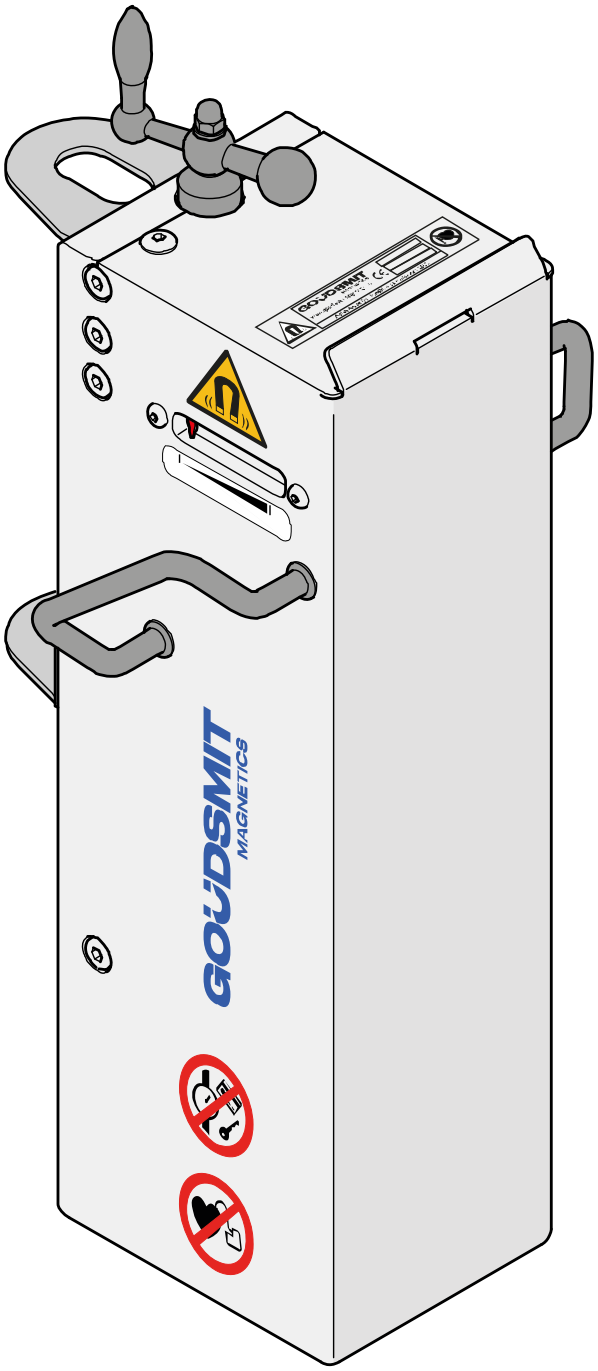
GOUDSMIT MAGNETICS

Installation and maintenance manual

Manually switchable magnetic sheet separators, HSS … series



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1 Introduction

This manual contains information about correct use and maintenance of the device. The manual contains instructions that should be followed to prevent injury and serious damage and to ensure safe and problem-free operation of the device. Read this manual thoroughly and ensure that you fully understand everything before using the device.

If you need more information or still have questions, please contact Goudsmit Magnetic Systems B.V.. The contact details are provided on the title page of this manual. Additional copies of the manual can be ordered by providing the device description and/or article number as well as the order number.

In this manual, the HSS magnetic sheet separator is further referred to as ‘device’.

NOTICE

Read this manual carefully before installation and commissioning!

The descriptions and figures in this manual, provided for explanatory purposes, may differ from the descriptions and figures of your version.

NOTICE

This manual and manufacturer’s declaration(s) are to be considered part of the device.

Both documents must remain with this device if it is sold.

The manual must be available to all operating personnel, service technicians and others who work with the device throughout the life of the device.

2 Safety

2.1 Safety risks

This chapter describes the safety risks of the device. Where necessary, warning pictograms have been affixed to the device. These pictograms are explained later in this document.

