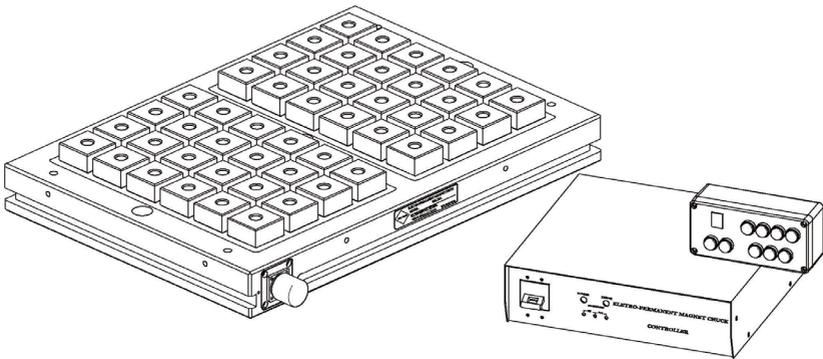




## Electro Permanent Magnet Chuck Manual



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  - The appearance and specifications of this product may be changed without prior notice to the users to improve their quality.

## Introduction

Thank you for purchasing Sangwon ENG's electro-permanent magnetic chuck, SSEN CHUCK.

To ensure your safety, please read the product's operating manual prior to its use. The operating manual covers the methods for using SSEN CHUCK and precautions for its smooth and efficient operation.

Please be careful not to lose this operating manual, and keep it near the machine when it is in use for reference.

## Warning symbols and their meanings



**Danger**

This indicates that the potential risk to life or cause of injury is very high.



**Warning**

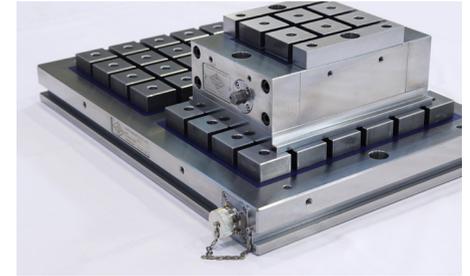
This indicates that the potential risk to life or cause of injury is high.



**Caution**

This indicates that there is a risk of getting injured or causing damage to the product or to the property.

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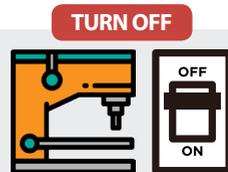
# 1. Safety precautions

Please read about the **safety precautions** before using the product. The following precautions should be observed so that operators can avoid unexpected risks or damage.

The precautions are classified as **“Danger,” “Warning,”** and **“Caution.”** Mishandling the product by ignoring these symbols may result in serious risks. Thus, please take note of the symbols and follow the precautions.

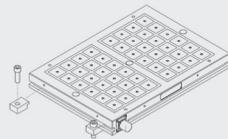
## **Danger**

Turn off the **power supply** to the machine and the controller before the installation, maintenance, and repair of the electro-permanent magnetic chuck.



## **Warning**

Securely **tighten** the fixing bolts at the proper torque.



Use an **eyebolt** and **wire rope** when moving the electro-permanent magnetic chuck.



Be cautious when you set up the work **pieces** to prevent your **fingers** or **gloves** from getting caught inside or in between the **machine tools**.



Do not go near the product if you are wearing a **pacemaker**.



**Only the manufacturer's employees** are allowed to disassemble, modify, or repair the machine to prevent its abnormal operation and failure. Otherwise, the manufacturer will not take responsibility for such results

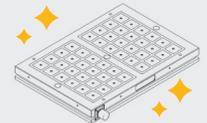


Do not hit nor apply **excessive force** to the product.



## **Caution**

Keep the product and its surroundings **clean**.



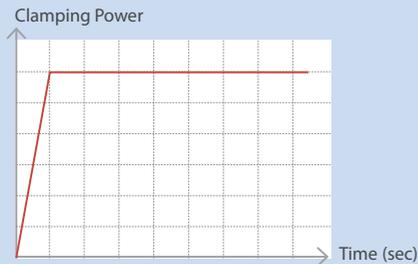
## 2. Overview

By precisely controlling the principles of magnetism, the electro-permanent magnetic chuck features the effect of clamping machine tool workpieces, which is better than fixing jigs or using electromagnetic chucks.

### 2-1 Permanent holding power

★★★★★

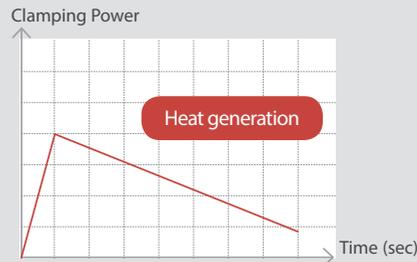
#### Electro-Permanent Magnetic Chuck | 5.0



- Magnetism occurs within seconds.
- Additional power supply is not required.
- When a machine operates, there is no interference between power lines.
- Magnetism is uniformly and permanently generated.

