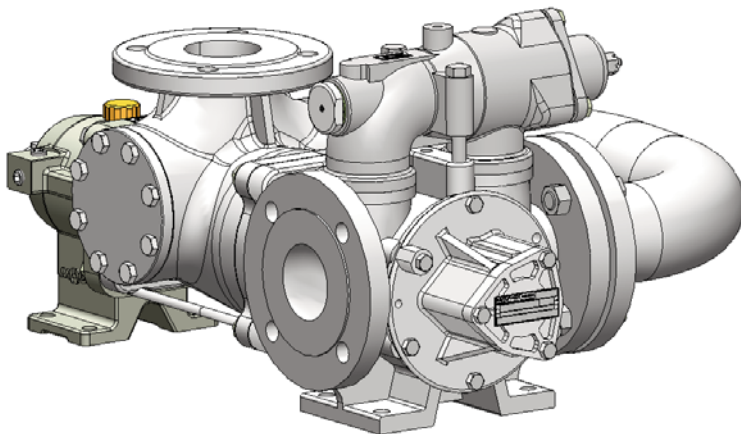


# ***PUMPS SLP25 i SERIES***



***INSTALLATION***

***OPERATION***

***MAINTENANCE***

# VANE PUMPS

## SAFETY, STORAGE, INSTALLATION AND MAINTENANCE INSTRUCTIONS

### MODELS : SLP SERIES

#### SLP25 i

### TECHNICAL SPECIFICATIONS

- Construction I : **Stainless steel**
- Non-food grade pump
- Maximum pump speed : **1000 rpm**
- Maximum differential pressure : **12 bar relative**
- Maximum suction pressure : **1,5 bar relative**
- Max admissible transmission torque : **135 Nm**

Pump n° :

Date of bringing into service :

### SAFETY INFORMATIONS



#### 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.



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



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



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

#### NOTICE

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

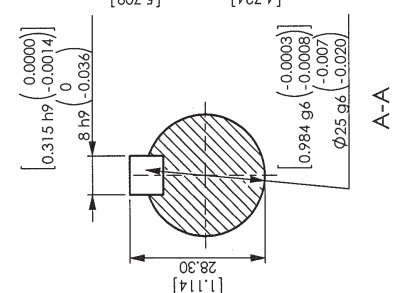
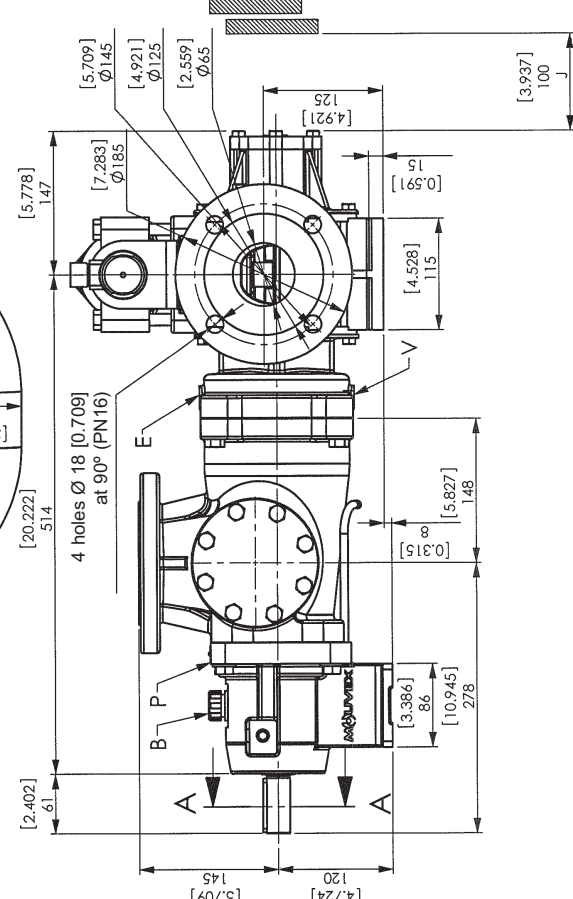
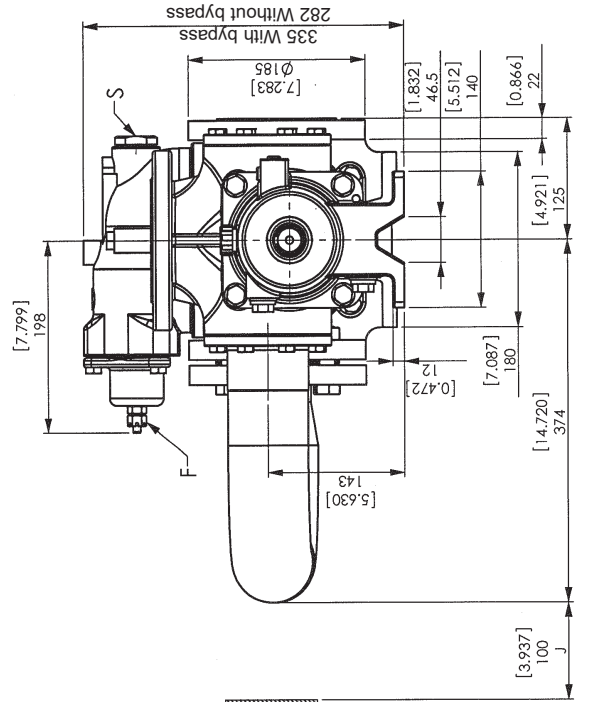
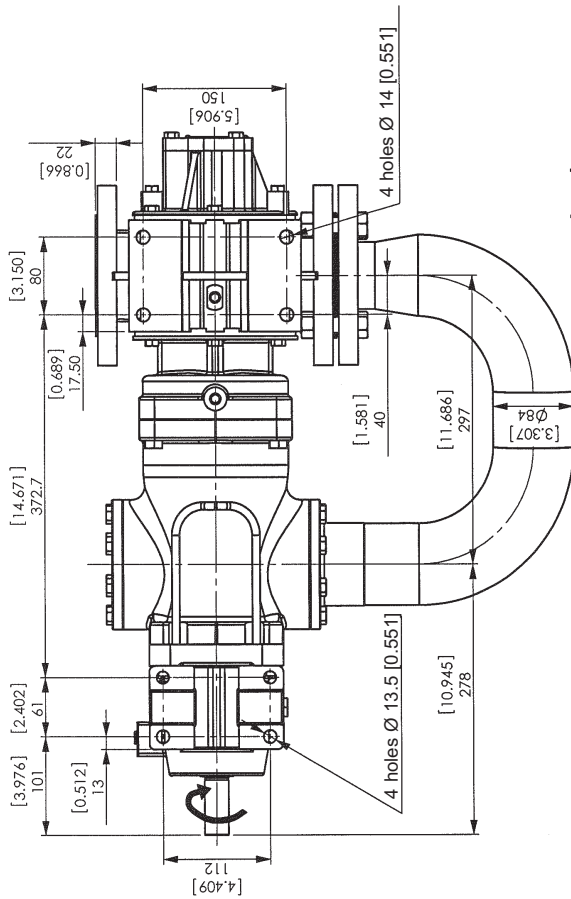
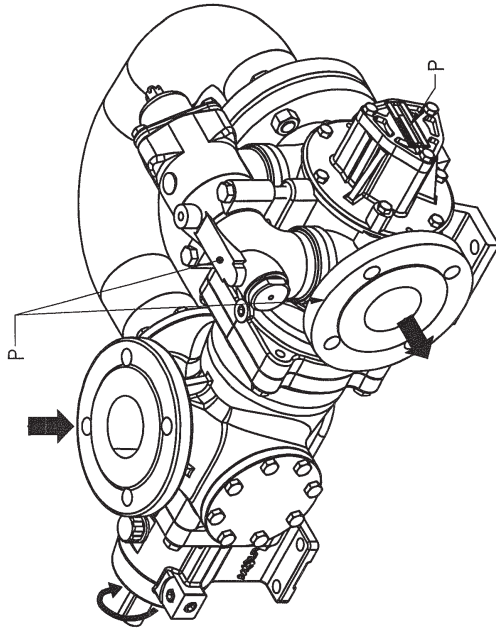
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# 1. OVERALL DIMENSIONS

B	Plug (filling, breather)
V	Inlet tube drain
E	Inlet tube vent
S	Positioning of sensor M6 x 8 mm max
F	Bypass setting
J	Space for dismantling
P	Pump plate

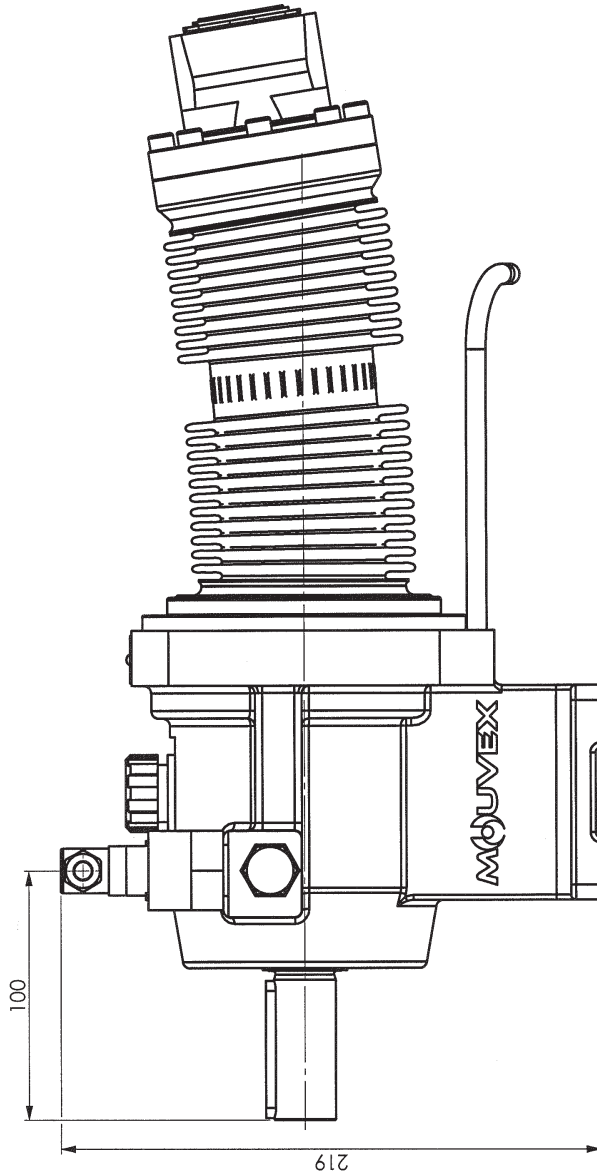
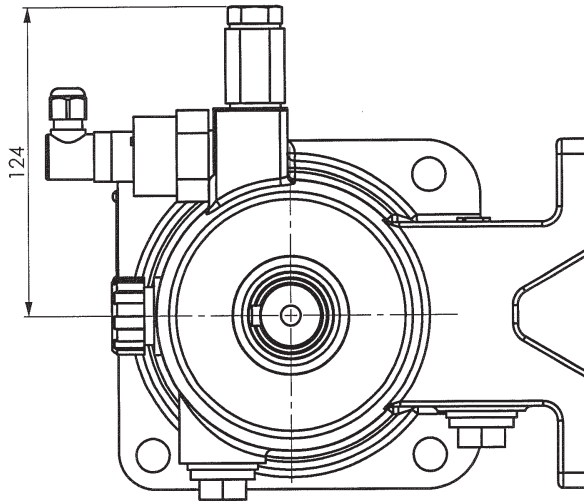


