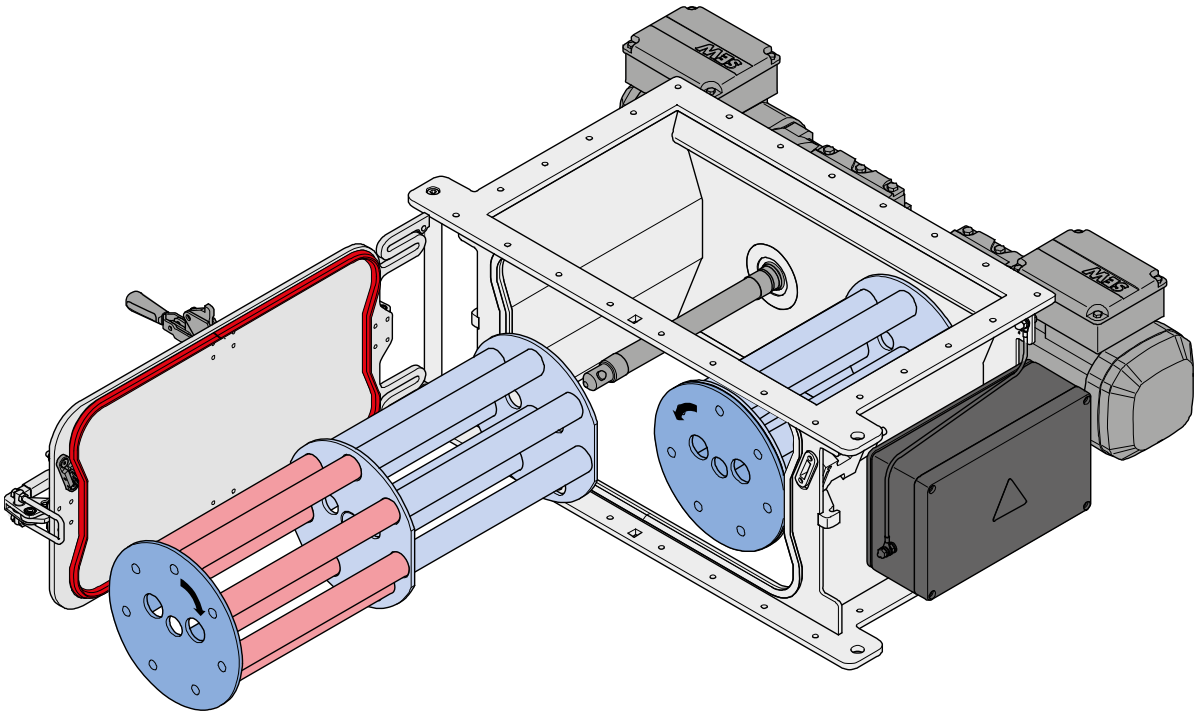
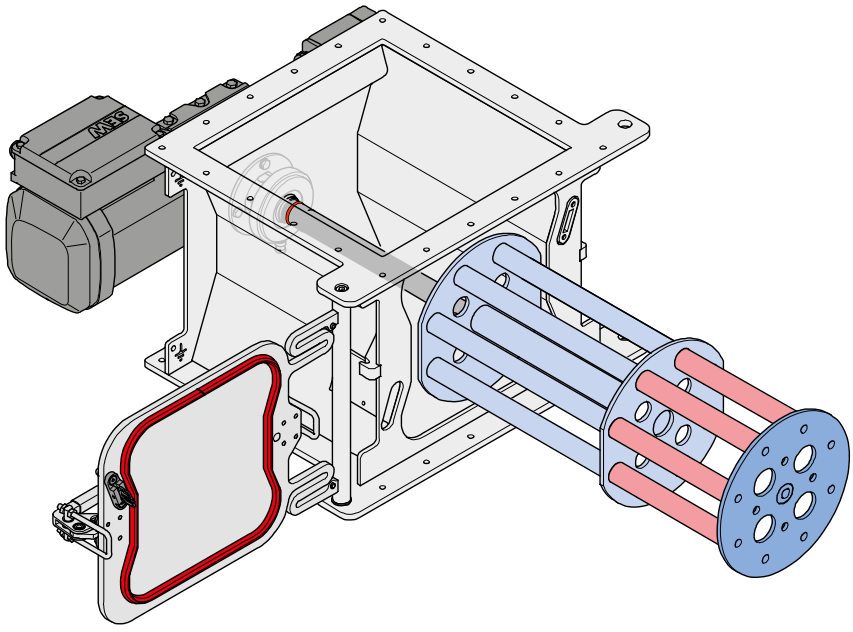
GOUDSMIT MAGNETICS

Installation and user manual

Rotating Cleanflow magnetic separator, series SECR

Magnetic separator with permanent magnet.





GOUDSMIT Magnetic Systems B.V.
P.O. Box 18, 5580 AA Waalre
Petunialaan 19, 5582 HA Waalre
The Netherlands

☎ +31 (0)40 221 32 83
info.goudsmitmagnetics.com
www.goudsmitmagnetics.com

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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 SECR Cleanflow magnetic 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 General safety instructions

- The instructions in this manual must be complied with. If they are not, there is a risk of material damage, personal injury and even a danger of death.
- The device may only be used for the magnetic filtration of dry and greasy powders in free-fall conveying lines. Any other use is inconsistent with the regulations. Any resulting damage is not covered by the factory warranty.
- Ensure that people who work on the device or in its immediate vicinity wear adequate protective equipment.
- Impose additional safety measures and use additional warning pictograms if the device remains easily accessible to people. If this is not possible, ensure that clear instructions are provided for the entire system in which this device is integrated.
- 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 take locally applicable safety and environmental regulations into account.

2.2 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.

2.3 Remote control

- The device may only be operated remotely when all covers are in place and moving parts are inaccessible.

2.4 Dust explosion hazard – Ex marking

If the device is manufactured for compliance with an Ex dust category (1D/2D/3D, in accordance with ATEX equipment directive 2014/34/EU) and may therefore be used in an Ex dust zone (20/21/22, in accordance with ATEX workplace directive 99/92/EC), the Ex category is shown on the identification plate.

- Check whether the device meets the correct Ex category.
- Check whether the installed parts (such as reductor motor, safety switch, proximity sensor) that have their own identification plate meet the appropriate Ex category for the Ex zone in which the device will be used.

See chapter ‘ATEX’ for a full description.

2.5 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

There is a risk of personal injury when carrying out work and measurement checks on the device. Do not place the fingers or other body parts between the magnetic components.

2.6 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 CE marking

In terms of construction and operation, this device complies with European and national requirements.

The CE marking confirms the conformity of the device with all applicable EU regulations associated with the application of this marking.

3.2 Directives

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

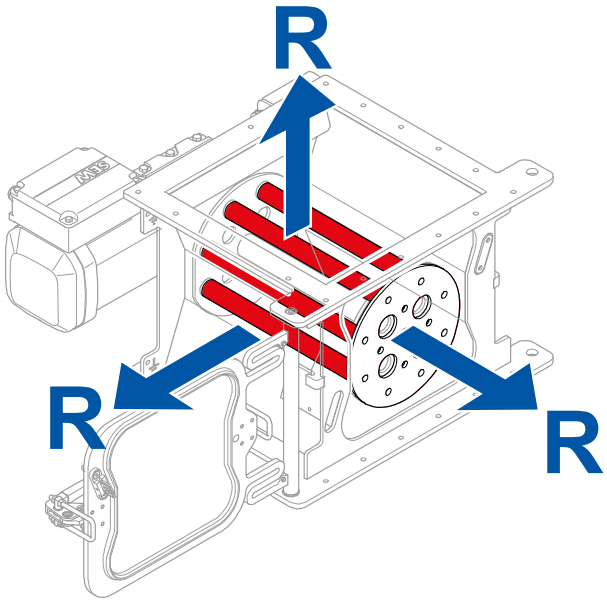
- Machinery directive 2006/42/EC
- EMC directive 2014/30/EU
- ATEX directive 2014/34/EU (if applicable)

3.3 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 0.25 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 0.08 metre(s) of the device.