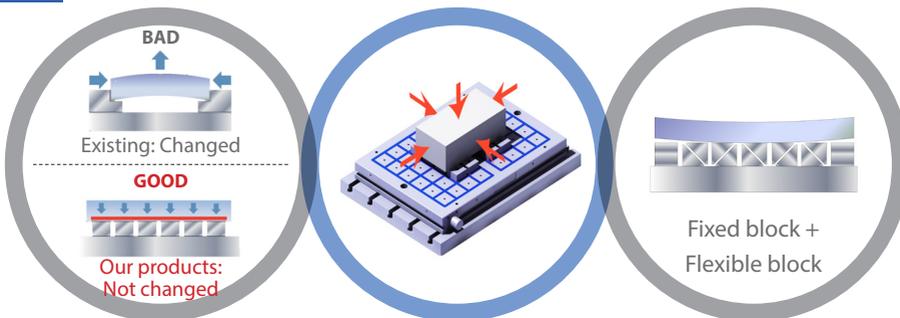
★★★☆☆

#### Electromagnetic Chuck | 3.0



- Electrical power must be constantly supplied even during machining operations.
- When a power outage occurs or there is disconnected power line, defects in machined workpieces may occur.
- Maintenance is difficult.
- Long-term use → Heat generation from the electromagnetic chuck → Decreased clamping power

### 2-2 Advantage: Overcoming the limitations of the existing clamping methods

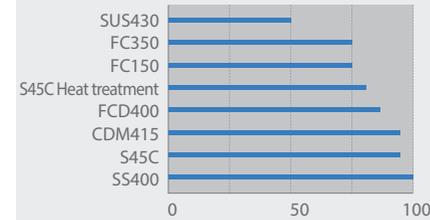


Machining operations without causing any change to materials

Allows machining of a five-sided workpiece without the interference of a clamping vise

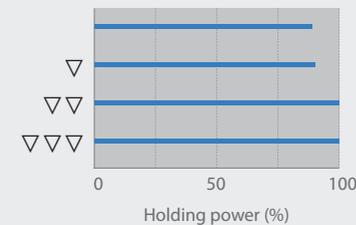
Allows the machining of curved materials

### 2-3 Holding power



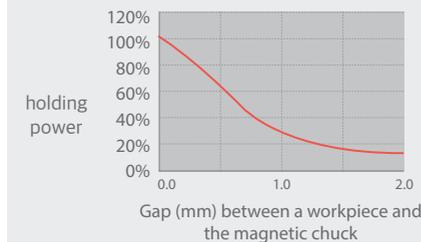
#### Holding power depends on the materials of the workpieces

The holding power of a magnetic chuck depends on the material quality of workpieces. Also, as the holding power is in inverse proportion to the amount of alloys, Stainless 304 is not held at all.



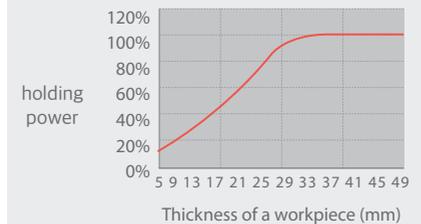
#### Holding power according to the surface finish of workpieces

The surface of a workpiece coming in contact with the magnetic chuck must be even. The less prominent and inclined (close to being horizontal) the surface is, the stronger the holding power is.



#### Holding power according to the gap between the surfaces of a workpiece and the magnetic chuck

If there is a gap between a workpiece and the magnetic chuck because of dust, impurities, and foreign substances, the holding power decreases.



#### Holding power according to the thickness of workpieces

The thinner a workpiece is, the smaller the holding power becomes. In particular, note that for a workpiece with a thickness of 20 mm or below, the holding power exponentially decreases.

Note that although the magnetism is switched OFF, die steels, SKD11 (H, T) and S45C (H, T), or workpieces with less heat treatment may not be easily disconnected from the chuck because of the residual magnetism on the surface of the workpieces.

