

Smart Lifting Solution of Electro-Permanent Magnets



Electro-Permanent
Lifting Magnets



Battery Powered
Lifting Magnets



Magnetic Grippers
For Robots



Electro-Permanent
Magnetic Chuck



The best work from us for your business



WELCOME TO HVR MAG

Our Core Values:

- H**onesty – “We ensure honesty and integrity in every partnership”.
- V**igorous – “Stay vigorous to give our best to every customer”.
- R**eliability – “Be a reliable magnetic solution provider & a reliable partner”.



WHY CHOOSE US



20⁺ years

Industrial Experience



40⁺ patents

Professionalism and leadership



1000⁺ Customers

All over the world

Company Profile

HVR Magnetic Co., Ltd. is a leading company in China in the field of electric permanent magnet technology. Founded in 2010, located in Gaoke industrial park, Tianyuan District, Zhuzhou City, Hunan Province, China. The company's main business is the development, design, production and sales of a wide range of electro-permanent magnetic industrial clamps and lifters.

After years of development, the company's products have formed four series of products, which are electro permanent lifting magnet, magnetic quick mold change system, magnetic chuck and magnetic gripper.

The unique advantages of HVR products are “safety, energy saving, and high efficiency”.

We attach great importance to product quality and intellectual property protection, so we have carried out certifications and patent applications in multiple countries and regions. In Germany, we have successfully obtained the TÜV Rheinland certification, which is a globally renowned authoritative certification organization that can verify and prove that products meet the relevant safety and quality standards. In addition, in Japan and the United States, our products have also undergone patent applications and successfully obtained patent certifications. These certifications and patents are proof of our company's continuous innovation and improvement of product competitiveness, as well as recognition of our long-term efforts. We will continue to focus on maintaining the advantage of product quality and intellectual property rights, and provide customers with better products and services.

HVR's electropermanent magnet products are widely used in shipyards, wind power, steel structure, metal cutting workshops, steel mills, engineering workshops. At present, our products are exported to Europe, USA, Singapore, Japan, Korea, Brazil, Russia and other parts of the world. Thanks to these achievements, HVR has become one of the world's most reliable forces in industrial magnetic equipment.

Product Categories

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Lifting Magnets**

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**Electro-Permanent
Magnetic Chuck**

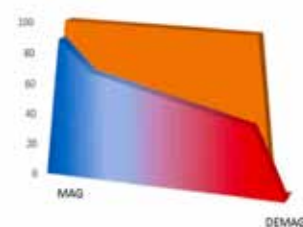
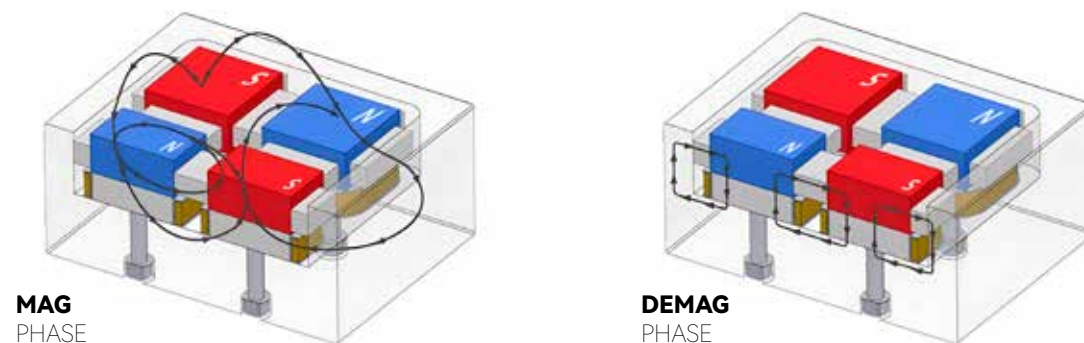
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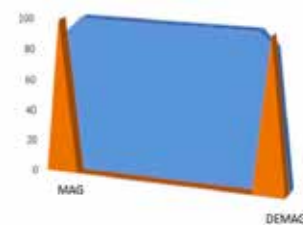
Working Principle of Electro-Permanent Magnet

Electro permanent magnets are composed of two distinct magnetic materials: one that is magnetically hard, such as Nd-Fe-B, and one that is semi-hard, such as Alnico. These materials are capped at both ends with a magnetically soft material, typically iron, and are then wrapped with a coil. When a current pulse of a specific polarity flows through the coil, it causes the materials to align and increases the external flow of magnetic flux. However, when a current pulse of the opposite polarity flows, it reverses the magnetization of the semi-hard material while leaving the hard material unchanged. This redirects some or all of the flux to circulate within the device, effectively reducing the external magnetic flux. The end result is a highly controlled and efficient method of manipulating magnetic fields for a wide range of applications.



Constant Power

Because no continuous current flows through the electric coils, electro permanent magnets do not heat up and the force remains constant. This contrasts with electro magnets that require continuous current and heat up, resulting in a loss of power.



95% Lower Energy Consumption

HVR MAG electro permanent magnets use electrical current for only a few seconds to reverse the polarity of the magnetic poles. This contrasts with electromagnets that continuously consume electrical power during the entire lifting process.



Advantages of Electro-Permanent Magnet



Energy Saving

only uses electricity in MAG & DEMAG phase, saving energy up to 95%



Efficiency

magnetization/ demagnetization with in 2 seconds



Reliability

unique structure consisting of dual magnetic source



Safety

magnetic force can remain even in a sudden power failure



Maintenance-free

no moving parts inside nearly zero maintenance cost



Deformation-free

uniformly distributed magnetic force



Scope of Application



Metallurgy & Mechanical



Train & Rolling Stock



Automotive



Automation



Shipyards & Offshore



Wind power

9 SAFETY FUNCTIONS

1 ELECTRO PERMANENT MAGNETIC TECHNOLOGY

The electric current is only used to invert the magnetic field, while the effective force is generated by permanent magnets. In the event of a power failure, the magnetic force remains permanently present = 100% safe.

2 PICK-UP CYCLE

Lifting is done in 2 phases, whereby the workpiece is first lifted at a lower preset force, immediately followed by FULLMAG (100% of the total force)

3 SAFETY FACTOR 3:1

To lift safely, a possible air gap between the contact surface of the magnet, and the steel to be lifted, must be considered.

That is why all our magnets are designed with a minimum safety factor of 3: 1 measured at an air gap of 0.4 mm.