Employees who are pregnant and the general public may not come within a radius ‘R’ of 0.025 metre(s) of the device.

WARNING

Projectile hazard

Ferromagnetic objects will be attracted if they come within a radius of 0.3 metre of the magnet.

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

NOTICE

Goudsmit Magnetics offers an annual maintenance inspection, including replacement of the seal(s) and an inspection report with certificate for the magnets.

4 ATEX

4.1 EX marking

If the equipment is suitable for use in a potentially explosive atmosphere (ATEX), the identification plate includes an Ex marking that indicates the environment for which the equipment is suitable, the specific equipment category and other criteria the equipment meets.

Example Ex marking for dust:  II 1/2D c T140°C

Explanation:

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

Equipment category	1D	2D	3D
Suitable 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)
T140°C	→	Maximum surface temperature for dust atmosphere

If the device is externally certified, the ATEX certificate number is included on the identification plate. Next to the CE marking is the identification number of the notified body that certified our ATEX quality assurance system.

The overall ATEX classification of the assembled device may be lower than indicated by the ATEX marking on the Goudsmit Magnetics identification plate if the additional parts with their own ATEX marking have a lower rating.

4.2 Description of ATEX options

Equipment-level product key:

SECR - B - 3030 - 08E - HT - Ex - F5M - B - B - M1

The **Ex** part of the product code indicates the following ATEX options:

Value	Explanation of Ex marking	
NA	Not explosion-proof (No ATEX)	
EX		II 1/2D c T140°C
X4		II 1/3D

4.3 ATEX measures

- The temperature of the product must not exceed 80 °C.

- For ATEX dust environment:
  - The ignition temperature of the dust must exceed 157 °C.
  - The smouldering temperature of a dust layer must exceed 180 °C.
  - Dust layers thicker than 5 mm must not accumulate on the equipment.
- Ensure that no particles >10 mm are present in the product flow. These can damage the magnets or extractor bars or cause sparks.
- If necessary, fit a mechanical filter (sieve) upstream of the separation system!
- The free fall height above the equipment must not exceed 10 metres.
- For the ATEX-certified magnetic device, additional purchased parts must be certified in accordance with the ATEX directive. This includes control units, terminal box(es), switch(es), sensor(s), pneumatic components, etc. Make sure these are fitted by qualified personnel!
- If the device is placed in storage or will not be used for longer periods, make sure it is emptied and cleaned.
- The device must be earthed. The electrical resistance to earth must be less than 1 MΩ. If a gasket is used between the device and the larger installation, provide a way to equalize potential electrostatic charges with a maximum electrical resistance for the installation of 25 Ω. This can be done by fitting a braided bonding cable or other means.
- No paint or coatings may be applied to the internal surface of the product channel.
- No insulating paints or coatings with a thickness of more than 2 mm may be applied to the outside of the equipment.
- All screw connections inside the device must be secured against loosening.
- Prevent ignition sources such as glowing particles, flames or hot gases from entering the device. If explosive gases, vapours or mists are present in the equipment, the ingress of electrically charged bulk material must be prevented. Substances that are susceptible to accumulating an electric charge can be an ignition source for gases, mists, and vapours (e.g., static-chargeable plastic granulates with solvent vapours).

NOTICE

The purchased ATEX parts have their own ATEX marking.

5 General information

5.1 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.

5.2 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.
- Lubricants other than those prescribed for this device are used.
- 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.

5.3 Other remarks/warnings

- Do not use the device if it is damaged.
- Only use the device for the application for which it was designed.
- Check that all protection covers (including all safety circuits) are correctly fitted and installed.
- Ensure that the device is maintained correctly and in accordance with the instructions in this manual.
- Rectify all faults before operating the device.

6 Specifications

6.1 Description of function

The device is suitable for magnetic filtration of small amounts of ferrous contaminants from dusty or poorly flowing – such as greasy – powders in free-fall conveying lines. Rotation of the magnetic bars prevents bridging and blockages. The product must not contain any ferromagnetic particles large or heavy enough to cause damage to the magnetic bars.

- If necessary, place a sieve in front of the product inlet of the device in your installation.

6.2 Range of applications

The device can be used for powder and granular products (grain size from 0.03 mm to 10 mm) such as flour, sugar, coffee beans, plastics, ceramics, etc. If even smaller or weakly magnetic stainless steel particles need to be filtered out, the device can be fitted with even more powerful Neoflux® magnets.

The device is NOT suitable for use in sticky or moist product flows and environments.

6.3 Use in food product flows

The device is supplied as a stainless steel model as standard, with a 3 µm ceramic-blasted finish.

This finish is suitable for normal food contact applications. All contact materials are compliant with European Framework Regulation EC1935/2004. Higher-quality finishes are available for applications with more stringent requirements. See data sheet for the specifications.

6.4 Pressure within the product channel

The (relative) overpressure in the product channel must be below 0.2 bar. The (relative) negative pressure in the product channel must not exceed 0.5 bar.

6.5 Magnet quality

The device is fitted with grade N-42, N45 SH or N-52 magnets. The table below shows the field strengths (magnetic flux density values).

Grade of magnet used (at 20 °C and Tmax 80 °C)	Magnetic bar / extractor tube size [mm]	Field strength (flux density) measured at magnetic bar (±10%)	Field strength (flux density) measured at extractor tube (±10%)
N-42 (Br 13,300 gauss)	Ø23 / Ø25	10,700 gauss	8,000 gauss
N-52 (Br 14,800 gauss)	Ø23 / Ø25	12,000 gauss	8,800 gauss

Grade of magnet used (at 20 °C and Tmax 150 °C)	Magnetic bar / extractor tube size [mm]	Field strength (flux density) measured at magnetic bar (±10%)	Field strength (flux density) measured at extractor tube (±10%)
N-45SH (Br 13,700 gauss)	Ø30 / Ø32	13,000 gauss	10,500 gauss

6.6 Temperatures

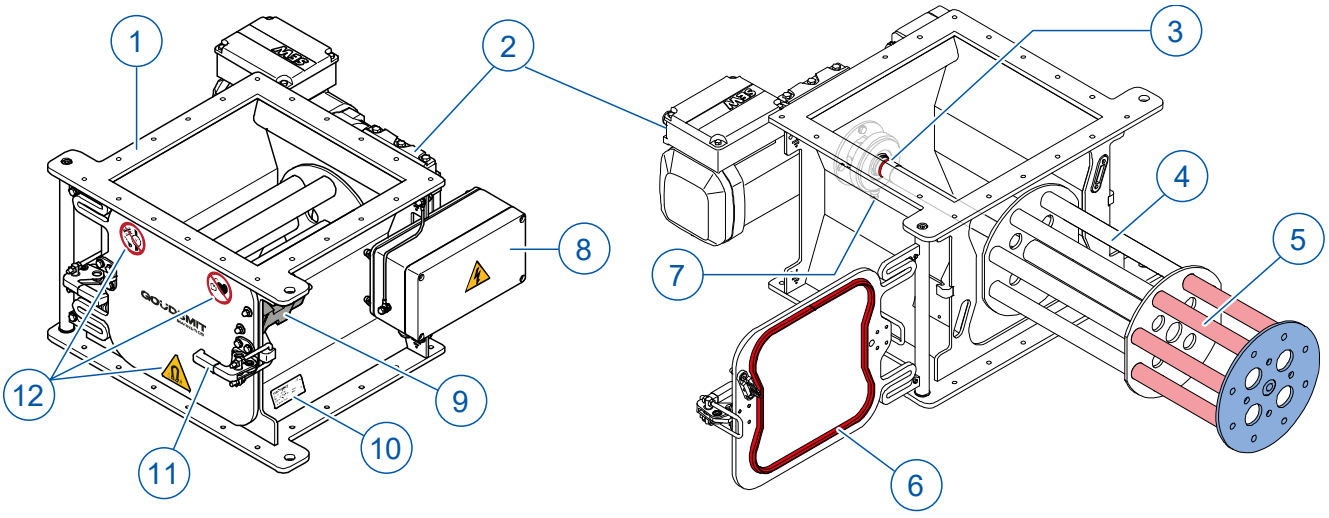
The devices are suitable for the following ambient and product temperatures:

Grade of magnet used	Ambient temp.	Ambient temp. (ATEX)	Max. product temp.	Max. product temp. (ATEX)
N-42	-10 °C to +60 °C	-5 °C to +40 °C	60 °C	60 °C
N-45SH	-10 °C to +60 °C	-5 °C to +40 °C	100 °C	60 °C
N-52	-10 °C to +60 °C	-5 °C to +40 °C	60 °C	60 °C

The magnetic material must be protected against higher temperatures than those specified on the data sheet as the magnet will permanently lose magnetic force if exposed to higher temperatures.

