

Installation, Operating, Maintenance & Safety Instruction

for M PUMPS CM MAG-P Series

Centrifugal light Mag-Drive pumps (CM MAG-P4/6/10/15/30)



This manual presents installation, servicing, troubleshooting, maintenance for
M PUMPS CM Mag-P SERIES

Information that may be required regarding performance, alterations or detailed technical data which is not included here may be obtained from your M PUMPS representative.

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1) SAFETY

INSTALLATION, OPERATION AND MAINTENANCE MUST BE DONE BY THOROUGHLY QUALIFIED PERSONNEL IN STRICT ACCORDANCE WITH THIS MANUAL AND MUST COMPLY WITH ALL LOCAL, STATE AND FEDERAL CODES.

For your protection and the protection of others, learn and always follow the safety rules outlined in this booklet.

Observe warning signs on machines and act accordingly. Form safe working habits by reading the rules and abiding by them.

Keep this booklet handy and review it from time to time to refresh your understanding of the rules.



DANGER

The use of the word “DANGER” always signifies an immediate hazard with a high likelihood of severe personal injury or death if instructions, including recommended precautions, are not followed.



WARNING

The use of the word “WARNING” signifies the presence of hazard or unsafe practices which could result in severe personal injury or death

if instructions, including recommended precautions, are not followed.

CAUTION

The use of the word “CAUTION” signifies possible hazards or unsafe practices which could not result in minor injury, product or property damage if instructions and recommended precautions are not followed.

MAGNETIC

CM MAG-P are magnetic driven pumps. The use of the word “Magnetic” indicates the persistent presence of a magnetic field. Such fields present immediate danger to individuals having electronic medical devices, metallic heart valves, metallic prosthetics or metallic surgical clips.

2 INSPECTIONS

All M PUMPS products unit are inspected prior to shipping and prepared for safe transportation.

Upon receipt of CM MAG-P pump, check usually for any damage which may have occurred during shipment.

Notify the courier and M PUMPS promptly if damage has occurred.

3 STORAGE

If the pump is not installed immediately, it should be protected from exposure to moisture and dust.

Shipping protections of the ports installed at the factory, must be kept securely in place.

Storage instruction provided by the driver manufacturer should be observed.

4 INSTALLATION

Locate the pump on a firm base close to the liquid source, preferably below liquid level in such a way to be easily accessible for maintenance and inspection.

5 OPERATION SAFETY BASICS

Listed below are some of basics you should keep during mind in addition to your own company rules regarding installation, operation and maintenance:

NEVER: start this pump without proper prime (casing must be full of liquid)

NEVER: operate these pumps with the suction or the discharge valve closed.

NEVER: run this pump dry over a few minutes.

NEVER: operate pump if there are question signs of leakage.

NEVER: change pump condition of service without approval of your M PUMPS representative.

NEVER: loosen port connection while system is under pressure.

NEVER: attempt to clean the pump while it is operating.

NEVER: operate pump above rated temperature and pressure.

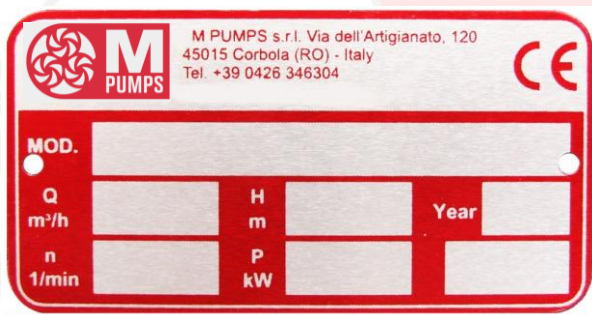
NEVER: Pump liquids containing ferromagnetic particles of any size, or substances which will erode or chemically attack the internal parts of the pump. If in doubt, please contact your pump supplier for advice.

NEVER: Restrict both the inlet and the discharge lines while the pumps are running. Restriction of the inlet may cause the pump to cavitate, leading to loss of efficiency and rapid wear.

If the pump is to be shutdown for an extended period, circulate clean water (or other suitable solvent compatible with pump materials) for several minutes, to avoid the risk of internal precipitation or encrustation.

6 PUMP IDENTIFICATION

Every M PUMPS pump unit has a nameplate located on the side of the casing. It is recommended that the purchaser record the serial number and reference it when requesting information or service parts from M PUMPS. The serial number must be used for all correspondence and spare parts order.



Nameplate

7 ELECTRICAL

DANGER

- ▲ Only a qualified electrician should make the electrical connections to the pump drive motor.
- ▲ Thoroughly read motor manufacturers instructions before making installation.
- ▲ Check motor nameplate data to be certain that all wiring, switches, starter, and overload protection are correctly sized.

Install the motor according local electrical codes. Check all connections to motor and starting device with wiring diagram. Check voltage, phase, and frequency on motor nameplate with line circuit.

NOTE: Install a flexible electrical coupling on the motor. Allow for movement of at least 12 inches. This is necessary to service and inspect the pump.

10 TROUBLESHOOTING

8 PUMP SPEED

CM MAG-P *M PUMPS* are designed to rotate at speed up to 4000RPM.

