The final ATEX classification of the whole unit may be lower than the ATEX marking on the typeplate if the attachments have a lower ATEX marking.

Safety

The instructions in this manual must be observed. Failure to comply with these instructions may result in material damage, personal injury or even death.
This chapter describes the safety risks of your device.

General safety instructions

- The instructions in this manual must be observed. If not, material damage, physical harm or life threatening situations may occur.
- The device may only be used for separating ferrous particles from dry powder and granulate streams. Any other use does not comply with the regulations. Damage which results from this use is not covered by the manufacturer's warranty.
- The device is equipped with safety and shielding devices. Make sure all personnel working with or in the direct vicinity of the device are wearing sufficient safety equipment. Always leave all safely and shielding devices at their original location when it is not necessary to remove them.
- Take extra safety precautions when the device is still easily accessible for personnel. If this is not possible, make sure clear instructions are given about the installation if which the device is a part.
- The device may only be used remotely when all shields are installed and moving parts are not accessible.
- **Danger of crushing!** Do not clean or do any maintenance work while the device is still running, not even with the cover plate or inspection hatches removed.
- All work on the device must only be done by qualified personnel. Maintenance work should preferably be done by Goudsmit personnel.
- Always apply local safely and environmental regulations.

Responsibility of the owner

The plant is used in an industrial environment. The owner therefore is subject to the legal duties of occupational safety.
In addition to the safety notes contained in the present instructions, you must heed the safety, accident prevention and environment protection regulations. In particular:

- The owner must inform himself of applicable industrial safety regulations and must identify additional hazards resulting from the special work conditions in force at the plant site in a risk assessment. He must convert such findings into work instructions for operation of the plant.
- The owner must verify whether or not the instructions he compiled comply with the current state of rules and standards and amend the instructions if necessary throughout the entire service life of the plant.
- The owner must clearly define and assign the responsibilities for installation, operation, maintenance and cleaning.
- The owner must make sure all employees handling the plant have read and understood the operating instructions. He must also train the staff at regular intervals and instruct them with regard to the hazards.
- The owner must provide the required personal protection.

The owner is also responsible for a technically perfect condition of the plant at all times; the following therefore applies:

- The owner must make sure the maintenance intervals mentioned in the present operating instructions are heeded.
- The owner must have all safety devices tested for proper function and completeness at regular intervals.

Staff requirements – Qualification

WARNING

Risk of injury due to insufficient qualification.

Inexpert handling can result in severe injuries and damage to material.

▶ Assign all work on the device to qualified staff only.

The following qualifications are defined in this manual for the different areas of work:

Only persons who may be expected to work reliably must be employed. Persons whose ability to respond is impaired, e.g. by narcotics, alcohol or drugs, are not allowed to work.

- *Instructed person* was instructed by the owner with regard to the tasks assigned to him and of potential hazards in case of inexpert behaviour.
- *Specialist staff* is capable of performing the tasks assigned to him, recognizing and avoiding potential hazards due to his training, knowledge, experience and knowledge of commonly applicable regulations.

Personal protection

To minimise the health hazard, the use of personal protection is mandatory.

▶ Make sure to always wear the protective equipment required for the respective task.

▶ Make sure to always wear protective clothing, safety shoes, hearing protection, breathing protection, goggles and protective gloves.

▶ Observe the instructions regarding personal protection on display in the work area.

Damage by magnetic field

The magnets create a strong magnetic field that attracts ferromagnetic parts. Always use none ferromagnetic tools and work benches with a wooden counter top and a none ferromagnetic base.
Do not bring any other ferromagnetic items, such as keys, coins and tools, into the magnetic field as they can be forcefully attracted by the magnet, which can cause serious damage.

Strong magnetic field

During maintenance and measuring checks of the magnet components of the magnets, injuries can occur. Make sure your fingers cannot get caught between the components.

Particular hazards

This chapter describes residual risks identified on the basis of a risk assessment.

▶ In order to reduce health risks and avoid dangerous situations, please observe the following warnings and safety instructions.

Switch off in case of emergency

The device does NOT have a safety switch. It is very important your installation has the possibility to switch off the electrical supply to the device in case of emergency.

DANGER

Danger of life due to electrical power

There is an immediate danger to life when touching live wires. Damage to insulation or individual parts can pose a hazard to life.

- When insulation damage is found, interrupt the power supply and have insulation repaired immediately.
- Assign work on the electrical system to be carried out by trained electricians only.
- Always de-energise the electrical system and check that it is de-energised before carrying out any work on the device, as live components may be present.
- Switch off the power supply and secure it against switching on due to maintenance, cleaning and repair work.
- Keep moisture away from live parts because it can cause short circuits.

WARNING

Risk of explosion due to dust

Dust deposits can be raised and form an explosive mixture with ambient air.

- Smoking, handling open fires and/or ignition sources of all kinds is strictly forbidden in the area around the plant and in the hall.
- Keep the danger area free of dust.
- Interrupt work immediately if excessive dust formation occurs. Wait until the dust has settled and then remove the dust layer.

WARNING

Health risk due to dust

In the long term, inhaled dusts can result in lung damage and other health impairments.

- Always wear breathing protection during work.

WARNING

Risk of injury due to moving parts

- Never put any body parts between moving and stationary parts of the drum magnet during operation.

The casing contains inspection hatches with warning pictograms.

- Do NOT open inspection hatches during operation.

Warning pictograms

Warning pictograms are attached to the device where necessary.

▶ Check regularly that the pictograms are present and clearly legible. Ensure that they are replaced in the correct place if they have been removed or irreparably damaged.

Product Standards and Directives

CE marking

This device complies with all the European and national requirements for construction and operation.

The CE marking confirms the compliance of the device with all the for this marking applicable EU regulations.

Directives

The standard version of this device complies with the requirements of these European Directives:

- Machine Directive 2006/42/EC;
- EMC Directive 2014/30/EU;
- ATEX Directive 2014/34/EU (if applicable).

Occupational and public exposure limit values for (electro) magnetic fields

The limit values of magnetic fields are defined by the EMV-guideline 2013/35/EU as follows:
Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on 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:

Life danger for persons with implanted medical devices

Persons with active implanted medical devices (i.e. pacemaker, defibrillator, insulin pump) must not enter within a radius of **5 metres** from the device.

