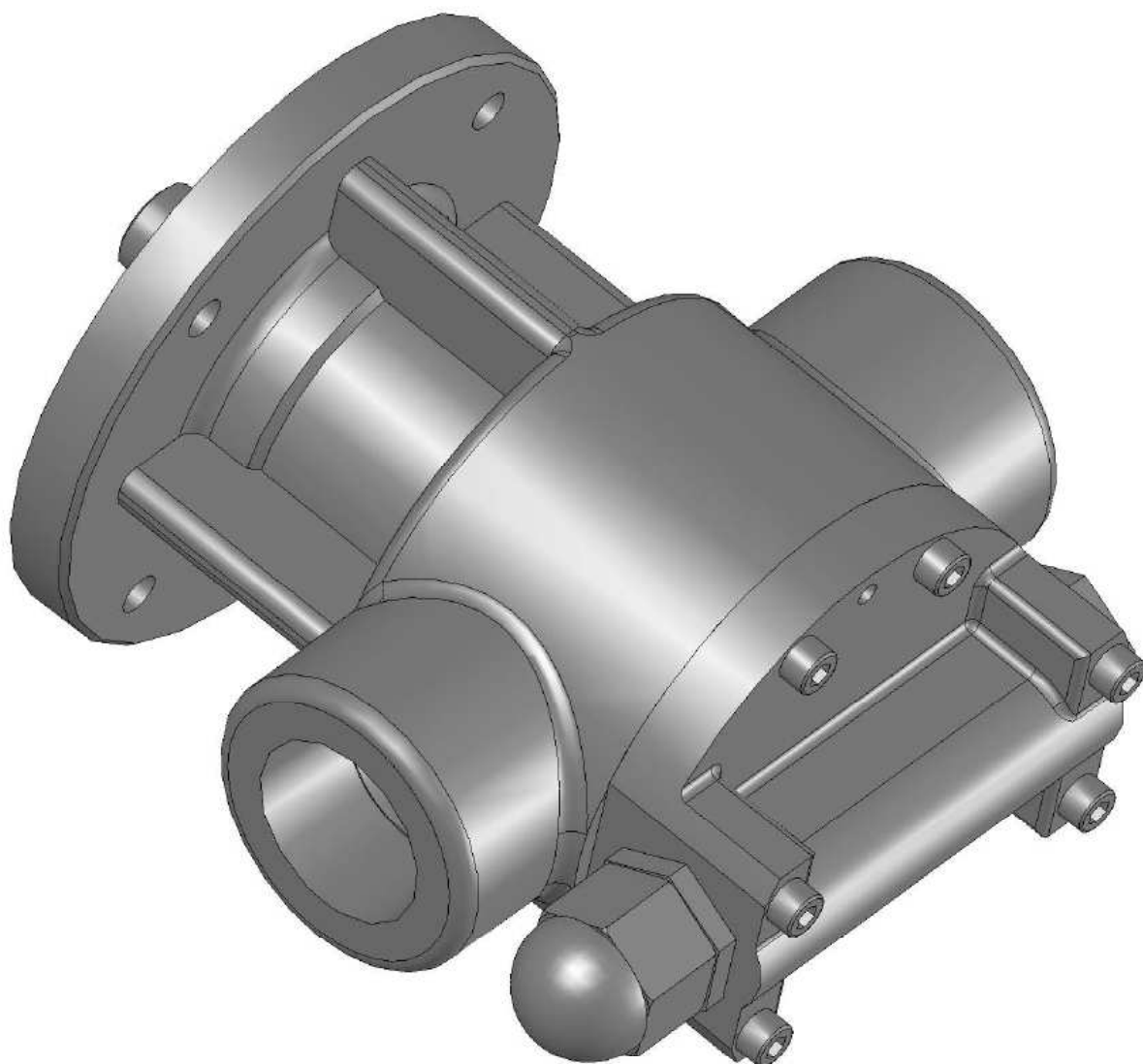




# *Instruction Manual*

## *P 40 to 60*



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# INTRODUCTION

MUST BE IMPERATIVELY READ AND PRECIOUSLY KEPT

POMPES POLLARD has the right to modify this documentation. For further information, please contact our company.

