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## GPHV SERIES OSCILLATING DISC MAGNETIC DRIVE PUMP

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### *INSTALLATION, OPERATIONAL MAINTENANCE MANUAL*

PLEASE READ CAREFULLY ALL THE NOTES INCLUDED IN THIS MANUAL IN ORDER TO OBTAIN THE BEST PERFORMANCES OF YOUR GREENPUMPS GPHV SERIES.

Missing observation of the procedures included in this manual could cause heavy damages to your GREENPUMPS pump and contractual guarantee will expire.

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### **GENERAL INFORMATION**

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GPHV oscillating piston pumps are based on the transfer of high viscosity fluids or fluids which may be influenced by their being shaken and on high volatile fluids such as solvents.

The main features of these pumps are:

#### **DRY SELF PRIMING**

Because of the high vacuum generated during the suction, this pump does not need any previous filling and so they do not need any foot valve.

#### **REVERSIBILITY**

By inverting the sense of rotation the flow of the liquid is also inverted while keeping unchanged the technical characteristics. In order to do this, we need to change position to a grain located inside the pump casing. This grain must be installed in the low pressure side.

Please consult the factory or your Greenpumps Area Distributor.

#### **SLOW ROTATION SPEED**

In this case reliability and lack of liquids sharing are granted.

## **ELASTICITY OF THE IMPELLER**

It allows the adaptability of these pumps to a large range of viscosities, tolerances and thermal expansion adjustments and also it allows the pumping of particles.

In the latter case please consult the factory.

As far as the used materials are concerned, GREENPUMPS GPHV pumps may be built in cast iron, bronze or stainless steel, according to the chemical properties of the pumped fluid.

The pumps are built in four sizes with:

**FLOWS UP TO 25 m<sup>3</sup>/h – HEAD UP TO 5 BAR**

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## ***INSTALLATION & MAINTENANCE***

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Please make sure that the pump speed is the one advised according to the type of fluids and their viscosity.

Afterwards, please connect the piping flanges to the pump ports inserting a suitable gasket in order to avoid air suction and / or dangerous leakages.

Anchor the pump to a rugged base plate and avoid any piping vibration or exceeding max allowable flanges loads.

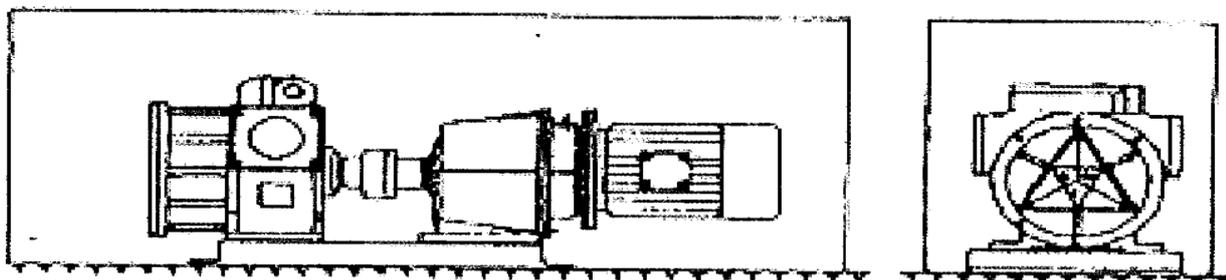
Place the pump as close as possible to the suction tank.

Connect pipes with a diameter not smaller than the pump ports diameter.

In presence of high density liquids, it is advisable, at least as far as the suction pipe is concerned, the use of pipes of larger sizes.

During piping design and installation, it is necessary to avoid any restriction and obtain wide angle curves only.

It is advisable also to have a large enough space left around the pump to allow maintenance and routine checking and oil changing into the gear box.





The GREENPUMPS GPHV, because of their self-priming ability, do not need any foot valve, unless volatile liquid and system with high negative suction head is used.

In such case it is advisable to provide a foot valve with inside diameter not smaller than the one of the suction pipe.

It is also advisable that the piping, on its horizontal part, should have a slight down grade towards the pump so that a little amount of liquid remains inside the pump.

