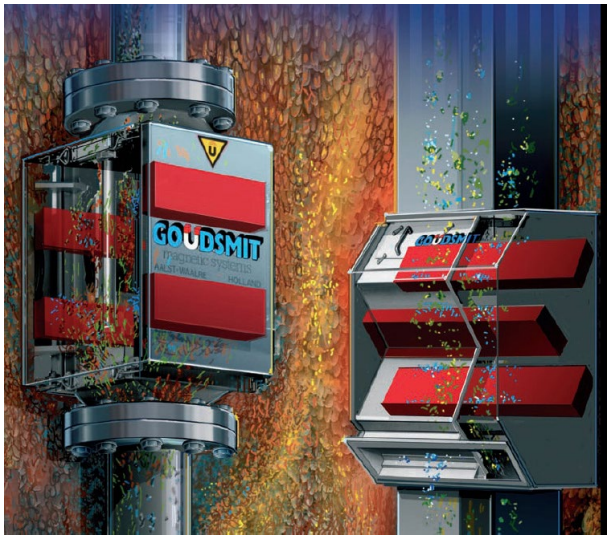
GOUDSMIT MAGNETICS

User manual

Plate magnet, series SVMx / SxVx

☺ Suited for removal of ferromagnetic parts out of powders and granulates that have good flowing characteristics

☹ Less suited for badly flowing (sticky) products



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.

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Revision history

Version	Date	Description
1.0	05-2006	First version of the English version of the user manual. Before today only a pamphlet with warnings was delivered with the magnets
1.1	12-2006	Remarks, warnings and installation guidelines regarding strong magnets added to pages 13, 14 and 15. Extra warnings are necessary because of the ever growing strength of the magnets and the dangers for health that goes with that.
2.0	02-2009	• ATEX remarks added • Quick-cleaning type added
2.1	09-2009	Specification sheet and declaration by the manufacturer separated from manual
2.2	04-2010	User temperatures changed from -20°C to -40°C Remark added: “User temperature may be max. +40°C in case of ATEX execution”
3.0	01-2019	Updated layout and terms.

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.**
(+31 (0)40 2213283).

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.

- 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 lifecycle.

Table of contents

General

This user 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 instruction 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:

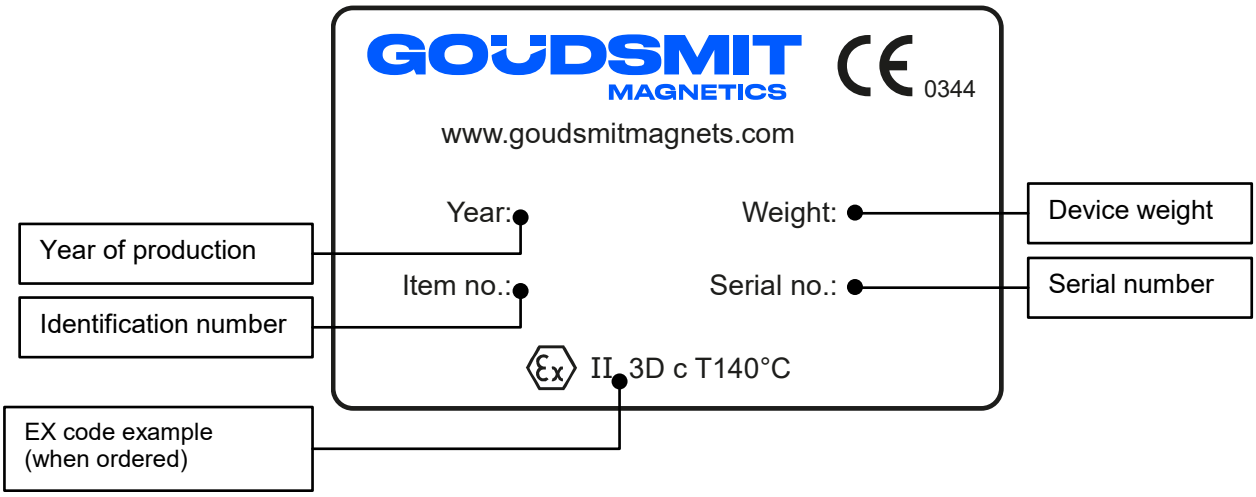
- Possible damage and/or shortcomings as a result of transport. If so, ask the transporter to draw up a transport damage report.
- Completeness of the delivery/deliveries, the absence of anything (additionally) ordered.

