

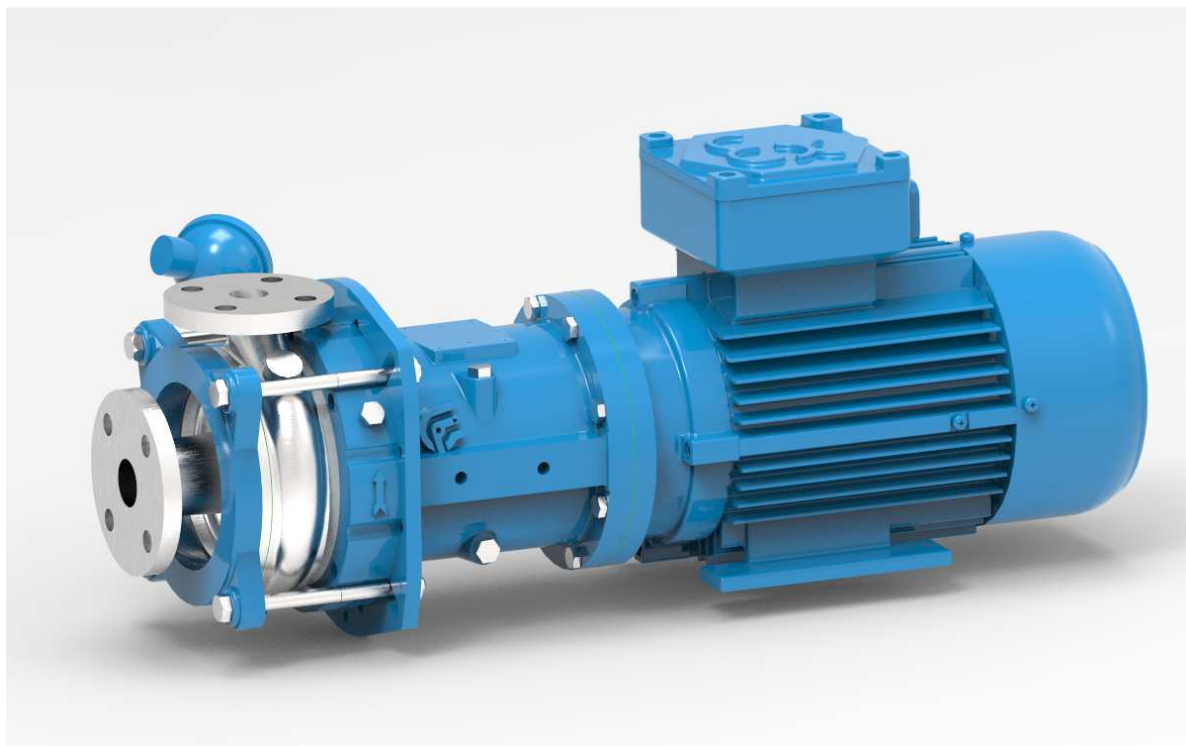


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MAGNETIC COUPLING PUMPS

MG-LG



INSTRUCTION MANUAL FOR INSTALLATION, OPERATION AND MAINTENANCE



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I GENERAL

This pump has been manufactured according to proven techniques, guaranteeing a reliable machine in compliance with the 2006/42 / EC machine directive. The condition of a good functioning and a long use resides in the strict observation of this note. It is imperative to ensure, prior to installation, that all service conditions meet its specification.



This manual contains information for installation, service and maintenance, as well as the essential conditions to be met for safe and reliable use of the pump. This manual, as well as any accessories supplied with the unit, must be read carefully before proceeding with the installation and start-up of the pump.

This manual contains instructions for the installation, operation and maintenance of MG-LG pumps, mainly with regard to the safety of people and property. However, since it is not possible to provide an exhaustive list of all incidents that may occur on all installations, it is mandatory that the staff be appropriate, specialized and expert in the tasks mentioned below, both in terms of installation and operation. The said staff should have the opportunity to read this manual carefully, and to contact the company **POMPES GROSCLAUDE** for any particular problem that is not addressed in this manual, or for more detailed explanations or additional. For these contacts, it is absolutely necessary to indicate the serial number of the pump concerned.

In accordance with the Labor Code, the employer must inform, in an appropriate manner, the workers in charge of the implementation and maintenance of the work equipment. Communication to the end operator of the instruction manual can help the user to comply with the Labor Code.

The pump must be used in the correct service conditions for which it was purchased and as described in the technical specifications of the technical file supplied with the pump. Any change in the physical or chemical characteristics of the pumped liquid or conditions of use shall be evaluated in cooperation with the manufacturer.

The pump has not been designed to exceed the performance (flow, head, rotational speed, temperature, pressure, etc.) indicated in the sales documents and / or on the nameplate or be used in the presence of ionizing radiation.



An additional leaflet concerning the protection for use in an Atex environment is attached to this manual and contains important warnings when the pump is installed in an explosive environment according to EU Directive 2014/34 EU: 2014; it is imperative to respect them in order to avoid all dangers. This does not take into account the safety regulations in force at the place of installation. The responsibility for their respect lies with the operator itself in the matter of the personnel to which it has called.

The company **POMPES GROSCLAUDE cannot be held responsible for any malfunction, deterioration due to conditions of service, use or liquid not consistent with that for which the equipment was designed.**

I-1 Warranty

Our equipment is guaranteed 12 (twelve) months after commissioning, limited to 18 (eighteen) months delivery date against any manufacturing defect or material defect. The guarantee is limited to the replacement or reparation, in our workshops, of the part recognized as defective.

The warranty does not apply to replacements or repairs that would result from normal wear and tear of equipment, damage or accidents due to negligence, lack of supervision or maintenance, faulty installation or any other reason beyond to our control.

Our warranty is void immediately and completely if the supplied material has been modified or repaired without our agreement. Repair, modification or replacement of parts during the warranty period cannot have the effect of extending the original warranty period. We do not accept any return of material without prior agreement from us.

In case of return to our factories, shipping and packing are the responsibility of the sender.

In any case, our contractual warranty does not replace the legal warranty that requires the professional seller to guarantee the buyer against all defects or hidden defects of the thing sold. However, the contractual guarantee does not in any way imply the possibility of a claim for damages or indemnities. We are not responsible in case of particular destination of the material or subjection not declared by the purchaser in the order form.

I-2 L liability limitation

The responsibility of **POMPES GROSCLAUDE** for recourse of any kind does not exceed in any case the purchase price of the equipment and / or installation at the origin of the recourse. It ceases at the end of the guarantee period defined in Chap I-1. "Recourse of any kind" means any loss or damage arising out of or in connection with, including negligence, performance, design, manufacture, operation, use or even possibly, at the installation, to the decisions of technical direction of the installation, the visit, the maintenance or the repair of any equipment and / or any installation delivered.

