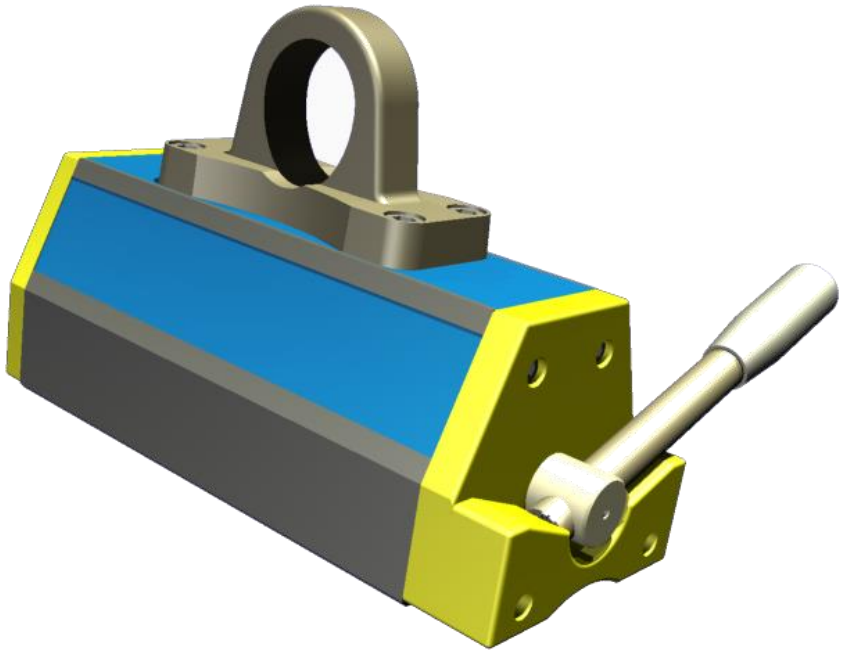
Lever-operated magnetic lifter

Series MHM-IT

Assembly and Operating Manual



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Dear customer,

Congratulation on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, top quality and best service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time – even after purchase.

Kindest Regards

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1 About this manual

This instruction manual is an integral part of the product and contains important information for a safe and proper assembly, commissioning, operation, maintenance and helps for an easier trouble shooting.

Before using the product, read and note the instruction, especially the chapter "Basic safety notes".

1.1 Warnings

The following signal words and symbols are used to highlight dangers.

1.1.1 Signal words

DANGER	Dangers for persons. Non-compliance will inevitably cause irreversible injury or death.
WARNING	Dangers for persons. Non-compliance may cause irreversible injury or death...
CAUTION	Dangers for persons. Non-observance may cause minor injuries.
ATTENTION	Information on how to avoid material damage.

1.1.2 Symbols

Warning about a danger point

Warning about dangerous electrical voltage

Danger of magnetic field

Danger of pieces falling down

General mandatory sign to prevent material damage

2 Basic safety notes

2.1 Intended use

The lever-operated magnetic lifters by SCHUNK GmbH & Co. KG have exclusively been designed for the handling and lifting of any workpiece out of ferromagnetic material.

The requirements of the applicable standards must be observed and complied with. The magnetic lifter may only be used in the context of its defined application parameters.

For its intended use, it is also essential to observe the technical data and installation and operation notes in this manual as well as the maintenance intervals.

2.2 Environmental and operating conditions

- Use the magnetic lifter only within its defined application parameters. See chapter "Technical data" (☞ 5, Page 11).
- Make sure that the environment is clean and the ambient temperature corresponds to the specifications.

2.3 Product safety

Dangers may arise from the magnetic lifter, if e.g.:

- the magnetic lifter is not used in accordance with its intended purpose:
- the magnetic lifter is not installed or maintained properly.
- potentially hazardous operation are not avoided and / or the proper use described in the following chapter is not observed.

Avoid any manner of working that may interfere with the function and operational safety of the magnetic lifter.

Wear protective equipment according to the Machine Directive.

NOTE

More information is contained in the relevant chapters.

2.4 Personnel qualification

Assembly, initial commissioning, maintenance, and repair of the magnetic lifter may be performed by trained and skilled personnel, only. Every person called upon by the operator to work on the magnetic lifter must have read and understood the complete assembly and operating manual, especially the chapter "Basic safety notes" (☞ 2, Page 5). This applies particularly to personnel commissioned only occasionally, such as maintenance personnel.

DANGER

Danger due to a magnetic field.
As the magnetic lifter is basically a magnetic system, the following groups of persons must not come into contact with it:

- Persons with pacemakers.
- Persons with metal or electronic prostheses.
- Persons with insulin pumps.
- Persons with muscular stimulation systems.
- Pregnant women.

These persons should always keep a safe distance of at least 2m to the lifter.

2.5 Using personal protective equipment

When using this product, observe the relevant industrial safety regulations and use the required personal protective equipment (PPE)!

- Use protective gloves, safety shoes and safety goggles.
- Observe the required safety distances.
- Minimum safety requirements for the use of work equipment.

2.6 Potentially hazardous operations

- Do not use the equipment for the lifting and transportation of people, or for services other than its intended use;
- Do not lift loads while people are crossing the operation area below;
- Do not cross, stop, work or carry out any operation underneath the suspended load and do not stand in a position where falling down pieces may cause damage;
- Do not allow the equipment to be used by unqualified or unsuitable personnel;
- Do not fail to pay proper attention during the load lifting and handling operations;
- Do not leave the suspended load unattended;
- Do not exceed the rated load capacity of the equipment;
- Do not lift unequally distributed or unbalanced loads;
- Do not lift more than one piece at a time;
- Do not allow the load to oscillate while being lifted;
- Do not lift “guided” loads;
- Don’t let the load hit mobile or fixed parts;
- Do not reach the “limit stop” area at full speed during handling operations;
- Do not move the load without having made sure that the magnetic gripping has been properly performed;
- Do not intervene without having removed the lifted load first;
- Do not lift loads having a temperature of more than 80°C;
- Do not use the equipment without wearing suitable work clothing and PPE;
- Do not lift bulky or extremely thin-walled pieces. The technical product specifications are described in the following.