Damage to magnet sensitive objects

Objects which contain ferromagnetic parts, such as bank, credit or chip cards, keys and watches can be irreparably damaged when they come within a radius of **3 metres** from the device.

Pregnant personnel should keep a minimal distance of **0.5 meter** from the magnets.

Please note that ferrous objects/tools located within a radius of **1 metre** from the device may be attracted.

N.B. Occupational exposure limit values (general and for limbs) are not exceeded.

Device description

Intended use / user indications

Products

The permanent drum magnet is designed for separation of ferromagnetic (Fe) particles out of powder and granulate product streams in vertical pressureless or free-fall pipes, such as blasting grid, cocoa beans, coffee beans, sugar, cattle feed, animal meal and ceramic granulates.

Also for short-wire products, such as shredded car tires.

Not to be used in (moist) product that is sticky and/or badly flowing

Fe parts

Suitable for separation of ferromagnetic (Fe) particles from approx. 0.5 mm (with standard magnets). See product specifications for the correct values.

The product flow should be free of Fe particles or other particles that could damage the contact plates of the drum magnet (thin wall thickness). Preliminary (mechanical) sieving is recommended, if necessary.

Temperatures

Suitable for use in ambient temperatures from -20 °C to +40 °C and for product stream temperatures up to 60°C (for standard Neoflux® magnets) or more, depending on the magnet type.
See product specifications for exact value.

The magnet is to be protected against higher temperatures than prescribed, because the magnet might **lose magnetic force permanently** when exposed to high temperatures.

Air pressure

In principle, the magnetic drum separator is not suitable for pipelines with over- or underpressure.
If you wish to feed a product with over- or underpressure, please contact the Sales department for the available options.

Free space

Make sure that there is approximately 1 meter of free space around the device to perform and ease the inspection and maintenance operation.

Noise level

The noise level of the device is less than 70 dB at delivery. If it becomes higher, the device should be checked immediately for possible faults or defects.

Vibrations

Extreme vibrations transmitted to the magnets can cause **permanent loss of magnetic force**, both directly and indirectly through magnet breakage.

The vibrations caused by the operation of the drum magnet are forced by the rotating drum and the material flow falling onto the drum magnet. These vibrations must be absorbed / damped by your suspension construction. If the vibrations increase, check for malfunctions!

Cleaning

Minimum once per day cleaning of the device is advised for an optimal magnetic separation and to prevent dirt accumulation on the drum magnet and the problems that can be caused by that. Clean magnets have the best Fe separation result. This also prevents the accumulation of dirt and the problems that this can cause. For more information on cleaning, see section Maintenance.

Deliverable specials

High temperatures

When one wants a strong magnetic drum magnet in a hot surrounding (> 80° C for Neoflux® and > 100° C for ferrite), then the standard magnets cannot be used. For product stream temperatures and or surrounding temperatures up to 150 °C there is – for instance - the possibility of using special high temperature Neoflux® magnets. For even higher temperatures other magnet material can be a solution.

Abrasive products

If you have an abrasive product, we can supply the drum magnet or the inside of the housing with a protective coating, such as a tungsten carbide coating.

Use in FOOD product flows

The drum magnet can be used in many food streams. The standard version already has few gaps and mainly stainless steel AISI316 materials in the product channel. The product channel (or even complete housing including the exterior of the drum) can be supplied in gap-free AISI304 or AISI316, or in combination with other - for example customer specified or supplied - food grade materials. Surface treatments such as electrolytic polishing, staining, etc. are of course also possible.

We have also a special Neoflux® food grade type added to our product range.

ATEX

The drum magnet is standard not to be used in ATEX zones according **EU Guideline 2014/34/EU**. When suited for ATEX, then the ATEX marking is always stated on the Goudsmit identification sticker. The marking on this sticker is only for the parts, produced by Goudsmit, but one can assume that the marking is for the overall device as well. The built-in or built-on components that carry their own marking should have the same or higher ATEX marking as the Goudsmit marking.

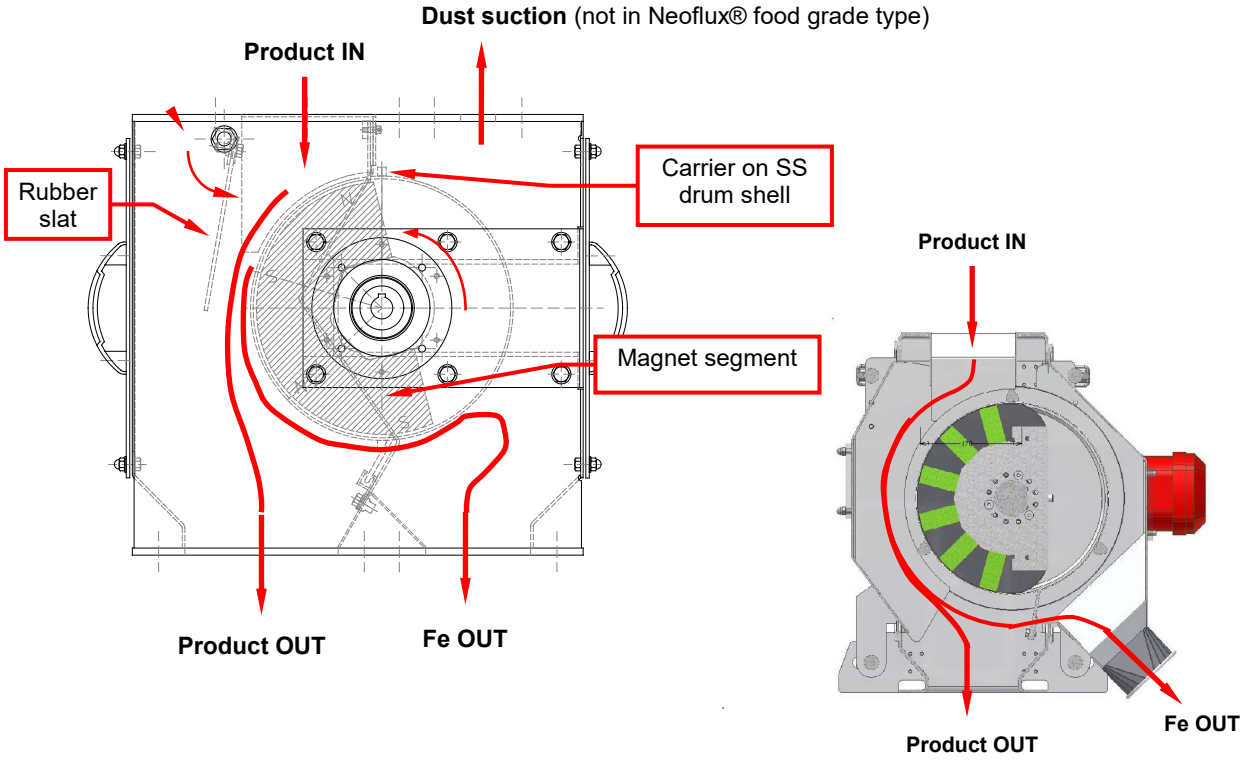
When components are built-on or built-in to ATEX devices, they should be of the same or higher ATEX marking as the Goudsmit marking, stated on the identification sticker.

