



INSTRUCTIONS 1001-E00 e

| | |
|-----------|----------------|
| Section | 1001 |
| Effective | September 2018 |
| Replaces | October 2016 |

Original instructions

C4 A - C4 A HT C8 A - C8 A HT PUMPS



INSTALLATION
OPERATION
MAINTENANCE

WARRANTY :

C 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.



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Your distributor :

ECCENTRIC PISTON PUMP MOUVEX PRINCIPLE

SAFETY INSTRUCTIONS, STORAGE, INSTALLATION AND MAINTENANCE MODELS : C4 A - C4 A HT - C8 A - C8 A HT

TECHNICAL CHARACTERISTICS

- Maximum pump speed : 750 rpm
- Running temperatures :
 - ambient-15°C → + 40°C
 - heating fluid (jacket).....-15°C → +180°C
 - continuous pumped product
 - C4 A - C8 A-15°C → +100°C
 - C4 A HT - C8 A HT.....-15°C → +160°C
- Maximum suction pressure :
 - In normal use, the suction pressure must be higher than the required NPSH and **less than 1 barg** (14,50 psig).
 - Pump **stopped**, the pressure must not exceed **6 barg** (87 psig).
- Acceptable maximal differential pressure :
 - C4 A C4 A HT9 bar (130,50 psi)*
 - C8 A C8 A HT5 bar (72,50 psi)*
- Maximum pressure jacket : 8 barg (116 psig)
- Cylinder capacity :
 - C4 A C4 A HT0,108 litre
 - C8 A C8 A HT0,178 litre

* When the pump works with an inlet gauge pressure less than zero, the maximum outlet pressure will be calculated as if the inlet pressure is equal to zero.

USED PRESSURE UNITS

Unit without suffix :

Differential pressure, for example, pressure difference between equipment suction and discharge.

Unit with suffix "a" :

Absolute pressure.

Unit with suffix "g" :

Gauge pressure, given regarding to atmospheric pressure (~101325 Pa, taken at 1 bar / 14,5 psi in this IOM).

Example :

$P_{suc} = -0,2 \text{ barg} = 0,8 \text{ bara}$

$P_{dis} = 8,8 \text{ barg} = 9,8 \text{ bara}$

$\Delta P = P_{dis} - P_{suc} = 9 \text{ bar}$

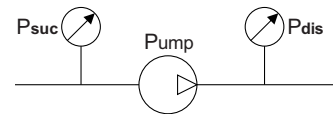


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Definition of safety symbols



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.



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.