2.7 Proper use

- Check regularly the conditions of the equipment;
- Use appropriate tools and personal protection devices during working or maintenance operations;
- Place the equipment on the centre of gravity of the piece to be lifted;
- Magnetize the equipment only after it has been correctly placed onto the piece;
- Lift and move the load with care, avoiding any unbalancing;
- Clean the poles and the surface of the piece in contact with the equipment prior to each use;
- Inform anyone standing within the operation field of the equipment that lifting is about to start;
- Carry out an initial test lifting of about 5-10 cm to check that the magnet has properly taken hold of the workpiece;
- Carefully place the piece on stable surfaces before starting demagnetization.
- After demagnetization, slowly raise the equipment to make sure that the piece is detached;
- Make sure that the whole magnetic area of the lifter is covered to guarantee maximum lifting capacity;
- The lifter's nominal load is guaranteed at air gap* = 0. If the air gap increases, the capacity decreases.

*air gap = space between the lifter and the piece to be lifted.

3 Warranty

The warranty is valid for 12 months from the delivery date to the production facility under the following conditions:

- Intended use in 1-shift operation
- Observe the mandatory maintenance and lubrication intervals.
- Observe the environmental and operating conditions.

Parts touching the work piece and wearing parts are not part of the warranty.

Procedure in the event of warranty

The buyer agrees to send a written detailed report on newly discovered defects of the magnetic lifter to SCHUNK within 10 days after identification.

4 Scope of delivery

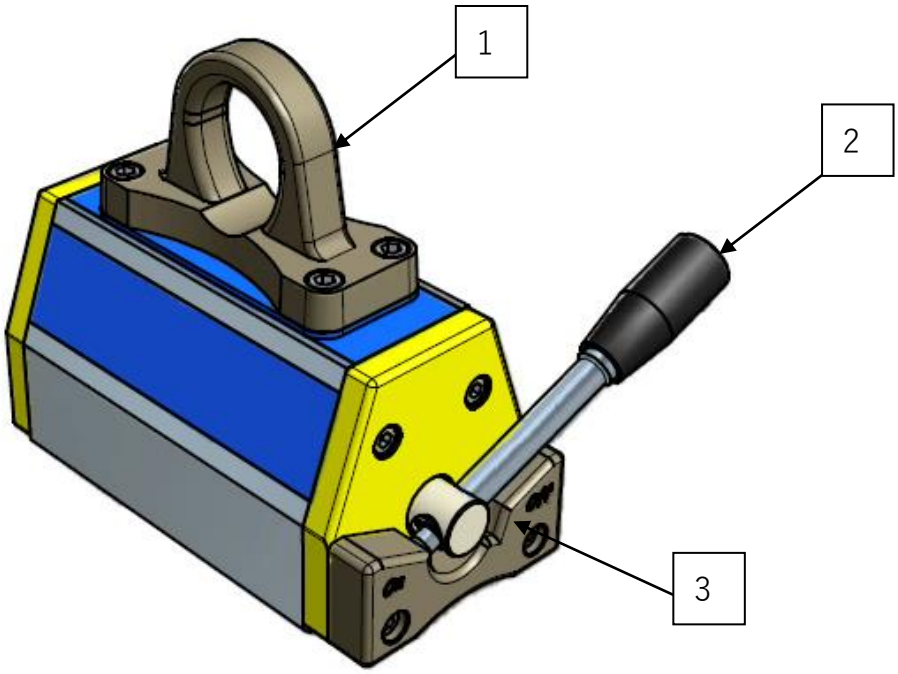


Fig. 1

The scope of delivery includes:

- Lever-operated magnetic lifter with lifting hook (1), operating lever (2), and lever lock to avoid any unintentional demagnetization (3).

5 Technical Data

5.1 Standard lifters

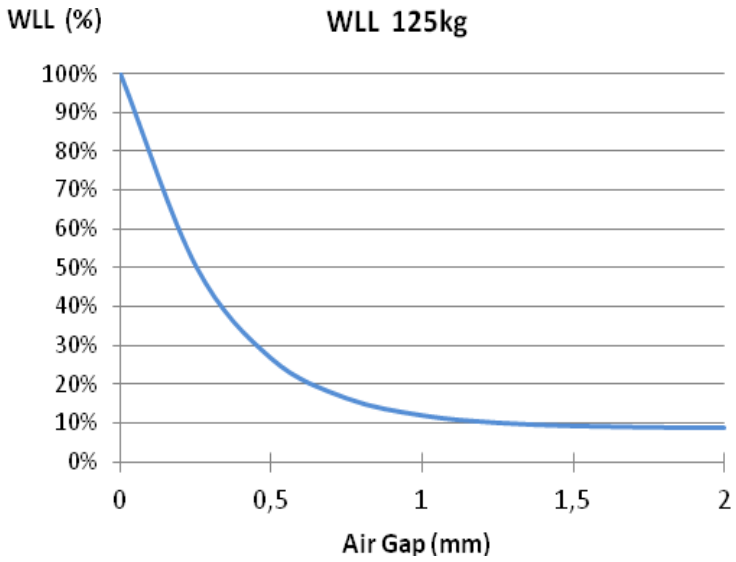
The technical product properties are given in the table below:

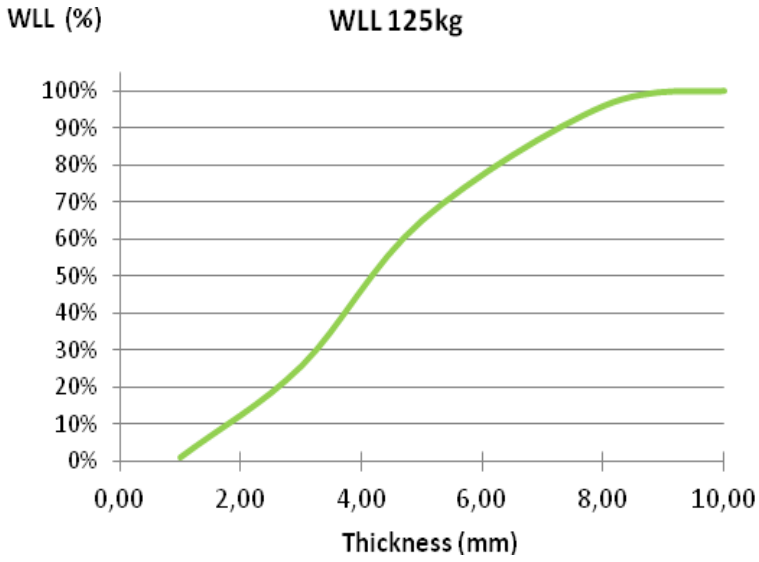
Id.-No.	Nominal holding force on flat / round work-piece [kg]	Min. thick-ness [mm]	Max. length [mm]	Min. / Max. diameter [mm]	Weight [kg]
0421000	125 - 60	10	2000	35 - 180	6
0421001	250 - 125	20	2000	35 - 270	15
0421002	500 - 250	25	2500	35 - 220	25
0421003	1.000 - 500	40	3000	40 - 360	45
0421004	2.000 – 1.000	55	3000	40 - 340	95

The nominal load of the lifter is guaranteed at an air gap=0 and for certain minimum thicknesses of the workpiece to be lifted.
If the air gap increases, the maximum load of the lifter de-creases.
If the minimum thickness decreases, the maximum load of the lifter decreases, as well.

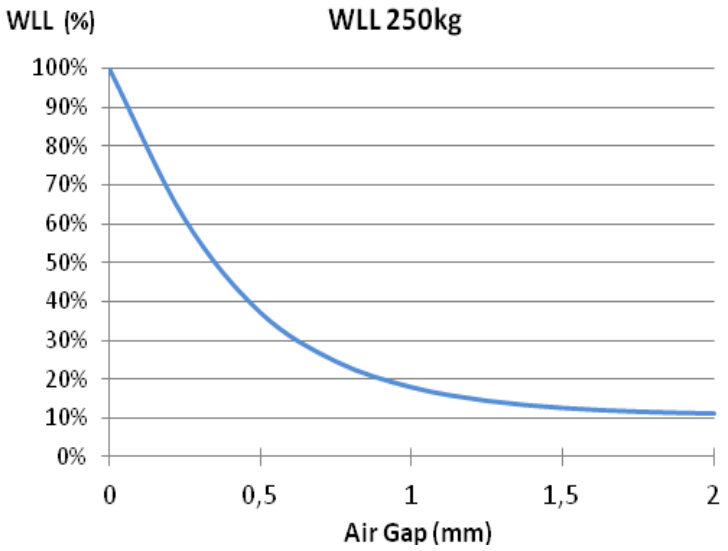
The following charts show how the maximum load of each lifter varies depending on the different air gap values and thicknesses.