NOTICE

Observe the following measures:

- ► Read the warning pictograms on the device carefully.
- ► Check that the pictograms on the device are present and legible at regular intervals.
- ► Keep the pictograms clean.
- ► Replace pictograms that have become illegible or that have been removed with new pictograms in the same locations.

2.2 General safety instructions

DANGER

Risk of entrapment due to strong magnetic fields

The magnets can cause severe and permanent injuries. Ferromagnetic objects are attracted when they come within a radius of 0.3 metres from the magnet.

- The instructions in this manual must be complied with. If these are not complied with, there is a risk of material damage, personal injury and even a danger of death.
- The device may only be used for separating steel sheets. Any other use is inconsistent with the regulations. Any resulting damage is not covered by the factory warranty.
- Provide clear markings around the device to minimize danger to passersby. The markings must include a clear warning regarding the strong magnetic fields.
- Work on the device may only be carried out by qualified personnel. Ideally, maintenance work on the magnets should be carried out by Goudsmit Magnetic Systems B.V. personnel.
- Always observe locally applicable safety and environmental regulations.

2.3 Damage due to magnetic field

The magnets generate a powerful magnetic field that attracts ferromagnetic particles. This also applies to ferrous materials that may be carried on the person, including keys, coins and tools. When working within the magnetic field, use non-ferromagnetic tools and workbenches with a wooden worktop and non-ferromagnetic base.

WARNING

Strong magnetic field

During work and measurement checks on the device, injury can occur from loose ferromagnetic tools or materials within the magnetic field.

2.4 Other remarks/warnings

Rectify all faults before operating the device. If the device is used whilst exhibiting a fault, after having completed a risk assessment, warn operating and maintenance personnel of the fault and the potential risks associated with that fault.

3 Standards and directives

3.1 Directives

The standard version of this device conforms to the requirements of the following European directives:

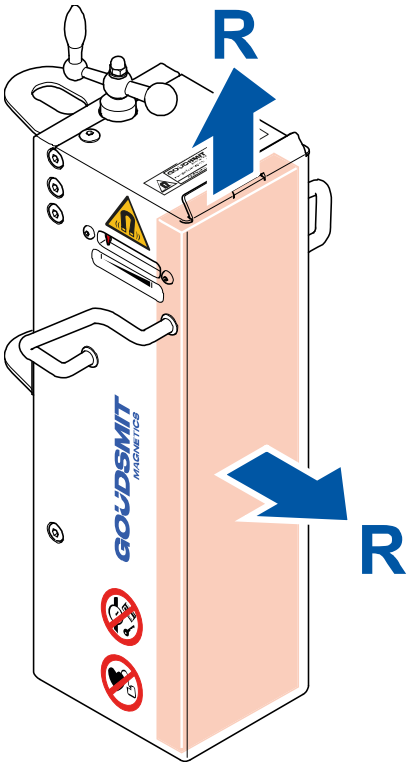
- EMC directive 2014/30/EU

3.2 Limit values for occupational and public exposure to permanent magnetic and electromagnetic fields

The limit values and magnetic fields are defined in accordance with the EMC Directive 2013/35/EU as follows:

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

Observe the following measures in relation to exposure to magnetic fields in accordance with EN12198-1 (machine category = 0, no restrictions) of the device:



Life-threatening danger to people with implanted medical aids

People with an active implanted medical aid (e.g. pacemaker, defibrillator, insulin pump) may never be present within a radius ‘R’ of 0.5 metre(s) of the device.

Damage to products with sensitivity to magnets

Products that contain ferromagnetic parts, such as debit cards, credit or chip cards, keys and watches, may be rendered permanently damaged if they come within a radius ‘R’ of 0.25 metre(s) of the device.

Employees who are pregnant and the general public may not come within a radius ‘R’ of 0.05 metre(s) of the device.

Limit values for occupational exposure (general and for limbs) are not exceeded.

4 General information

4.1 Ferromagnetism

The device's principle of operation is based on ferromagnetism. Ferromagnetism is a property possessed by certain materials, such as iron, cobalt and nickel. These materials can become magnetized when exposed to an externally applied magnetic field. Materials that remain magnetized after the external magnetic field is removed are called permanent magnets or magnetically hard.

