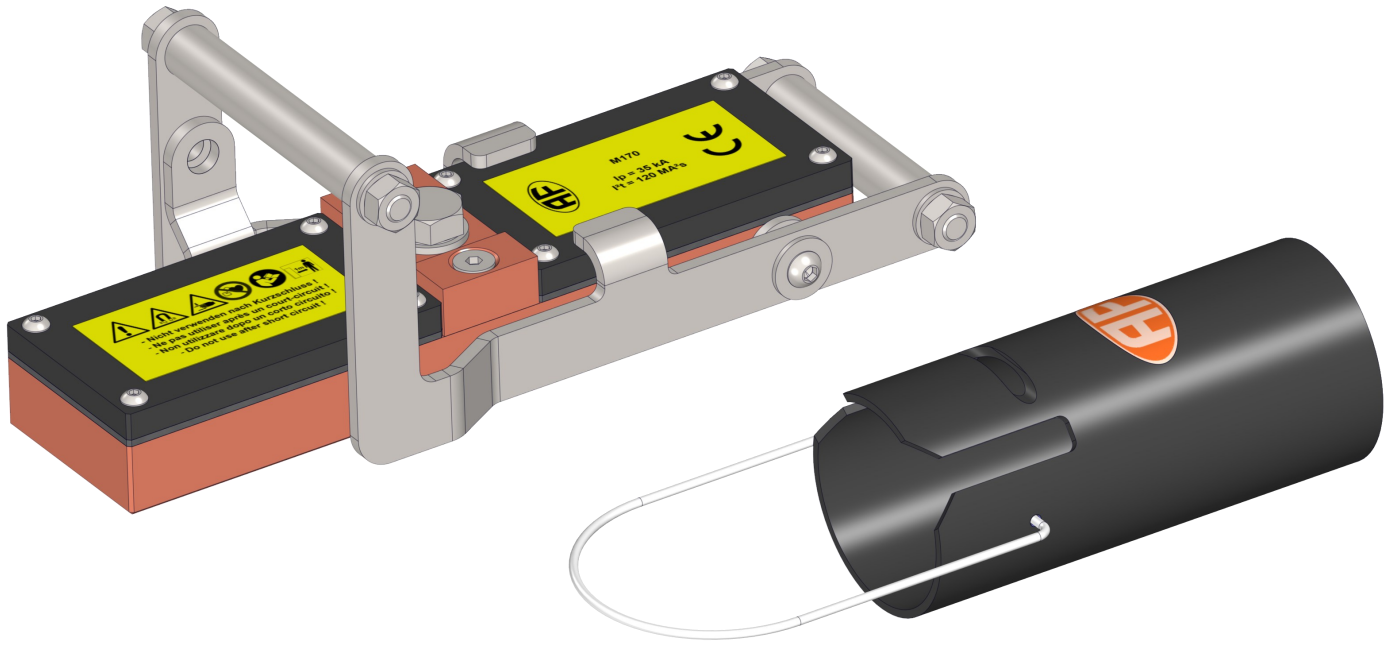
V 2025/11

Magnetic earthing contact M170



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DANGER OF DEATH

Make sure before starting work on the overhead contact line that it has been switched off.

1. Instructions on use of the operating manual

Purpose
This operating manual contains important instructions and information for safe and problem-free operation and is a part of the magnetic earthing conact M170.

- The operating manual describes the magnetic earthing contact in the state in which it is first delivered after manufacture.
- For safe and problem-free operation and the fulfilment of any warranty claims, read the operating manual before every use and follow the instructions contained therein.
- The operating manual should be passed on to the subsequent owner or operator. The manufacturer / distributor is not liable for damage or malfunctions that result from the non-observation of this operating manual.
- Contact Arthur Flury AG if you have any questions after reading this operating manual.

Safekeeping
- As far as possible the operating manual must be kept in the immediate vicinity of the magnetic earthing contact and protected from emissions.
- This operating manual must be accessible to the operating personal at all times.
- The content must be continually and clearly legible throughout the lifetime of the product. Should any part of the operating manual be missing or no longer legible, contact the manufacturer to replace the document

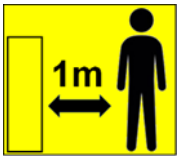
Limitation of liability
The contents of this manual have been compiled under consideration of the applicable guidelines and standards, the state of the art and our many years of experience.