7 Product information

7.1 Construction



[1]	Flange gasket	[5]	Magnet	[9]	Door switch
[2]	Reductor motor	[6]	Door seal	[10]	Identification plate
[3]	O-ring	[7]	Flushing air connection or check nut	[11]	Quick-acting clamp
[4]	Extractor	[8]	Control box	[12]	Warning pictogram

- The device consists of a rotating magnet unit on a shaft driven by a reductor motor [**2**].
- The magnet unit consists of a magnet rotor [**5**] with an extractor [**4**]. The magnet rotor [**5**] is fitted with multiple magnetic bars in thin-walled stainless steel tubes. The extractor [**4**] consists of two flanges with tubes welded or brazed between them.
- The reductor motor [**2**] is a flange motor and is mounted directly on the stainless steel housing [**1**].
- The housing [**1**] has an inlet and outlet flange with holes for bolt mounting.
- The door is made dust-tight, dirt-tight and watertight with a seal [**6**] and is secured by quick-acting clamps [**11**].
- As standard, the door switch [**9**] is connected to the control box [**8**]. If the door is opened while the motor is running, the reductor motor is switched off immediately and the magnet unit stops rotating. The magnet unit can then be inspected and cleaned.
- In some versions, the shaft between motor and magnet rotor is additionally extended with an intermediate bush for easy detection of motor oil loss through the shaft, to further reduce the danger of motor oil entering the housing.
- Between the housing and the reductor motor is a check nut or a flushing air connection [**7**]. If a check nut is fitted, the device is NOT suitable for the application of overpressure.

7.2 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.

7.3 Notes on the magnet unit

The magnet unit has fragile extractor tubes. Excellent ferrous separation efficiency is achieved due to the thin wall thickness of the tubes. However, larger, heavier ferrous and other particles in the product flow can cause dents in the fragile extractor tubes.

Make sure there are no heavy particles in the product flow that could damage the extractor tubes.

- For prevention, install a mechanical sieve upstream of the device.

Careless handling of the magnet unit during a cleaning cycle may also result in dents in the extractor tubes. Once there are dents in the extractor tubes, it may be difficult to remove the magnetic bars of the magnet rotor from the extractor.

If the magnet bars get stuck in the extractor tubes, this problem must be rectified as soon as possible. Fit a new extractor to prevent further damage.

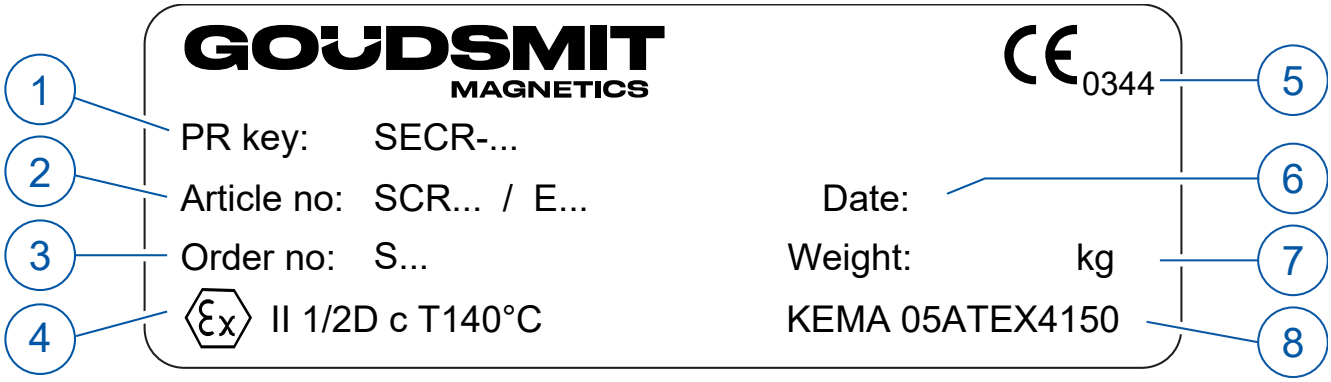
NOTICE

Damage to extractor tubes or damage caused by damaged extractor tubes are not covered by the warranty.

7.4 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.



[1]	Product key	[5]	Inspection body number (Notified body number)
[2]	Article number	[6]	Year of manufacture
[3]	Order number	[7]	Weight
[4]	ATEX marking (if applicable)	[8]	Certificate number

7.5 Door switch

The door switch acts as a safety switch and can be supplied in two versions:

1 As soon as the door is opened in operation, the motor immediately stops running (standard).

2 The door is electrically locked and can only be unlocked by a signal from the controller.

8 Transport and installation

8.1 Transport

WARNING

Note

The device permanently emits a magnetic force.

Observe the safety instructions for transport in the Safety risks [▶ 6] section.

- During transport, make sure the area is clear around the installation in which the device is integrated.
- During transport, avoid all impact in order to prevent damage, especially to the magnetic bars. In the event of damage to the tubes, the magnet packs may not move in the tubes, or only move with difficulty.

8.2 Installation

DANGER

Danger of electrical voltage

Have all work related to the installation and electrical connection of the device performed by electricians or qualified personnel who are trained to do such tasks.

▶ Always ensure that the electrical voltage is switched off when performing electrical work on the device, as voltage may be present on some parts.

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 [▶ 6] section for the precautions that must be taken when working on the device.

▶ Only qualified personnel should 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 non-magnetic structural parts are permitted within the range of the magnetic field in order to prevent a negative impact on the removal of ferrous particles. In simple terms, the magnetic field may not be ‘short circuited’.

▶ Only use lifting/hoisting tools that are in good condition, and do not exceed the lifting capacity of the tools.

▶ The supply and discharge channels and structure must be sufficiently strong to bear the weight of the device with the captured ferrous particles.

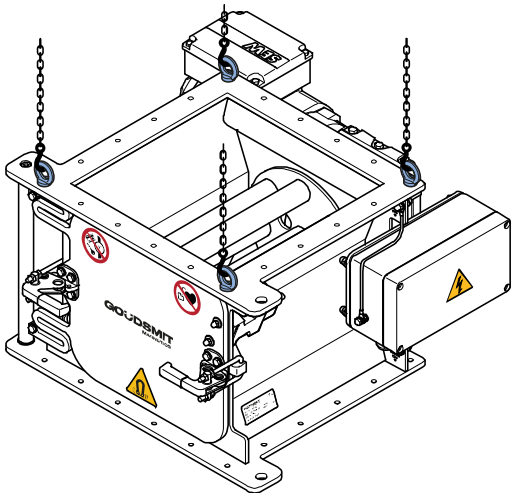
▶ When installing the device, ensure that the free-fall height of your product is a **maximum of 0.4 metres**. A higher free-fall height will increase the speed of the product, resulting in poorer separation.

- Pay careful attention to the location of the centre of gravity. This is because it is NOT in the centre of the device, but on the motor side.
- The device is delivered in a wooden crate. Open the box and fit four lifting eyes on the top flange. Attach chains or lifting straps to the lifting eyes.