## Warranty

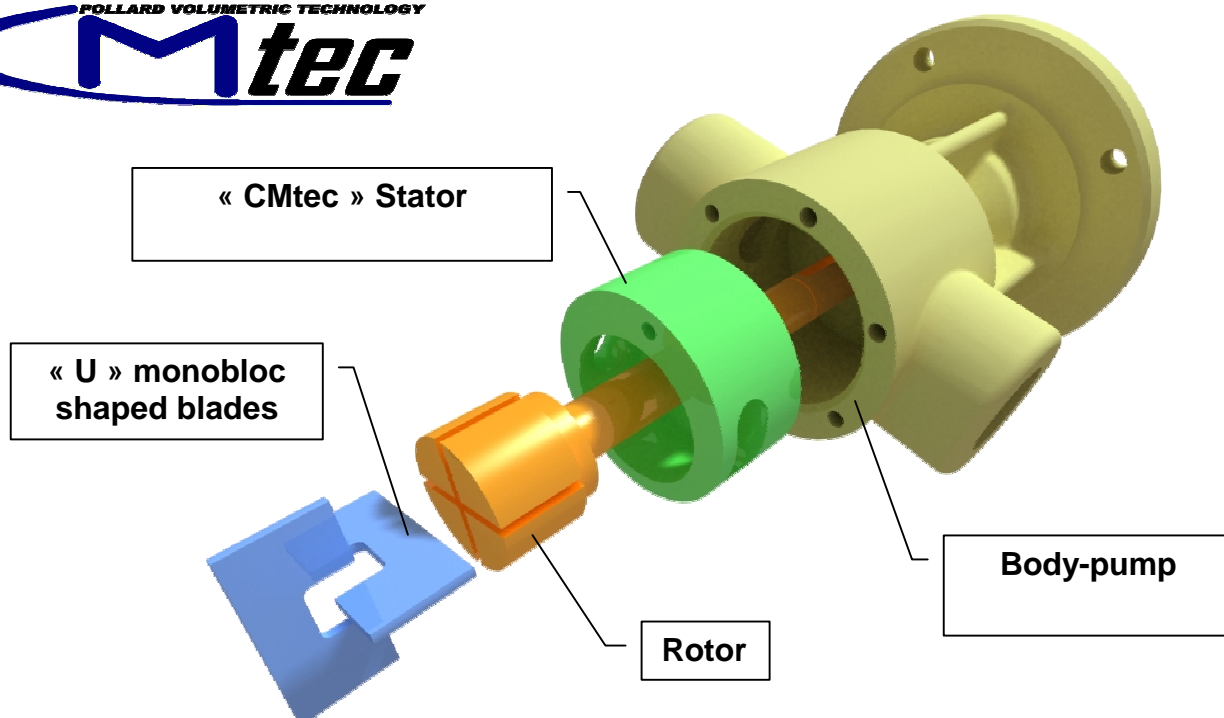
Warranty is void in following circumstances: installation, storage outside vendor facility or material use not according to proper operating rules or vendor instructions, deterioration or accident as a result of negligence, lack of supervision or maintenance, modification of working conditions.

Warranty is also void in case of interference, repair or dismantle of the material by the buyer or by a third party without vendor's approval.

## Exclusive Technology

Developed in the mid 40's, the "CMtec" technology allowed to design a pump capable of providing the advantages of the gear pump and the vane pump in a single pump.

Today, more than 60 years after selling its first pump, POMPE POLLARD SA has built its reputation for reliability and performance on this innovation.



**CM tec = Curved stator and Monoblock blades technology**


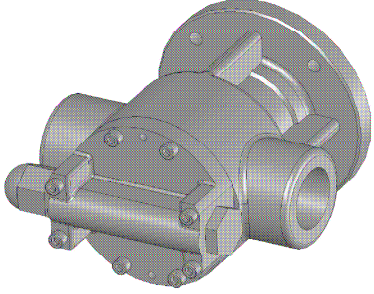
**CM tec concept :**

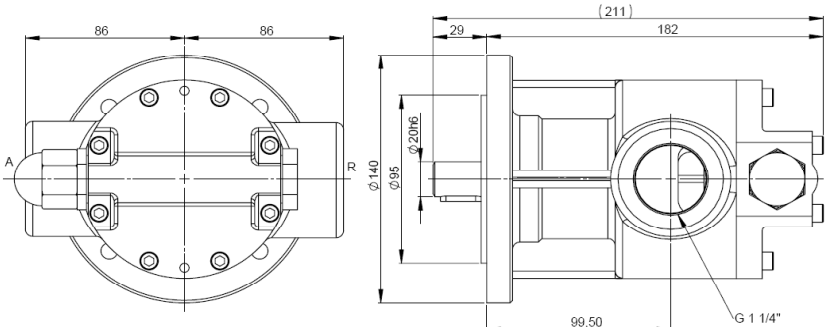
Unlike most of the other types of pump, the stator bore is not cylindrical but of special shape, calculated by a mathematical equation.

The gear train is replaced by two rigid U-shaped blades.

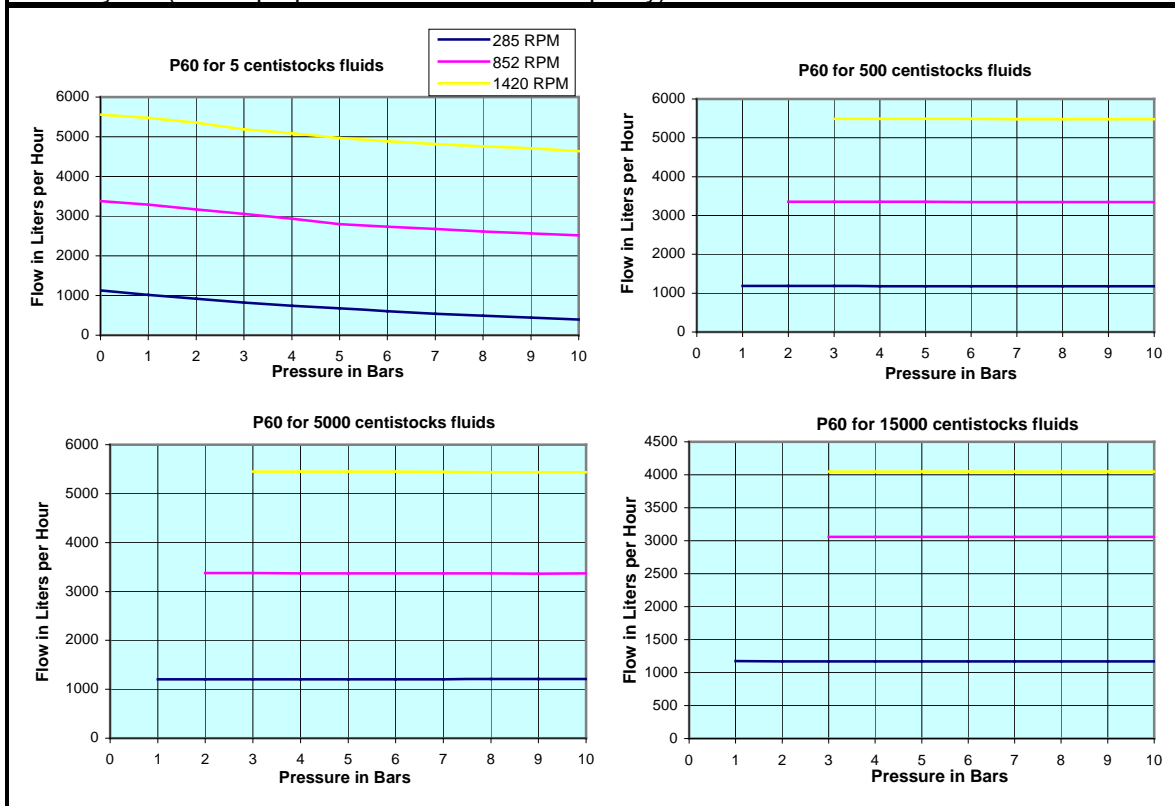
**Main advantages of CM tec technology:**