The manufacturer shall not be held liable for damage or accidents resulting from:
- Ignoring this manual
- Ignoring safety directives
- Incorrect use of equipment

Copyright protection
This operating manual must be treated as confidential. It is intended exclusively for the people who use the product. This manual may not be made accessible to third parties without written consent from Arthur Flury AG. The contents of the operating manual in the form of text, images, illustrations, drawings, diagrams or other depictions are protected by copyright of Arthur Flury AG.

Symbols used in the operating manual

Warning symbols

Symbol	Meaning	Description
	General danger	General danger warning
	Danger from magnetism	Magnets generate a magnetic field. This, depending on its strength, can damage televisions, computers, magnetic strip cards, electronic data storage devices, clocks, hearing aids, pacemakers and loudspeakers etc. Magnets must be kept away from all devices which could be damaged by magnetic fields. We recommend maintaining a distance of at least 50 cm from the magnetic earthing contact.
	Danger of hand injuries	If magnets are not handled with due care, magnetic force can cause trapping of body parts or skin. This can lead to crushing and bleeding of the affected parts. Therefore, suitable safety shoes and gloves must be worn when handling the magnetic earthing contact.
	Effect on people	Magnetic fields of permanent magnets have, to our knowledge, no measurable effects on people. The magnetic field of a permanent magnet is unlikely therefore to pose a danger to health but this cannot be completely ruled out. For personal safety, long-term contact with the magnetic earthing contact should be avoided. The magnetic earthing contact must be kept at least one meter away from people in the container provided for this purpose.
	Air freight	Magnetic fields of incorrectly packed magnets can affect aircraft navigation systems. In the worst case this can lead to an accident.
	Shipping by post	Magnetic fields of incorrectly packed magnets can cause problems for sorting devices and damage sensitive goods in other packages.

Prohibition signs

Symbol	Meaning	Description
	Prohibited for people with pacemakers	Magnets can affect the function of pacemakers and implanted defibrillators. A pacemaker maybe switched to test mode and cause the wearer to feel unwell. In some circumstances, a defibrillator will stop working. Wearers of such devices must maintain a sufficient distance from the magnetic earthing contact. Wearers of such devices must be warned before approaching the magnetic earthing contact.

Bid signs

Symbol	Meaning	Description
	Wear eye protection	General safety instruction
	Wear protective footwear	Read the "Danger of hand injuries" section
	Wear hand protection	Read the "Danger of hand injuries" section

Informative signs

Symbol	Meaning	Description
	Instruction	A potentially harmful situation in which the product or an item in its environment could be damaged.
	Important	Application instructions and other useful information.

2. Safety instructions

Target group

This operating manual is intended for technical specialist personnel and operators. Specific target groups being addressed are noted in the individual chapters. Only these persons are approved to carry out the corresponding activities. The remaining contents of the operating manual apply for all target groups.

Technical specialist personnel	
Qualification	• Mechanical and electrical foundation qualification • Electricians • Product-specific training
Authorisation / activity	• Commissioning • Operation • Service and maintenance • Instruction of operating personnel

Operator	
Qualification	• Product-specific training • Electrical engineering training
Authorisation / activity	• Operation • Service and maintenance

General safety instructions
This product may only be used when it is in perfect technical order and operationally safe. It must be inspected for integrity before commissioning. For safety reasons earthing and short-circuiting apparatus to which this magnetic earthing contact belongs, must be handled with great care.

Residual dangers
This product has been manufactured to the latest state of the art and recognised safety regulations. Use of this product however may pose dangers for life and limb of the operator or third parties and/or have effects on this product or other property.

There are dangers associated with the use of technical products. Dangers which cannot be ruled out by design measures or protective measures are residual dangers. The safety instructions in this operating manual refer to the known residual dangers. If additional dangers occur in operation, the operator is obliged to disclose these immediately to Arthur Flury AG.

The following residual dangers may occur:
- No short circuit-proofing after short circuit.
- Magnetic interference due to non-compliance with the minimum distances defined in this manual.
- Tripping and falling dangers due to materials lying on the floor (transport pipes, magnetic earthing contact, earthing cable etc.).