**SLP25 i**

Weight :  
84 kg

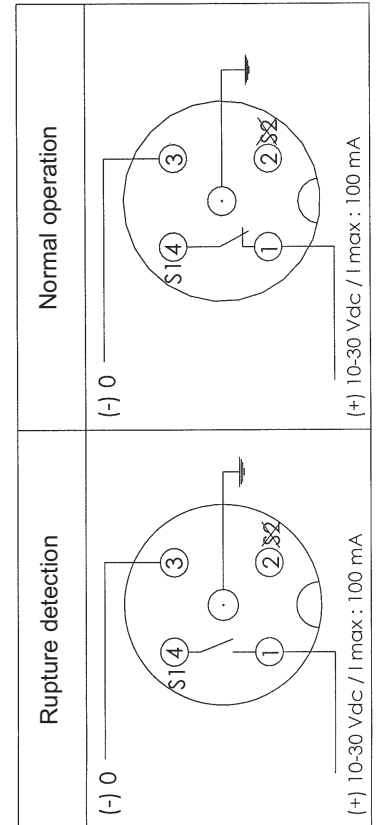
# Bellows monitoring system (pressure switch)

## SL MECH D 135



**Connection diagram**  
**Connector**  
**Do not use S2**

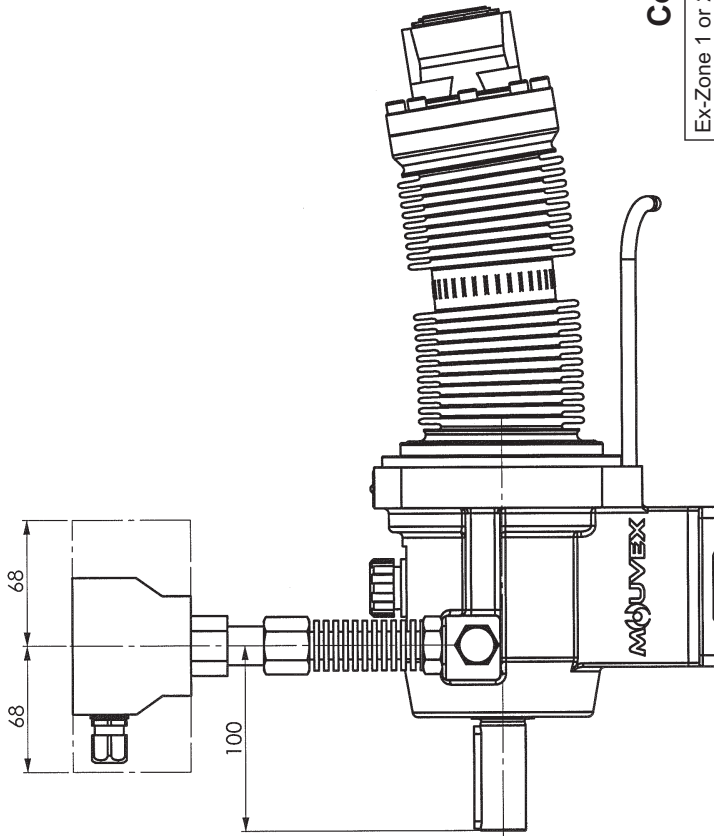
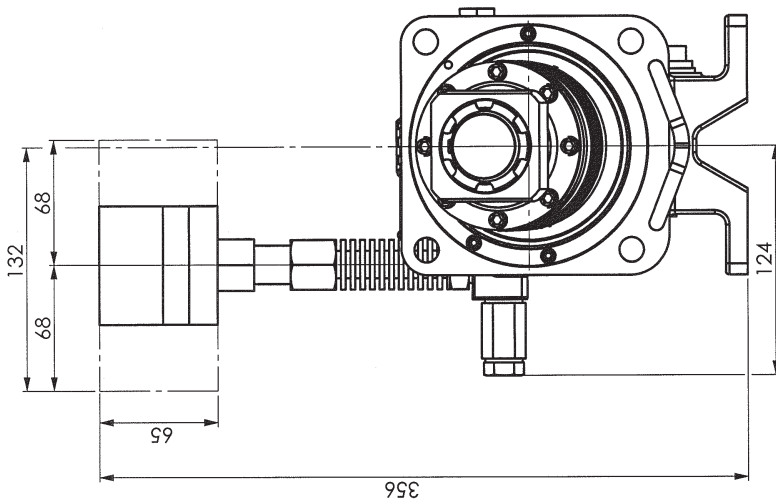
**CAUTION :**  
**WRONG CONNECTION MAY DESTROY**  
**THE SENSOR.**



**NOTA :**  
 Adjustments of the detection levels are made in the factory and must not be modified.  
 For other dimensions, refer to pump overall dimension drawing.  
 The transmission may only be dismantled in the factory.

# Bellows monitoring system (ATEX pressure switch)

## SL MECH D 135



When the pressure drops, 3-2 opens.

**CAUTION :**

Wrong connection may :

- create a fire risk,
- make monitoring ineffective
- damage the sensor

**NOTA :**

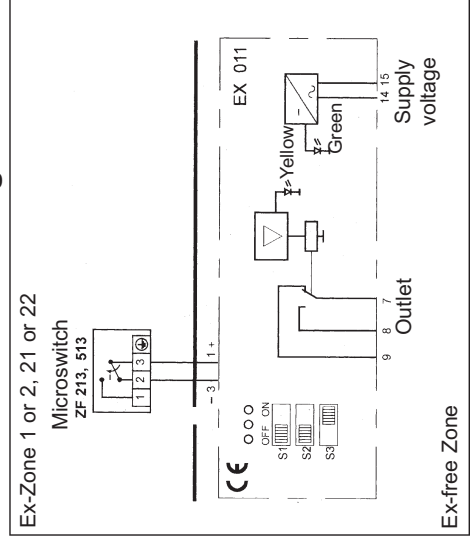
Adjustments of the detection levels are made in the factory and must not be modified.

For other dimensions, refer to pump overall dimension drawing.

The transmission may only be dismantled in the factory.

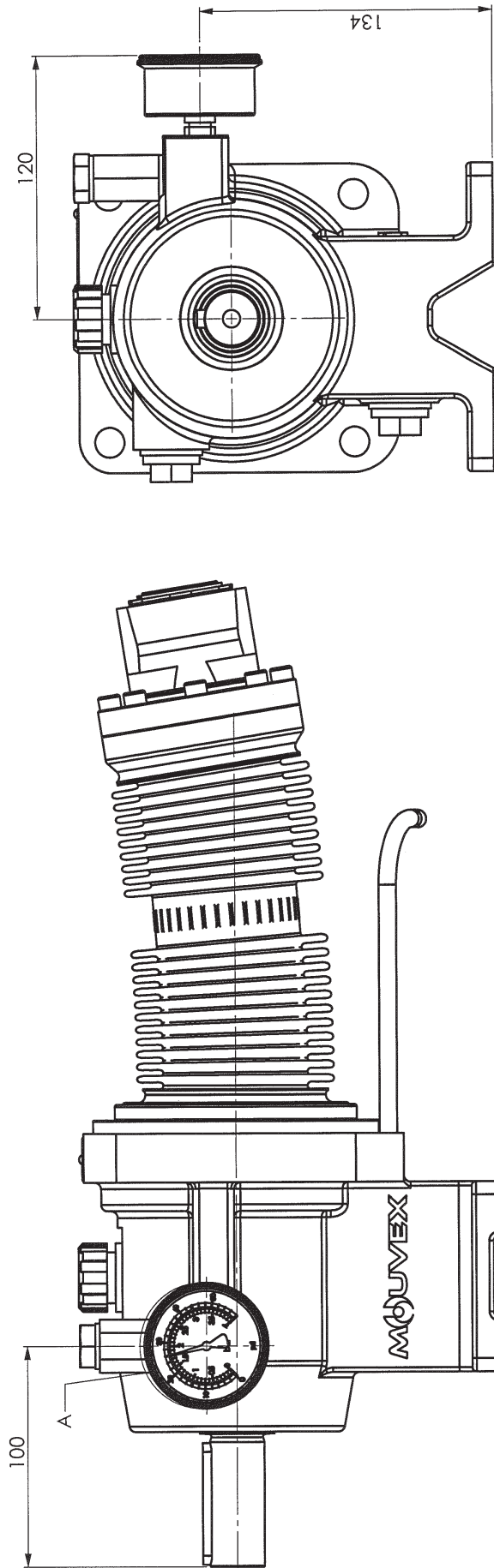
# 1. OVERALL DIMENSIONS (continued)

## Connection diagram

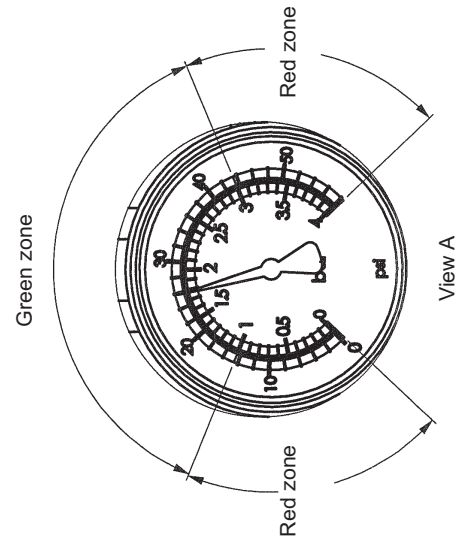


Double wall transmission with pressure gauge

SL MECH D 135



**NOTA :**  
 Adjustments of the detection levels are made in the factory and must not be modified.  
 For other dimensions, refer to pump overall dimension drawing.  
 The transmission may only be dismantled in the factory.



---

## 2. INSTALLATION

### 2.1 Pump selection

To obtain expected performance from MOUVEX series SLP pump, regarding both performance and durability, it is essential that the type of pump, its rotation speed and the materials used in its construction are suitably determined in accordance with the pumped liquid and the installation and operating conditions.

Our technical departments are at your disposal any time for all necessary informations.

### 2.2 Pipe diameter

To obtain optimum conditions of use, it is important to check the following recommendations regarding the sizing of pipes :

- The pipe diameter will be determined depending on their length and the flow and viscosity of liquid pumped, so that pressure losses stay within the admissible limits for the motor-driven pump unit. It is therefore difficult to give general and precise instructions. 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 the pump ports 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.
- For viscous liquids, special attention should be paid to determining the pipe diameters. Indeed, the variation in pressure loss is proportional to the viscosity and inversely proportional to the diameter exponent 4. A slight reduction in the pipe diameter could therefore have serious consequences on the pump's operating conditions.