When using the magnet device in an ATEX zone, it is the users own responsibility to take the right measures, like in-time cleaning to prevent thick dust layers, suited grounding, electric spark prevention and air-blow prevention.

Read this manual thoroughly for ATEX measures.

Principle of operation

A drum magnet separates ferromagnetic (Fe) particles from a material flow and can thus prevent dust explosions and/or damage to valuable machine parts. Goudsmit permanent drum magnets separate Fe particles without having to interrupt the material flow. Capacities up to 300 m³/hour can be achieved. Its low installation height makes it ideally suited for installation in a vertical drop pipe.

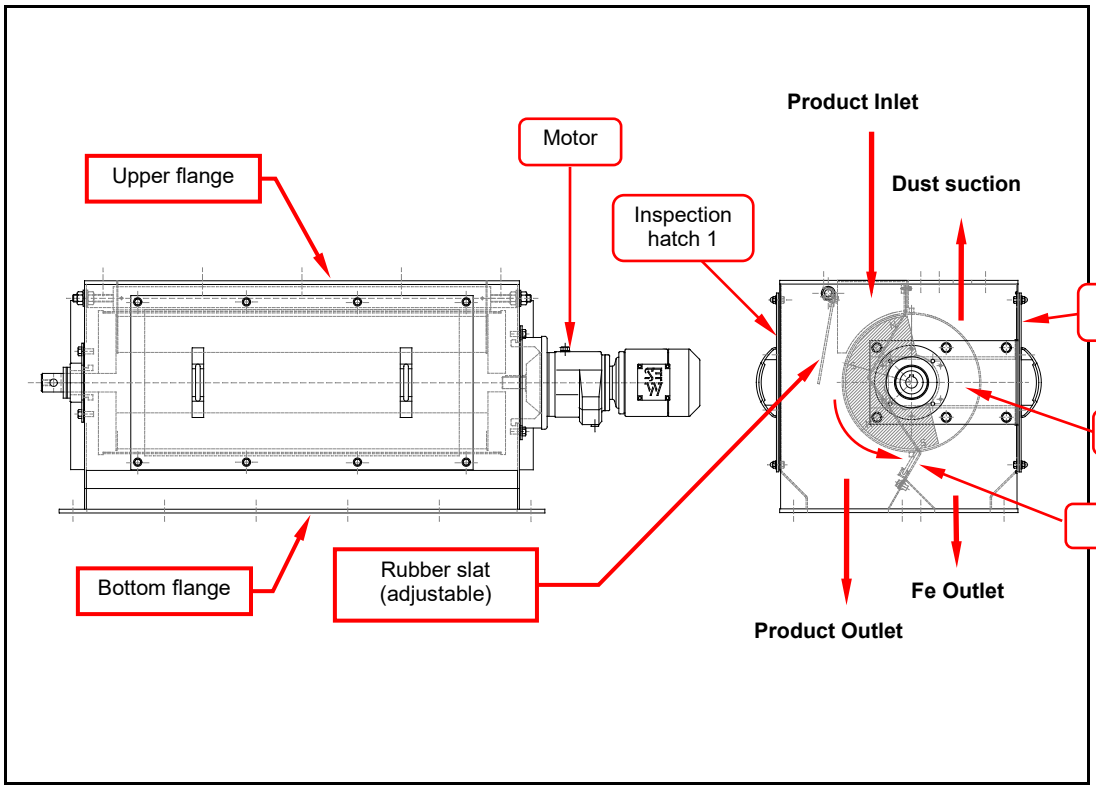


Drawing: Working principle of standard drum magnet

Working principle Neoflux® drum magnet in food grade

- The drum consists of a stationary **magnet segment** and **a stainless steel non-magnetic shell**. The drum shell is driven by a motor and resolves in the product. The magnet segment is stationary. The Fe objects are attracted through the stainless steel shell and “stick” to the casing. The product, which is non-magnetic, is not attracted and falls straight through to the bottom. The Fe objects are transported to the non-magnetic part of the drum. Here the - no longer attracted - Fe objects will fall off the drum, into the **Fe outlet**. To ensure that the Fe objects are pushed out of the powerful magnetic field several **carriers (ribs)** are welded to the casing.
- Raw product – contaminated with Fe – reaches the drum shell through the **Product IN**.
- An adjustable **rubber slat** is mounted under the "Product IN" opening. By slightly loosening the nuts on the outside of the housing, the slat can be turned. By turning the slat to the left or right, the material flow is directed to the drum to a greater or lesser extent (see chapter Device Description/Equipment Design).
- The filtered product leaves the device through the **product outlet**.
- A **dust suction opening** (not in Neoflux® food grade type) can be used to suck away dust clouds inside the housing.