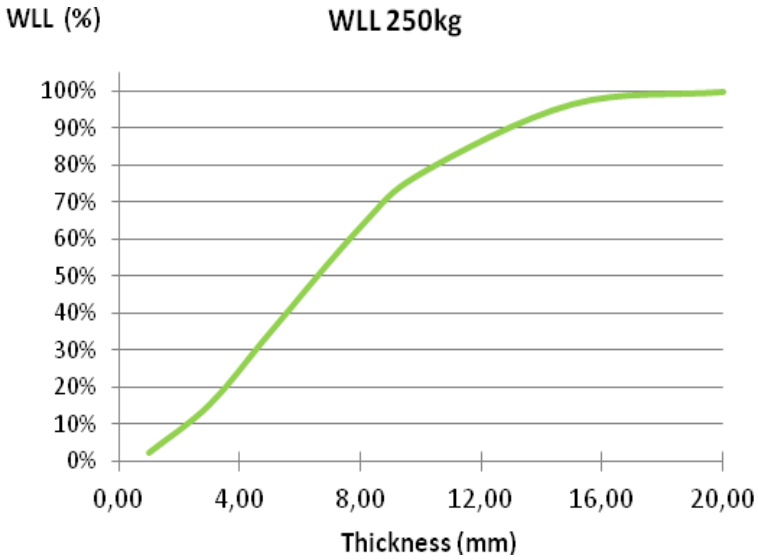
Lifter 0421000



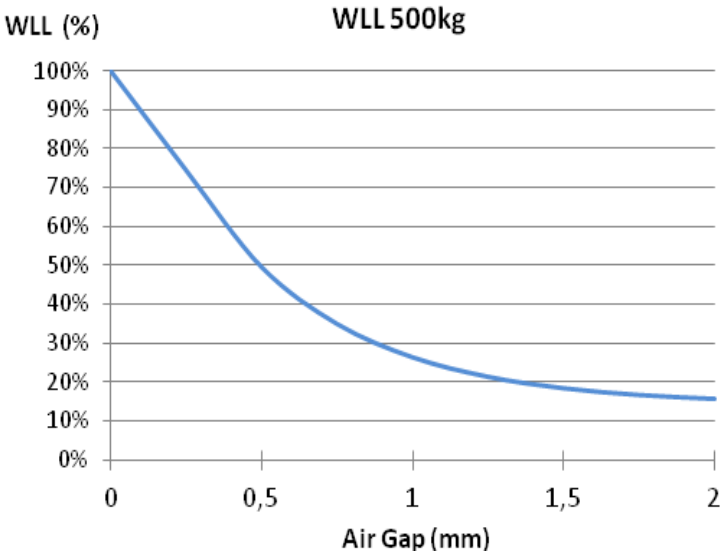


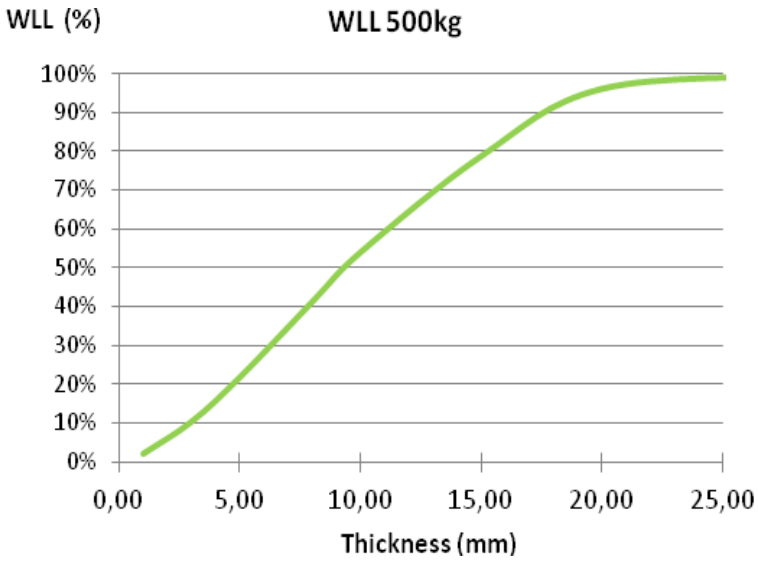
Lifter 0421001



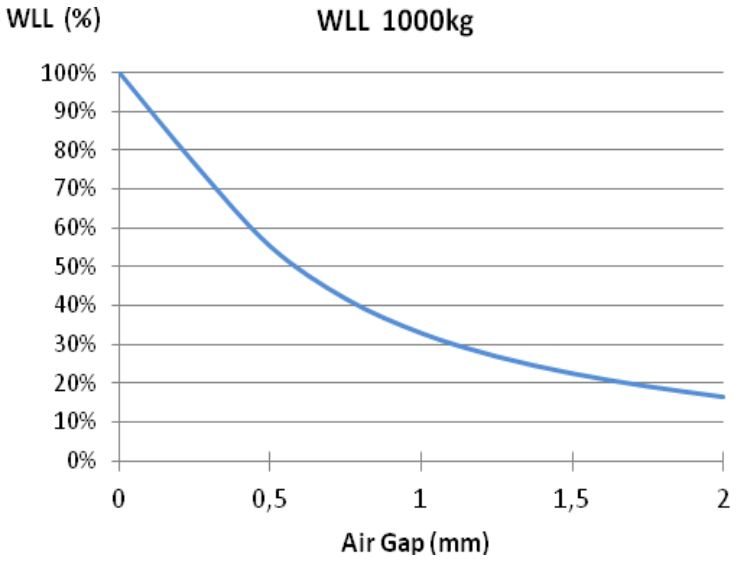


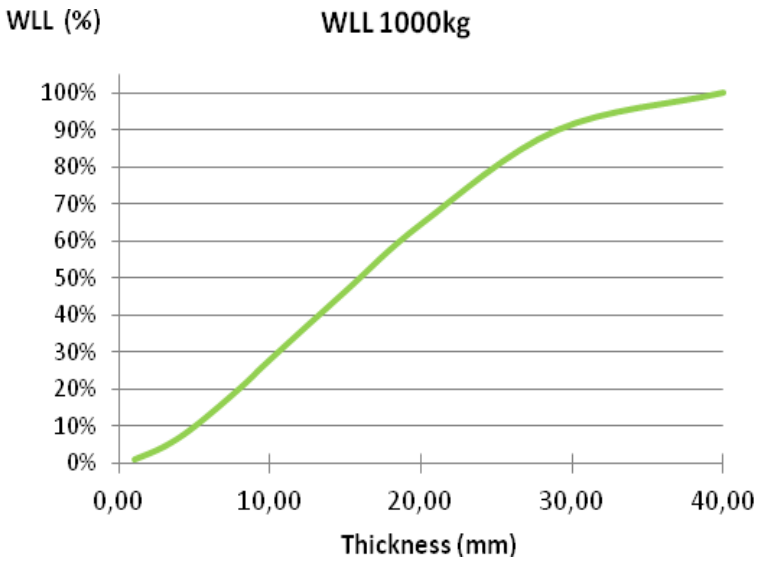
Lifter 0421002



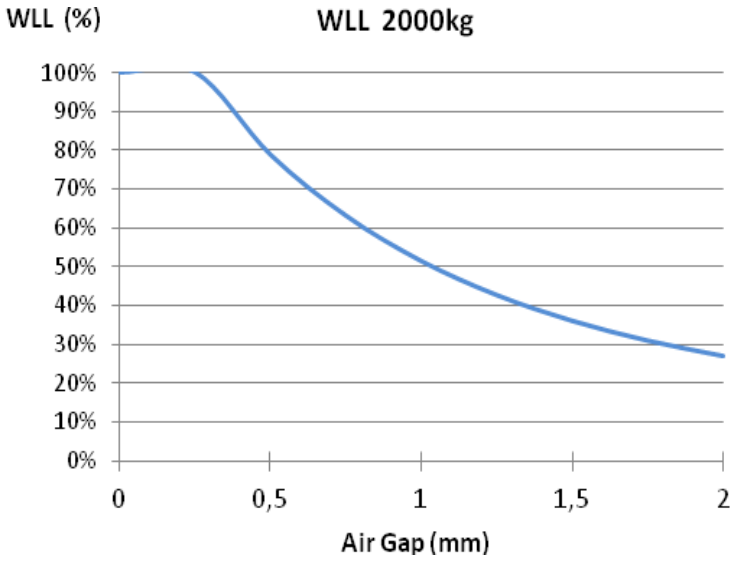


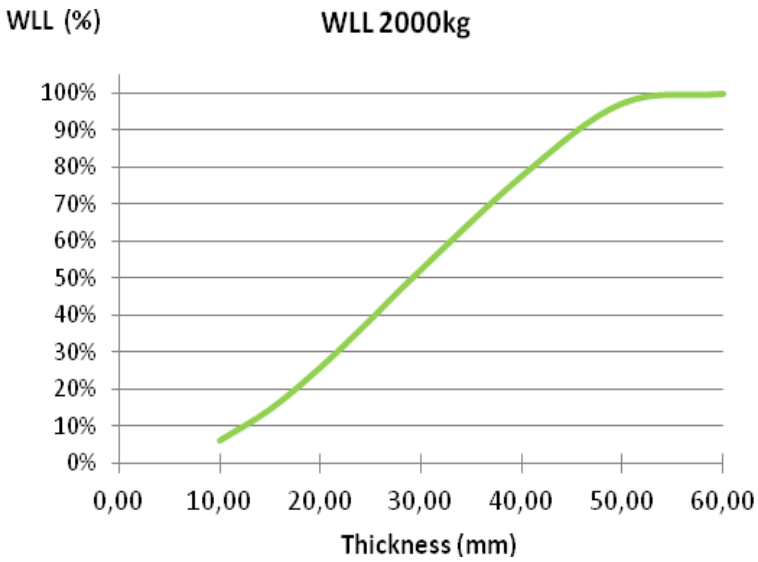
Lifter 0421003





Lifter 0421004





5.2 Special lifters

For technical data of lifters for special applications, please refer directly to the sales agreements or to the label placed on the lifter.

5.3 Identification plate

The identification plates are placed on the side of the magnetic lifter:

Fig. 2