However, most magnetic materials lose their magnetism after the external magnetic field is removed. These are soft magnetic materials. Most alloys of iron, cobalt and nickel are magnetic.

However, some stainless steel alloys, such as AISI304 or AISI316, are only slightly magnetic.

4.2 Warranty conditions

The warranty on the device is void if:

- Service and maintenance are not performed in accordance with the operating instructions or are carried out by personnel not specially trained for this purpose. Goudsmit Magnetic Systems B.V. recommends having service and maintenance carried out by service technicians from Goudsmit Magnetic Systems B.V..
- Modifications to the device are carried out without our prior written consent.
- Parts of the device are replaced with non-OEM or non-identical parts.
- Parts of the device become damaged, because the device was put into production with a malfunction and/or a persistent malfunction.
- The device is used injudiciously, incorrectly, carelessly or in a manner not in keeping with its nature and/or intended use.

NOTICE

All parts subject to wear and tear are excluded from warranty.

4.3 Other remarks/warnings

- Do not use the device if it is damaged.
- Only use the device for the application for which it was designed.
- Ensure that the device is maintained correctly and in accordance with the instructions in this manual.
- Rectify all faults before operating the device.

5 Specifications

5.1 Description of function

The devices are designed to separate steel sheets. Steel sheets are often difficult to pick up from a stack when coated with a corrosion-resistant oil film, causing them to stick together. The presence of burrs resulting from cutting processes can also cause steel sheets to stick together.

This creates the risk that two or more sheets are lifted together and fed into the production machine.

This can cause significant damage, for example, when feeding into a 3D moulding die where there is no space for a double sheet.

In addition, when lifting a steel sheet from a stack, a vacuum is created between the lifted sheet and the stack. This vacuum can lead to significant lifting forces, especially with larger sheet sizes, particularly as the transport speed increases.

The devices use powerful neodymium magnets to strongly magnetize the steel sheets, effectively turning each sheet into a magnet.

Because like magnetic poles repel each other, the repulsive forces push the top sheets apart, creating space between the steel sheets so that a vacuum or magnetic gripper can easily lift only the top steel sheet.

5.2 Application

The devices are suitable for separating ferromagnetic steel sheets up to 4 mm thick.

Steel sheets thicker than 4 mm typically do not require a sheet separator, as a possible second sheet detaches due to its own weight and remains on the stack. In some cases, when there is a significant amount of sticky oil present, it may still happen that a second sheet does not detach. In that case, a sheet separator can still be helpful. The magnetic force will not separate the top sheet from the stack, but when the sheet is lifted, the magnetic force will peel off the second sheet, causing it to remain on the stack.

The devices are suitable for separating steel sheets of all shapes and sizes, including round or asymmetrical shapes. For large sheet sizes, it may be necessary to install multiple sheet separators for effective separation. In the case of clean, non-oiled steel sheets, the sheet separators effectively separate an area of up to approximately 34 dm^2. For steel sheets that are sticky, due to oil or burrs, the effective area may be reduced to approximately 22 dm^2.

5.3 Temperatures

Suitable for use in ambient temperatures from -20 to +50 °C.

The device is constructed with permanent magnets, which are sensitive to temperature changes. Ensure that the magnets are not exposed to temperatures above 50 °C during transport and storage. High temperatures cause a permanent loss of magnetic force.

5.4 Surface and corrosion protection

The device is composed of stainless steel parts, anodized aluminium parts and nickel-plated steel parts. The corrosion protection is more than adequate for use in technical production environments.

5.5 Vibration and shocks

Although the device is built with heavy-duty construction and robust design to withstand the high loads resulting from its use in the steel industry, it is still important to avoid or prevent extreme vibration, shocks and mechanical stresses.