4 SPC-SYSTEM(SYSTEM PERFORMANCE CHECK)

The electronic system continuously monitors the proper functioning of the magnet. Any abnormal situation is reported immediately and indicated by an error code on the help screen. In this way, errors can be immediately analysed and resolved.



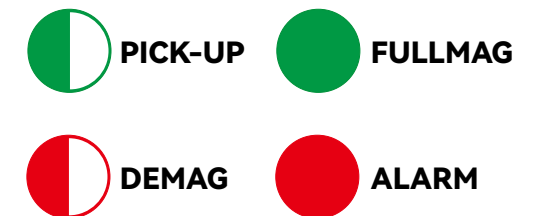
5 2 BUTTON OPERATION

To start the demagnetization cycle, 2 buttons (SAFE + DEMAG) must be pressed consecutively on the remote control.



6 LAMP BLOCK

The status of the magnet is visually indicated by a clear LED lamp block. The load may only be moved when the green lamp lights up continuously.



7 LANDING DETECTION

An inductive proximity switch and associated cam mounted on the harpshackle of the hoisting chain, prevents accidental demagnetizing in the air



8 RADIO REMOTE CONTROL

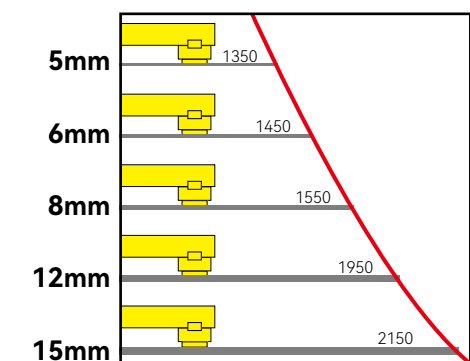
The magnet is operated from a safe distance. The operator should not come in the immediate vicinity of the load.

9 INSTRUCTION PANEL

With clear safety instructions for the user regarding:

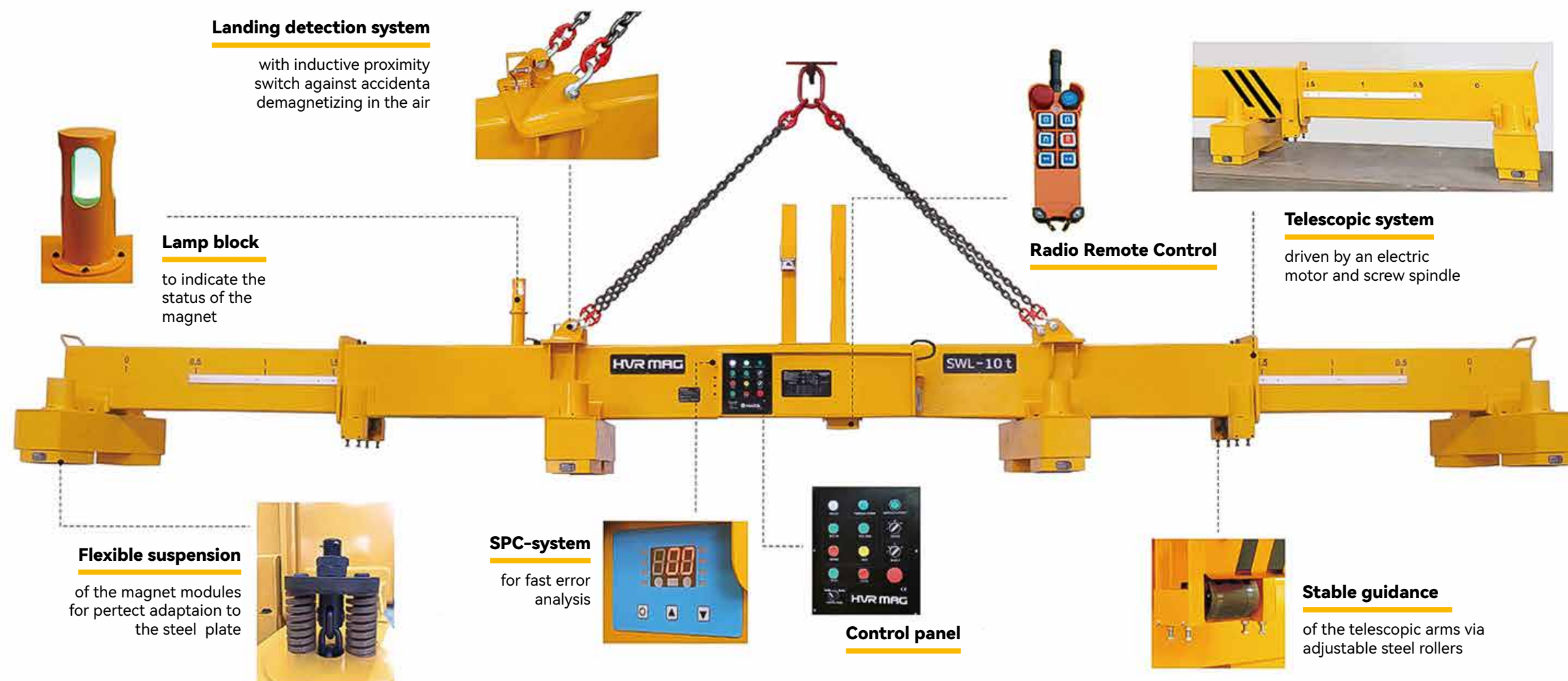
-Maximum weight of the load in function of material thickness.

-Maximum wing in function of the deflection of the material.