DANGER

Risk of entrapment

Do not place your hands inside the crate during lifting.



- Lift the device out of the crate.
- Check at the quick-acting clamps that the door is properly closed. During transport, the door may open, allowing the magnet unit to fall out of the housing.
- Preferably mount the device at a working height of about 1.5 metres so that the operator can easily remove the magnet unit for cleaning and maintenance work.
- Bolt the flanges of the device to the product channel firmly and leak-tight.
- To prevent physical damage and wear, the cabling on the outside of the device must be adequately protected.

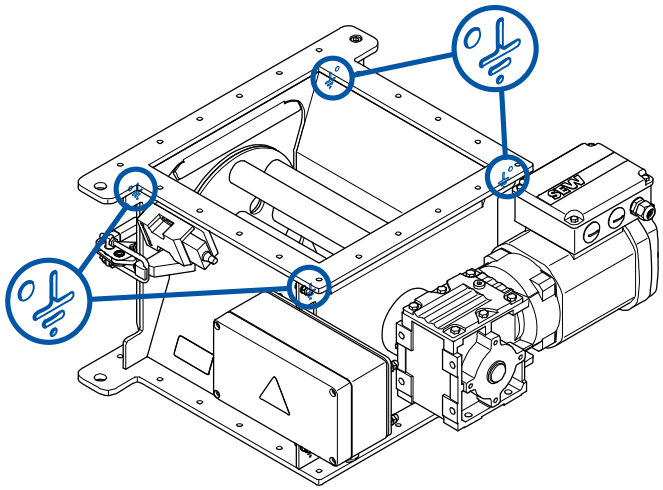
8.3 Vibrations

The construction of the channel in which the device is mounted must not cause vibrations that could damage or cause wear to the device, as exposure to intense vibrations results in permanent reduction of magnetic force.

The only vibrations in the device are caused by the moving and rotating magnet unit.

The product channel in which the device is mounted must be thick enough to absorb the (relatively low) forces of the rotating magnet unit.

8.4 Preventing electrostatic discharges (earthing)

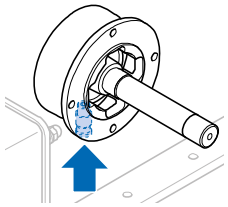


To prevent electrostatic discharge, a provision must be made to prevent potential differences between the installation and the device. This can be done by installing a connection cable to the installation. The electrical resistance must be less than 25 Ω.

8.5 Free space

The available free space around the device must be adequate for inspection and maintenance work, such as removing and/or fitting the magnetic unit. This means, among other things, that at least 1.5 times the bar length must be kept clear at one end.

8.6 Air pressure between the oil seals on the motor shaft and the housing



There is an air connection between the reductor motor and the device housing to introduce overpressure. The air flushing prevents product the escape of material. It also prevents contaminants from outside the product channel from entering the product channel. If an air pressure connection is connected to the motor mounting flange, the connection pressure must not exceed 0.1 bar.

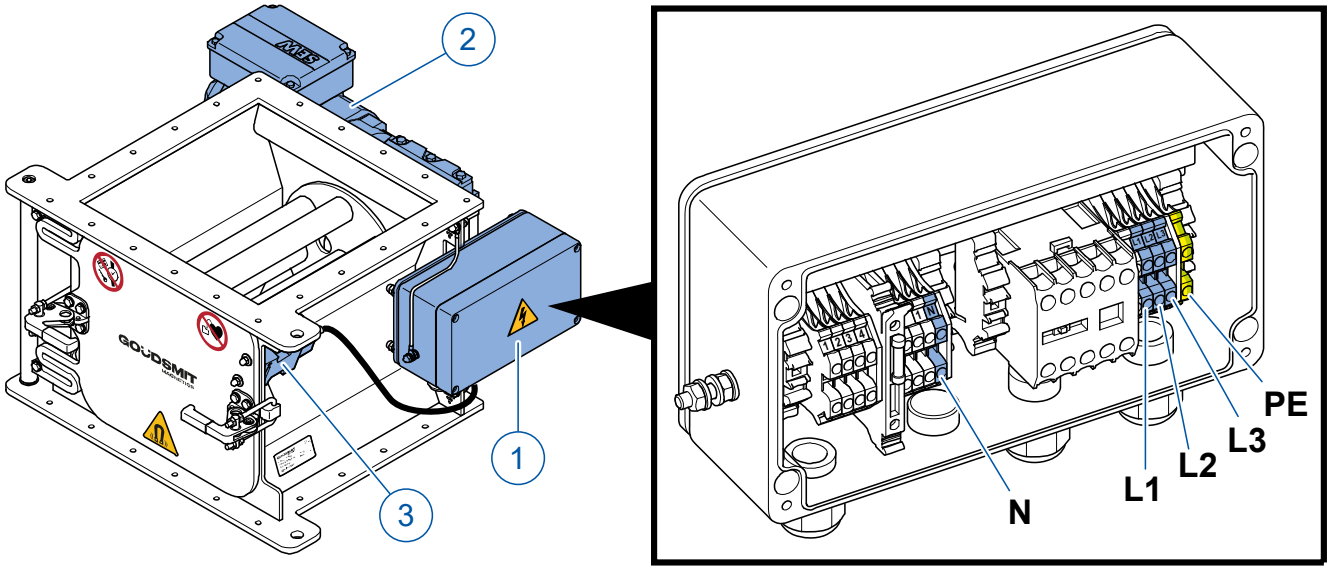
This air pressure may only be connected if an air coupling (1/8" - 6 mm) is fitted. If a check nut is fitted, the device is NOT suitable for the application of overpressure.

The air pressure seal works optimally when there is equal pressure inside and outside the product channel.

9 Electrical connection

- Always ensure that the supply voltage is switched off before you begin the work, and ensure that it cannot be switched on again without your knowledge.
- Make sure that the electrical connections are carried out professionally and safely, in compliance with national and local electrical standards and regulations.
- The electrical connection values are shown on the identification plate and the electrical drawings. Before connecting the delivered equipment, check the on-site connection values and make sure that the connecting cables to be used are adequately rated for the electrical power to be drawn.
- Make sure all the electrical connections are checked/tightened after delivery and regularly thereafter (e.g. once a year).

9.1 Connecting supply voltage



The device comes standard with a control box [**1**]. The reductor motor [**2**] and door switch [**3**] are connected to it. The supply voltage of the control box is shown on the supplied wiring diagrams.

- Connect the power cable to the terminals **N**, **L1**, **L2**, **L3** and earth (**PE**) in the control box.

Check that the electrical installation has been installed properly by performing the following checks after switching on the supply voltage:

- Open the door – reductor motor stops running.
- Close the door – reductor motor starts running again.

NOTICE

Motor protection switch

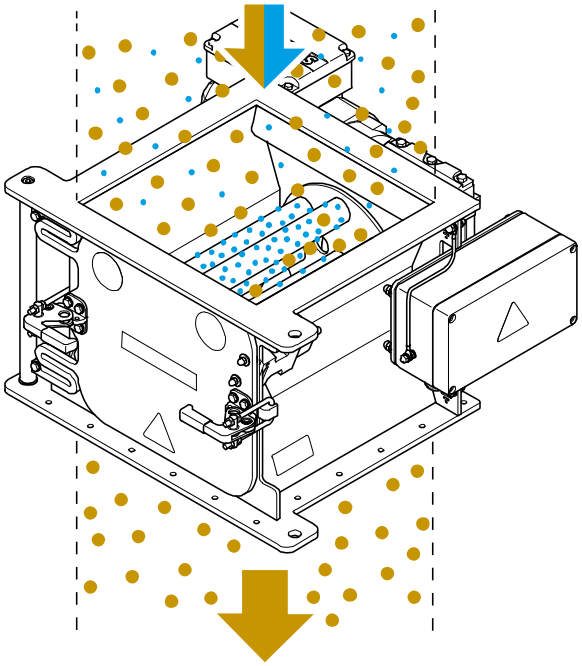
The device does NOT have its own controller. As a result, there is NO motor protection switch integrated in the terminal box. You must implement your own motor protection device that complies with local and legal requirements and regulations.