Under no circumstances, either as a result of a breach of the **POMPES GROSCLAUDE** warranty, or by negligence, **POMPES GROSCLAUDE** will not be liable for any particular and consequential immaterial damage including, but not limited to:

- Loss of profit and income,
- Loss of use of equipment, installations or ancillary tools,
- The cost of capital, the cost of equipment, or replacement facilities,
- Services and equipment they require
- Costs of downtime or recourse of the buyer's customers for these damages

II SAFETY

As a manufacturer, we allow you to remember the following recommendations

- Internal instructions and safety legislation must be followed and respected.
- Only suitable tools and handling equipment should be used.
- The pump must be used in the correct operating conditions for which it was purchased and as described in the technical specifications of the technical file supplied with the pump. Any change in the physical or chemical characteristics of the fluid carried or conditions of use shall be evaluated in cooperation with the manufacturer.
- All safety standards specific to electrical equipment and those specified by the manufacturer must be respected.

II-1 Meaning of symbols used in this manual

The instructions to be complied with to prevent any danger to persons are indicated by the symbol:



Electric current risks are indicated by the symbol:



Machine integrity risks are indicated by the symbol:



Explosion-proof protection instructions are indicated by the symbol (see Appendix):



Markings placed directly on your pump such as an arrow indicating the rotating direction or arrows indicating the inlet or outlet holes must be respected and maintained in good reading condition.

II-2 Personnel qualifications and training



The personnel responsible for installing, operating and maintaining the equipment must be competent, authorized and informed about the rules of the art and have this manual in their possession. Before proceeding with any operation, the pump purchaser must verify and ensure that the personnel authorized to perform these tasks have read and understand the contents of this manual.

In the event where the personnel would not be competent, the operator must be trained accordingly. Personnel incompetent to perform assembling / disassembling operations could cause risk to:

- Operator lives (effects of an explosion)
- The pump and its environment
- Characteristics normally obtained from the pump

The company **POMPES GROSCLAUDE** will be relieved of all responsibility in event of accident.

When the unit is installed in an explosive environment, the appendix of this notice marked must be particularly respect:



(NCPAE 19b-02)

II-3 Accident prevention

The purchaser of the equipment agrees to comply with all the safety instructions mentioned in this manual.



In potentially explosive areas, the operator is responsible for ensuring the proper operation of the equipment and for preventing any failure leading to an unacceptable mode of operation for the equipment.

II-4 Safety instructions for users

This pump has been manufactured in accordance with the standards for pump safety, in a temperature classification T1 to T5 European Directive 2014/34 EU: 2014



- Parts subject to temperature fluctuations ($T^{\circ}C > 65^{\circ}C$ or $T^{\circ}C < -20^{\circ}C$ present a risk of burning by hot or cold) and whose contact can be hazardous must be protected by appropriate systems. Sudden changes in liquid temperature cause thermal shock and may cause damage or destruction of some pump components. They must be specially avoided when the pump construction materials have not been selected for this eventuality and / or the manufacturer has not been informed that this is the case.
- Protections against accidental contact of moving parts (*coupling guard, for example*) should only be removed when the machine is switched off and off. The pump should never be started without a coupling guard or any other protection provided with the pump. Starting in the wrong direction of rotation can damage the pump and must be checked according to the rules of the art. The maximum rotation speed is indicated on the nameplate or it is indicated in the technical specifications of the technical file provided with the pump.
- To protect people and the environment according to the regulations in force considering the temperature, the toxicity, the harmfulness, the flammability, the corrosivity etc. of the conveyed fluid, protection, filling and emptying devices must be provided for both normal leaks and accidental leaks that may result from failures.





- The discharge valve will never be closed and it must allow the passage to at least 8% of the nominal flow. Adjustments are made using the discharge valve by checking the pressure using pressure gauge or safety device and making sure not to exceed the power consumption indicated on the motor nameplate.



- Any operation of the pump with suction valve closed and / or discharge valve closed is not allowed.
- The pump must operate without excessive vibration. If this is not the case, check the alignment and wear of the coupling elastic element (see Section VI-9 Lineness) and if this does not solve the problem, contact the manufacturer.
- A backup pump should start at least once a month, make sure that it is full of liquid and follow the instructions given in Chap. VI & VII.
- To ensure correct lubrication and to avoid overheating of the bearings, it is necessary to observe the appropriate oil level and the recommended intervals between two maintenance operations or the service life of the bearings greased for life (see also Chapter VIII - Interview)




THIS PUMP MUST NEVER RUN DRY EVEN A SHORT INSTANT

- The use of the pump without liquid causes the seizure of rotating parts resulting in the destruction of shaft seals and consequently liquid leaks endangering people and the environment. It is imperative to ensure that all installed safety devices are in use.
- Dispose of all electrical risks, consult the specific regulations of the country of installation, as well as those of local services if applicable.



II-5 Safety instructions for application in explosive atmospheres.



When the unit is installed in an explosive environment, it is particularly important to comply with the appendix of this manual  and the special dedicated notice provides in addition (NCPAE 19b-02).

II-6 Safety instructions for the maintenance, disassembly of the pump

The operator must ensure that all actions concerning the installation, maintenance and inspection of the equipment are carried out by competent and qualified persons who have read this manual.

It must be remembered that pumps carrying dangerous liquids must undergo decontamination.

After the end of the interventions all protections and safety devices must be immediately reinstalled and immediately reactivated.



II-7 Pump modification and spare parts





The attention of the user is particularly drawn to the fact that the use or installation of spare parts and / or accessories not supplied, not approved by the manufacturer and which are not subject to a control or approval may impair the proper functioning of the pump and / or render it unfit for the purpose for which it was designed. The company **POMPES GROSCLAUDE** declines any responsibility for damages resulting from the use of spare parts other than the original parts or the use of non-approved accessories.

III - NAMEPLATE

Identification: Each pump has a company identification plate in one of the following models:

III-1 Standards Pumps








 POMPES GROSCLAUDE 29 Rue du 35e Régiment d'Aviation 69500 BRON - France			
Type	EX215/3X-xxx-4-2I		
N°	30123		
An./Y.	2019		
H	8 m	Ø	160/140/140
Qv	50 m ³ /h	n	2 900 min ⁻¹
Tag	CD-400-B01-P01		
www.pompes-grosclaude.com			
(33) 4 72 37 94 00			

ou

 POMPES GROSCLAUDE 29 Rue du 35e Régiment d'Aviation 69500 BRON - France			
Type	MX215/3X	H	8 m
N°	30123	Qv	50 m ³ /h
An./Y.	2019	Tag	CD-400-BC
www.pompes-grosclaude.com (33) 4 72 37 94 00			

Fig 1a

III-2 Atex Pumps

 POMPES GROSCLAUDE 29 Rue du 35e Régiment d'Aviation 69500 BRON - France		  	
Type	EX215/3X-xxx-4-2A		
N°	30123		
An./Y.	2019		
H	8 m	Ø	160/140/140
Qv	50 m ³ /h	n	2 900 min ⁻¹
Tag	CD-400-B01-P01		
	II 2 G Ex h IIB T 4 Gb		
INERIS -EQEN 035085/19			

ou



 POMPES GROSCLAUDE 29 Rue du 35e Régiment d'Aviation 69500 BRON - France		 CE	
Type	MX215/3X	H	8 m
N°	30123	Qv	50 m³/h
An./Y.	2019	Tag	CD-400-B0
 II 2 G Ex h IIB T 4 Gb INERIS -EQEN 035088/19			

Fig 1b

The parts in red are adapted according to the needs and the selected material

IV - UNPACKING, HANDLING, STORAGE

IV-1 Unpacking

Upon receipt of the equipment and before unpacking, check that the packaging of the pump shows no damage, if not indicate it on the waybill and set up the necessary actions with the carrier to make a claim. If a claim has not been made with the carrier, the company **POMPES GROSCLAUDE** reserves the right to decline any liability for damage sustained during transport.