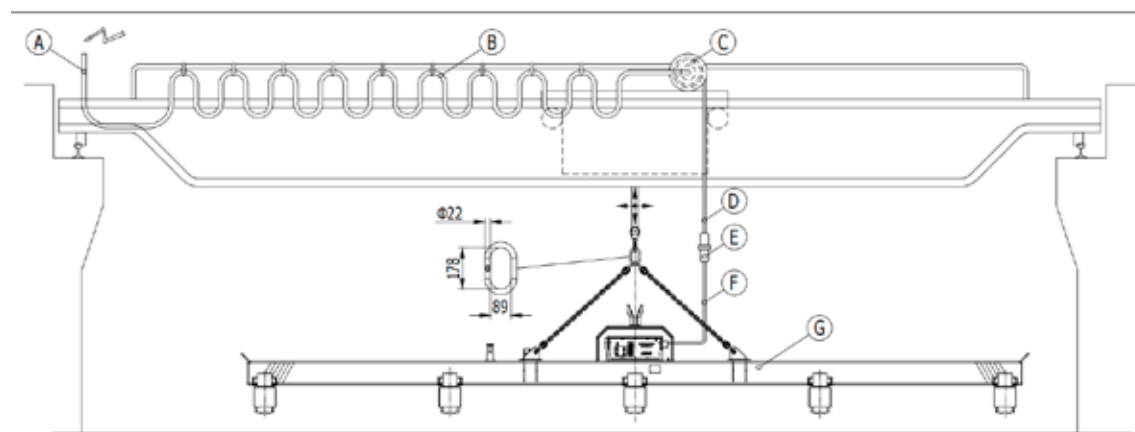
Overview of Electro-Permanent Lifting Magnets





Supporting System for Electro-Permanent Lifting Magnets

 ELECTRO-PERMANENT LIFTING MAGNET



- A** Power supply **B** Crane cable **C** Cable reel **D** Cable of cable reel
E Plug/socket **F** Discharge cable **G** Magnetic beam



> TYPE:

HM1

Fix Beam Lifting Magnets for Thick Plate

HM1 Keywords:

Thickness $\geq 5\text{mm}$ *Multiple magnet modules**Offering selective control of magnet groups*

This set of magnetic lifting system is specifically designed for handling steel plate $\geq 5\text{mm}$, consisting of multiple magnet modules, offering selective control of magnet groups for plates with varying length. offer model selection of magnets according to the plate specification and the lifting capacity of crane.



Length: 2,500 – 12,000mm
Width: 1,200 – 3,000 mm
Min. Thickness: 6 mm
SWL: 7,000 kg



Length: 3,200 – 12,000mm
Width: 1,500 – 3,200 mm
Min. Thickness: 6 mm
SWL: 25,000 kg

HM1 | The best work from us for your business



Length: 6,000-12,000mm
Width: 1,500-2,500 mm
Min. Thickness: 5-100mm
SWL: 20,000 kg



Length: 3,000-12,000mm
Width: 1,500-3,200 mm
Min. Thickness: 5mm
SWL: 25,000 kg



Length: 3,000 - 9,000mm
Width: 1,200 - 2,400 mm
Min. Thickness: 3 mm
SWL: 5,000 kg



Length: 3,000-9,000mm
Width: 500-2,500mm
Min. Thickness: 5mm
SWL: 10,000 kg

> TYPE:

HM2

Telescopic Beam Lifting Magnets for Thick Plate

HM2 Keywords:

Thickness $\geq 5\text{mm}$ *Multiple magnet modules**Telescopic beam driven by motor**Handling plates with wide range of variation in length*

Specifically designed for handling steel plates with varying length, yet with similar weights ($\geq 5\text{mm}$), the external part of beam can stretch/retract by itself. Compared with HM1 Series, this magnetic lifting system is more suitable for handling plates with wide range of variation in length, by reduce the quantity of magnets and thus saving storage space in shop floor.



Length: 3,000 - 16,000mm
Width: 500 - 3,200 mm
Min. Thickness: 5 mm
SWL: 24,000 kg



Length: 3,000 - 16,000mm
Width: 500 - 3,200mm
Min. Thickness: 5 mm
SWL: 14,000 kg

HM2

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Length: 3,000-12,000mm
Width: 500-3,200 mm
Min. Thickness: 5mm
SWL: 8,000 kg



Length: 3,000-12,000mm
Width: 500-3,200 mm
Min. Thickness: 10mm
SWL: 10,000 kg

Close

Open



Length: 3,000-16,000mm
Width: 500-3,000 mm
Min. Thickness: 5mm
SWL: 20,000 kg

> TYPE:

HM3

Lifting Magnets for Thin Plate

HM3 Keywords:

Thickness range from 1.5 to 12mm

For single steel plate

Without picking up the next/second sheet

Specifically designed for handling single steel sheet with a range from 1.5~6mm in thickness, without picking up the next/second sheet. Multi-point lifting method makes lifting magnets adapt to the deflection of long thin sheet to reduce deformation.



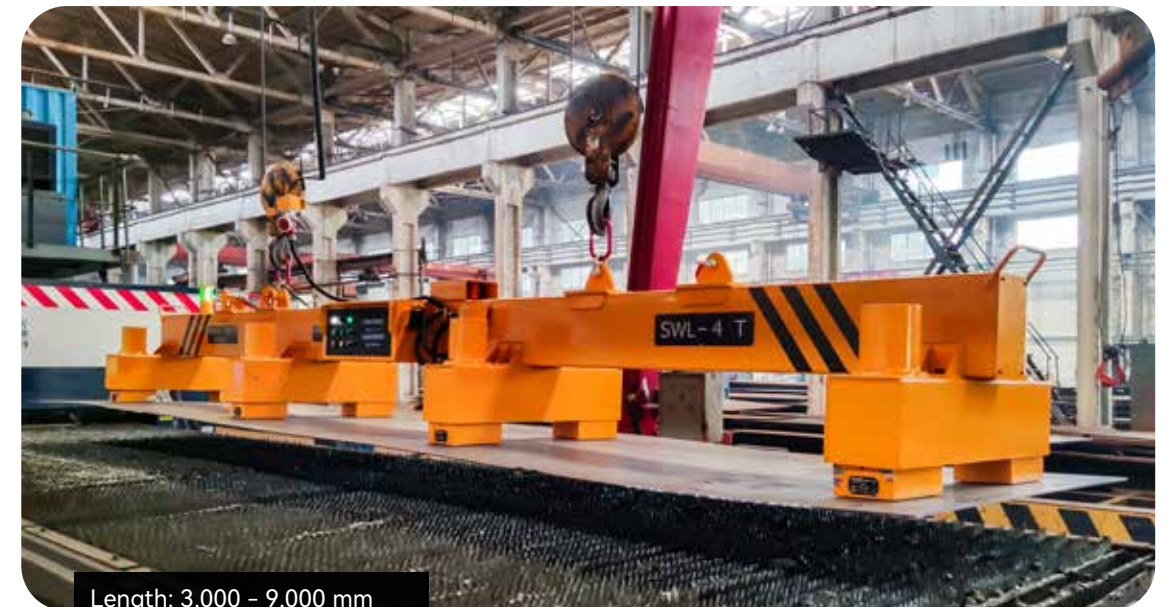
Length: 1,000 – 16,000 mm
Width: 1,000 – 2,500 mm
Min. Thickness: 2.5 mm
SWL: 4,000 kg