9.2 Electrical connections & ATEX

If the device is used in an Ex zone, any changes or additions to the electrical installation must meet the requirements for the applicable dust zone.

10 Operating principle

10.1 General



The rotor with very strong neodymium magnetic bars is located in the centre of the product flow. The product contaminated with ferromagnetic particles passes several magnetic bars as it flows through the separator.

The magnets attract passing ferromagnetic contaminants. The captured particles stick to the magnets, while the purified product flows on.

Because the rotor rotates in the housing, the product continuously falls off of the bars. This prevents 'bridging', product accumulation and ultimately blockages. Moreover, the magnetic filter capacity remains optimal, because the magnetic bars remain clean.

10.2 Cleaning process – disposal of ferromagnetic particles

When cleaning the device, wear the requisite protective clothing, such as overalls, gloves, goggles and safety shoes.

CAUTION

Risk of burns from hot surface

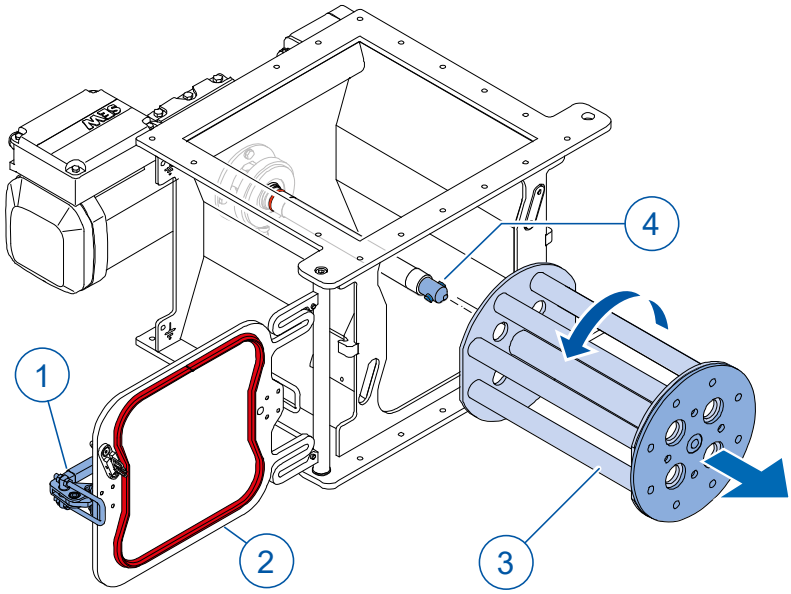
Contact with hot parts may cause burns.

- ► Always wear protective work clothing and safety gloves when carrying out work near hot components.
- ► Make sure all components have cooled down to ambient temperature before carrying out any work.
- ► If applicable, apply additional warning pictograms for hot surfaces to the installation and device.

Cleaning process

Magnetic systems attract ferromagnetic particles. Regular cleaning is therefore necessary. Clean magnetic bars separate ferromagnetic parts significantly better than contaminated magnetic bars.

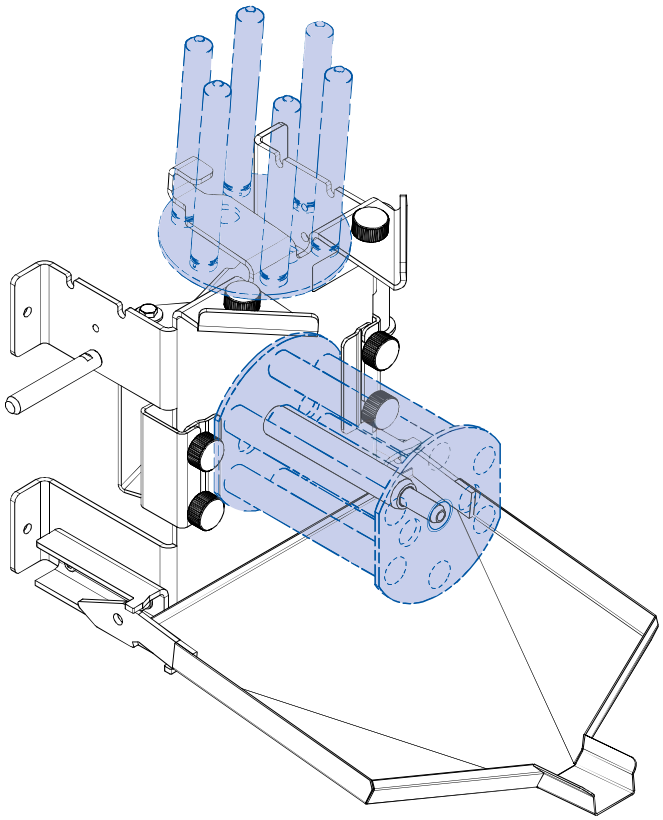
If a magnetic bar is very saturated, it can lose these ‘trapped’ ferrous particles. These ferrous particles then re-enter the product flow. Also, a saturated magnet can block the flow of product and the magnet unit, causing the magnet unit and reductor motor to break down.



To clean, proceed as follows:

- Stop the product flow. Wait until all the product material has left the product channel.
- Switch off the reductor motor.
- Wait until the magnet unit [**3**] has come to a complete stop.
- Release the quick-acting clamps [**1**] and open the door [**2**].
- Remove the magnet unit [**3**] from the bayonet fitting on the shaft with a slight twist and pull [**4**]. When doing so, ensure that the magnetic bars remain in the extractor. Otherwise, ferrous particles may fall back into the product or damage may result.

10.3 Cleaning with the magnet rotor cleaning unit (accessory)



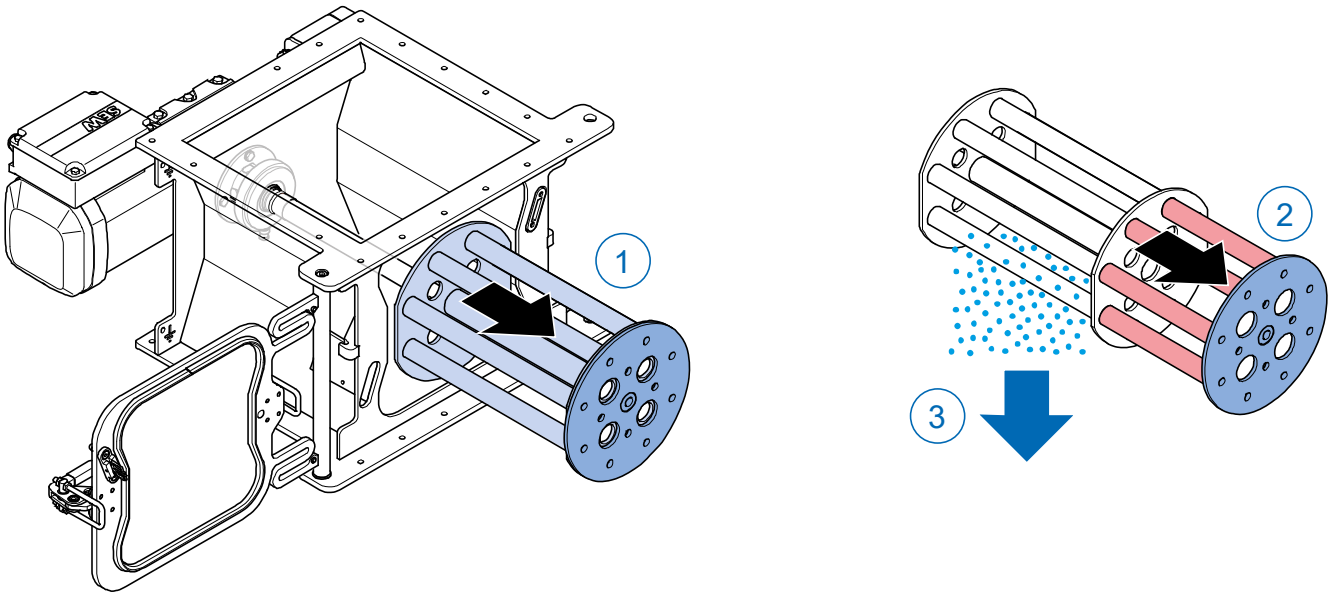
A special cleaning unit has been developed for these devices.

