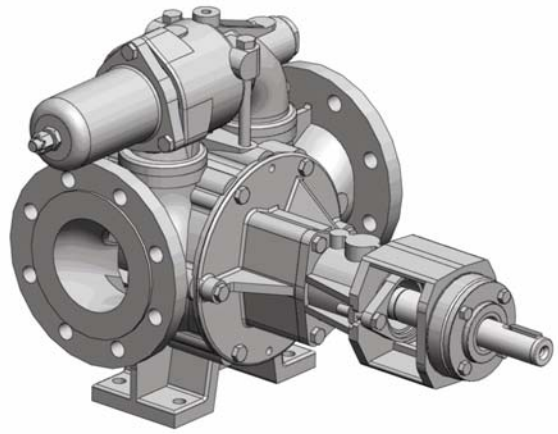
INSTRUCTIONS 1008-D00 e

Section	1008
Effective	August 2018
Replaces	September 2016

Original instructions

P BI series
P15 - P25 - P40 - P60 - P100



INSTALLATION

USE

MAINTENANCE

WARRANTY :

P Series pumps are covered 24 months by warranty within the limits mentioned in our General Sales Conditions. In case of a use other than that mentioned in the Instructions manual, and without preliminary agreement of MOUVEX, warranty will be canceled.

a DOVER company

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Your distributor :

VANES PUMPS

SAFETY, STORAGE, INSTALLATION AND MAINTENANCE INSTRUCTIONS

MODELS : P BI SERIES

P15 - P25 - P40 - P60 - P100

TECHNICAL SPECIFICATIONS

- Maximum pump speed : **1000 rpm**
- Running temperature :
  * FKM seals ..... -10°C to +200°C
  * CVT seals..... -10°C to +200°C
- Construction I : Stainless steel
- Rotor : 12 vanes (pump fully reversible)
- Maximum differential pressure : **12 bar**
- Maximum discharge pressure : **13,5 bar**
- Front cover with heating jacket :
  * Maximum temperature of the heating product : 250°C
  * Maximum pressure of the heating product : 12 bar

Definition of safety symbols

This is a SAFETY ALERT SYMBOL.
When you see this symbol on the product, or in the manual, look for one of the following signal words and be alert to the potential for personal injury, death or major property damage.

DANGER

Warns of hazards that WILL cause serious personal injury, death or major property damage.

WARNING

Warns of hazards that CAN cause serious personal injury, death or major property damage.

CAUTION

Warns of hazards that CAN cause personal injury or property damage.

NOTICE

Indicates special instructions which are very important and must be followed.

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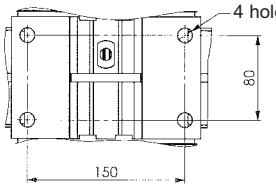
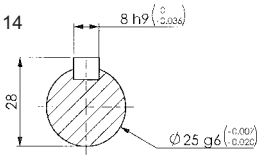
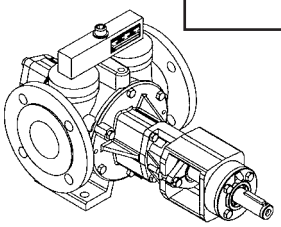
1. DIMENSIONS

J	Space required for removing front cover
P	Pump plate
PA	ATEX plate

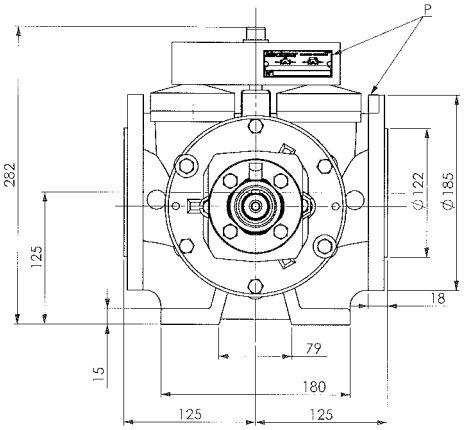
P15 - P25 BI
Stirrup

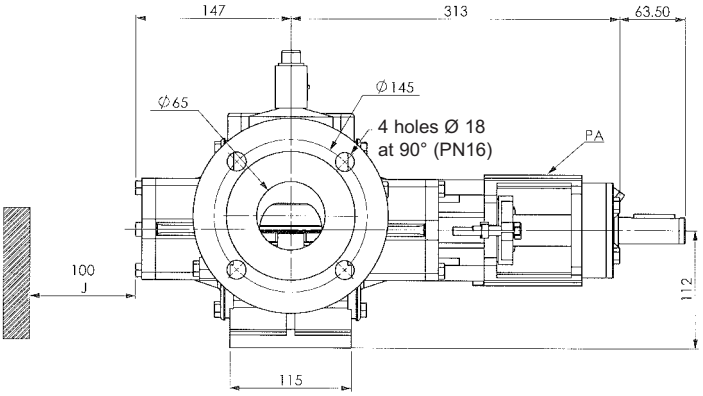






Weight :
42 kg

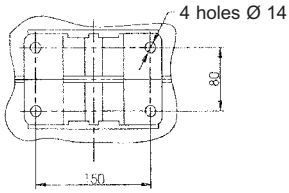


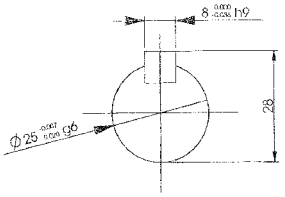


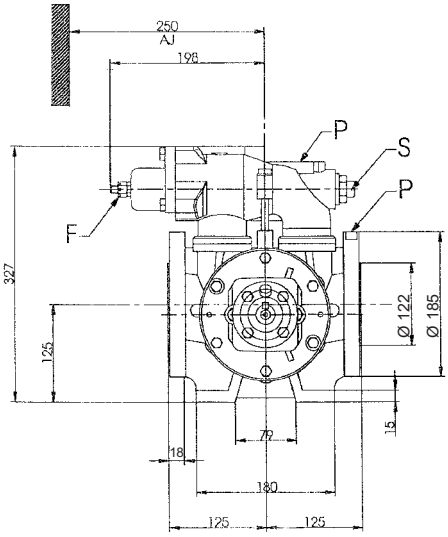
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.

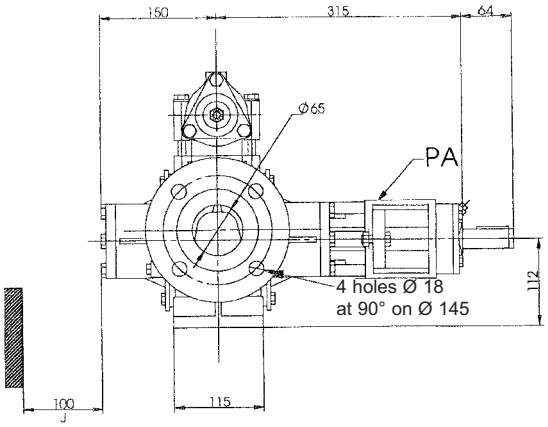
P15 - P25 BI
Single bypass

Weight :
51 kg





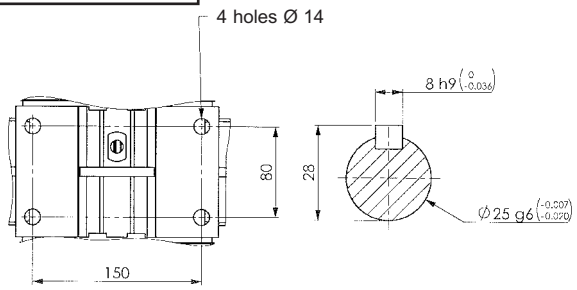


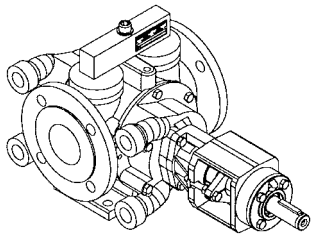


1. DIMENSIONS (continued)

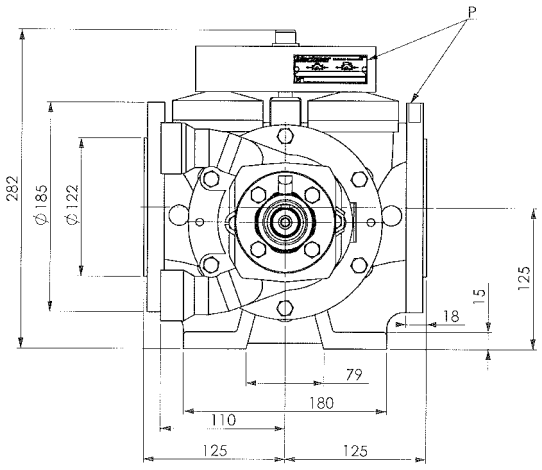
P15 - P25 BI
Jacket
Stirrup

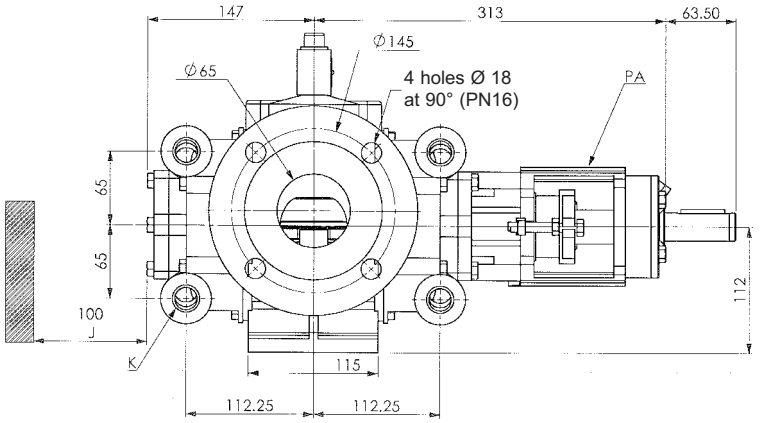
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate





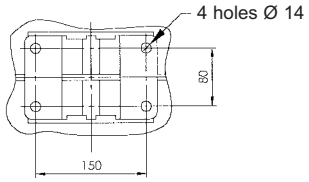
Weight :
45 kg

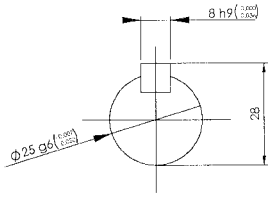




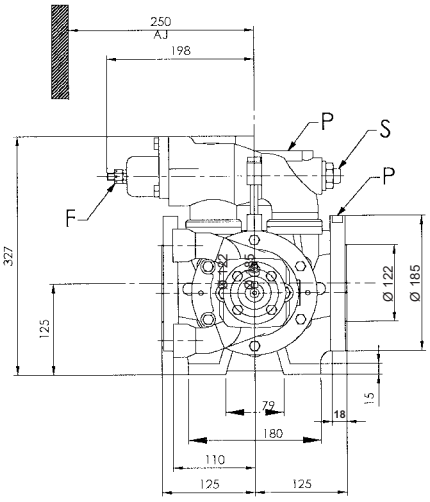
P15 - P25 BI
Jacket
Single bypass

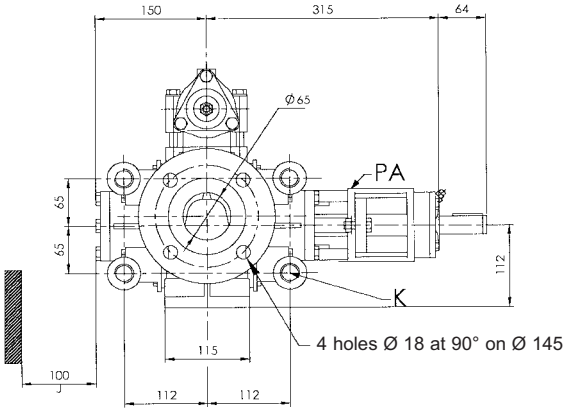
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.





Weight :
51 kg

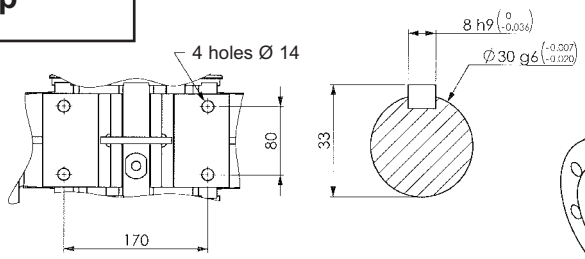


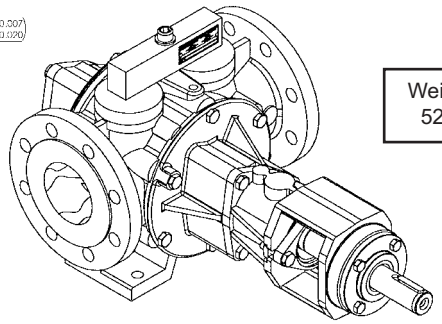


1. DIMENSIONS (continued)

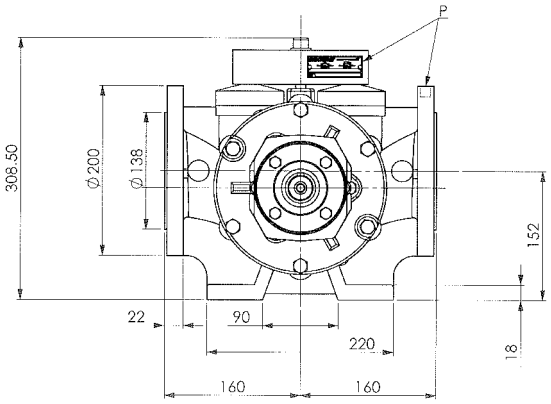
P40 BI
Stirrup

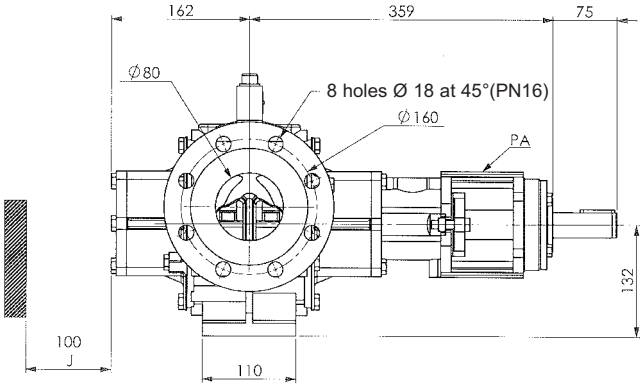
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate





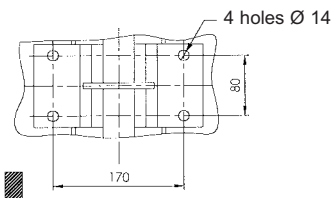
Weight :
52 kg

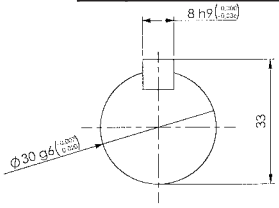




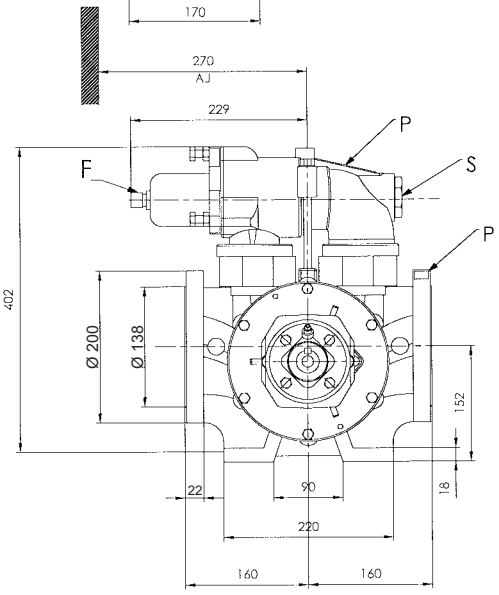
P40 BI
Single bypass

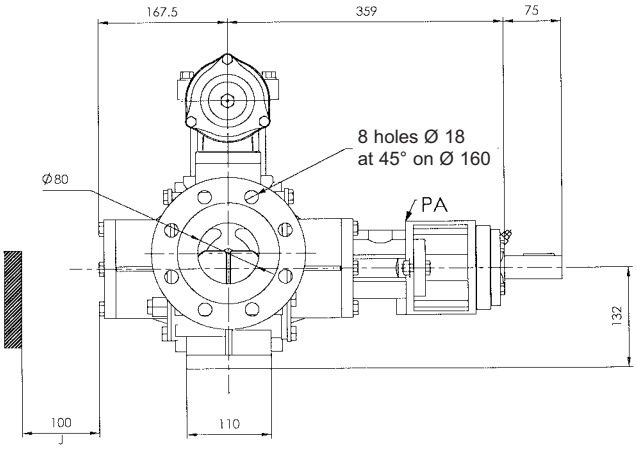
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.





Weight :
65 kg

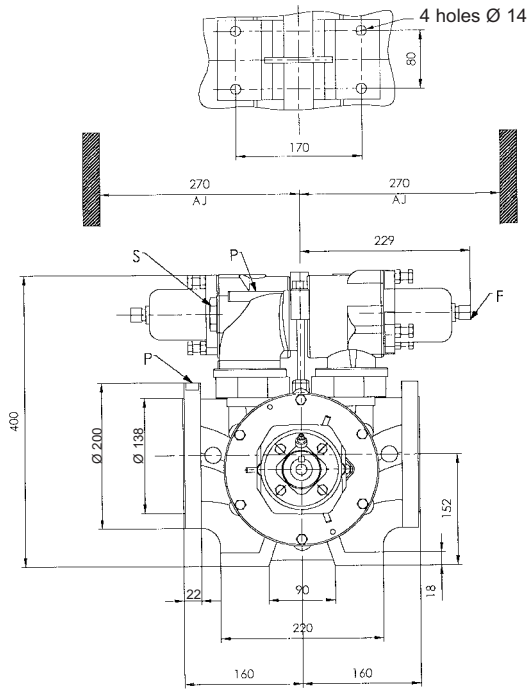


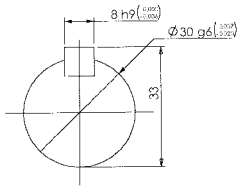


1. DIMENSIONS (continued)

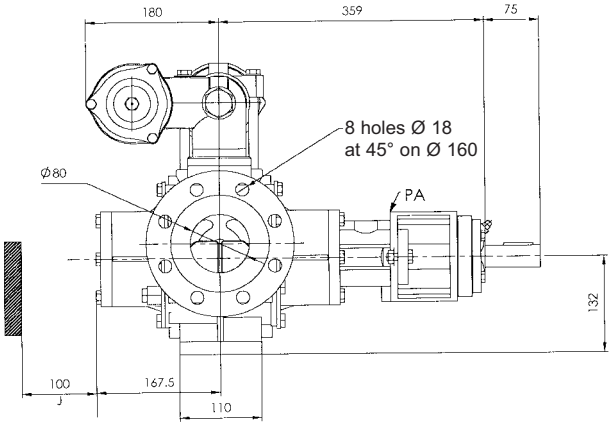
P40 BI
Double bypass

AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor * Thread size : 8 mm max.