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 both the Serial number and the Identification number in case of breakdowns or delivery of spare parts.



Description ATEX certification

If the device is ordered for use in an explosive (dust) zone and with ATEX certification, then a Ex marking is added to the identification data which describes the category to which the device complies:

- Code example: Ex II 3D c T140°C
- Explanation:

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

  3D ➔ Category (1 = very high, 2 = high, 3 = normal) (D = dust)

  Zone (20, 21, 22) (zone covered by ATEX)

  c ➔ Type of explosion protection used by Goudsmit

  T140°C ➔ Maximum permitted surface temperature

  If the device complies to category 1D or 2D, then the name and number of the certifying entity are also added to the identification plate, as also the certification number of the device.

The final ATEX classification of the composed apparatus can be lower than the ATEX marking indicated on the main identification plate, if the mounted parts have a lower ATEX marking.

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.

Safety

This chapter describes dangers associated with the machine.
Warning pictograms are placed on the machine where necessary.
This chapter explains the meaning of pictograms that may be present.

Learn the meaning of the pictograms!

! *Regularly check that all warning pictograms are still present and legible, and clean if necessary. Make sure that new pictograms are applied at the correct locations, if they have been lost or damaged.*

General

The machine is provided with safeguards where necessary. Make sure every person who comes in contact with the machine, or enters the area around it, wears adequate personal protection (overalls, safety glasses, ear protectors, helmet, steel-toed safety shoes etc.). Areas of the machine considered dangerous are marked with warning pictograms.
If the machine remains easily accessible to persons, extra safety precautions (e.g. safeguards) must be installed. When safeguards are not possible, make sure clear instructions are given to people using the machine.

Danger of dust explosion

If this device is made according to an EX dust category (1D/2D/3D, acc. to ATEX equipment directive 2014/34/EU) it can accordingly be used in a dust zone (20/21/22, acc. to ATEX workplace Directive 99/92/EC). The Ex category is then described on the identification plate.

! *Make sure that the device complies to the correct explosion category.*

Danger – dust explosion!
(no sticker on device)

Also check if **the identification plates of mounted parts** show the correct Ex-category for the Ex zone in which the device will be used.

Danger of magnetic field

The magnets generate a powerful magnetic field that strongly attracts ferromagnetic (Fe) materials. Always take into account that these materials may suddenly be powerfully drawn towards the magnet. This applies to steel workbenches and steel tools, as well as ferromagnetic materials carried on your person, such as coins in your wallet or your keys. Use non-magnetic tools and workbenches fitted with a wooden worktop and preferably a non-Fe frame (e.g. stainless steel) whenever possible.

! Remember that ferromagnetic items, including personal items, will be attracted - even personal items if you are closer than 0.3 metres to a magnet.

Danger - strong magnetic field!

! People fitted with pacemakers should never enter the magnetic field (within a radius of at least one metre).

Prohibited for people with pacemakers!

! Credit cards, chip cards, computer disks/tapes, computer screens, watches etc. may be damaged or destroyed if they enter the magnetic field (within a radius of at least 0.5 metre).

Danger for magnetic cards!

Device description

Intended use

Material flows/streams

The **plate magnet** is an aid for separating ferromagnetic* (Fe) particles out of a close enough passing material stream (e.g. foodstuffs, plastics, chemicals, wood, stone and ceramic materials).

Not to be used in sticky and/or badly flowing material streams.