HM3

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Length: 1,000 – 10,000 mm
Width: 1,000 – 2,500 mm
Min. Thickness: 3 mm
SWL: 9,000 kg



Length: 3,000 – 9,000 mm
Width: 1,200 – 2,400 mm
Min. Thickness: 3 mm
SWL: 4,000 kg

> TYPE:

HM4

Lifting Magnets for Vertical/Tilt Plate

HM4 Keywords:

Thickness $\geq 3\text{mm}$

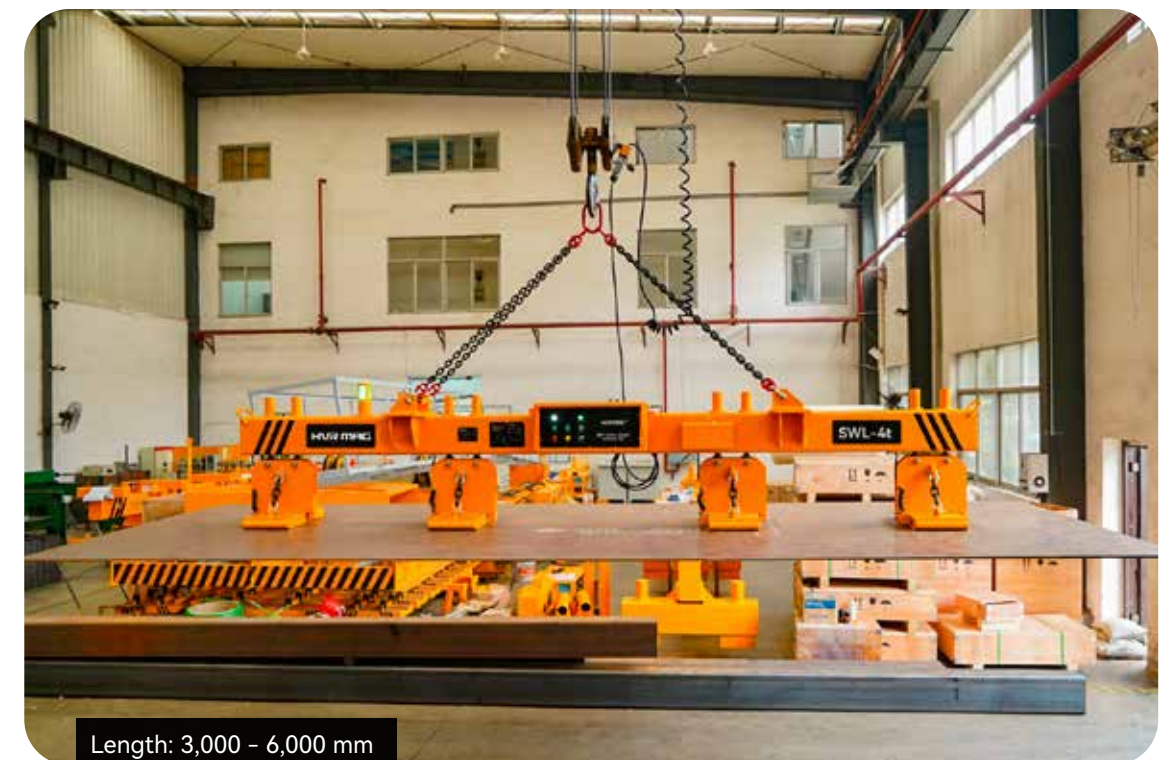
For single steel plate

Without picking up the next/second sheet

Specifically designed for lifting steel plates in vertical storage space or for 90 degree tilt lifting of steel plate, easily switched from vertical lifting or horizontal lifting, vice versa.



Length: 3,000 - 7,200 mm
Width: 1,200 - 3,000 mm
Min. Thickness: 5 mm
SWL: 4,000 kg



Length: 3,000 - 6,000 mm
Width: 1,200 - 3,000 mm
Min. Thickness: 5 mm
SWL: 4,000 kg

> TYPE: **HM5**

Lifting Magnets for Cutting System

HM5 Keywords:

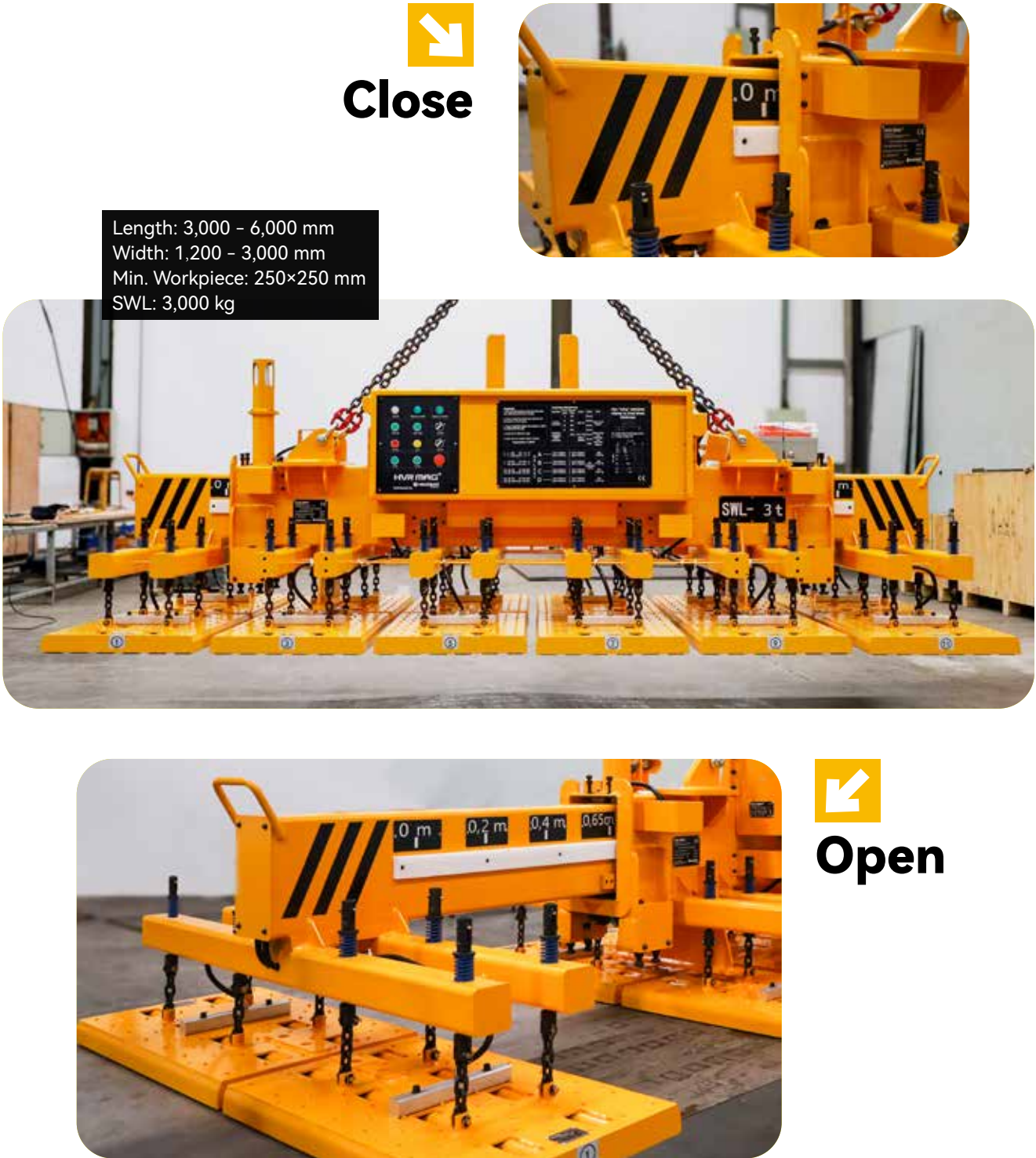
- Thickness range of 1.5~100mm
- Without picking up the next/second sheet
- Use for laser, plasma, flame cutting system