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

### 2.3 Piping assembly

In order to achieve the best operating conditions, it is important to take account of the following recommendations regarding piping assembly :

- The positioning of the pump in the transfer or recycling circuit should always be chosen 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 pipe diameter), on both the inlet and discharge sides.
- The pipes are supported and aligned with the pump so as to avoid generating 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 any adjustments and checks, it is recommended that pressure tapping ports to which pressure/vacuum gauges may be fitted, are provided as close as possible to the pump's suction and discharge ports (preferably at a distance of less than 5 times the pipe diameter).
- If the suction head is especially high or if you want to prevent the pipes emptying at shutdown, you can install a foot valve. This should have a large diameter so as not to generate additional pressure 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 be full bore models.
- All steps should be taken to prevent foreign bodies from entering the pump (the use of a filter at the pump intake is therefore strongly recommended).
- Before installing new pipes or tanks, check that they are carefully cleaned to remove waste from welding, rust, etc. which when carried through by the liquid could cause deterioration to the pump.
- The pipes should be designed to allow thermal expansion/contraction (the use of flexible couplings or expansion loops is therefore recommended).
- If there is danger of the liquid freezing or solidifying, it must be possible to drain the piping by installing taps at the low points and air vents at the high points.

## 2. INSTALLATION (continued)

### 2.4 Direction of rotation

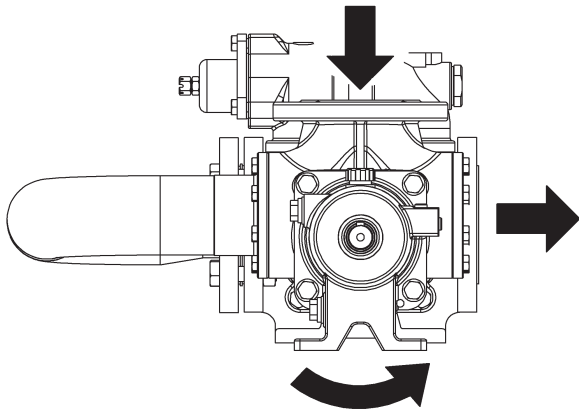
- In its standard configuration, the SLP series MOUVEX pump is supplied as non reversible and with anticlockwise rotation.

**NOTE :**

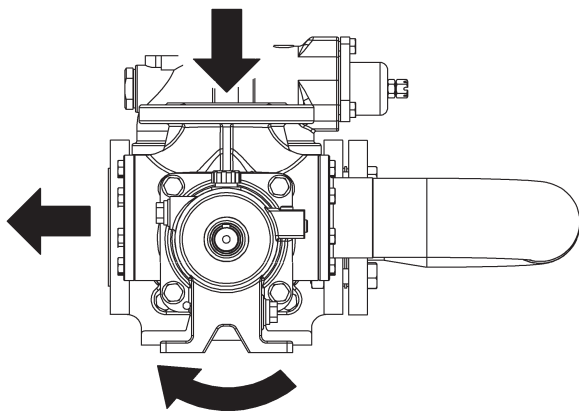
ALL VIEWS IN THIS INSTRUCTION MANUAL SHOW PARTS IN THE STANDARD DIRECTION OF ROTATION.

The rule for the discharge side and the direction of rotation is as follows :

- For anticlockwise rotation (standard), the discharge should be on the right side of the pump.



- For clockwise rotation, the discharge should be on the left side of the pump.



In all cases, suction is from the top.

Operation in the opposite direction from that designed for the pump is authorised nonetheless for a maximum duration of 5 minutes as long as it remains below the pressure limits (1,5 bar at the bellows).

The direction of rotation may be reversed :

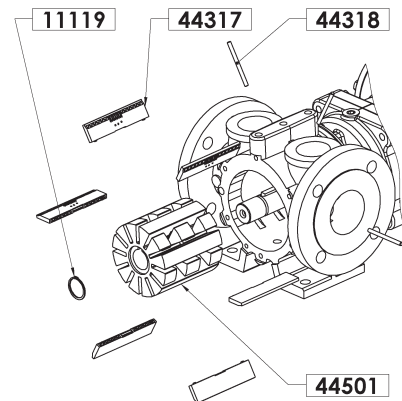
- On request at the time the order is placed. In this case the pump will be supplied with clockwise rotation.
- Or manually, referring to the following §.

### 2.5 Changing the direction of rotation

**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, HAS COOLED DOWN AND HAS BEEN DRAINED.

- Dismantle the connection manifold (see § DISMANTLING /ASSEMBLING THE CONNECTION MANIFOLD).
- Dismantle the relief valve (see § ORIENTATION OF BYPASS).
- Change the position of the rotor, the vanes and the pushrods (for a pump with pushrods) : see § OPENING AND CLOSING THE PUMP ON THE NON-DRIVE SIDE.



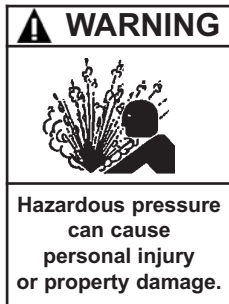
- Remove the vanes **44317** and the pushrods **44318**.
- This may be carried out by removing the vanes **44317** horizontally and then the pushrods **44318** using a screwdriver and pushing them to one of the pump outlet ports.
- Follow the same procedure for the other vanes **44317**.
- Remove the circlips **11119** (**BE CAREFUL not to scratch the shaft**).
- Remove the rotor **44301**, turn it over and re-assemble it so that the rotor pushrods **44301** match up with the holes in the shaft **44501**.
- Place a suitable screw at the end of the shaft to pull it and reveal the circlip groove.

	Screw
SLP25	M8

- Replace the circlips **11119** taking care not to scratch the shaft **44501**.
- Re-assemble the vanes **44317** and the pushrods **44318** facing the correct direction (see § VANE CHECKS).
- Re-assemble the bypass facing the correct direction (see § DIRECTION OF BYPASS).
- Re-assemble the connection manifold on the correct side (see § DIRECTION OF ROTATION).

## 2. INSTALLATION (continued)

### 2.6 Protecting the installation against over-pressure



INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND PROPERTY DAMAGE.



FAILURE TO INSTALL ADEQUATELY SIZED PRESSURE RELIEF VALVE(S) CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

To protect the installation from any overpressure, the use of a pressure relief safety device is recommended.

The standard pump is supplied fitted with a single internal relief valve to protect the system in one operating direction. Its orientation therefore depends on the operating direction of the pump (refer to § RELIEF VALVE).

It is also possible to order the following option :

- Without relief valve : the pump then has no other inbuilt safety device. In this case, the pump must be protected (for example with a pressure switch) to reduce any overpressure.

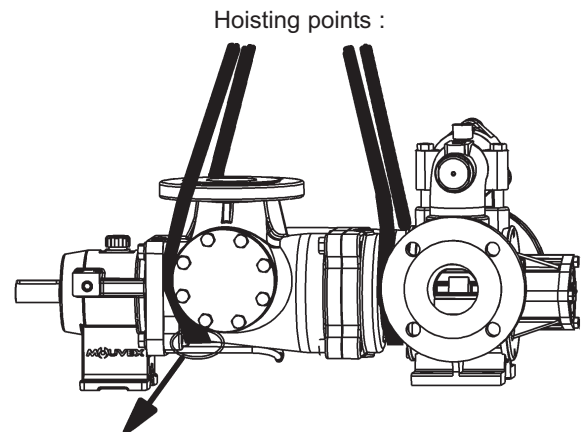
If the rotation of the pump is to be used in both directions, (whatever the operating conditions), it is recommended to use a device that protects the pump from overpressure when rotating in both directions (pressure switch, etc.).

### 2.7 Cleaning

As the pumps are well-greased when supplied, it may be necessary to clean them before starting them up.

They may be cleaned either by circulating an appropriate liquid or by dismantling the pump and carefully cleaning the internal parts (in which case, refer to § relating to pump maintenance).

### 2.8 Hoisting devices

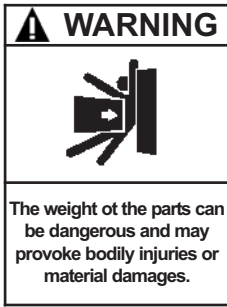


The strap must pass between the cradle and the manifold.

- Use straps designed for the weight of the pump (see overall dimension drawing).

## 2. INSTALLATION (continued)

### 2.9 Installation of units



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

The correct seating of a unit is essential for ensuring smooth operation and longevity. The base must be flat, level and sufficiently resistant to absorb stresses caused by the motor-driven pump without being distorted (concrete blocks must conform to the BAEL 91 standard).

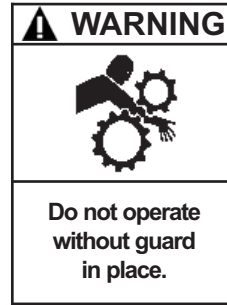
Where the unit is fastened using anchor lugs or bolts, it must be wedged carefully to prevent any distortion of the chassis when tightening the bolts. Distortion of the chassis could cause prejudicial stress to the pump and the drive device and put the coupling out of alignment, causing vibrations, noise and premature wear. Check that the chassis is clear of the floor and off the support plates.

Where the chassis is a one-piece unit in folded sheet metal, it is recommended to leave a clear horizontal space of around 50 cm between one end of the chassis and the other to allow access to the locking nuts on the pump, the reduction gearbox and the motor. In all cases, the space around the pump unit should allow enough room for dismantling the pump (refer to the overall dimension drawing at the beginning for details of these distances).

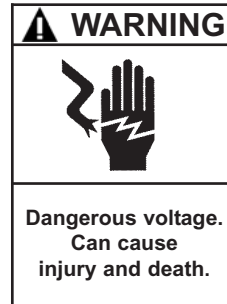
The chassis is equipped with an earth connection that must be used to protect personnel and equipment.

The mounting base of the vane pump body and the pump bearing are not on the same level (see § OVERALL DIMENSIONS). Different wedging must therefore be used for these two bases.

### 2.10 Alignment of motor/pump or reduction gearbox/pump shafts



OPERATION WITHOUT THE SHAFT PROTECTOR CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.



DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

The motor and pump shafts are accurately aligned in the factory before dispatch, but they must be checked automatically upon arrival and realigned if necessary. To align the coupling and the shaft, use a straight edge to check the offset and thickness gauges for angular misalignment.

The 3 figures below illustrate the operation and show the admissible deviations :

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

It is important to check the alignment at each stage of installation to ensure that no stresses are caused to the unit or the pump :

- after fixing to the base.
- after attaching piping.
- after pump has operated at normal operating temperature.

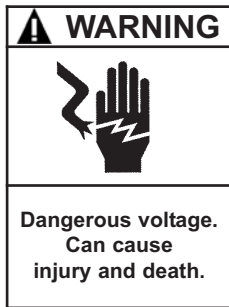
#### Reminder :

The coupling must not be relied on to compensate for a misalignment.

**NEVER START A UNIT IF THE COUPLING ALIGNMENT IS INCORRECT. THIS WILL INVALIDATE OUR WARRANTY.**

## 2. INSTALLATION (continued)

### 2.11 Electric motors



**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 check the contacts which must be thoroughly tightened. The motors must be protected by appropriate circuit breakers and fuses. Connect the regulatory ground connections.

**Rotation direction check :**



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



**PUMPS OPERATING AGAINST A CLOSED VALVE CAN CAUSE SYSTEM FAILURE, PERSONAL INJURY AND PROPERTY DAMAGE.**



**OPERATION WITHOUT THE SHAFT PROTECTOR CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.**

This check should be carried out on the pump with no liquid being pumped through and both the suction and discharge circuits venting so as to avoid generating unexpected pressure (at suction for example). This will avoid damaging either the pump or the system.

Start the pump empty to check that the connections are sound and that the direction of rotation corresponds to the system intake and discharge directions. If it should be required 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.

### 2.12 Diesel engines drive



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

Do not forget that these engines are not reversible. It is therefore essential to check carefully the pump's intake and discharge sides before connecting the unit to the pipes.

