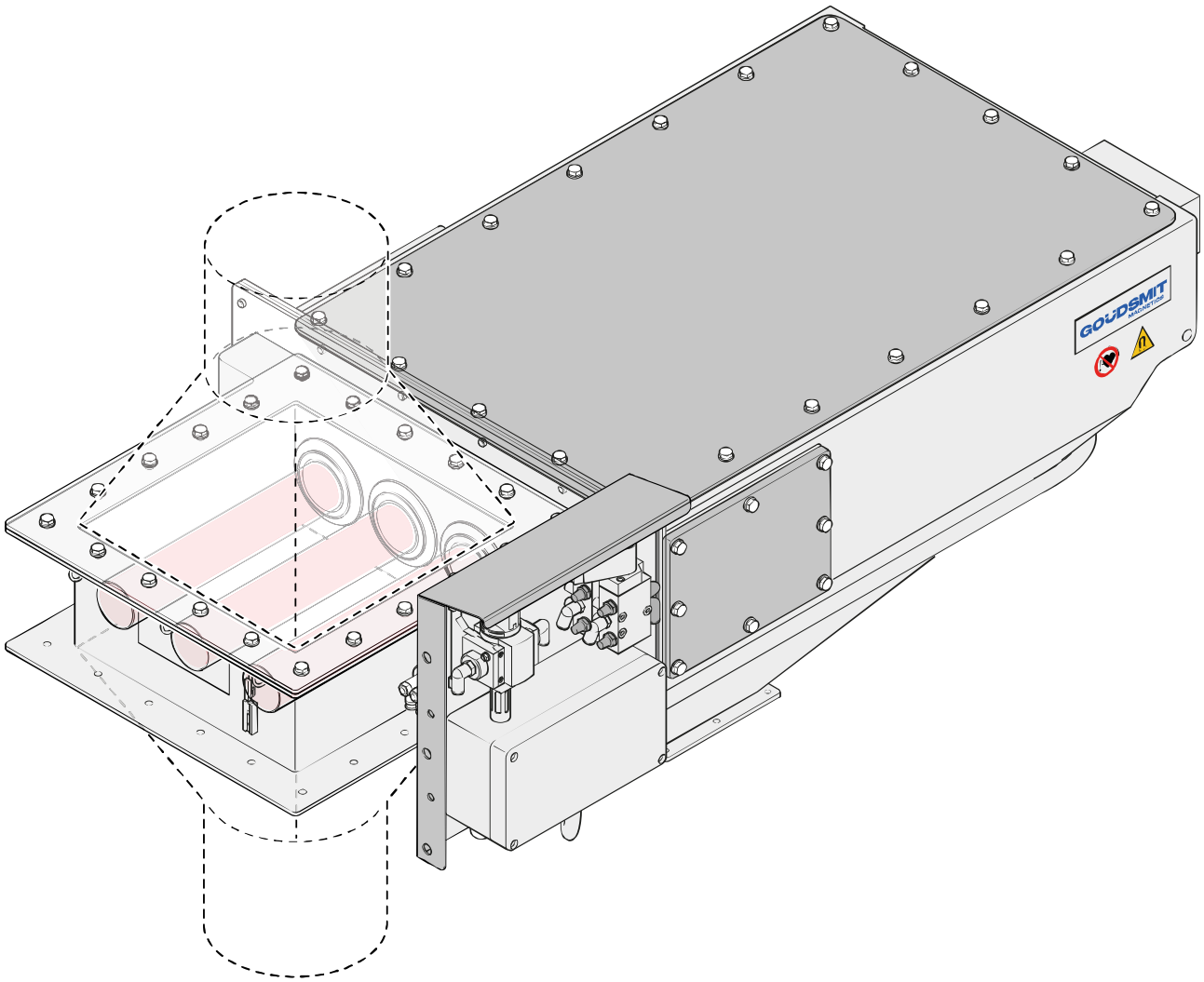
GOUDSMIT MAGNETICS

Installation and maintenance manual

Automatic discontinuous cleaning Cleanflow magnet, type "Easy-Clean", SECA series

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

Table of contents

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.

The details published in this manual are based on the information available at the time of delivery.

We reserve the right to change or modify the construction and/or design of our products at any time, without any obligation to make the same changes to previously supplied products.

In this manual, the SECA automatic Cleanflow magnet is further referred to as the ‘device’.

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.

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.

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

- 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 to filter dry powders and granulates. Any other use is inconsistent with the regulations. Any resulting damage is not covered by the factory warranty.
- The device is equipped with safety provisions and safety guards. Ensure that people who work on the device or in its immediate vicinity wear adequate protection equipment. Always leave all safety and shielding provisions in place if it is not necessary to remove them.
- Impose additional safety measures 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.
- The device may only be operated remotely when all covers are in place and moving parts are inaccessible.

WARNING

Risk of entrapment!

Do not carry out any cleaning or maintenance work inside the device while it is still in operation, even with the cover plate or inspection covers removed.

- 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.

2.3 Emergencies

WARNING

Switching off in case of emergency

The device does NOT have a safety switch. It is very important that your installation includes a provision for shutting off the power and air supply to the device in an emergency.

2.4 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.

2.5 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.

2.6 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:

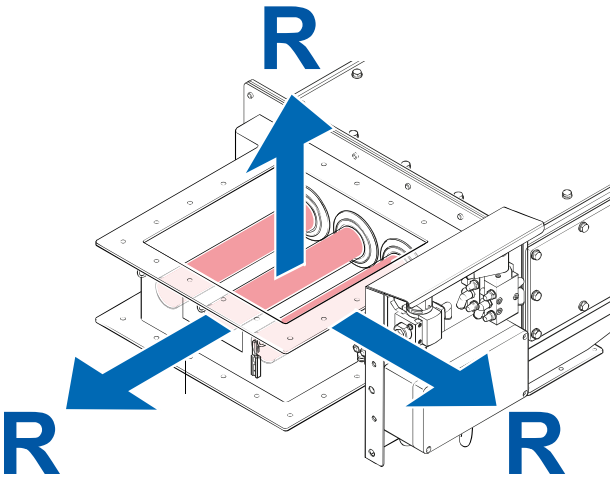
- Machinery directive 2006/42/EC
- EMC directive 2014/30/EU
- ATEX directive 2014/34/EU (if applicable)

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 0.1 metre(s) of the device.