IV-2 Handling

Material handling must absolutely be done in the following way:

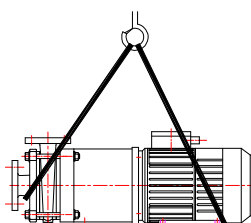


Fig 2

IV-3 Intermediate storage

To allow intermediate storage under good conditions the following instructions are applicable:

- Store in a closed and dry place, free from vibrations.
- Do not remove the protective caps from the pump flanges.
- Periodically operate the rotating part of the pump to avoid marking the ball bearing and gluing the friction faces of the mechanical seal.



- Contact the company **POMPES GROSCLAUDE** to agree on the recommended and adapted products for your application for storage longer than 3 months.
- Maximum Storage time:
 - for pumps made of stainless materials: 3 years
 - for oxidizable materials (*cast iron, steel*): 1 year

For prolonged and predictable storage, under different conditions, thank you to inform the company **POMPES GROSCLAUDE** for the implementation of protections and appropriate packaging.

V - DESCRIPTION OF THE PRODUCT AND ACCESSORIES

V-1 General Description

Centrifugal single or multicellular horizontal pump with radial sealing surface with axial suction flange and radial discharge flange for pumping fluids for industrial use.

V-2 Identification - Type

Série MG

MGX	109	/2	X	-	95/90	-	0,37	-	2	A
	Orifices E/S	Nombre de roues	Matière en contact avec le liquide		Diamètre des roues				Moteur	
106		1 roue	X Inox 316L				Puissance en kW		2 2 pôles (# 2900 tr/mn)	Protection
109		/2 2 roues	U Uranus B6						4 4 pôles (# 1450 tr/mn)	A ATEX
...		/3 3 roues	C Hastelloy C276							I non ATEX
827	Voir ci-dessus		U1 Uranus S1							

Série LG

LGF	317		F	-	165	-	2,2	-	2	I
Type de montage	Orifices E/S	Nombre de roues	Matière en contact avec le liquide		Diamètre des roues				Moteur	
LGF Accouplement magnétique	317	1 roue	F Fonte GS				Puissance en kW		2 2 pôles (# 2900 tr/mn)	Protection
	517		A Acier au carbone						4 4 pôles (# 1450 tr/mn)	A ATEX
	613/34	Voir ci-dessus								I no ATEX

V-3 Design and function

Séri

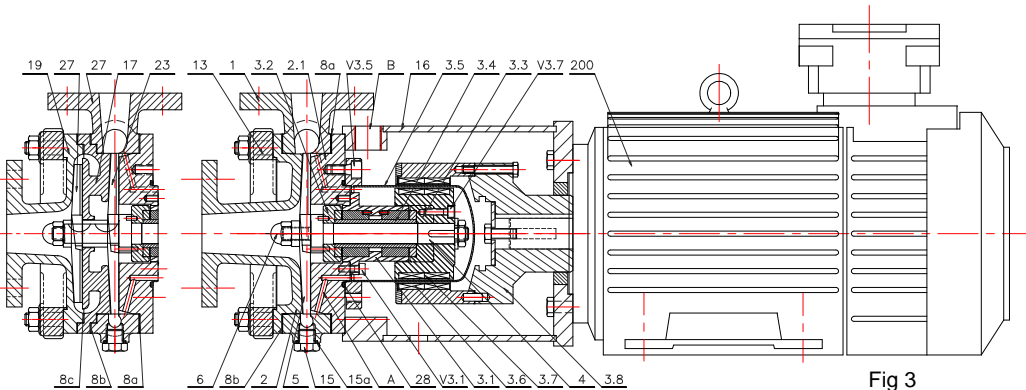


Fig 3

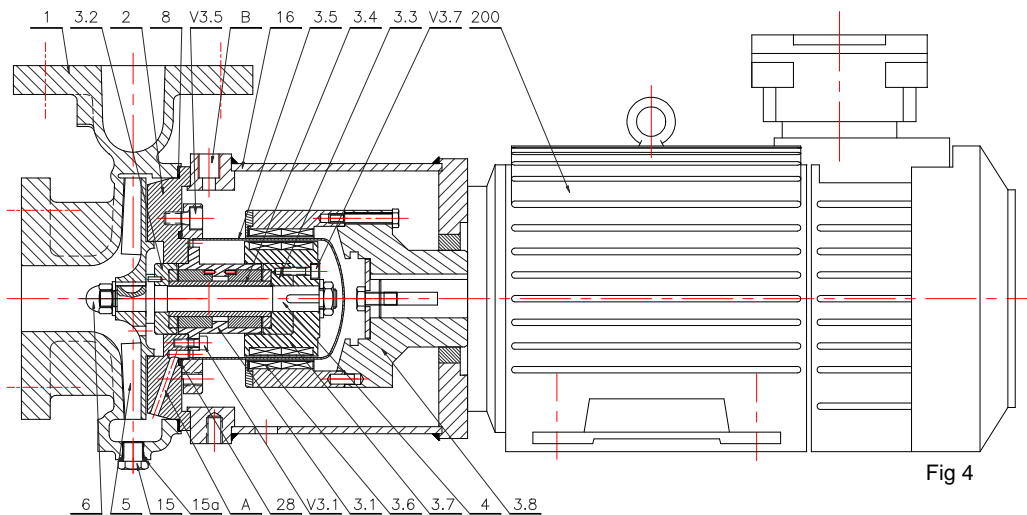


Fig 4

Série LG

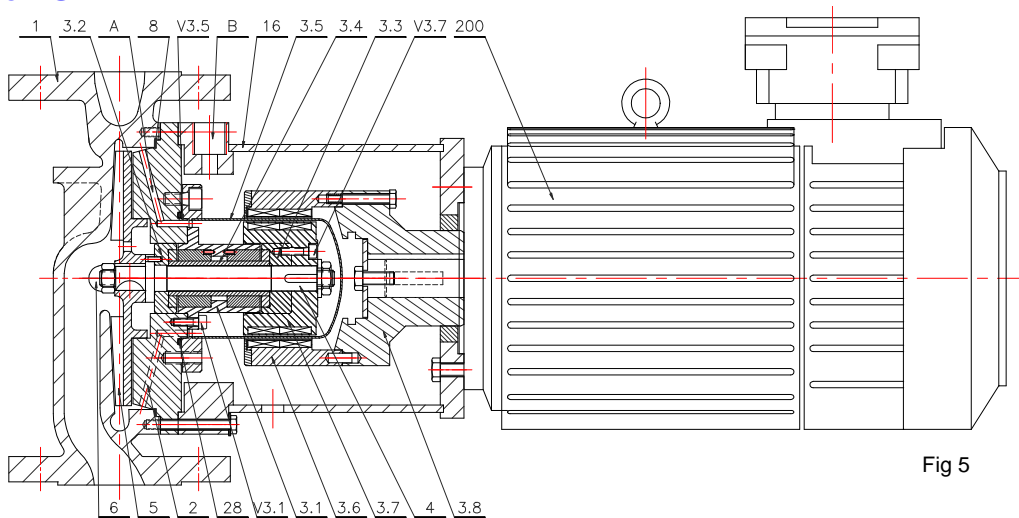


Fig 5

Where the wheels are mounted on a tree.