6 Product information

6.1 Scope of delivery

Check the shipment immediately upon delivery for:

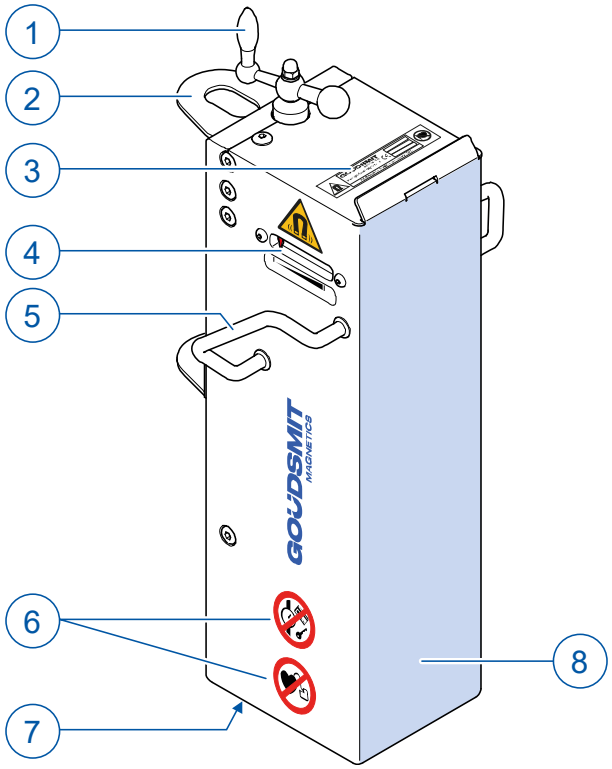
- Possible damage and/or shortcomings as a consequence of transport. In the event of damage, ask the carrier for a transport damage report.

- Completeness.

NOTICE

In the event of damage or incorrect shipment, contact Goudsmit Magnetics immediately. The contact details are provided on the title page of this manual.

6.2 Overview drawing



[1] Crank handle
[2] Mounting bracket
[3] Identification plate
[4] Red indicator (Magnet OUT/IN)
[5] Handle
[6] Warning pictograms
[7] M10 threaded mounting holes (2x) on bottom
[8] Magnetic system contact plate / working surface

6.3 Identification plate

The following identification data are shown on the device. The identification data are very important for maintenance of the device.

Always keep the identification data clean and legible. Always provide the article and order numbers when ordering spare parts, requesting service or reporting a malfunction.

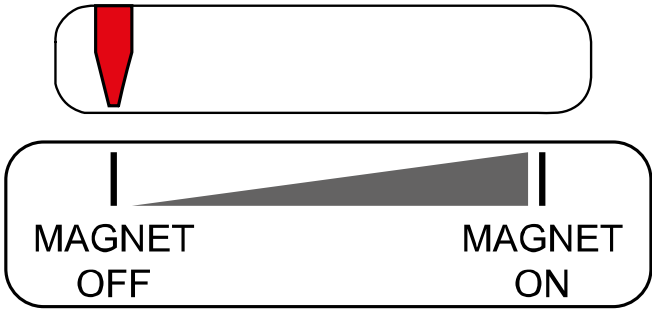
Never remove the identification plate!

[1] Article

[2] Order number

[3] Product key

6.4 Setting the magnetic field strength



Use the crank handle to set the field strength at the working surface. Turning the crank handle clockwise increases the field strength; turning it anti-clockwise decreases it.

The position of the red indicator shows whether the magnets are on or off. When the red indicator is fully left, the field at the working surface is inactive. As the red indicator moves to the right, the field becomes stronger. When the red indicator is fully right, the field at the working surface is at maximum.

7 Installation

7.1 Transport

DANGER

Risk of entrapment

Do not place your hands inside the crate during lifting.

WARNING

Note

The device permanently emits a magnetic force.