The magnet rotor cleaning unit makes it easier to remove the magnetic rotor from the extractor (tubes) and clean the extractor.

More information about this accessory can be found on our website:

Cleaning with the magnet rotor cleaning unit (accessory)

10.4 Cleaning without cleaning unit



- Stop the product flow. Wait until all the product material has left the product channel.
- Switch off the reductor motor. Wait for the magnet unit to come to a complete stop.
- Release the quick-acting clamps and open the door.
- Remove the magnet unit [**1**] from the bayonet fitting on the shaft with a slight twist and pull, and place it on a clean – non-ferrous – surface and press your thumbs in the holes.
- Pull the magnet rotor [**2**] completely out of the extractor and place it on a plastic or wooden surface – far enough away from the extractor.
  The ferrous particles now fall from the extractor tubes [**3**] and can be collected and disposed of.

NOTICE

Make sure the ferrous particles on the extractor tubes do not ‘jump’ to the magnetic bars, as they are very difficult to remove from them.

- Clean the outside and inside of the extractor tubes thoroughly to prevent the magnetic bars from getting stuck in the extractor tubes.
- Clean the magnet rotor with compressed air and/or a soft, clean cloth. The magnet rotor can also be cleaned with special cleaning fluids that do not affect the material.
- If you choose to clean with a cleaning fluid, make sure the parts are completely dry before reassembly.
- Place the magnet rotor back in the extractor. You will have to gently guide the magnetic bars towards the holes of the extractor.
- Slide the magnet unit over the shaft in the housing until it is fully seated in the housing. A small twist secures the magnet unit in the bayonet fitting on the shaft.
- Close the door and fasten the quick-acting clamps.
- Switch on the reductor motor.
- Production can now be safely resumed.

11 Maintenance and inspection

11.1 General guidelines

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.

WARNING

Caution

The product flow must be stopped when work is being carried out on the device.

Exercise caution with tools. The magnetic force is permanent.

- 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.

11.2 Frequency of maintenance

NOTICE

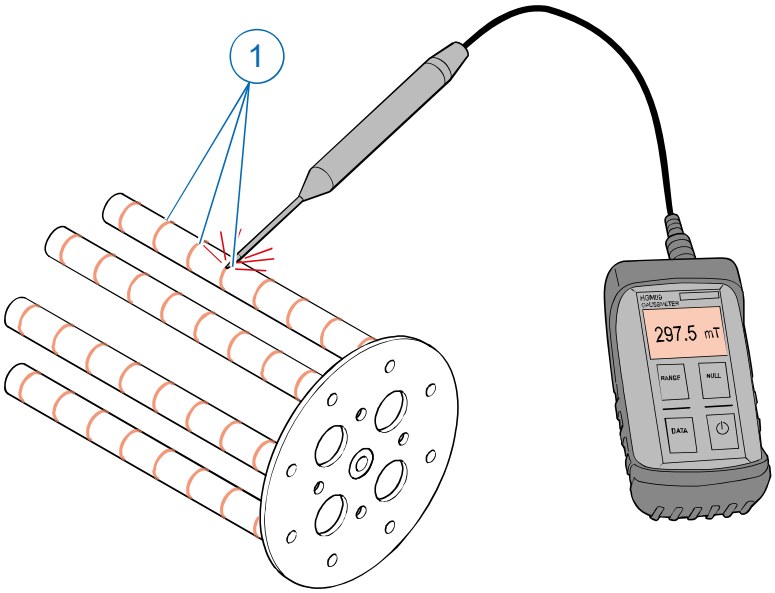
Goudsmit Magnetics offers an annual maintenance inspection, including replacement of the seal(s) and an inspection report with certificate for the magnets.

Action	Daily	Monthly	6 months	1 year	2 years
Clean magnetic bar tubes with extractor (for maximum performance) (► Cleaning instructions [▸ 33]).	min. 2x [1)]				
Visually inspect extractor tubes and magnetic bars for scratches, dents and wear.		•			
Clean motor cooling fins (to prevent overheating and explosion hazard)			•		
Replace door sealing ring and shaft O-ring (► Replacing sealing rings [▸ 28]).			•		
Measure flux density of magnetic bars (► Flux density measurement of a magnetic bar [▸ 27]).				•	
Replace PTFE seals in rear wall of housing (► Replacing PTFE seals [▸ 29])					•
Check and replace motor oils		(► Reductor motor [▸ 30])			

[1)] The frequency of the cleaning process depends on the capacity of your product flow and the level of soiling.

11.3 Flux density measurement of a magnetic bar

The magnetic bars must be measured at periodic intervals to check their magnetic flux density and to determine whether the magnetic force has reduced. Use a suitable gauss meter/tesla meter to measure the poles of the magnetic bar on the surface (the unit is tesla, gauss, kA/m or oersted).



Goudsmit Magnetics can perform magnet measurements on location, if desired. Proceed as follows:

- Stop the product flow. Wait until all the product material has left the product channel.
- Switch off the reductor motor.
- Wait for the magnet unit to come to a complete stop.
- Release the quick-acting clamps and open the door.
- Remove the magnet unit from the bayonet fitting on the shaft with a slight twist and pull.
- Place the magnet unit on a sturdy – non-ferrous – surface.
- Then pull the magnet rotor out of the extractor and remove the captured ferrous particles.
- Clean the extractor tubes and the magnet rotor with a soft, clean cloth and, if necessary, a suitable cleaning agent. The inside of the extractor tubes must also be kept clean to prevent the magnetic bars from jamming in the extractor tubes.
- Move the gauss meter/tesla meter probe [**1**] along the poles on the magnetic bar.

The measured values may fluctuate for various reasons, such as the position (angle) of the probe on the magnetic bar tube, the thickness of the probe and the reproducibility of the measurement. The temperature of the magnetic bar tube may be higher than 20-22°C due to the influence of the product flow.

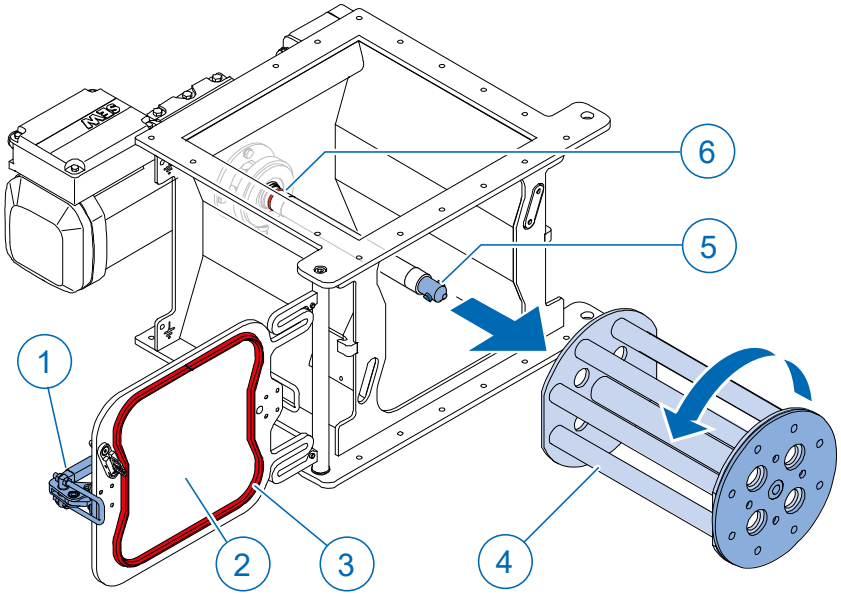
- Record the highest measured value.
- Using the accompanying data sheet, check whether the measured value falls within the permitted range for the peak value. **Note:** The measured values on the data sheet are values measured at a measurement temperature of 20°C ± 2°C.
- Reassemble all parts in reverse order.
- Production can now be safely resumed.