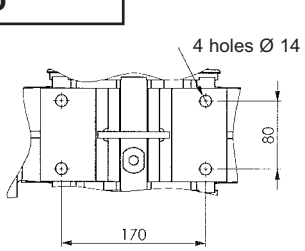


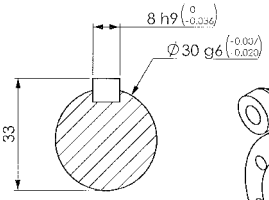
Weight :
70 kg

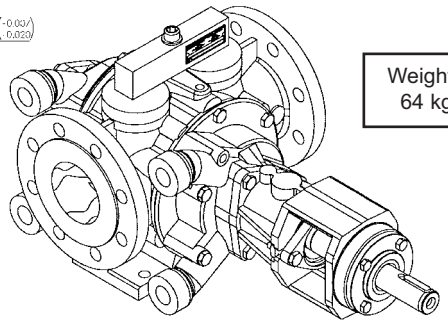


P40 BI
Jacket
Stirrup

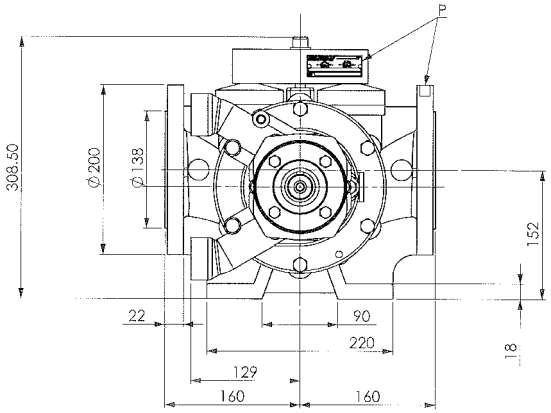
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate

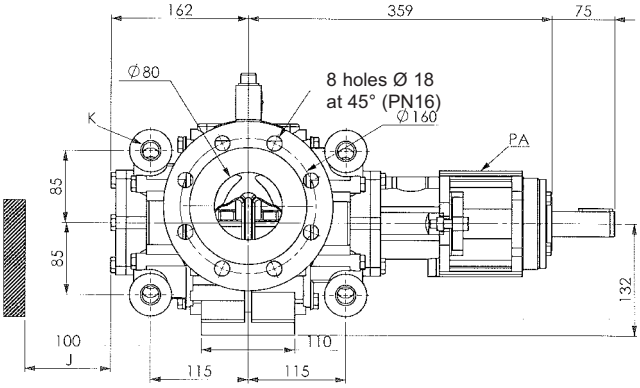






Weight :
64 kg





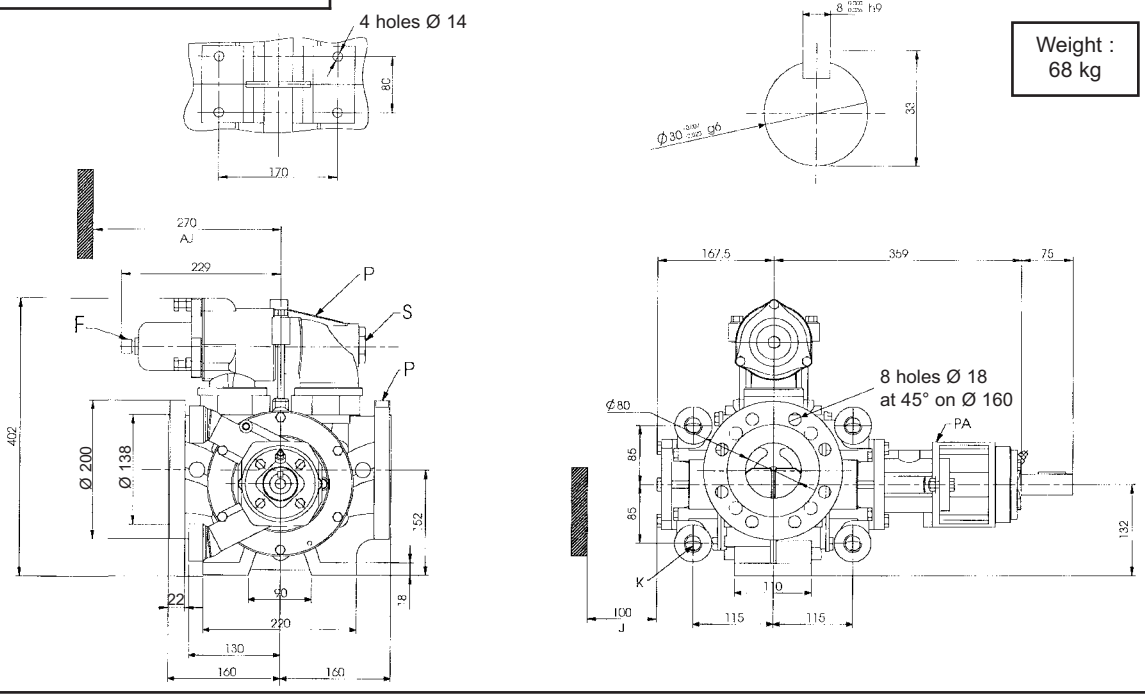
* 2 sensors on double bypass : 1 on each plug.

1. DIMENSIONS (continued)

AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.

P40 BI
Jacket
Single bypass

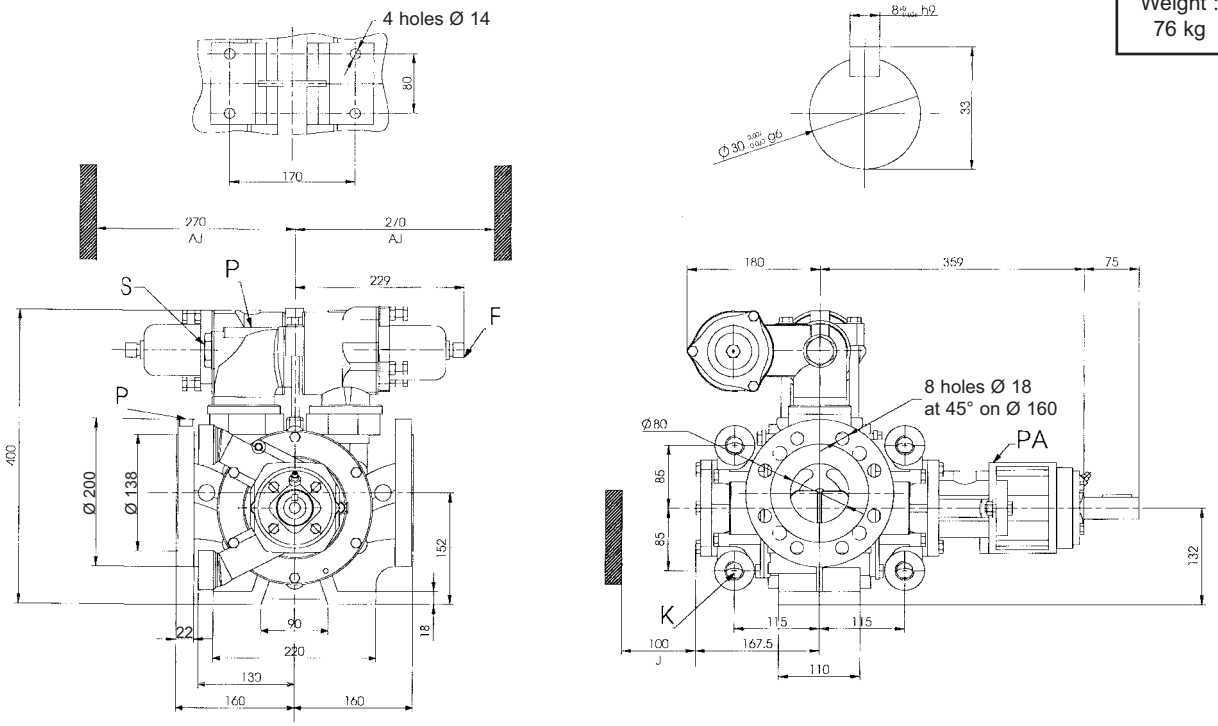
Weight :
68 kg



AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor * Thread size : 8 mm max.

P40 BI
Jacket
Double bypass

Weight :
76 kg

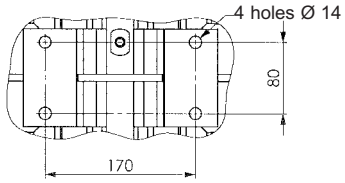


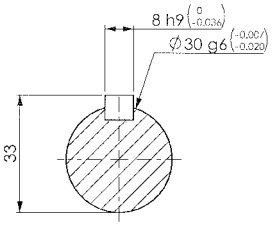
* 2 sensors on double bypass : 1 on each plug.

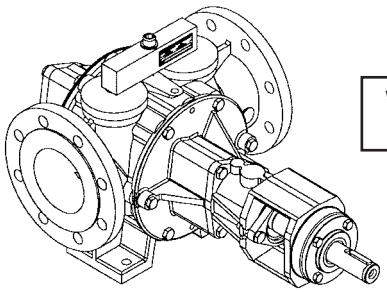
1. DIMENSIONS (continued)

P60 BI
Stirrup

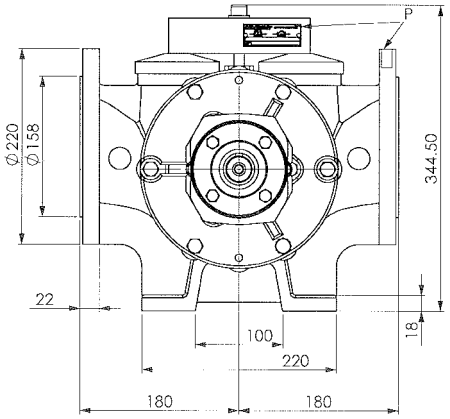
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate

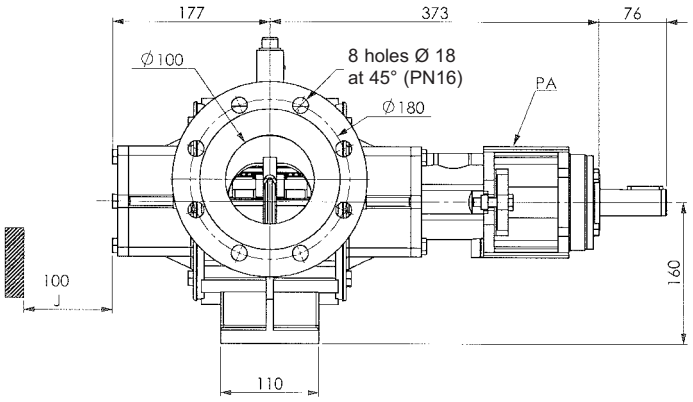






Weight :
79 kg

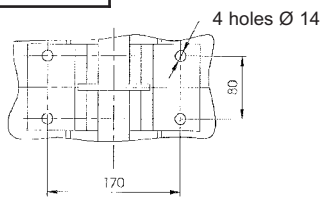


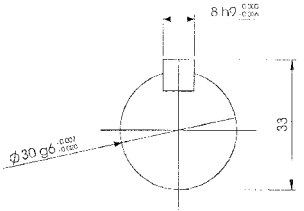


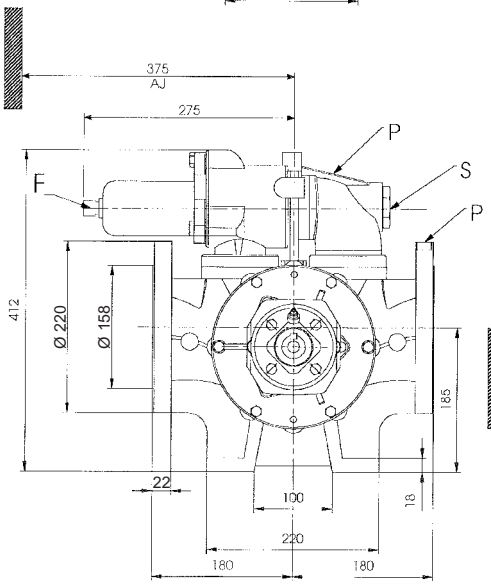
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor ; Thread size : 8 mm max.

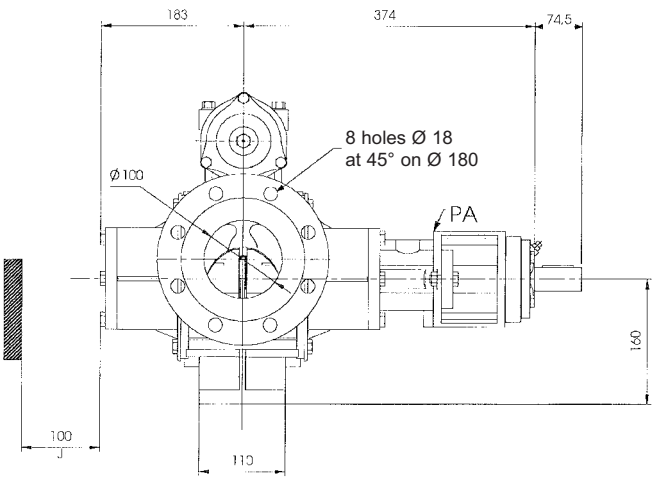
P60 BI
Single bypass

Weight :
85 kg





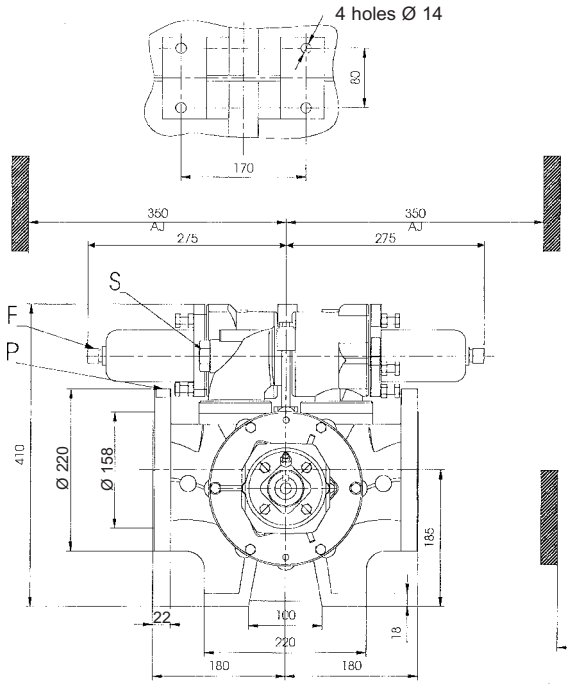




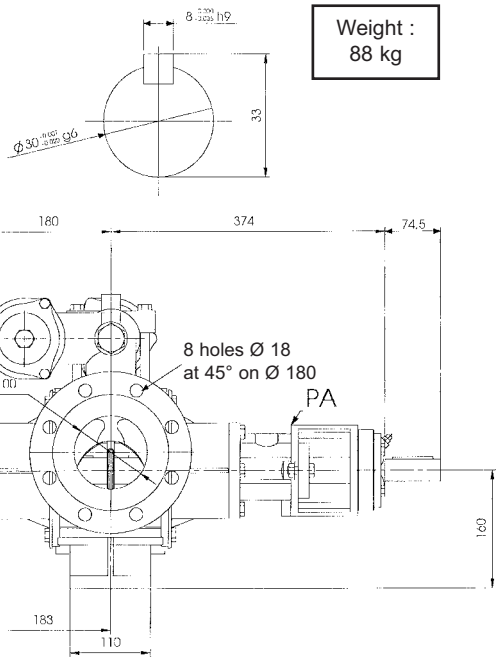
1. DIMENSIONS (continued)

P60 BI
Double bypass

AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor * Thread size : 8 mm max.



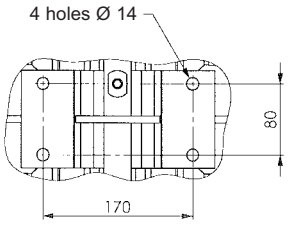
Weight :
88 kg

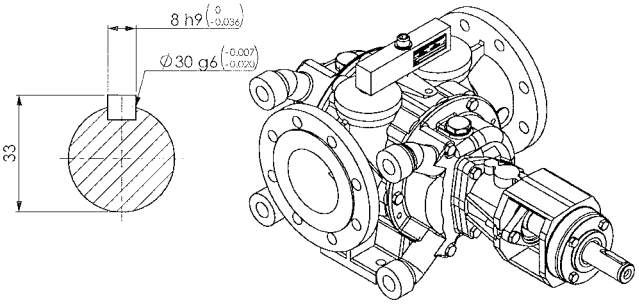


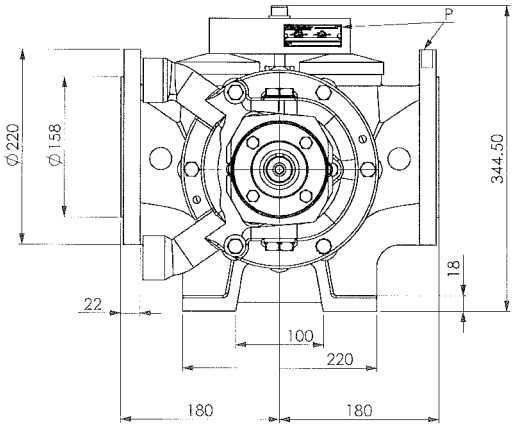
P60 BI
Jacket
Stirrup

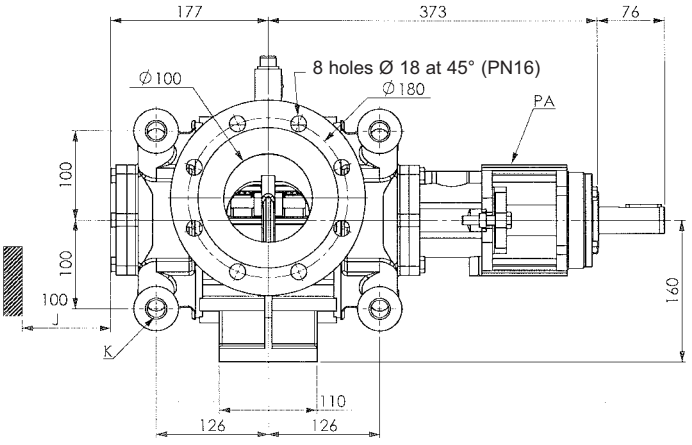
J	Space required for removing front cover
K	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate

Weight :
82 kg









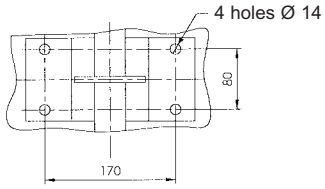
* 2 sensors on double bypass : 1 on each plug.