Information	Description
Model	Model
Id. No.	Product code No.
Serial No.	Serial number
Work No.	Production order No.
Weight	Weight
Year	Year of production

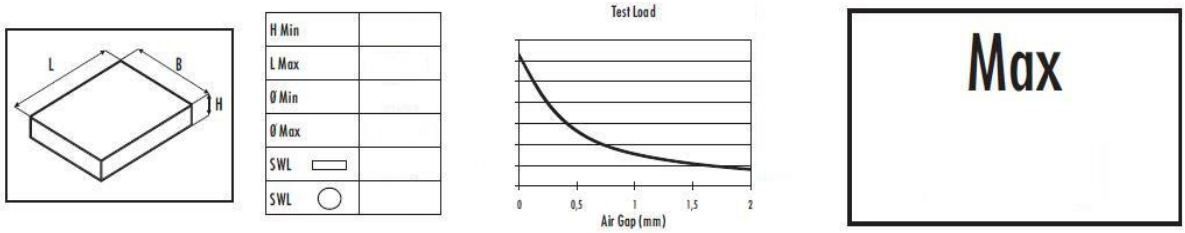


Fig. 3

Information	Description
H Min	Minimum height of the workpiece to be lifted
L Max	Maximum length of the workpiece to be lifted
Ø Min	Minimum diameter of the workpiece to be lifted
Ø Max	Maximum diameter of the workpiece to be lifted
SWL	Maximum safety load on flat workpiece
SWL	Maximum safety load on round workpiece

The identification plate must never be removed! Please always have the serial no. at hand when contacting SCHUNK about technical matters.