Duties of the operator
The operator shall only to allow persons to work with the product who
- are familiar with the basic directives on occupational safety and accident prevention
- are trained electricians or persons who have been trained in electrical engineering
- have undergone training to work with this product
- have read and understood this operating manual.

Correct use of equipment

General
Interventions and modifications which affect the safety technology and the functionality of the earthing kit may only be carried out by Arthur Flury AG.

Problem-free and safe operation assumes qualified operation and correct maintenance.

All relevant accident prevention directives and the other generally acknowledged technical and occupational safety rules must be observed.

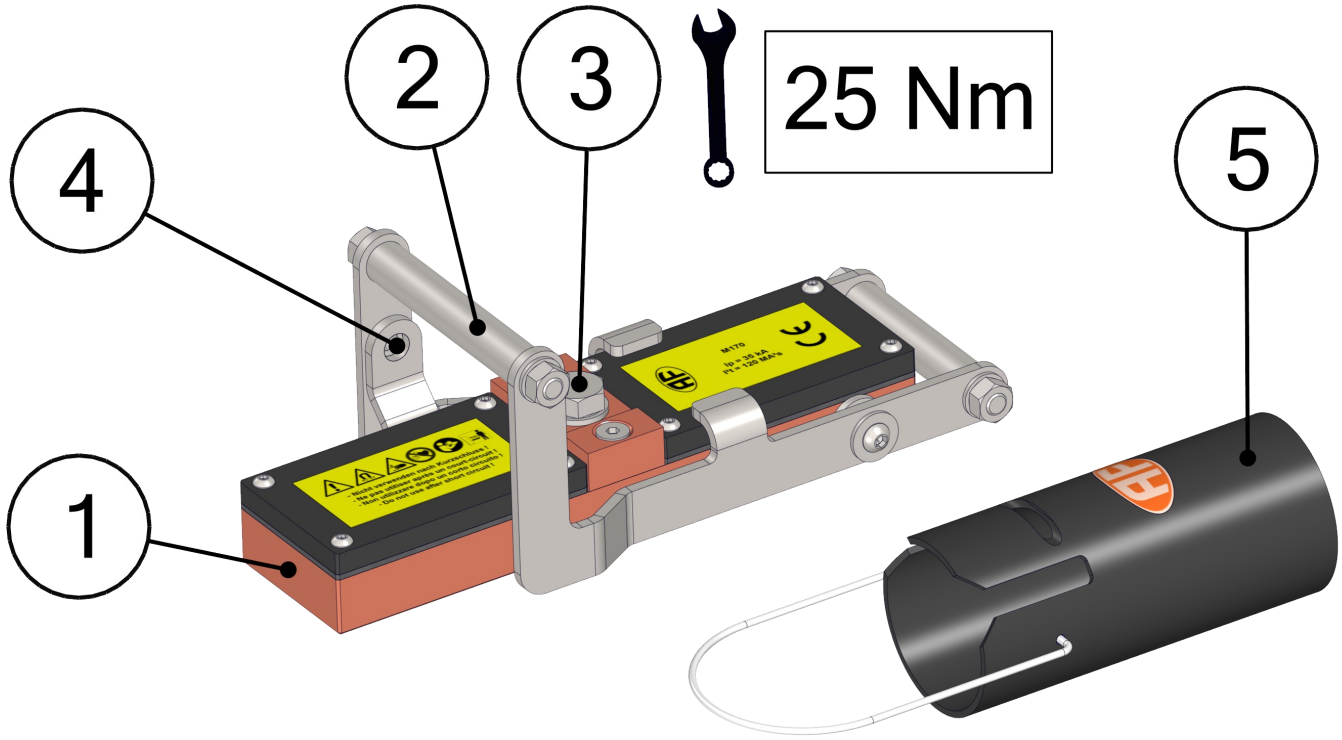
Use on railways
The magnetic earthing contact is intended for the earthing of live overhead lines in AC & DC systems. For this purpose the recognised principles of earthing of overhead lines (for instance the 5+5 safety regulations) must be strictly adhered to.

Use in construction
The magnetic earthing contact is intended for the earthing of construction machinery in the immediate vicinity of live lines. Instead of being connected to the overhead contact line, the construction machine is connected to the earthed track. For this purpose the relevant details of the construction machinery manufacturer must be strictly observed.

