

### User Manual

## Permanent bullet magnet, series SPPx...

- Fe separator by magnetic force -

- ☺ Suited for removal of ferromagnetic parts out of powders and granulates
- ☹ Not suited for extremely bad flowing and or sticky products



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

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**Versions overview of standard manual**

| Version | Date    | Description  |
|---------|---------|--|
| 1.0     | 03-2000 | First version of the English version of the user manual.                                   |
| 1.1     | 01-2004 | Complete renewed version of the manual.  |
| 1.2     | 10-2006 | Revisions page added.<br>Remarks regarding ATEX versions added to pages 7, 8, 9, 15 and 18 |
| 2.0     | 07-2009 | Specification sheet and declaration by the manufacturer separated from manual              |
| 2.1     | 06-2010 | CE mark removed from front page + CE note attached to nameplate explanation                |
| 2.2     | 06-2014 | Description ATEX ambient temperature range Ta 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 (ORxxxxxx).

- 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.

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## 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**

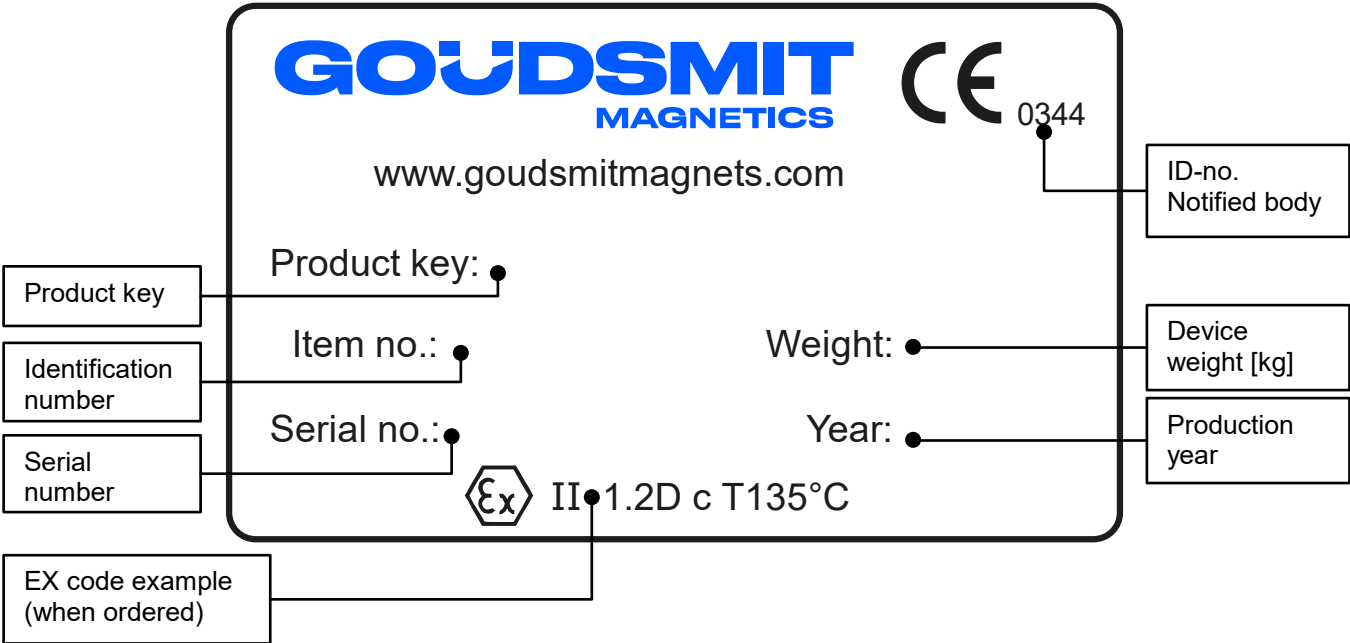
Check the shipment immediately on delivery for:

- 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 the Serial Number and the Item 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 T120°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)

T120°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

Ta → Ambient temperature range; only displayed when the range deviates from the standard temperature range for ATEX of -20 ... +40°C

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 than 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**

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

**General**

The device is provided with safeguards where necessary. Make sure every person who comes in contact with the device, wears adequate personal protection (overalls, safety glasses, hearing protectors, helmet, steel-toed safety shoes etc.).

Areas of the device considered dangerous are marked with warning pictograms.