Fe particles

The device is suited for catching ferromagnetic* (Fe) particles. Material stream has to be free from Fe parts or other parts that can cause damage to the plate magnet bottom plate. *Mechanical or other sieving is advised to prevent for unnecessary damage.*

Suited for material streams with Fe particles of **0.5 mm** and larger with Ferroxdure magnets.

Suited for material streams with Fe particles of **30 µm** and larger with Neoflux® magnets.

Temperatures min / max

- User temperatures from -40 °C to +80 ° for standard Neoflux® magnet material.
- User temperatures from -40 °C to +100 °C for Ferrite magnet material.
- Exception: user temperature may be max. +40°C in case of ATEX execution.

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

Free space

Make sure that there is enough free space around the device to perform and ease the cleaning, inspection and maintenance operation.

Noise level

Vibrations

The magnet is to be protected against strong external vibrations, because the magnet might **lose magnetic force permanently** and or the brittle ceramic magnet material might break.

*ferromagnetic: see chapter General/Ferromagnetism.

Cleaning

Minimum 2x per day cleaning (Fe disposal) of the device is advised for an optimal magnetic separation and to prevent Fe parts accumulation on the plate magnet and the problems that can be caused by that. Clean more often if necessary, or less when proven possible. Clean magnets have the best separation result. So, make sure to clean more often than assumed necessary, to achieve a satisfactory result of the magnet device.

For more dirt cleaning info: see chapter Maintenance.

Deliverable specials

Higher product temperatures

For higher product temperatures (above 80°C) there is the possibility of using other magnet material than the standard Neoflux® magnets inside the plate magnets. Special high temp Neoflux® can than be used, which means that the temperature resistance can be raised up to 220°C. For even higher temperatures another magnet material might be the solution. Ferrite magnet material can be used up to 225°C (consult sales department for these kinds of temperatures).

Abrasive products

If the material stream to be cleaned is abrasive, then we can supply the plate magnet bottom plate housing with a protective coating, like for instance a tungsten carbide coating.

Use in FOOD product flows

The plate magnet can be adapted so that it is more suitable in your specific food stream. The magnet can be adapted on customer request to other – for instance prescribed or delivered by customer – food improved materials. Surface treatments like electrolytic polishing, staining, etc. are naturally possible.

ATEX

The plate magnet is ATEX II 3D ready, which means that it is suited for use in Explosive dust zone 22. If you want a certificate to come with the magnet, then this has to be mentioned when ordering the magnet. The id plate and the paperwork will then mention the Ex code. Small extra price will be charged for this.

It is, besides that, your own responsibility to take the right precautions when using the SEMR in zone 22, like in-time cleaning to prevent for thick accumulating dust layers, and suitable grounding measures.

Read this manual thoroughly for all recommended ATEX measures.

Working principle and construction

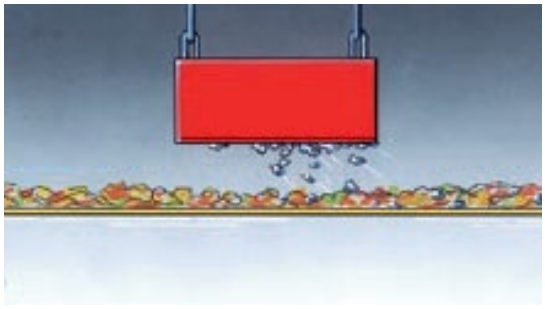
The **plate magnet** is an aid for separating Fe particles out of a close enough passing material stream. The **catch field** of a specific type of plate magnet determines how far the magnet can be placed from the material flow.