- ***High reliability.***
- ***Characteristic ability to handle viscous fluid.***
- ***Volumetric pumping regardless of pump rotation speed and fluid viscosity.***
- ***Fluid flow direction independent of spindle rotation direction***  
***(For Reverse Plus pumps)***
- ***Powerful suction.***
- ***Security By-pass included to provide pipe line protection.***
- ***Technical very simple.***
- ***Simple and fast maintenance.***

<b>P40 - P60</b>			
Cubic displacement per rotation cm <sup>3</sup>	40	60	
Speed rotation range in RPM	0 - 1800		
Fluid viscosity range in cSt	1 - 50 000		
Pump vacuum in bar	- 0,7		
Max operating pressure in bar	20		
Standard operating temperature in °C	-20 / +160		
Body-pump raw material	Cast iron		
Shaft and Stator raw material	Special steel		
Integrated safety by-pass	Yes		
Maximal size of hard particles	400 µ		
Maximal size of soft particles	10 mm		
Seal type	Mechanical	Magnetic	
End shaft type	Key		




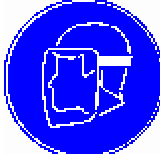

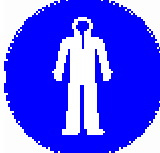





**Flow calculation :** Curves are for PR60 pump (60cm<sup>3</sup> per rotation), for PR40 it is necessary to divide by 1.5 (flow is proportional to the cubic capacity).



# SAFETY

## Icons used

	Danger		Hand protection is needed
	Electrical danger		Face protection is needed
	Do not touch		Body protection is needed
	Corrosive substances		
	Stumbling risk		
	Explosion risk		



## Working conditions







We do remind you that employer is compelled to inform employees dealing with that equipment to respect this instruction manual

We do remind you that you have to inform your staff about followings:

- Material working conditions and maintenance prescriptions
- additional instructions
- how to react to predictable abnormal situations
- additional safety information resulting from previous experiences which may decrease accident risk.

### Safety instructions

	<ul style="list-style-type: none"> <li>• This pump can not operate dry. Dry running will create friction heat which will damage the pump.</li> <li>• The body pump, the piping and junction areas are under internal pressure. One must never take off any security or protection, or unscrew any bolts, because it may induce damage to goods or persons.</li> <li>• Insufficient control and maintenance may result in accidents to goods and persons, especially when toxic or dangerous liquids are being pumped.</li> <li>• Using the pump in an environment requiring a certain level of protection or an engine and electrically superior components is forbidden. Please use components meeting environment security standards.</li> <li>• When a pump is bought without its engine, the coupling with the engine must respect technical norms and safety rules, including providing appropriate protections for future couplings, transmission belts, ...</li> <li>• Before proceeding to any pump dismantling (in case of inspection, cleaning, maintenance, etc.), preliminary rules have to be taken :             <ul style="list-style-type: none"> <li>○ Turn off the engine and unplug the electric wiring.</li> <li>○ Close the aspiration and evacuation system valves in order to avoid any flood risk.</li> <li>○ Use appropriate protection for hands and face in case the pump contains dangerous liquids (acids, solvents, ...)</li> </ul> </li> <li>• The general installation requires an appropriate cooling ventilation and sufficient maintenance space</li> <li>• The motor pump has been designed so that while operating the user can not interact with rotating components.</li> </ul>
	<ul style="list-style-type: none"> <li>• Electrical components are under high voltage.</li> <li>• Operations on electrical parts have to be carried out by qualified staff, trained to respect technical instructions and in use rules and only after allowance from the equipment responsible.</li> </ul>

  	<ul style="list-style-type: none"> <li>The motor pump has been designed so that while operating the user can not interact with rotating components. The trundle must not be removed while the pump is in use. The pump must not be started without this trundle.</li> <li>In cases liquids with temperature exceeding 60°C are pumped, appropriate protections have to be used and these areas must be marked with warning text reading "Hot surface" to avoid burns.</li> </ul>  <ul style="list-style-type: none"> <li>Always wear suitable safety clothing when handling the pump.</li> </ul> 
	<ul style="list-style-type: none"> <li>The trundle is can not be used in any case as a step or a support.</li> </ul>
	<ul style="list-style-type: none"> <li>The group equipped with an IP 55 electrical engine is can not be used in any case in a classified area.</li> <li>The pump must always be used in areas according the engine protection level (check with the governmental agency responsible for such precautions).</li> <li>Improper installation can cause fatal injuries.</li> </ul>

# TRANSPORT AND STORAGE

## **Transport**

When receiving the pump, please check the packaging condition.

If you remark obvious damages, please proceed as under described:

- Accept the product and mention the observed defaults on delivering papers.
- Take pictures of obvious damages
- Inform the carrier by registered letter with acknowledgment of receipt, joining the pictures taken earlier.