The use of diesel engines drive is now well known. However, we strongly advise careful reading of the accompanying technical manual.

## 3. USE

### 3.1 Pumping hot or cold liquids



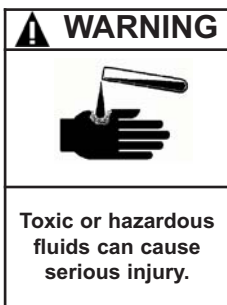
THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

For hot liquids : after the initial start-up, make sure that the screws and bolts are tightened to compensate for the effects of expansion.

### 3.2 Pump full of liquid when stopped



FAILURE TO INSTALL ADEQUATELY SIZED PRESSURE RELIEF VALVE(S) CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



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

Where the pump circuit is to be positioned between valves and / or check valves, account must be taken of the temperature variations that may occur and lead in particular to expansion of the liquid in the circuit. In this case, a means must be provided of discharging the expanded volume. The use of a relief valve may fulfil this function. The opening pressure of this valve should be compatible with the admissible pressure for the various components of the circuit.

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

Where liquids contain particles that may settle on shut-down, it is necessary to ensure that the consistency of the deposit will not prevent the pump being restarted.

### 3.3 Noise level

The noise level of a pump is generally influenced by the conditions of use. Cavitation and the pumping of products with high gas content generally increase the noise level.

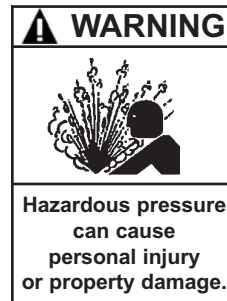
Under the following pumping conditions :

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

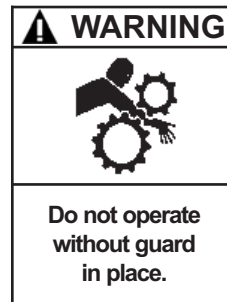
The noise level expected for an SLP series pump in good operating condition without the drive is less than :

- SLP25 i . . . . 74 dB(A)

### 3.4 Starting-up the pump



FAILURE TO RELIEVE SYSTEM PRESSURE PRIOR TO PERFORMING PUMP SERVICE OR MAINTENANCE CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.



OPERATION WITHOUT THE SHAFT PROTECTOR CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.

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 those on the suction side.
- For liquids requiring heating, they must be brought to their pumping temperature before starting the pump.

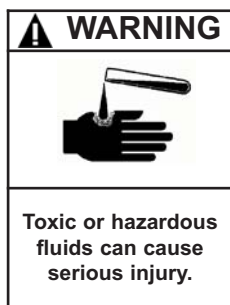
### 3.5 Shutting down the pump

When shutting down the pump, it is recommended to wait for it to stop completely before closing the valves, especially the suction valve.

---

## 3. USE (continued)

### 3.6 Storage



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

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

- the temperature must remain between 10°C and 49°C.
- the relative humidity does not exceed 60%.
- exposure to vibration is limited (maximum movement : 0,05 mm).

We recommend the following procedure for longer periods of storage :

#### 3.6.1 Storage

If the pump is stored with its gear motor unit, the recommendations of the manufacturer for this equipment should be followed.

Pump ports should be filled with a non-corrosive liquid that is 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 best storage conditions are inside a building that meets the conditions described above.

If inside storage is not possible, the equipment should be covered to prevent direct exposure to sun and rain. This protection should also protect the equipment from any 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 components being damaged if they are moved slightly by vibrations.

#### 3.6.2 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.

If the pump has a safety internal relief valve, remove it and inspect the parts and make sure they move freely (see § RELIEF VALVE FOR DISMANTLING INSTRUCTIONS).

For the transmission unit, the bearing must be drained (see § DRAINING OF BEARING).

### 3.7 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) and of its transmission (lubricant).

---

## 4. REQUIRED TOOLS AND TIGHTENING TORQUES

### 4.1 Necessary tools

- Open-end spanners 8 - 11 - 13 - 16 - 17
- Socket wrench 13
- Opening circlip pliers
- Screwdriver
- Extractor
- Torque wrench
- Wrench for 6 hexagonal hollows of 3
- Pin punch Ø 3 and Ø 4
- Lip seal extractor
- Chisel


### 4.2 Assembly torques

- M6.....8 Nm
- M8.....18 Nm
- M10.....30 Nm
- M12.....50 Nm

## 5. OPENING AND CLOSING THE NON-DRIVE SIDE OF PUMP

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.

**⚠ WARNING**



Dangerous voltage.  
Can cause injury or 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 of 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**



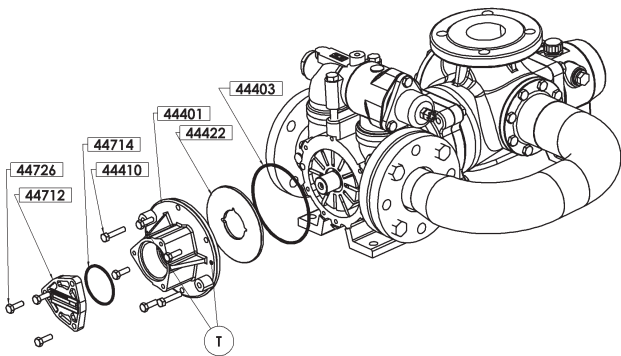
Any unforeseen start-up can cause serious injuries or important material damages.

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

## 5. OPENING AND CLOSING THE NON-DRIVE SIDE OF PUMP (continued)

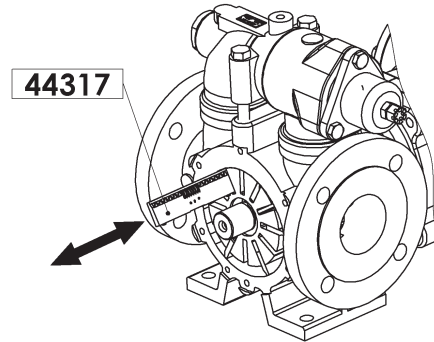
### 5.1 Opening the base on the non-drive side

- Unscrew the 4 screws **44410** and 2 screws **44411**.
- Place 2 screws **44410** in the 2 diametrically opposed tapped holes.
- Detach the front cover **44410** by screwing the 2 screws simultaneously.
- When the cover is loose on the shaft, withdraw it manually while supporting it.
- Check the seal **44403** and the front disk **44422** (see § MAINTENANCE).
- Check the bushing **44407** inside the cover **44401** (see § MAINTENANCE).

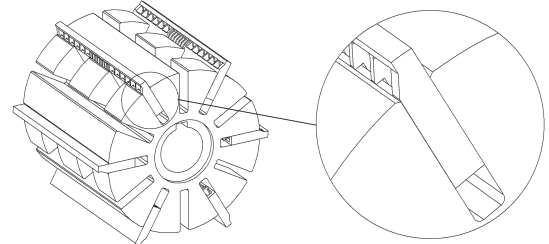
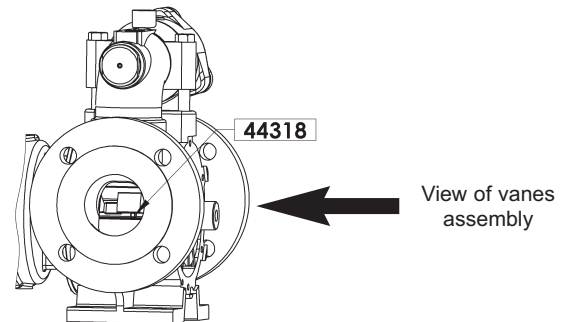


- Seal **44714** may be checked and change if necessary by unscrewing the 3 screws **44726** and removing the cover **44712**.

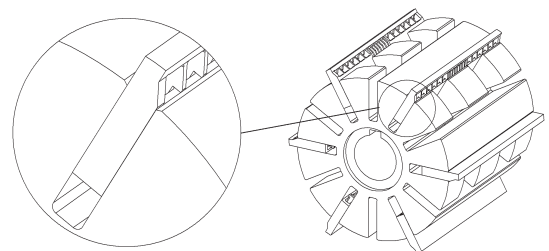
### 5.2 Checking the vanes



- Remove a vane **44317** situated horizontally.
- Check it for wear (see § MAINTENANCE). In the case of abnormal wear, check the state of the body and front cover faces.
- The pushrods **44318** may be removed (and replaced) using a screwdriver through one of the pump ports.
- Replace the vane **44317** (with a new one if necessary), making sure it is fitted in the right direction and making sure it slides properly in its slot. Take care with the pushrods if applicable. Take care with the pushrods if applicable.



Clockwise rotation\*



Anticlockwise rotation\*

- Turn the pump shaft manually to bring the next vane to a horizontal level. Follow the same procedure for each vane.

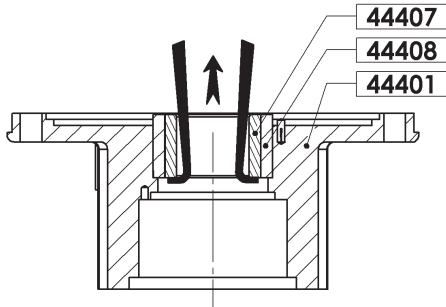
\* view from motor side

## 5. OPENING AND CLOSING THE NON-DRIVE SIDE OF PUMP (continued)

### 5.3 Changing the bushing

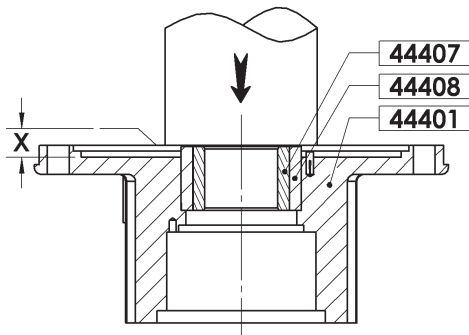
#### Dismantling :

- Place the front cover **44401** vertically on side casing.
- Insert the extractor inside the ring **44407**, as far as the front cover **44401**.
- When the extractor is in place, remove the bushing **44407**.



#### Remounting :

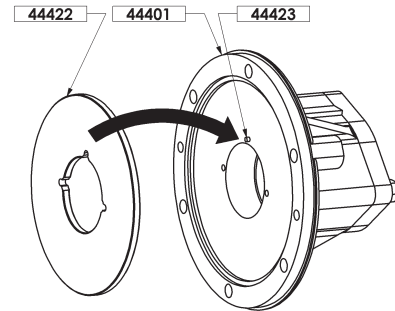
- Place the cover **44401** vertically.
- Position the bushing **44407** over the hole.
- Slide the bushing on, pushing it with a sleeve on a press. The face of the bushing **44407** must be assembled according to dimension X marked below.



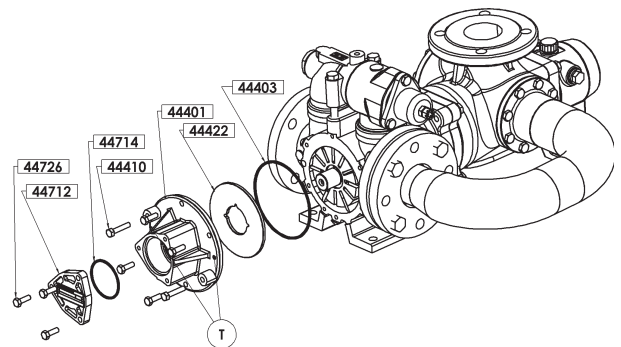
	X
SLP25	4,9 <sup>±0,1</sup>

### 5.4 Closing the non-drive side base

- Assemble the seal **44403**.
- Place the base disk **44422** in the base. TAKE CARE with its positioning.
- The notch must be correctly positioned with the pin as indicated in the diagram below.