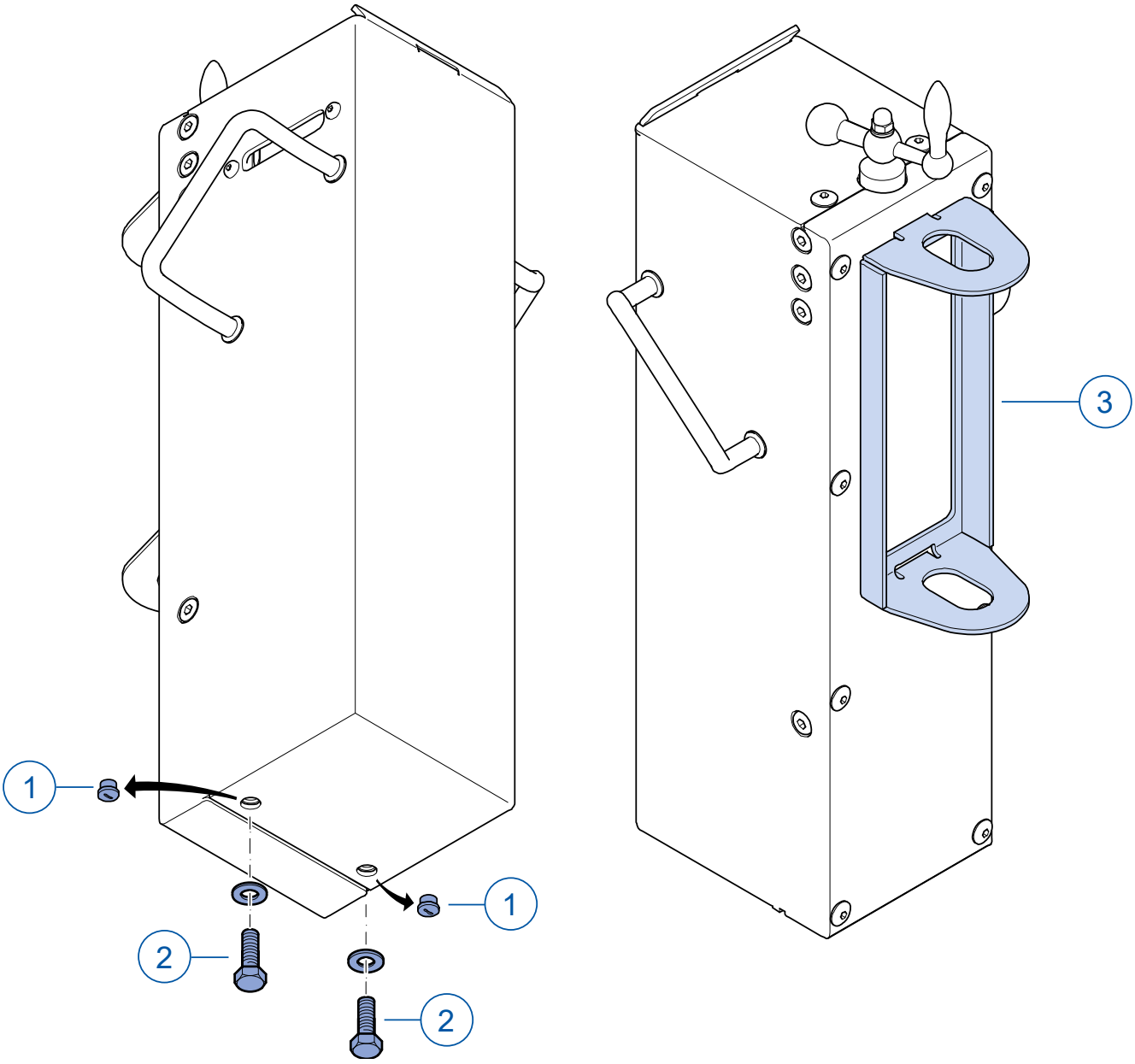
Observe the safety instructions for transport in the Safety risks [▶ 5] section.