Construction drum magnet

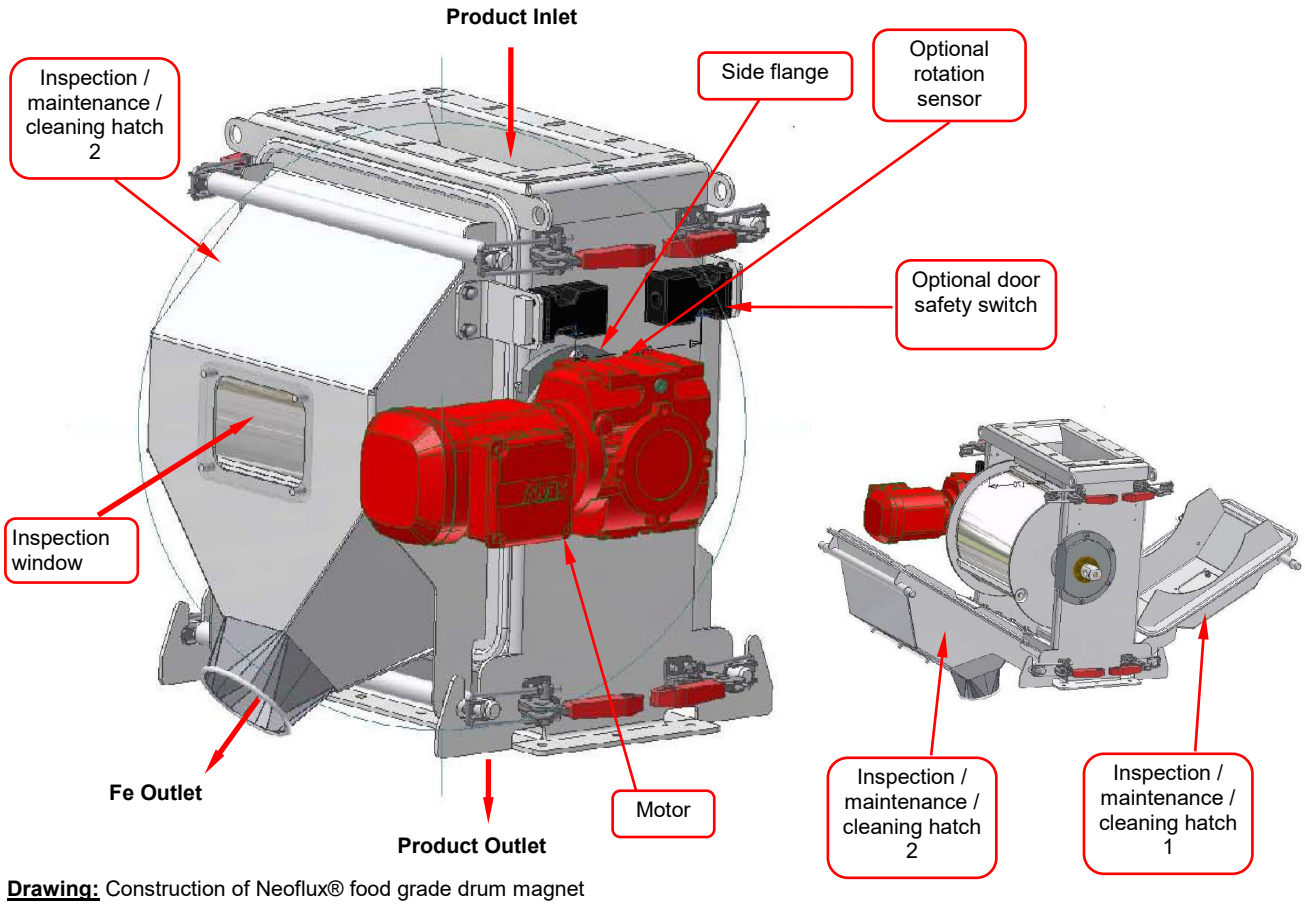


Drawing: Construction of standard drum magnet

- The Drum Magnet is to be connected to your equipment by the **product inlet flange** and the **product outlet flange**. For this purpose, they are provided with holes for screw-nuts.
- The top flange has a **dust collection** opening – with flange holes – on top of which you can mount a vacuum suction device.
- The bottom flange has an **Fe outlet** opening with flange holes.
- By opening **inspection hatch 1** you can inspect the drum's product side.
- A **brush strip** between the product outlet and the Fe outlet 'sweeps' off most unwanted non-magnetic parts from the shell and also works as a 'dust curtain'.
- By opening **inspection hatch 2** and the 2 **side plates**, the drum can be dismounted and taken out in case of any failures / breakdowns.

➔ *for dismounting the drum, see section 'Drum (dis-)assembling'.*

Neoflux® food grade drum magnet



Drawing: Construction of Neoflux® food grade drum magnet

- The Drum Magnet is to be connected to your equipment by the **product inlet flange** and the **product outlet flange**. For this purpose, they are equipped with holes for nuts and bolts.
- The **Fe outlet** is situated at the side and has a Jacob flange connection.
- The 2 **inspection/maintenance/cleaning hatches** can be fully taken away, thus opening the complete sides of the drum magnet, making inspection, cleaning and maintenance very easy to do.
- A **brush** between the product outlet and the Fe outlet 'sweeps' off most unwanted non-magnetic parts from the shell and also works as a 'dust curtain'.
- By opening **maintenance hatch 2** and loosening the bolts of the 2 **side flanges**, the drum can be dismounted and taken out in case of any failures / breakdowns.

➔ *for dismounting the drum, see section 'Drum (dis-)assembling'.*

Magnet construction

In standard execution, the drum magnet is fitted with both ferrite (Ferroxdure) and the 3 times more powerful Neodymium (Neoflux®) magnets. The Neoflux® magnets ensure an extra high magnet value on the drum. The Ferroxdure magnets increase the working depth of the magnetic field. An ideal combination!

In food grade execution, the complete magnet system is powered with Neoflux® magnets, for most powerful magnet configuration.