- Place the front cover **44401** on the shaft **44501** and tighten it as much as possible by hand.
- Tighten the 4 screws **44410** and 2 screws **44411**.
- Turn the shaft whilst tightening screws **44410** and the 2 screws **44411**.



- If the cover **44712** has been removed, reassemble seal **44714**, check it and change it if necessary.
- Reposition the cover and tighten the 3 screws **44726**.

## 6. OPENING AND CLOSING THE DRIVE SIDE BASE

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 clear, flat surface.

### ⚠ WARNING



DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.

Dangerous voltage.  
Can cause injury or death.

### ⚠ WARNING



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

Hazardous pressure can cause personal injury or property damage.

### ⚠ WARNING



FAILURE TO RELEASE ALL SYSTEM AIR AND WHEN EQUIPPED, HYDRAULIC PRESSURE, 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.

Hazardous or toxic fluids can cause serious injury.

### ⚠ WARNING



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

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

### ⚠ CAUTION



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

Slippery lubricant. Spills should be cleaned up.

### ⚠ CAUTION



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

Excessive temperature can cause injury or severe damage.

### ⚠ WARNING



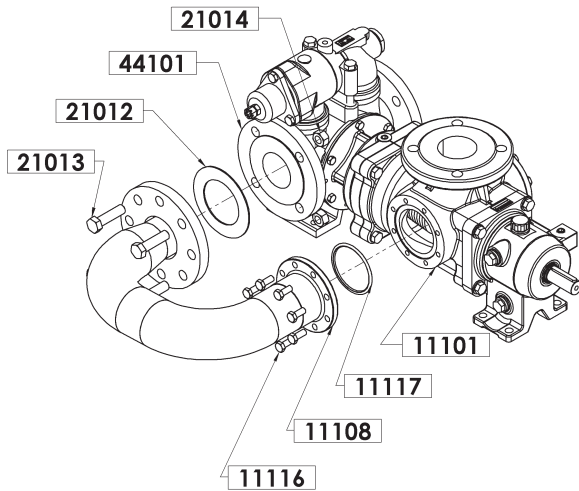
TAKE ALL NECESSARY MEASURES TO RENDER ANY START-UP, EVEN ACCIDENTAL, OF THE PUMP DURING THE WORK IMPOSSIBLE.

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

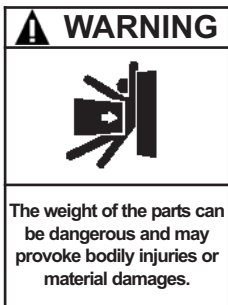
## 6. OPENING AND CLOSING THE DRIVE SIDE BASE (continued)

### 6.1 Dismantling / reassembling connection manifold

- For ease of operation, the relief valve by be removed.



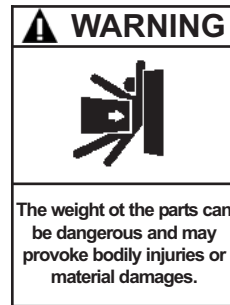
- Remove the 4 bolts 21013/21014.
- Unscrew the 8 screws 11116.



BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED. IT IS ADVISABLE TO HOLD THE CONNECTION MANIFOLD WHEN DISMANTLING.

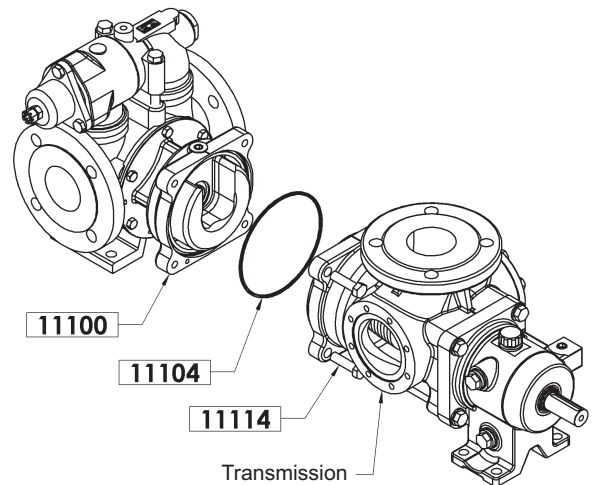
- Put down the connection manifold 11108.
- Remove seals 11117 and 21012, replacing them if necessary.
- Follow the procedure in reverse for reassembly.

### 6.2 Dismantling / reassembling transmission

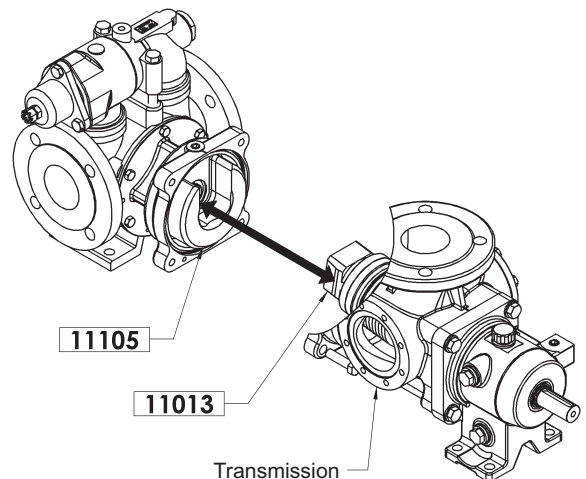


BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.

- Loosen the screws 11114.
- Remove the transmission from the base 11100.
- Remove seal 11104, replacing it if necessary.



- Follow the procedure in reverse for reassembly, carefully positioning the square block 11013 in the drive 11105 as shown below.

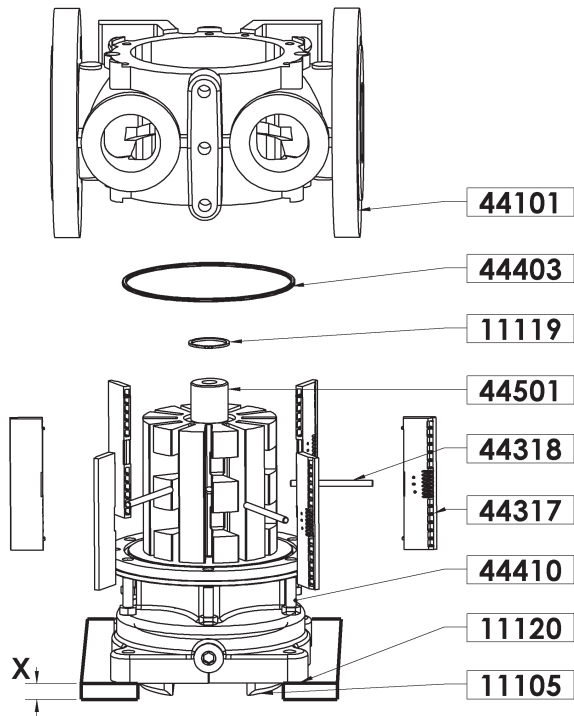


## 6. OPENING AND CLOSING THE DRIVE SIDE BASE (continued)

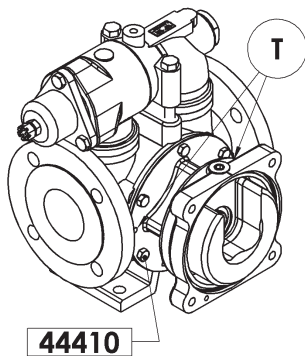
### 6.3 Dismantling the adaptation unit base

- For ease of handling, this unit may be positioned vertically as shown, preferably on blocks.

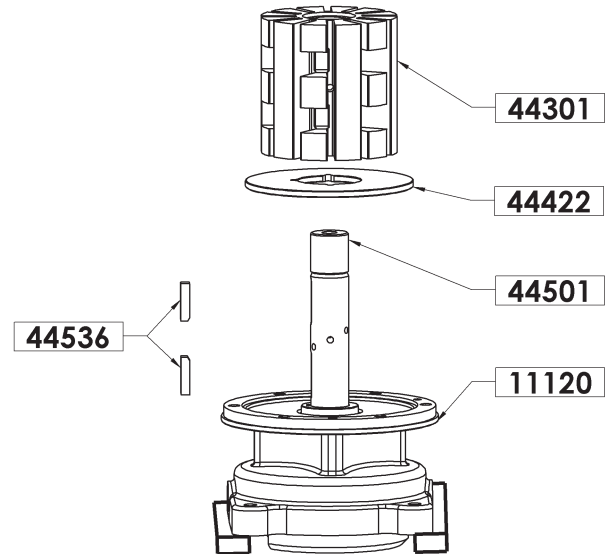
	Height X of blocks (mm)
SLP25	17,5



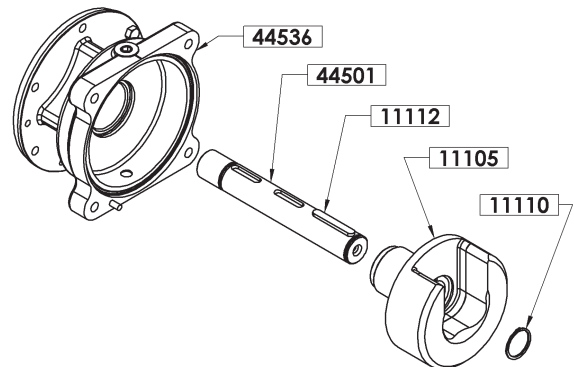
- Loosen the 6 screws **44410**.
- Place 2 screws **44410** in the 2 diametrically opposed tapped holes T.



- Detach the front cover of the body by tightening the 2 screws simultaneously.
- Remove the casing **44101**.
- Remove vanes **44417** and pushrods **44418** using a screwdriver if these were not removed when the base was dismantled (see § VANE CHECKS).
- Remove and check the seal **44403**.
- Check pushrods **44318** and vanes **44317** (see § MAINTENANCE) and change them as necessary.
- Remove circlips **11119**.



- Pull out the rotor **44301**.
- Remove keys **44536**.
- Check the wear of the keyways and of the 2 keys **44536**.
- Remove the carbon disk **44422** and check it for wear.



- Place the remainder of the assembly in horizontal position.
- Remove the shaft unit **44501** / drive **11105** / key **11112** / circlips **11110**.
- Remove circlips **11110**.
- Remove the drive **11105** and check it for wear (must be checked with the square bushing **11013**, as these 2 parts should be changed at the same time).

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

- Check the bushing **11108** and change if necessary as follows :
  - Extract the pin **11109** using a pin punch.
  - Break the bushing **11108** using a chisel. TAKE CARE not to damage the surface below the bushing.
  - Replace the new bushing **11108**, heating it (in oil bath or High Frequency) to 110°C max.

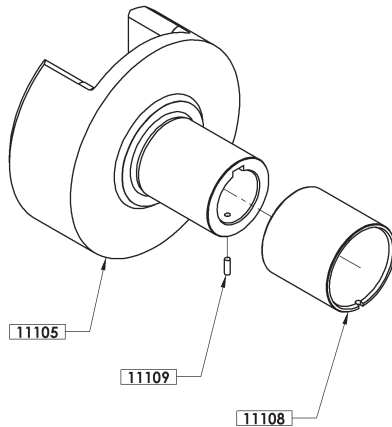
**⚠ CAUTION**

Position the bushing **11108** carefully to allow the fitting of pin **11109**.

