ELFRI
Via Friuli, 9
33050 Gonars (UD)
Tel. (+39) 0432.931425
mail elfri@elfri.com
www elfri.com

HOLDING ELECTROMAGNET

Type
EXS060_xxx
EXS070_xxx
EXS080_xxx

CE 2575

USE AND MAINTENANCE MANUAL

ABOUT THIS DOCUMENT

This document provides the necessary information on installation, use and maintenance for the holding electromagnets EXS series.
This document is intended for qualified, trained, and informed persons who are fully capable of understanding them and with the technical knowledge in relation to the risk of explosion (and related classified hazardous areas).
Always attach this document to the documentation of the application in which the holding electromagnet is installed.
This document must be available for consultation at any time and for the whole service life of the holding magnet.

ELFRI accepts no responsibility whatsoever for damage and/or injury to persons, animals or property caused by failure to observe the prescriptions contained in this document.

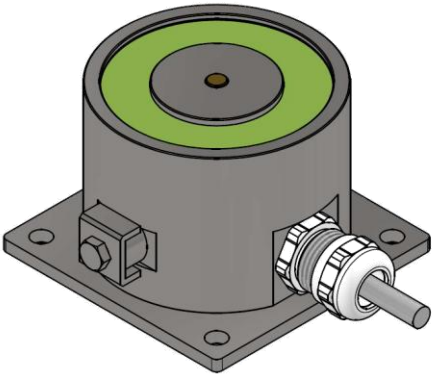
The electromagnets are certified for use in hazardous areas zone 1, 2 (gas, mist, vapour) and zone 21, 22 (dust).
It is designed for use in potentially explosive areas of category 2, equipment group II

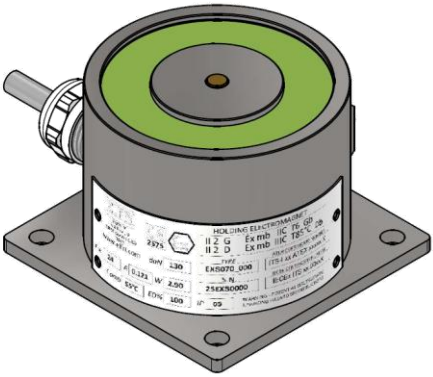
- Foreseeable applications are: door holder, holding, lifting and handling of ferrous pieces and parts of machines.

The operating principle is based on the creation of an electromagnetic field through the application of electricity to the inner enamelled round copper wire (air coil). The component that is magnetized is the magnetic core (i.e. the central metal and outer ring surfaces of the holding electromagnet).
When powered, the electromagnet retention force is made active and a suitable object/surface can be attracted. On the other hand, when the supply voltage is cut off, the electromagnet loses its retention force.

INTENDED USE

To ensure the nominal retention force (see the "TECHNICAL DATA" table on page 2) and correct, safe application, use only accessories supplied by ELFRI.





ATTENTION! Any use or value different from the ones written above cannot guarantee sufficient safety and reliability and are therefore strictly forbidden.

The type code of product is: **EXS yyy_xxx**

PRODUCT SERIES
PRODUCT MODEL
SEE TECHNICAL DATA BELOW
yyy = replaced values as per technical data as table below

ADMITTED PRODUCT VARIANTS
xxx = values replaced by the ELFRI technical department, limited to acceptable ATEX variants

The holding electromagnet is explosion-proof EU-type approved in compliance with ATEX Directive 2014/34/EU and IECEx scheme. It is designed, manufactured and tested for use in hazardous areas of category 2 [zone 1, 2 (gas, mist, vapour) and zone 21, 22 (dust)], equipment group II, with potentially explosive atmospheres, according to the Ex Marking affixed on it:

Approval for gas	**II**	**2**	**G**	**Ex**	**mb**	**IIC**	**T6**	**Gb**
Approval for dust	**II**	**2**	**D**	**Ex**	**mb**	**IIIC**	**T85°C**	**Db**

EQUIPMENT GROUP
EQUIPMENT CATEGORY
ENVIRONMENT
EXPLOSION PROTECTION

EQUIPMENT PROTECTION LEVEL (EPL)
TEMPERATURE CLASS / TEMPERATURE
GAS GROUP / DUST GROUP
TYPE OF PROTECTION

ATTENTION! Any use in areas different from the ones written above cannot guarantee sufficient safety and reliability and is therefore strictly forbidden.