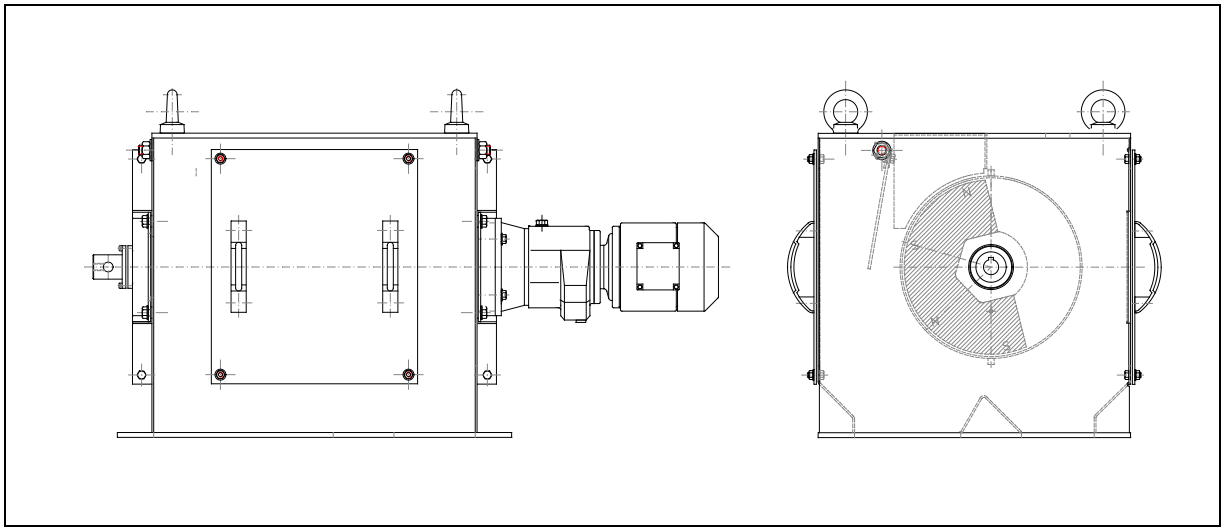
Installation

The drum magnet is installed in a product channel as part of a complete installation. The frame of this installation must be able to support the weight of the drum magnet and withstand the vibrations caused by the drum magnet during operation. In addition, the construction must be damped to prevent increasing vibration (and noise), as this can lead to a permanent loss of magnetic force or malfunction of the installation.
Furthermore, the drum magnet must be mounted at an easily accessible location in the installation for maintenance and repair.

Placing, transporting or moving the magnet

The drum magnet must always be lifted on all 4 lifting lugs!
Mount these lifting lugs only onto the 4 corners of the top flange.

Take the position of the centre of gravity into account. This is *not* in the middle / centre of the device, but closer to the motor side of the magnet.

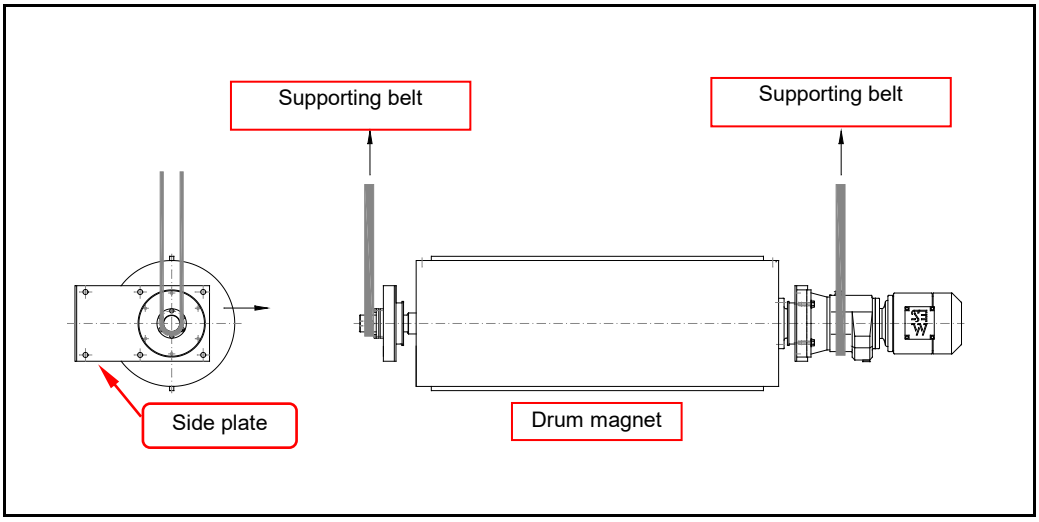


Drawing: Mounting the 4 lifting lugs

- Use only lifting/hoisting and transport equipment that is in good condition and never exceed the safe working load of the equipment being used.
- Avoid shocks during transport.
- Be sure your channel construction is strong enough to safely carry the weight of the drum magnet.
- Work safely, ensure sufficient working space and use stable and reliable scaffolding, ladders and other auxiliary equipment to ensure that the device can be installed without risk.
- Screw the flanges of the magnetic drum separator onto the outlet and inlet channel.

The weight is stated on the identification plate/sticker/etching, which is placed on the device housing.

Drum (dis-)assembling



Drawing: Drum magnet lifting

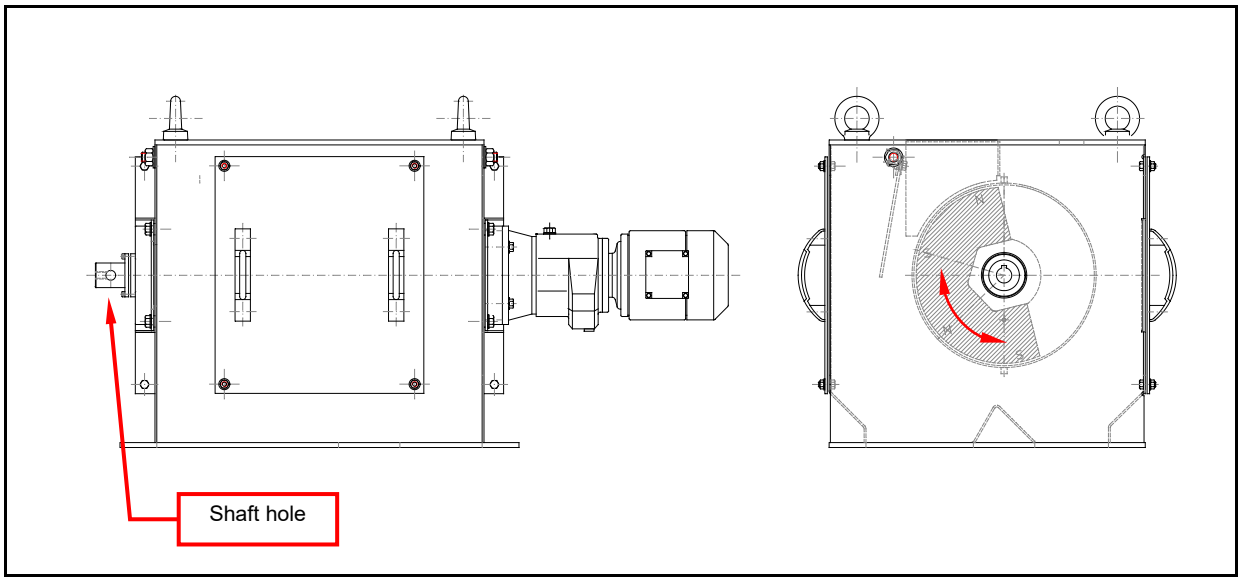
Danger!