## **Storage**

A pump which is not installed immediately should be stored in a cool and dark room. The storage should not exceed 2 years. If the pump has been out of operation for a longer period of time, the vanes should be greased before use to regain optimal suction ability.

## **Handling**

The motor pump dimension does not need special handling equipment. However, if the group exceeds 20kg, a lifting equipment is required.

## **Extended stop**

In case of long time period pump shut down, empty completely the pump and wash it thoroughly in order to avoid scales and/or encrustations accumulation.

This will ensure seal and pump durability

It is the user's responsibility to ensure that washing liquids are compatible with pump raw materials and substances in process in the pump.

For CMtech pumps use water with soap. If the pump has been out of operation for a longer period of time, the vanes should be greased before use to regain optimal suction ability.

**Warning:** Before using the pump for different liquids than those specified upon buying, please verify that joints and mechanical sealing materials are compatible with the new product (please contact the company if otherwise).

# ASSEMBLING AND INSTALLATION



Please read imperatively the safety chapter

## **Group deployment**

The pump and its engine must not undergo any constraints (ex.: heavy pipes supported by the pump).

Do not remove the plugs from the junction orifices before installing the pipes, this is to avoid any access to the interior pump from any object.

## **Engine plugging**



The wiring has to be carried out by qualified employees

Cables and stuffing box must be of compatible diameter.

Electrical protections must be in accordance with usual standards.

Using a phase indicator ahead of the section switch allows identifying the colors of the wires and the junctions which will permit the engine to rotate the right direction. One must imperatively respect the rotation direction, indicated on the pump and on the trundle to avoid deterioration of the mechanical seal and the by-pass.

## **Pipe line installation**

Always clean the piping before installing it. Remove the welding chips, flashes, carbon deposits and rust particles in case of rigid pipes.

Avoid the accumulation of air pockets in the pipe alimentation by having a steady inclination. Motor pumps can be installed in any position, however engines are designed for horizontal use (if otherwise please contact the company).

The hydraulic junctions should preferably be made with flexible and rotating junctions. Their interior diameter has to be compatible with pump flow, the viscosity and the pressure of the product being pumped (to avoid cavitations and over pressure).

On the suction side, install a straight pipe of 0.6m long without diameter variation (flow tranquilization area).

On the discharge side install a no return valve.


These junctions have to be done without constraints or charges on the pump. Check that the joints or seals do not run over the pipes.

**IMPORTANT:** we advise to use control equipment at the pump discharge: flow control, pressure indicator, etc. to be able to avoid an unexpected lack of lubricant.

**WARNING:** The pump must not undergo water hammer.  
If the circuit is provided with a fast or ultra rapid closing valve (less than a second), use an anti water hammer system on the suction pipe.

Generally, the pump is equipped with a security by-pass set for 5 bars full flow (this setting may be modified on demand). This by-pass must no be used as a pressure discharge indicator.

### ***First running***

	<ul style="list-style-type: none"><li>• Before starting the pump, make sure that nobody could be hurt by this operation.</li><li>• Before first installation, verify pipe seals.</li></ul>
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## SUPPORT AND MAINTENANCE


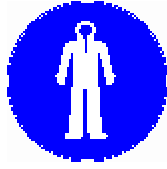
Output spindle sealing must be assured by lip seals or mechanical seals made out of Nitril or Viton elastomer. One must verify that the product being pumped is compatible with these materials, if you have any doubts please contact the manufacturer or our company.

After roughly 1500 running hours or after maximum 2 years, dismantle the mechanical seal and change it.

The engine is equipped with bearings lubricated for life.

While the pump is running, control the rotation speed and the pressure at the pump discharge. Make sure that the pump rotates regularly without jerks or strange noises.

### Warnings

	<ul style="list-style-type: none"><li>• Any assembling or dismantling error may result in pump malfunctioning.</li><li>• POMPE POLLARD is not responsible for accidents or damages resulting from not abiding by these instructions.</li><li>• Never work on the pump while it is in use.</li><li>• Assembling and dismantling the pump has to be performed by experienced personnel who have acquired the necessary hydraulic knowledge. These employees always have to wear appropriate protection equipment.</li></ul> 
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Please work in a clean environment. Keep preciously all fragile parts in their original packaging. Spare parts have to meet technical requirements defined by manufacturer which is always guaranteed if you original spare parts.