11.4 Replacing sealing rings

Replacing door seal and shaft O-ring

We recommend replacing the sealing ring at least every six months or more frequently, depending on the level of wear.

Proceed as follows:



- Stop the product flow. Wait until all the product material has left the product channel.
- Switch off the reductor motor. Wait for the magnet unit to come to a complete stop.
- Release the quick-acting clamps [**1**] and open the door [**2**].
- Remove the old door seal [**3**].
- Thoroughly clean the groove in the door.
- Fit the new door seal into the groove.
- Remove the magnet unit [**4**] from the bayonet fitting on the shaft with a slight twist and pull [**5**] and place the magnet unit on a sturdy – non-ferrous – surface.
- Remove the O-ring [**6**] from the shaft and thoroughly clean the groove and shaft.
- Fit a new O-ring.
- Place the magnet unit back on the shaft and secure it with the bayonet fitting.
- Close the door and fasten the quick-acting clamps.
- Switch on the reductor motor.
- Production can now be safely resumed.

If necessary, the door can be removed to replace the door seal. Then place it on a clean, flat surface.

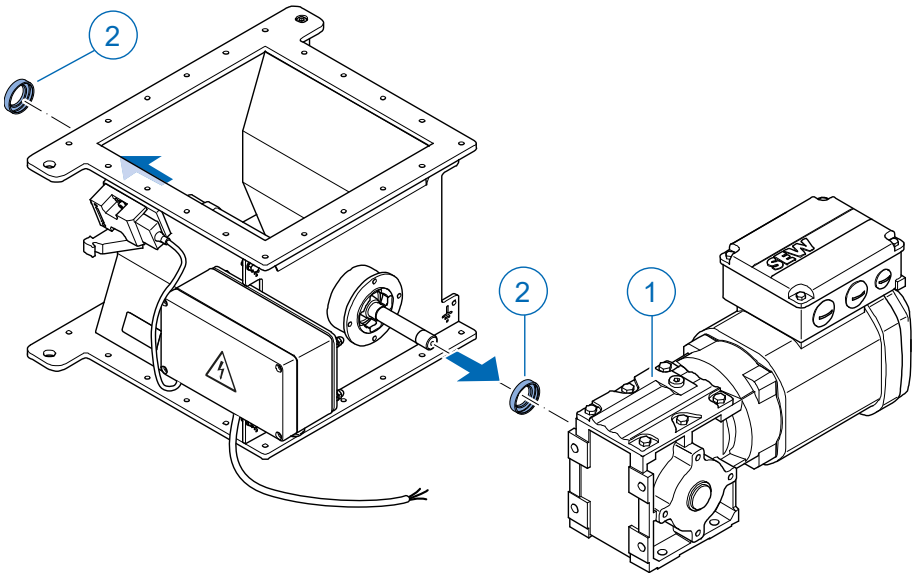
NOTICE

If the seals wear quickly, e.g. due to excessive temperature or an excessively abrasive product, enquire about alternative seals.

11.5 Replacing PTFE seals

We recommend replacing both PTFE seals at least every two years or more frequently, depending on the level of wear.

Proceed as follows:



- Stop the product flow. Wait until all the product material has left the product channel.
- Stop the reductor motor and disconnect it from supply voltage.
- Release the quick-acting clamps and open the door.
- Remove the magnet unit from the bayonet fitting on the shaft with a slight twist and pull, and place it on a clean – non-ferrous – surface.
- Remove the reductor motor [**1**].
- Remove both PTFE seals [**2**]. One PTFE seal is accessible from the inside of the device and the other from the outside. If necessary, use the special tool ‘SECR-S-TOOL PTFE Seal’ (E0125121) developed by Goudsmit Magnetics.
- Clean the plain bearing internally and externally with a soft, clean cloth.
- Fit the new PTFE seals.
- Reassemble everything in reverse order.
- Re-connect supply voltage to the reductor motor.
- Production can now be safely resumed.

11.6 Reductor motor

CAUTION

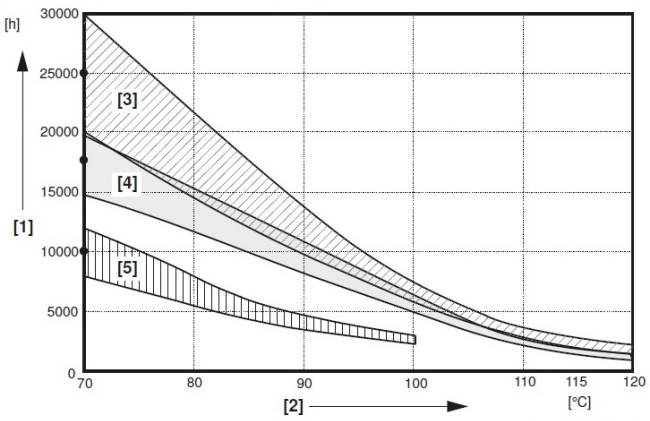
Danger of burns

Switch off the motor and disconnect the power supply to the device to prevent it from being accidentally switched on again. Wait for the motor to cool down.

- Regularly check whether the motor makes more noise than usual or is hotter than usual. If so, determine the cause and correct the problem as quickly as possible to prevent further damage.

The table below shows the manufacturer's general recommendations for inspection and maintenance intervals under normal environmental conditions.

Reductor motor	
Interval	**Work**
Every 3,000 operating hours, at least every 6 months.	• Check the oil and oil level. • Check the running sound for possible bearing damage. • Check the seals visually for leaks. • For reductor motors with a torque arm: Check the rubber buffer and replace if necessary.
Depending on operating conditions (see chart below), at least every 3 years. Depending on the oil temperature.	• Change the mineral oil (see reductor motor data sheet for oil type and quantity). • Change the grease in the frictionless roller bearings (recommended). • Replace the oil seal (do not fit it in the same groove).
Depending on operating conditions (see chart below), at least every 5 years. Depending on the oil temperature.	• Change the synthetic oil (see reductor motor data sheet for oil type and quantity). • Change the grease in the frictionless roller bearings (recommended). • Replace the oil seal (do not fit it in the same groove).
Some reductor motors (such as the SEW R07, R17, R27, F27 and Spiroplan®) are lubricated for life and are therefore maintenance-free.	
Various (depending on external factors).	• Touch-up or reapply surface/anti-rust coating. Check with the motor manufacturer for more information on the coating.
Every 10,000 operating hours, at least every 6 months.	Inspect the motor: Check all bearings and replace if necessary - replace the oil seal; - clean the cooling air vents.

Reductor motor	
Interval	**Work**
	[1] Operating hours. [2] Constant oil bath temperature. Average value per oil type at 70 °C. [3] **CLP PG**. [4] **CLP HC / HCE** Food-grade lubricant for the food industry. [5] **CLP HLP / E** Lubricants based on biodegradable oils for agriculture, forestry and water boards.

NOTICE

When changing the oil, use SEW GearOil Poly 460 H1 E1, for example, which is suitable for occasional food contact.

Note! SEW GearOil Poly 460 H1 E1 cannot be mixed with other mineral or synthetic oils.