Employees who are pregnant and the general public may not come within a radius ‘R’ of 0.04 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 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 device is designed for the magnetic filtration of small quantities of ferromagnetic contaminants – even if they are only weakly magnetic – from high-capacity granulate and powder flows in free-fall and low-pressure conveying lines up to 0.5 bar.

The maximum particle size is 10 mm. 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.

5.2 Range of applications

The device is suitable for free-flowing or reasonably to well-flowing powdered and granular products (with a particle size of up to 10 mm), such as flour, sugar, coffee beans, plastics, ceramics, and more.

Thanks to its automatic cleaning system, this separator is ideal for use in situations where access to the magnetic separator for operation and cleaning is limited or impossible.

The device is NOT suitable for poorly flowing sticky/greasy powders that cause clogging.

5.3 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 EU directive EC1935/2004. Higher-quality finishes are available for applications with more stringent requirements. See data sheet for the specifications.

5.4 Temperatures

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

Applied magnet quality	Max. ambient temp.	Max. ambient temp. (ATEX)	Max. product temp.	Max. product temp. (ATEX gas environment)	Max. product temp. (ATEX dust environment)
N-42SH	-10 to +60°C	-5 to +40°C	130°C	80°C	100°C
N-52	-10 to +60°C	-5 to +40°C	60°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.

5.5 Connection voltage

The connection voltage for the solenoid valve and detection sensors is 24 V_{DC}.

5.6 Air pressure for control

For the pneumatic connection(s), use an air pressure of 4 to 6 bar.

5.7 Air quality (compressed air)

Goudsmit Magnetics recommends using compressed air with a quality consistent with ISO 8573-1 (2:4:1) for the flow of food products.

It is your responsibility to choose the air quality that is appropriate for your product flow. There is no direct contact between the air and the product. The used air is ventilated outside the device. If an alternative setup is preferred, the exhaust air can be conveyed in a return circuit or to another space.

6 ATEX

6.1 Markings

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 (gas or dust), the specific equipment category and other criteria the equipment meets.

Example Ex marking for dust:		II 1/2D Ex h IIIC T105°C Da/Db	Ta = -5° to +40°C
Example Ex marking for gas:		II 1/2G Ex h IIB T4 Ga/Gb	Ta = -5° to +40°C

Explanation:

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

	Dust			Gas		
Equipment category	1D	2D	3D	1G	2G	3G
Suitable for ATEX zone(s)	20 (21 & 22)	21 (22)	22	0 (1 & 2)	1 (2)	2

[inside device / outside device]

h	→	Type of explosion protection: h = non-electrical equipment (protection method not specified)
T105°C	→	Maximum surface temperature for dust atmosphere
T4	→	Temperature class for gas atmosphere
IIB	→	Gas group the equipment is suitable for
Da/Db or **Ga/Gb**	→	Equipment Protection Level (EPL)

	Dust			Gas		
EPL	Da	Db	Dc	Ga	Gb	Gc
Suitable for ATEX zone(s)	20 (21 & 22)	21 (22)	22	0 (1 & 2)	1 (2)	2

[Da = inside device / Db = outside device]

Ta	→	Ambient temperature range – shown only if the range differs from the standard temperature range for ATEX (-20 to +40 °C).

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.

6.2 Description of ATEX options

To allow for greater configuration flexibility, this equipment is ATEX certified at the level of mechanical assembly. This provides more versatility but also makes the documentation and equipment marking more complex. There are two levels of marking: 1) For the fully assembled equipment, and 2) For the explosion-certified mechanical assembly. The latter does not include sensors, the terminal/control box, or the pneumatic components. Below is a description of the ATEX options available at both levels.

Product key at assembled equipment level:

SECA – xxxx – xxx – xx – xxx – x – x – xx – x – xx – x – x – x – EX

The **Ex** item in the product key indicates the following ATEX options:

Value	Explanation Ex marking	
NA	Not an ATEX version	
EX		II 1/2D Ex h IIIC T105°C Da/Db Ta = -5°…+40°C
X4		II 1/3D Ex h IIIC T105°C Da/Dc Ta = -5°…+40°C
G1		II 1/2G Ex h IIB T4 Ga/Gb Ta = -5°…+40°C
G4		II 1/3G Ex h IIB T4 Ga/Gc Ta = -5°…+40°C
Y		II 1/2D Ex h IIIC T105°C Da/Db II 1/2G Ex h IIB T4 Ga/Gb Ta = -5°…+40°C
Y4		II 1/3D Ex h IIIC T105°C Da/Dc II 1/3G Ex h IIB T4 Ga/Gc Ta = -5°…+40°C

Product key at mechanically assembled level:

SECA/MA – xxxx – xxx – xx – xxx – x – xx – x – xx – EX

The **Ex** item in the product key indicates the following ATEX options:

Value	Explanation Ex marking	
NA	Not an ATEX version	
EX		II 1/2D Ex h IIIC T105°C Da/Db
Y		II 1/2D Ex h IIIC T105°C Da/Db II 1/2G Ex h IIB T4 Ga/Gb

For a full description of all product key options, see the Annexes (Annexes [▶ 31]).

6.3 ATEX measures

- The maximum permitted product temperature depends on the type of ATEX environment and must not exceed the temperatures specified in the table below.