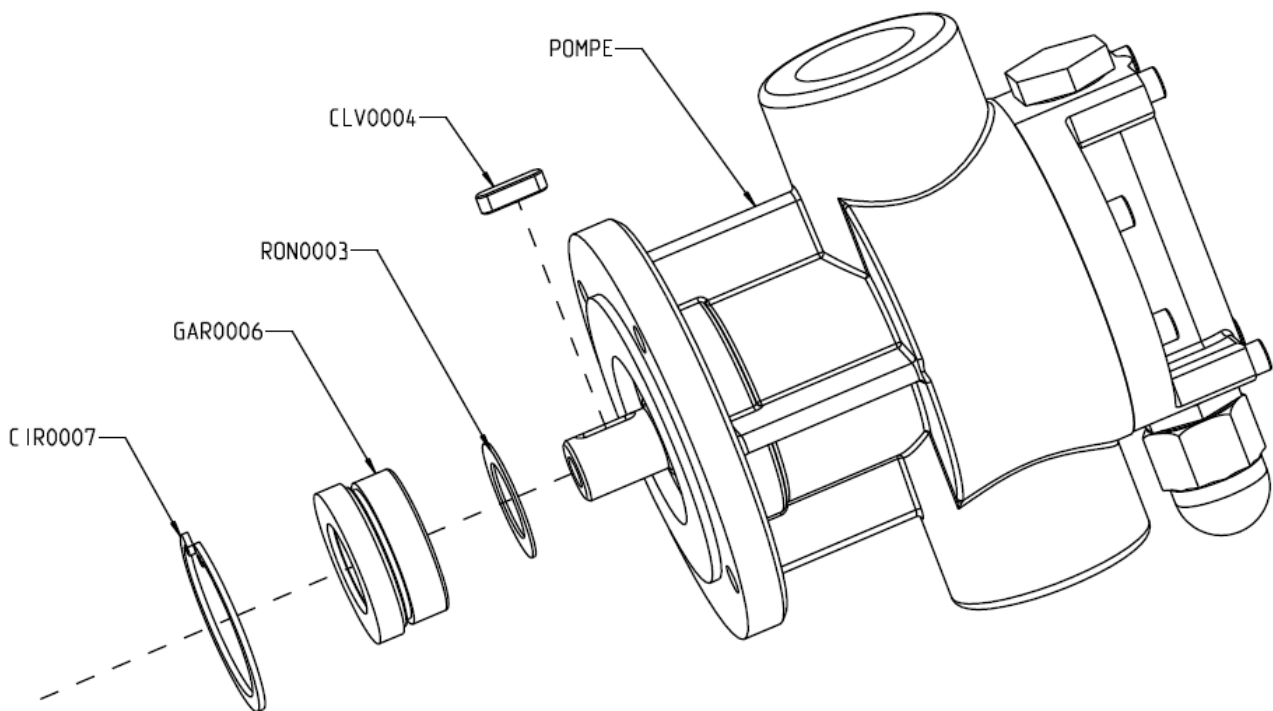
Please check that none of the parts have been damaged during transportation.

While using joints, make sure that you do not damage them by passing over sharp edges, screwing, etc. Make sure that they are not bent in their slots when being installed.

## Mechanical seal dismantling

- At first realize the *Motor pump dismantling* operation (see above)
- Remove the wedge (rep. CLV0004)
- Remove the circlip for bores (rep. CIR0007)
- Remove the mechanical seal (rep. GAR0006) and replace it when reassembling
- Remove the support washer (rep. RON0003)

Mechanical seal reassembling should be made in the opposite order.



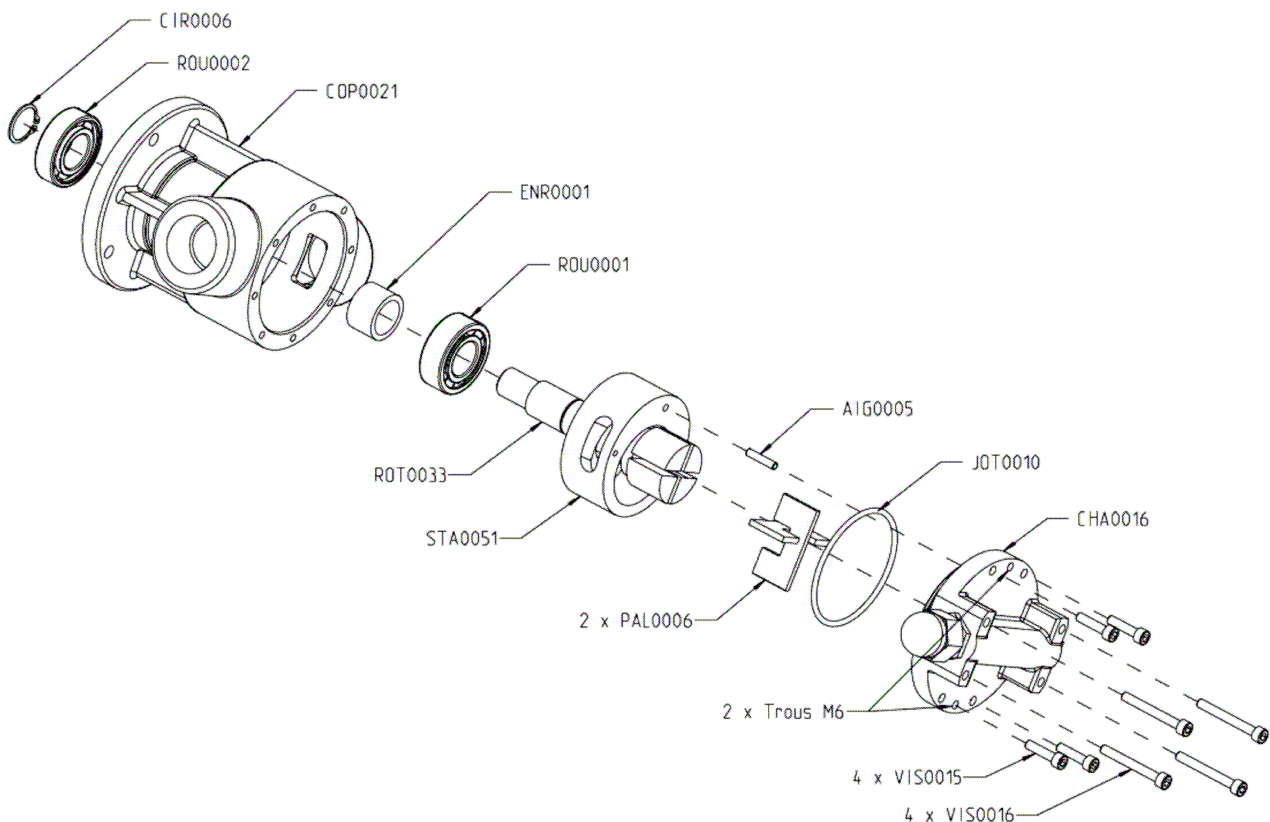
## Pump dismantling

- At first realize the *Mechanical seal dismantling* operation (see above)
- Unscrew the 4 screws CHC M6 (rep. VIS0015) and the 4 screws CHC M6 (rep. VIS0016)
- Use 2 of these fastening screws in the 2 M6 holes (reference mark 2 X M6 Holes) of hat (reference mark CHA0016) to withdraw it correctly its housing.