ELFRI
Via Friuli, 9
33050 Gonars (UD)
Tel. (+39) 0432.931425
mail elfri@elfri.com
www.elfri.com

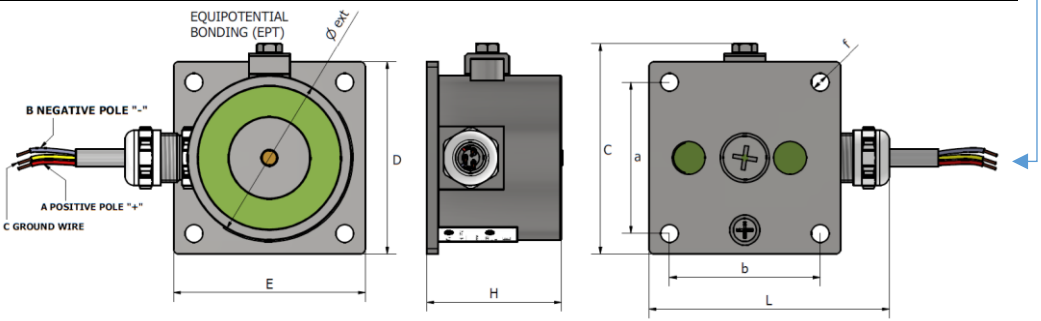
HOLDING ELECTROMAGNET

Type
EXS060_xxx
EXS070_xxx
EXS080_xxx

CE 2575

IECEx

TECHNICAL DATA		EXS060_xxx	EXS070_xxx	EXS080_xxx
Retention force		70 daN	130 daN	200 daN
Supply voltage *		24 V_{DC} apply to terminals A and B		
Ripple max. *		20 %		
Absorbed current		100 mA	121 mA	135 mA
Power consumption		2.4 W	2.9 W	3.24 W
Recommended fuse Time-delay (T) - 250V - 1500A interrupting power		200 mA	250 mA	315 mA
Duty cycle *		100 %		
Degree of protection EN 60529		IP65		
Materials		Housing: S235JR or S355JR or 11SMnPb37 Encapsulation (compound): epoxy potting resin		⚠ WARNING ⚠ KEEP AWAY FROM UV RAYS
Dimensions	Ø ext x H x L	60 x 49 x 86 mm	70 x 54 x 97 mm	80 x 54 x 107 mm
	E x D	70 x 70 mm	80 x 80 mm	90 x 90 mm
	a x b	55 x 55 mm	65 x 65 mm	75 x 75 mm
	Ø f	6.5 mm		
Weight		0.9 kg	1.3 kg	1.7 kg
Ambient temperature *	Normal	-20°C +60°C		
	Storage	-40°C +80°C		
*** ATTENTION!** Failure to comply with the above values can irreparably damage the holding electromagnet and negatively affect the retention force; therefore a sufficient safety and reliability cannot be guaranteed.				
Electrical connection		High temperature cable: two wires (A and B) + PE wire for the internal air coil 1 mm^2 EPB for external equipotential bonding (minimum 4 mm^2 single wire). Screws torque 5.5 Nm		



SAFETY PRESCRIPTIONS

Carefully respect all the national and international laws, standards and regulations in force where the electromagnet is intended to be installed and used. Explosion-proof applications do not depend solely on the electromagnet but also on the electrical system in which is installed. The electrical system shall respect all the mandatory legislative and regulatory references as well. Installing and using the holding electromagnet with evident damages, defects and wear (cracks, exposure of encapsulated parts, dents, swelling, separation of adhering parts, detachment of parts, softening, damaged cables and glands) is dangerous and absolutely forbidden. The same concept is valid in case the holding magnet is dropped. Promptly contact ELFRI for the necessary support.
The following is deemed improper use and therefore forbidden:

- mechanical and/or electrical modification or any other kind of tampering to the holding electromagnet;
- using the holding electromagnet in fields of application other than as described in INTENDED USE and TECHNICAL DATA on the previous page.

Pay attention to the following important prescriptions:

- The equipment shall be protected against direct sunlight or ultraviolet lights.
- Reduce the impact velocity not more than 1 m/s and reduce the maximum potential impact energy not more than 500 J.
- The user shall provide the required strain relief for both supply cable.