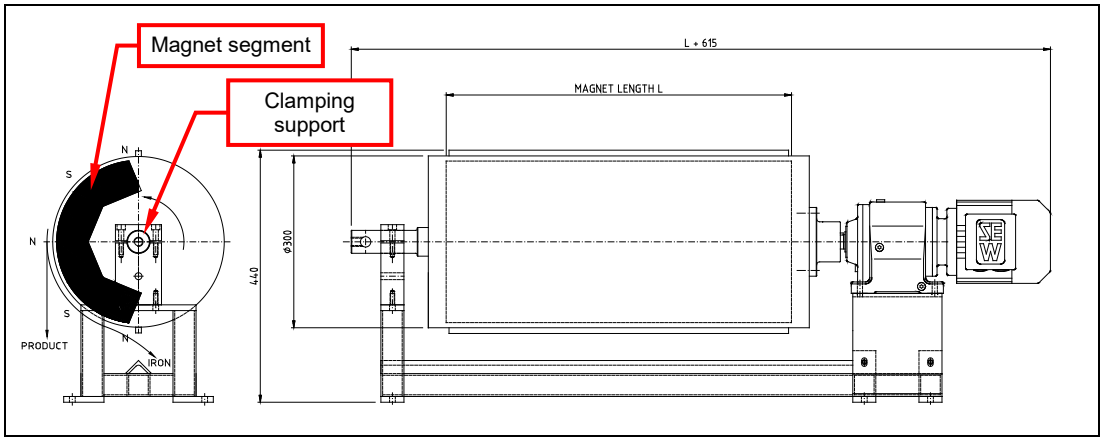
The drum is permanent magnetic and will therefore attract Fe or other magnetic parts!

Follow the instructions below for disassembling the drum magnet:

1. Place supporting belts around the flange motor reductor and the shaft at the opposite side. Ensure that the drum magnet hangs horizontal (at the same height).
2. Loosen/tighten the side plates' bolts so the plates are loosened from the housing.
3. Remove service hatch 2 from the housing.
4. For maintenance personnel: clear area all around your work space.
5. Move the drum magnet out of the housing using the hoisting equipment with supporting belts.
6. To ease the maintenance process and eliminate injury risks, it is highly recommended to place the drum magnet on the floor.
7. Reassembling: in opposite order.

(Re-)Adjusting the magnet segment





Drawings: (re-)adjusting the magnet segment

We have already mounted the magnet segment in the correct position. It will therefore probably not be necessary to readjust it. If however you have a bad separation because all Fe parts fall down before they are above the Fe outlet, then you well have to rotate the magnet segment to the correct position. This can be done as follows :

1. Loosen the clamp bush or clamping support bolts. The magnet is mounted on the shaft that is now loosened.
2. Rotate the magnet segment to the desired position by rotating the shaft. For this purpose you can use the aid of the adjustment hole on the shaft on the non-motor side. In this hole you can place a lever, for instance a long round bar, to apply torque.

   The magnetic field must start below the Product IN opening and end above the Fe Outlet, as shown in the figure above in the left-hand view.
   The magnetic segment should be approximately in the position as drawn above (right view).
3. Retighten the clamp bush or clamping support bolts.

Incorrect adjustment of the magnetic segment can cause poor Fe separation.
Therefore, pay special attention to this adjustment!

(Re-)Adjusting the magnet spacing

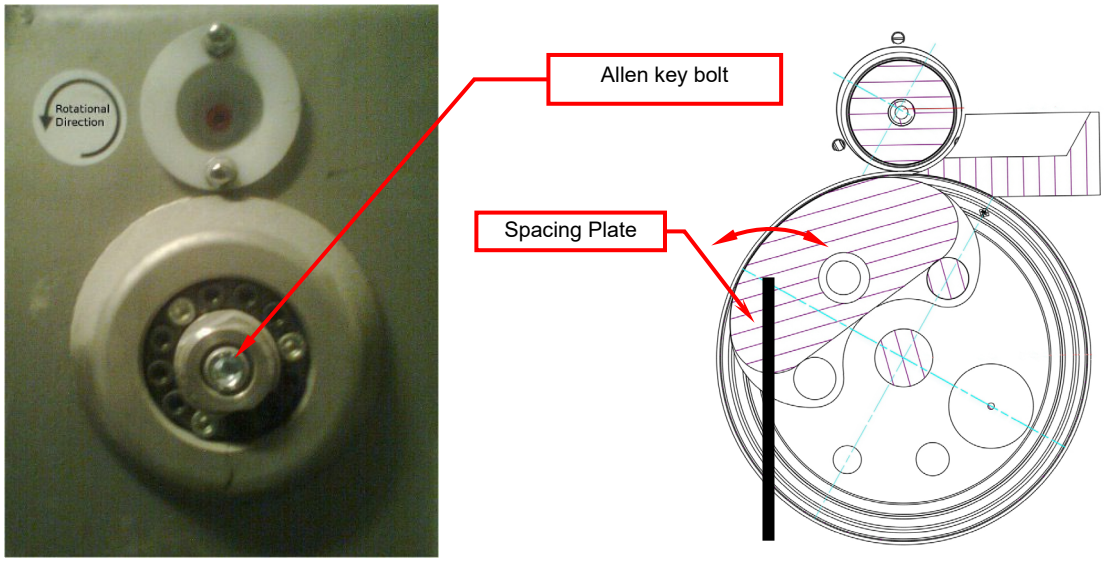


Photo 1: (re-)adjusting the magnet spacing for drum magnet with pre-mounted lever handle.
Diagram: drum magnet with spacing plate

To create a thin and even laminar flow over the magnet, the magnet spacing may be adjusted. The correct spacing is dependent on the type of product and flow rate.