Loading & unloading solution for laser, plasma, flame cutting system, custom designed according to the dimensions of plate/cut parts. Adjustable magnetic force and selective control of magnet modules, for unloading the skeleton & cut parts in one movement or partially.



HM5 |

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> TYPE:
HM6

Lifting Magnets for Multiple Plates

HM6 Keywords:

- Lifting multiple steel plates each time
- 6-8 sheets(6mm)
- 4 sheets(8-10mm)
- 3 sheets(12-16mm)
- 2 sheets(20-25mm)

Magnetic solutions for lifting multiple steel plates each time, 6-8 sheets(6mm), 4 sheets(8-10mm), 3 sheets(12-16mm), 2 sheets(20-25mm), tailor designed per client's requests.



> TYPE:
HS

Lifting Magnets for
Steel Profile

HS Keywords:

- H beam blanks
- Angle iron
- L beam
- Tilt lifting of steel profiles

Specifically designed for lifting of steel profiles, H beam blanks, angle iron, L beam blanks etc swiftly and safely. If required, the profiles can be lifted at an angle.



> TYPE:
HR

Lifting Magnets for
Steel Round/Tube

HR Keywords:

- Without damaging the coating or paint layer on the surface
- Single or multiple tubes(pipes)

For fast and safe handling of single or multiple tubes(pipes), tube in a row or bundle without damaging the coating or paint layer on the surface.



> TYPE: **HB**

HB Lifting Magnets for Slab

HB Keywords:

- Thick steel billets and slabs
- Flexible design of different working conditions

For handling thick steel billets and slabs, the number of magnets depends on the specification and quantity of slabs to be lifted.



> TYPE: **HC**

Lifting Magnets for Steel Coil

HC Keywords:

- Horizontal lifting
- Vertical lifting





Battery Powered Electro-Permanent Lifting Magnets

The product adopts a monolithic structure which integrates electro-permanent magnet, maintenance-free battery, and controller. The control system uses new electronic circuits, plus the remote control, can perform quick settings of 8 parameters such as magnetization intensity and magnetization time, etc.



Energy-saving & Efficiency

Battery powered lifting magnets, free of restricting cords and wires, only use electricity temporarily in MAG & DEMAG phase. Due to the low power consumption, the battery has an autonomy of over 600 cycles.



Convenient Operation

With the remote controller, the operator can perform magnetization, lifting, transfer, and demagnetization at a safe distance away from the materials to be handled.



Battery Powered Lifting Magnets for Forklift Truck

Keyword:

Outdoors

Combined with forklift

Continuous battery monitoring



Specially designed for forklifts. They can be easily attached to the forklift's carriage or forks, enabling quick and secure lifting of various objects. These magnets eliminate the need for additional clamps or attachments, simplifying the lifting process.

> TYPE:
HBEPP

Battery Powered Lifting Magnets for Plate

HBEPP Keywords:

- Completely autonomously
- Integrated rechargeable battery
- Continuous battery monitoring

Thanks to the integrated rechargeable battery group, this electro permanent magnetic lifting beam functions completely autonomously, ideal for use in areas where electric power supply is unavailable. Continuous battery monitoring - when at low battery voltage, only demagnetization can be done.