Install check valve to be able to remove the pump from the system without any loss of liquid, particularly if the piping cannot be drained.

In the presence of high viscosity and/or low temperature liquid, it is necessary to equip the pipe and the pump with a suitable heating system and an insulation in order to minimize the increase of viscosity and the friction losses, with consequent suction problems and motor overload.

It is advisable for outdoor installation to provide an easily removable cover.

As soon as the installation has been completed, please make sure that the pump shaft is free to rotate and, to do this, it is enough to rotate either the joint or the motor fan.

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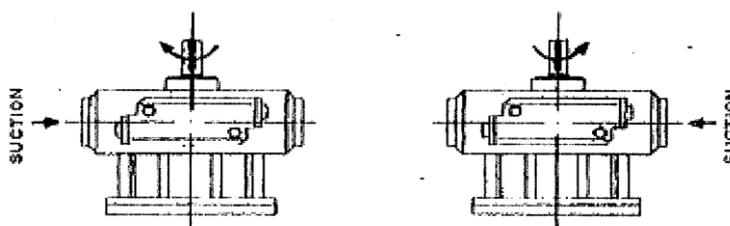
### ***OPERATING INSTRUCTIONS:***

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Please verify that the sense of rotation is correct.  
Viewing the pump from the motor side:

- If the pump rotates clockwise the suction is from the right side
- If the pump rotates anti-clockwise the suction is from the left side.

To reverse the flow it is sufficient to reverse the sense of rotation of the motor and consequently, pump rotates on the reverse side and change position to a grain located inside the pump casing. This grain must be installed in the low pressure side. For this operation please consult the factory or your Greenpumps Area Distributor.



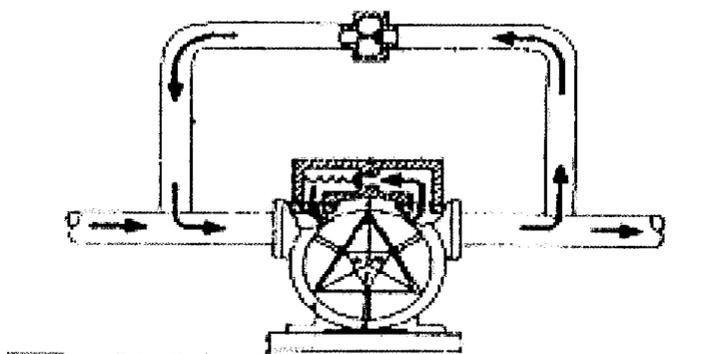
**FIG. 2**

Check that the motor voltage corresponds to the right one.

For high power motors it is advisable the use of delta star starting.

Before starting the pump, check the oil level in the gear-box, if it is oil-lubricated. The gear boxes of the MAS series are grease lubricated excluding MAS 45 type, which is oil lubricated (in any case please refer to the gear-box instruction manual).

It is advisable to protect the pump from functioning against closed or obstructed discharge valve. For that reason it is also advisable to install a by-pass on the discharge pipe.



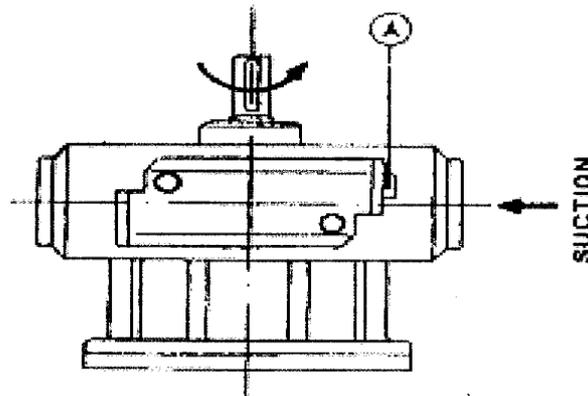
**FIG. 3**

The max pressure valve (if pump is provided with) must be adjusted according to the required pressure of the system.

To adjust it, it is necessary to rotate the nut, set on the suction side (Fig. 4 Pos. A).

- Rotate clockwise if you want to lower the opening pressure on the valve
- Rotate ant-clockwise if the pressure has to be increased.