ATEX dust environment (D)	ATEX gas environment (G)
100°C	80°C

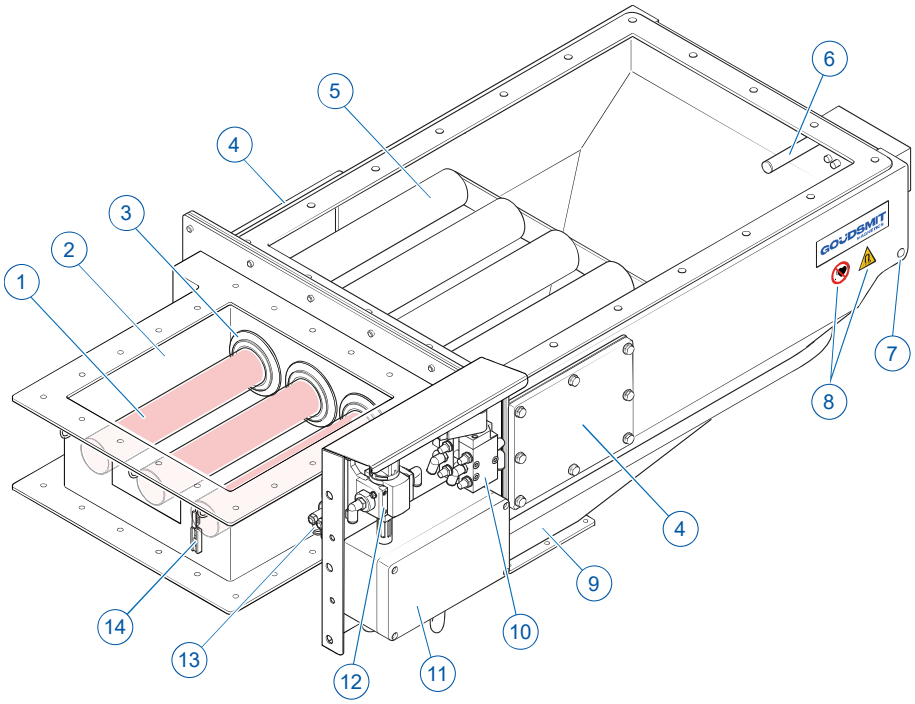
- For ATEX dust environment:
  - The ignition temperature of the dust must exceed 157 °C.
  - The smouldering temperature of a dust layer must exceed 180 °C.
  - Dust layers thicker than 5 mm must not accumulate on the equipment.
- For ATEX gas environments:
  - Any gases or vapours present must fall within temperature class T4, T3, T2, or T1.
  - The gases must have an ignition temperature higher than 135°C.
- 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.

7 Product information

7.1 Construction



[1]	Magnetic bar	[6]	Sensor discharge and cleaning	[11]	Connection box (24 VDC)
[2]	Product channel	[7]	Support point	[12]	On/off valve
[3]	Sealing ring	[8]	Warning pictogram	[13]	Pneumatic cylinder
[4]	Inspection hatch	[9]	Discharge channel	[14]	Production sensor
[5]	Magnetic insert	[10]	Solenoid valve		

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.

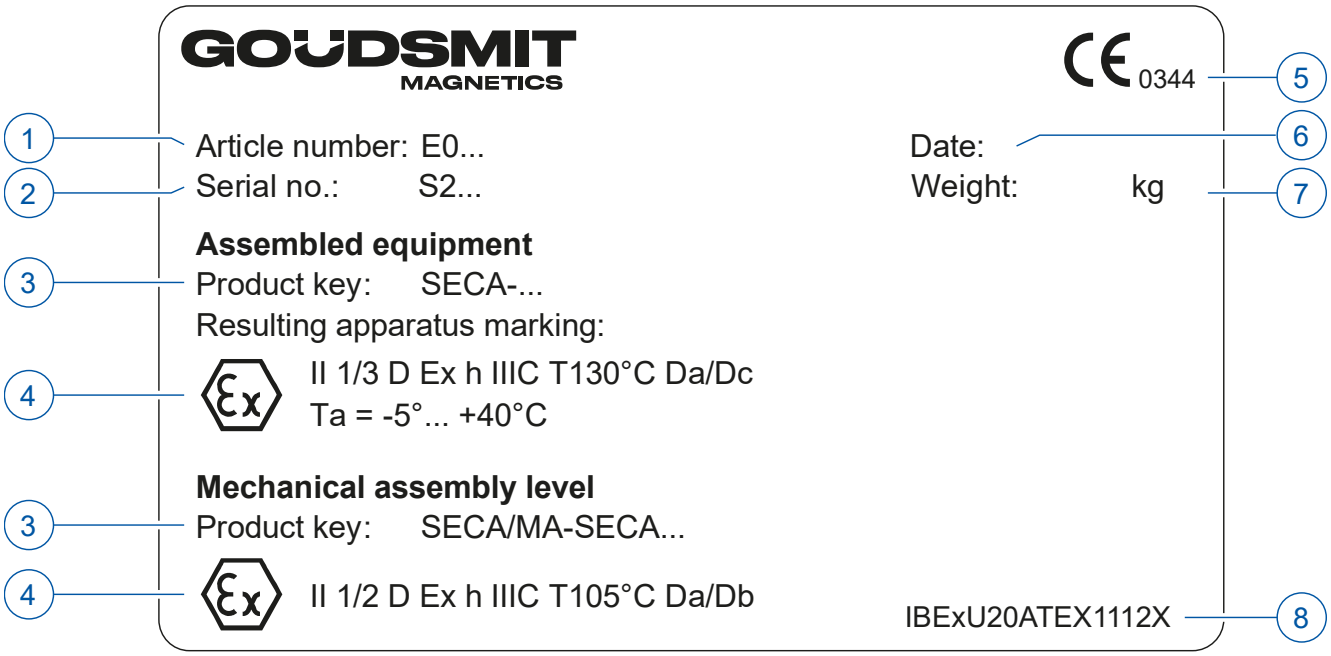
NOTICE

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

7.4 Accessories

On the website you will find a complete overview of available accessories for this device.

- See the first page of this document for the web address.

8 Transport and installation

8.1 Transport

WARNING

Note!