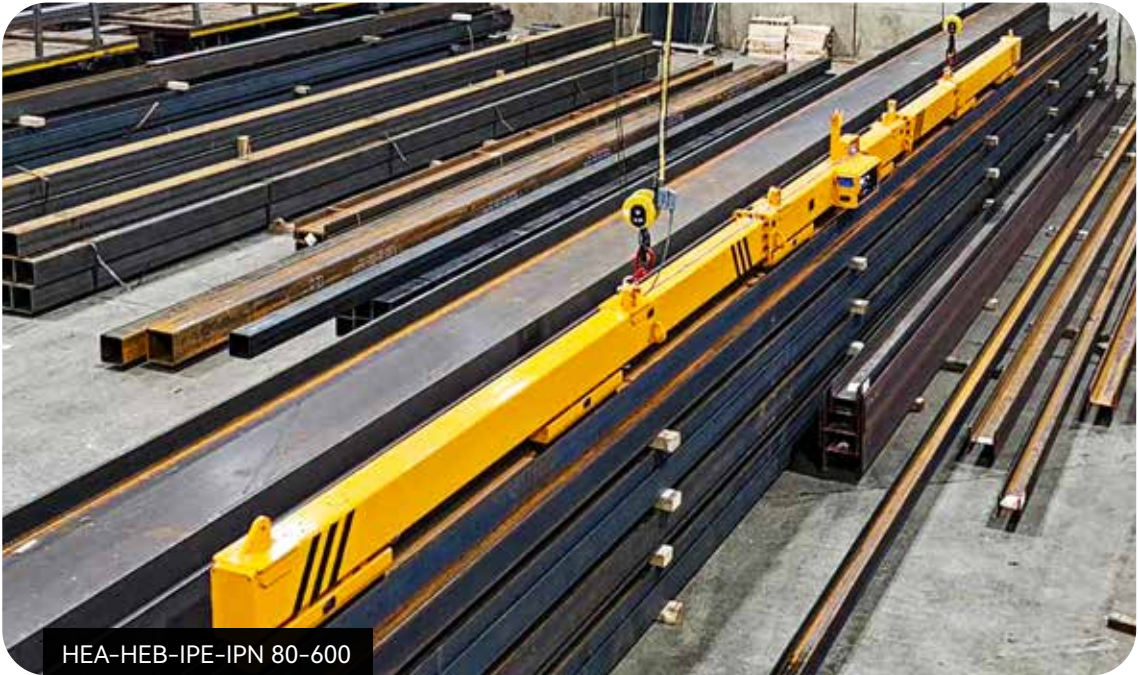
> TYPE: **HBEPS**

Battery Powered Lifting Magnets for Profiles

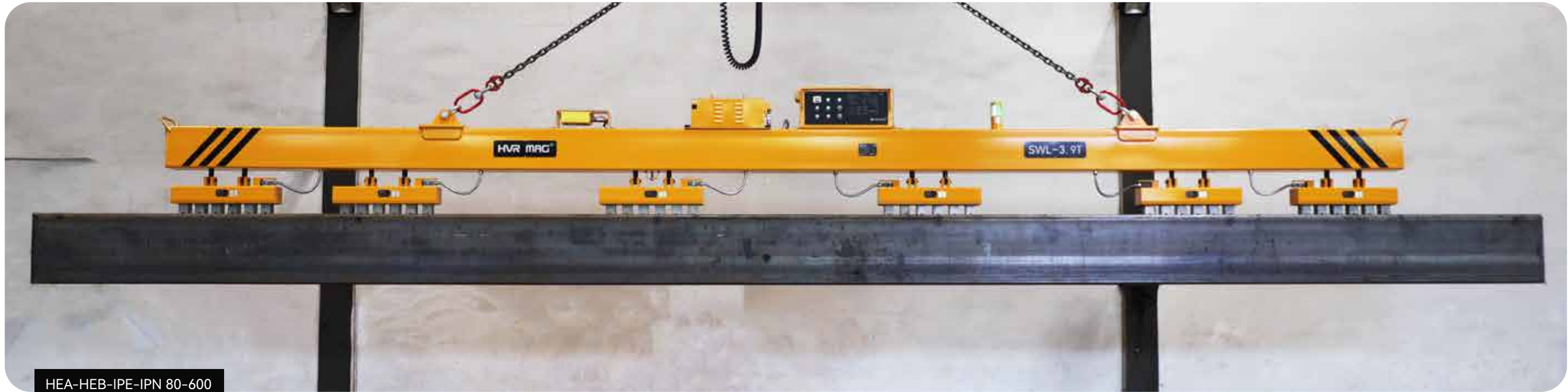
HBEPS Keywords:

- Small steel parts
- No external power supply required
- Rechargeable battery
- 500 cycles of lift

Custom designed lifting magnets with battery supply, for handling steel profiles, h beam blanks, angle iron, etc.



HEA-HEB-IPE-IPN 80-600
Length max: 9,000 mm
SWL: 2,600 kg



HEA-HEB-IPE-IPN 80-600
Length max: 18,000 mm
SWL: 3,900 kg

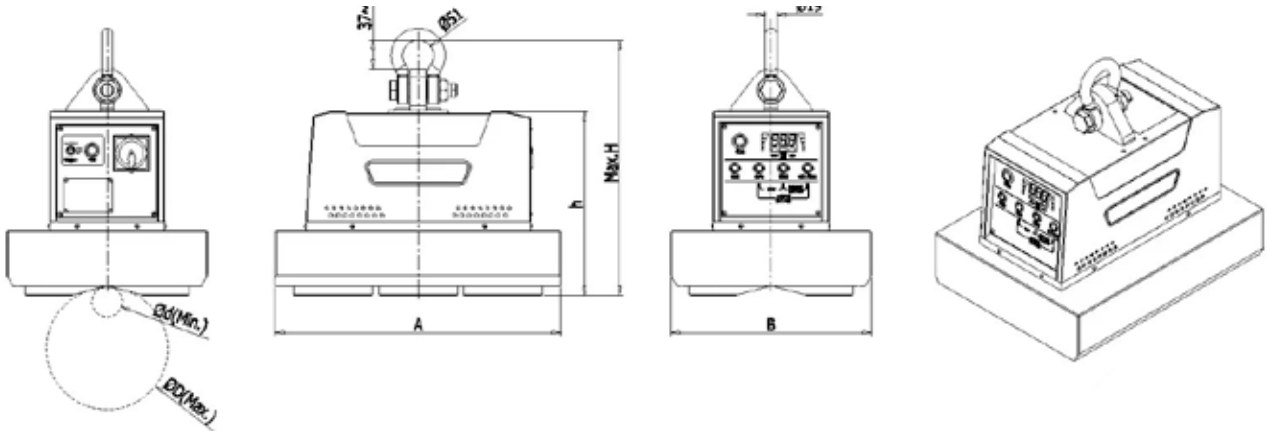
> TYPE: **HBEP**

Lifting Magnets with Battery Supply

HBEP Keywords:

- Small steel parts
- No external power supply required
- Rechargeable battery
- 1000 cycles of lifting
- Lifting capacity of 500kg,1000kg, 1500kg, 2000kg, 3000kg

This type of battery powered lifting magnet is specifically designed for moving small steel parts. We have standard models with lifting capacity of 500kg,1000kg, 1500kg, 2000kg, 3000kg customizable. With a fully charged battery, over 1000 cycles of lifting and releasing can be performed.