If the device remains easily accessible to persons, then extra safety precautions (e.g. fencing) must be installed. When safeguards are not possible, make sure clear instructions are given to people using the device.

**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 drawn towards the magnet, very powerfully. This applies to steel workbenches and steel tools, but also to Ferromagnetic materials carried on your person, such as coins in your wallet or your keys. Make use of non-magnetic tools and workbenches fitted with a wooden worktop and preferably a non-Fe frame (for instance stainless steel).

- ! Always be aware that Ferromagnetic parts will be attracted - even personal items - if you are closer than 0.3 meter to a magnet.



***Danger - strong magnetic field!***

- ! People fitted with pacemakers should on no account enter the magnetic field (within a radius of at least 1 meters).



***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 meter).



***Danger for magnetic cards!***

**Device description****Intended use / user indications****Products**

Suited for Fe separation out of free flowing powder and granular products.

Designed for use in product flows like cattle food, plastics, chemical, pharmaceutical, sand, grinding & cement and ceramic industries. etc.

Not suited for (moist) products that are (too) sticky and/or badly flowing

**Fe parts**

Suited for product flows with Fe particles of **50 micron** and larger.

**Temperatures**

Suited for outside temperatures of -20 °C to +40 °C and product temperatures up to +100 °C with (standard) ferrite magnets.

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 product channel**

Not suited for overpressure or underpressure inside the product chute. If you have overpressure or underpressure in the product chute, please contact our sales department.

**Free space**

Make sure that there is approximately 0.5 meter of free space around the bullet magnet. to perform and ease the inspection and maintenance operation.

**Noise level**

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**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.

The bullet magnet creates no vibrations itself. The bullet magnet should be installed vibration-free in order to prevent from Fe parts from breaking off when caught by the magnet and to prevent for breakdowns caused by the vibrations.

**Cleaning**

**Minimum 2x per day** cleaning (Fe disposal) of the device is advised for an optimal magnetic separation and to prevent Fe accumulation on the magnet and the problems that can be caused by that. Clean magnets have the best separation result. So, make sure you clean a little more than you think is necessary, to achieve a satisfactory result of the magnet device.

For dirt cleaning, see chapter [Maintenance](#)

**Deliverable specials****High product temperatures**

For higher product temperatures there is the possibility of using other magnet material than the standard ferrite or standard Neoflux® magnets inside the magnet core.

**Abrasive products**

If you have an abrasive product, we can supply the magnet and /or inside housing with a protective coating, like for instance a tungsten carbide or PU coating.

**Use in FOOD product flows**

The bullet magnet can be adapted so that it can be used in most food streams. Its standard execution already has little gaps in the product channel. The product channel (or even complete housing + magnet) can be delivered in gap-free SS AISI304 or AISI316, or in combination with other – for instance prescribed or delivered by customer – food improved materials. Surface treatments like electrolytic polishing, staining, etc. are possible on request.

**ATEX**

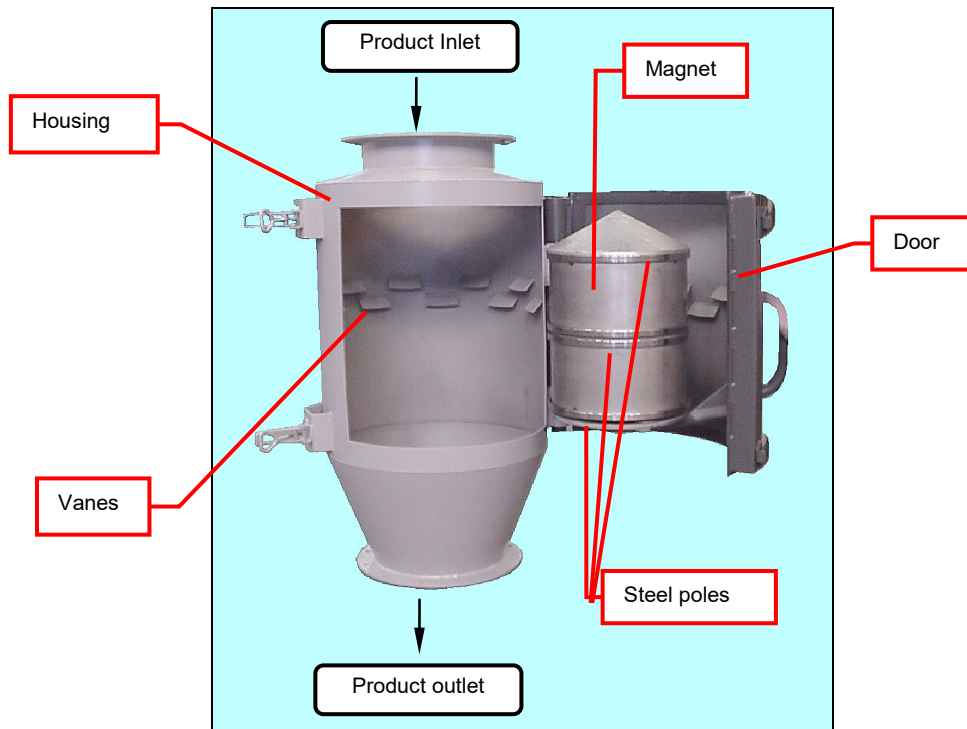
The standard permanent bullet magnets are ATEX II 1/2D executed, suited for use in dust explosive atmospheres zone 20 inside, zoned 21 outside.