5.4 Overall dimensions

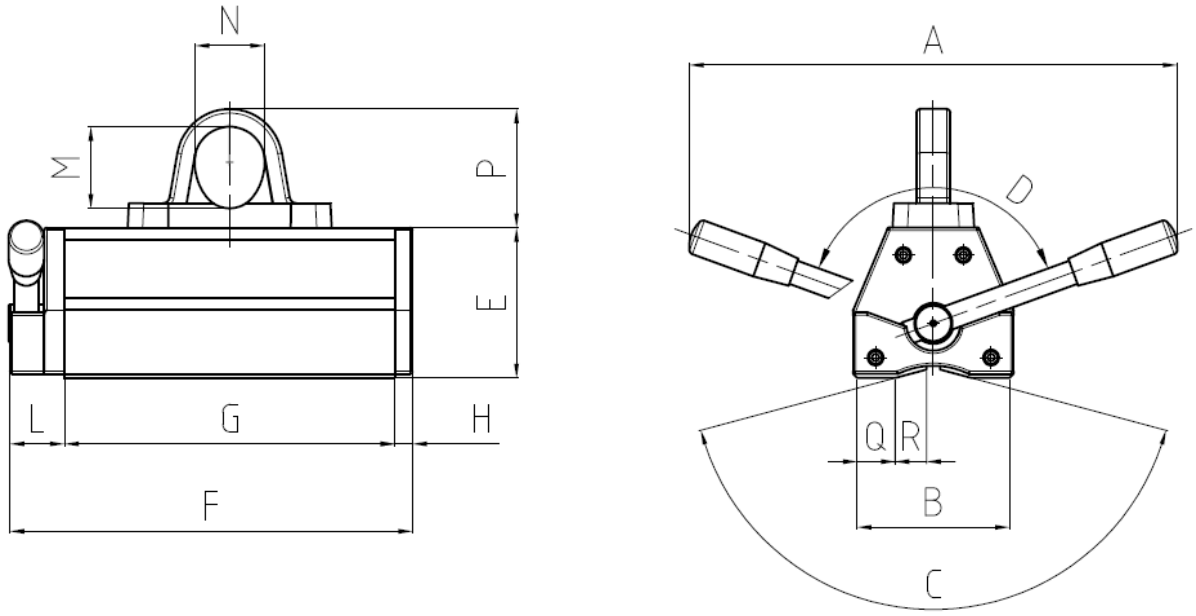


Fig. 4

Type	Nominal dimensions (mm)													
	A	B	C	D	E	F	G	H	L	M	N	P	Q	R
MHM-IT125	220	78	150°	140°	81	160	125	10	25	43	35	63	16	18
MHM-IT250	374	118	150°	150°	115	196	143	13	40	43	35	63	24	30
MHM-IT500	380	118	150°	155°	115	296	243	13	40	60	51	92	31	23
MHM-IT1000	420	148	160°	155°	145	355	300	15	40	60	51	92	42	27
MHM-IT2000	627	177	160°	160°	190	545	480	15	50	87	64	128	59	25

6 Description

6.1 The lever-operated magnetic lifter is able to lift all ferromagnetic materials, with the exception of:

- Aluminium and its alloys
- Bronze
- Brass
- Non-magnetic cast iron
- *Some types of STAINLESS steel (of austenitic type* even if slightly magnetisable after plastic deformation hardening).

For an optimal exploitation of the magnetic force, particular attention must be paid to:

a. the position of the magnetic lifter on the workpiece;
b. the contact surface between the piece to be lifted and the poles of the magnetic lifter;
c. the air gap value (space between the poles of the lifter and the piece to attract).

Even among ferromagnetic materials, the clamping degree depends on the reluctance of the piece to be anchored by the lifter.
The reluctance value depends on the chemical composition of the material itself. This composition may cause strong reductions (up to 20 ÷ 30%) of the maximum value of the attraction force that can be reached with mild steel.

Material	Efficiency
Standard steel (Fe 360 - C40)	100%
Raw ferromagnetic steel	90%
Magnetic stainless steel	65%
Cast iron	50%

Heat treatments performed on the workpiece to be machined.
Some heat treatments reduce the magnetic attraction properties. Special attention should therefore be given to materials which have undergone one of the following treatments:

- Tempering in all possible types
- Decontamination
- Cementation
- Nitriding

6.2 Installed safety devices

The present magnetic lifter has been designed to meet the essential safety and health protection requirements.

To this purpose, a safety lock is installed at the end stroke of the activation lever. This lock is meant to avoid any unintentional demagnetization by the operator, .i.e. if the lever is in the ON-position (lifter magnetized) the lock prevents the lever from being turned to the OFF-position (lifter demagnetized) by a hit or due to the inattention of the operator.

⚠ WARNING

Danger due to the breakage of the lever lock.

The lever lock is an extremely important safety component. Prior to each use, please check if it is intact and make sure it is not worn-out.

In case of breakage or wear and tear, don’t use the lever unless this safety component has been replaced.

7 Installation

1 Check the packaging before accepting the magnetic lifter.

2 Open the packaging and take out the magnetic lifter.

3 Check the magnetic lifter for transportation damage!

4 Compare the magnetic lifter with the specifications given in the order!

5 Clean the poles of the magnetic lifter with lever by removing the rust preventive oil.

6 Then mount the lifter to a supporting structure (overhead crane, hoist, etc.) by means of the relevant hook. Any other additional hook, eyebolt and fastening hole or special structure must be discussed during the sales negotiations.

7 Please check after the installation that the lifter is safely fixed to the supporting structure.

NOTE

Please always have the serial number at hand when contacting SCHUNK GmbH & Co. KG or Service Centres.

8 Initial commissioning and normal operation

8.1 Initial commissioning

After having installed the magnetic lifter, its proper functioning must be checked:

1 Ensure that the magnetic lifter is not magnetized.

WARNING

Danger due to suspended loads
If the handling and putting into service of the magnetic lifter requires the use of lifting equipment, such as cranes, hoists, etc., please keep the respective safety distances!

2 Position the magnetic lifter onto the workpiece to be lifted by centring it in order to avoid unbalanced loads.

Fig. 5

3 Pull the activation lever outside its locking seat.

Fig. 6

4 Turn the lever from the Off- to the ON-position (see fig. 7).

Fig. 7

5 Push the activation lever inside its locking seat to secure it.

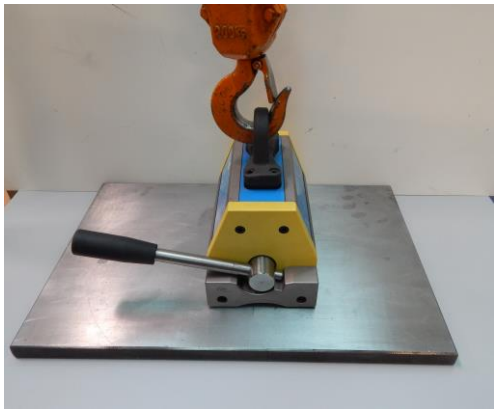


Fig. 8

6 Slightly lift the workpiece (approx. 10 cm) in order to check if it is properly anchored to the magnetic lifter (see fig. 9).