Model	Rated Lifting Force(kg)	Min. Plate Thickness (mm)	Working Voltage (DC:V)	Charge Time (h)	Dimension(mm)						Weight (kg)
					A	B	d	D	h	H	
HBEP-005	500	4	60	7-8	370	190	40	100	266	382	51
HBEP-010	1000	6	60	7-8	370	240	50	150	298	414	73
HBEP-015	1500	6	60	7-8	426	240	50	150	305	421	88
HBEP-020	2000	8	60	7-8	470	330	50	200	418	470	118
HBEP-030	3000	10	60	7-8	638	346	50	200	431	638	185

Note: The indicated rated lifting force is based on 20mm steel plate. It is 50% for round steel





Magnets for Industrial Automation

In addition to lifting and workholding, electro permanent magnets can be used as magnetic grippers for robots to pick, lift, load, place, transfer of ferrous parts, or as magnet clamps in welding line. With the trend of "Industry 4.0", electro-permanent magnets will be more and more widely applied to intelligent plant in automation applications in the near future.

Transfer lines

Pick and place equipment Robotics

Robotics

Palletising/depalletising systems

Conveyor lines

Packaging machinery

Welding line

Advantages

- 1** Magnetic gripper can handle a variety of material sizes and shapes including items with holes
- 2** Magnets do not change their magnetic state when power failure
- 3** Less energy consumption
- 4** Low-maintenance
- 5** Compact and powerful
- 6** Control unit could be integrated to the PLC system of robot





Magnetic Grippers for Pick and Place Robots (Grip+ Flip)

Pick and place of flat workpiece



Pick and place of structural steel (H beam blanks, angle iron, square tubes, pipes etc.)



Magnetic Grippers for Gantry Robots

Pick and place of flat workpiece



Pick and place of structural steel (H beam blanks, angle iron, square tubes, pipes etc.)





Magnetic Grippers for "cutting line" or "cutting table"

Dot matrix end-effector and adaptive flexible grasping. Workpieces in the heavy industry have characteristics such as large shape differences and a wide variety of types.

To ensure stable grasping of various types of workpieces, this product adopts a self-designed dot matrix flexible end-effector with simple structure, high versatility, single-point controllability, stable performance, and plug-and-play advantages, which can achieve flexible grasping of a large number of workpieces.

Meanwhile, based on visual intelligent control, it can ensure precise adsorption of workpieces with irregular shapes and avoid sticking with surrounding waste.



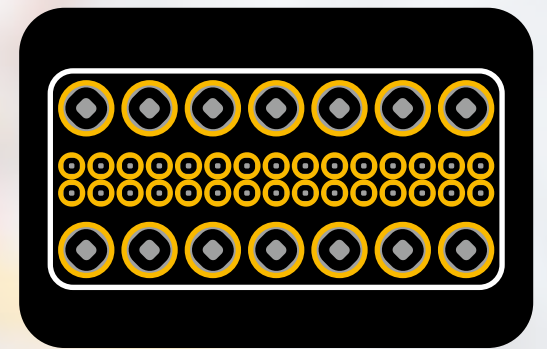
Magnetic Grippers for Different Shapes of Workpieces



Magnetic Grippers



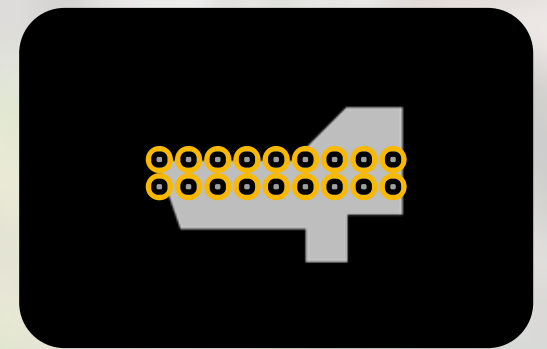
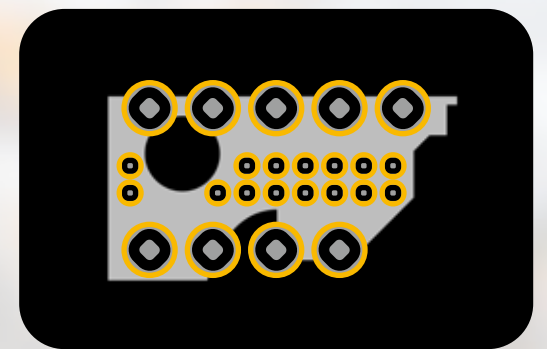
Magnet arrangement



Workpiece

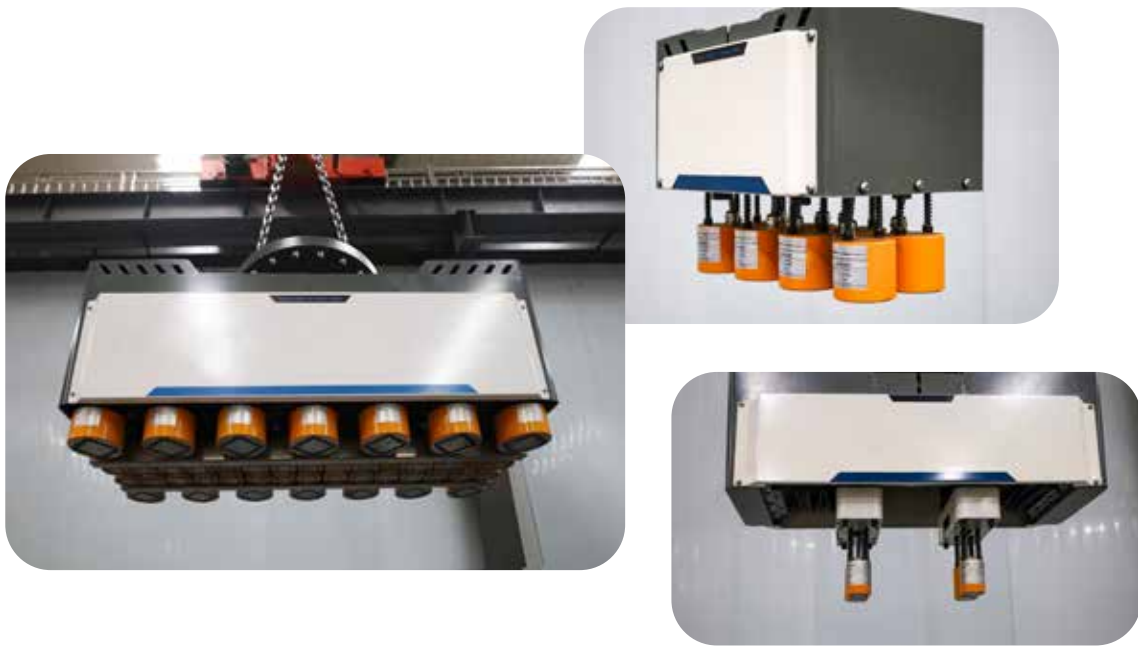


Working magnet





Magnetic Grippers for Different Shapes





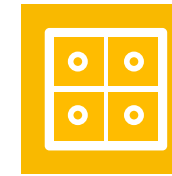
Magnetic Grippers in Welding



With strong attractive force, electro-permanent magnetic grippers are suitable as clamping tools in automatic steel plate welding process.