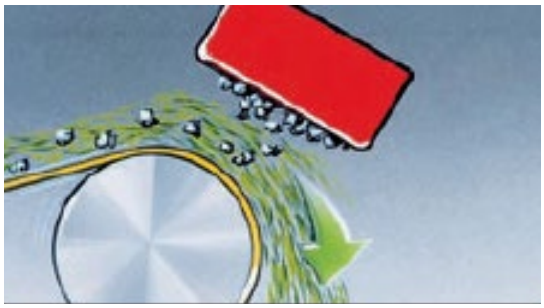
The magnets pull at the Fe particles and draw them towards the magnet. They stick onto the magnet plate or extractor plate (quick cleaning type). An extra wedge can protect the caught Fe parts extra against the passing material flow.

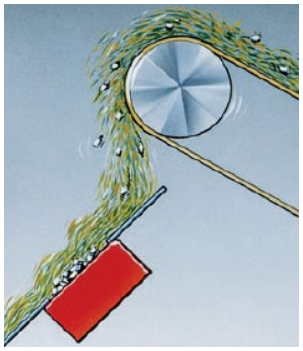
Caught Fe particles have to be removed manually by wiping off, or by moving the extractor plate away from the magnet (quick cleaning types).

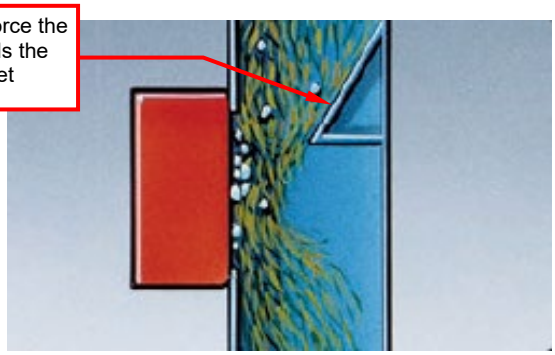
Mounting examples

Plate magnets can be mounted in various positions/angles under, over or besides a material flow.









Examples of use

Photo: Next to free fall stream– free hanging

Photo: angled in fall stream – against channel

Magnet materials

Plate magnets can be equipped with Neoflux® or with Ferroxdure magnets.
Executions with other magnet materials are also possible, but in practice only these 2 materials are used so far.

Ferroxdure magnets

- Cheaper (in reality, depending on the position of the magnet).
- Have good penetration (up to max. 400 mm).
- Can be employed up to max. 225 °C.
- Value at magnetic poles; approx. 2800 Gauss ➔ depends on which type.
- Not suitable for capturing stainless steels particles.
- Application: in the recycling or cattle-feed industry, for the protection of mills.

Neoflux® plate magnets

- Are minimum 4 times as powerful, but more sensitive to temperature than Ferroxdure magnets.
- As a result they can be constructed in a light and compact manner.
- Standard model can be employed up to 80°, special model to 220° (so far).
- Value at magnetic poles; approx. 10,000 Gauss ➔ depends on which type.
- Model is completely of stainless steel and is completely waterproof (IP67).
- Especially suitable for the food industry.

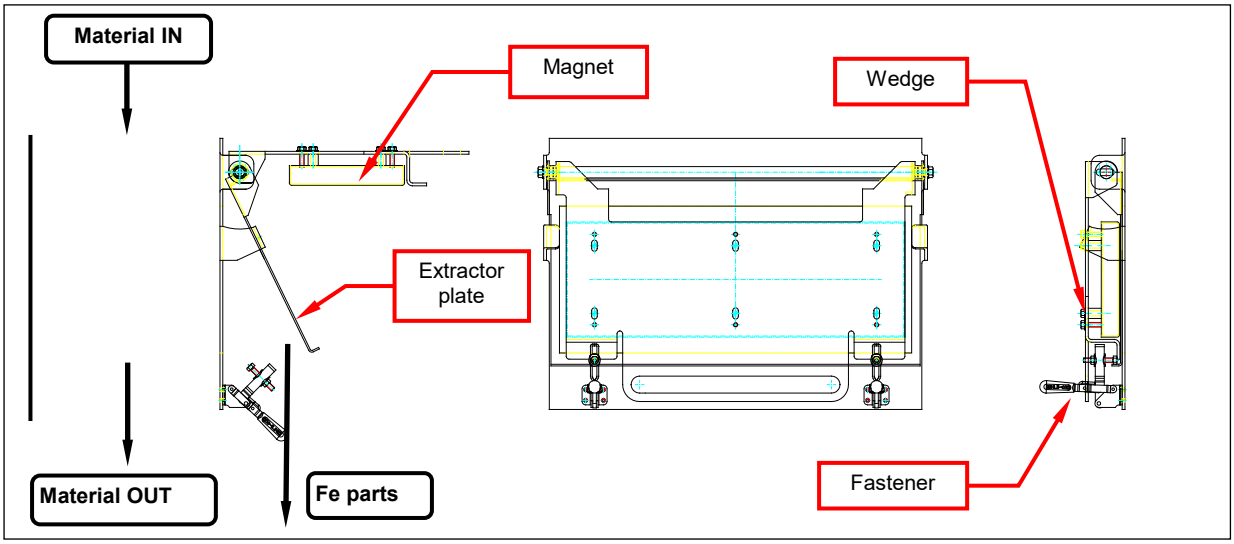
For a wide overview of plate magnets and their positioning in relation to the material flow, also read the brochure on our website.