(Re-)adjustment of the magnet spacing can be done as follows:

1. While the drum magnet rotates, carefully turn the allen key bolts clockwise. The magnet spacing plate is adjusted towards the drum magnet.
2. Once the plate rubs the drum surface, a noise will become audible. Turn the allen key anti-clockwise 30 degrees or half a turn, until the noise ceases.
3. Check that the product flow is optimal and re-adjust if necessary.

Faulty plate spacing can cause a bad iron separation result, while the right position gives the best result. Therefore special attention to the positioning is very important!

Electrical connections

Always ensure that the electrical power supply is switched off before starting work on the device. Make sure that it cannot be switched on again without your knowledge.

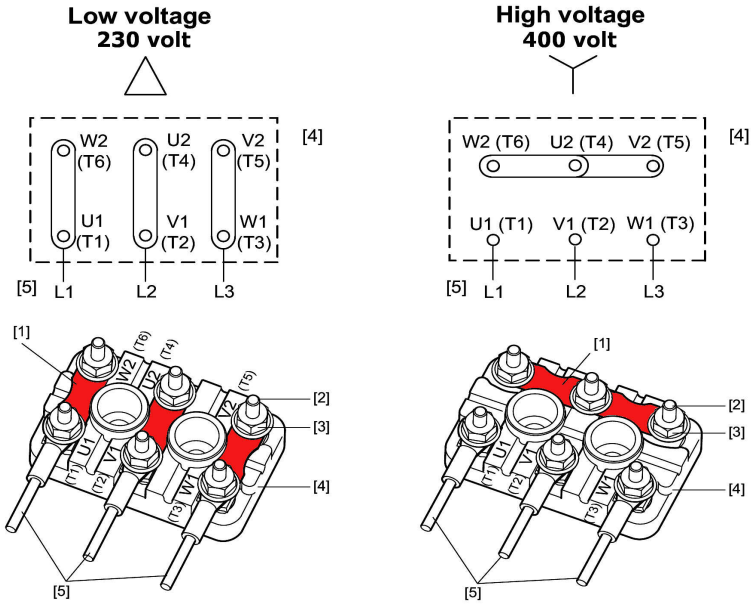
Ensure that the electrical connections are made properly and safely, and observe the national and local electrical engineering standards and regulations.
The electrical connection values can be found on the type plate and/or the accompanying electrical drawings. Before connecting, check the equipment supplied for the local electrical values and make sure that the connecting cables to be used are designed for the electrical power consumption.

Ensure that all electrical connections are checked/tightened after delivery and regularly thereafter (e.g. once a year).

Connection details for the control unit (if included) can be found in the enclosed diagrams.

Electrical motor installation (only if applicable)

Check that the rotation direction of the driving motor is correct:
This can be checked by briefly switching the motor ON.
If the direction of rotation is incorrect, reverse 2 of 3 phases (U - V):
(*It makes no difference whether you have a **Y** or a **Δ** circuit!)*



Electrical connections & EX

If the device is placed in an Ex zone, everything you add or change to the device's electrical installation must be executed and documented according to the regulations for the specific Ex zone.

Gasket material / grounding

To prevent the build-up of static electricity, make sure there is metal bridge between the magnetic device / product channel and the installation. The completed installation must also be grounded.

Start-up

Checks before and during start-up

During start-up, it is essential to follow the safety notes in this user manual!

Before start-up, make sure that:

- The device or the installation has no damages or malfunctions.
- All connections (electrical, mechanical, pneumatically) have been made properly.
- The device or the installation is placed and located correctly.
- All protective covers (if applied) have been fitted correctly.
- All foreign (iron) objects larger than 10mm are blocked from entering the production channel.
- The device is thoroughly cleaned, internally and externally.
- The product does not fall into the magnet device, from a greater height than 10 meters.
- That the entire installation, including the magnet tubes, is grounded.
- There are no other sources of danger.

During operation, make sure that:

- The device or the installation has no damages or malfunctions.
- The motor is running correctly (no overload, no speed fluctuation, no loud noises, etc.).
- The motor rotates in the correct/wanted direction.

Maintenance

Magnetic systems attract Ferromagnetic particles. Regular cleaning is essential.
A clean magnet functions considerably better

All parts are best cleaned with pressurized air and/or a soft cloth. It's also possible to deep clean with special cleaning fluids that do not harm the material. Ensure that these fluids do not contaminate the product

Regularly check that all warning pictograms and the identification plate are present at the correct locations on the device. If warning pictograms or the identification plate should get lost or damaged, immediately apply new ones to the original locations.

Always inform operating personnel regarding planned inspections, maintenance, repairs or if attending to breakdowns.

Cleaning & ATEX

To prevent explosion risk, avoid dust clouds and the build-up of dust layers.
If dust particles or layers heat up they may ignite and burn. This in turn can ignite airborne dust clouds and cause an explosion.

Cleaning instructions

Cleaning the inside of the product chute requires the customer to make a provision to enable access to the inside of the product chute.

Cleaning and disinfecting methods and agents used for cleaning should be adapted to the specific type of soiling that occurs (carbohydrates, proteins, fatty substances etc.) and the level of cleanliness required for your application. The type of product being processed therefore determines to a great extent what combination of cleaning agents are suited. Consult your supplier of cleaning agents to select the right cleaning agents for your specific situation.

The materials of construction are stainless steels 1.4301/SAE 304L and 1.4404/SAE 316L. Check with your cleaning agent supplier for compatibility with the material of the seals that was selected (Silicone, NBR or VITON).

Wet or dry cleaning

When use fluids is not allowed in your installation use no-rinse sanitizing wipes, suitable for food contact, when necessary.
Frequency of cleaning is dependent on the level of cleanliness required for the product processed.
In applications where sensitive foodstuffs are processed the cleaning frequency should be increased.
Perform a hygiene risk assessment to determine the requirements in your case.

Bearing systems with open, greased bearings

Regularly check whether the bearings make more noise than usual or whether they are warmer than normal. If this is the case, find out what the cause is and solve the problem(s). After that, it might be necessary to replace the grease and/or to replace the bearing(s).

For bearing **replacement intervals**, combine own experience data of bearings in similar applications with the recommended and/or estimated interval periods, as indicated in the maintenance tables and/or formulas of the bearing manufacturer.