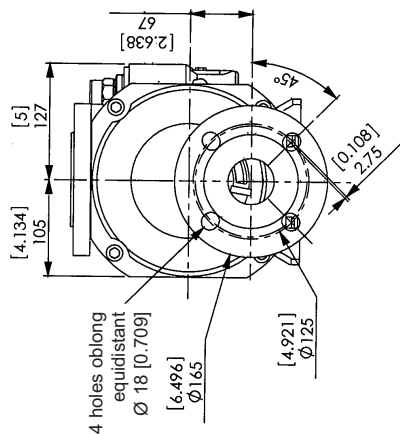
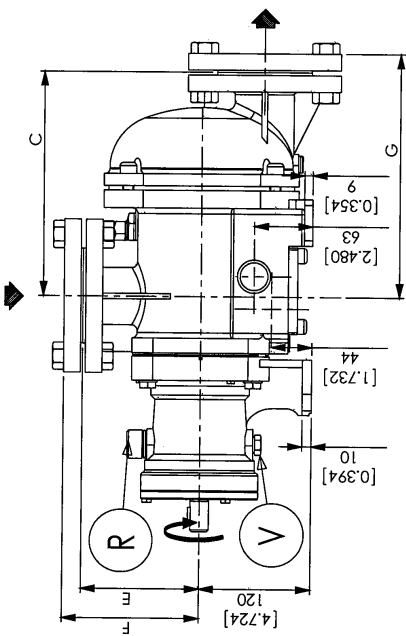
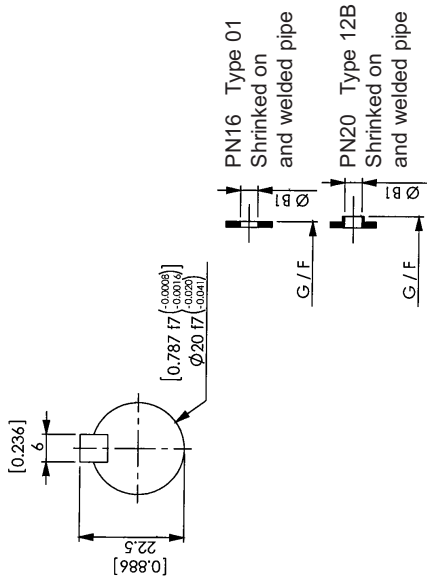
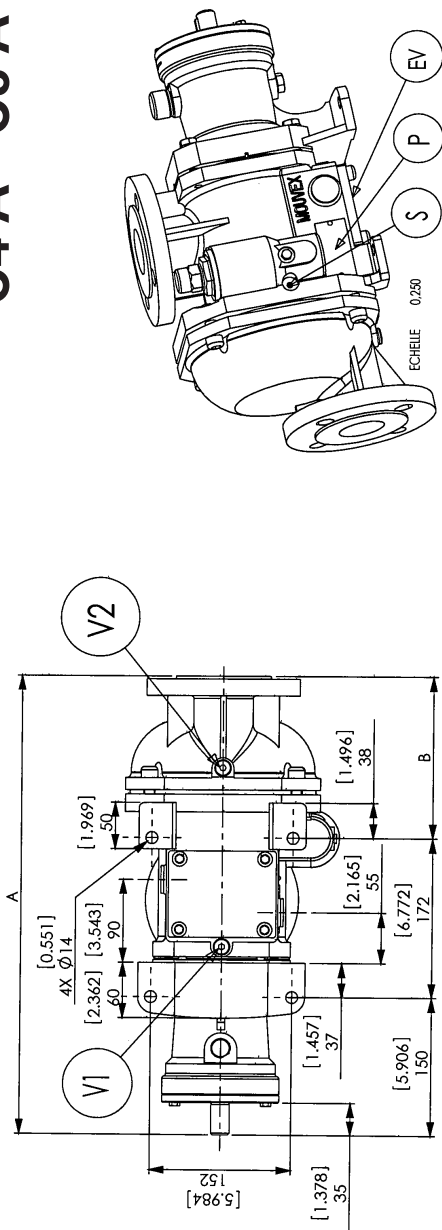
NOTICE

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

1. OVERALL DIMENSIONS

C4 A - C8 A

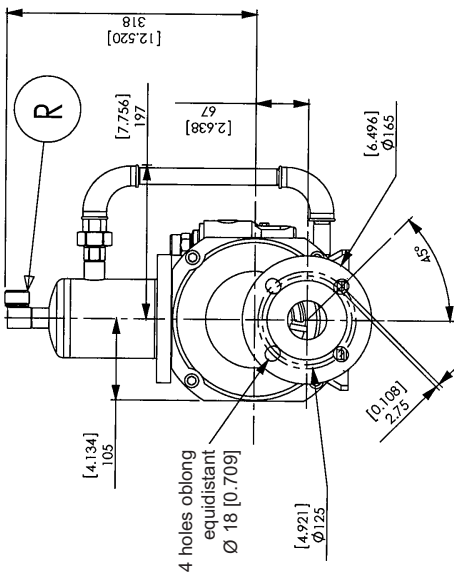
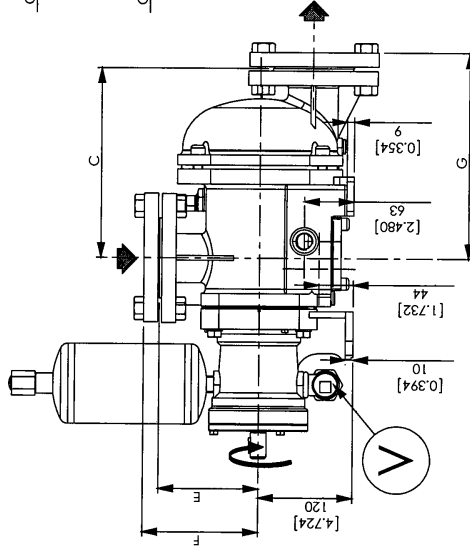
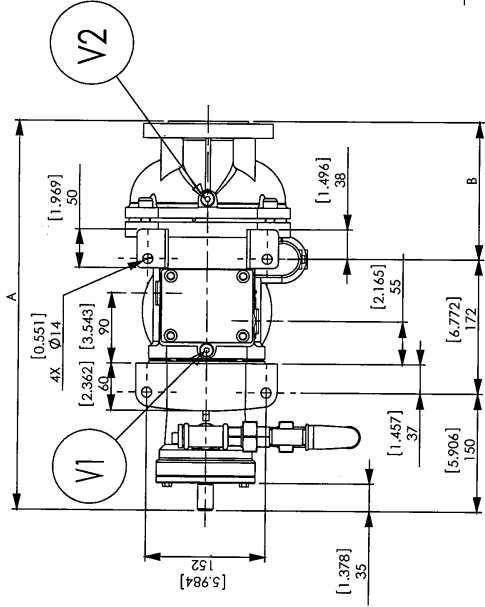
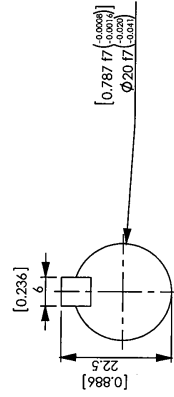
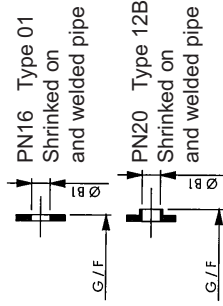
| | |
|-----------|--|
| P | Pump plate |
| R | Filling / Breather |
| V | Draining of transmission |
| V1 | Draining of main body 1/4" BSP (option) |
| V2 | Draining of front cover 1/4" BSP (option) position 4 only |
| EV | Jacket (variant) |
| S | Mounting point for probe : M6 - threaded width : max. 8 mm. |