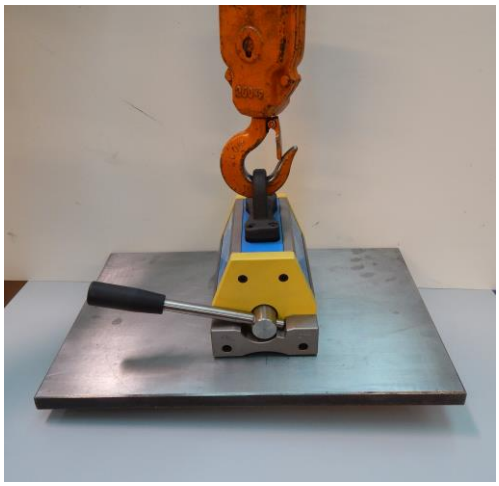


Fig. 9

7 Put the piece back onto the ground or onto a stable surface (see fig. 10).

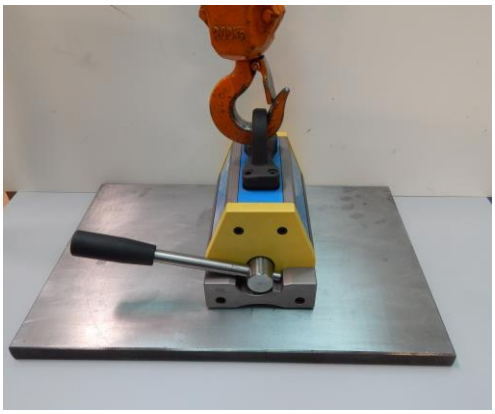


Fig. 10

8 Pull the activation lever outside its locking seat (see fig. 11).

Fig. 11

9 Turn the lever again into the OFF-position (see fig. 12) and make sure that the workpiece detaches from the lifter without any difficulties.

Fig. 12

NOTE:
Please contact SCHUNK SCHUNK GmbH & Co. KG if the expected results are not achieved even if you strictly followed the previously described steps.

8.2 Normal operation

In order to use the magnetic lifter in complete safety, please follow the below steps:

1 Ensure that the magnetic lifter is not magnetized.

2 Position the magnetic lifter on the workpiece to be lifted by centring it in order to avoid unbalanced loads

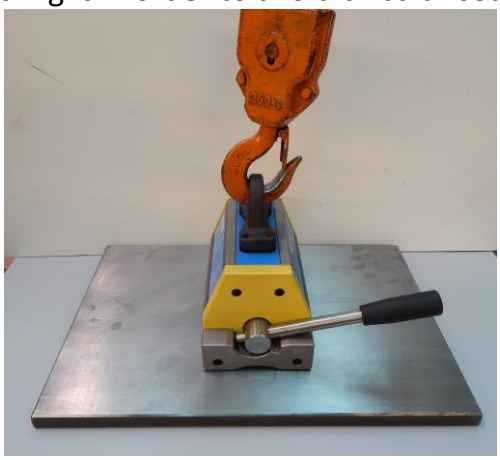


Fig. 13

3 Make sure that the properties of the workpiece (weight, air gap, material, thickness) are compatible with the load capacity of the magnetic lifter.

4 Pull the activation lever outside its locking seat.

Fig. 14

5 Turn the lever from the Off- to the ON-position (see fig. 15).

Fig. 15

6 Push the activation lever inside its locking seat to secure it.

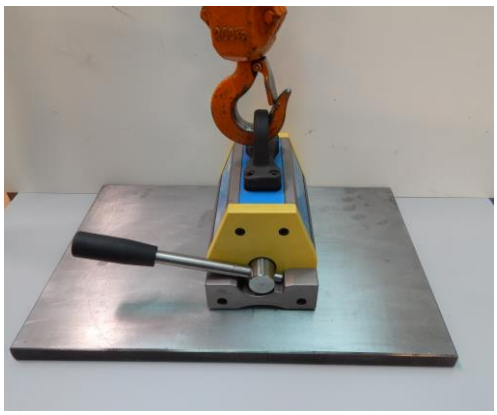


Fig. 16

7 Slightly lift the workpiece to be handled (approx. 10 cm) in order to check if it is properly anchored to the magnetic lifter (see fig. 17).

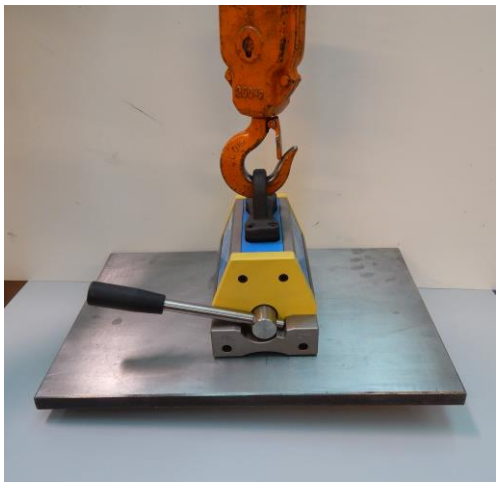


Fig. 17

8 Carry out the required handling operations.

9 Put the piece back onto the ground or onto a stable surface (see fig. 18).

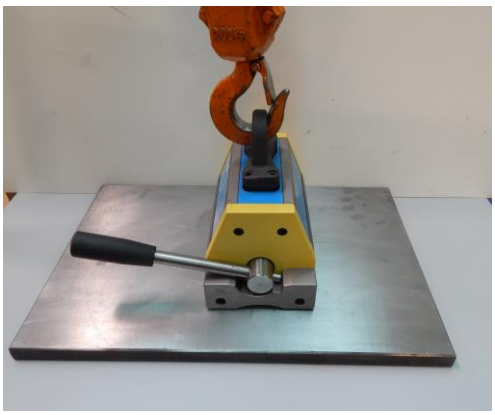


Fig. 18

10 Pull the activation lever outside its locking seat (see fig. 19).

Fig. 19

11 Turn the lever again to the OFF-position (see fig. 20) and make sure that the workpiece detaches from the lifter without any difficulties.