7.2 Installation of the device

NOTICE

Take the following precautions:

- ▶ Work safely, provide ample work space and use dependable scaffolding, ladders and other tools so the device can be installed without any risks.
- ▶ The device permanently emits a magnetic force. See the Safety risks [▶ 5] section for the precautions that must be taken when working on the device.
- ▶ Only qualified personnel may work on the device.
- ▶ Ensure that there is sufficient clearance around the installation to install the device in the installation/structure and for operation, inspection and maintenance work to be carried out.
- ▶ Ensure that no external vibration is transferred to the device, as this can cause permanent loss of magnetic force.
- ▶ Only use lifting/hoisting tools that are in good condition, and do not exceed the lifting capacity of the tools.



- Remove the cover caps [**1**].
- Fasten the device to a structure with two M10 bolts [**2**]. Screw the bolts into the device no more than 20 – 25 mm.
- The device can also be mounted on a structure or robot arm using the mounting brackets [**3**].

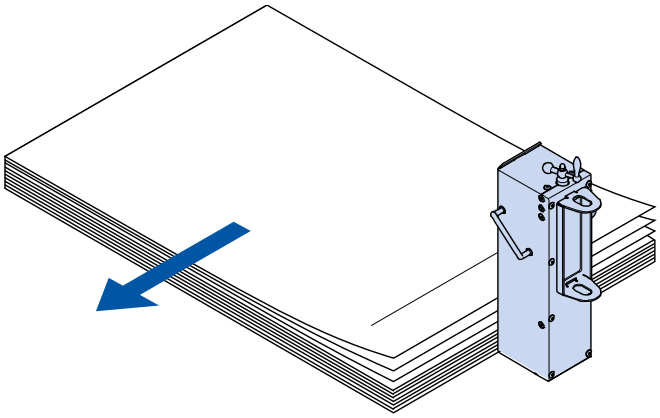
8 Application and assembly examples

The devices can be positioned next to a stack of steel sheets in various ways, with one, two or multiple magnets at the same time. Experience will show which method works best. See examples below.

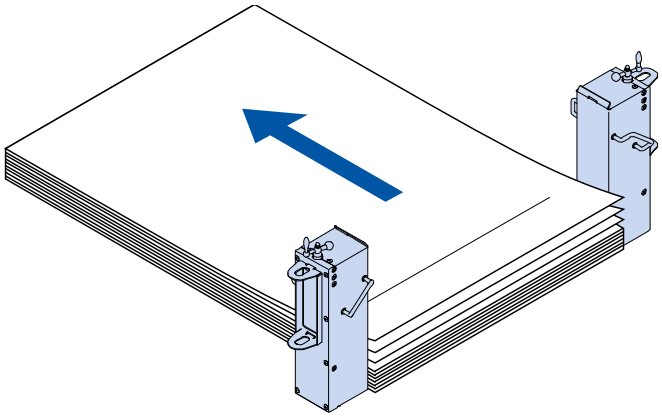
8.1 Assembly examples

Assembly is carried out using the threaded holes at the bottom of the device (see section Installation of the device [▶ 12]. The arrows on the diagrams indicate the recommended transport direction for the sheets after they have been separated by the device.

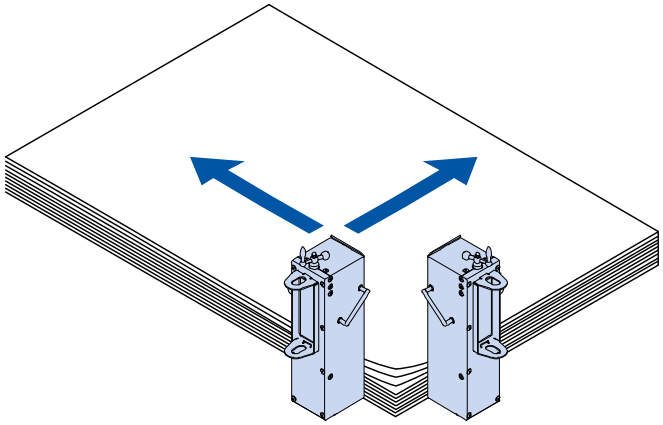
For **smaller sheets**, position the device in the centre of the shortest side.



When the devices are placed **opposite each other**, the sheets will remain suspended.



For a stack of **large steel sheets**, position the devices at the corners.