A magnetic drive pump requires a pumped liquid internal circulation. This forced circulation of the pumped liquid is carried out through the ducts A arranged for this purpose.

When the fluid is clean, an internal circulation in the bell is sufficient.

When the pumped fluid is dirty, loaded with abrasive or magnetic particles, the circulation will have to be made from the discharge of the pump towards the bell via a cyclone separator or a magnetic filter.

Depending on the use, cooling and / or forced circulation from an external source may be necessary

V-3-1 Pump casing

MG and LG pump bodies come in three versions:

- The 109-212-215-315 pumps can be mounted either in single cell or multicell, according to fig.3
- 106-209-210-216-312-316-414-516-522-614-619-827 pumps can be mounted in single cell only fig.4
- Pumps 317, 517 and 613 are inline pumps fig.5

The MG pump casings can be mounted in 4 orientations (*to be specified on ordering*):

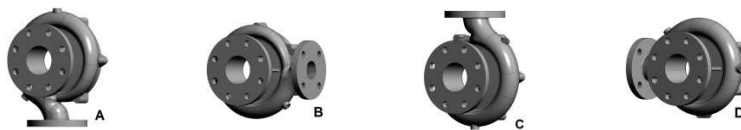


Fig 6a

LF pump casings can be mounted in 4 positions (*to be specified on ordering*):

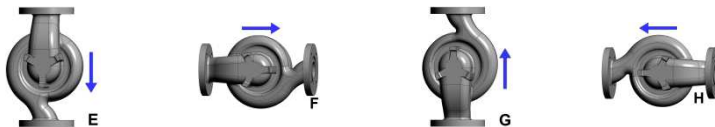


Fig 6b

MG and LG pumps motors can be mounted in 4 positions (*to be specified on ordering*):



Fig 6c

V-3-2 Impellers

MG and LG pump wheels come in two versions:

- Open impellers 109-212-215-216-312-315 according to fig 7



Fig 7

- Semi-open impellers 209-210-316-414-516-522-614-619-827 fig 8 with balanced axial thrust by a hydraulic seal.



Fig 8

V-3-3 Sealing

The seal is ensured by a magnetic coupling

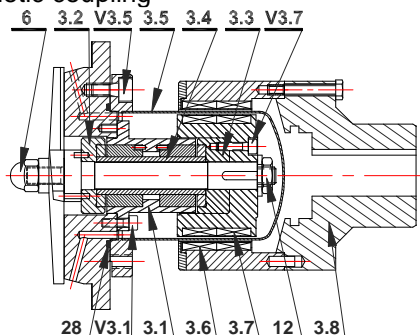


Fig 9

The leading magnets 3.6 are rotated by a motor around a sealing bell 3.5. 3.7 driven magnets collect the magnetic force inside this bell and transmit the motive power to the wheel through a shaft guided by hydrodynamic smooth bearings.

The perfect water tightness of the hydraulic part is obtained by means of a gap bell 3.5 fixed by screws V3-5.

These magnets are very powerful. When the rotors are disassembled, they create a large magnetic field and can be attracted brutally to metal masses, causing injury or damaging parts.

Attention also to pacemakers that can be damaged and data storage on magnetic media (*floppy disks, hard disks, credit cards...*).



V-3-4 Bearing bracket

The shaft is guided by plain bearings in carbide or carbon lubricated by the product conveyed, which imposes an operation in the presence of liquid in the pump.

V-3-5 Reheating the pump body

The maximum permissible pressure in the cooling jacket is 3 barg (*this value can be increased on request*)

It is also necessary to install a control device so that:

- The pump starts only after the heating system has been activated.
- In case of absence or decrease of the temperature, the pump stops automatically and / or an alarm is activated.



The use of water can cause scale-like deposition, which can reduce heat exchange capabilities to prevent circulation. Therefore, it is important to plan the inspection and cleaning of the heating envelope periodically.

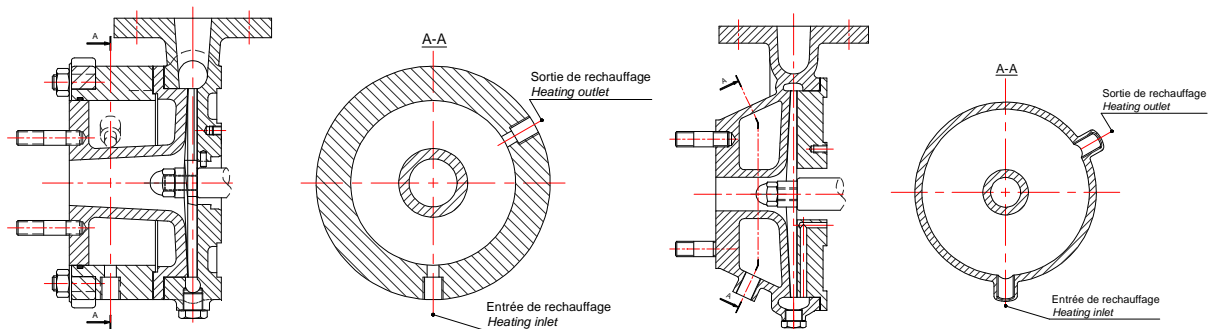


Fig 10

V-3-6 Accessories

Accessories that can be provided as an option:

- Dry running detection
- Temperature sensor

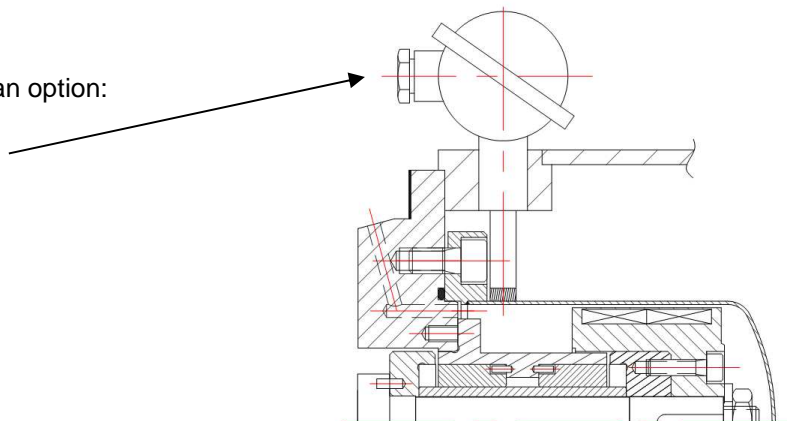


Fig 11

VI PREPARATION OF THE INSTALLATION

VI-1 Personnel

The installation of the pump must be carried out by qualified, trained and authorized people.

VI-2 Tools

No specific tools needed for this operation.