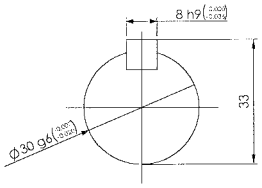
1. DIMENSIONS (continued)

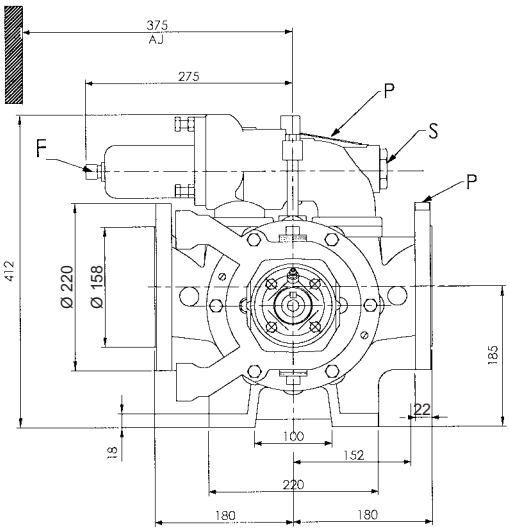
P60 BI
Jacket
Single bypass

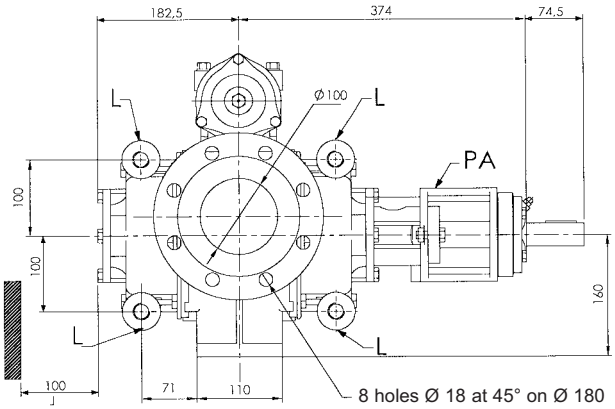
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
L	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.

Weight :
87 kg





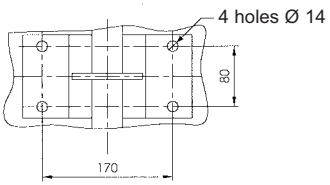


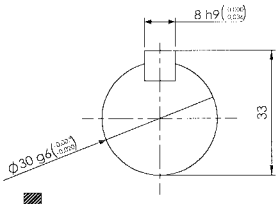


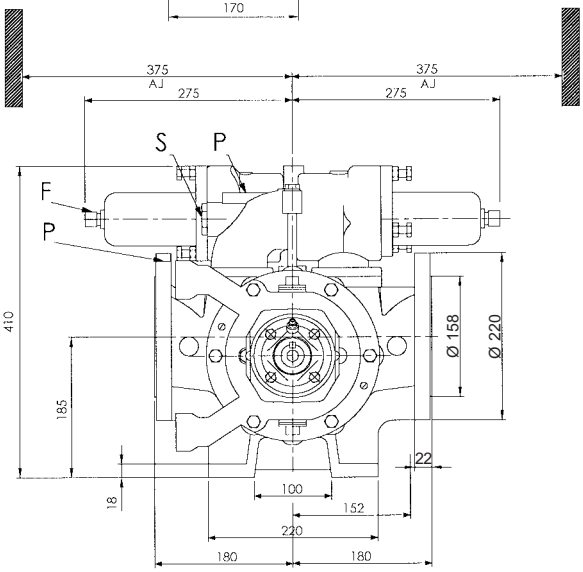
P60 BI
Jacket
Double bypass

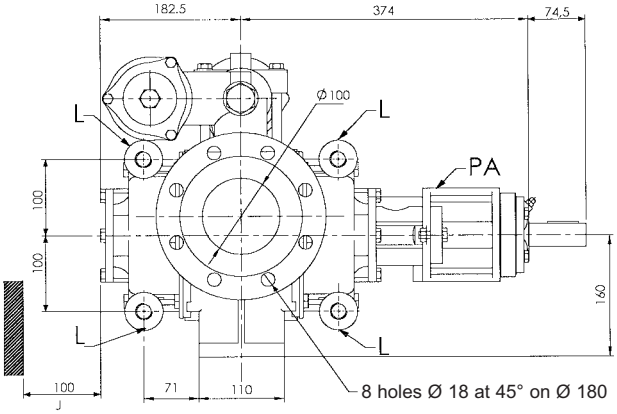
AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
L	Reheating jacket G3/4" port
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor * Thread size : 8 mm max.

Weight :
90 kg







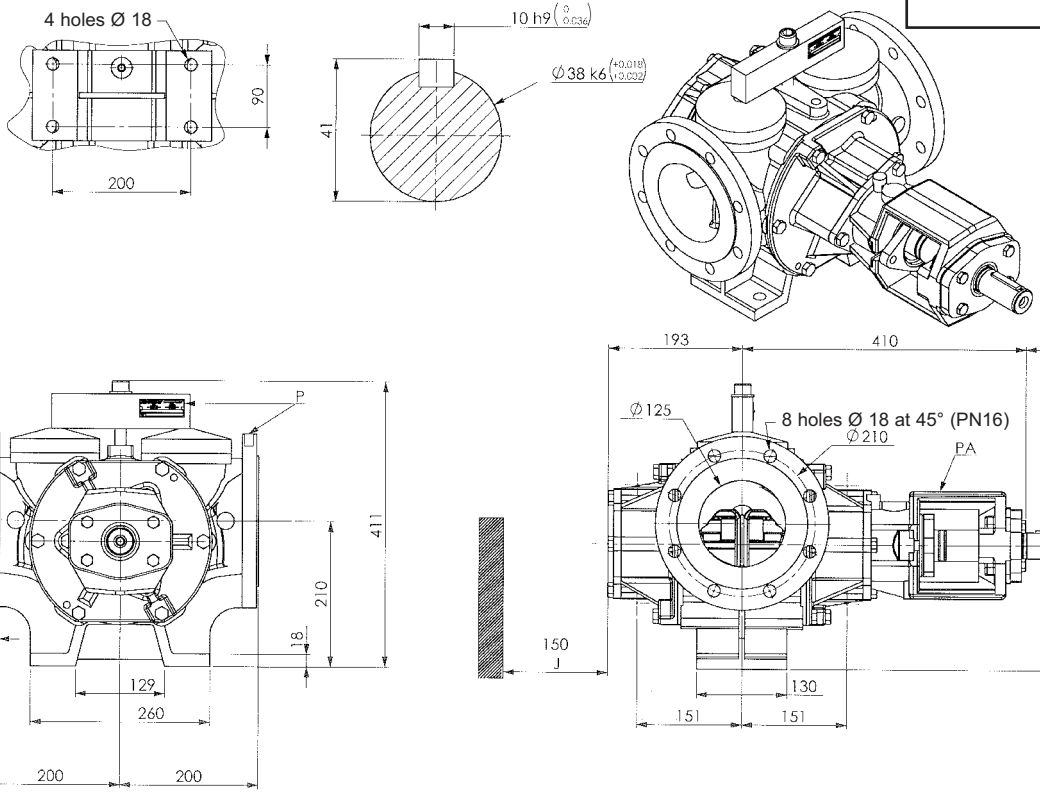


* 2 sensors on double bypass : 1 on each plug.

1. DIMENSIONS (continued)

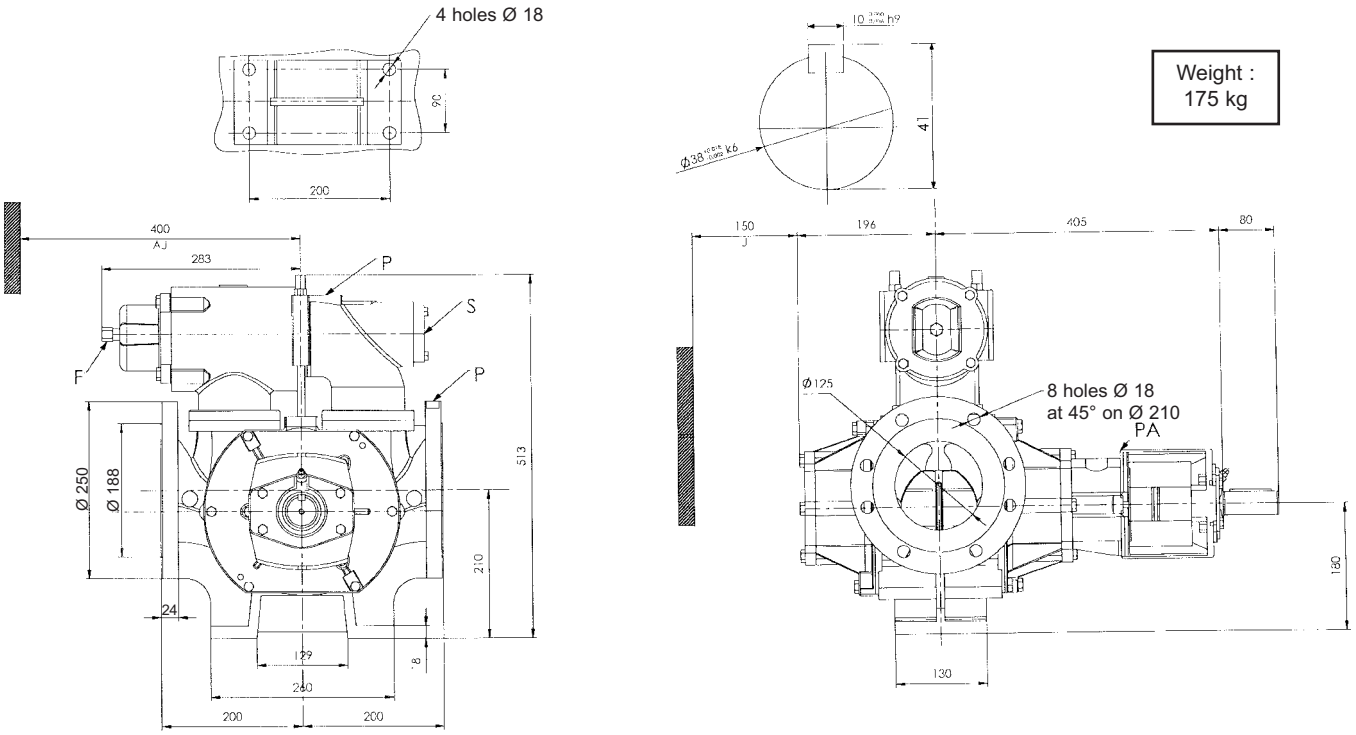
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate

P100 BI
Stirrup



AJ	Space required for removing cap
F	Bypass adjustment
J	Space required for removing front cover
P	Pump plate
PA	ATEX plate
S	Inserting M6 sensor Thread size : 8 mm max.

P100 BI
Single bypass



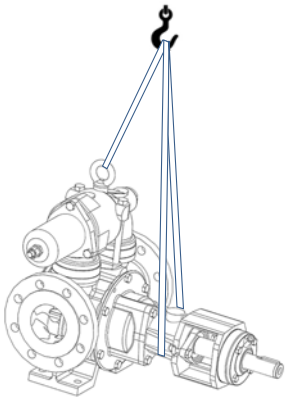
2. INSTALLATION

2.1 Choice of pump

To obtain the service expected from a MOUVEX P BI series pump, regarding both performance and longevity, it is vital that the type of pump, its speed and the materials used for its construction are determined as a function of the pump output, its installation and operating conditions.
You can contact our Technical Services at any time to ask for the information you require.

2.2 Hoisting devices

Hoisting points :



2.3 Pipe diameter

In order to achieve the best usage conditions, it is important to take the following recommendations into account when it comes to pipe dimensions :

- The pipe diameter should be chosen as a function of pipe length and the flow rate and viscosity of the pumped liquid, so that any head loss remains within the permissible limits for the motor/pump unit. Therefore it is difficult to give general and precise directions. However, it is never a disadvantage to over-dimension pipe diameters, especially for the section on the inlet side.
- In the case of thin liquids and the piping on the discharge side, one can generally allow a diameter equal to that of the ports on the pump and a larger diameter for the piping on the inlet side, if the value for the inlet power of the pump is negative or especially high.
- In the case of viscous liquids, special care should be given to choosing pipe diameters. In fact, the variation in head loss is proportional to viscosity and inversely proportional to the diameter as power of 4. A slight reduction in the pipe diameter could have serious consequences for the operating conditions of the pump.

Our Technical Services are always available to provide you with precise data if you give them accurate information or, better still, the installation plans.

2.4 Piping assembly

In order to achieve the best usage conditions, it is important to take the following recommendations into account when it comes to fitting pipes :

- The location of the pump in the transfer or recycling circuit should always be determined so as to reduce the height and length of the piping as much as possible.
- Wherever possible, siphons and reverse slopes should be avoided in the inlet piping.
- Particular care needs to be taken with the sealing on the inlet side to prevent air entering.
- Pipe elbows must always have a large radius (more than 3 times the diameter of the pipes) and must not be mounted too close to the pump flanges (min. recommended distance : 10 times the diameter of the pipes), on both the inlet and discharge sides.
- The pipes are supported and aligned with the pump in such a way as to avoid putting stress on the pump flanges. Non-compliance with this instruction can lead to deformation of pump parts, misalignment of bearings and accelerated material wear, even causing parts to break.
- For ease of adjustment and checking, it is recommended that pressure tapping ports for pressure gauges/vacuum gauges be provided as close as possible to the pump's inlet ports (preferably, at a distance of less than 5 times the diameter of the piping).
- If the suction head is especially high or if you want to prevent the pipes emptying at shutdown, you can install a foot valve. It should have a large diameter so as not to generate additional head loss.
- We recommend placing valves as close as possible to the pump ports to avoid having to drain the entire system each time maintenance is carried out. These valves should have the same diameter as the pipes and preferably by full bore models.
- All these steps should be taken to prevent foreign bodies entering the pump (the use of a filter in the pump inlet pipe is strongly recommended).
- Before installing new pipes or tanks, be sure to clean them very carefully to remove any solder, rust, etc. which could be carried along with the water and cause excessive pump wear.
- The pipes should be designed to allow for thermal expansion/contraction (the use of flexible hoses or expansion loops is recommended).
- If the liquid may freeze or solidify, prepare for draining the piping by installing drain taps at the low points and air vents at the high points.

2.5 Direction of rotation

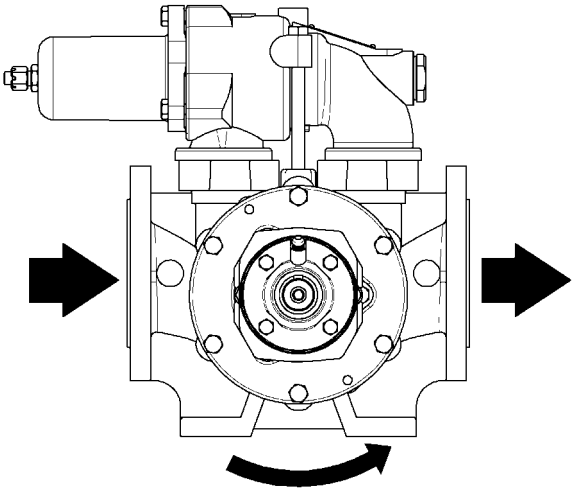
• In its standard configuration, the MOUVEX P BI series pump is supplied as reversible and with counterclockwise rotation.

NOTE :
THE VIEWS CONTAINED IN THIS INSTRUCTION MANUAL SHOW PARTS IN THE STANDARD DIRECTION OF ROTATION.

The rule governing the inlet side and the direction of rotation is as follows :

• The inlet will be on the left side of the pump if the direction of rotation is counterclockwise (seen from the shaft side).

• The inlet will be on the right side of the pump if the direction of rotation is clockwise.



Counterclockwise direction of rotation

The direction of rotation can be reversed :

• On request at the time the order is placed. In this case, the pump will be supplied with clockwise rotation.

• Manually, by referring to the relevant §.

It is also possible to order a reversible-direction MOUVEX P BI series pump which can be operated in either direction.

⚠ CAUTION

REGARDLESS OF THE INTERNAL DESIGN OF THE PUMP, THE DIRECTION OF ROTATION SHOULD NOT BE CHANGED UNTIL THE PUMP HAS COME TO A COMPLETE STOP.

2.6 Protecting the system against overpressure

⚠ WARNING	
 **Hazardous pressure can cause personal injury or property damage.**	**INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND PROPERTY DAMAGE.**

⚠ WARNING	
 **Hazardous pressure can cause personal injury or property damage.**	**FAILURE TO INSTALL ADEQUATELY SIZED PRESSURE RELIEF VALVE(S) CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**

It is recommended that a safety device be used to protect the system from overpressures.

The standard pump is supplied fitted with a single bypass to protect the system in one operating direction. This is to say that its orientation is a function of the operating direction of the pump (see § BYPASS).

It is also possible to order the following options :

• Bypass clamp : the pump then has no other integrated safety device. In that case, it is strongly recommended to install a pressure switch to limit any overpressure.

• Double bypass : Here, the pump is fitted with an integrated safety device to protect the system in both directions of operation.

If the pump is to be used in both directions of rotation (whatever the operating conditions), it is recommended that a device (pressure switch, double bypass, etc.) be used to protect the pump from overpressures, whatever the direction of operation.

2.7 Cleaning

Since the pumps are delivered well greased, they must be cleaned before starting them up (especially when transferring food products, for example).

Cleaning can be done either by circulating an appropriate liquid, or by removing the front cover of the pump and carefully cleaning the internal parts (to do so, refer to the section on pump maintenance).

2.8 Heating jacket variant

2.8.1 Technical characteristics

To avoid any liquid solidification in the pump, two heating jackets are located on each side of the body.

Heating jackets permits the circulation of steam or liquid up to 250°C and up to 12 bar (maximum pressure).

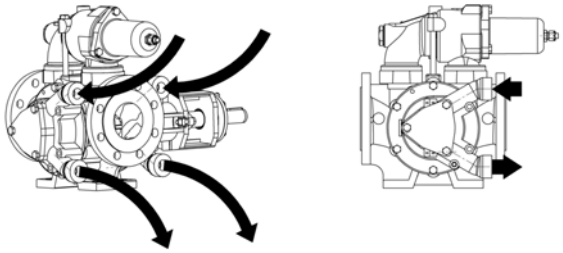
Jacket connections are :

- **P15 - P25 - P40 - P60 pumps :** 3/4" B.S.P.F. tapped holes.
- **P100 pumps :** 1" B.S.P.F. tapped holes.