Magnet cleaning / Fe disposal cycle

Minimum 2x per day cleaning (Fe disposal) of the device is advised for an optimal magnetic separation and to prevent Fe accumulation on the magnets and the problems that can be caused by that. Clean magnets have the best separating result. So, make sure you clean more than you think is necessary, so to achieve a satisfactory result of the magnet device. Clean more often than twice a day if necessary and less often when proven possible. For dirt cleaning, see chapter Maintenance.

Pay attention to personal dangers / wear protective clothing, glasses, shoes and hand gloves:

- Fe disposal /cleaning can best be done with stopped material flow to prevent for unnecessary material loss and missing Fe particles to be caught.
- The Fe disposal / cleaning for manual types can simply be done by wiping off by hand (use strong safety gloves!)
- The disposal of caught Fe particles for quick-cleaning types is described below:



Drawing: Plate magnet – type quick-cleaning (with extractor plate)

Working order fast cleaning type plate magnets

1. Stop material flow;
2. Loosen fasteners that clamp the magnet units against housing.
3. Turn magnet unit incl. extractor plate as far away from material channel as possible.
4. Turn magnet as far away from the extractor plate as possible.
5. *Dispose the Fe particles that will now fall off the extractor plates.*
6. Sweep with a brush of soft cloth and or blow clean the magnet and or extractor plate (not in the direction of the material channel or the magnet!).
7. Turn plate magnet back against extractor plate.
8. Turn magnet + extractor plate back against housing.
9. Tighten the fasteners so magnet units close material channel without leaving open gaps.
10. (Re-)Start the material stream.

Installation

The plate magnet should be mounted crosswise (not lengthways) above the stream of basic material. In this manner the stream of basic material passes through two strong magnetic poles to have the biggest chance of catching the Fe particles.

- Use only lifting/hoisting and transport equipment that is in good condition and never exceed the safe working load of the equipment being used.
- Also take into consideration that the installation to which the plate magnet is mounted can carry the weight of the plate magnet itself. If not, then reinforce the installation.
- Work safely, ensure sufficient working space and safe, non-magnetic, auxiliary equipment to ensure that the magnet can be installed without risk.
- Only non-magnetic construction components may be used within the range of the magnetic field in order to prevent the removal of Fe particles from being adversely affected. In short: the magnetic field may not be “short-circuited”.
- Make sure before moving or transporting the plate magnet, that the extractor plate (quick cleaning types) is well closed against the housing; otherwise the magnet might fall away due to its large weight and cause injuries.

Strong magnetic plate magnets are delivered with PU SAFETY BLOCKS underneath the magnet. Install the magnet with PU SAFETY BLOCK still underneath the magnet. Only remove the PU safety block when the magnet is in its working position!