- Assemble pin **11109**.

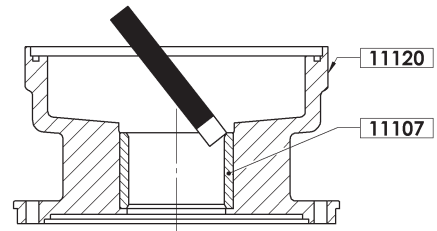
**⚠ CAUTION**

The pin must not stick out into the bore of the drive **11105** or beyond the bushing **11108**.

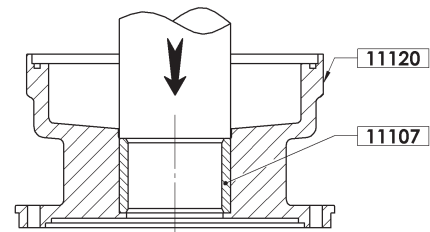


### 6.4 Changing the bushing in the adaptation base

- Break the bushing **11107** using a chisel and taking care not to damage the bore in the base **11120**.



- For reassembly, place the base **11120** vertically on its biggest surface.
- Position the bushing **11107** over the hole.
- Slide the bushing **11107** on, pushing it with a sleeve on a press. The bushing **11107** must fit closely to the base **11120**.



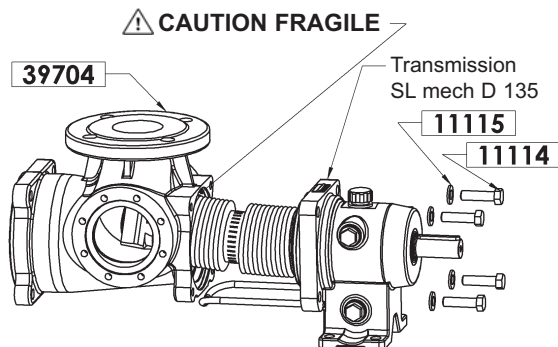
Dimensions of bushing :

	Ø int	Ø ext	L
SLP25	50	60	40

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

### 6.5 Dismantling inlet manifold

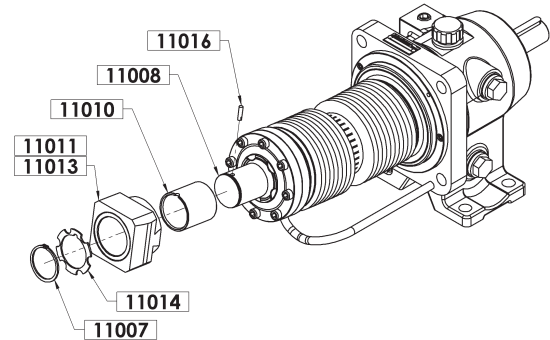
- Remove the 4 screws 11114 and washers 11115.
- Remove the manifold 39704 taking extreme care of the bellows.



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

### 6.6 Dismantling / reassembling transmission square driver

- Remove the circlip 11007, the flange 11014 and the square driver 11013 with its bushing 11011.
- Follow the procedure in reverse for reassembly.
- If the carbon bushing 11011 is worn, replace it. The new bushing 11011 is fitted using a press, pushing it with a sleeve. The face of the ring 11011 must be in line with that of the square driver 11013.



Dimensions of bushing 11011 :

	Ø int	Ø ext	L
SLP25	40	50	40

- If the bushing 11010 is badly marked, replace it. Procedure :

- push the pin 11016 into the hub.

	Ø pin 11016
SLP25	4

- break the bushing 11010 using a chisel. TAKE CARE not to damage the surface below the bushing.

- refit the new bushing 11010 by heating it to 110°C max.

**CAUTION**

Position the bushing 11010 carefully to allow the fitting of pin 11016.

- Replace the pin in position using a pin punch. If the pin is damage, remove it completely and replace it with a new one.

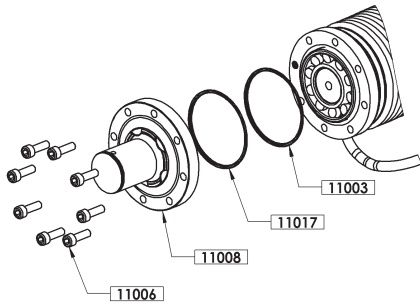
**CAUTION**

The pin 11016 should not stick out beyond the bushing 11010.

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

### 6.7 Changing the transmission and/or hub nose seal

- As the seal may be in contact with the product, its condition must be checked and the part changed if necessary.
- Empty the pump (see § MAINTENANCE).
- Unscrew the 8 screws **11006**.
- Remove the square driver hub **11008**.
- Check the condition of seals **11003** and **11018**, replace them if necessary.

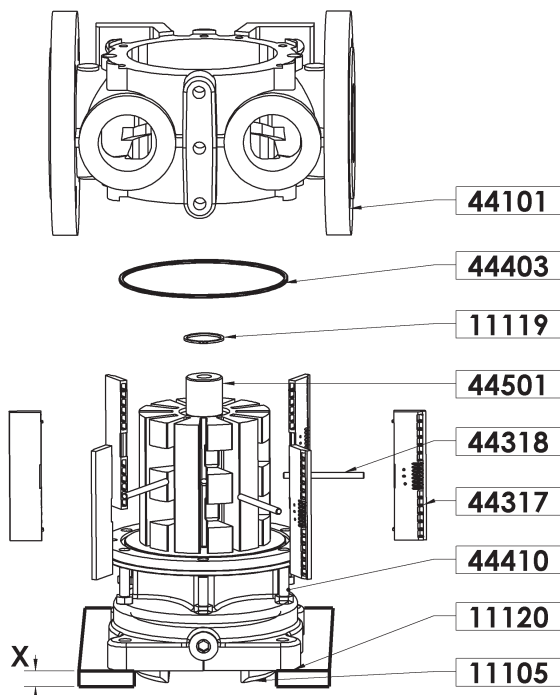


- Follow the procedure in reverse for reassembly.

#### **⚠ WARNING**

Replace the oil in the transmission (see § DRAINING).

### 6.8 Reassembly of vanes and pushrods

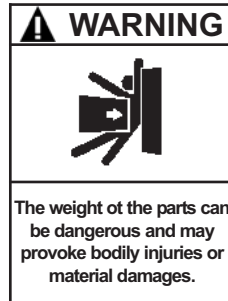


- For reassembly, carry out the dismantling procedure in reverse (see § DISMANTLING THE ADAPTATION UNIT BASE) up to the rotor.
- Fit the rotor.

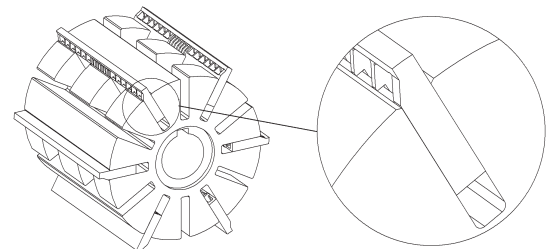
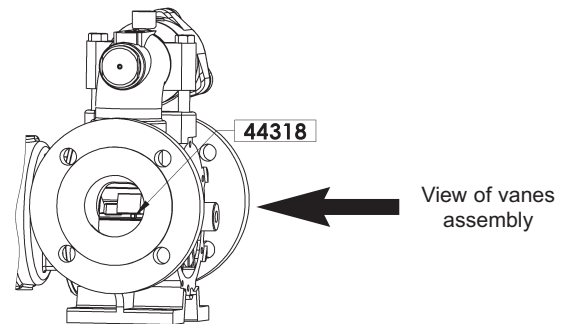
#### **⚠ CAUTION**

The rotor must be fitted facing the correct direction! Follow the instructions in § CHANGING THE DIRECTION OF ROTATION to ascertain the assembly position of the rotor.

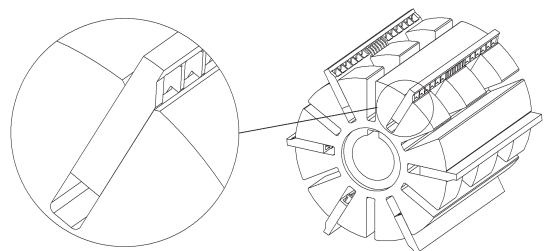
- Fit the circlips **11119**.
- Assemble the seal **44403**, checking its condition and changing it if necessary.
- Insert the pushrods **44318** in the holes on the rotor **44301**.
- Reassemble the casing **44101**.



- Put back the 6 screws **44410**.
- Insert the vanes **44317** in the mounting direction (see detail below) and check that they slide freely.



Clockwise rotation\*

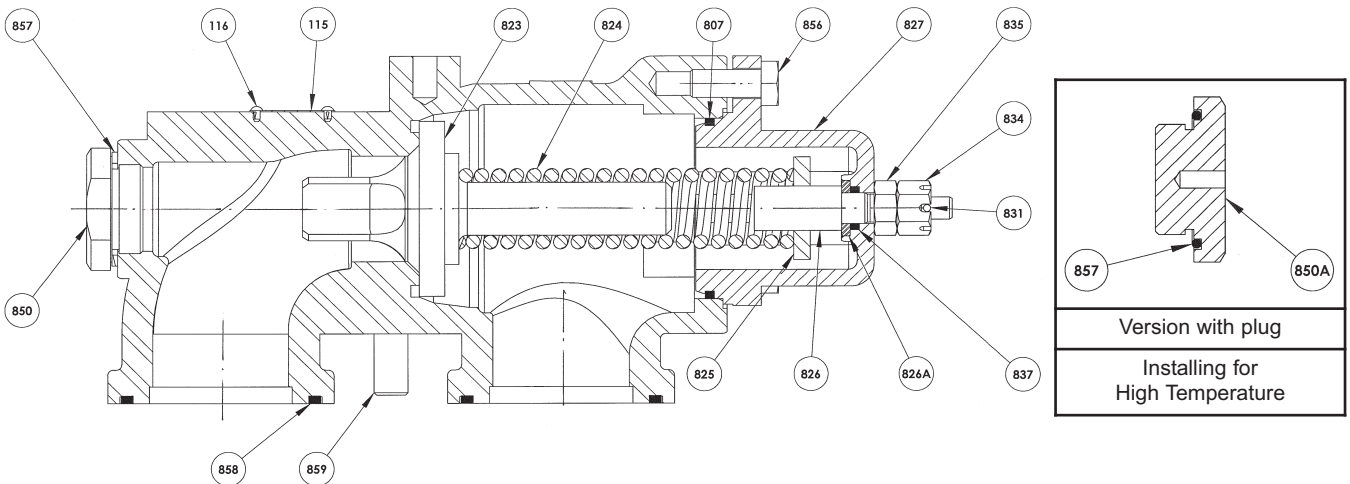


Anticlockwise rotation\*

- Reassemble the cover as indicated in § CLOSING THE NON-DRIVE SIDE BASE.