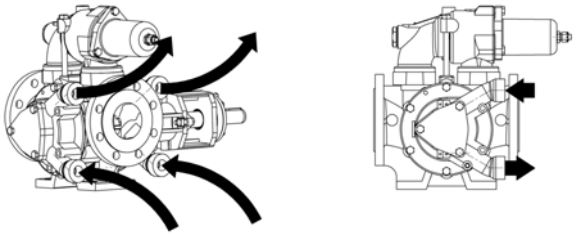
2.8.2 Connection system

The direction of the heating circuit connection to the jacket depends on the nature of the heating fluid :

- If using steam, the inlet will be on the upper opening and outlet will be on the lower opening.



- If using liquid, the inlet will be on the lower opening and outlet will be on the upper opening.

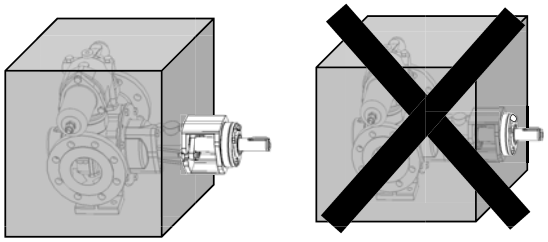


⚠ WARNING	
	BEFORE DRAINING THE HEATING JACKET, IT IS ESSENTIAL TO MAKE SURE THAT THE PUMP HEATING CIRCUIT AND HEATING JACKET ARE NO LONGER PRESSURIZED.
Hazardous pressure can cause personal injury or property damage.	

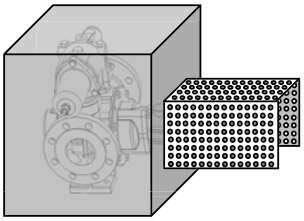
- Draining the product when hot could cause serious injuries or damage.

2.9 Heat insulation

Take care of keeping outboard bearing holder and bearing outside insulation to ensure sufficient bearing cooling.



Coupling guard : For any application with a pumped product temperature above 100°C / 212°F, use a perforated coupling guard to ensure sufficient bearing cooling.



2. INSTALLATION (continued)

2.10 Installation of units

WARNING	
 The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.	BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

The correct seating of the pump is vital for its efficient operation and its longevity. The base must be flat, level and sufficiently resistant to absorb the stresses caused by the motor-driven pump without deformation (if it is made of concrete, it must comply with standard BAEL 91).

In the case where the unit is fastened by anchor lugs or bolts, it must be carefully wedged to prevent any deformation of the chassis when tightening the bolts. Deformation of the chassis will cause stress prejudicial to the pump and the drive device and put the coupling out of true alignment, thereby causing vibrations, noise and premature wear. Care must be taken so that the chassis is clear of the ground, apart from the base plates.

If the chassis is a one-piece unit in doubled plate, it is recommended that a horizontal clearance of about 50 cm be left between one section of the chassis and the other to allow access for fastening the nuts on the pump, reduction gearbox and motor. In all cases, the clearance around the motor-driven pump should all room for demounting the pump (for distances, refer to the dimension drawing at the start of the notice).

The chassis is equipped with a ground connection that must be used to protect people and equipment.

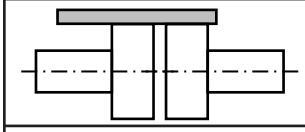
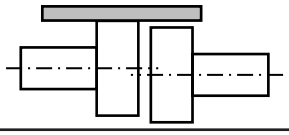
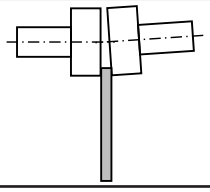
2.11 Alignment of motor/pump and reduction gearbox/pump shafts

WARNING	
 Do not operate without guard in place.	IF OPERATED WITHOUT THE SHAFT GUARD, THERE IS CONSIDERABLE RISK OF SEVERE PERSONAL INJURY, SIGNIFICANT PROPERTY DAMAGE OR EVEN DEATH.

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

The motor and pump shafts are accurately aligned at the factory before dispatch, but they should be checked carefully when received at the site and realigned if necessary. To align the coupling and the shaft, use a straight-edge to check the concentricity and thickness gauges for the angular misalignment.

The 3 figures below show the procedure in detail and the admissible deviations :

Make this check for 4 points: up - down - left - right	
	*Correct*
	*Out-of-parallelism*
	*Angular defect (maximum : 1°)*

Controlling the alignment at each stage of the installation is important to be sure that none of the following procedures has generated stresses on the unit or the pump :

- after fastening on the foundations.
- after fastening the pipes.
- after the pump has been operated at the normal operating temperature.

REMINDER :

You cannot rely on the coupling to compensate for misalignment.

NEVER START A UNIT IF THE COUPLING ALIGNMENT IS INCORRECT. THIS WILL RENDER OUR WARRANTY INVALID.

2.12 Electric motors

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

Check that the supply voltage matches the indications on the motor rating plate.

Comply with the wiring diagram, make sure the wires are rated for the power and take care with the contacts, which must be thoroughly tightened. The motors must be protected by appropriate circuit breakers and fuses. Connect the regulatory ground connections.

Check the direction of rotation :

WARNING	
 Any unforeseen start-up can cause serious injuries or important material damages.	TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	PUMPS OPERATING AGAINST A CLOSED VALVE CAN CAUSE SYSTEM FAILURE, PERSONAL INJURY AND PROPERTY DAMAGE.

WARNING	
 Do not operate without guard in place.	IF OPERATED WITHOUT THE SHAFT GUARD, THERE IS CONSIDERABLE RISK OF SEVERE PERSONAL INJURY, SIGNIFICANT PROPERTY DAMAGE OR EVEN DEATH.

This check should be done with no liquid being pumped, and both the inlet and discharge circuits vented to avoid generating unexpected pressure (on the inlet side, for example). This will avoid damaging either the pump or the system.

Start the pump empty to check that the connections are good and that the direction of rotation corresponds to the system intake and discharge directions. If it is necessary to reverse the direction of rotation, follow the instructions below :

Three-phase motor : switch any 2 current input wires.

Bi-phase motor : switch two same phase wires.

Single-phase motor : follow the instructions on the notice supplied with the motor.

2.13 Diesel engines drive

CAUTION	
 Excessive temperature can cause injury or severe damage.	THE SURFACES CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

Do not forget that these engines are not reversible. It is therefore vital to carefully check the inlet and outlet sides of the pump before connecting the pump unit to the piping.

The use of diesel engines drive is now well known. Nevertheless, we strongly recommend that you carefully read the technical manuals concerning them.

3. USE

3.1 Pumping hot liquids

CAUTION	
	THE SURFACES CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.
Excessive temperature can cause injury or severe damage.	

When pumping hot liquids, make your you retighten screws and bolts after starting for the first time in order to compensate for contraction.

3.2 Pump full of liquid when stopped

WARNING	
	FAILURE TO INSTALL ADEQUATELY SIZED PRESSURE RELIEF VALVE(S) CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.
Hazardous pressure can cause personal injury or property damage.	

WARNING	
	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.
Toxic or hazardous fluids can cause serious injury.	

If the pump circuit is to be located between valves and/or a non-return valve, you need to take account of the variations in temperature that can lead to contraction of the liquid in the circuit. In this case, you need to provide some means of compensating for the contraction. A discharge valve may be sufficient. The opening pressure for this valve should be compatible with the permitted pressure for the other components in the circuit.

It is also advisable to fit a discharge device to allow the circuit to be completely emptied for any maintenance work.

In the case of liquids containing particles settling on shut-down, it is necessary to make sure the consistency of the deposit will not impede restarting the pump.

3.3 Noise level

The sound level of a pump is greatly influenced by its conditions of use. Cavitation and pumping products with high gas contents generally increases the sound level.

Under the following pumping conditions :

- excluding cavitation
- maximum differential pressure : 12 bar
- speed of rotation 1000 rpm
- product viscosity of 1 cSt

The sound level reached for the MOUVEX P BI series pump in good conditions without the drive is less than :

- P15 - P25. . . 74 dB(A)
- P40 - P60. . . 76 dB(A)
- P100. . . . . 78 dB(A)

3.4 Starting-up the pump

WARNING	
	FAILURE TO RELIEVE THE SYSTEM PRESSURE PRIOR TO PERFORMING ANY WORK ON THE PUMP OR THE INSTALLATION CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.
Hazardous pressure can cause personal injury or property damage.	

WARNING	
	IF OPERATED WITHOUT THE SHAFT GUARD, THERE IS CONSIDERABLE RISK OF SEVERE PERSONAL INJURY, SIGNIFICANT PROPERTY DAMAGE OR EVEN DEATH.
Do not operate without guard in place.	

Before starting the pump, make sure that the following conditions are met :

- The circuit should be in one of its pumping configurations, with the appropriate valves open, especially on the intake side.
- For products requiring heating, they must be brought to their pumping temperature before starting the pump.

3.5 Running without liquid in the pump

MOUVEX TVP (PEEK) vane pumps P Series can run without liquid in the pump for 5 minutes without causing damage, in particular during pump priming.

3. USE (continued)

3.6 Shutting down the pump

When shutting down the pump, we recommend waiting for it to stop completely before closing the valves, especially the inlet valve.

3.7 Storage

3.7.1 Short duration (≤ 1 month)

WARNING	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.
	
Toxic or hazardous fluids can cause serious injury.	

MOUVEX pumps and motor-driven pumps are well lubricated when delivered to protect the internal parts during brief storage in a building where :

- the temperature remains between 10°C and 50°C.
- the relative humidity does not exceed 60%.
- exposure to vibration is limited (maximum movement : 0,05 mm).
- pump is stored in an area sheltered from bad weather and sun.

3.7.2 Long duration (> 1 month)

We recommend the following procedure for longer periods of storage :

The recommendations from the manufacturer should be followed if the pump is stored with its gear motor.

Pump ports should be filled with a non-corrosive liquid that it compatible with the pump components in order to prevent corrosion.

Unpainted external surfaces of the pump (e.g. shafts, couplings, etc.) should be covered in some form of anti-corrosion protection.

The bearing should be well greased. If the pump is to be stored for more than three years, the grease should be replaced every three years to prevent it degrading (see § CHANGING THE BEARING for how to remove the cover).

The best storage conditions are inside a building that meets the conditions set out above.

If inside storage is not possible, the materials should be covered to prevent direct exposure to sun and bad weather. This protection should also prevent condensation.

It is recommended to turn the pump by hand every two months to distribute the lubricant around the interior. Items should then be placed where there is no risk of damage if they are moved slightly by vibrations.

3.7.3 Restarting

Follow the standard start-up procedure for the pump/motor-driven pump, as well as the instructions below.

Turn the pump by hand to make sure the parts move freely.

Remove the cover as explained in § CHANGING THE BEARING and replace the grease used to lubricate the bearing.

If the pump has a safety bypass, remove it and inspect the parts and make sure they move freely (see § BYPASS for removal instructions).

3.8 Lubrication

If the type of liquid requires it, the pump should be lubricated before each start-up, after each shutdown and every 3 or 4 hours during continuous operation.

Preference should be given to lubricants that will not dissolve in the pumped liquid and, if hot liquids are involved, to lubricants that maintain their viscosity at operating temperatures.

3.9 Scrapping

The pump must be scrapped in compliance with the regulations in force.

During this operation, particular care must be paid to the drainage stages of the pump (pumped product).

4. NECESSARY TOOLS AND TIGHTENING TORQUES

4.1 Necessary tools

- Open-end spanners 13 - 17
- Socket wrench 17
- Opening circlip pliers
- Screwdriver
- Extractor (FACOM U-35L for example)
- Torque wrench (eventually)

4.2 Assembly torques

- M6..... 687 Nmm
- M8.....1684 Nmm
- M10.....3347 Nmm

5. OPENING AND CLOSING THE NON-DRIVE SIDE BASE

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING	
 Hazardous or toxic fluids can cause serious injury.	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

WARNING	
 The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.	BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

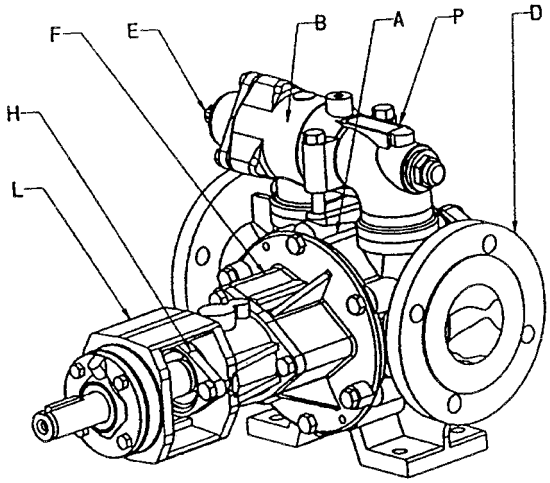
CAUTION	
 Slippery lubricant. Spills should be cleaned up.	THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION	
 Excessive temperature- can cause injury or severe damage.	THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

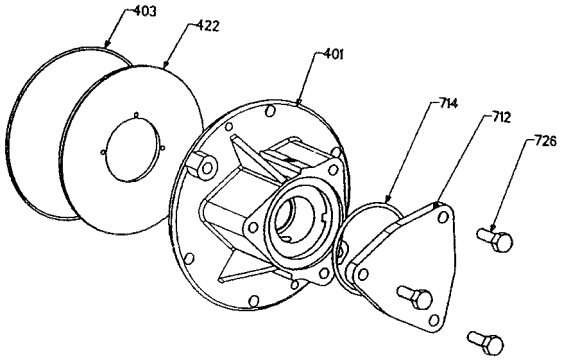
WARNING	
 Any unforeseen start-up can cause serious injuries or important material damages.	TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

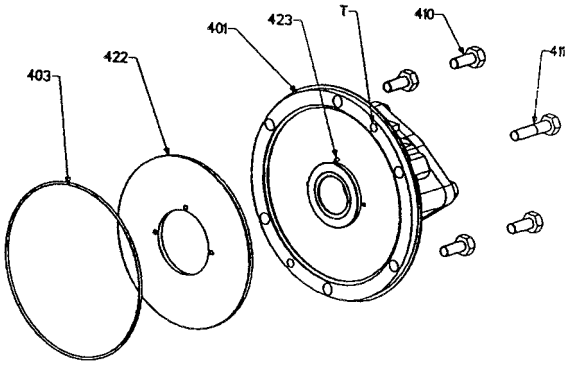
Before any disassembly, make sure that the pump has been drained and take all the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

5. OPENING AND CLOSING THE NON-DRIVE SIDE BASE (continued)



A - Pump cylinder
B - Bypass
D - PN16
E - Bypass adjustment
F - Cover
H - Shaft seal casing
L - Outboard bearing
P - Pump plate





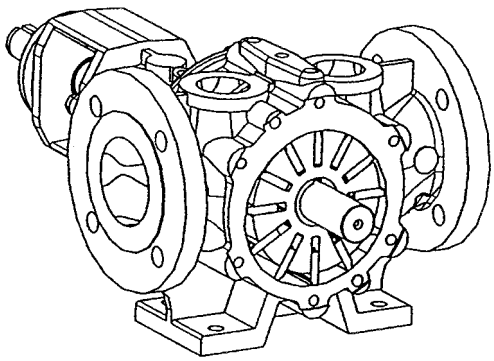
5.1 Opening the non-drive side base

- Loosen the 4 screws **410**.
- Loosen the 2 screws **411** and place them in the 2 diametrically opposed tapped holes.
- Detach the front cover **401** of the body by screwing the 2 screws **411** at the same time.
- When the cover is free on the shaft, withdraw it manually while supporting it.
- Take out the disk **422**.

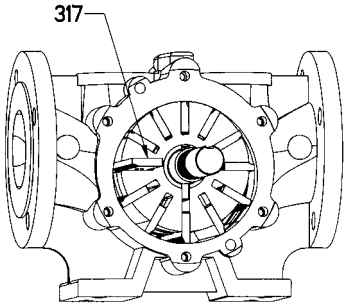
CAUTION

Wearing carbon disks 422 are only positioned in the covers, hold them by hand while the dismantling process is taking place (fragile parts susceptible to shock).

- Unscrew the 3 screws **726**.
- Remove the cover **712** and its seal **714**.
- Check the seals **403** and **714**.
- Check the bushing **407** inside the front cover **401** (see § MAINTENANCE).

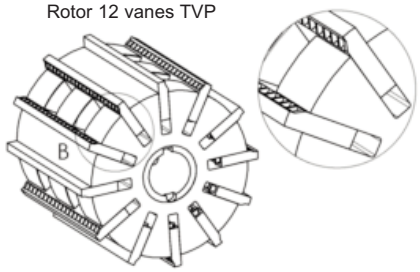


5.2 Checking the vanes



- Remove a vane **317** situated in an horizontal plane.
- Check it for wear (see § MAINTENANCE). In the case of abnormal wear, check the state of the body and front cover faces.
- Replace the vane (with a new one if necessary), making sure it is fitted in the right direction (see details below) and making sure it slides properly in its slot.

Rotor 12 vanes TVP



- By hand, turn the pump shaft to bring the next vane into a horizontal plane.
  Then proceed in the same way for each vane.

5. OPENING AND CLOSING THE NON-DRIVE SIDE BASE (continued)

5.3 Changing the bushing

Dismantling :

• Extract the ring **407** by pressing it home with a sleve-tube.

Reassembly :

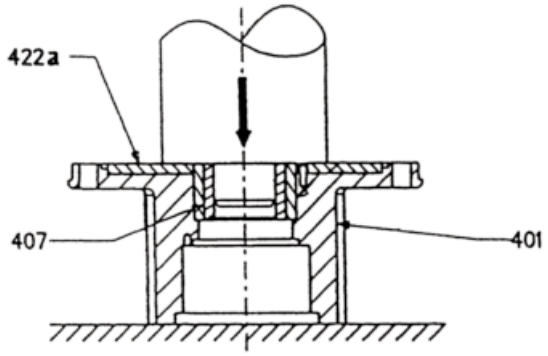
• Position the front cover **401** vertically on its small side and insert a dummy **422a** in the place of the disk **422**.

• Mount the ring **407** by pressing the latter home with a sleeve-tube.

• Take out the dummy disk **422a** and replace the disk **422**.

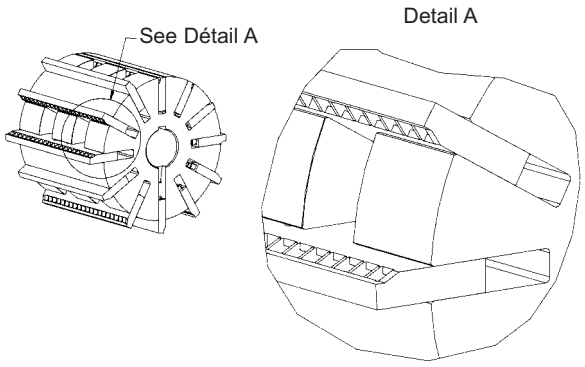
NOTA :

The side of the ring must be offset by 0,1 mm relative to the cover disk 422.



5.4 Closing the non-drive side base

For the versions without pushrods, insert the vanes making sure they are fitted in the right direction (see detail A).



• Proceed, as necessary, to replace the wearing disk **422** (to remove the old disk, it may be necessary to break it).