| | | Flanges | | | | | | | | | | | | |
|----------------------|---------|----------|---------|----------|-----|---------|----------|----------------|-------|--|--|--|----------------|-------|
| DN | A | B | C | E | F | G | ØB1 | Weight kg [lb] | | | | | Weight kg [lb] | |
| PN16 (ISO 7005-1) | 50 | 497 | 175 | 242 | 127 | 147 | 262 | 61,5 | 43 | | | | | 43 |
| | [1,969] | [19,567] | [6,89] | [9,528] | [5] | [5,787] | [10,315] | [2,421] | [95] | | | | | [95] |
| PN20 (ISO 7005-1) | 50 | 514 | 192 | 259 | 127 | 147 | 279 | 61,5 | 45 | | | | | 45 |
| | [1,969] | [20,236] | [7,559] | [10,197] | [5] | [5,787] | [10,984] | [2,421] | [100] | | | | | [100] |
| C4 A | 50 | 497 | 175 | 242 | 127 | 152 | 267 | 62 | 43 | | | | | 43 |
| | [1,969] | [19,567] | [6,89] | [9,528] | [5] | [5,984] | [10,512] | [2,441] | [95] | | | | | [95] |
| C8 A | 50 | 514 | 192 | 259 | 127 | 152 | 284 | 62 | 45 | | | | | 45 |
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1. OVERALL DIMENSIONS (continued)

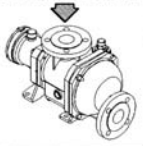
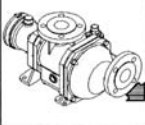
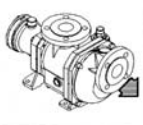

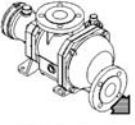
C4 A HT - C8 A HT

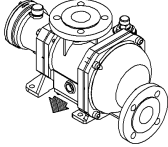
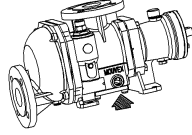
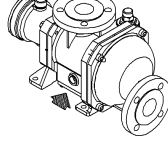
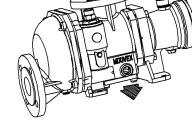


| | |
|-----------|--|
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| R | Filling / Breather |
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| EV | Jacket (variant) |
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| Flanges | | | | | | | | | | | Weight |
|----------------------|---------|----------|---------|----------|-----|---------|----------|---------|-------|--|--------|
| DN | A | B | C | E | F | G | ØB1 | Weight | | | |
| | | | | | | | | kg [lb] | | | |
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| PN20 (ISO 7005-1) | 50 | 497 | 175 | 242 | 127 | 152 | 267 | 62 | 46 | | |
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| | [1,969] | [20,236] | [7,559] | [10,197] | [5] | [5,984] | [11,181] | [2,441] | [106] | | |

2. INSTALLATION

| POSSIBLE POSITIONS | | | | |
|--------------------|---|--|---|---|
| SUCTION | | 2-STANDARD  | | |
| DISCHARGE | 1 | 2 | 3 | 4-STANDARD |
| |  |  |  |  |

| JACKET CONNECTION (variant) 1/2" CYLINDER GAS | |
|--|--|
| LIQUID |   |
| STEAM |   |




2.1 Installation design

2.1.1 Pump

To obtain the service expected from a MOUVEX 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.