VI-3 Safety

Before starting the pump:

- Ensure that the flange blanks are removed.
- Make sure the flanges are properly connected to prevent leaks.
- Ensure that the pump is filled with the liquid to be conveyed
- Make sure the suction and discharge valves are closed properly.
- Check the power supply disconnect to connect.



VI-4 Implantation, environment

The pump or unit must be placed on a flat concrete floor and must not be exposed to external vibrations. The wedges from 3 to 10 mm, will be carefully chosen so that the group rests horizontally: Fill the mortar holes, wait for its setting before tightening the nuts. Mechanically welded bases are filled with epoxy-bonded mortar to prevent shrinkage during drying.

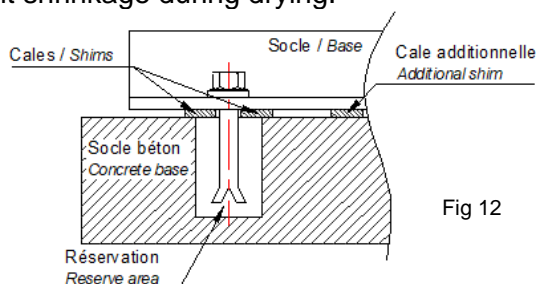


Fig 12



Check that the space around the unit is sufficient and in particular, at the rear of the engine, provide a wall distance X at least equal to the engine cooling air intake diameter D.

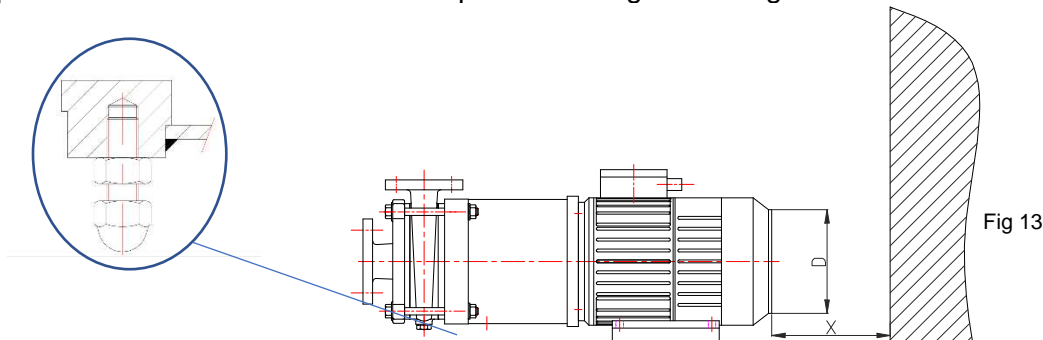


Fig 13

The pump must be implanted in such a way that it is not subjected to climatic constraints and in particular the risk of lightning. In addition, it is important to avoid any risk of falling objects on the pump or that it can fall from the support where it will have been installed permanently attached to the ground or in a subset to avoid any risk of fall (with the appropriate mechanical protections to avoid shocks in the transport (base or support of higher dimensions for example ...)).

Possible mounting position for LG pump:

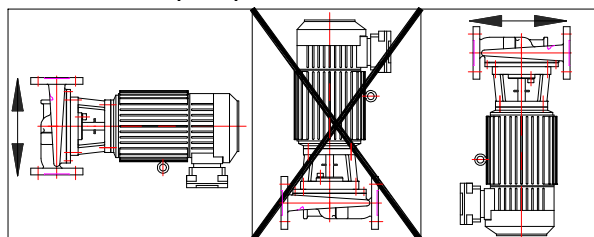


Fig 14

For the motor position at the top, consult us as it requires a modification of the construction of the pump.

VI-5 Piping

Check that the cleaning of the installation has been carried out correctly before any operation of setting up the pump *(to avoid contamination of the inside of the pump and in particular the sealing of the pump with particles, unwanted fluids ...)*.

Please observe the flow direction of the fluid *(if necessary adjust the direction of rotation of the motor)*.

The piping must be at least equal in diameter to the I / O ports of the pump. If necessary, use convergent / divergent to adjust the diameters.

The flange seals must not protrude inside the pipes and be put in place according to the recommendations of the suppliers.

Adjust the pipe fasteners so that they do not cause any stress on the pump flanges *(the pump must be removable from its location without the piping moving)*. The stresses due to the expansion can be compensated by expansion sleeves.

Avoid sudden changes in diameter *(use asymmetrical convergent)* as well as short radius bends near the pump I / O connections.

Provide for suction a straight length equal to at least 10 times the nominal diameter of the suction of the pump and at the discharge 5 times the nominal discharge diameter of the pump.

The flow velocity of the fluid will be between 1 to 2 m/s at the suction and 2 to 3 m/s at the discharge

Provide for the installation of control and security devices:

- Gauge
- Mano-vacuum gauge
- Thermal relays
- Emergency stop devices on malfunction detector following:
 - No liquid carried or auxiliary fluid *(heating, cooling)*, checking the presence of liquid and / or the minimum pressure.
 - Heating due to mechanical seizure.
- ...

During the installation of the pump or the group, it is important to keep in mind the materiality and the liquid conveyed.

The pump must be started full of liquid.

The pump must not be used as a fixed point for piping



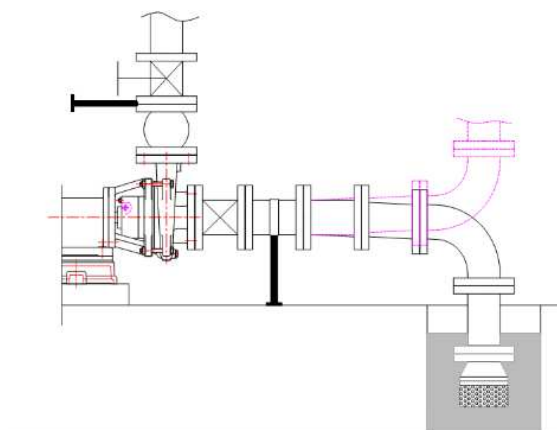


Fig 15

Support must be installed within 0.5 m of the I / O flanges of the pump.

If there are auxiliary connections and accessories, they must be mounted and connected according to plan. They are essential for the proper functioning of the group.

VI-6 Effort on flanges



Exceeding the permissible forces and moments causes leaks on the pump and therefore a danger if the liquids conveyed are toxic or hot.