11.7 Bearings

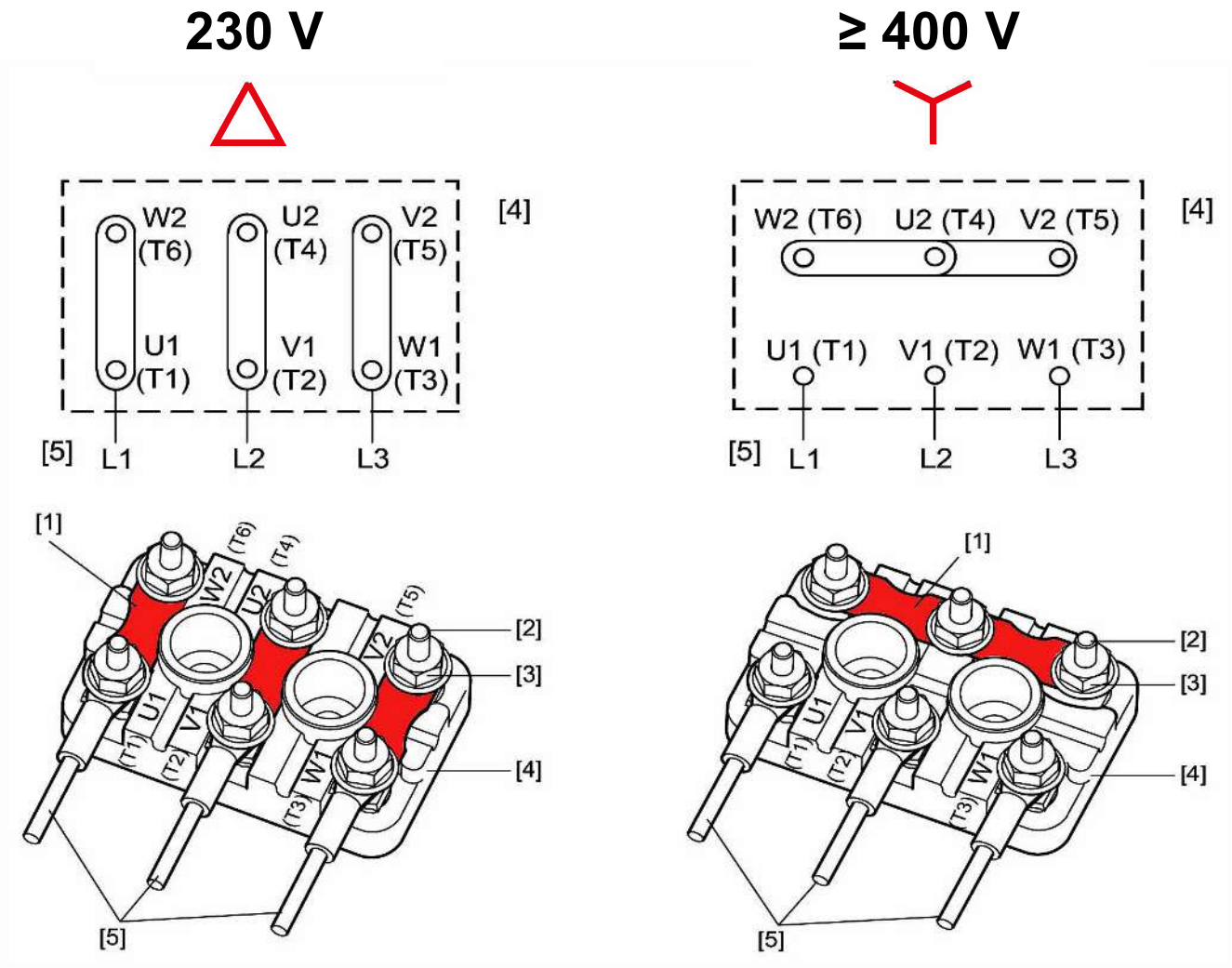
The reductors are equipped with maintenance-free bearings and run in an oil-lubricated bath.

For more information, visit the motor manufacturer's website (see data sheet).

11.8 Replacing motor

The electrical connection values of the motor are listed on the motor's identification plate.

- Check the correct direction of rotation of the motor. This can be done by briefly switching on the motor. If the direction of rotation is incorrect, swap two of the three phases (U, V, W). Here, it does not matter whether you have a Δ or **Y**connection.



- Do not forget to attach the earth wire.

11.9 Cleaning instructions

NOTICE

For cleaning the inside of the product channel, the customer must make a provision to allow access to the inside of the product channel.

When used in food product flows

Cleaning and disinfectant methods and agents that are used for cleaning must be adapted to the specific type of soiling (carbohydrates, proteins, fats, etc.) and the degree of cleaning required for your application. The type of product that is processed thus determines to a large extent which combination of cleaning agents is suitable. Consult your cleaning agent supplier to select the correct cleaning agents for your specific situation.

The device is made of stainless steel or ‘food-grade stainless steel’ 1.4301/SAE 304L and 1.4404/SAE 316L.

Check with your cleaning agent supplier whether the products are suitable for the material of the chosen seals (silicone, NBR or Viton).

Wet or dry cleaning

If the use of fluids is prohibited in your installation, use disinfectant cloths that are suitable for contact with the processed product, if necessary.

The frequency of cleaning is dependent on the degree of cleanliness required for the processed product. The frequency of cleaning must be increased in applications where sensitive food products are processed. Perform a hygiene risk assessment to determine the requirements in your situation.

Cleaning and ATEX

Prevent dust accumulations, thus mitigating avoidable ignition risk resulting from heating of the dust layer. As dust layers heat up, they can smoulder and then ignite, subsequently igniting a passing dust cloud into an explosion or become a self-igniting dust cloud. So clean frequently enough to prevent dust accumulation.

12 Troubleshooting

12.1 Troubleshooting table

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
The device does not separate ferromagnetic particles completely or at all.	The magnetic bar is overloaded with ferromagnetic particles.	• Remove the captured particles from the magnetic bar (more frequently). • Use a permanent magnet to check whether the separated particles are ferromagnetic.
	Particles that are not attracted are not sufficiently ferromagnetic.	• Check the magnetic behaviour of the installed parts around the magnets by holding a ferrous object close to the magnets. If there are parts that react to the magnet, replace them with non-magnetic parts, such as those made from stainless steel.
	Ferromagnetic parts near the magnet reduce the ferrous separation capacity.	
Leakage of product material.	Sealing ring is not seated properly in the groove.	• Fit the sealing ring in the groove properly.
	Sealing ring is worn.	• Replace the sealing ring.
Magnet unit binds in extractor element.	Dents in the extractor tubes.	• Remove the dents from the extractor tubes. • Contact Goudsmit Magnetics.
Motor makes too much noise / draws more current [A] than normal.	The magnetic bar is overloaded with ferromagnetic particles.	• Remove the captured particles from the magnetic bar (more frequently).
	There is an object between the rotor and the device housing.	• Remove the object and clean the extractor.
	The resistance of the dust seals or bearing ring between housing and rotor is higher than normal due to wear or cracks.	• Replace the dust seal(s) or bearing ring.
Magnet unit does not rotate.	Problem with electrical connection.	• Check and repair the electrical connection.
	Motor does not run.	• Repair or replace the motor.
	The resistance of the dust seals or bearing ring between housing and rotor is higher than normal due to wear or cracks.	• Replace the dust seal(s) and/or bearing ring.
Magnetic rotor is difficult or impossible to move out of the extractor.	Dent(s) in one or more extractor tubes.	• Remove the dents or order a new extractor or complete magnet unit.
If a second control box is included in the scope of delivery.	Start button on control box is not pressed.	• Press the (green) start button.
	Thermal protection has been triggered.	• Find the cause and solve the problem. Reset the thermal protection.
If a door closer with safety lock is included in the scope of delivery.	The safety lock housing has not been activated.	• Make sure the safety catch makes good contact with the safety catch housing.
	Door not closed properly.	• Close the door by pressing the safety catch and locking the closing mechanism.

13 Service, storage and disassembly

13.1 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.

13.2 Spare parts

Spare parts are usually parts that are subject to wear. These include:

- O-ring(s)
- gasket(s)
- magnetic bars
- magnet rotor
- extractor
- motor

See the data sheet for the precise specifications. Please get in touch with us for information on the availability of spare parts.

- 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.

13.3 Storage and disposal

Storage

If you do not intend to use the magnet product for an extended period of time, we recommend placing the device in a dry, safe place, and applying preservative to the vulnerable parts, if necessary.

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. To this end, see also the Safety risks [▸ 6] section.

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