Foreseeable misuse
Any use other than that defined in the section "Correct use of equipment", or which goes beyond that use is considered as incorrect use and voids any liability and warranty claims against Arthur Flury AG.

3. Description

Magnetic earthing contact with storage tube



No.	Description
1	Magnet holder
2	Operating lever for fastening and loosening the magnet earthing contact on the rail
3	M12 fastening screw for the earthing cable (tightening torque 25 Nm)
4	Hole for attaching a padlock to prevent unauthorized tampering
5	Storage tube for the magnetic earthing contact

	It should be noted that the required earthing wire is not included in the delivery of the magnet earthing contact.

Technical data

Dimensions			
Total length		L	260 mm
Total height in closed state		H_g	94 mm
Total height in open state		H_o	210 mm
Total width		B	117 mm

Absolute maximum values			
Surge current resistance	IEV 441-17-18	I_p	35 kA
Joule Integral	IEV 441-18-23	I^2t	120 MA^2s

Absolute maximum values at crest factor = 1.42 (typical for DC)			
Rated current	IEV 651-25-06	I_k	28 kA_{rms}
Rated duration	IEV 651-25-06	t_k	150 ms

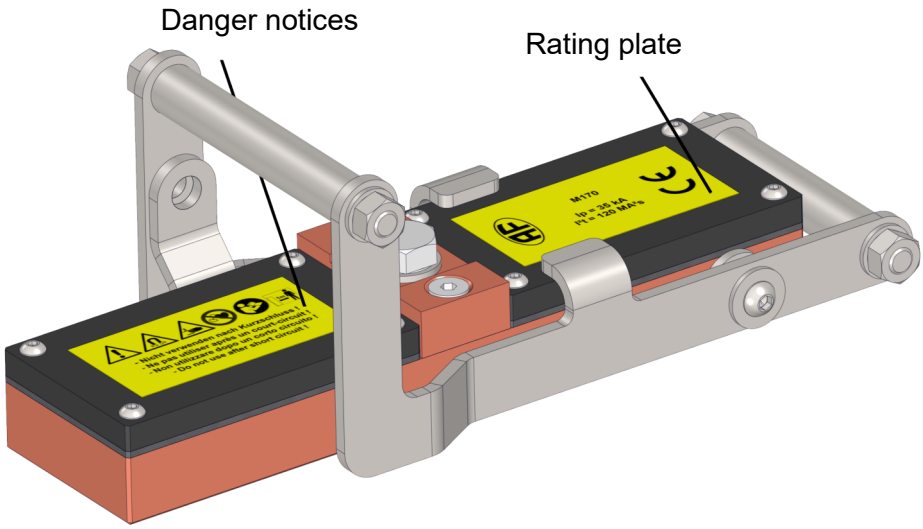
Absolute maximum values atcrest factor = 2.5 (typical for AC)			
Rated current	IEV 651-25-06	I_k	16 kA_{rms}
Rated duration	IEV 651-25-06	t_k	465 ms

Absolute maximum values at rated duration = 300ms			
Rated current	IEV 651-25-06	I_k	20 kA_{rms}
Crest factor	IEV 103-06-15		1,75

Mass and weight			
Total weight (without earthing cable)		m	2.80 kg
Bonding force		F	1700 N

Ambient conditions			
Ambient temperature	IEC EN 62217	T_a	-40°C bis +50°C
Humidity (non-condensing)	IEC EN 62217	Rh_d	10% - 90%
Sunlight	IEC EN 62217		< 1‘000 W/m^2

Identification



Danger notices	Rating plate
	

Operating modes

The magnetic earthing contact can be run in the following operating modes:

Operating mode	Description
Commissioning	Connection of earthing cable (not part of the scope of delivery of the magnetic earthing contact) with M12 fixing screw. Tightening torque: 25 Nm.
Normal operating mode	Earthing of live overhead lines in AC&DC systems according to acknowledged principles of the earthing of overhead lines. Earthing of construction machinery according to applicable instructions of the construction machinery manufacturer.
Service and maintenance	Service and maintenance of the safety and functionality of the magnetic earthing contact according to service and maintenance plan