They can be attached to all magnetically conductive metal surfaces and can hold steel plates of different sizes and shapes, making the welding process increasingly safe.



Electro-Permanent Magnetic Chuck

As a special type of workholding fixtures for metal machining (including turning, milling, grinding, planing, drilling, etc.), electro-permanent magnetic chucks are widely used in machining centers due to the following strengths:

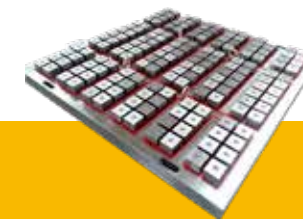
Strong & uniform holding force for high machining accuracy

Can hold ferrous work pieces larger than the machine table

No heat generation

Supports 5-side machining

Maintenance-free



**Magnetic Chucks
for Milling**

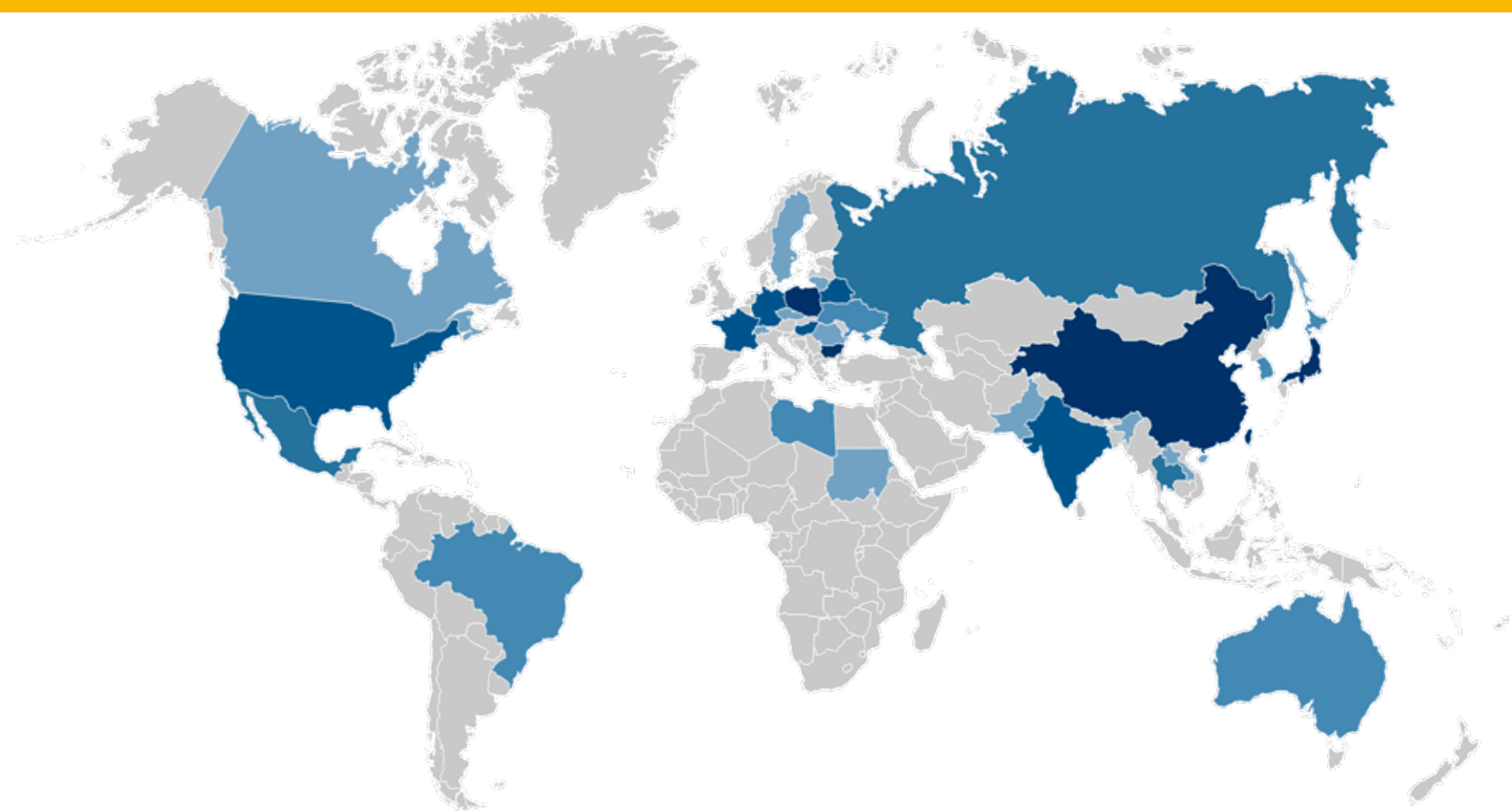


**Magnetic Chucks
for Lathe**



**Magnetic Chucks
for Grinding**

A Reliable Magnetic Solution Supplier



1000⁺
Customers

HVR's electropermanent magnet products are widely used in metal mould, machinery, shipbuilding, electric power, automobile, railway, IT system, medical and varies of industries. At present, our products are exported to Europe, USA, Singapore, Japan, Korea, Brazil, Russia and other parts of the world. Thanks to these achievements, HVR has become one of the world's most reliable forces in industrial magnetic equipment.

Pantners

Global Client Distribution

 China	 America	 Russia	 Japan
 Germany	 France	 Belgium	 Romania
 Canada	 Thailand	 Philippines	 Mexico
 Singapore	 Malaysia	 Sweden	 Italy
 India	 Spain	 U.K	 Vietnam



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