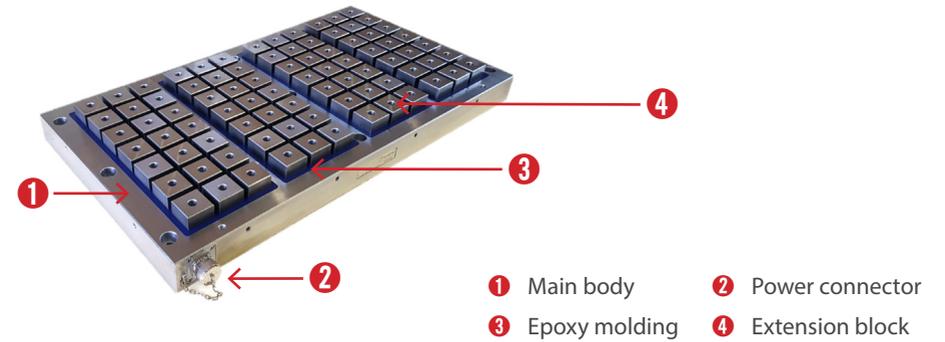
### 3. Components



No	Component name	Q'ty	Remarks
1	Main body of the electro-permanent magnetic chuck	1	
2	Controller	1	2-2CH, 2-4CH, 4-4CH / 5-m power cable
3	Wired remote controller	1	3.5-m electric wire
4	Extension block (square shaped)		
5	Wrench bolt with a six-sided head		
6	Eyebolt	2	
7	Chuck cable	1	3.5m
8	Fixing clamp	4	Installation components

### 4. Structure

#### 4-1 Structure of the electro-permanent magnetic chuck



#### 4-2 Structure of the controller

##### Front Side



- 1 Circuit protector for safety
- 2 Built-in switch for magnetizing/demagnetizing in response to an emergency

##### Rear Side



- 3 Magnetic Chuck (1) connector
- 4 Magnetic Chuck (2) connector
- 5 External PLC controlling connector
- 6 Wired remote controller connector
- 7 Power cable of the controller

##### Wired Remote Controller



- 1 Magnetism control
- 2 Magnetizing and demagnetizing
- 3 Channel selection

## 5. Installation and operating methods

### 5-1 Precautions

- 1 Follow the installation procedures as specified in the operating manual when installing the product.
- 2 First, turn off the power for safety, and install the main power cable with the help of an electrician.
- 3 In case a problem occurs during the installation, do not disassemble the product to prevent its damage.

### 5-2 Installation procedures



- 1 Secure the product with bolts using a slot or counterbore.



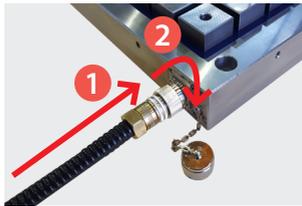
- 2 Fasten the extension blocks on the upper part using wrench bolts with six-sided head.



- 3 Check the ground plans of the electro-permanent magnetic chuck and the machine tool before micromachining the extension blocks.



- 4 Check for foreign substances in the connector. If such substances are present, remove them with an air gun.



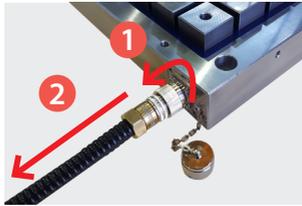
- 5 Insert the cable connector into the connector keyway, and fasten it to the right.



- 6 Turn on the controller power switch.



- 7 When the POWER LED of the remote controller switches on, place a workpiece on the electro-permanent magnetic chuck before magnetizing or demagnetizing it.



- 8 Afterward Disassemble the cable connector to the left.



- 9 Disconnect the cable from the electro-permanent magnetic chuck after magnetizing or demagnetizing. Then, tighten the waterproof cover to the right before machining the workpiece.

### 5-3 Controller specifications and levels and operating methods

- Controller specification: Power— 220 V of AC
- Magnetism levels of the electro-permanent magnetic chuck

LEVEL	1	2	3	4	5	6
Magnetism	30%	50%	70%	80%	90%	100%

- How to operate the controller



Plug the power and turn the switch ON.



If the remote controller is broken, use the Controller to select channels.



Magnetizing Method to Hold a Workpiece

Simultaneously press the magnetizing button and the safety button to activate the magnetizing function.



Demagnetizing Method to Disconnect a Workpiece

Simultaneously press the demagnetizing button and the safety button to activate the demagnetizing function.



Magnetism Control

Use the (+) and (-) buttons to control the magnetism.



Channel Selection

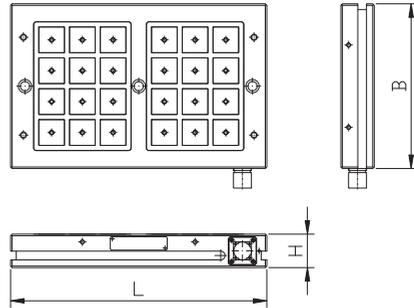
Use the CH1 and CH2 buttons to select the channels.