- ▶ Lift the device by lifting eyes. Keep in mind the centre of gravity.
- ▶ **Risk of entrapment:** Do not place your hands inside the crate during lifting. Maintain a distance of at least one metre.
- ▶ During transport, make sure the area around the device is clear.
- ▶ 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

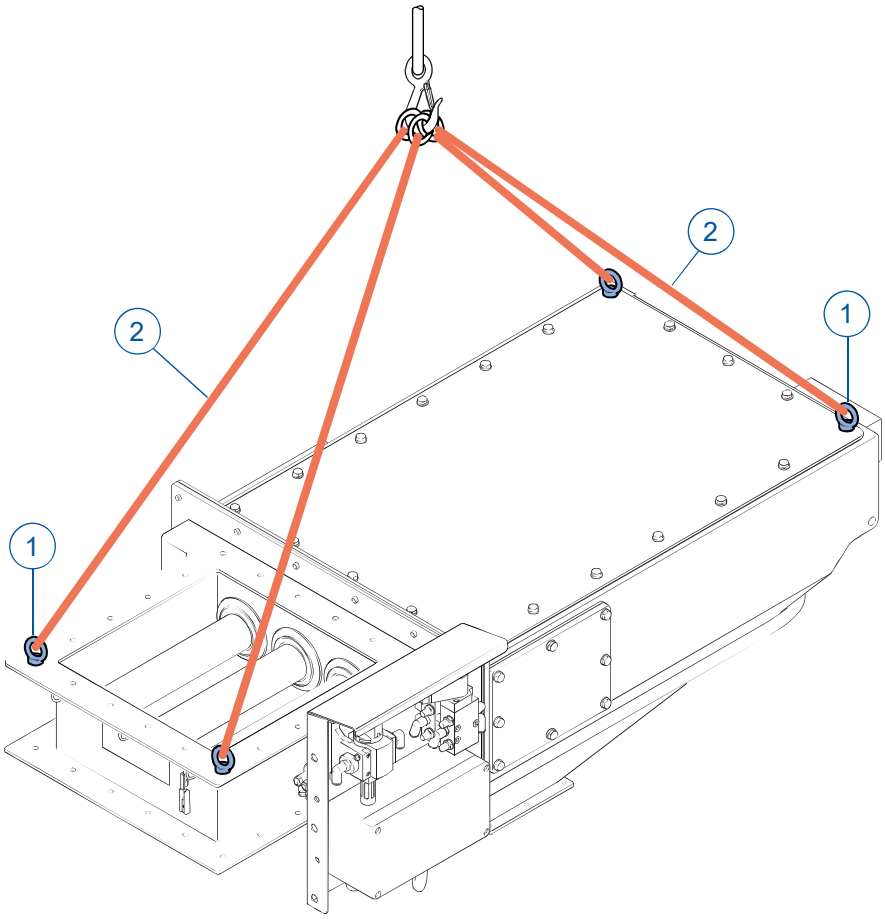
Have all work related to the installation and electrical connection of the device performed by electricians or qualified personnel who are trained to do such tasks.

- ▶ 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 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 and transportation aids that are in good condition, and do not exceed the permissible lifting capacity.
- ▶ The product channels must be strong enough to support the weight of the device and the raw product.
- ▶ Provide inspection hatches immediately above or below the device so it is possible to check whether the product inlet or outlet of the device is blocked by particles.
- ▶ Shut the supply of compressed air off with the on/off valve on the control panel when working on the device.



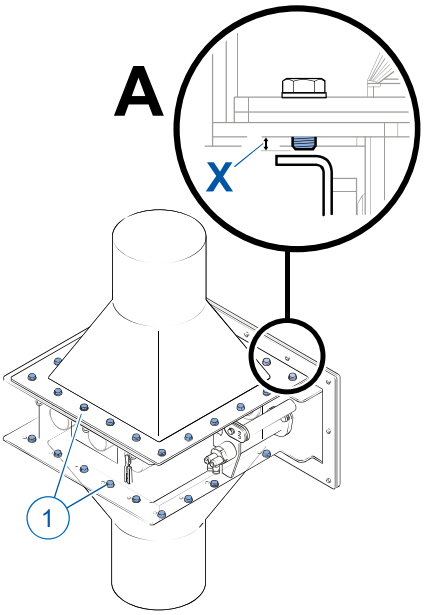
- The device is delivered in a wooden crate. Open the crate and remove the 2 bolts [**1**] at the corner of the device.
- Fit an M8 lifting eye at all 4 corners [**2**] of the device. Use gloves and exercise caution with tools due to the magnetic attraction force.
- Lift the device out of the crate evenly. Use a suitable lifting/hoisting arrangement that supports the weight of the device.

DANGER

Risk of entrapment

Do not place your hands inside the crate during lifting.

- Lift the device upwards and move it to the installation position. Use lifting/hoisting equipment if the size and weight of the device requires it.
- Install the device at the correct working height for the operating personnel. Ensure that each corner is at the same height to achieve proper alignment during installation.



- Screw the bolts [**x**] into the device flanges at the inlet and outlet flange of the product channel and tighten (see detail **A**). Misalignment and/or loose mounting can cause leakage.
- A support should preferably be installed at the rear of the device (► "Construction [▷ 15]", [**7**]) to relieve stress on the product channel. Depending on the situation, the device support can be either floor-mounted or suspended.

NOTICE

Ensure that the bolts protrude by no more than 5 mm below the flange (detail A, distance **X**), as otherwise the magnetic insert may catch on them, potentially resulting in leakage.

- Do not remove the lifting gear with lifting eyes until the device has been fully installed in the product channel.

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 Cleaning before use

The device must be cleaned thoroughly after installation. Use a cleaning agent that is suitable for the product material being filtered.

9 Control of the device

9.1 Control box for integration into a central control system

NOTICE

Refer to the provided electrical and pneumatic diagrams to properly connect the device.

The pneumatic and electrical controls can be fully configured and controlled by your control system. The box pictured is the device's standard control box.

Control of the device can be integrated into your own central control system. The device can then be operated and controlled from your control room or another designated control area.