• Clean its seating. Take care with the positioning of the disk. The 3 diameter 4 holes must be opposite the 2 circulation holes of the cover and the pin **423** (P15, P25, P40 only).

• In this assembly operation, check and replace, as necessary, the seal **403** and fit it with a suitable lubricant.

• Orient the front cover **401**, pin **423** to the vertical.

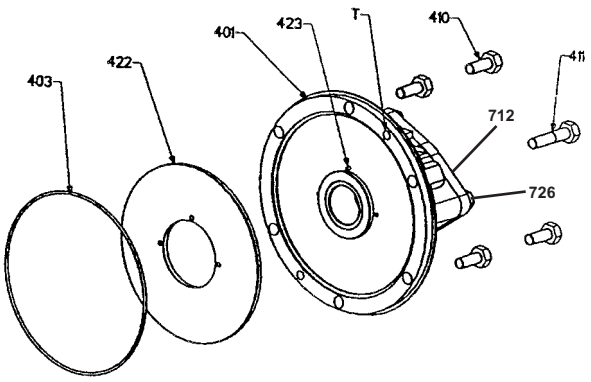
• Tighten the 4 screws **410**.

• Tighten the 2 screws **411** into the 2 bosses of the front cover **401**.

• Check that the pump can be turned freely by hand.

• Replace the cover **712** and its seal **714** (a new one if necessary).

• Tighten the 3 screws **726**.



6. OPENING AND CLOSING THE DRIVE SIDE BASE

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING	
 Hazardous or toxic fluids can cause serious injury.	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

WARNING	
 The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.	BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

CAUTION	
 Slippery lubricant. Spills should be cleaned up.	THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION	
 Excessive temperature- can cause injury or severe damage.	THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

WARNING	
 Any unforeseen start-up can cause serious injuries or important material damages.	TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

Before any disassembly, make sure that the pump has been drained and take all the necessary precautions to prevent it from starting up.The pump must not start up, even accidentally.

Uncouple the pump by removing the coupling sleeve.

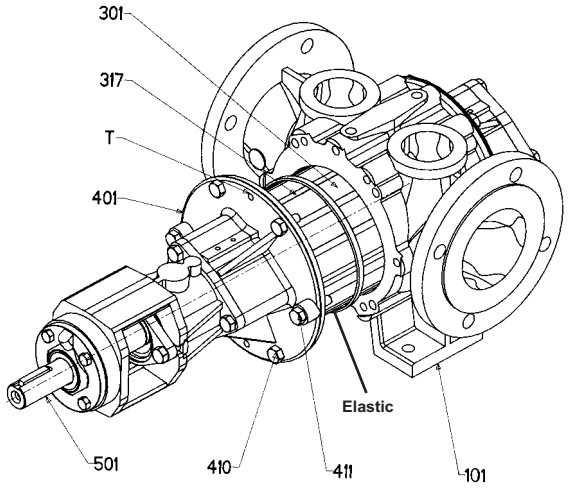
Remove the pump mounting screws.

Place it on a workbench or on a flat surface free from obstructions.

6. OPENING AND CLOSING THE DRIVE SIDE BASE (continued)

6.1 Opening the drive side base

- Uncouple the pump by removing the coupling sleeve.
- Loosen the 4 screws **410** and the 2 screws **411** and place them in the 2 tapped holes T.
- Detach the cover of the cylinder by screwing the 2 screws **411** at the same time.
- Withdraw the front cover **401** in such a way as to release the rotor **301** from a little more than half of the pump body **101**.
- Hold the vanes **317** in place by means of suitable straps (elastic, bracelets...).
- Place the front cover-rotor assembly on a bench, remove the straps and the vanes.
- Check the seal **403**.

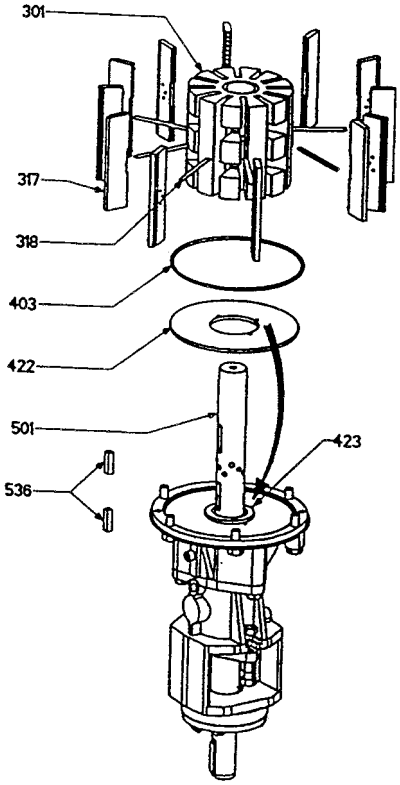


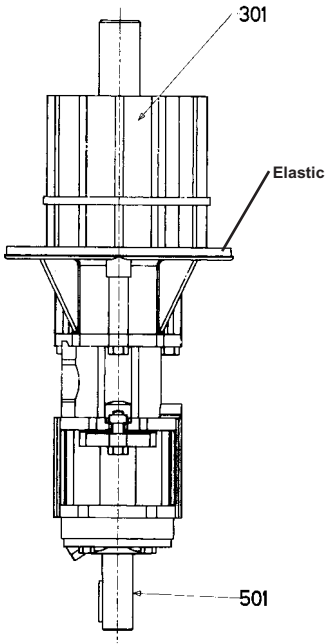
6.2 Dismantling the vanes and pushrods

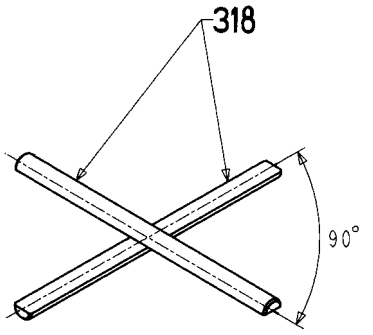
- Place the front cover **401** and rotor **301** assembly on a bench.
- Remove the straps and the vanes **317**.
- Pull out the pushrods **318** by pushing them, if necessary, with a screwdriver.
- Check the pushrods **318** for wear (see § MAINTENANCE) and change them as necessary.
- Pull out the rotor **301**.
- Remove the keyways **536**.
- Check the wear of the keyways and of the 2 keys **536**.

CAUTION

The wearing carbon disks 422 are only positioned in the covers, take care not to drop them when the rotor is being removed.





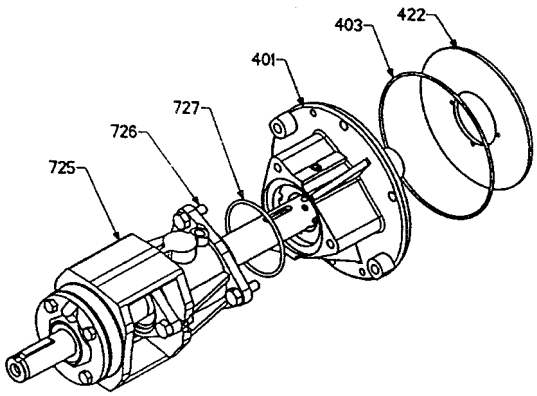


6. OPENING AND CLOSING THE DRIVE SIDE BASE (continued)

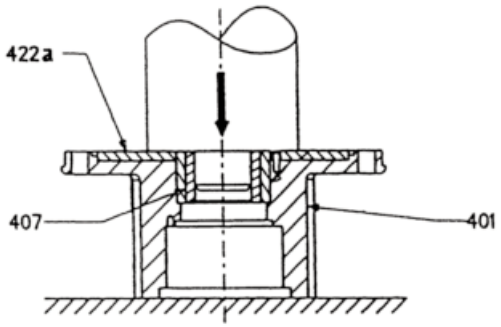
6.3 Changing the bushing

Dismantling :

- Loosen the 3 screws **726**.
- Remove the front cover **401a** from the strainer **725** by sliding it along the shaft **501** (be careful not to drag the shaft seal or subject it to any impact).



- Extract the ring **407** by pressing it home with a sleve-tube.



Reassembly :

- Position the front cover **401** vertically on its small side and insert a dummy **422a** in the place of the disk **422**.
- Mount the ring **407** by pressing the latter home with a sleeve-tube.
- Take out the dummy disk **422a** and replace the disk **422**.

NOTA :

The side of the ring must be offset by 0,1 mm relative to the cover disk 422.

- Fit the front cover **401** on the strainer **725.**

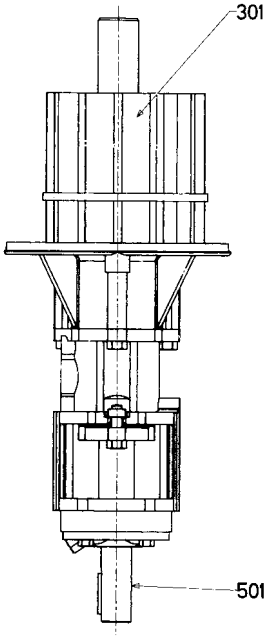
CAUTION

If there is a double shaft seal, index the seal insert and the front cover.

- Tighten the 3 screws **726**.

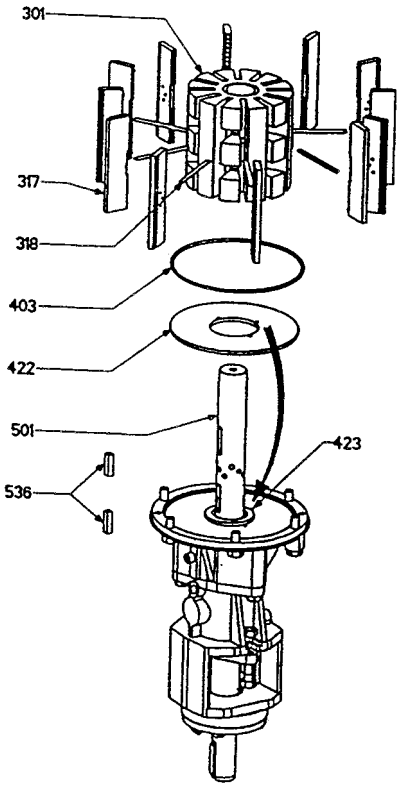
6.4 Reassembly the vanes and pushrods

- Position the shaft **501** vertically with the front cover **401** facing down.
- Proceed, as necessary, to replace the wearing disk **422** (to remove the old disk, it may be necessary to break it). Clean its seating before reassembling a new disk.
- **Caution** : Take care with the positioning of the disk. The 3 holes must be opposite the 2 circulation holes of the front cover and the pin **423** (P15, P25, P40 only).
- Replace as necessary the seal **403** and fit it with a suitable lubricant.
- Fit the keyways **536** (after checking their wear).
- Insert the rotor **301** on the shaft **501**.

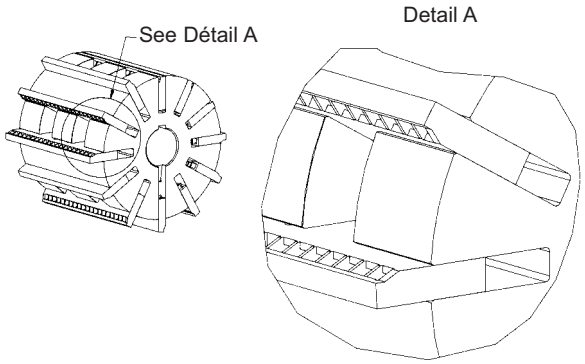


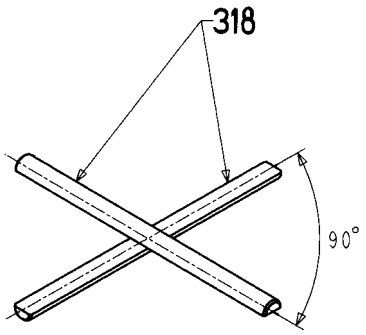
6. OPENING AND CLOSING THE DRIVE SIDE BASE (continued)

• Insert the pushrods **318** using orthogonal matings.



• Insert the vanes making sure they are fitted in the right direction (see detail A) and check that they slide freely. Hold them in place using suitable straps (elastic, bracelets...).

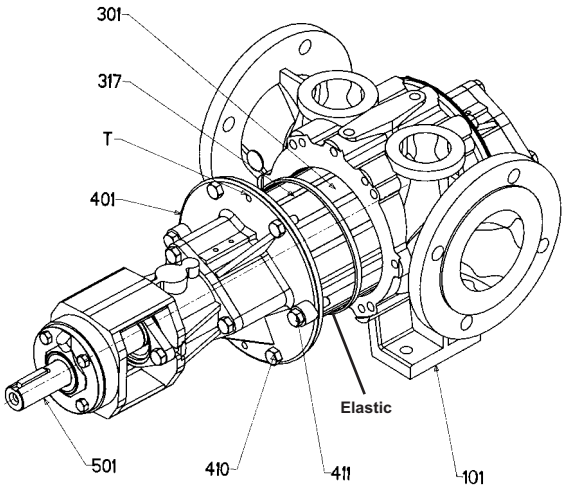




6.5 Closing the drive side base

• Insert this assembly into the body **101**, removing the straps at an opportune moment (version with pushrods only).

• Orientate the front cover **401**, pin **423** to the vertical, fix it to the pump body.



7. CHANGING THE BALL BEARING

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING	
 Hazardous or toxic fluids can cause serious injury.	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

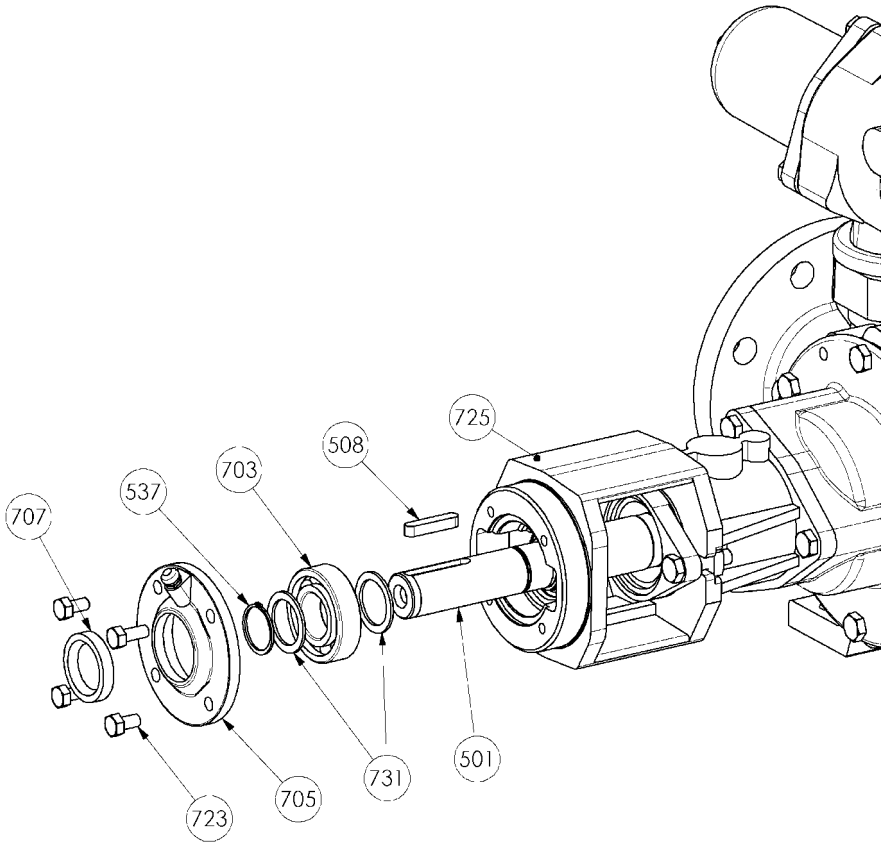
WARNING	
 The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.	BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

CAUTION	
 Slippery lubricant. Spills should be cleaned up.	THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION	
 Excessive temperature- can cause injury or severe damage.	THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

WARNING	
 Any unforeseen start-up can cause serious injuries or important material damages.	TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

7. CHANGING THE BALL BEARING (continued)



Before any disassembly, make sure that the pump has been drained, and take all the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

Uncouple the pump by removing the coupling sleeve.

Remove the pump mounting screws.

Place it on a workbench or on a flat surface free from obstructions.

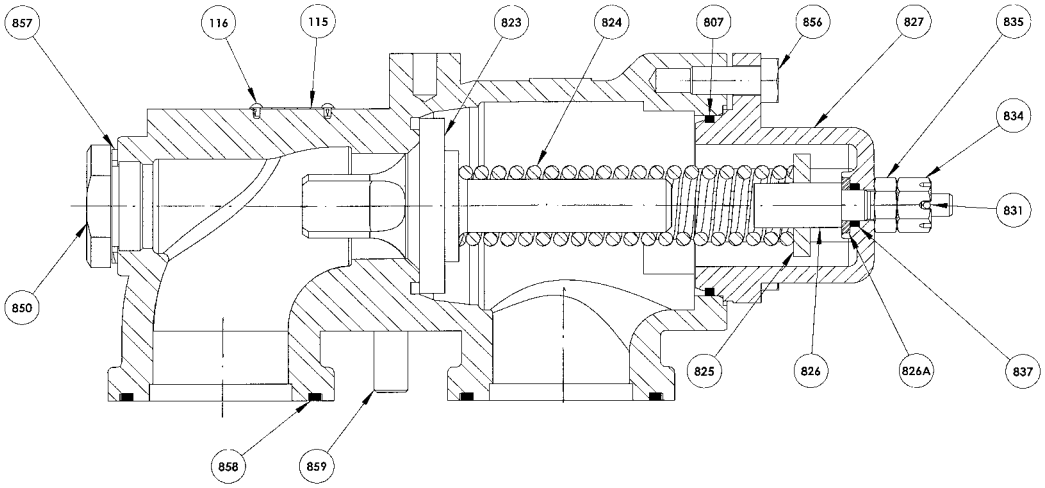
Dismantling :

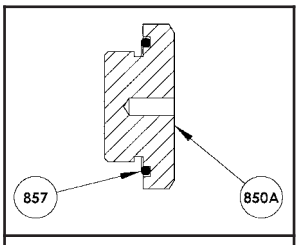
- Remove the key **508**.
- Carefully clean the shaft end with emery paper no. 320 to remove any trace of paint, oxidation, burrs, etc.
- Loosen the 4 screws **723**.
- Remove the cover **705**, taking care not to damage the lip seal **707**.
- Remove the circlips **537**.
- Remove the washer **731**.
- Remove the balls bearing **703** using the extractor : pass the grippers behind the balls bearing while sliding them into the holes of the strainer **725**, using the shaft end **501** as a support.
- Keep the washer in place **731**.