Standard speeds are:

ELECTRIC MOTOR	50Hz	60Hz
2POLES	2900RPM	3500RPM
4POLES	1450RPM	1750RPM

If the pump is driven at variable speed via an a.c. frequency inverter, keep within the recommended limit of speed.

9 STARTING

Fully open the suction valve. Pump requires a flooded suction.



WARNING

- ▲ Do not operate pump with suction or discharge valve closed. Operating pump more than a few minutes with the suction valve closed can cause bearing failure.



CAUTION

- ▲ Check driver for proper rotation. Correct rotation is clockwise when viewed from the pump casing.



CAUTION

- ▲ At start-up immediately check pressure gauges. If discharge pressure is not quickly reached stop the driver, relieve and attempt to restart.

- Check the pump and piping to assure that there are no leaks.

TROUBLE	POSSIBLE CAUSE	INVESTIGATIVE/CORRECTIVE ACTION
No flow, no pressure at start up.	Pump not completely filled with liquid.	Check the suction conditions as the pump must be full-filled. Allow more cool down time if pumping low temperature fluid. Check suction line for air leak if suction pressure is lower than atmospheric.
	NPSH actually lower than NPSH requirement listed on specification sheet.	Suction line blocked – check suction screen and valve. Excessive pressure drop through suction piping. Flow restricted by vapour pockets in high points of suction line. Suction tank level or pressure too low. Entrained air or vapour in pumped fluid. NPSH reduced by presence of more volatile fluid in process fluid.
	Failure of drive component, such as interconnecting shaft.	Disassemble and inspect.
	Reverse direction of rotation.	Note: impeller and driver rotate in the same direction.
Insufficient flow or head-rise.	NPSH actually lower than NPSH requirement.	Refer to solutions listed under “No flow, no pressure at start-up”.
	Diffuser discharge partially plugged or impeller damaged by passage of a solid particle.	Clean these areas of all obstructions and restore surfaces to a smooth polished finish (use emery cloth or machine), free of all corrosion pitting.
	Drive speed too low.	Check speed against value listed on specification sheet.
Driven overloaded.	Pressure gauges of flow meters in error.	Calibrate instrumentation.
	Fluid specific gravity or viscosity higher than values listed on specification sheet.	Check actual viscosity and specific gravity against value listed on specification sheet.
	Electrical failure in electric driver.	Check circuit breaker heater size and setting. Check voltage. Current for each phase should be balanced within three percent.
	Mechanical failure in driver, or pump.	Remove driver and check for freedom of rotation of pump shaft assemblies. Remove fluid end and search for any mechanical failure.
	Insufficient NPSH.	Refer to solution for insufficient NPSH under “No flow, no pressure at start-up”, above.
Excessive discharge pressure pulsations.		

11 MAINTENANCE AND DISASSEMBLY

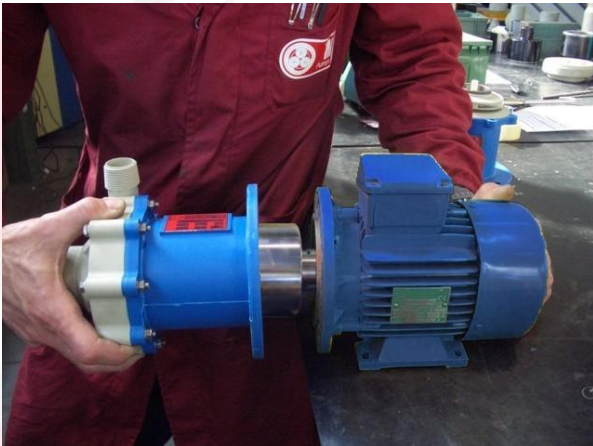
The maintenance and disassembly procedure are intended for use during standard field inspection or service.

CM MAG-P *M PUMPS* contain very strong magnets.

The use of non metallic work surface is highly recommended.

In case the pump has to be sent back to the manufacturer to be reconditioned, in case it pumped aggressive or toxic liquids, the same has to be thoroughly drained and cleaned by the customer.

- 1) Remove bolts connecting pump and motor to foundation or base plate.
- 2) Remove hex bolts connecting pump to motor.
- 3) Separate the pump from the motor and pull the driver away from the pump.



WARNING **MAGNETIC**

▲ **M PUMPS** units contain extremely strong magnets. The use of non magnetic tools and work surface is highly recommended.

▲ Strong magnetic attraction when disassembling / assembling drive end to liquid end.

CAUTION

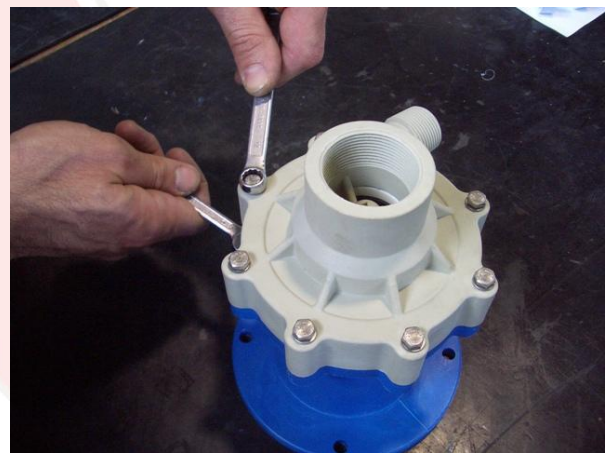
A) Disassembly

In case the pump has handled hot liquids, make sure that it cools down before disassembling it. The pump could have handled dangerous or toxic liquids: it is therefore necessary to wear protections for the skin and the eyes.