**IMPORTANT:** While dismantling the cap, make sure you have recovered the index hand (rep. AIG0005) which assures the stator (rep. STA0051) positioning with the cap (rep. CHA0016).

- Remove the O-ring seal (rep. JOT0010) and replace it when reassembling
- Remove the 2 blades (rep. PAL0006) and replace it when reassembling
- Remove the stator (rep. STA0051) and replace it
- Remove the circlip (rep. CIR0006)
- Remove the rotor (rep. ROT0033) and replace it too
- Remove the bearing with simple line of balls (rep. ROU0002)
- Remove the bearing with simple line of balls (rep. ROU0001)
- Remove the cross bar (rep. ENR0001)

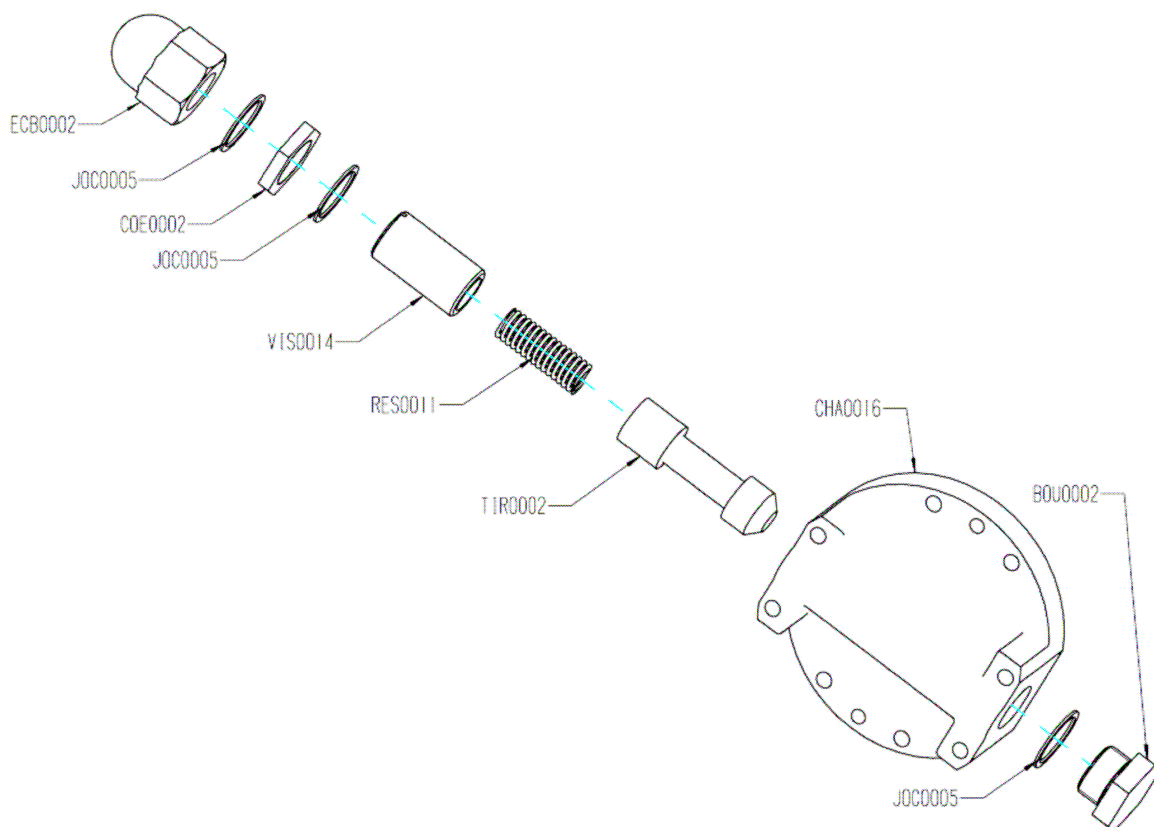
Pump reassembling should be made in the opposite order.



### **By-pass dismantling and control**

By-pass calibration has already been done by means of the VIS0014. While dismantling it, it is important to memorize the number of unscrew rotation in order to reassemble it correctly.

- Unscrew the cap nut (rep. ECB0002)
- Remove its copper joint (rep. JOC0005) and replace it when reassembling
- Unscrew the counter nut (rep. COE0002)
- Remove its copper joint (rep. JOC0005) and replace it when reassembling
- Unscrew the regulating screw (rep. VIS0014) and memorize the number of unscrew rotation
- Remove the spring (rep. RES0011)
- Remove the plug (rep. BOU0002)
- Remove the copper joint (rep. JOC0005) and replace it when reassembling
- Remove the slide valve (rep. TIR0002)



### **By-pass assembling**

It should be done in the opposite order:

Check the good flap state and its seat. Screw the VIS0014 with the same number of rotation as during the dismantling.

This by-pass is designed as safety equipment it has to be used only in case of incident or cold start but it must not be used as a discharge regulator.

If you notice any flap or seat deterioration one must control the instant pressure, change the flap and reset the seat.