9 Maintenance and inspection

WARNING

Risk of crushing

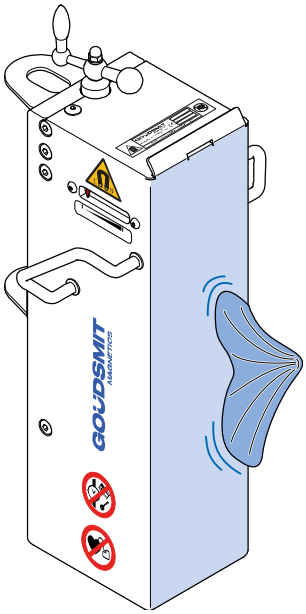
In view of the large magnetic forces, replacing the internal magnet components is extremely dangerous as they are difficult to handle. Replacement may ONLY be carried out by appropriately qualified personnel or (ideally) by Goudsmit Magnetics technicians.

If the replacement is carried out by unqualified personnel, the warranty will be void.

Goudsmit Magnetics cannot be held liable for any consequential damage to people and/or materials if this prohibition is ignored.

9.1 Periodic inspection and maintenance

- Always inform operating personnel of scheduled inspections, maintenance, repairs and in the event of faults.
- Check regularly that all warning pictograms are still present in the correct locations on the device. If the warning pictograms are lost or no longer legible, replace them with new pictograms in the original locations immediately.
- Ensure that the device is externally clean. Remove dust, dirt and particles from the device as appropriate.
- Regularly clean the device's working surface with a clean, lint-free cloth or compressed air. A thorough cleaning with specialist cleaning fluids is also possible. However, ensure these fluids do not adversely affect the steel sheets.



- Check the proper operation and performance of the sheet separator.
- Verify that all fastening bolts and parts are properly tightened.

NOTICE

Goudsmit Magnetics offers an annual maintenance inspection and an inspection report with certificate for the magnets.

10 Troubleshooting

Use the following table to search for faults, determine the possible cause and find the remedy. In the event of a fault that is not in the table, contact Goudsmit Magnetics customer service.

Problem	Possible cause	Solution
Magnet cannot separate the sheets, or does so poorly.	The active surface is dirty or damaged.	• Clean the active surface more frequently. • Increase the magnetic field strength. • Have Goudsmit Magnetics replace the working surface.
	The sheets to be separated are too thick.	• Order a magnet with a higher capacity. Maximum sheet thickness is 4 mm.
	The sheets to be separated are not or only weakly ferro-magnetic.	• Use a permanent magnet to check the sheets that were not/poorly separated to determine if the load is not or only weakly attracted. For advice, contact Goudsmit Magnetics.
	The sheets may not be placed correctly near/against the device.	• Place the sheets correctly (flat and evenly) against the working surface of the device.

11 Service, spare parts, storage and dismantling

11.1 Customer service

Have the following information to hand when contacting customer service:

- Data from the identification plate.
- Type and scope of the problem.
- Presumed cause.

11.2 Spare parts

The high quality of the products from Goudsmit Magnetics means that the device is highly reliable in operation.

Spare parts are typically parts subject to wear, such as the active surface that comes into contact with the steel sheets. For replacement of the active surface, contact Goudsmit Magnetic Systems B.V..

The contact details are provided on the title page of this document.

- When ordering, state the article and order numbers that appear on the identification plate.
- For further information, please contact us by +31 (040) 22 13 283 or consult our website.

11.3 Storage and disposal

Avoid direct sunlight and storage at high temperatures (above 50 °C).

Avoid extreme mechanical shocks, as the adjustment of the switching mechanism could be affected.

Disposal/recycling

When dismantling and/or scrapping the magnet product, keep in mind the materials from which the individual parts are made (magnets, iron, aluminium, stainless steel, etc.). This should ideally be done by a specialized company. Always observe the local regulations and standards pertaining to industrial waste disposal.

Inform those disposing of the magnet material of the hazards of magnetism. For more information, see the Safety risks [▶ 5] section.

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