Fig. 20

NOTE:

Please contact SCHUNK if the expected results are not achieved even if you strictly followed the above mentioned steps.

9 Troubleshooting

Detected trouble	Possible causes	Suggested operations
The piece detaches from the magnetic lifter	The workpiece doesn't comply with the load capacity of the lifter.	Check weight and properties of the piece to be lifted with the technical features of the lifter.
		Make sure there's no increased air gap between the lifter and the workpiece to be handled.
		Make sure that the thickness of the workpiece is not too small.
		Clean the contact surfaces between the piece and lifter thoroughly.
The demagnetization has not been correctly performed.	Lot of residual magnetism inside the workpiece.	Place the workpiece onto the floor or onto a stable surface and slightly hit it by means of a rubber/nylon hammer until it comes off.

PLEASE NOTE: Should you have any problems or need any further information, please contact the customer service.

10 Servicing and maintenance

We recommend you to regularly check the state of the magnetic lifter. An excellent and careful maintenance at regular intervals is a decisive factor for optimal safety, functioning and performance and a longer service life of the product.

⚠ CAUTION

Maintenance should be performed by trained and skilled personnel, only. Maintenance personnel must carefully read the present manual.

To ensure optimum efficiency and reliability of magnetic lifter in the long run, the parts exposed to the greatest strain during the use of the same must be inspected regularly.

Please follow the instructions and maintenance intervals given in the table below so as to avoid expensive repairs due to failures or defects along with the consequent downtimes and inconveniences.

Prior to any operation, thoroughly clean the lifter surfaces in contact with the workpiece.

Operation	Description	Frequency			
		Prior to each switching on	Once a week	Once a month	Once a year
Check and cleaning of the poles	Make sure that the poles of the magnetic lifter are clean. Remove, if necessary, any dirt that could cause an air gap, thus reducing the magnetic force. Make sure that there are no cracks, deformations or breaks on the polar surface.	●			
Check of the identification plates / labels	Make sure that the identification plate and labels with all the relevant technical details of the lifter are not damaged and ensure their good legibility.	●			
Check of the safety lever lock	Check that the safety lever lock, avoiding an unintentional turning of the same whenever it is in the ON-position, isn't damaged, worn out or broken.	●			
	Make sure that the lever can move freely in any direction perpendicularly to the pin.				
Check of the hook	Make sure that the upper hook doesn't present any cracks, deformations or breaks.		●		
Check of the frame	Check each lifter component. Make sure there are no cracks, deformations or breaks.			●	
Checking the correct load capacity of the magnetic lifter	By means of already known weights, check if the lifter features a magnetic force of ≥ than 3 times the SWL indicated on the lifter.				●

Defective mechanical components must always be exchanged by SCHUNK Service personnel. If components are replaced by the operator, this automatically renders the warranty void.

After maintenance, all protection devices must be restored.

11 Transportation and storage

11.1 Transportation

⚠ WARNING

Risk of injury and damage to the magnetic lifter in case of its falling down during the shipping!
The magnetic lifter must be handled by means of a device with a suitable lifting capacity.

- The weight of the packaging is stated on the side label: please refer to this data during the transportation. The total weight of the product, on the contrary, is indicated of the relevant delivery documents.
- Use the required personal protective equipment during handling and shipment.

11.2 Storage

When storing the magnetic lifter for a longer period of time, observe the following instructions to ensure its good functionality up to the time of installation:

- Ensure an adequate packaging!
  Recommendation: store the product in its original packaging.
- The magnetic lifter and the packaging should be inspected at regular intervals.
- Inspect packaging for outer damage and effects of the weather.
- Make sure that the temperature does not exceed values between +5°C and +40°C during transportation and storage in order to prevent the magnetic lifter from damages. A temperature up to +50°C is only allowed for a short period of time, not exceeding however 24 hours.
- If the magnetic lifter has to be stored, make sure that the humidity values in the storage area range between 30% and 80%.

12 Disposal

This product is made of plastics, iron and permanent magnets. If it is taken out of operation, it has to be disposed of in compliance with the applicable regulations.

The magnetic lifter has been designed to grant sturdiness, durability, and flexibility on a long-term basis. As soon as the end of the lifecycle has been reached, the magnetic lifter has to be decommissioned, i.e. put into a state in which it can no longer be used for its original intended use and in which it is still possible to recycle the raw materials it contains.

NOTE
SCHUNK GmbH & Co. KG assumes no liability for material damage or personal injury that may result from reusing individual components of the magnetic lifter for other purposes than its original intended use! SCHUNK GmbH & Co. KG provides neither implicit nor explicit declarations about any possible usability of recycled components after decommissioning the magnetic lifter.

Procedure for final decommissioning and disposal of the magnetic lifter:

⚠ CAUTION

Risk of injury.
Decommissioning, disassembly and disposal of the magnetic lifter must be performed by qualified personnel using suitable tools.

1. Make sure that no suspended load is anchored to the magnetic lifter and that it is completely demagnetized;
2. Disconnect the product from the supporting structure;
3. Have the magnetic lifter disposed of by a company specialized in the disposal of magnetic equipments.

13 Spare parts

The lever-operated magnetic lifter is supplied complete of all its components.

In case of a spare parts request, please get in contact with our customer service department.