**Nomenclature**

Component	Naming	Qt
STAxxxx *	SHAPED STATOR	1
JOTxxxx *	O-RING SEAL 82.14X3.53	1
GARxxxx *	MECHANICAL SEAL DIA 25	1
RES0011	BY-PASS SPRING 60700-5	1
COP0021	SHAPED PUMP BODY P40 150	1
CHA0016	BY-PASS CAP 60304	1
ROT0033	SHAPED ROTOR P40	1
PAL0006	SHAPED BLADE 5829	2
VIS0014	BY-PASS REGULATING SCREW 60602	1
TIR0002	BY-PASS SLIDE VALVE DIA20	1
COE0002	COUNTER NUT P40	1
ECB0002	CAP NUT P40	1
BOU0002	BY-PASS PLUG 60601	1
JOC0005	COPPER JOINT 22.2X27X1	3
ROU0001	BEARING 4205	1
ROU0002	BEARING 6205	1
ENR0001	CROSSPIECE 60801	1
RON0003	SUPPORT WASHER 25X38X1	1
CIR0006	CIRCLIP FOR SHAFTS E25	1
CIR0007	CIRCLIP FOR BORES I55	1
AIG0005	NEEDLE 5 X23.8 BR	1
CLV0004	WEDGE BA 6X6X20	1
VIS0015	SCREW CHC 6X25	4
VIS0016	SCREW CHC 6X50	4

**N.B.:** \* For any spare part replacement, please contact our company.

# TROUBLE SHOOTING CHART

Failures										causes	corrections
The pump does not run	The delivery is not sufficient	The pressure is not sufficient	The pump stops priming	Power absorption too higher	Leakages from the mechanical seal	Short life of the mechanical seal	Failure of the mechanical seal	Anomalous vibrations and/or noise	Short life of bearings		
										Air entering from suction connections.	Check the lock.
										Air entering from the lip seal.	Replace the lip seal or arrange a solution with a vacuum spring in case of vacuum suction operation.
										Obstructions present along suction pipes or valves closed along pipes.	Verify and remove all foreign matters from pipes and finally verify valves status (if closed, open them).
										NPSH available in the plant is lower than NPSH needed by the pump.	Reduce the friction loss or adjust the pump at a lower delivery point.
										Plant friction losses higher than pump performances.	Reduce friction losses or replace the pump with a most suitable one for requested performances
										Opposite direction of rotation or too low velocity (in case of a pump operated by an inverter).	Restore the correct sense of rotation; increase the motor speed.
										Worn lip seals.	Replace worn parts.
										Pumped fluid too viscous.	Verify the pump size.
										Presence of too much gas in the fluid.	Fit an air relief valve.
										Plant friction losses lower than foreseen ones.	Increase friction losses or adjust the pump at a higher working point.
										Fluid specific gravity higher than foreseen one.	Increase the installed motor power.
										Pumped fluid too viscous.	Verify the pump size.
										Rotation speed too high (when pump is controlled by an inverter).	Reduce the velocity.
										Misalignment of pump-motor or distorted shaft.	Restore the correct alignment between pump and motor; replace the shaft with a new one.
										Worn bearings of pump or motor.	Replace the bearings.
										Electric misconnection.	Modify the electric connection by strictly following ratings written on the motorplate according to the available voltage.
										Voltage not suitable for the installed motor.	Replace the motor with one having a suitable voltage.
										Lip seal worn	Replace the lip seal.
										Pump fluid or temperature not suitable for the assembled lip seal or its parts.	Verify the lip seal selection.
										Non-cleaning when using fluids which tend to crystallize.	Increase washing cycles and don't leave the product laying inside the pump for a long time.
										Incorrect assembly of the lip seal.	Assemble the lip seal again with attention.
										Dry operation of the pump.	Arrange the proper dry-running protection in order to avoid the problem.
										Oscillations on the shaft due to a too high assembly allowance, worn bearings, etc.	Restore normal assembly conditions by replacing the worn pieces.
										Suspended solid parts in the fluid.	Verify the lip seal selection.
										Too high temperature or thermic shock.	Increase gradually the fluid temperature by avoiding instantaneous thermic amplitudes; prevent the pump from dry-running.
										Pump and/or pipes are not properly anchored.	Verify and adjust anchorage of the involved parts.
										Water seepage due to worn oil retainers.	Replace worn parts.

**POMPES POLLARD**  
**GENERAL SALES TERMS, FRANCE AND EXPORT**

The present sales terms form part of the contract and take precedence over any conflicting documents of the buyer which have not been accepted in writing by the seller. Any amendments which the parties might make to the present terms require express written agreement.

1. - Drawings and documents

The weights, technical characteristics, prices, performance levels and other data contained in the catalogues, brochures, circulars, advertisements, prints, price lists are given as a guide. These data have a compulsory value only if the contract explicitly refers to them.

2. - Offer

The offers are drawn up as a function of the specifications supplied by the buyer. The seller is bound only by signed written agreements under the company's letter heading. Unless agreed otherwise, the validity of the offer is one month.

3. - Drawing up and performance of the contract

The contract is regarded as perfect when, on sight of an order, the seller has addressed a written acceptance to the buyer or by the signing of the contract by the two parties. The coming into force of the contract will start after the cashing of the down payment specified in the order and will likewise, where applicable, be subject to the licences of the official bodies involved in exports and imports and to the supply of the other documents specified in the contract, conforming and utilisable by the seller.

The contract will be performed in compliance with its terms. Any amendment must be the subject of a codicil accepted in writing by the seller.

4. - Checks and tests

All checks, tests or inspections requested by the buyer are at his expense.

5. - Prices

Unless agreed otherwise, the prices are net of tax for non-packaged equipment "made available in the works" or, in the case of export sales, according to the INCOTERM EX WORKS. They do not include duties, taxes, additional costs or levies of any nature whatsoever payable outside France. Unless stipulated to the contrary, the prices are expressed in the currency which is legal tender in France. For any invoice whose net amount, excluding taxes, is less than 46 Euros, a participation in the administration costs may be applied.