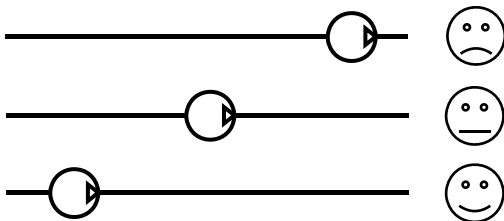
You can contact our Technical Services at any time to ask for the information you require.

2.1.2 Pipe

- Not recommended 
- To be avoided if possible 
- Recommended 

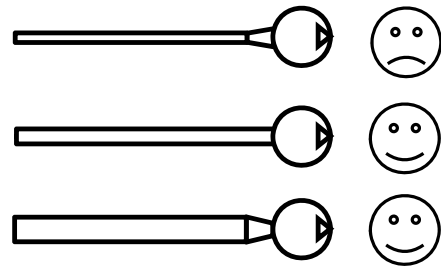
Suction pipe length

Length should be as short as possible.



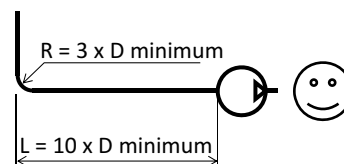
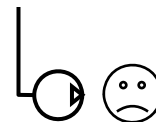
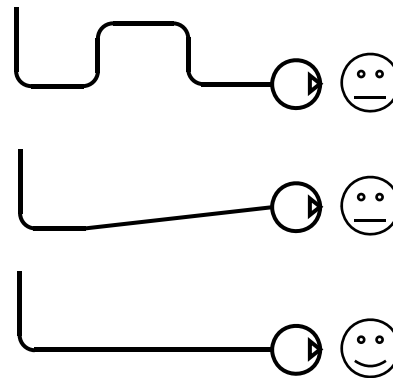
Suction pipe diameter

Diameter must be at least equal to pump port diameter and even more if required by pumping conditions.



Suction pipe configuration

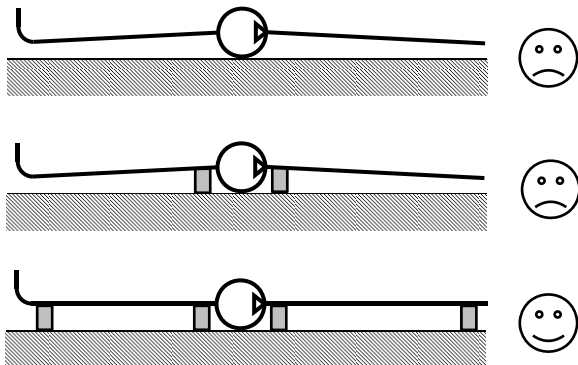
Check tightness to avoid accidental air intake.



2. INSTALLATION (continued)

Pipe alignment and supporting

Pump must not support piping nor endure stress resulting from piping weight or dilatation effects. For latters, expansion loops should be included.

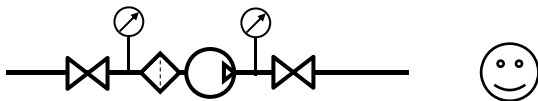


Pipe equipment

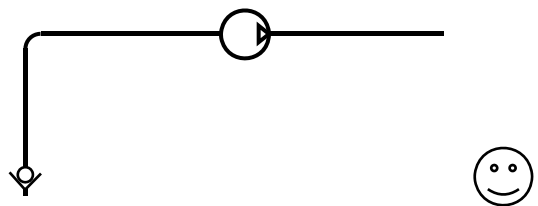
- Place valves close to the pump to avoid draining pipe during maintenance operations. Preferably select full bore ball or butterfly valves.

Pressure connections on pump suction and discharge are recommended for settings and controls.

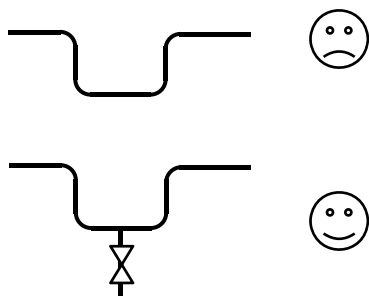
Make sure piping, vessels valves and other installation devices are carefully cleaned before mounting.