4. Commissioning

Personnel qualification

	Mandatory presence:	Technical specialist personnel
	Optional presence:	Operator

Connecting of earthing cable



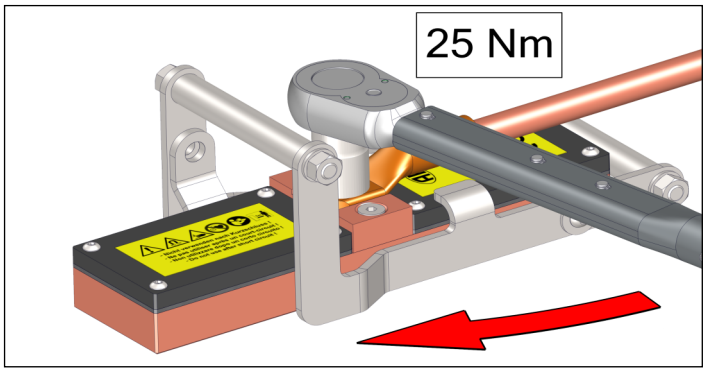
Before connecting the earthing cable it must be ensured that

- the earthing cable cross section is adequate for use in the event of a short circuit.
- the sheathing of the earthing cable corresponds to the directives.
- the cable lug corresponds to the cable cross section, has been crimped according to regulations and is suitable for connection to the M170 magnetic earthing contact with an M12 fixing screw.
- No electronic corrosion of the M170 magnetic earthing contact can occur between the cable shoe and the cable shoe lug.

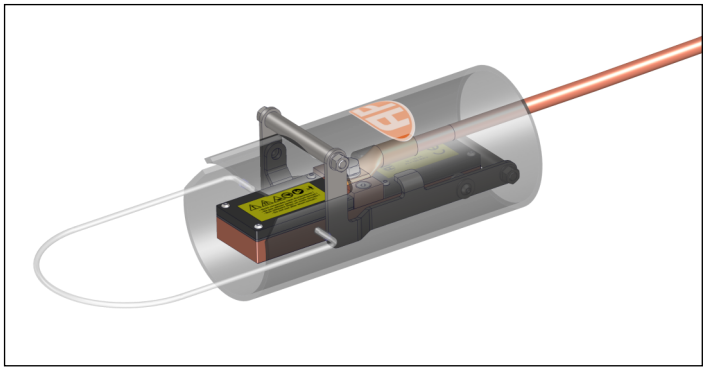
	Due to the dangers of electrochemical corrosion of the magnetic earthing contact between the cable lug and the cable lug holder, any cable lug used must be made of material that is compatible with untreated copper. The cable lug must have a width of 28 mm and must be designed for attachment with an M12 screw.

Attach the earthing cable to the cable lug with the M12 fixing screw as shown. Ensure that the fixing screw turns smoothly.

Tightening torque: **25 Nm**



In order that the storage tube is always close to hand it is recommended that the earthing cable is passed through the tube before attachment to the magnetic earthing contact.



5. Operation

Personnel qualification

	Mandatory presence:	Technical specialist personnel
	Optional presence:	—

Normal operating mode



Preparation

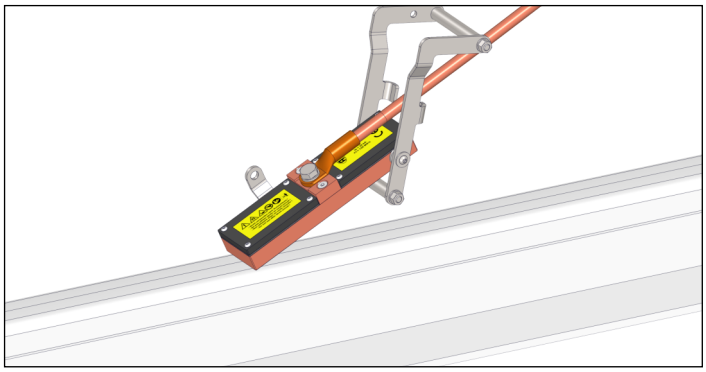
Make sure that that
- the metal rail head to which the magnetic earthing contact is to be attached is clean, bright and mainly free from grease.
- the rail head is flat and large enough for the magnetic earthing contact to be in contact along its entire length.
- the earthing cable and the magnetic earthing contact are intact and undamaged.