Any modification/tampering or inadequate installation may entail injuries and even death, property damage and economic loss.

INSTALLATION

ATTENTION! Installing the holding electromagnet is not sufficient to guarantee sufficient safety and reliability. Before installing the holding magnet, perform a risk assessment dedicated to the hazardous areas with potentially explosive atmospheres. ELFRI exclusively guarantees the safe functioning of the holding electromagnet to which this document refers and not the safety of the hazardous areas.

ELFRI
Via Friuli, 9
33050 Gonars (UD)
Tel. (+39) 0432.931425
mail elfri@elfri.com
www.elfri.com

HOLDING ELECTROMAGNET

Type
EXS060_xxx
EXS070_xxx
EXS080_xxx

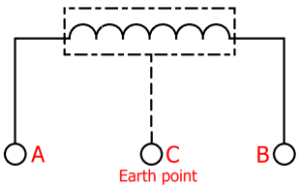
CE 2575

Installation shall be carried out by qualified and trained personnel who have read and understood this document.
Electrical connections shall be carried out in compliance with the TECHNICAL DATA written on the previous page.
Technical standards EN/IEC 60079-14 and EN/IEC 60079-17 shall be used as reference for proper and safe installation, inspection and maintenance of the electrical system.
Do not stress the holding electromagnet and its electric cables with bending and twisting. Do not exceed the tightening torque specified in the mounting procedure. Do not drill or varnish the holding electromagnet.
The equipment is furnished with the supply already connected, through a suitable cable gland. The connection of the free end of the cable shall be carried out in safe zone or suitably protected, using one of the types of protection foreseen by the standard CEI EN IEC 60079-0(2018-11) and IEC 60079-0.
Vibrations that may affect the proper functioning of the holding electromagnet must be avoided.
Make sure that the whole electrical system is compliant with the EMC Directive (electromagnetic compatibility).

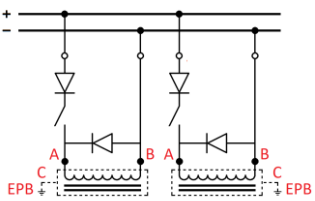
MOUNTING

Fix the holding electromagnet with four screws, (minimum M5 and material 4.8 minimum) in the four holes shown in the figure above. Be sure to tighten the screws to the torque specified by the technical standard or recommended by the manufacturer (approximate value 2.3 ÷ 3.0 Nm for M5 screws 4.8).
Secure the support electromagnet, keeping its magnetic surface parallel to the surface to be supported.
Connect the power line to terminals A-B and C of the support electromagnet (see wiring diagram). Use electrical cables with insulation and cross-sections compliant with current regulations. Consider installing a flyback diode (minimum 1 A, minimum 1000 V).
When installing electromagnets, the encapsulation surface must be protected from mechanical damage and exposure to light. Therefore, the armature plate must be installed directly opposite the electromagnet's support surface. The space between the armature plate and the magnet must be protected by a folding bellows.

Wiring diagram



Parallel connection of electromagnets



ELECTRICAL CONNECTION

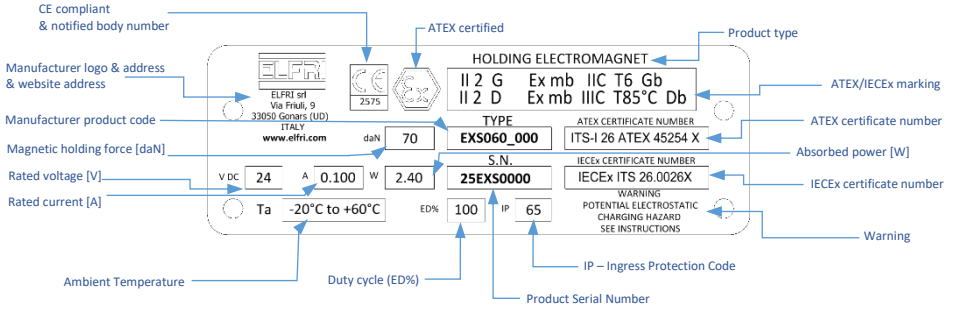
A stabilised power supply unit is recommended in order to avoid excessive residual ripple (see TECHNICAL DATA on page 2).
Do not pull electrical cables before, during and after installation.
Electrical cables must be installed in a fixed position, protected against mechanical and thermal damage.
Wire as indicated on the wiring diagram.
Connect the electromagnet to a suitable dimensioned and verified equipotential system.
The supply voltage is 24V DC. No warranty claims relating to use with a higher voltage will be recognized. Wiring must always be made in absence of voltage supply (upstream main switch opened).
The same applies when unwiring and unmounting the holding electromagnet.