Greasing (relubrication)

The bearing systems applied by **GOUDSMIT magnetic systems** all contain **grease-lubricated bearings**, which are properly sealed against dirt and humidity. They, however, basically still need maintenance, for example when the bearings are used in dirty and/or humid environments and/or at high temperatures and/or when they have a longer operating life than the operating life of the grease. The way and frequency of replacing bearing grease (relubrication) depends on the application and the employed grease (higher-quality grease requires less frequent maintenance). It is desirable to use grease that is equal to the originally filled. Different greases should not be mixed because it can cause a poor lubrication performance

When **relubricating**, completely replace the old grease by fresh grease at a moment that the state of the grease still is sufficient. Preferably supply the grease during operation, in order to avoid excessive greasing level. Inject the fresh grease from the grease supply fitting.

Continuous lubrication is only recommended at low revolutions and/or when the calculated greasing interval is very short and/or other greasing methods do not comply and/or access to the bearing is very difficult.

Table below provides a **general indication for greasing (relubrication) intervals**. For more precise greasing intervals, combine experience data of bearings in similar applications with the recommended and/or estimated interval periods, as indicated in the maintenance tables and/or formulas of the bearing manufacturer.

Table: General indication of greasing intervals

Operating temperature of bearing		General indication of greasing interval		
		Environmental condition		
°C	°F	Clean	Dirty	Very dirty / Heavily humid
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

Consult the (maintenance) manual from the bearing manufacturer for more specific maintenance instructions, like greases to be used and grease replacement intervals.

Motor reductor

De-energise the motor and make sure it cannot be switched back on without your knowledge.
Wait until it has cooled down – **DANGER FOR BURNING!**

Regularly check if the motor produces more noise than normal, or if it generates more heat than normal. If that is the case, find out what the cause is and solve the problem(s) as soon as possible to prevent (further) damage.

In the table below, general inspection and maintenance intervals are shown as an indication of the inspection and maintenance that is needed.

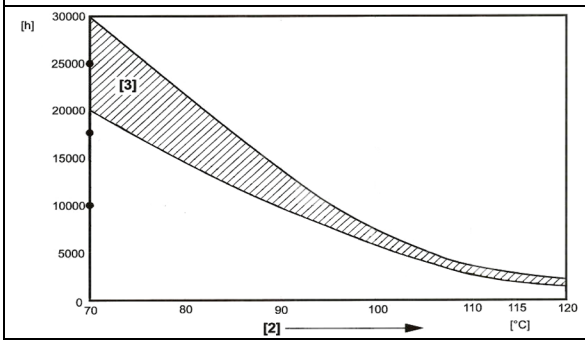
REDUCTOR	
Frequency	**What to do?**
• Every 3000 machine hours, at least every 6 months.	• Check oil and oil level. • Check the seals visually for leakage. • For gear units with a torque arm: Check the rubber buffer and change it, if necessary.
• Depending on the operating conditions (see chart below), every 3 years at the latest. • According to oil temperature.	• Change oil. • Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Depending on the operating conditions (see chart below), every 5 years at the latest. • According to oil temperature.	• Change synthetic oil. • Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Some gear units (like SEW R07, R17, R27, F27 and Spiroplan®) have lubrication for life and are therefore maintenance-free.	
• Varying (depending on external factors).	• Touch up or renew the surface/anticorrosion coating.
MOTOR	
Frequency	**What to do?**
• Every 10.000 hours of operation.	Inspect the motor: • Check ball bearings and change if necessary. • Change the oil seal. • Clean the cooling air passages.
	[1] Operating hours. [2] Sustained oil bath temperature. Average value per oil type at 70°C [3] Most of our gearboxes use 0.4 liter CLP PG NSF H1 Klubersynth UH1 6-460 oil [4] Replacement interval is dependent on temperature

Table: general motor gear inspection and maintenance intervals

When replacing oil, use CLP PG NSF H1 **KLUBERSYNTH UH1 6-460** which is approved for incidental contact in the Food and Pharmaceutical industry.

Malfunctions/Service

CAUTION!

Improper handling of the magnet device may lead to damages.
Potential damage to body and or property!

- Any repair to GOUDSMIT magnet devices may be performed by qualified personnel only.
- Be aware that permanent magnets attract ferromagnetic material with great force when it gets in reach of the magnetic field ➔ danger of getting jammed**!**
- Consult GOUDSMIT MAGNETIC SYSTEMS service

Malfunctions

In case of malfunctions, consult the following table in order to determine the cause of the malfunction and its possible remedy. In case a specific malfunction can't be found in the table, consult the **GOUDSMIT Magnetic Systems** service.

Malfunction	Cause	Possible remedy
Magnet does not separate ferromagnetic (Fe) particles, or separates them badly	Magnet segment not mounted at correct angle	Adjust the magnet segment angle (see installation)
	Not separated objects are not ferromagnetic, or not enough ferromagnetic	Check if particles expected to be separated are ferromagnetic using a permanent magnet
	Blockage of Fe and/or product outlet	Remove parts that are blocking the outlet(s)
Motor makes too much noise and/or has a higher nominal current [Ampere]	An object got stuck between the drum shell and the outside housing	Remove the object that got stuck
Motor does not run (turn)	The power supply is not connected correctly	Check the power supply
Bearing(s) make(s) too much noise	Bearing(s) shows severe wear	Replace the bearing(s)

Customer service

Please have the following information available if you require customer service assistance:

- Identification plate (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

Spare parts

As a result of the robustness and quality of **GOUDSMIT Magnetic Systems** products the device possesses high operational reliability.

When however a specific component requires replacement, the correct component can be ordered by quoting the type number stated on the *identification plate* or on one of the drawing(s) added to this user manual in the added data sheet.

The spare parts are mostly wear parts, such as:
bearings and gear motor, the drum when the product is very abrasive, brush strip and rubber slats.

Following mutual consultation Goudsmit magnetic systems will arrange rapid and correct delivery.

Storage and Dismantling

Storage
If the device will not be used for a long period of time, we advise to store the device in a dry, safe place and to conserve fragile and/or sensitive parts.

Dismantling / scrapping
On scrapping and/or disposal of the device's parts separately, take into account the different nature and dangers of the components (magnets, iron, aluminium, electrical parts, insulating materials, etc.) and ensure safe disposal. Preferably entrust the task to a specialised company, and always observe the local regulations in regard to disposal of industrial waste.