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

Before start-up, make sure that:

- The device or the installation has no damages or malfunctions.
- All connections (electrical, mechanical, pneumatic) have been made properly.
- The device or the installation is placed and situated correctly.
- All protective covers (if applicable) have been fitted correctly.
- That all objects larger than 10mm are blocked from entering the product 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.
- There are no other sources of danger present.

During start-up, make sure that:

- The device or the installation has no damages or malfunctions.
- All other parts of the device or installation function as described.

STRONG MAGNETIC FIELD
Make sure to have read the safety chapter before start-up an installation with magnets.
This may prevent serious injuries!!!

Maintenance

Magnetic systems attract dust and Fe particles. Regular cleaning of any device fitted with a magnetic system is therefore essential. A clean magnet functions considerably more efficient than a heavily contaminated magnet.

All parts are best cleaned by pressurized air and/or soft cloth. Also it is possible to deep clean with special cleaning fluids that do not harm the materials

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, then immediately apply new ones at the original locations.

Always inform operating personnel well in advance regarding planned inspections, maintenance, repairs and when attending to failures or breakdowns.
Make someone responsible who also exercises supervision.

STRONG MAGNETIC FIELD
Make sure to have read the safety chapter before doing maintenance work with magnets; this may prevent for serious injuries!!!
The magnetic field is permanent, so also active during maintenance and/or cleaning of the magnet!

Only do maintenance works to the magnet when the material stream is stopped.

Maintenance activities are indicated by the icons below.

Inspection

- Inspect regularly on faults and wear;
- Inspect regularly whether the magnet is saturated with Fe particles;
- Inspect regularly whether warning pictograms and identification plate are still present and readable;

Cleaning

- Magnetic systems attract dust and ferromagnetic material, so regularly cleaning is necessary.
- A clean magnet functions much better then a saturated one, so regularly clean the saturated magnet, to have an optimum magnetic separation

Wear security gloves, glasses, and other necessary safety clothing while cleaning the magnet!!! (not applicable for auto cleaning types

Clean magnet of caught Fe particles ➔ see chapter Working principle / *Cleaning cycle / Fe disposal* for a detailed description.

Lubrication

- Lubricate the hinges (quick-cleaning type) occasionally to avoid unnecessary wear.
- For food products: lubricate the bearings with special food approved grease.

Replace / Revise

- Replace (wear) parts immediately if broken, or periodically according to its replacement schedule
- Also replace any warning pictograms immediately if they are damaged or lost.

Magnet system

- Dependent on the abrasiveness of the material stream and or the Fe contamination within, the magnet or extractor plate can wear out after time.

Wear caused by abrasive material streams can be minimized by coating with a protective coating, like for instance tungsten carbide.
For information, consult: **GOUDSMIT magnetic systems**

- When the magnetic surface of the plate magnet is bumped, then probably the magnets inside are damaged to.

Bumped magnets should be revised or replaced, to prevent for further damage inside the magnet system and for the magnetic force lowering as a consequence.

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.

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	Possible cause	Possible Remedy
Magnet does not separate ferromagnetic (Fe) particles out of the product stream, or separates them badly	Magnet unit is full of dirt and or saturated with Fe particles	Clean magnet unit Actuate Fe disposal cycle more often when necessary
	Not separated particles are not (enough) ferromagnetic.	Check if particles to be separated are ferromagnetic, using a small permanent magnet. • not attracted: the particles cannot be separated with a (any) magnet • slightly attracted: possibly a magnet with a higher capacity can do the job, so contact Goudsmit for consultancy
	Fe parts within the range of the magnets reduce the Fe separation capacity.	1. Check the range of the magnets using a small piece of iron. 2. Clean the magnet surface.
	Overflow of material stream capacity	Do not exceed the flow rate capacity stated in the specification.

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 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, motor, bar seals and the O-ring between the rotor and housing.

After contacting you, GOUDSMIT Magnetic Systems B.V. will arrange rapid 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.