- MOUVEX pumps are self priming. However, if line emptying should be avoided and/or if suction lift is high, a foot valve can be added.



- If pumped liquid presents a risk of in pipe solidification and potential dilatation, low points on the pipe should be avoided or equipped with drain valve.



- If installation is heated, it must be designed so that fluid dilatation can evacuate through piping. Therefore fluid contained in piping must be heated before fluid contained in the pump. Also check that a heated pump is not isolated by closed valves.

The C Series pump is a selfpriming volumetric PD pump. Therefore, the pump must not run on a circuit with a closed valve. This is valid both for the suction circuit and for the discharge circuit.

2.2 Orientation of the pump ports

The suction part axis is placed on the top.

The discharge port may be oriented in various positions.

If the port positions needs to be changed at any time, see the corresponding paragraph.

NOTICE

C-Series pumps remains drainable whatever position is chosen for the inlet port, but the outlet port must be at the bottom (position 4) to keep the self-draining capability.

2.3 Direction of rotation

When looking at the shaft, the rotation will be clockwise. When looking at the front cover, the direction of rotation will be anti-clockwise. An arrow situated on the bearing housing indicates the correct direction of rotation.



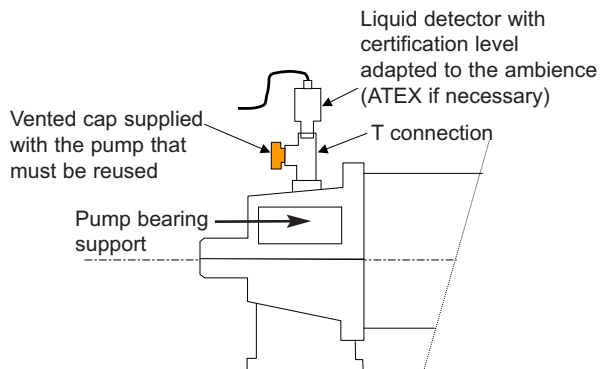
Verification of the correct rotation direction :

Turn the pump the wrong way is not dangerous for the pump.

2. INSTALLATION (continued)

2.4 Protection of the pump installation



- Before any start-up, during operation or complete stopping of the pump, make sure the valves are open.
- During stop periods, with the pump full of product, either the suction or discharge circuit must be left open to enable expansion or contraction of the pumped product through reheating or cooling. If this instruction is not complied with, The bellows may be damaged and lead to premate failure.
- In case of flodded suction, it is possible to install a liquid detector in the place of the transmission breather.







- The bearing must be ventilate at all times, therefore the breather mounted on the bearing must be re-used. Never put the plug on.
- This detector will enable the user to be informed in the case of failure of the bellows. In the case of detection, the installer must make sure the pump is stopped and the isolating valves are closed. Non compliance with this instruction can lead to the pumped product being spilt outside the pump.
- The stop time may lead to cooling of the product in the pump and therefore to an increase in viscosity. If this is the case, we recommend re-starting the pump at a speed adapted to this new viscosity (starting pump). Once the product arrives in the pump at the installation definition temperature, the pump may run at the speed specified for this application.
- Protection against excess pressure :

The pump must be protected against excess pressure. It can be delivered with a pressure switch to carry out this function.

If protection is provided by a control valve, check that the system does not generate excess pressure at the bellows (particularly if there are water hammers). Operating in this way would damage the bellows and shorten their lifetime.

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

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

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

- Protection against foreign bodies :

The pump and the installation must also be protected against any risk of damage through the passage of foreign bodies by mounting a pre-filter at the pump suction.

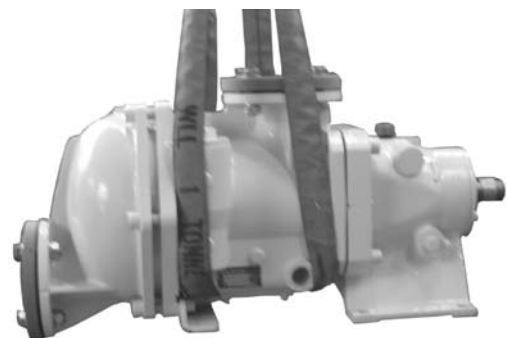
In the case of foreseeable clogging of the pre-filter, we recommend using a vacuum switch to inform the user of pre-filter clogging. Prolonged running under cavitation may damage the pump.