If the max pressure valve (if pump is provided with) is of the one way type, the setting nut has to be positioned on the suction side.



**Fig. 4**

In the case of double pressure valve, the setting is to be made by acting on the suction side.

### **GREENPUMPS OSCILLATING DISC PUMPS ARE REVERSIBLE**

For that reason it is compulsory to consider the installation of non return valve, to avoid that the pump, when stopped, rotates spontaneously with reverse sense of rotation.

This phenomena is caused by the pressure generated from discharge liquid column head with consequent reflux of the transferred liquid.

Such a feature can be conveniently used to empty the piping from the liquid which, when the pump stops, can solidify or however increase its viscosity.

When calculating the dimension of the piping, it is to be kept in mind that a smaller diameter than that advised for the outlet causes a higher pressure with excess of motor power need, thereby causing higher cost of energy.

Suction conditions, if badly designed, may generate malfunctioning of the pump, with consequent efficiency reduction and decreasing of the pump performance.

### **SUCTION PIPING MUST BE TOTALLY SEALED**

An air infiltration, even a very little one, can reduce or even reduce to zero the flow of the pump or the self-priming capability.

For the same reason all the connection valves and filters concerned must be checked.

When high viscosity liquids or liquids that could change drastically their viscosity with temperature lowering, it is necessary to equip the pump with a heating jacket and piping tracing and / or insulating.

The heating jacket is designed for system pressure up to 6 Bar and may be heated by hot water, steam or hot oil.

In the case of hot water or steam, do not forget to drain the heating circuit in case of prolonged pump stopping with low ambient temperature, in order to avoid the freezing of the system.



### **NEVER START THE PUMP IF TOTALLY DRY**

If necessary, fill the pump with the liquid to be pumped, particularly when the suction pipe is very long.

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## ***INSTALLATION AND MAINTENANCE:***

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### **GENERAL**

GREENPUMPS pumps series GPHV are supplied already greased, ready for use.

All the models are provided with greased ball bearings that need to be changed every 20.000 hours of running.

When pump is coupled with an oil gear box, it is necessary to check frequently the oil level and its replacement. See the instructions written on the gear box manual.

### **GENERAL CHECKING**

It is advisable to check periodically the wear and tear of the pump in order to prevent its abnormal functioning or even catastrophic damages.

This is essential when un-lubricated, corrosive fluids are pumped or when the liquid contains abrasive particles.

Pipes and filters must be checked and controlled and must be cleaned from any dirt or anything else which could obstruct the flow, causing an increase of the discharge pressure and motor overloading.

If the pump is used for liquid transferring; i.e. polymers or paint or any fluid that may solidify or polymerize, before each stopping it is necessary to carefully wash the pump internally with water or suitable solvent.

When the pump is not used for a long period of time it is advisable to run the pump from time to time with oil or fuel oil and wrap it with polyethylene or similar.

Before re-starting the pump take out the protective oil and if necessary, wash the pump accurately.

Run the pump shaft by hand until it rotates freely.

If it should not happen, then it is necessary to dismantle the pump and check it internally.

### **TROUBLE SHOOTING**

If properly installed and correctly used GREENPUMPS GPHV PUMP render a safe and reliable service with very low maintenance.



In the case of some trouble on the functioning such as:

**INSUFFICIENT FLOW**

**PULSATIONS AND VIBRATIONS**

**MOTOR OVERLOADING**

These inconveniences may be caused by:

- Wrong direction of rotation;
- Too high suction head;
- Too high suction friction losses (foot valve, undersized filter, obstructed filter, fluid with excessive viscosity);
- Entrained air into the suction pipe;
- Discharge max pressure valve obstructed by dirt or not properly set;
- Safety valve set with too low pressure;
- Too high discharge head which causes relief valve opening;
- Too small suction pipe diameter related to the fluid viscosity and pump rotating speed;
- Air pockets into either the pump or piping;
- Failure or stress of internal rotor shaft spring;
- Wear and tear of pumping parts.

NOTE: carefully check the clearances between the rotor impeller and pump body and also the tolerance between rotor impeller and pump casing which, in case of liquids with relatively low viscosity, should not exceed 0,05 mm.