Reassembly :

- Check that the washer **731** is pressed against the shoulder of the shaft **501**.
- Couple the balls bearing **703** on to the shaft by hand (see § GREASING OF THE BALL BEARING).
- Push it on with a sleeve until it comes to bear against the washer **731**. In no case must the balls bearing be pushed on to the shaft without support for the shaft **501.** **FAILURE TO FOLLOW THIS PROCEDURE CAN SERIOUSLY DAMAGE THE INTERIOR OF THE PUMP.**
- Place a second washer **731** against the balls bearing **703**.
- Fit the circlips **537**.
- Check the lip seal **707** and change it as necessary.
- Clean the sides of the cover **705** and of the strainer **725** with a clean rag.
- Fit the lip seal **707** in the cover **705**, with the lip facing inward.
- Fit the cover **705** on the strainer **725**.
- Screw the 4 screws **723**.
- Check that the pump rotates freely when turned by hand.
- Put the pump back on the installation.
- Replace the pump mounting screws.
- Couple the pump by placing the coupling sleeve.
- Check the pump alignment (see § ALIGNMENT OF MOTOR/PUMP AND REDUCTION GEARBOX/PUMP SHAFTS).

8. BYPASS





Version with plug

Installing for
High Temperature

WARNING	
 Dangerous voltage. Can cause injury and death.	DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING	
 Hazardous pressure can cause personal injury or property damage.	FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING	
 Hazardous or toxic fluids can cause serious injury.	IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

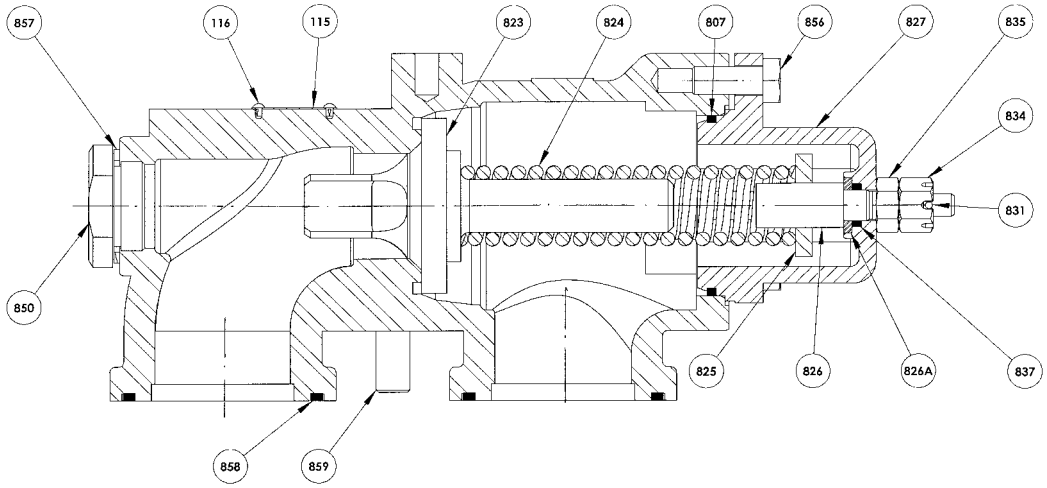
WARNING	
 The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.	BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

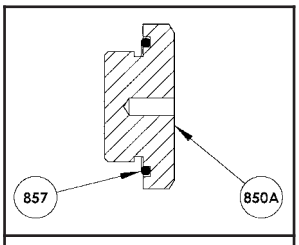
CAUTION	
 Slippery lubricant. Spills should be cleaned up.	THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION	
 Excessive temperature- can cause injury or severe damage.	THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

WARNING	
 Any unforeseen start-up can cause serious injuries or important material damages.	TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

8. BYPASS (continued)





Version with plug

Installing for
High Temperature

8.1 Bypass operation

The compensated bypass operates like a valve, by automatically limiting the discharge pressure at the value for which it is adjusted.

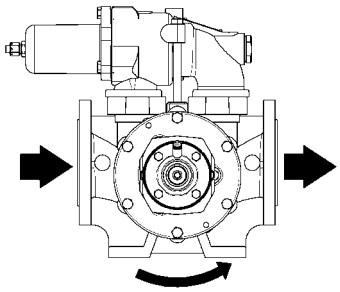
When the discharge pressure reaches the adjusted pressure of the spring, the valve **823** opens, thus permitting the partial or total return of the liquid to the inlet side of the pump.

The compensated bypass is used when the pump flow is frequently diverted through its bypass, i.e. when the discharge is closed, the compensated bypass is designed to generate a very small increase of pressure, which means that the motor will economically supply the necessary additional power for specific working conditions. It should be noted that the role of the bypass, as a safety device, is limited to protecting the pump against accidental over-pressure.

For all electric motors - unless the model used can handle the increased load due to maximum overpressure - (pump sending its flow through the bypass with the spring tightened to the maximum) it is vital to provide appropriate overload protection.

8.2 Bypass orientation

The single bypass only protects the pump in one direction of operation. Consequently it is necessary to check that the pump's direction of operation is correct by verifying that the cap **827** is located on the inlet side. The bypass must be reversed if in the wrong direction.



Counterclockwise rotation

8.3 Bypass inversion

- Loosen the 2 screws **859**.
- Remove the bypass.
- Check the seals **858** and change them as necessary.
- Turn the bypass through 180°.
- Screw the 2 screws **859**, taking care to balance the tightening so that the bypass remains vertical.

8.4 Bypass adjustment

WARNING	
	**INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND PROPERTY DAMAGE.**
Hazardous pressure can cause personal injury or property damage.	

- Loosen the lock nut **835**.
- Turn the adjustment nut **834** clockwise to increase the discharge pressure and anticlockwise to decrease it.
- Once the adjustment is finished, screw the lock nut **835**.

Adjustment of the bypass is satisfactory when the flow meets the pump's requirements and when the motor bears, without incident, either excessive energy consumption or the power increase due to the overpressure seen upon closing the discharge. This is how the bypasses of our pump units are adjusted, as a function of the information provided by our Technical Services.

8. BYPASS (continued)

8.5 Obtaining the flow

WARNING	
	INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND PROPERTY DAMAGE.
Hazardous pressure can cause personal injury or property damage.	

If the flow is lower than anticipated, the cause may be due to incorrect adjustment of the bypass valve. To correct it, see § BYPASS ADJUSTMENT.

Make sure that the pump is running well at the recommended speed.

If during adjustment, you compress the spring to its limit or disturb the operation of the motor, without obtaining the flow required, this means that the motopump unit must operate with a pressure higher than that for which it was designed. In this case you should consult our Technical Services.

When you obtain the required flow, make sure that the motor can withstand the increased power due to the overpressure created by closing off the discharge line.

If need be, adjust the bypass again to enable the motor to obtain it.

8.6 Energy consumption

If the energy consumption does not correspond to expectations, the reason may be poor adjustment of the bypass valve.

To correct it, close the discharge valve and adjust the bypass (see § BYPASS ADJUSTMENT) until the energy consumption is satisfactory.

8.7 Replacing the spring

Before any disassembly, make sure that the pump has been drained and take all the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

Disassembly :

- Loosen the 2 screws **859**.
- Lift off the bypass and place it on a bench or flat surface free from obstructions.
- Set the bypass pressure to the minimum (see § BYPASS ADJUSTMENT).
- Keep the bypass vertical during the rest of the process.
- Slowly loosen the screws **856**.

CAUTION

THE SPRING IS ALWAYS UNDER SLIGHT TENSION.

- Remove the cap on the bypass **827** and its pressure screw (**825 - 826 - 831 - 834 - 835 - 837**).
- Withdraw the bypass spring **824**.

Reassembly :

- Keep the bypass vertical during this process.
- Insert the spring **824** into the bypass. Check the position of the valve **823**. It should rest flat on its support and slide freely in its strainer.
- Replace the bypass cap **827** and pressure screw (**825 - 826 - 831 - 834 - 835 - 837**).
- Slowly tighten the screws **856**.

CAUTION

YOU WILL NEED TO COMPRESS THE SPRING SLIGHTLY BEFORE YOU CAN TIGHTEN THE SCREWS.

- Check the 2 seals **858** and change them as necessary.
- Refit the bypass on the pump, checking the installation direction in relation to the direction of operation.
- Tighten the 2 screws **859** equally so the bypass stays vertical.
- Set the spring pressure to the desired value (see § BYPASS ADJUSTMENT).

9. SHAFT SEAL

9.1 Single mechanical shaft seal

MOUNTING SHAFT SEALS STANDARDIZED IN ACCORDANCE WITH NF EN 12756					
Pump	**Shaft seal variant**	**Shaf Ø**	**L1K**	**X Mounting dimension (L1K -L)**	**L Compression dimension**
P15	PGSN	30	42,5	(42.5-L)± 0.3	Refer to manufacturer's instructions
P25	PGSN	30	42,5	(42.5-L)± 0.3	
P40*	PGSN	35	42,5	(42.5-L)± 0.3	
P60*	PGSN	35	42,5	(42.5-L)± 0.3	
P100*	PGSN	45	54,0	(54.0-L)± 0.3	

WARNING

Dangerous voltage. Can cause injury and death.

DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING

Hazardous pressure can cause personal injury or property damage.

DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING

Hazardous pressure can cause personal injury or property damage.

FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING

Hazardous or toxic fluids can cause serious injury.

IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

WARNING

The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.

BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

CAUTION

Slippery lubricant. Spills should be cleaned up.

THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION

Excessive temperature- can cause injury or severe damage.

THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

WARNING

Any unforeseen start-up can cause serious injuries or important material damages.

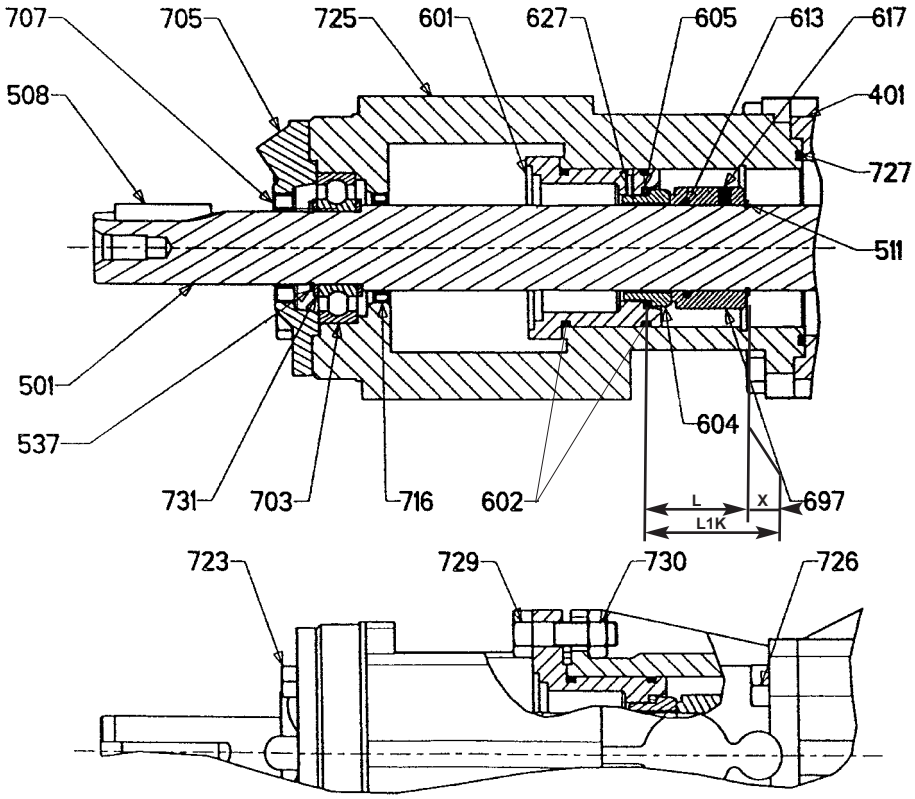
TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

* does not apply to jacket version (mounted with calibrated bushing 512).
Maximum elevation of shaft seal = L1K.

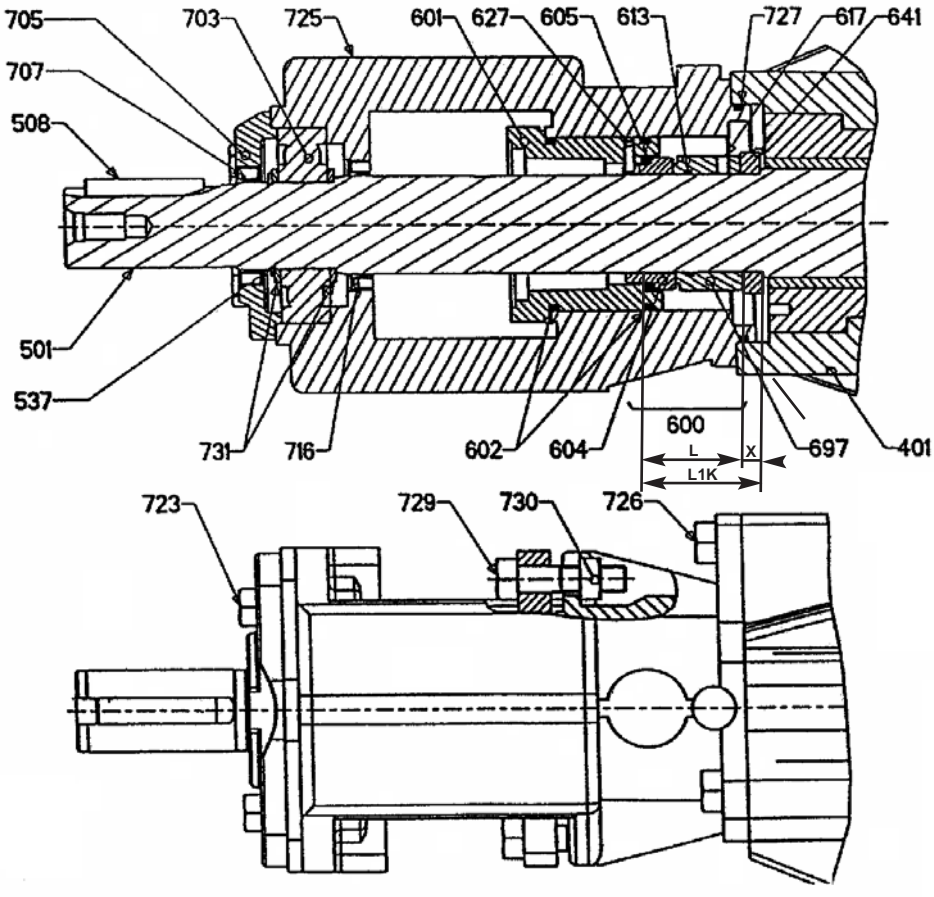
9. SHAFT SEAL (continued)

9.1 Single mechanical shaft seal

P15 - P25 - P40 - P60 PUMPS



P100 PUMPS



9.1.1 Operation of a single mechanical shaft seal

The shaft **501** drives the rotating part **697** by means of set screws **617**. The counterpart **604** is integrated with the shaft seal holder **601** by the seal **605** and the pin **627**.

THE SEALING IS ACHIEVED :

- On the shaft, by ring seals **613** of rotating part **697**.
- By the contact face between the rotating part **697** and the fixed counterpart **604**.
- Between the fixed counterpart **604** and the shaft seal holder **601** by the seal **605**.

Fluid tightness therefore depends on the condition of the friction faces and ring seals.

REASONS FOR LEAKING SHAFT SEAL :

- Seal damaged during assembly (scratching on friction faces, etc.).
- Shaft seal unsuitable for the liquid pumped (chemical attack or mechanical damages to seals and counter-parts).
- Normal wear of the shaft seal.

9.1.2 Replacing a single mechanical shaft seal

Before undertaking disassembly, make sure that the pump has been drained, and take the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

Uncouple the pump by removing the coupling sleeve.

Remove the pump mounting screws.

Place it on a bench or a flat surface free from obstructions.

Dismantling :

- Remove the shaft key **508**.
- Carefully clean the end of the shaft with emery paper no. 320 to remove any traces of paint, oxidation, burrs, etc.
- Unscrew the 4 screws **723**.
- Remove the cover, **705** without damaging the seal **707**.
- Remove the circlips **537**.
- Remove the washer **731**.
- Using the bearing puller, remove the bearing **703** : position the claws behind the bearing, sliding them into the openings in the housing **725** and pressing against the shaft end **501**.
- Remove the second washer **731**.
- Unscrew the 3 screws **726** (4 screws in the case of jacket versions P40 - P60 - P100).
- Slide the strainer assembly **725** along the shaft **501** taking care not to damage the lip seal **716** or the fixed counterpart **604** (for jacket versions P40 - P60 - P100, the shaft seal holder **601** is connected directly to the front cover **401a.** The strainer **725** should be removed with just its seals).
- Unscrew the 2 screws **729** and their square nuts **730**.
- Remove the shaft seal holder **601**.
- Remove the counterpart **604** and its ring seal **605** remaining on the shaft seal holder **601**.
- Undo the screws **607** on the shaft keeping the rotating part in place **697** (for jacket version P40 - P60 - P100 : unscrew the plug **651** on the front cover **401a** to get access to the screw **617**, turn the shaft **501** slowly to align them).
- Remove the rotating part **697** by sliding it along the shaft **501** (for jacket version P40 - P60 - P100 : remove the jacket unit **622** and rotating part **697** by sliding them along the shaft **501**).

9. SHAFT SEAL (continued)

Reassembly :

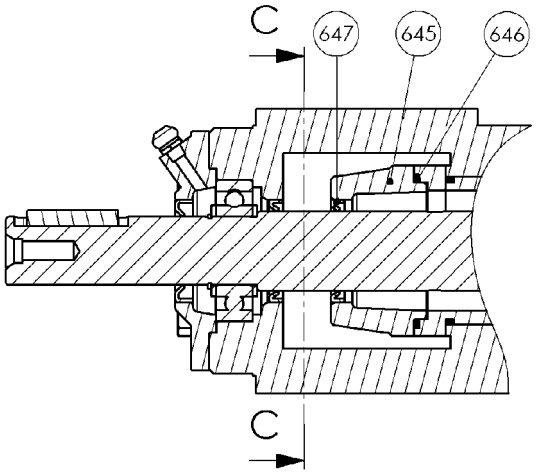
Steps 1 to 9 :

- Check that the surfaces in contact with the counterparts **604** and rotating part **697** are in good condition.
- Check the ring seals **602** (2) - **605** (1) - **613** (1) and change them as necessary.
- Check the lip seals **707** (1) - **716** (1) and replace if necessary.
- Use a clean cloth to clean the surfaces in contact with the shaft seal.
- Mount the counterpart **604** and its seal **605** in the shaft seal holder **601** inserting the pin **627** in the slot in the counterpart.
- Lightly lubricate the shaft **501.** Check that the spacer is **512** resting correctly against the circlip **511** then introduce the jacket **622** and its seals **602** and **623** inside the front cover **401a**, the two M5 threads must be positioned horizontally, with the bigger hole facing upward (for jacket versions P40 - P60 - P100).
- Slide the rotating part **697** of the shaft seal and its seal **613** onto the shaft **501** to reach the side indicated in the table (against the spacer **512** for jacket versions P40 - P60 - P100).
- Tighten the screws **617** to keep the rotating part **697** on the shaft **501**. Lock the screws with Loctite® 643* or equivalent (the screws are accessed **617** through the top hole on the front cover **401a**). Make sure you insert the rotating part fully against the spacer. Tighten the second bolt **617** by locating it in front of the hole in the front cover **401a** and turning the shaft **501** for jacket versions P40 - P60 - P100).
- Insert the shaft seal holder assembly **601** and the counterpart **604** into the strainer **725** (be careful not to bump the edge of the shaft seal counterpart **604**).
- Tighten the 2 screws **729** and nuts **730** on the strainer **725**.
- Slide the strainer assembly **725** onto the shaft **501** until it reaches the front cover **401a** (be careful with the friction face of the counterpart **604** of the shaft seal and the lip seal **716**).

