

# USER MANUAL

## MACMAG magnetic separator MHK • MHF

**Important : Read the safety precautions before use.**

**Thank you for your purchase. This user manual contains important information on avoiding damage and personal injury resulting from the use of the equipment. Make sure you fully read and understand this whole manual before using the equipment.**

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# 1. Terminology used in safety precautions and its meaning



\*Important : These safety precautions must be observed.

The following information is provided in relation to safety precautions that must be observed in order to prevent damage or personal injury, both to persons using the equipment and to bystanders.

The information contained within is categorized as follows according to the extent of damage or personal injury that may be caused by failing to observe these safety precautions.


 <b>HAZARD</b>	Failing to observe safety precautions marked as shown on the left can be expected to result in imminent serious injury or death.
 <b>ALERT</b>	Failing to observe safety precautions marked as shown on the left can be expected to result in the possibility of serious injury or death.
 <b>CAUTION</b>	Failing to observe safety precautions marked as shown on the left can be expected to result in the possibility of serious injury or physical damage.

The information contained within the safety precautions is also further categorized as follows.

	Information marked with this symbol indicates prohibited actions that must not be taken.
	Information marked with this symbol indicates mandatory actions that must be carried out.


## Clothing


To avoid accidents resulting from clothing being wound or caught in the equipment:

 <b>ALERT</b>	Remove gloves and ensure that clothing is in good condition and worn neatly.
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## Working Environment


To avoid accidents resulting in fire or falls:

 <b>ALERT</b>	There is a risk of fire when using oils. Keep them away from flames and sparks.
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 <b>CAUTION</b>	There is a risk of being caught on protrusions on the tank, sludge box and other parts of the equipment. Always watch your step and position.
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## Installation

To avoid electrocution and electrical accidents:

 <b>ALERT</b>	To avoid serious injury resulting from electric shock, ensure that the equipment is grounded or earthed.
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## Attachment of Safety Equipment

To avoid accidents resulting in serious injury or death:

 <b>ALERT</b>	Ensure that the safety cover is firmly closed.
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## Operation

To avoid accidents involving fingers and hands being caught in the equipment:

**⊘ ALERT** Do not remove the safety cover while the equipment is running.

## Maintenance, Inspections and Cleaning

To avoid electrocution and electrical accidents:

**⚠ HAZARD** To avoid the risk of electric shock, always turn the main power to the equipment off before performing maintenance and inspections.

To avoid injury to or loss of finger:

**⚠ ALERT** The chute and the edge of the scraper are sharp. Use caution when cleaning these parts to avoid cutting your fingers.

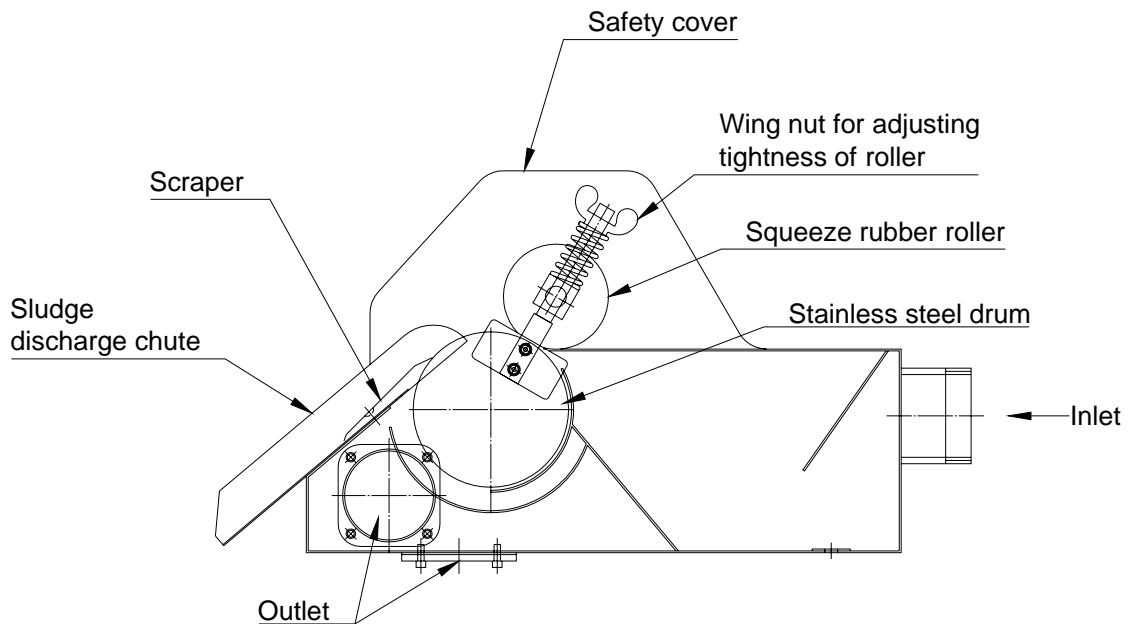
To avoid damage to watches, magnetic cards and other items susceptible to magnetic fields, and to prevent metallic objects from being caught in the equipment:

**⚠ ALERT** The magnetic drum produces a strong magnetic field. Items susceptible to magnetic fields should therefore be kept away. There is also the risk of the magnetic field attracting metallic objects.


**⚠ ALERT** The magnetic drum is extremely heavy and produces an extremely strong magnetic field. There is therefore the risk of the drum being dropped or falling, or attracted to metallic objects.

## 2. Overview of Equipment Parts and Operation

Contaminated liquid expelled from other processes is fed into the magnetic separator through the inlet. When the liquid passes through the drum, impurities (magnetic material) are attracted by the strong magnetic field and effectively extracted from the liquid. The resulting clean liquid is expelled from the outlet. Impurities held on the stainless steel drum by the magnetic field are scraped off and deposited in the sludge box by the scraper.




### 3. Safety Precautions when Installing

 CAUTION
There is a risk of being caught on protrusions on the tank, sludge box and other parts of the equipment. Always watch your step and position.

Ensure that the inlet and outlet can be disconnected easily.

The equipment may overflow if the correct fluid feed rate is not observed.

- 1) Remove packaging materials from the magnetic separator and position it where it is to be installed (ensure that it is installed on a flat surface).
- 2) Firmly fix the magnetic separator in place with strong bolts using the holes in the installation brackets (ensure that the location is relatively free of vibrations).
- 3) Wiring:

 ALERT
To avoid serious injury resulting from electric shock, ensure that the equipment is grounded or earthed (Category-3 Equipment Earthing)


) Power supply : 3-phase, 50/60 Hz, 200 V. Remove the lid from the terminal box on the drive motor in order to connect the power supply (ensure that it is located indoors and that it will be easy to perform inspections).

) Use magnetic switches and pushbutton switches in order to protect the drive motor.

) Direction of drum rotation:

Ensure that the drum rotates in the direction in which the sludge is expelled (stable location). If the drum rotates in the opposite direction, swap two of the three wires on the power supply.

### 4. Preparing for Operation

 ALERT
Removing the safety cover while the magnetic separator is in operation will expose rotating parts creating the risk of persons or objects being caught in the equipment. Do not remove the cover. If the lid on the drive motor's terminal box has been removed, ensure that it is replaced before supplying power to the magnetic separator.

1) Cautions before operating:


- ) Do not remove the safety cover while the equipment is in operation.
- ) Do not place fingers or other objects within the rotating parts of the separator while the equipment is in operation.
- ) Before operating the magnetic separator, check the surroundings and ensure that the equipment is operated under safe circumstances.

2) Test operation

- ) Turn the power on and off several times to check the direction of drum rotation (equipment faults or malfunctions may result if the drum rotates in the wrong direction).
- ) Turn the power on and operate the equipment.


## 5. Safety Precautions when Operating the Equipment

- 1) Do not operate the equipment if any of the parts are not working.
- 2) Do not allow the motor to get wet. This may cause it to short out.
- 3) Fluid output may be high when the upstream process is not running.

 <b>ALERT</b>
Cut the power to the equipment during electrical outages to ensure that the equipment does not start up suddenly when the electricity is restored. There is a risk of personal injury if this precaution is not observed.

- 4) Foreign objects caught in the equipment may cause roller slippage and excess equipment wear.
- 5) Excess sludge inflow will block the coolant pathway and cause the equipment to overflow.
- 6) Exceeding the maximum rate of fluid inflow will reduce separation performance and cause the equipment to overflow.

## 6. Maintenance and Inspections

 <b>ALERT</b>
Always stop the equipment and disconnect the power off before performing maintenance and inspections, replacing parts, dealing with faults or malfunctions occur or performing any other modifications or adjustments. Personal injury may result if working on the equipment while the power is on. Always place a "DO NOT TURN POWER ON!" sign on the equipment when performing inspections.