Example of an earthing kit

Placing of the magnetic earthing contact

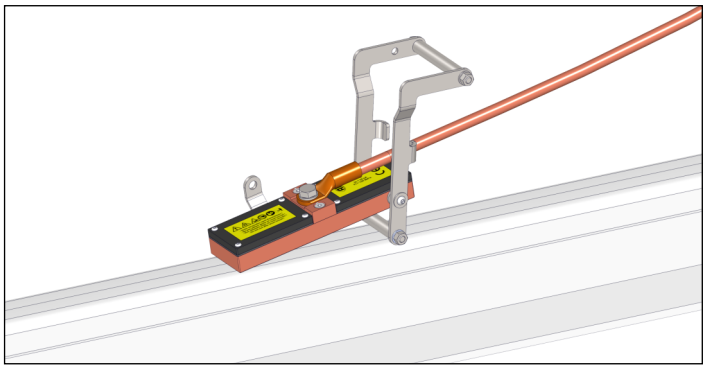
Lift the operating lever

Lift the operating lever fully and position the magnetic earthing contact on the rail heads.



Lower the operating lever

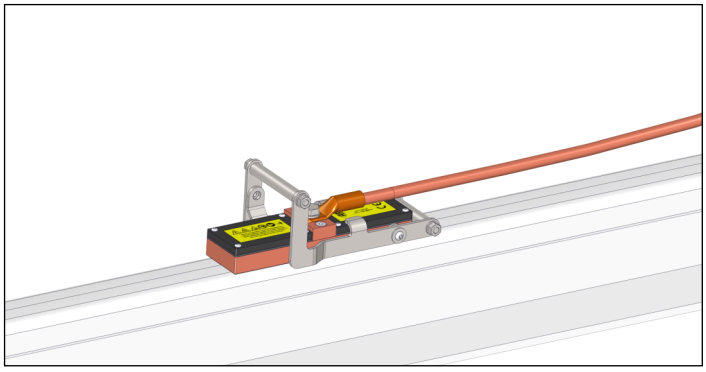
Lower the operating lever towards the rail head. Beware of any trapping points in the process.



Move the operating lever to the end position

Guide the operating lever to the end position at the rail head.

If necessary, attach a padlock to prevent unauthorised manipulation.

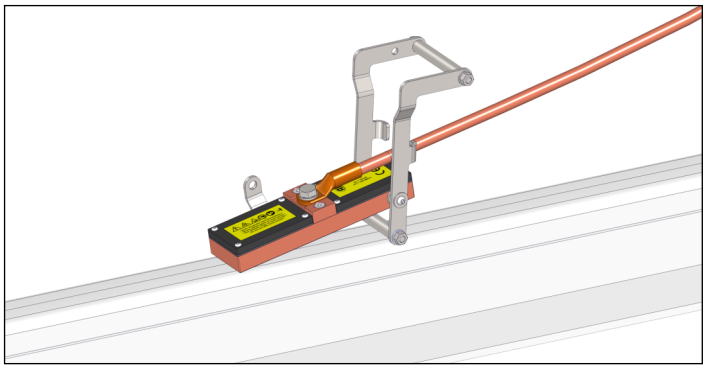


Removing the magnetic earthing contact

Remove the padlock (if present).

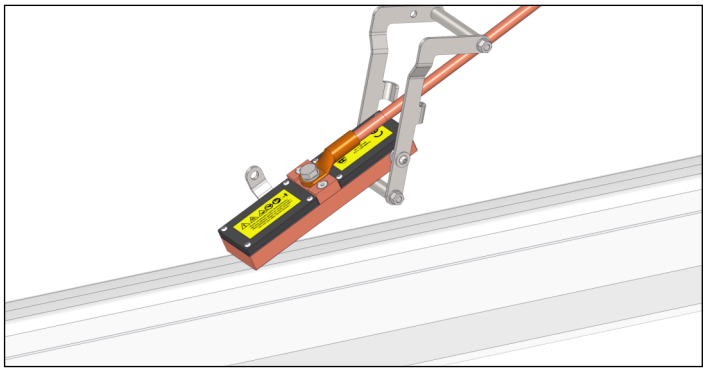
Raise the operating lever

Raising the operating lever causes the magnetic earthing contact to be released from the rail head.