The coils of the pneumatic valves and the optional proximity sensors can be connected via the terminal strip in the control box. For specifications, see the supplied electrical diagram.

9.2 Connection procedures

After the device is installed, the compressed air and power supply must be connected to the device in order to put it into operation.

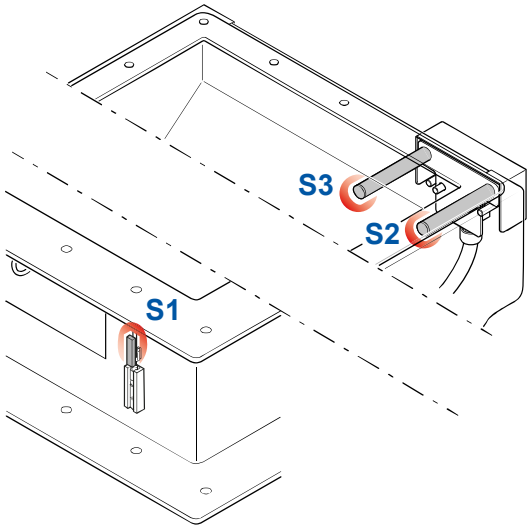
9.3 Cleaning cycle

The cleaning cycle and timings outlined below apply to a single row of magnetic bars. The total duration of the cleaning cycle can be adjusted as required. This cycle must be programmed into the central control system.

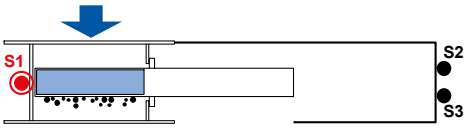
NOTICE

Before starting a cleaning cycle, stop the product flow and ensure that the product channel is completely depressurised.

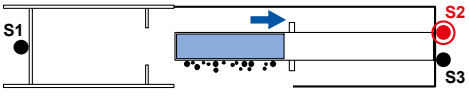
- **S1** = production position sensor
- **S2** = discharge position sensor (magnetic insert)
- **S3** = cleaning position sensor (magnetic insert)
- **1** = high (e.g. [S1] [1])
- **0** = low (e.g. [S3] [0])



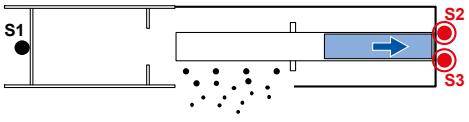
1. When the device is in operation (magnetic insert in the product channel), sensor **S1** will indicate “high”, while sensors **S2** and **S3** will indicate “low”.



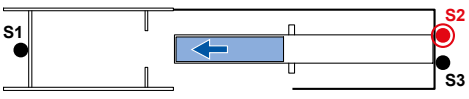
2. After the discharge signal, the magnetic insert moves to the discharge position (this takes 2 seconds).
Sensor **S1** will be “low” and the position of the discharge sensor **S2** will be “high”, but the magnet cleaning sensor **S3** will still be “low”.



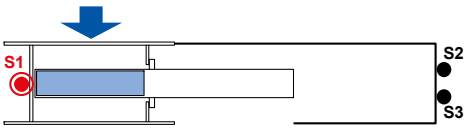
3. The magnet bundle inside the magnetic bar is moved to the opposite end of the bar (this takes 10 seconds).
The captured ferromagnetic particles are released into the discharge channel. Sensor **S1** will be “low” but sensors **S2** and **S3** will both be “high”.



4. After the discharge time (approx. 30 seconds), the magnet bundle is returned to the other end of the magnetic bar (this takes approx. 10 seconds).
Sensor **S3** will be “low” again, but sensor **S2** remains "high". Sensor **S1** will still be “low”.



5. The magnetic insert moves back into the product channel (this takes 2 sec.).
Sensor **S1** will be “high”, but sensors **S2** and **S3** will be “low”.



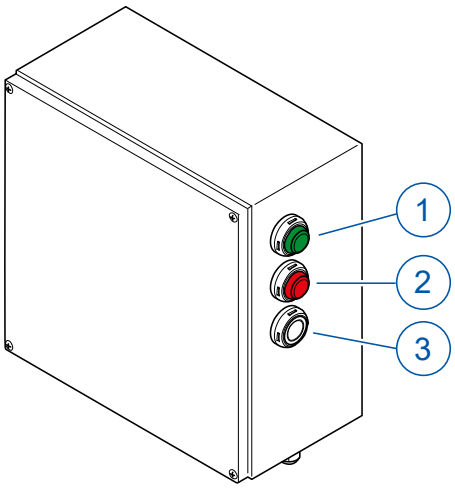
10 Optional local control unit (Sigmatek)

The SECA magnetic separator can optionally be equipped with Sigmatek PLC control integrated into the control unit. The system is pre-configured at the factory and users will not normally need to adjust the settings.

10.1 Operation

In standard operating mode, the magnetic bars are positioned within the product channel to capture ferromagnetic particles from the product flow. A discharge cycle can be initiated to remove the captured particles. Note: The product flow must first be stopped. This discharge cycle can be started either locally by pressing the manual discharge cycle button [**3**], or remotely via the central control system.

10.2 Status lamps and manual activation of the discharge cycle



1. Green indicator (status lamp) – operating status
2. Red indicator (status lamp) – error message (flashing)
3. Pushbutton for manual discharge cycle

During normal operation, the green status lamp [**1**] is illuminated. The magnetic bars are in the production position and the equipment is ready to capture ferromagnetic particles. If the product flow is currently paused, it may now be resumed. When a discharge cycle is in progress, the green status lamp [**1**] will go out until the cycle is complete.

If the control system detects a fault, the red status lamp [**2**] will begin flashing. The flash pattern indicates the specific fault and consists of a sequence of short pulses followed by a long pause (5 seconds). The number of short pulses corresponds to a specific fault, as detailed in the table below:

# pulse	Fault description	Cause	Solution
1	Single (or upper) row of magnets not returned to production position.	Sensor for detecting the magnets in the production position is misaligned.	Adjust the sensor to detect the magnets in the production position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
2	(Optional): Second row of magnets not returned to production position.	Sensor for detecting the magnets in the production position is misaligned.	Adjust the sensor to detect the magnets in the production position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.