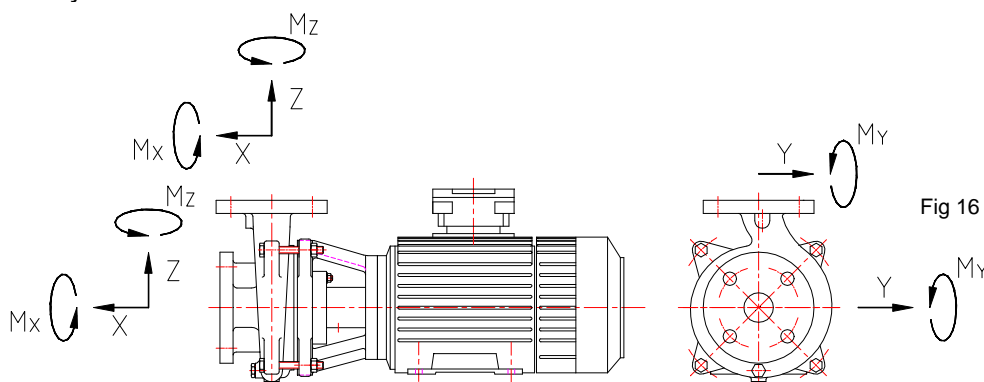


Fig 16 – Pompe MG

SUCTION FLANGE

Pump	DN	FORCE (daN)			MOMENT (m.daN)		
		FX	FY	FZ	MX	MY	MZ
109	20	23	8	5	0,455	0,805	0,805
210	20	22	9	7	0,848	1,166	1,166
212	25	32	16	12	1,624	1,856	1,856
215	32	32	16	14	1,740	1,856	1,856
216	25	27	11	12	1,334	1,566	1,566
312	32	32	16	14	2,10	2,24	2,24
315	40	32	16	14	2,25	2,40	2,40
316	50	35	16	16	2,67	2,91	2,91
318	40	32	16	14	2,25	2,40	2,40
414	40	30	13	12	1,875	2,25	2,25
516	80	38	19	18	3,70	3,80	3,80
522	65	38	18	20	3,53	3,53	3,53
614	65	35	18	19	3,44	3,26	3,26
619	80	38	18	19	3,70	3,80	3,80
827	100	40	19	27	5,06	4,40	4,40

DISCHARGE FLANGE

Pump	DN	FORCE (daN)			MOMENT (m.daN)		
		FX	FY	FZ	MX	MY	MZ
109	15	12	12	9	0,315	0,315	0,84
210	20	13	14	11	0,583	0,583	1,431
212	20	16	22	18	0,954	0,954	2,014
215	25	16	22	20	1,060	1,060	2,014
216	25	14	20	17	0,901	0,901	1,802
312	32	16	23	20	1,400	1,400	2,73
315	32	16	23	20	1,400	1,400	2,73
316	32	21	28	25	1,750	1,750	3,43
318	32	18	18	18	1,260	1,260	2,52
414	40	14	16	14	1,050	1,050	2,25
516	50	26	26	23	1,909	1,909	4,316
522	50	28	27	23	1,909	1,909	4,565
614	65	24	23	22	2,05	2,05	4,371
619	65	27	26	24	2,23	2,23	4,929
827	80	35	35	25	2,50	2,50	7

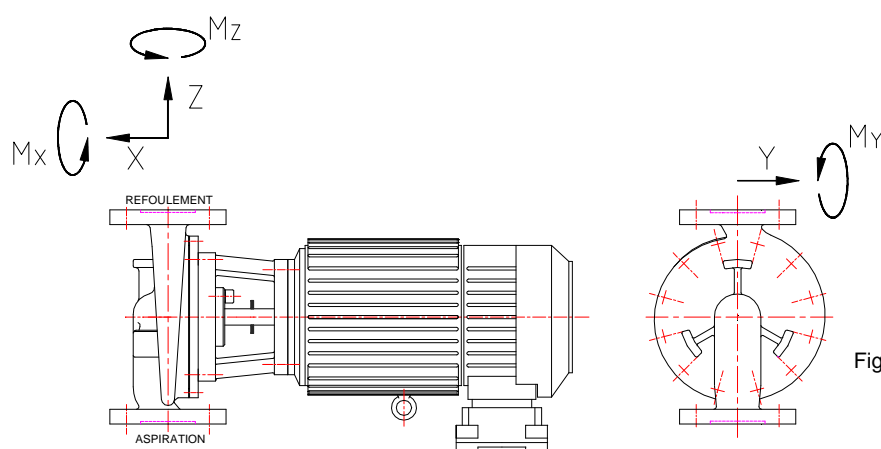


Fig 17 – Pump LG

SUCTION FLANGE

Pump	DN	FORCE (daN)			MOMENT (m.daN)		
		FX	FY	FZ	MX	MY	MZ
317	32	42	36	32	2,52	2,94	2,52
517	50	66	60	54	4,92	5,41	4,92
613	65	82	74	68	6,80	7,54	6,80

DISCHARGE FLANGE

Pump	DN	FORCE (daN)			MOMENT (m.daN)		
		FX	FY	FZ	MX	MY	MZ
317	32	42	36	32	2,52	2,94	2,52
517	50	66	60	54	4,92	5,41	4,92
613	65	82	74	68	6,80	7,54	6,80

These values are valid for a fluid temperature below 120 ° C.

VI-7 Direction of rotation of pump



The direction of rotation of the pump depends directly on the direction of rotation of the motor

To check the direction of rotation of the motor (*clockwise view on the motor fan side*), the pump must be disconnected from the motor in order to avoid any damage to the pump.

- The reversal of the direction of rotation of the motor is done by phase inversion
- An arrow on the pump indicates the direction of rotation to be respected

VI-8 Electrical connection



The electrical connection must only be carried out by a qualified electrician.

The motors are calculated for mains voltage tolerances of +/- 10%. The characteristics of the voltage network must comply with the nameplate. The motor must be connected in accordance with the diagram in the terminal box for direct start-up.

When the electric pump unit is connected to a frequency converter (*recommended frequency ranges 20 to 60 Hz*), the motor is equipped with a temperature sensor in the winding to ensure its protection and we recommend that you connect it.



When the unit is installed in an explosive environment, it is particularly important to comply with the appendix of this manual marked (NCPAE 19b-02).

VI-9 Last check before start-up

The last checks should cover the following points:

- No one should be endangered by starting
- The pipes are well connected
- Verification of the tightness of the joints
- The pump is filled with the fluid to be conveyed as well as the pipes
- The discharge side valve is partially closed to allow the passage of at least 8% of the nominal flow
- The suction side valve is fully open.
- The tightness and functionality of auxiliary piping.
- The tightness of the shaft is not too tight (when using braided sealing)
- The shaft turns freely by hand.
- Check the supply voltage and the connection of the motor terminal box correspond to the said voltage
- The direction of rotation of the motor is correct.
- Clamping and sealing of flange connections.
- The tightening of the anchor bolts.
- The good lineage of the engine and hydraulic assembly
- Parallelism and concordance of the pipe flanges with those of the pump.
- If a starter filter is fitted to protect the pump against dirt and impurities from the installation; the fouling of the latter must be controlled by the differential pressure measurement, in order to avoid cavitation.

VII START-UP

VII-1 Safety instructions

The electrical connections and protections must be made according to the rules of the art and by trained, qualified and qualified personnel in accordance with the prescriptions and standards in force. See in particular the recommendations of the engine manufacturer's manual.

In potentially explosive atmospheres comply with the requirements of EN 60079-14: 2008



The pump must be filled with liquid to avoid deterioration see the destruction of the magnetic coupling

The air purge of the pump is done through the discharge pipe.

Flow control will be done with the discharge valve.



The suction side valve should always be open to prevent cavitation.

The pumps of the MG-LG series must not be used as a reactor (*place of reaction between two chemical compounds*) and must be imperatively washed / rinsed / neutralized when used on several chemicals that may potentially / possibly interact.

VII-2 Priming

Pump and suction pipe must be completely filled.