Removing the magnetic earthing contact

In the operating lever end position the magnetic earthing contact can be raised from the rail. Beware of any trapping points in the process.



6. Service and maintenance

Personnel qualification

	Mandatory presence:	Technical specialist personnel
	Optional presence:	Operator

Maintenance



Correct and careful service and maintenance extends the lifetime of the product.

	Before each use, check that the magnetic earthing contact is fit for function. If defective parts or damage to the contact surface are discovered, note that the magnetic earthing contact cannot be used again until it has been serviced by the manufacturer. If the magnetic earthing contact is exposed to a short circuit, it cannot be used again until it has undergone a full service by the manufacturer.

Service and maintenance schedule

Note the following intervals with regard to service and maintenance work:

Component	Interval	Check	Task
Magnet holder	Before each use	Visual inspection	Clean contact surface and check for damage
Earthing cable	Before each use	Visual inspection	Inspect for damage. If damaged, replace
Fixing screw M12	Before each use	Carry out visual checkand function check	Check whether the screw has become loose.
Operating lever	6 months	Carry out visual check and function check	Check for ease of move-ment
Cable lug holder	6 months	Visual check	Check that no corrosion has formed between the cable lug and the cable lug holder on the mag-netic earthing contact
M12 fixing screw	6 months	Carry out visual checkand function check	Inspect ease of thread movement. Re-grease if necessary. Check tightening torque 25 Nm
Complete device	After a short circuit	Decommission	Send device back to manufacturer/distributor

	Some of the above tasks depend heavily on ambient conditions. The cycles specified above are minimum requirements. In some cases shorter service cycles are possible. If the magnetic earthing contact is exposed to a short circuit, it cannot be used again until it has undergone a full service by the manufacturer.

Cleaning

The magnet holder's contact surface can be cleaned with a damp cloth.

The M12 fixing screw used to attach the cable lug of the earth cable must move easily. Therefore it is recommended to re-grease threaded parts during routine inspections.

Storage

- Relative humidity: 10 - 90% (non-condensing)
- Air temperature: -40°C to +50° C
- Long term direct sunlight: < 1000 W/m2
- The magnetic earthing contact should be stored in inside the protective tube and secured against access by third parties..

7. Disposal

Disposal / recycling

	All components of the magnetic earth contact must be separated into material type and disposed of correctly according to local directives and guidelines. Where necessary, the manufacturer and/or distributor will be happy to provide further assistance.

8. Shipping and export

Shipping

Air freight
Magnetic fields of incorrectly packed magnets can affect aircraft navigation systems. In the worst case this can lead to an accident.
- The packaging of the magnetic earthing contact must fulfil the regulations of the responsible air freight authorities and shipping organisation.
- Further information is available, e.g. at supermagnete.ch.

Shipping
Magnetic fields of incorrectly packed magnets can cause problems for sorting devices and damage sensitive goods in other packages.
- Check shipping directives for magnets e.g. at supermagnete.ch.
- Use a generously-sized box and place the magnetic earthing contact in the centre of the package, surrounded by filler material.
- Arrange several magnetic earthing contacts in a package so that the magnetic fields cancel one another out.
- If necessary, use iron plates to shield the magnetic fields.

Export

	Please consult Arthur Flury AG for exports to the USA, Canada and Japan.

9. Legal information

The product must only be operated by trained specialists.

The product can be permanently damaged by loads that exceed the maximum values. If the product is exposed to absolute maximum loading for an extended period, it may impair the product's reliability and life. Arthur Flury AG will not accept any liability in this case.

Arthur Flury AG will not accept any liability for incorrect use and use for applications other than those specified in these instructions.

If damage to the product is suspected, any use or operation must be stopped immediately. Arthur Flury AG will not accept any liability in the event of continued use despite suspected damage.

Due to the diverse ways in which this product can be used, the instructions for use represent a general guide only and do not constitute a guarantee of the product's suitability for use in a specific application. The user is responsible for checking the full product data and clarifying the product's suitability for the intended use. The user is responsible for the choice of product and compliance with all the safety regulations and warnings. Please contact Arthur Flury AG if you require additional product information.

Our products comply with the current legal requirements and regulations (including RoHS, REACH, WEEE) in the markets where we operate. Please refer to Arthur Flury AG's Code of Conduct, available on our website, for further information.

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