The liquid must be recovered and eliminated according the existing environmental laws.

▲ **The shop area must be clean and free of any ferrous particles.**

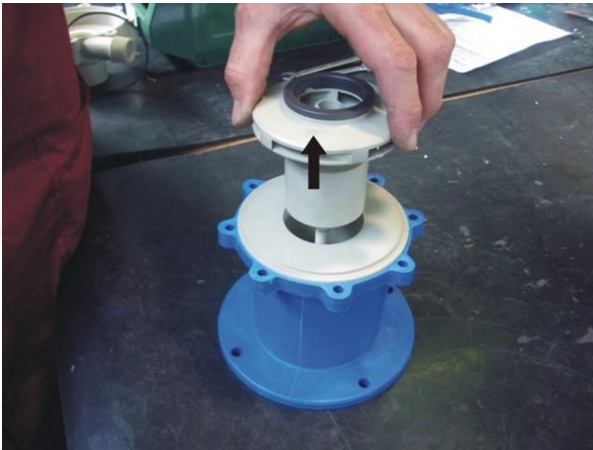
- 4) Remove pump casing hex nut.



- 5) Pull out the pump casing and then verify the status of the O-ring and pump casing thrust bearing. Replace it if necessary.



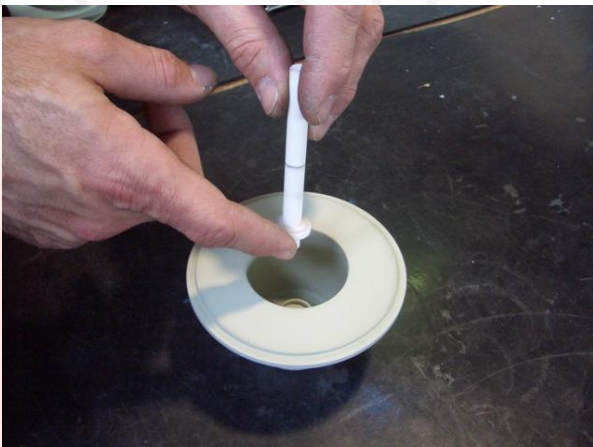
- 6) Pull out the internal assembly from the pump rear casing. Check status of all internal parts and replace it if necessary.



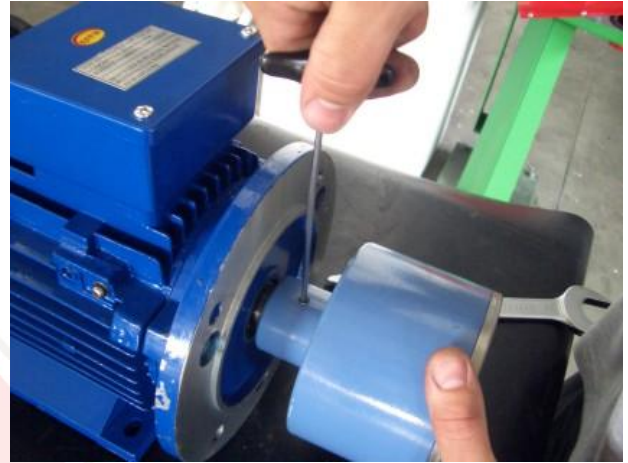
7) Pull out the rear casing with the shaft.



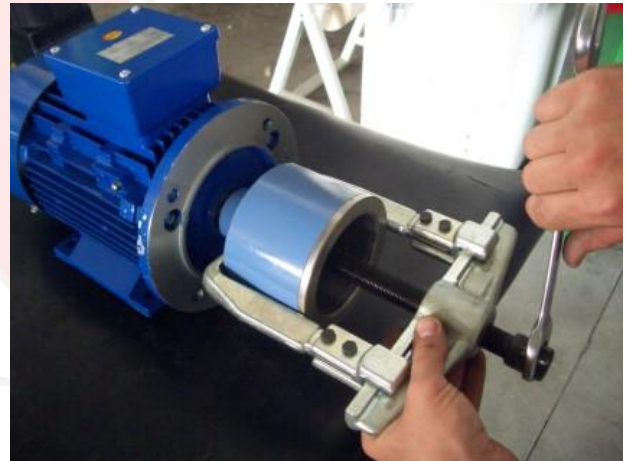
8) Pull out the shaft and the rear ring, check status and replace if necessary.



9) Remove the external magnet screws.



10) Using an extractor pull-out the external magnet from motor shaft.



To re-assembly the pump, please follow the above instruction on the contrary.

CAUTION

▲ **Thoroughly clean all parts before assembly. Make sure all parts are free of dirt, metallic particles, etc.**



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