\* view from motor side

## 7. BYPASS



**⚠ WARNING**

**Dangerous voltage.  
Can cause injury or 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 of 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.**

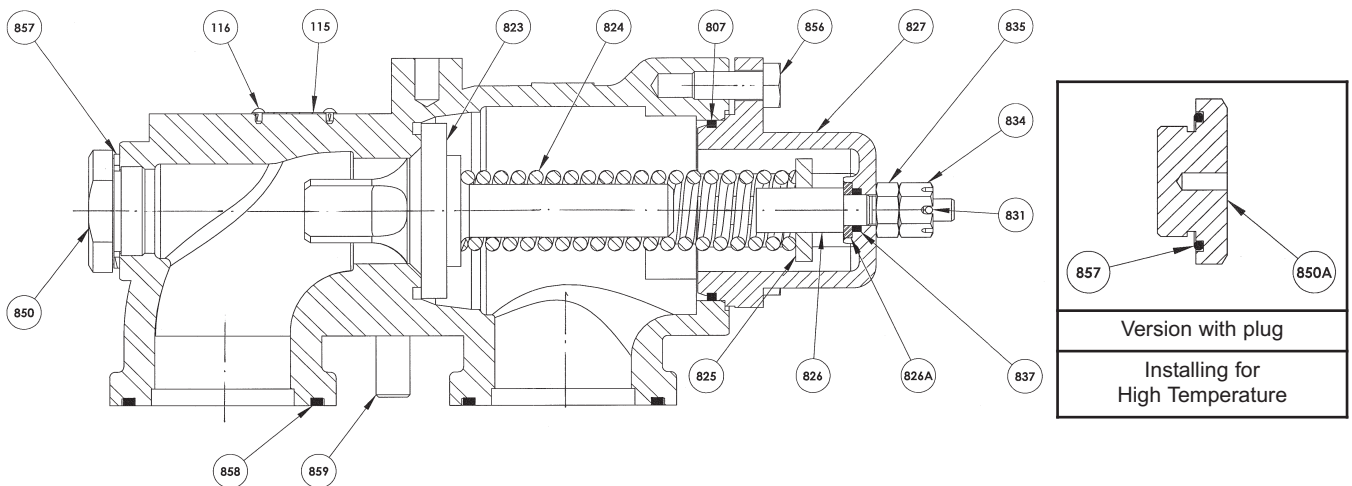
THE SURFACES OF THE PUMP CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.

**⚠ 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. BYPASS (continued)



### 7.1 Bypass operation

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

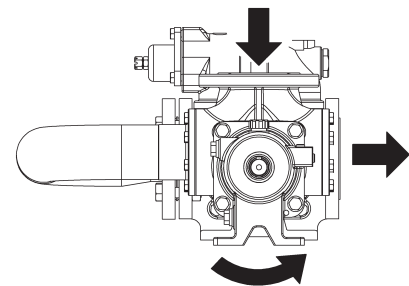
When the discharge pressure reaches the adjusted pressure of the spring, the valve **823** opens, thus permitting the partial or total return of the liquid to the suction side of the pump.

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 however that the role of the bypass as a safety device, is limited to protecting the pump against accidental over-pressure.

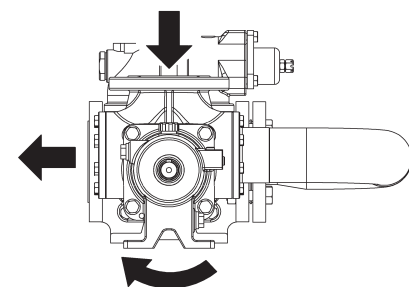
Therefore for all electric motors - unless the model used can handle the increased load due to maximum over-pressure (pump sending its flow through the bypass with the spring tightened to the maximum) - it is vital to provide appropriate overload protection.

### 7.2 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 suction side. The bypass must be reversed if in the wrong direction.



Anticlockwise rotation



Clockwise rotation

### 7.3 Bypass inversion

- Unscrew the 2 screws **859**.
- Remove the bypass.
- Check the seals **858** and change them as necessary.
- Turn the bypass through 180°.
- Tighten the 2 screws **859** equally so the bypass remains vertical.

## 7. BYPASS (continued)

### 7.4 Bypass adjustment



INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND 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 motor-driven and electric pump units are adjusted, according to the information provided by our Technical Services.

### 7.5 Obtaining the flow



INCORRECT SETTINGS OF THE PRESSURE RELIEF VALVE CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND 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, the spring is compressed to its limit or the operation of the motor is disturbed, without the required flow being obtained, this means that the motor-pump unit must operate with a pressure higher than that for which it was designed. In all cases our Technical Services must be consulted.

When the required flow is obtained, 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.

### 7.6 Energy consumption

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

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

### 7.7 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.

#### Dismantling :

- Unscrew the 2 screws **859**.
- Lift off the bypass and place it on a bench or clear, flat surface.
- 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**.



THE SPRING IS ALWAYS UNDER SLIGHT TENSION.

- Remove the bypass cap **827** and its pressure screws (**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.
- Lay down the bypass cap **827** and its pressure screws (**825 - 826 - 831 - 834 - 835 - 837**).
- Gradually tighten the screws **856**.




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 remains vertical.
- Set the spring pressure to the desired value (see § BYPASS ADJUSTMENT).

## 8. TRANSMISSION

<b>⚠ WARNING</b>

Dangerous voltage. Can cause injury or death.

DISCONNECT THE ELECTRICITY SUPPLY BEFORE ANY MAINTENANCE OPERATION.


<b>⚠ WARNING</b>

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.

<b>⚠ WARNING</b>

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.


<b>⚠ WARNING</b>

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.

<b>⚠ WARNING</b>

The weight of 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.


<b>⚠ CAUTION</b>

Slippery lubricant. Spills should be cleaned up.

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

<b>⚠ CAUTION</b>

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.

<b>⚠ WARNING</b>

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. TRANSMISSION (continued)

### 8.1 Checking the bellows

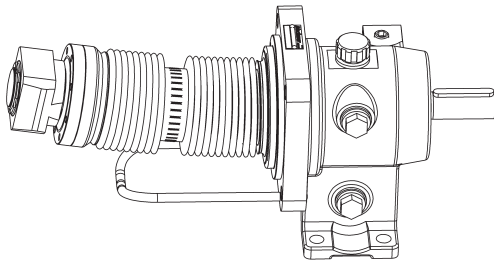
#### ⚠ WARNING



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

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

- Follow the Dismantling / Reassembling instructions in § DISMANTLING/REASSEMBLING MANIFOLD CONNECTION and DISMANTLING/REASSEMBLING TRANSMISSION.
- Inspecting the bellows : any sign of impact, scratches or distortion necessitates its replacement.



The transmission may be replaced during the preventive maintenance (every 225 million cycles).

### 8.2 Draining the bearing

#### ⚠ CAUTION



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

Slippery lubricant. Spills should be cleaned up.

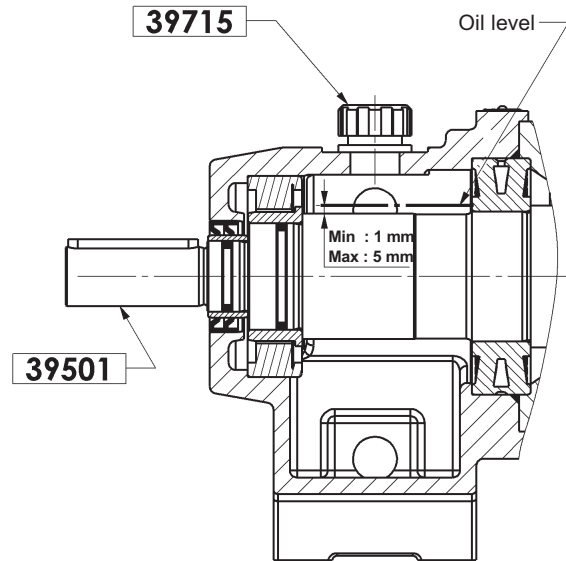
- Drain the transmission according to the table below :
- **Data for standard MOUVEX oil :**

Temperature of product pumped / heating product	Drainage frequency <sup>1</sup> (hours of operation)
80 °C < T ≤ 100 °C	12 000
T ≤ 80 °C	17 000

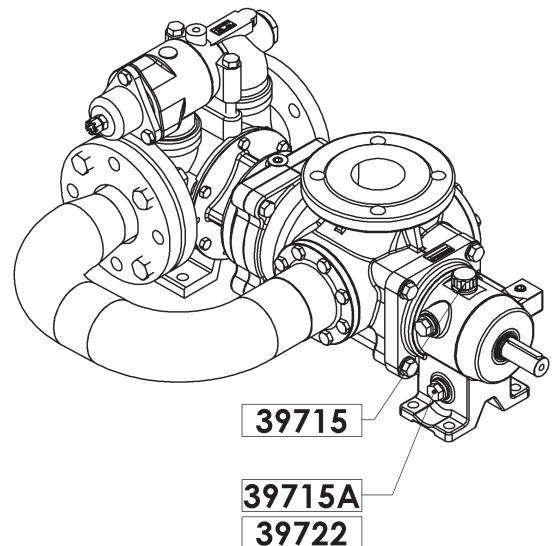
<sup>1</sup> In all cases, the oil must be replaced every two years even if the pump has not been in operation.

- **Data for other oil brands :** The draining frequency is defined by the customer (test results) regarding the oil specifications and the pump conditions.
- Drain the pump by removing the drain bung with its seal **39715A-39722** and the breather valve **39715**.
- Replace the drain bung and its seal.
- Fill the transmission with 0,7 litres of oil\*.

- Check that the oil level is between 1 and 5 mm above the shaft.



- Screw back the breather valve **39715**.




\* **Standard oil provided by MOUVEX : CS17 Food grade synthetic oil (Safety data sheet is supplied with the new pump and on request).**

\* **other oil provided by customer.**

\* Loctite® is a registered brand.

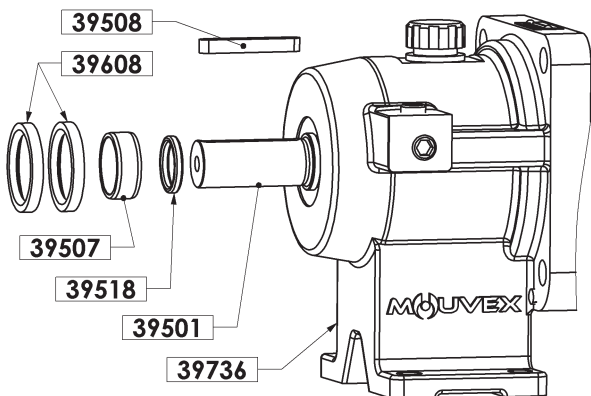
## 8. TRANSMISSION (continued)

### 8.3 Changing lip seals

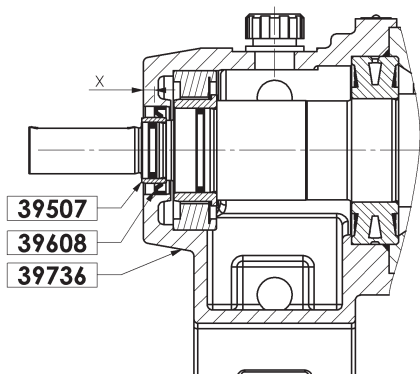
<b>⚠ CAUTION</b>

<b>Slippery lubricant. Spills should be cleaned up.</b>

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

- Drain the pump bearing (see § DRAINING OF BEARING).