An overcurrent protection device must be installed upstream of each holding electromagnet (Fuse according to IEC 60127-1, IEC 60127-2) max. 3 x absorbed current, as per the values on page 2.
The rated fuse voltage must be equal to or greater than the specified nominal magnet voltage. The breaking capacity of the fuse link must be equal to or greater than the maximum short-circuit current at the place of installation (usually 1500 A).

In order to avoid voltage spikes in the electric system, a flyback diode (minimum 1000 V, 1 A) must be provided upstream each holding electromagnet installed.

Scrupulously follow the general safety rules for emergency management.

PLATE DESCRIPTION



ELFRI
Via Friuli, 9
33050 Gonars (UD)
Tel. (+39) 0432.931425
mail elfri@elfri.com
www.elfri.com

HOLDING ELECTROMAGNET

Type
EXS060_xxx
EXS070_xxx
EXS080_xxx

CE 2575

USE AND FUNCTIONAL TEST Make sure that the object/surface to be attracted is always smooth and clean.
Once the electromagnet is energised, check that the object is attracted and consequently couples perfectly, leaving no free space between it and the core.
De-energise the holding electromagnet and check that it can be separated from the object/surface within two seconds.

MAINTENANCE The electromagnets do not require particular maintenance, but an inspection is recommended every 6 months or at shorter intervals depending on the intensity of use. The inspection includes the visual and functional check, verification of the integrity of the electromagnet and the electric power cables, as well as the tightening of all the screws.

If the device is exposed to heavy charge-separating processes, dangerous electrostatic charges can occur. Charge-separating processes are, for example, direct exposure to pneumatic transport media.
- Avoid heavy charge-separating processes at the installation site and during cleaning.
- Clean only with water or damp cloths.
- Avoid unintentional and dry rubbing.
- Do not clean with compressed air, high-pressure or steam jets.
- Earth the device housing.

ATTENTION! When cleaning the electromagnet, avoid generating electrostatic currents.
Disconnect the electrical power and clean the surfaces with a damp rag. Allow wetted parts to dry completely before restoring power.
ATTENTION! Do not disassemble or try to repair the holding electromagnet. In case of malfunction or failure it is mandatory to replace it.

With de-energised holding electromagnet (upstream main switch opened):
- visually check the absence of damages, defects and wear (cracks, exposure of encapsulated parts, dents, swelling, separation of adhering parts, detachment of parts, softening, damaged cables and glands);
- check the proper fixing of the holding electromagnet as well as that of the object/surface intended to be coupled.
- check the correct tightening of:
  - 8 Nm torque for cable glands;
  - 5.5 Nm torque for screws of equipotential bondings;
  - 2.3 ÷ 3.0 Nm torque for M5 screw used to fix the electromagnet.

The above values are indicative.
Make sure to tighten the screw to the tightening torque according to the technical standard or suggested by the screw manufacturer.
With energised holding electromagnet (upstream main switch closed):
- check that the holding electromagnet properly withholds the object/surface intended to be couples (refer to USE AND FUNCTIONAL TEST).

DISPOSAL
At the end of service life, the holding magnet must be properly disposed according to the laws in force in the country in which the disposal takes place.
In general:
- it is forbidden to dispose of it in a household waste container;
- it is forbidden to dispose of it as unsorted waste.



SUPPORT
For all that is not mentioned and in case of any doubt, always contact our technical department tecnico@elfri.com.
This document together with the EU Declaration of Conformity and the EU-type certification is made available by ELFRI on *www.elfri.com*

CERTIFICATIONS

ATEX Directive 2014/34/EU
*Certificate number ITS-I 26 ATEX 45254 X - Notified body **2575***

IECEx scheme
Certificate number IECEx ITS 26.0026X

⚠ WARNING ⚠

KEEP AWAY FROM UV RAYS
POTENTIAL ELECTROSTATIC CHARGING HAZARD

Gonars (UD) Italy
Updated 27.10.2026