### 1) Inspection table

Maintenance, inspections and adjustments are essential to ensure the safe and normal operation of the equipment. Carry these tasks out in accordance with the inspection table shown below.

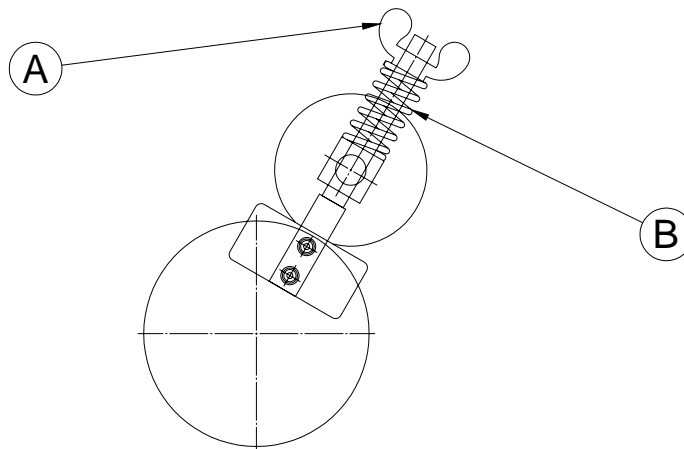
Inspection details	Inspection frequency	Inspection method	Response
Improper drum or roller rotation	Daily	Visual	Replace
Foreign objects caught in the roller	Daily	Visual	Remove
Scraper wear or damage	Once a month	Visual	Replace
Roller wear	Once a month	Visual	Replace
Loosening of screws	Once a month	Visual/Check by hand	Tighten
Sprocket and chain wear	Once every six months	Visual	Replace
Excess/abnormal noise or heat generated from bearings	Once every six months	5 senses/Check by hand	Replace
Heat generated by motor	Once every six months	Temperature gauge	Max: Ambient +50
Sludge in tank	Schedule periodic tank cleaning depending on the operating status of the machine.		

2) List of consumable items

No.	Name of consumable item	Lead time
1	Sludge scrapper	1 month
2	Roller	1 month
3	Oil seals	1 week
4	Bearings	1 week
5	Sprocket and Chain	1 week
6	Gear head	1 week

3) Adjusting the roller

If the roller is not supplying enough force on the drum, turn the wingnut (A) in order to adjust the tension of the spring (B).



## 7. Determining the Causes of and Resolving Equipment Problems

Details of problem	Causes		Solution
Magnetic separator stops	Electrical	No power	Investigate power supply
		Disconnected cable	Find point of disconnection and replace or reconnect
		Thermal fault	Replace
		MS fault	Replace
		Motor burnt out	Replace
	Foreign object caught in machine		Remove
	Sprocket or chain wear		Replace
	Magnetic drum bent, deformed or damaged		Replace
	Damage to bearings		Replace
Fluid overflow	Maximum rate of inflow exceeded		Adjust valve to return to correct rate of flow
	Foreign object caught in machine		Remove
	Outflow pipe too small		Use appropriate piping
	Change of coolant		Altering the viscosity may result in inadequate coolant performance. Seek advice.
Separation performance low	Change in quality of materials		Seek advice
	Increase in impurities in fluid resulting from a change in specifications		
	Maximum rate of flow exceeded		
	Change of coolant		
	Change of inlet		Avoid direct impacts on the drum

## 8. Warranty

- 1) The warranty period on this equipment is one year from the date of shipment from the factory. If machine faults or malfunctions occur within this one year period, despite proper use of the equipment, the corresponding parts will be repaired or replaced free of charge. However, this warranty is limited to those mechanical parts that have failed or malfunctioned, and no guarantees are provided in relation to expenses or losses incurred as a result of faults, malfunctions or downtime.
- 2) Regardless of the warranty period, expenses (technician callout, repair, replacement, etc.) arising in relation to faults and other problems due to the following causes are not covered by the warranty:
  - ) Precautions and procedures relating to installation, pipes, wiring, operation, and maintenance and inspections were not observed (required tasks not performed or prohibited actions carried out);
  - ) Repairs or modifications carried out without approval;
  - ) Problems caused by devices not supplied by us;
  - ) Problems due to disasters or accidents resulting from natural disasters or natural phenomena;
  - ) Use of the equipment in a manner other than set out in the specifications (e.g., use of different coolants, exceeding the flow rate, etc.).
- 3) In the event that the cause or causes are unclear, a course of action will be decided on based on discussion and consultation.