# pulse	Fault description	Cause	Solution
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
3	(Optional): Third row of magnets not returned to production position.	Sensor for detecting the magnets in the production position is misaligned.	Adjust the sensor to detect the magnets in the production position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
4	Single (or upper) row of magnets not in discharge position.	Sensor for detecting the magnets in the discharge position is misaligned.	Adjust the sensor to detect the magnets in the discharge position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
5	(Optional): Second row of magnets not in discharge position.	Sensor for detecting the magnets in the discharge position is misaligned.	Adjust the sensor to detect the magnets in the discharge position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
6	(Optional): Third row of magnets not in discharge position.	Sensor for detecting the magnets in the discharge position is misaligned.	Adjust the sensor to detect the magnets in the discharge position. Ensure that the orange LED is illuminated.
		No air supply to the solenoid valve for moving the magnets.	Restore the air supply.
		Magnets are stuck in the bars.	Contact Goudsmit Magnetics for service to the device.
7	Time-out of cylinder movement for single (or top) row.	Cylinder has not reached end sensor in time.	Check whether the air supply is sufficient for the cylinder to move quickly enough.
			Adjust the sensor to detect the cylinder and check whether the orange lamp is illuminated.
8	(Optional): Time out of cylinder movement for second row.	Cylinder has not reached end sensor in time.	Check whether the air supply is sufficient for the cylinder to move quickly enough.
			Adjust the sensor to detect the cylinder and check whether the orange lamp is illuminated.
9	(Optional): Time out of cylinder movement for third row	Cylinder has not reached end sensor in time.	Check whether the air supply is sufficient for the cylinder to move quickly enough.
			Adjust the sensor to detect the cylinder and check whether the orange lamp is illuminated.

# pulse	Fault description	Cause	Solution
10	Time-out of movement for single (or upper) row of internal magnets	Magnets have not reached end sensor in time.	Check whether the air supply is sufficient for the magnets to move quickly enough.
			Adjust the sensor to detect the magnets and check whether the orange lamp is illuminated.
11	(Optional): Time-out of movement for second row of internal magnets	Magnets have not reached end sensor in time.	Check whether the air supply is sufficient for the magnets to move quickly enough.
			Adjust the sensor to detect the magnets and check whether the orange lamp is illuminated.
12	(Optional): Time-out of movement for third row of internal magnets	Magnets have not reached end sensor in time.	Check whether the air supply is sufficient for the magnets to move quickly enough.
			Adjust the sensor to detect the magnets and check whether the orange lamp is illuminated.
13	(Optional): Cap not closed	Cap is not closed.	Close the cap.
		Sensor for detecting the cap is misaligned.	Align the sensor and check whether the orange LED is illuminated.

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

- ► Perform all work on the device while the product flow is stopped and the compressed air is shut off via the on/off valve.
- ► Be careful with tools and ferrous objects. The magnetic force is permanently present.

Magnetic systems attract ferromagnetic particles. These particles are removed when the magnet unit is cleaned (cleaning cycle). A small portion of your product will also ‘adhere’ to the magnet unit and in the discharge channel. These particles are not removed by the cleaning cycle and will need to be removed by hand. A clean magnet is considerably more effective!

11.2 Daily/weekly maintenance and inspection

- Always inform operating personnel of scheduled inspections, maintenance, repairs and in the event of faults.

Exterior of device

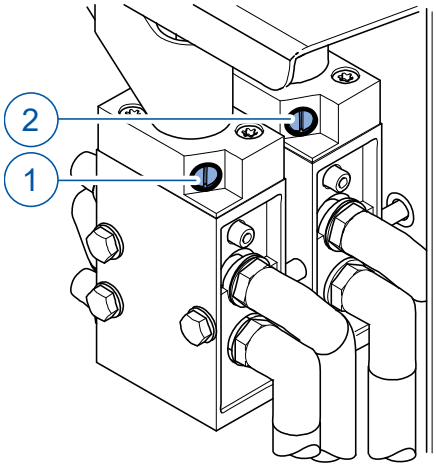
- Check regularly that all warning pictograms and the identification plate are present in the correct location on the device. If the warning pictograms or the identification plate are lost or damaged, replace them with new pictograms or a new plate in the original locations immediately.
- Check the outside of the device for any defects (e.g. pneumatic lines loose, inspection hatch not fully closed or inspection hatch missing).
- Ensure that the device is externally clean. Remove dust, dirt and particles from the device as appropriate.

Interior of device

- Check the sealing rings around the magnetic bars for wear and proper placement.
  If necessary, replace them with new sealing rings.
- Check the tubes of the magnetic bars for wear.

The frequency of cleaning is dependent on the capacity of the product flow and the level of contamination with ferromagnetic particles.

- Remove the captured particles from the magnetic bar tubes at regular intervals to ensure maximum performance. Follow the steps below for manual cleaning:



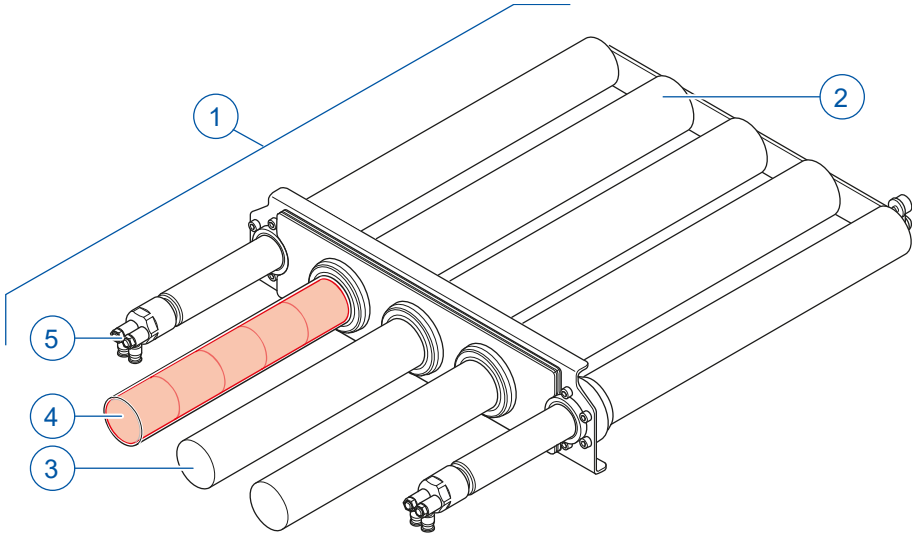
- Stop the product flow.
- Ensure that no further signals are sent to the device from the central control system.
- Move the magnetic insert to the discharge position using the adjustment screw [**1**] on the solenoid valve.
- Move the magnet bundles inside the magnetic bars to the discharge position using the adjustment screw [**2**].
- The ferromagnetic particles will be released and fall into the collection tray or discharge channel via the discharge channel.
- Stop the air supply to the solenoid valves.

11.3 Magnetic bars

WARNING

Damage to the magnetic bars

Avoid heavy and/or coarse parts in your product flow. These can damage the tubes of the magnetic bars.



The magnetic insert [**1**] consists of a magnetic bar unit comprising two or more magnetic bars [**2**].

The magnetic insert is moved in and out of the product flow by pneumatic cylinders [**3**]. Inside the magnetic bars, magnet bundles [**4**] move within a thin-walled tube [**5**]. The wall thickness of the tube is 0.7 or 1.2 mm, depending on the version. Heavy and/or large particles in the product flow can cause dents in the tubes. These can hinder the movement of the magnet bundle in the tube and/or damage it. ► "Range of applications [▸ 11]" for the maximum allowable particle size in the product flow.

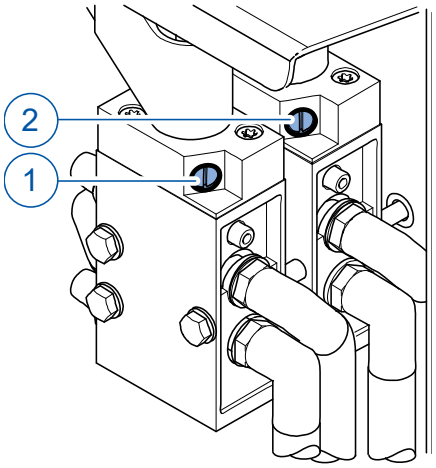
11.4 Flux density measurement of the magnetic bars

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).

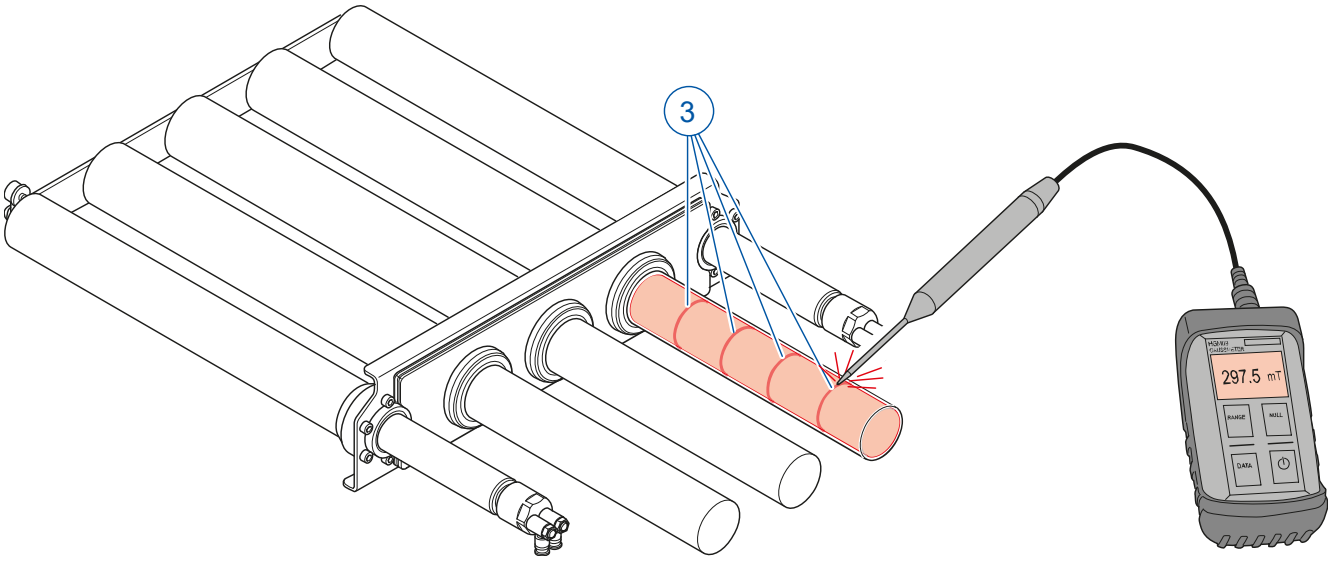
Goudsmit Magnetics can perform magnet measurements on location, if desired.

Proceed as follows:

- Stop the product flow.
- Ensure that no further signals are sent to the device from the central control system.



- Move the magnetic insert to the discharge position using the adjustment screw [**1**] on the solenoid valve.
- Move the magnet bundles inside the magnetic bars to the discharge position using the adjustment screw [**2**]. The ferromagnetic particles will be released and fall into the collection tray or discharge channel via the discharge channel.
- Stop the air supply to the solenoid valves.
- Remove the cover plate from the discharge channel.
- Remove the captured particles from the magnetic bar tubes with either a linen cloth or compressed air.



- Move the gauss meter/tesla meter probe [**3**] along the poles on the magnetic bars.

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.
- Replace the cover plate on the discharge channel. Ensure all bolts are tightened hand-tight.
- Move the magnet bundles and magnetic insert back to the production position using adjustment screws [**2**] and [**1**] respectively.
- The product flow can be restarted.