6. - Payment terms

The contract determines the payment terms. Failing that, the following conditions will be applied: 1/2 when ordering, the balance on the making available in the works. Payment is constituted by the effective cashing of the monies into the seller's account. The payments cannot be delayed for any reason whatsoever, even in the event of a legal dispute, or be the subject of any compensation. The fact that a delivery or invoicing takes place after the 25th of the month does not authorize any particular date deferment. Any delay will give rise automatically to a penalty of 10% per annum on the sums still owing. It is pointed out that in France this penalty cannot be less than 1.5 times the French statutory interest rate. In addition the seller reserves the right to demand, in the event of a delay in payment, the immediate settlement of the debts arising from the contract, and/or of the contracts in progress with the buyer. Barring separate agreement, the payments take place at the seller's domicile, net and without discount, within 30 days of invoicing, with the exception of the down payment, which is due immediately.

7. - Delivery date

The date runs from the day on which the conditions on the coming into force of the contract are fulfilled. The seller is released automatically from any commitment relating to the delivery dates if the buyer does not meet one or more of his obligations under the contract, or in the case of major force or events or causes independent of the will of the seller. The latter will as far as possible keep the buyer informed of these events at the appropriate moment. Penalties for delay are due only if they are accepted in writing by the seller, they exclude any other reparation to which the buyer might lay claim.

8. - Packaging

Any packaging requested are always at the buyer's expense as a supplement to the agreed price, and are not taken back by the seller, save where particularly stipulated.

9. - Delivery

Save where stipulated otherwise in the contract, the equipment is delivered non-packed "made available in the works". Subsequent operations, in particular those of transport, handling, bringing to the site, are at the expense and at the cost and risk of the buyer. In the case of export sales, the delivery is conducted according to the INCOTERM "EX WORKS". The risks linked to goods not collected are the responsibility of the buyer, and the storage costs can be invoiced to him by the seller, barring special agreement. In all cases it is up to the buyer to check the consignments on arrival and, where applicable, to make reservations concerning use to the carrier within 48 hours and to inform the seller of this immediately.

Any mention of INCOTERMS will imply reference to their latest version in force during the drawing up of the contract.

10. - Industrial property

The seller is, and remains, the exclusive owner of the design work, model drawings and subsidiary document whatever their media, of which the buyer may have gained a knowledge in the context of the contract or an offer. They can be used only by the buyer and solely for the requirements of the performance of the present contract. They are confidential and cannot be communicated to third parties, in whatever manner, without the prior written consent of the seller, and must be returned to him if the contract is not signed, or whenever requested by him.

Any violation of these rules can be the subject of legal proceedings.

11. - Guarantee

The seller guarantees his supply against any operating fault resulting from a defect in manufacture or design, in material or execution, for a maximum period of 12 months, after "making available in the works". This period will be reduced by half in cases of operation in continuous service. The guarantee does not cover normal wear and tear, including parts subject to wear. The guarantee on the components and sub-assemblies not manufactured by the seller is limited to that given by his supplier.

To invoke the benefit of the guarantee, the buyer must inform the seller immediately and in writing of the existence and the exact nature of the faults which he attributes to the equipment. Under the guarantee, the seller will repair, replace or modify at his choice the parts accepted as being defective by his departments. The guarantee does not cover the costs resulting from dismantling, remounting, transport and re-arranging operations. The replacement of one or more parts, whatever the reason, does not prolong the guarantee period.

12. - Liability

The seller is exempted from any liability in cases of indirect and/or special damage such as losses of production, loss of earnings ... caused to the buyer or to third parties. The amount of the compensation by the seller for the material damage caused to the client in the course of and resulting from the performance of the contract cannot exceed the amount net of tax of the sums charged under the contract. The client stands surety vis-à-vis the seller and his insurers for any claims by third parties for indirect or special damage or for material damage exceeding the above ceiling.

13. - Right to ownership

The seller retains ownership in the goods sold up to effective cashing of the whole of the sums due. Failure to pay any of the instalments may lead to the reclaiming of these goods.

It is pointed out that the presentation of banker's drafts or of any other deed creating an obligation to pay does not constitute a payment.

Nevertheless, the transfer of the risks to the buyer operates as soon as the delivery of the equipments, as defined above, and responsibility for the corresponding insurances is incumbent on the buyer.

The buyer whose business consists in re-selling is authorized to re-sell the equipment, which re-sale entails the transfer to the seller of the debts resulting therefrom. He will inform his client of the existence of the present clause. Any unpaid bill will deprive him of this right. He can on no account give the equipment as surety or as other guarantee.

14. - Termination

In the event of non-performance by the buyer of one of his contractual obligations, and particularly in the event of non-compliance with one or more of the payment instalments, the seller can automatically terminate the contract after a formal notice addressed to the buyer has remained without effect for a week

15. - Development of commercial relations

The commercial conditions granted to the client do not constitute a commitment of the seller as to future conditions. In the case particularly of a payment incident, serious doubt as to the solvency of the buyer, commercial practice prejudicial to the seller, the latter can propose new conditions or not accept new conditions.

16. - Sub-contracting

The seller has the option of sub-contracting the whole or part of the design work, supplies, services and works covered by the contract.

17. - Law and disputes

The contract is governed by French law. In the case of a sale in France, all disagreements will come under the exclusive jurisdiction of the Commercial Court of Toulon. In the case of a sale outside France, any disagreement will be decided definitively according to the conciliation and arbitration rules of the International Chamber of Commerce, by three judges appointed in accordance with these rules; the language of the arbitration will be French and the venue of the arbitration will be Toulon.