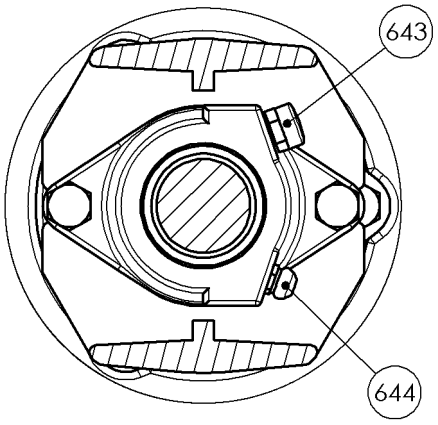
Step 12 :

- Screw the 3 screws **726**.
- Position the washer **731** against the shoulder of the shaft **501**.
- Fit the bearing **703** on the shaft by hand.
- Push it on with a casing until it comes to bear against the washer **731**. Under no circumstances should you push the bearing onto the shaft without holding the shaft **501**.
  FAILURE TO FOLLOW THIS INSTRUCTION CAN CAUSE SERIOUS DAMAGE TO THE INTERIOR OF THE PUMP.
- Position the second washer **731** against the bearing **703**.
- Fit the circlip **537**.
- Clean the surfaces of the cover **705** and of the housing **725** with a clean cloth.
- Fit the lip seal **707** into the cover **705**.
- Fit the cover **705** on the strainer **725**.
- Screw the 4 screws **723**.
- Check that the pump rotates freely when turned by hand.
- Replace the pump on the installation.
- Replace the pump mounting screws.
- Couple the pump by placing the coupling sleeve.
- Check the pump alignment (see § ALIGNMENT OF MOTOR/PUMP AND REDUCTION GEARBOX/PUMP SHAFTS).

* Loctite® is a registered brand.



COUPE B-B



COUPE C-C

9.2 Remounting a single mechanical shaft seal with grease container

- When fitting a shaft seal with grease reservoir, follow steps 1 to 9 in § REPLACING A SINGLE MECHANICAL SHAFT SEAL - **Reassembly**.
- Check and change seals as necessary **646** (1) and **647** (1). Be sure to fit the seal **647**, with its lip facing the side opposite the shaft exit.
- Slide the cover **645** and seals **646** and **647** onto the shaft **501**, facing the lubricator thread **644** downward and the breather valve **643** upward, then tighten the screws **729** and nuts slightly **730**.
- Follow step 12 in § REPLACING A SINGLE MECHANICAL SHAFT SEAL - **Reassembly**, then :
- Fit the lubricator **644** and breather **643**.
- Unscrew the 2 screws **729** and push the cover **645** outward.
- Using a grease gun, fill the interior of the shaft seal holder **601** and the cover **645** with grease, driving out as much air as possible, then tighten the 2 screws **729**.
- Use the lubricator to fill the reservoir with grease **644** up to the edge of the breather **643**.

9.2.1 Filling the grease container 645 (on pumps that have one)

Every 500 hours of operation : fill the grease container up to the edge of the breather **643**.

9. SHAFT SEAL (continued)

9.3 Double mechanical shaft seal

MOUNTING SHAFT SEALS STANDARDIZED IN ACCORDANCE WITH NF EN 12756						A*	B*	C*
Pump	Seal variant	Shaf Ø	L1K	X Mounting dimension (L1K - L)	L Compression dimension			
P15	PGDN	30	42,5	(42.5-L)± 0.3	Refer to manufacturer's instructions	124,5	A =B	0
P25	PGDN	30	42,5	(42.5-L)± 0.3		124,5	A =B	0
P40	PGDN	35	42,5	(42.5-L)± 0.3		129,5 ±0,8	A =B	0
P60	PGDN	35	42,5	(42.5-L)± 0.3		129,5 ±0,8	A =B	0
P100	PGDN	45	45,0	(45.0-L)± 0.3		106,5 ± 0,2	138,5 ± 0,2	32

WARNING

Dangerous voltage. Can cause injury and death.

DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

WARNING

Hazardous pressure can cause personal injury or property damage.

DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE.

WARNING

Hazardous pressure can cause personal injury or property damage.

FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

WARNING

Hazardous or toxic fluids can cause serious injury.

IF PUMPING HAZARDOUS OR TOXIC FLUIDS, THE SYSTEM MUST BE FLUSHED PRIOR TO PERFORMING ANY SERVICE OPERATION.

WARNING

The weight ot the parts can be dangerous and may provoke bodily injuries or material damages.

BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

CAUTION

Slippery lubricant. Spills should be cleaned up.

THE PUMP LUBRICANT IS VERY SLIPPERY AND MAY CAUSE SERIOUS INJURY. ANY SPILLS MUST BE CLEANED UP.

CAUTION

Excessive temperature- can cause injury or severe damage.

THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

WARNING

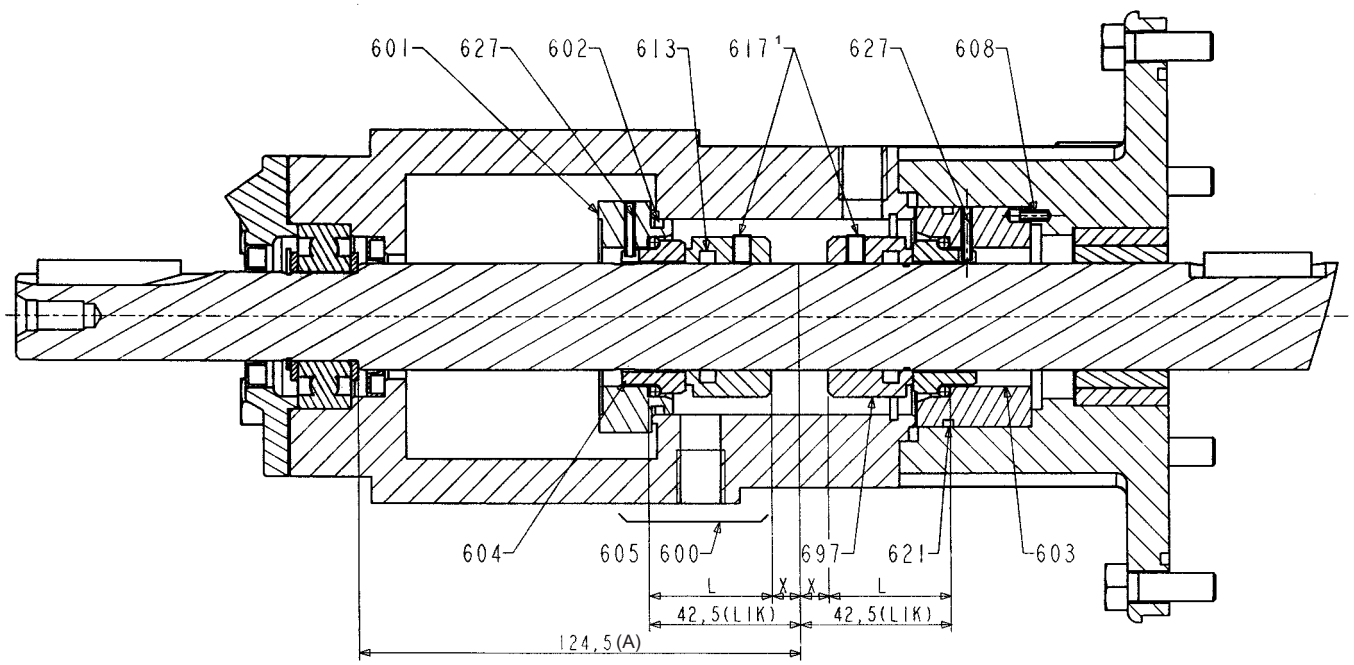
Any unforeseen start-up can cause serious injuries or important material damages.

TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

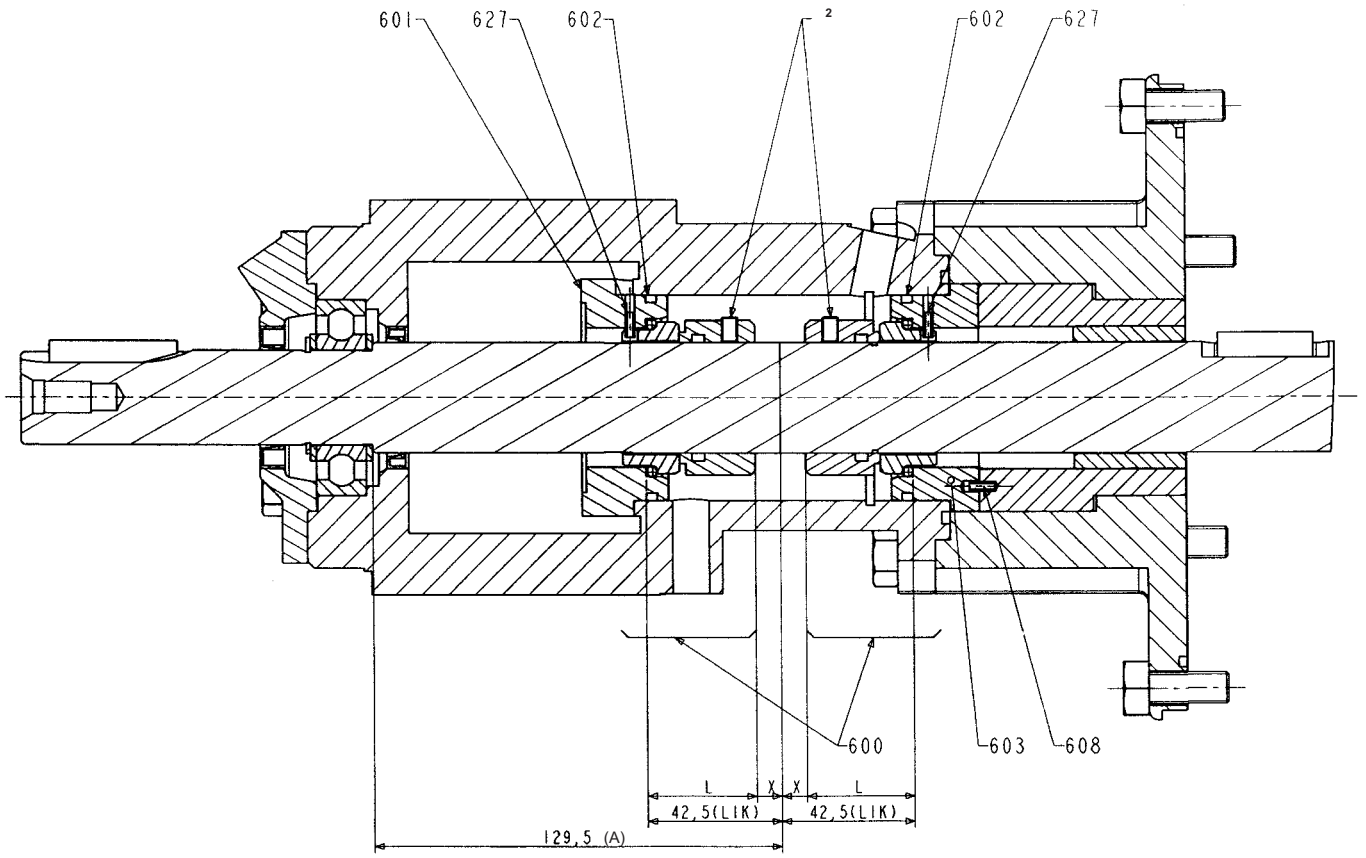
* does not apply to jacket version (shaft seals mounted back to back).
Maximum elevation of shaft seal = L1K.

9. SHAFT SEAL (continued)

P15 - P25 PUMPS



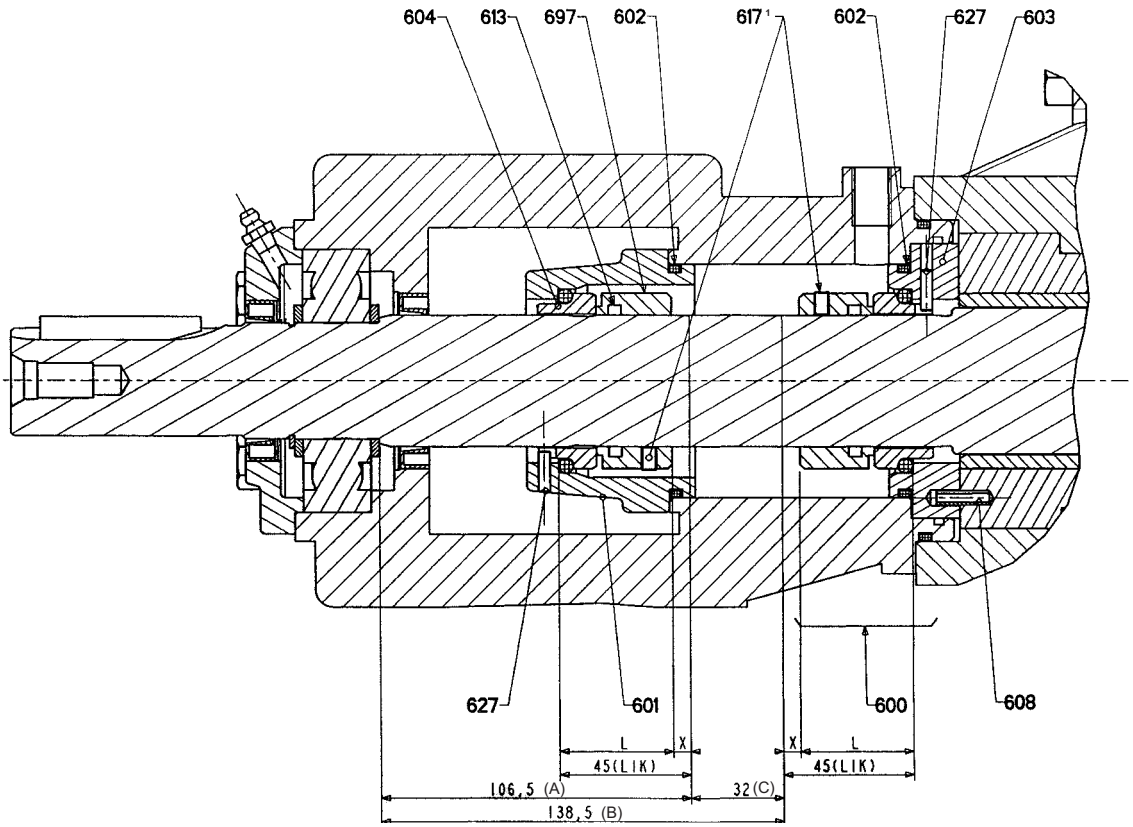
P40 - P60 PUMPS



[1] Slope of standard thread lock Loctite® 243.
[2] Slope of standard thread lock Loctite® 241.
(Loctite® is a registered trademark)

9. SHAFT SEAL (continued)

P100 PUMPS



[1] Slope of standard thread lock Loctite® 243.
(Loctite® is a registered trademark)

9.3.1 Operation of a double mechanical shaft seal

The shaft **501** drives the rotating parts **697** by means of set screws **617**. The fixed counterparts **604** are integral, one with the shaft seal holder **601** by means of the seal **605** and the retainer **627** and the other with the front cover **401a** via the seal **605** and retainer **627**.
The circulation of a liquid (at a pressure higher than that between the two shaft seals) allows contact between the pumped liquid and the air to be avoided and prevents the pumped liquid leaking into the interior (this is called a barrier liquid and is used where liquids could crystallize in contact with air or in the case of dangerous liquids).

THE SEALING IS ACHIEVED :

- On the shaft by the ring seals **613** of the rotating parts **697**.
- By the contact surfaces between the rotating parts **697** and the fixed counterparts **604**.
- Between the fixed counterpart **604** and the shaft seal holder **601** by the seal **605**.
- Between the fixed counterpart **604** and the insert **603** via the ring seal **605**.
- Between the insert **603** and the strainer **725** via the ring seal **602**.
- Between the shaft seal holder **601** and the strainer **725** via the ring seal **602**.

Fluid tightness therefore depends on the condition of the friction faces and ring seals.

CLEANING OUT SHAFT SEALS :

- Two threaded G ¼" ports are provided for this purpose, so as to avoid air pockets in the strainer, the liquid enters via the lower port and exits via the upper port.
- To ensure that the double shaft seal unit will work properly, the flushing liquid should be pressurized to a level higher than that between the seals.

REASONS FOR LEAKING SHAFT SEAL :

- Seal damaged during assembly (scratches on friction faces, etc.).
- Seal unsuitable for the liquids it contacts (chemical attack or mechanical damage to seals and counterparts).
- Normal shaft seal wear.

9.3.2 Replacing a double mechanical shaft seal

Before undertaking disassembly, make sure that the pump has been drained, and take the necessary precautions to prevent it from starting up. The pump must not start up, even accidentally.

Uncouple the pump by removing the coupling sleeve.

Remove the pump mounting screws.

Place it on a workbench or on a flat surface free from obstructions.

Dismantling :

- Remove the shaft key **508**.
- Carefully clean the end of the shaft with emery paper no. 320 to remove any traces of paint, oxidation, burrs, etc.
- Unscrew the 4 screws **723**.
- Remove the cover **705** taking care not to damage the lip seal **707**.
- Remove the circlip **537**.
- Remove the washer **731**.
- Remove the bearing **703** using the extractor : position the claws behind the bearing, sliding them into the openings in the housing **725** and pressing against the shaft end **501**.
- Remove the second washer **731**.
- Unscrew the 3 screws **726** (4 screws in the case of jacket versions P40 - P60 - P100).
- Slide the strainer assembly **725** along the shaft **501** taking care not to damage the lip seal **716** or the fixed counterpart **604** (for jacket versions P40 - P60 - P100, the shaft seal holder **601** is directly attached to the front cover **401a.** The strainer **725** should be removed with just its seals).
- Unscrew the 2 screws **729** and their square nuts **730**.
- Remove the shaft seal holder **601**.
- Remove the remaining counterpart **604** and seal **605** on the shaft seal holder **601**.
- Undo the bolt on the shaft **607** keeping the rotating part in place **697** (for jacket version P40 - P60 - P100 : unscrew the plugs **651** on the front cover **401a** to get access to the screw **617**, turn the shaft **501** slowly to align them).
- Remove the rotating parts **697** by sliding them along the shaft **501** (for jacket version P40 - P60 - P100 : remove the jacket **622** and rotating parts **697,** fixed counterpart **604** from front cover **401a** by sliding them along the shaft **501**).
- Remove the remaining fixed counterpart **604** and seal **605** on the pump (the counterpart **604** and seal **605** are to be removed from the insert **603,** for jacket version P40 - P60 - P100 : unscrew the plugs **651** on the front cover **401a** to get access to the screw **617**, turn the shaft **501** slowly to align them).