It is however your own responsibility to take the right precautions when using the SECF in dust explosive atmospheres, like in-time cleaning to prevent for thick accumulating dust layers, and suitable grounding measures.

Read this manual thoroughly for all ATEX measures.

**Working principle & construction**

The bullet magnet functions as a separator of ferromagnetic parts out of a passing raw product flow.



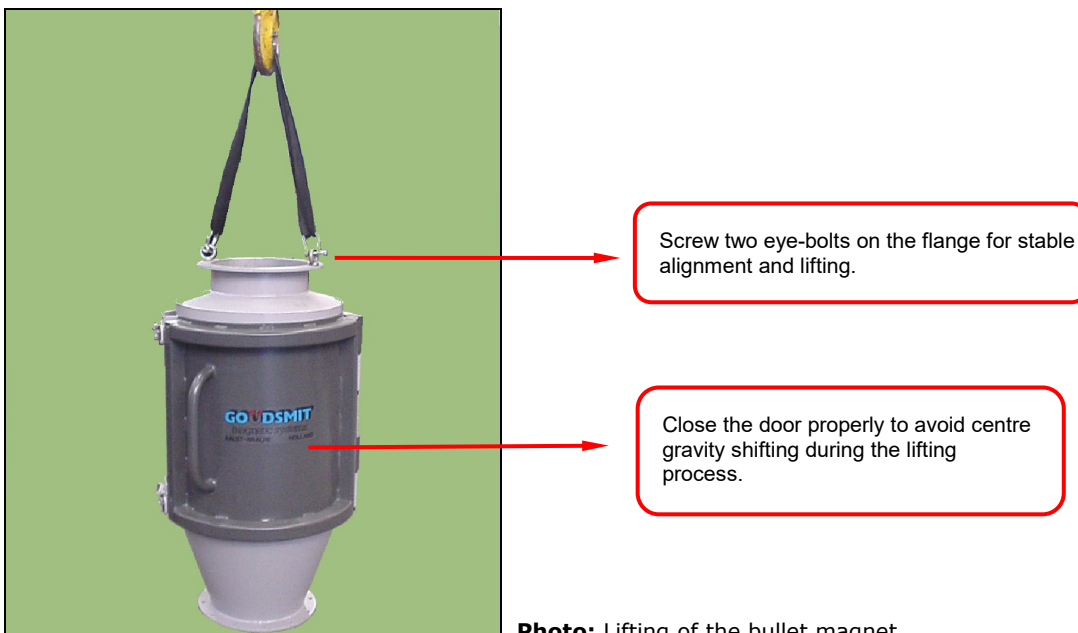
**Photo:** Permanent bullet magnet

- The **product inlet** is bolted to your channel, where the raw product goes inside.
- Within the **housing** of the bullet magnet a **permanent magnetic core** is placed, which creates a double and deep magnetic field. Iron and other ferromagnetic (Fe) parts will be 'caught' out of the passing raw product and will cling onto the magnet's **steel poles**.
- **Vanes** guides the product towards the magnet to optimise the Fe separation process.
- The **product outlet** is bolted to your channel where the cleaned product leaves the bullet magnet for further processing.
- The **door** in the magnet's **housing** allows the operator to clean the magnet from magnetically separated Fe particles.
- For cleaning the magnet of separated Fe parts → see chapter **MAINTENANCE**

**Installation**

Have all the installation work done by skilled personnel and in accordance with all locally applicable safety regulations.