NOTICE

It is also possible to incorporate these steps into the control software.

11.5 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.

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.

Fault	Possible cause	Solution
The device does not separate ferromagnetic particles, or does not do so properly.	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.	
Magnets are not in the correct position.	The magnets are not all in the product channel when the filter is active.	• Check the sensor (the sensor in the product channel has an LED).
	Magnets do not move towards cleaning channel during the cleaning cycle.	• Check the sensor.
Magnets do not move in their housing.	Dents in the magnetic bars.	• Contact Goudsmit Magnetics.
	Air pressure is too low or not present.	• Repair or replace the air connection, if necessary.
Leakage from product channel to discharge channel in production position.	Sealing rings worn.	• Replace the sealing rings.
Leakage from product channel to discharge channel during cleaning.	Product channel not depressurised.	• Despressurise product channel.
	Product flow not stopped.	• Stop the product flow for cleaning.

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:

- Sealing rings (various types are available for order). It is recommended that they be replaced every 6 months.
- Magnetic bars.

How quickly the magnetic sealing rings wear will depend on your product and how abrasive it is, as well as the capacity of your product flow. Several types of sealing ring are available for this device. See the data sheet for the precise specifications. Please get in touch with us for information on the availability of the sealing rings.

When replacing magnetic bars, it is recommended to replace the complete magnetic insert.

- 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.

14 Annexes

14.1 Annex 1: Description of SECA product key

Product key

Cleanflow magnet static – Automatic cleaning – Discontinuous

SECA - 2020 - 04V - ES - F1M - W - P - HS - B - SR - B - B - C - EX

Product

SECA	Cleanflow magnet static, Auto cleaning - discontinuous
SECAZ	Special Cleanflow magnet static, Auto cleaning - discontin.

Connection size

… .	Square in/outlet … x … [cm] (2020 = 200 x 200 mm)

Magnetic bars

05 …	Number of magnetic bars
… U	Magnetic bars Pneumatically operated Ø51.4 mm (tube 0.7 mm)
… V	Magnetic bars Pneumatically operated Ø52.4 mm (tube 1.2 mm)
… Z	Magnetic bars special

Magnet quality

HT	N44SH, Br 13.600 gauss, Tmax 150 °C
ES	N52, Br 14.800 gauss, Tmax 80 °C [Standard]

Finishing: Surface treatment & Welds

See info chart “Finishing: Surface treatment & Welds”

Coating

B	Basic - no coating	H	Hard inchromating on magnet
W	Wear resistant with Tungsten carbide coating on magnet	I	Hard inchromating on magnet+housing
T	Wear resistant with Tungsten carb. coating on magnet+housing	Z	Special coating

Control

P	Pneumatic (+ electronic components)	L	Sigmatec PLC control

Covering (top + side)

S…	Stainless steel cover on top	…S	Stainless steel cover on side
T…	Transparent grighen cover on top	…T	Transparent grighen cover on side
H…	Inspection hatch on top	ZZ	Special cover (top + side)
I…	Inspection hatch on top incl. safety switch		

Fe-collection

B	Basic - no collecting container	D	Dust proof Fe-collector
C	Collecting box	Z	Special tray

Seal ring housing - magnet

SR	Silicone red (standard)	SW	Silicone white	NB	NBR blue

Guiding flange (deflector)

B	Basic - no flange	G	Guiding flange

Flange gasket

B	Basic - no gasket	E	EPDM (EC1935/4)	S	Silicone 4 mm gasket set (EC1935/4)

Detection / sensors

C	Slider + single bar detection	F	Slider + Full bar detection

ATEX

NA	Not explosion safe (no Atex)	G1	Ex II 1/2G IIB T4	Y	Ex II 1/2G IIB T4 IIIC T105
Ex	Ex II 1/2D (zone 20/21)	G4	Ex II 1/3G IIB T4	Y4	Ex II 1/3G IIB T4 IIIC T105
X4	Ex II 1/3D (zone 20/22)				

14.2 Annex 2: Description of SECA/MA product key

Product key

Cleanflow magnet static – Automatic cleaning – Discontinuous

SECA/MA - XXXX - XXX - XX - XXX - X - XX - X - XX - XX

Product

SECA/MA	Cleanflow magnet static, Auto cleaning - discontinuous

Connection size

… .	Square in/outlet … x … [cm] (2020 = 200 x 200 mm)

Magnetic bars

05 …	Number of magnetic bars
… U	Magnetic bars Pneumatically operated Ø51.4 mm (tube 0.7 mm)
… V	Magnetic bars Pneumatically operated Ø52.4 mm (tube 1.2 mm)

Magnet quality

HT	N44SH, Br 13.600 gauss, Tmax 150 °C
ES	N52, Br 14.800 gauss, Tmax 80 °C [standard]

Finishing: Surface treatment & Welds

See info chart “Finishing: Surface treatment & Welds”

Coating

B	Basic - no coating	H	Hard inchromating on magnet
W	Wear resistant with Tungsten carbide coating on magnet	I	Hard inchromating on magnet+housing
T	Wear resistant with Tungsten carb. coating on magnet+housing		

Covering (top + side)

S…	Stainless steel cover on top	…S	Stainless steel cover on side
H…	Inspection hatch on top	…T	Transparent grighen cover on side *
I…	Inspection hatch on top incl. safety switch		

* not possible in combination with ATEX option Y (for gas)

Fe-collection

B	Basic - no collecting container	D	Dust proof Fe-collector
C	Collecting box	Z	Special tray

Seal ring housing - magnet

SR	Silicone red (standard)	SW	Silicone white	NB	NBR blue

ATEX

NA	Not explosion safe (no Atex)
Ex	Ex II 1/2D Ex h IIIC T105°C Da/Db
Y	Ex II 1/2D Ex h IIIC T105°C Da/Db Ex II 1/2G Ex h IIB T4 Ga/Gb

Notes

GOUDSMIT
MAGNETICS