9. SHAFT SEAL (continued)

Remounting :

- Check the condition of the contact surfaces of the counterparts **604** and rotating parts **697**.
- Check the ring seals **602** (2) - **605** (2) - **613** (2) and change them as necessary.
- Check the lip seals **707** (1) - **716** (1) and replace if necessary.
- Use a clean cloth to clean the contact surfaces of the shaft seal.
- Mount the counterpart **604** with its ring seal **605** into the insert **603** engaging the pin **627** in the slot in the counterpart.
- Lubricate the shaft **501** lightly.
- Fit the insert **603** and seal **602** inside the front cover **401a**. Be sure to index the insert **603** and pin **608**.
- Place the first rotating part **697** and seal **613** in position. Keep it on the side indicated in the table and tighten the screws **617** to keep it on the shaft **501**.
- Place the second rotating part **697** and seal **613** in position. Keep it on the side indicated and tighten the screws **617** to keep it on the shaft **501** (lock the screws with Loctite® 643* or equivalent).
- Mount the second counterpart **604** with its ring seal **605** in the shaft seal holder **601,** fitting the dowel pin **627** into the notch in the counterpart.
- Insert the shaft seal holder **601** and seal **602** in the strainer **725** (be careful not to bump the edge of the counterpart **604** of the shaft seal).
- Tighten the 2 screws **729** and their nuts **730**.
- Slide the strainer **725** onto the shaft **501** until it contacts the front cover **401a**.
- Tighten the 3 screws **726**.
- Position the washer **731** against the shoulder of the shaft **501**.
- Fit the bearing **703** on the shaft by hand.
- Push it using a sleeve until it comes up against the washer **731**. In no case must the bearing be pushed onto the shaft without support for the shaft **501**.

  FAILURE TO FOLLOW THIS INSTRUCTION CAN CAUSE SERIOUS DAMAGE TO THE INTERIOR OF THE PUMP.
- Position the second washer **731** against the bearing **703**.
- Fit the circlip **537**.
- Wipe the faces of the cover **705** and strainer **725** with a clean cloth.
- Fit the lip seal **707** into the cover **705**.
- Fit the cover **705** to the strainer **725**.
- Tighten the 4 screws **723**.
- Check that the pump rotates freely when turned by hand.
- Reinstall the pump.
- Refit the retaining screws on the pump.
- Couple the pump by refitting the coupling sleeve.
- Check the pump alignment (see § ALIGNMENT OF MOTOR/PUMP AND REDUCTION GEARBOX/PUMP SHAFTS).

* Loctite® is a registered brand.

10. MAINTENANCE

10.1 Lubrication of the bearing

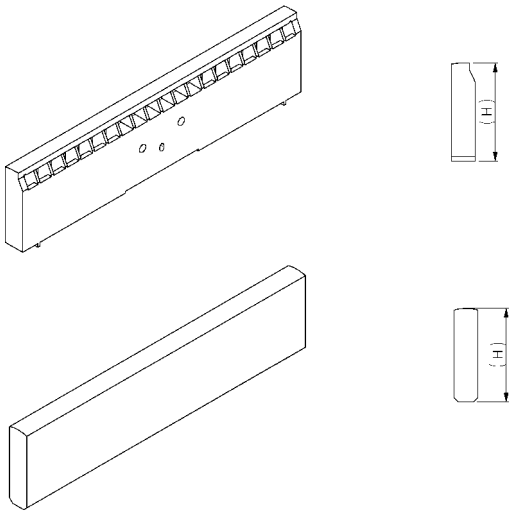
Except for special cases, the MOUVEX P BI series pump does not require lubrication especially for the shaft inlet bearing that is lubricated for life. In the case that lubrication is necessary, the cover **705** should be removed (see § DISMANTLING OF THE BEARING).

Use a high-quality bearing grease with a high drop point for pumps operating at temperatures above 100°C.

10.2 Checking the vanes and the pushrods

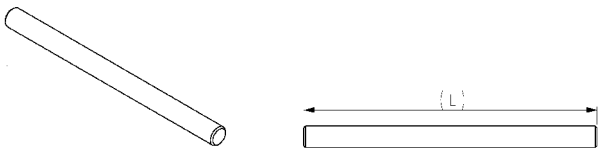
It is recommended that the condition of the vanes and pushrods should be checked every 700 hours of operation.

In the case of excessive wear, vanes and pushrods should be replaced by a complete new set.



Vanes :

	Original height (H)	Change if "H" <
P15	26,3	24,3
P25	26,3	24,3
P40	31,0	29,0
P60	35,3	33,3
P100	42,5	40,0



Pushrods :

	Original length (L)	Minimum length (L)
P15	62,30	61,80
P25	66,35	65,85
P40	82,30	81,80
P60	85,60	85,10
P100	103,30	102,80

10.3 Checking the condition of friction bushings

We advise checking the condition of the friction bushings at the same intervals as the vanes and pushrods.

Replacement of the bushings should be scheduled if a bushing shows large scratches or if it is more than 1 mm out of oval.

Bushings :

	Wear dimension (mm)
P15	0,8
P25	0,8
P40	1,0
P60	1,5
P100	2,0

10.4 Mechanical seal

Mechanical shaft seals should be replaced if there are leaks from the contact surfaces (see § SINGLE MECHANICAL SHAFT SEAL or DOUBLE MECHANICAL SHAFT SEAL, depending on the pump model).

11. TROUBLESHOOTING

ZERO OR INSUFFICIENT FLOW RATE			
1			**PRELIMINARY CHECKS**
	1-1		Make sure that the plastic plugs have been taken away from the ports of the pump and that the pump is running (defective drive, damaged motor, etc., faulty transmission : broken coupling, worn or poorly coupled clutch, etc.).
	1-2		Make sure that the pump rotates in the correct direction corresponding to the direction in which the liquid circulates in the installation (cf. the pump plate). If necessary, change the electric motor connections or adjust the piping as necessary (Diesel engines drive).
	1-3		Make sure that there is liquid in the tank from which the pump draws and that the end of the inlet piping is constantly submerged.
	1-4		Make sure that the pump rotation speed is sufficient. Determine this by checking the speed of the pump motor (see motor plate) and the speed reduction ratio (see reduction gearbox plate) or use a rev. counter.
			If these checks do not highlight the problem :
2			**MEASURE THE DISCHARGE PRESSURE** (as close to the outlet of the pump as possible, with a minimum distance of 5 pipe diameters).
	2-1		If the pressure is lower than the figures given for the material, or null, this could be due to :
		2-1-1	A poorly adjusted bypass, the valve setting is lower than the discharge pressure (tighten the set screw or replace the spring after checking that the electric motor is suitably protected).
		2-1-2	The bypass valve is not closed : check whether the seat is contaminated.
		2-1-3	The pump is worn, this will also affect the suction capacity of the pump (cf 3-2-2 c).
	2-2		If the pressure complies with the equipment data (pump speed and motor output) it is possible that :
		2-2-1	The pressure required for the given installation to obtain the required flow rate is too high and the flow is partially or totally circulating via the bypass, or : a. the height of the discharge is too great (reduce it by bringing the discharge tank to the level where the pump is. The opposite could also be effective if the intake situation allows it.) b. that head losses are too high because : - the piping is unsuitable (too many “bends”, too long or the diameter is too narrow) for the process conditions : flow rate, specific gravity and viscosity which could change with temperature (reduce the loss by simplifying the circuit : reducing the number of accessories, the bends, etc., changing the height of the discharge or inlet reservoir if the inlet conditions allow, increasing the diameter of the pipes, reducing the viscosity by heating, reducing the flow rate, etc. - partially blocked piping (valve partially closed, tap partially shut, cloth obscuring flow, etc.).
		2-2-2	The discharge piping is completely blocked (valve fully closed, tap completely closed, cloth plugging flow, full protection seal left by carelessness, etc.), in this case, all the liquid passes via the bypass.

3			**MEASURING THE VACUUM PRESSURE** (as close as possible to the pump inlet, inlet side).
	3-1		If the vacuum is high, e.g. higher than or equal to 6 to 7 meters WC (about 45 or 50 cm of mercury), this can result in pump noise because :
		3-1-1	The suction head is too high, or : a. the suction lift is too high (reduce it by taking the pump down closer to the level of the liquid) b. that the dynamic suction losses are too high : 1. cf 2-2-1 b 2. the inlet piping orifice is too close to the bottom of the tank.
		3-1-2	The inlet piping is completely blocked (valve, tap, filter, cloth, full seal forgotten, etc.).
		3-1-3	The vapor tension of the liquid is too high (or has become so as a result of a change in temperature, for example. Bring the pump closer to the level of the liquid, install the pump closer to the feed or cool the liquid to reduce the vapour pressure.
	3-2		If the vacuum is low, for example, less than 3 meters WC (i.e. about 20 cm of mercury), isolate the pump from the inlet piping (by closing the valve nearest the pump or by inserting a full flange seal) and measuring the vacuum once again.
		3-2-1	If the vacuum is high, e.g. higher than or equal to 6 or 7 meters WC (i.e. about 45 to 50 cm of mercury), the pump is not the cause : a. air must be entering upstream of the pump isolating valve. b. the vapor tension of the liquid is to high or has become so as a result of a change in temperature (cf. 3-1-3).
		3-2-2	If the vacuum is low or zero, this may be because : a. the bypass valve is not closing properly, due to dirt on the valve seat. b. air is entering the pump (check the front cover seals, flanges, etc.) c. the pump is worn and the internal tightness is out of specification (broken shaft).
ABNORMAL HEATING OF BEARINGS			
4			This heating may be due to :
	4-1		- excessive pulling on the pump flanges by the piping (in this case, it must have been necessary to force the piping into position to connect it to the pump).
	4-2		- poor alignment of the pump - due for example to 4-1 (the pump is partially or totally uncoupled, the pump shaft and drive shaft are not aligned with each other).
	4-3		- inadequate anchoring of the pump unit leading to deformation of the chassis (make sure that the chassis is clear of the ground except for the 3 anchoring points).
	4-4		- seizing of the bushings (cured product preventing lubrication and cooling, excess power, etc.).
LEAKING SHAFT SEALS			
5			The seal : a. was damaged during assembly (scratches on friction surfaces, etc.) b. is not suitable for the product (chemical attach, mechanical damage - abrasion - to seals and counter-parts) c. is showing normal wear.
6			The shaft is worn at the seal or does not rotate correctly due to poor alignment, excessive tension on the transmission belts, chains, etc.

ABNORMAL NOISES			
			These noises can be hydraulic or mechanical. They can be distinguished by the fact that only the former disappear (or at least lessen) when air is allowed into the inlet pipe.
7			**HYDRAULIC NOISE**
			These noises can come from insufficient product being supplied to the pump, or :
	7-1		- the rotation speed is too high for the installation conditions (increase of viscosity due to a change of product or a reduction of temperature, etc.).
	7-2		- the suction head is too high or has become too high due to excessive head losses following clogging of the piping or filter, a change of viscosity of the liquid, etc.
	7-3		- an increase of the vapour pressure with a rise of temperature.
8			**MECHANICAL NOISES**
			These can be due to :
	8-1		- the bypass valve hitting the seat, the discharge pressure approaching the bypass discharge pressure (turn the adjuster screw after making sure the electric motor is suitably protected).
	8-2		- abnormal stress on the pump : the transmission is pulling on the shaft, pulling on the flanges by the piping.
	8-3		- broken material or a foreign body in the pump.
EXCESS POWER CONSUMPTION			
9			The most spectacular event occurs when a heat motor stalls or the power to an electric motor is shut off.
	9-1		If this incident occurs when closing the discharge line, the cause may be : a. bypass fitted wrong way around, b. bypass set too high, c. motor protection set too low.
	9-2		If the incident occurs during operation, the cause could be : a. an inadequate motor (in this case, the discharge pressure complies with what was expected). b. higher than expected losses due to viscosity or density higher than initially envisioned (in this case, the discharge pressure is higher than expected. The pressure can be reduced by loosening the bypass adjustment screw - the flow is decreased). c. excessive rotation speed. d. a fault of the equipment (faulty alignment, deformation of the chassis, stress exerted by the piping on the flanges, seizing, etc.).
			The latter case of excess power consumption can also be due to a poor motor connection (e.g. a 3 phases motor operating on 2 phases).

DECLARATION UE DE CONFORMITE
EU CERTIFICATE OF CONFORMITY – EU KONFORMITÄTSERKLÄRUNG

MOUVEX sas, ZI La Plaine des Isles – 2 Rue des Caillottes – 89000 Auxerre France, déclare que l'équipement suivant / *declares the following equipment / erklärt, dass folgende Ausrüstung:*

Modèle :_____ **N° de série :**_____ (A) Répondant aux spécifications indiquées dans l'ARC N° : _____ (B)
Designation / Bezeichnung *Serial N° / Serien Nr* *According to the specifications recorded in the acknowledgment of order N°: Entsprechend den Spezifikationen aus AB-Nr :*

Pour la Sté MOUVEX sas, fait à Auxerre le : _____
For Mouvex sas company – Date :
Fur die Fa Mouvex sas - Datum :

Responsable Qualité Clients
Customer Quality Manager / Qualitätsbeauftragter

Configuration : *Konfiguration*
☐ Pompe / Compresseur arbre nu *(Pump / Compressor « bare-shaft »)* *(Pumpe / Kompressor, freies Wellenende)*
☐ Groupe de pompage / de compression *(Pumping Unit / Compressor Unit)* *(Pumpen- / Kompressoraggregat)*

Type / *Geräteart* :
☐ Pompe à mvt excentré *(Eccentric Disc Pump /* Ringkolbenpumpe*)*
☐ Pompe péristaltique *(Peristaltic Pump /* Schlauchpumpe*)*
☐ Pompe centrifuge *(Centrifugal Pump /* Kreiselpumpe*)*
☐ Pompe à lobes *(Lobes Pump /* Drehkolbenpumpe*)*
☐ Pompe à palettes *(Vanes Pump /* Flügelzellenpumpe*)*
☐ Autre pompe *(Other Pump / Andere Pumpe)*
☐ Compresseur à Vis *(Screws compressor /* Schraubenverdichter*)*
☐ Compresseur à palettes *(Vanes compressor /* Flügelzellenverdichter*)*
☐ Refroidisseur Hydraulique *(Hydraulic oil cooler /* Hydraulikkühler*)*

Est conforme aux dispositions suivantes :

☐ **Directive « MACHINES » 2006/42/CE** et aux législations nationales la transposant, portant sur les dispositifs de sécurité liés aux risques mécaniques et électriques applicables aux machines tournantes.

NF EN 809:2009 NF EN 1672-2:2009 NF EN ISO 13857:2008
NF EN 12162:2009

☐ **Directive « ATEX » 2014/34/UE** du 26 février 2014 et aux législations nationales la transposant, portant sur les appareils destinés à être utilisés en atmosphères explosibles. Conformité obtenue par application des normes :

NF EN 1127-1:1997 NF EN 13463-1:2009 NF EN 13463-5:2009

Certification ATEX délivrée par INERIS*, Organisme Certificateur, et portant le marquage suivant : (C)

Is in conformity with the provisions of the following Directive:

☐ ***« MACHINES » Directive 2006/42/EEC*** *as transposed by the national legislation, concerning safety equipments and arrangements relative to mechanical and electric risks applicable to rotative machines.*

NF EN 809:2009 NF EN 1672-2:2009 NF EN ISO 13857:2008
NF EN 12162:2009

☐ ***« ATEX » Directive 2014/34/EU*** *(26 Feb. 2014) as transposed by the national legislation, concerning equipment intended to be used in explosive atmospheres. Conformity obtained by application of the standards :*

NF EN 1127-1:1997 NF EN 13463-1:2009 NF EN 13463-5:2009

ATEX Certification delivered by INERIS, Notified Body, and with the following marking:* (C)

den Bestimmungen der nachstehenden Richtlinien entspricht:

☐ ***„Maschinen-Richtlinie" 2006/42/EEC*** *wie umgesetzt im nationalen Recht hinsichtlich der Ausrüstungssicherheit und Sicherheitsvorkehrungen bezogen auf mechanische und elektrische Risiken, die für rotierende Maschinen gelten.*

NF EN 809:2009 NF EN 1672-2:2009 NF EN ISO 13857:2008
NF EN 12162:2009

☐ ***„ATEX" Richtlinie 2014/34/EU*** *(26. Feb. 2014) wie umgesetzt im nationalen Recht in Bezug auf Ausrüstungen für den Einsatz in explosionsgefährdeter Atmosphäre. Die Konformität hat Geltung durch Anwendung folgender Normen:*

NF EN 1127-1:1997 NF EN 13463-1:2009 NF EN 13463-5:2009

Die ATEX-Zertifizierung wurde von der benannten Stelle INERIS erteilt, und mit folgender Kennzeichnung: (C)*

II _ G ____ II _ – T _ Temp Max produit pompé / *Max Temp Flow / Max. T° Medium* = _____ °C (X = voir notice / see IOM / siehe Handbuch)

L'équipement désigné ci-dessus doit impérativement respecter les conditions d'utilisation ATEX décrites dans nos notices d'instruction. Il doit être employé conformément à l'utilisation qui en a été prévue de par sa conception et sa fabrication, et conformément aux normes en vigueur.

Nous, soussignés, déclarons que l'équipement concerné est conforme aux Directives listées ci-dessus et aux normes applicables s'y rapportant.

The equipment indicated above must imperatively comply with the ATEX conditions of use described in our Instruction book. It must be used according to the foreseen use by its design and its manufacturing, and according to the current standards.

We, undersigned, declare that the concerned equipment is in conformity with the Directives listed above and in the applicable standards in force.

Oben stehend bezeichnete Ausrüstung muss unbedingt den in unseren Betriebsanleitungen beschriebenen ATEX Anwendungs-bedingungen entsprechen. Sie ist entsprechend dem durch Konstruktion und Fabrikation vorgesehenen Verwendungszweck und entsprechend den geltenden Normen einzusetzen.

Die Unterzeichner erklären, dass die bezeichnete Ausrüstung den oben aufgeführten Richtlinien und den diesbezüglich geltenden Normen entspricht.

** (INERIS – Parc Techno Atala – 60550 Verneuil-en-Halatte – France).*