- Extract the 2 lip seals **39608** using an appropriate extractor.
- Before fitting the lip seals, grease the lips.
- If the seal face is marked, change the bushing **39507**.
- Extract the bushing **39507** using an appropriate extractor.
- If the seal **39518** is damaged, remove and replace it.
- Slide on new bushing after heating it to 110°C max (in oil bath or HF).
- Slide the first seal on using a tube calibrated to the mark X indicated.



	X
SLP25	6

#### Dimensions of lip seal :

	Ø int	Ø ext	L
SLP25	35	47	6

- Greasing.



**FOOD GRADE SYNTHETIC OIL :**  
Reference obligatory as it must be compatible with the standard MOUVEX bearing oil.

- Fit the second seal.

\* Standard oil provided by MOUVEX : CS17 Food grade synthetic oil (Safety data sheet is supplied with the new pump and on request).

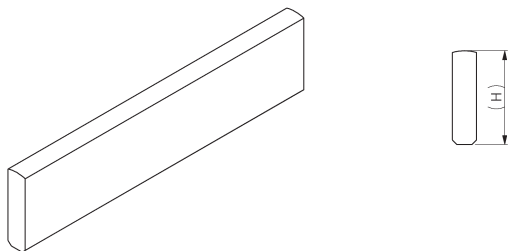
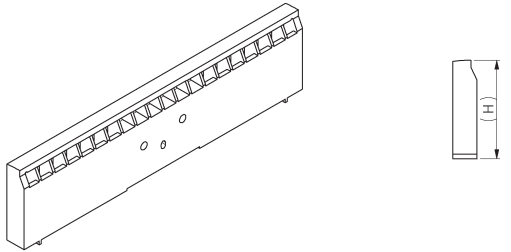
\* other oil provided by customer.

## 9. MAINTENANCE

### 9.1 Checking the condition of vanes and the pushrods

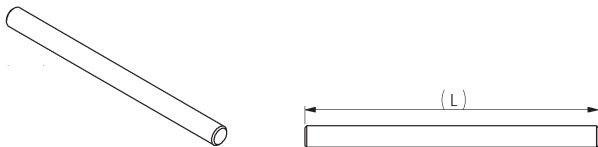
It is advisable to check the condition of the vanes and pushrods every 700 hours of pump operation.

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



**Vanes :**

	Original height (H)	Minimum height (H)
SLP25	26,3	24,3



**Pushrods :**

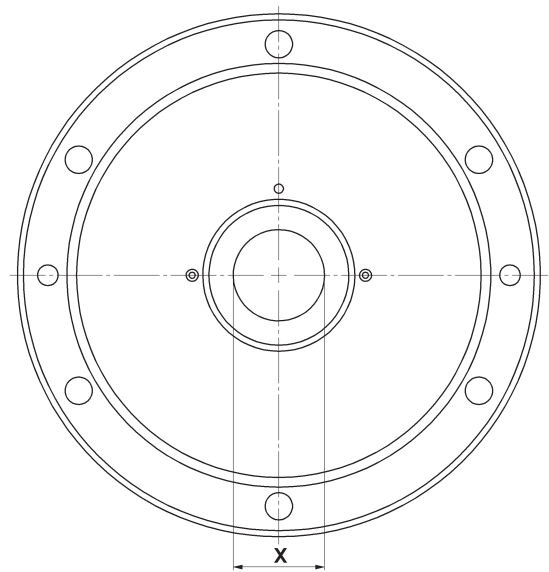
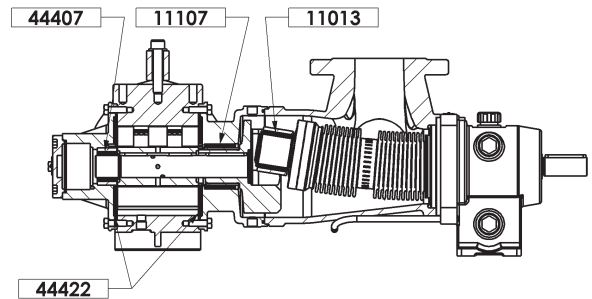
	Minimum original length (L)	Minimum length (L)
SLP25	66,35	65,85

### 9.2 Checking the condition of friction bushings

It is advisable to check the condition of the friction bushings **44407**, **11107** and **11013** at the same intervals as the vanes and pushrods.

Replacement of all the bushings and base disks **44422** should be scheduled if serious scratches are evident or when the wear on the base bushing **44407** is greater than the value indicated in the table below. For this operation, dismantle the base (see § OPENING THE NON-DRIVE SIDE OF PUMP). Check the wear on the bushing in accordance with the table below. The figure read relates to the greatest out-of-round figure.

	Wear dimension X of bushing <b>44407</b> (mm)
SLP25	30,4



## 10. TROUBLESHOOTING

<b>ZERO OR INSUFFICIENT FLOW RATE</b>			
<b>1</b>			<b>PRELIMINARY CHECKS</b>
	1-1		Make sure that the caps have been removed from the ports of the pump and that the pump is running (defective drive, damaged motor, etc., faulty transmission : disconnected coupling, worn or poorly coupled gear, 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. 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 suction 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 by using a rev. counter.
			If these checks do not highlight the problem :
<b>2</b>			<b>MEASURE THE DISCHARGE PRESSURE</b> (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 equipment, or zero, possible causes are :
		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 no longer closes : 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	<p>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, either :</p> <ul style="list-style-type: none"> <li>a. because the height of the discharge is too great (reduce it by bringing the discharge tank to the level of the pump. The opposite could also be effective if the suction conditions allow it.)</li> <li>b. because head losses are too high due to : <ul style="list-style-type: none"> <li>- unsuitable piping (too many "bends", too long or the diameter is too narrow) for the process conditions : flow rate, density of the liquid and viscosity which could change significantly with temperature (reduce the loss by simplifying the circuit : reduce the number of accessories, bends, etc., by increasing or decreasing the height of the discharge reservoir from the pump if the suction conditions allow, by increasing the diameter of the pipes, reducing the viscosity by heating, reducing the flow rate, etc.).</li> <li>- partially blocked piping (valve or tap partially shut, cloth obscuring flow, etc.).</li> </ul> </li> </ul>
		2-2-2	The discharge piping is completely blocked (valve or tap closed, cloth plugging flow, protection plate left inadvertently, etc.) causing all the liquid to pass via the bypass.

## 10. TROUBLESHOOTING (continued)

<b>3</b>			<b>MEASURING THE VACUUM PRESSURE</b> (as close as possible to the pump inlet, suction side).
	3-1		If the vacuum is high, e.g. higher than or equal to 6 or 7 meters of water (about 45 or 50 cm of mercury), this can result in pump noise because :
		3-1-1	The suction head is too high, either : a. because the suction lift is too high (reduce it by bringing the pump closer to the level of the liquid) b. because the pressure losses are too high : 1. cf 2-2-1 b 2. because the suction piping orifice is too close to the bottom of the tank.
		3-1-2	The suction piping is completely blocked (valve, tap, filter, cloth, forgotten blanking plate, etc.).
		3-1-3	The vapour pressure 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 or even load the pump, or cool the liquid to reduce the vapour pressure.
	3-2		If the vacuum is low, for example, less than 3 meters of water (i.e. about 20 cm of mercury), isolate the pump from the suction piping (by closing the valve nearest the pump, by inserting a seal plate, etc.) and re-measure the vacuum.
		3-2-1	If the vacuum is high, e.g. higher than or equal to 6 or 7 meters of water (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 vapour pressure of the liquid is too high or has become so possibly 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 foreign matter 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 (worn piston bearing springs, worn piston spring, worn partition, broken shaft).

### ABNORMAL HEATING OF BEARINGS

<b>4</b>			This heating may be due to :
	4-1		- excessive pulling on the pump flanges by the piping (in this case, it would 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 distortion of the chassis (make sure that the chassis is clear of the ground except at the anchoring points).
	4-4		- seizing of the bushings (coagulating liquid, excess power, etc.).
	4-5		- faulty lubrication
	4-6		- excessive load

### LEAKING TRANSMISSION :

<b>5</b>			Transmission fluid may leak as a result of :
	5-1		- a transmission seal in poor condition or badly fitted.
	5-2		- broken bellows.
	5-3		- through the breather valve : if there is too much oil in the transmission.

## 10. TROUBLESHOOTING (continued)

<b>ABNORMAL NOISES</b>		
		These noises can be caused by hydraulic or mechanical faults. They can be distinguished by the fact that only the former disappear (or at least lessen) when air is allowed into the suction pipe.
<b>6</b>		<b>HYDRAULIC NOISE</b>
		This may be caused by insufficient pump supply or excess NPSH, either :
	6-1	- because 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.).
	6-2	- because the suction head is too high or has become too high due to excessive head losses following an accumulated clogging of the piping or filter, a change of viscosity of the liquid, etc.
	6-3	- because of an increase in the vapour pressure with a rise of temperature.
<b>7</b>		<b>MECHANICAL NOISES</b>
		These may be caused by :
	7-1	- the bypass valve hitting the seat, the discharge pressure being similar to the bypass discharge pressure (turn the adjuster screw after making sure the electric motor is suitably protected).
	7-2	- abnormal stress on the pump : the transmission is pulling on the shaft, the piping is pulling on the flanges.
	7-3	- a broken part or foreign body in the pump.
<b>EXCESS POWER CONSUMPTION</b>		
<b>8</b>		The most spectacular event occurs when a heat motor stalls or the electric motor protection cuts out.
	8-1	If this incident occurs when closing the discharge line, the cause may be : a. bypass fitted wrong way round, b. bypass set too high, c. motor protection set too low.
	8-2	If the incident occurs during operation, the cause may be : a. an inadequate motor (in this case, the discharge pressure complies with designed pressure). 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. equipment fault (faulty alignment, distortion of the chassis, stress exerted by the piping on the flanges, seizing, etc.). e. product insufficiently heated at start-up. f. through-put of an excessively large foreign body.
		This latter incident can only be attributed to excessive power consumption caused by poor motor connection (e.g. a 3 phases motor operating on 2 phases).

# 11. CERTIFICATE OF CONFORMITY



## CERTIFICATE OF CONFORMITY CE

**Mouvex**, ZI La Plaine des Isles – Rue des Caillottes – 89 000 Auxerre France, declares the following equipment:

Set-up :  Pump / Compressor « bare-shaft »     Pumping Unit / Compressor Unit  
Type :  Eccentric Disc Pump     Vanes Pump     Lobes Pump  
 Peristaltic Pump     Centrifugal Pump     Other Pump  
 Screws compressor     Vanes compressors     Hydraulic cooler

Designation: \_\_\_\_\_ s/n°: \_\_\_\_\_

According to the specifications recorded in the file N°: \_\_\_\_\_

And with the following marking:  II2 G c IIB-T4    Max T° Flow = 80°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 94/9/EC (23 march 1994) 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 (INERIS - Parc Technologique Alata – 60550 Verneuil-en-Halatte - France).

The equipment indicated above 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.

For Mouvex SAS Company.

Date: \_\_\_\_\_

*Quality Manager*

**MOUVEX sas** : Z.I La Plaine des Isles – 2, rue des Caillottes - 89000 AUXERRE – France – SAS au capital de 8 496 855 €  
Tél : (33) 3.86.49.86.30 – Fax : (33) 3.86.46.42.10 – RCS AUXERRE 389 236 548 – APE 291 B – FR 85 389 236 548 – [www.mouvex.com](http://www.mouvex.com)