VII-3 Checking before start-up

Verifications should include the following:
see chap. VI-9 Last check before start-up

VII-4 Start-up


To start the pump or group, follow these instructions:

- Open the suction valve completely.
- Close almost completely the one to the repression.
- Start the engine.
- Purge the stuffing box, if applicable (*see chapter V-3-4-3*)
- Under certain conditions it is possible that the maximum torque of the magnetic coupling is exceeded. By limiting the average starting intensity a suitable device, the engine speed increase is progressive.
- Check the pressure gauge on the discharge side; if the pressure does not increase gradually with the speed of rotation, stop the engine and carry out a new degassing of the pump.
- When the motor has reached its speed, set the operating point using the discharge valve (*closed valve operation is only possible if a by-pass ensures a minimum flow*) or using the frequency converter (*recommended frequency 20 to 60 hz*).
- Monitor the temperature of the " bell " watertight envelope (*PT100 probe*).



VII-5 Operating control

During the first minutes of operation, check the following points:

- The intensity absorbed by the motor does not exceed the intensity indicated on the motor plate (*the power absorbed by the pump increases proportionally to the density of the liquid conveyed*)
- The speed of rotation and the pressure at the discharge.
- Monitor that the pump runs smoothly.
- Check the liquid levels in the suction tank.
- Respect the appendix of this notice marked  (*NCPAE 19b-02*).
- The permissible operating limits (*pressure, temperature, speed of rotation*) are indicated on the technical specifications of the technical file supplied with the pump.



VII-6 Shutdown

At the time of any shutdown, it is essential to close the discharge valve.

As soon as the pump is stopped, the valves installed upstream and downstream of the pump must be closed.



The starting frequency depends on the maximum permitted temperature rise of the motor (*motor <100 kW, 10 starts per hour ... for more details refer to the instructions supplied with the motor*)

If there is a risk of frost and / or prolonged shutdown, drain the pump, magnetic coupling and cooling / heating envelopes.

Installed standby pumps must be started regularly to ensure they are in good working order (*ideally once a month*).



BEFORE ANY INTERVENTIONS MAKE SURE THE POWER OFF AND SAFETY OF THE POWER CIRCUIT.

VII-7 Operating limits

The application limits of the pump are stipulated in the data sheet of the specification or specification, do not operate the pump at temperatures, densities, viscosities higher than those expected.

The pump must be used in the correct service conditions for which it was purchased and as described in the technical specifications of the technical file supplied with the pump. Any change in the physical or chemical characteristics of the fluid carried or conditions of use shall be evaluated in cooperation with the manufacturer.

If the pump is carrying abrasive substances, inspections should be carried out twice more often.

VIII MAINTENANCE

VIII-1 Safety



All work on the unit should only be undertaken after disconnecting it from the power grid. Take all necessary measures to prevent accidental engagement.

All work mentioned below must be carried out by competent and authorized personnel.



Pumps carrying products that are harmful to health must be decontaminated.

Please respect the legal provisions in force, so as not to endanger the health of the workers.

VIII-2 Electric Motor

Maintenance according to the instructions of the manufacturer's manual.

VIII-3 Magnetic Training

The maintenance of the shaft is ensured by a smooth bearing lubricated by the fluid conveyed. Under normal operating conditions (should only work in the presence of liquid). Periodic inspection is necessary, **dry running even for a short time damages the plain bearing**. If the bearing makes noise or causes vibration, stop the pump immediately for service on the inner bearing and refer to the specific instructions for Magnetic Drive Pumps MG-LG 19b-02.



IX DISSASSEMBLING

IX-1 Safety

Repair work should only be carried out by qualified and trained personnel.



Due to strong magnetic fields, people wearing cardiac simulators should not approach the electric pump unit.

The pump must be at room temperature, without pressure and drained. The draining of the pumped liquid is done by the plug rep 15 on the pump body, it must be evacuated and collected without presenting any danger for people and the environment.

In the case of a very toxic liquid, the pump must be rinsed thoroughly due to any residual liquid pumped.

In case of liquid whose residues can become corrosive in contact with the air or ignite on contact with oxygen, it must be rinsed, neutralized, dried, by blowing an inert gas free of water.

Spare parts used must be of manufacturer origin or approved by the latter (see Chapters II-7). Otherwise, the company **POMPES GROSCLAUDE** disclaims all liability for damage resulting from the use of spare parts other than the original or unapproved parts.

The order of disassembly operations can be deduced from the overall plan.

IX-2 Disassembling

Shutting down the pump (see Chapters VII-5)

Close the suction and discharge valves

In the case of work on the motor, observe the instructions and instructions of the motor manufacturer in its instructions.

Wait until the temperature of the body allows its handling without risk and in comfort.

Drain the pump by removing the plug. 15.

For oil bearings, drain through the plug.

The oil or any other liquids drained must be recycled or stored according to the rules in force.

If the pump is carrying harmful, toxic or dangerous products, the parts in contact with the fluid being transported must be cleaned and decontaminated before dismantling.

If necessary / applicable, dismantle measuring and control devices.

The different steps to follow are the following:

- Remove the pump casing by unscrewing the volute nuts, separate the volute from the rest of the pump.
- Extract the complete bottom volute, compensate and bell unit by exerting on it a firm traction to disassemble the pump part of the drive part (**ATTENTION: the magnetic field is powerful**).
- Unscrew the screws V3.5 to remove the waterproof enclosure 3.5.
- Using 2 suitable wrenches, unscrew the screw or nut 12 and the wheel nut 6.
- Remove the wheel 5 which can be screwed or keyed.
- Slide the inner rotor 3.7 and remove its key.
- Unscrew the screws V3.7 to extract the stop 3.3 from the rotor 3.7.



- At this point, the shaft 4 is easily removed by the pump side, slide the folder 3.4 and the stops 3.2.
- Unscrew the screws V3.1 to separate the bearing 3.1 from the bottom 2.
- Remove the seal 28.
- On the motor part, unscrew the shaft end screw and then remove the outer rotor 3.6 and driver 3.8 assembly and disassemble both.
- Remove the spacer from the motor.
- At this point, the dismantling of the pump is finished.

X WORK AFTER DISMOUNTING

Perform the following work:



- First, clean all parts, wear rings and joint planes with the appropriate solvent.
- Check the wear, the surface condition of the wheels and the shaft.
- Check the concentricity of the shaft (*and shaft sleeve*).
- Check the surface condition of the seal surface (*body, tray ...*)
- Check bearings, hydrodynamic stops, wear and surface condition.

XI REASSEMBLING

The reassembly of the pump is done in the reverse order of disassembly, the overall plan and the nomenclature serve as a reference.

It is necessary to always use a new seal set, graphite or PTFE joints should only be used once.

IMPORTANT: Mark the position of the circulation hole in the bottom of the volute using a mark on the outside diameter of the workpiece.

Replace damaged parts with original manufacturer's spare parts or under the responsibility of the user of the equipment (*as indicated by Euopump Guideline Part II - § 5*). The company **POMPES GROSCLAUDE** declines any responsibility for the damages resulting from the use of spare parts other than the parts of origin or not authorized.

XI-1 Assembly of the palliate



Fixing the landing must be done with a tree in vertical position. Fasteners must be braked to prevent them from unscrewing (*eg use of specific glue or by the devices used originally*).