## 6. Specifications



Model	Dimensions (mm)			Weight kg	Poles no.
	B	L	H		
SEP50203	260	380	65	34	12
SEP50205		500		50	18
SEP50206		620		65	24
SEP50208		740		80	30
SEP50208S		810		87	33
SEP50209		910		94	36
SEP50210	1030	108	42		
SEP50303	320	380	65	44	16
SEP50305		500		65	24
SEP50306		620		84	32
SEP50308		740		104	40
SEP50308S		810		110	44
SEP50309		910		123	48
SEP50310	1030	141	56		
SEP50403	440	380	65	60	24
SEP50405		500		89	36
SEP50406		620		115	48
SEP50408		740		142	60
SEP50408S		810		155	66
SEP50409		910		168	72
SEP50410	1030	193	84		
SEP50503	500	380	65	72	28
SEP50505		500		106	42
SEP50506		620		138	56
SEP50508		740		169	70
SEP50508S		810		185	77
SEP50509		910		200	84
SEP50510	1030	230	98		
SEP50603	620	380	65	88	36
SEP50605		500		130	54
SEP50606		620		169	72
SEP50608		740		207	90
SEP50608S		810		225	99
SEP50609		910		246	108
SEP50610	1030	282	126		

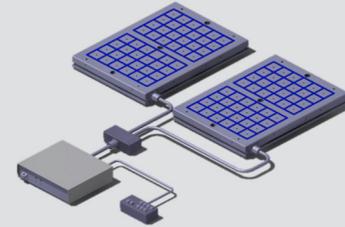
SEP → Model Series  
 5 → Pole Size  
 0203 → Body Size



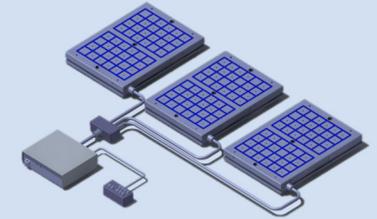
Other than our standardized products, our magnetic chucks that come in different sizes or shapes may also be customized.  
 e.g.) Side slots, connector directions, attaching holes, etc

## 7. Example

Two Magnetic Chucks  
 One Control Unit for two channels or four channels  
 One Junction Box  
 One Wired Remote Controller



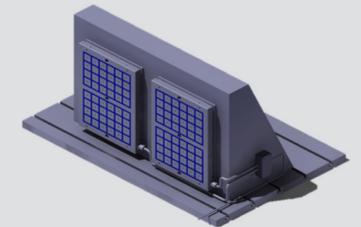
Three Magnetic Chucks  
 One Control Unit for three channels or six channels  
 One Junction Box  
 One Wired Remote Controller



Four Magnetic Chucks  
 One Control Unit for four channels or eight channels  
 One Junction Box  
 One Wired Remote Controller



Two Magnetic Chucks  
 One Control Unit for two channels or four channels  
 One Junction Box  
 Three Wired Remote Controllers



## 8. Maintenance

### 8-1 Maintenance of the electro-permanent magnetic chuck

- 1 Thoroughly remove pollutants such as chips, oil, and water after using the product.
- 2 Regularly check whether the extension blocks and the clamp blocks are secured in place.
- 3 When the product is not in use, close the waterproof connector cover, and apply oil to prevent rust and corrosion.

### 8-2 Maintenance of the controller

- 1 Regularly check the connector for foreign substances.
- 2 Regularly check whether cable has been damaged or whether the sheath of the copper cable has peeled off.
- 3 Keep the product in a dry and well-ventilated place after its use.

### 8-3 Overall maintenance

- 1 Only electricians are allowed to conduct tests on the product.
- 2 Always switch off the power before testing the product and implementing maintenance work on it.
- 3 Do not place the product where the floor is wet.
- 4 Wear safety shoes and insulating gloves during machine testing and maintenance.
- 5 Only the manufacturer's employees may disassemble the product.
- 6 Attention should be paid to avoid damage caused by external impacts.



The product is certified as follows.

Product name	SSEN CHUCK
Warranty period	12 months

Sangwon ENG warrants that this product has successfully undergone a strict comprehensive quality process prior to its release. This warranty covers machine failures that might occur during its transportation or normal operation.

This warranty shall not be reissued.



With respect to a failure caused during the warranty period, services and components are provided free of charge in the following cases:

- Where defects are found in the product itself when it is initially installed; and
- Where a failure during a normal operation is attributed to manufacturing defects.

In the following cases, services and components provided by the manufacturer will be charged according to its price list:

- Where the warranty has expired;
- Where a failure stems from customers' neglectful handling of the product such as its transport and excessive operation; and
- Where a failure is attributed to natural disasters such as a fire, a flood, abnormal voltage, etc.; and
- Where the product is arbitrarily modified or repaired by a party other than the manufacturer.



## Electro Permanent Magnet Chuck Manual

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