- Pay attention to the weight of the bullet magnet. The input and output channels must be able to support the bullet magnet.
- If not strong enough, one should stiffen them before installing!
- Only make use of lifting/hoisting and transport equipment that is in good condition and never exceed the safe working load of the equipment being used.
- Work safely, ensure sufficient working space and use stable and reliable scaffolding, ladders and other auxiliary equipment to ensure that the machine can be installed without risk.
- All auxiliary equipment used for transport purposes, such as support legs, must be dismantled and removed before putting the machine into operation.
- The device must always be lifted on minimum 2 lifting lugs!
- Close the door properly to avoid centre gravity shifting during the lifting process. Always use the two eye-bolts in the corner as guidance. Bolt the flanges tidily to prevent leakage during operation. Do not reduce the tension on the lifting chain/belt while positioning, as the bullet magnet may fall down to the side.

**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.



## 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.

Maintenance to the bullet magnet should be executed when the product flow is stopped.

Attention: the magnetic field is **permanent**, so also active during maintenance and/or cleaning of the magnet!

**Normal maintenance activities are indicated in the icons below:**

### Inspection:



- Check that the flanges are bolted tidily to the channels and aligned properly.
- Check periodically whether the core magnet if it is contaminated with Fe particles.

### Cleaning:

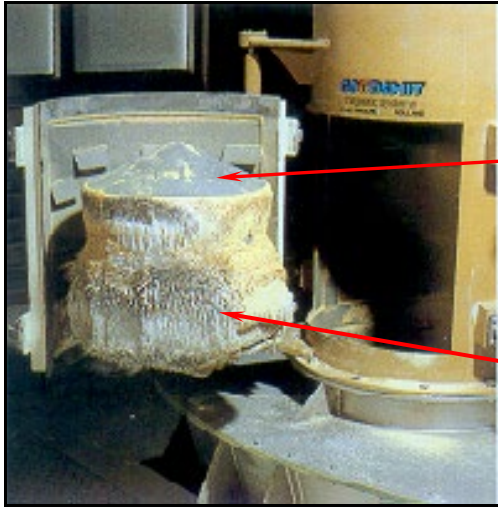


- Magnetic systems attract dust and ferrous material. That is why regularly cleaning is necessary.
- A clean magnet functions much better than a contaminated one, so regularly clean the contaminated magnet core (force is needed).



**Clean the magnet with security gloves, glasses, nose mask and other security clothing only!!!**

To ease the cleaning process, the magnet core can be rotated around its axis



Magnet core can be rotated around its axis

Attracted ferrous particles attach on the magnet core. Force is required to clean the magnet.

**Photo:** extremely contaminated bullet magnet

### Lubrication:



- Lubricate the door hinges 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.

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

## 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

|   |   |
|---|---|
|  | <b>CAUTION!</b>   |
|   | <p>Improper handling of the magnet device may lead to damages.<br/>Potential damage to body and property!</p> <ul style="list-style-type: none"> <li>• Any repair to GOUDSMIT magnet devices may be performed by qualified personnel only.</li> <li>• Be aware that permanent magnetic material attracts ferromagnetic material with great force when it gets in reach of the magnetic field</li> <li>• Consult GOUDSMIT MAGNETIC SYSTEMS customer service</li> </ul> |

## 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 customer service.

| Malfunction  | Cause  | Possible remedy   |
|--|--|---|
| Magnet does not separate ferromagnetic (Fe) parts, or separates them badly | Magnet is overloaded with Fe parts   | Remove Fe parts, so magnetic field becomes much wider again   |
|  | Not separated particles are not ferromagnetic.   | Check if particles to be separated are ferromagnetic, using a small permanent magnet  |
|  | Ferromagnetic parts within the range of the magnets reduce the Fe separation capacity. | <ol style="list-style-type: none"> <li>1. Check the range of the magnets using a small piece of iron/steel.</li> <li>2. Clean the magnet core.</li> </ol> |
|  | Overflow of product volume   | Do not exceed the flow rate capacity stated in the product specifications.  |

## 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:  
the **cone** on the magnet core, or inside housing parts, when/if worn out by the (abrasive) product flow,  
the door rubbers (packing).

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.