- **NEVER USE FORCE**
- Remove the protection of the friction faces and the bearing faces.
- Thoroughly clean the friction parts with methyl alcohol and assemble them on a clean cellulosic paper cloth.
- Fix the radial bearing 3.1 on the volute bottom 2 using screws V3.1.
- Slide the axial bearing 3.2 on the shaft 4 as far as it will go, making sure that the pin enters its housing.
- Mount the sleeve 3.4 on the shaft 4, centering it as far as it will go in the bottom of the axial bearing 3.2.
- Clean the surfaces of axial stop 3.2 and shaft sleeve 3.4 with methyl alcohol.
- Mount the pre-assembled shaft in the radial bearing 3.1.
- Fit the internal rotor 3.7 on the axial bearing 3.3, making sure that the cylindrical pins fit into their housings.
- Tighten the cylindrical screws V3.7 strongly. Screw braking is not required, it is provided in the tapping.
- Place the axial stop 3.3 and the internal rotor 3.6 on the shaft, centering the shaft sleeve 3.4.

- Fit the key in the groove of the shaft 4.
- Complete the assembly of the bearing by screwing the screw or nut 12 with its washer.
- Fit the key and then mount the wheel 5 by tightening the wheel nut 6.
- Tighten the wheel nut 6 and the screw or nut 12 evenly and without using force (such as shock or knocking) which could damage the bearings.

The shaft with the wheel and the bearing must rotate easily, maximum allowable offset 0.1mm

NO DRY MARKET IS ACCEPTABLE

XI-2 Mounting of the waterproof envelope

- Put on the bottom of volute 2 the seal 28.
- Fit the waterproof enclosure 3.5 over the internal rotor 3.7 and fix it on the volute bottom 2 using the screws V3.5.

XI-3 Final assembly

- Fix the spacer 16 on the motor with 4 screws.
- Assemble the external rotor 3.6 to the drive 3.8 using the screws. Screw braking is not required, it is provided in the tapping.
- Position the key on the motor shaft and fix the driver 3.8 using the screw and its washer. Check the free rotation of the external rotor 3.6.
- Put the motor in horizontal position and slowly approach the volute bottom assembly 2 thus preassembled, engage the sealed casing 3.5 in the outer rotor 3.6.
- **WARNING! The magnetic force is powerful.**
- Position the mark of the volute bottom 2 circulation hole at the highest point to ensure natural degassing of the inner part of the magnetic drive.
- Fit the body seal 8 on the volute bottom 2 and position the pump body 1 in its original orientation.
- Tighten the tie rods.
- Control the operating gaps in front of and behind the wheel; Fig. 15.



NB: Excessive play will cause a drop in pump performance; a too weak game will cause an increase of the absorbed power and a risk of contact between the fixed parts and rotating parts.

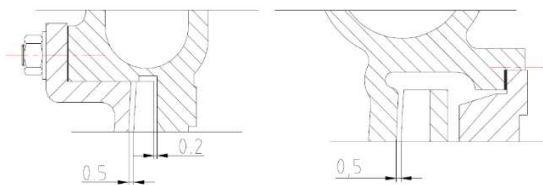


Fig 32

XI-4 Tightening torque

Ø vis	M6	M8	M10	M12
Couple	8 Nm	12 Nm	25 Nm	40 Nm

It is particularly important to pay attention to the respect of the indications above in case of presence of vibration or ultrasonic sources in the installations.

XII ABNOMARLITIES (causes and remedies)



XII-1 Observed dysfunctions

Defaults	Possible causes
The pump delivers no liquid	1-2-3-4-6-10-12-14-15-20-27
Insufficient flow	2-3-4-5-6-7-8-9-10-11-12-15-18-20-24-27
Inadequate gauge	5-12-14-15-18-20-24
Pump disengages after start	2-3-5-6-7-10
The pump heats	1-4-21-22-23-25-26
The pump vibrates or makes noise	2-3-4-8-9-10-19-21-22-23-24-25-26-27-28
Absorbed power is excessive	13-14-15-16-17-18-21-23-27

XII-2 Potential causes and remedies

	Causes	Remèdes
1	The pump is not primed	Fill the pump
2	Pump or suction piping is not completely filled with liquid	Complete the filling
3	The suction height is excessive	<ul style="list-style-type: none"> - Correct the level of the pumped liquid - Open the suction valve in large - Change the suction piping (too much pressure drop) - Filter control
4	The difference between the suction pressure and the vapor pressure is insufficient	
5	The liquid contains too much air or gas	
6	There are air pockets in the suction piping	Purge the installation
7	The suction pipe is not airtight, there is infiltration	Check all joints
8	The shutoff valve on the suction pipe is too small	
9	Shutoff valve is partially obstructed	
10	The suction piping is not sufficiently submerged	
11	Lubrication piping is obstructed	Eliminate deposits
12	The rotation speed is too low	Consult us
13	The rotation speed is too great	Consult us
14	The direction of rotation is not good	Intervert 2 phases of the diet
15	The height required for installation is greater than the height provided by the pump	Adjust the discharge valve
16	The height required for installation is lower than the height provided by the pump	Adjust the discharge valve
17	Pumped density is greater than expected	
18	The viscosity of the pumped liquid is different from that expected	See pump specification Consult us
19	Flow rate at the operating point of the pump is too low	
20	The pump is not suitable for parallel operation	
21	The tree is crooked	Replace it
22	The bearings of the coupling are worn	Replace them
23	Rotating parts come into contact with fixed parts	Stop the group, return to the workshop for dismantling and control
24	The wheel is damaged	Replace it
25	The rotating part is unbalanced because of vibrations	
26	Excessive thrust caused by the stress caused by the hydraulic balancing system	
27	Presence of a foreign body in the wheel	Disassemble the pump
28	Insufficiently rigid foundations	

XIII SPARE PARTS

For any order of spare parts, please tell us the type of pump and its serial number.



Example: Pump Type: MG109X-xxx-0,55-2A
 Serial Number: 30100

This information is indicated on the nameplate of the pump.

XIII-1 Spare parts recommended for 2 years service after commissioning.

- A set of joints
- A ball bearing set

XIII-2 Spare parts recommended for service following ISO

- a set of joints
- a wheel
- a tree
- a set of ball bearings
- a set of plain bearings
- a tree shirt
- a set of stops

XIV NOMENCLATURE

Item	Designation
1	Housing
2	Flange (fig 3) - Plate (fig 4 et 5)
2.1	Plate (fig 3)
3.1	Bearing
V 3.1	Bearing screw
3.2	Stopper
3.3	Stopper
3.4	shirt
3.5	Bell
V 3.5	Bells screw
3.6	External rotor
3.7	Internal rotor
V 3.7	Internal rotor screw
3.8	Entraîneur
4	Tree
5	Wheel
6	Wheel nut
8	Body seal
8a	Body seal
8b	Body seal
8c	Body seal
13	Clamping fange (fig.3)
15	Bleed screw
15a	Purge seal
16	Brace
17	Diffuser
19	Multicellular flask
20	Multicellular wheel
23	Multicellular wheel
27	Multicellular housing
28	Coupling seal
200	Motor
A	Lubrificated pipe
B	Internal lubrification