The largest dimensions of the allowable particles in the pump are :

- Soft particles :6,5 mm
- Hard particles :2,0 mm

2.5 Hoisting devices

Hoisting points :







2. INSTALLATION (continued)

2.6 Unit Assembly

The following instructions apply to pumps delivered with a bare shaft or for MOUVEX motor-driven pump units (if the latter have no specific instruction notice).

2.6.1 INSTALLATION OF UNITS

| | |
|---|---|
|  | 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. | |

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

The base below the unit is fundamental to ensuring correct operation and long service life.

The unit's base must be flat, level and sufficiently resistant to absorb the stresses caused by the motor-driven pump unit without deformation (if it is made of concrete, it must comply with the BAEL 91 standard).



If the unit is fastened using securing lugs or bolts, it must be carefully wedged to avoid deforming the frame while the bolts are tightened. A deformed frame would apply damaging stresses on the pump and the drive mechanism and misalign the coupling, causing vibrations, noise and premature wear. Ensure that the frame is well above the floor, except from the support plates.



If the unit is to be used in a food environment, support plates that allow the unit to be lifted for easier cleaning are recommended.

Allow, if possible, a clear space of approximately 50 cm on each side of the motor-driven pump unit (overall dimensions) to facilitate cleaning and give access if necessary to the pump, reduction gear and motor fastening nuts. In all cases, the dimensions around the motor-driven pump unit must be designed to give the space required for dismantling the pump (if the need arises, use the values given on the overall dimension drawing).

For staff and equipment protection, the frame includes a ground connection point that should be used.

2.6.2 ALIGNMENT OF THE MOTOR/PUMP OR REDUCTION GEAR/PUMP SHAFTS

| | |
|--|--|
|  | 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. | |

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

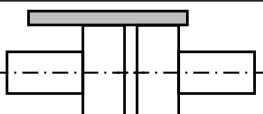
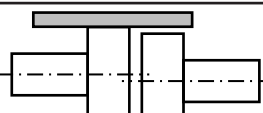
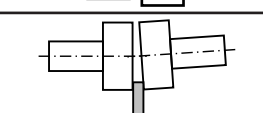
NEVER START A UNIT IF THE COUPLING ALIGNMENT IS INCORRECT. THIS IS A CONDITION OF OUR GUARANTEE.

REMINDER :

Coupling must never be used to compensate for a misalignment.

To control the alignment between the coupling and the shaft, use a straight-edge for concentricity and thickness gauges for angular misalignment (see instructions of the coupling for authorised values).

The 3 figures below show in detail the operation and the possible defects :

| | |
|--|---------------|
| Carry out the control at four points : at the top - at the bottom - left - right | |
|  | Correct |
|  | Bad alignment |
|  | Angular fault |

2. INSTALLATION (continued)



Controlling the alignment at each stage of the installation is important to be sure that none of these stages have 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.

Where the pumps are supplied assembled as a unit, the motor and pump shafts have been perfectly aligned in the factory before delivery, but they must be systematically controlled on acceptance at the site and realigned if necessary.

To do this, do not modify the wedging of the various parts, but check the flatness of the support surface and use the adjustable foot to clear the frame of stresses that could affect it.

2.6.3 ELECTIC MOTORS



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

Check the compatibility of the instructions on the motor with the supply voltage.

Follow the wiring diagram, use wiring that is appropriate for the power and be particularly careful about the contacts which must be well tightened.

The motors should be protected with circuit breakers and suitable fuses. Connect the regulatory electrical grounding.



2.6.4 THERMIC MOTORS



| | |
|--|--|
|  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 motors are not reversible. It is absolutely necessary to carefully control the suction and discharge sides of the pump before connecting the group to the piping.

Using electric motors is very common now; however, we strongly advise careful reading of the accompanying instruction manual.

2.6.5 CONTROL OF THE SENSE OF ROTATION

| | |
|---|--|
|  WARNING | |
|  | |
| Any unforeseen start-up can cause serious injuries or important | |
| 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. | |
| IT IS IMPERATIVE THAT THE HYDRAULIC PRESSURE IS RELEASED BEFORE EACH MAINTENANCE OPERATION TO AVOID PERSONAL INJURY OR MATERIAL 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 control needs to be done with no liquid pumped through the pump, and both the suction and discharge circuits venting to avoid generating unexpected pressure (at the suction side, for example). This will ensure that the control will not damage either the pump or the installation.

Start the pump empty to check that the connections are good and that the direction of rotation corresponds to the suction and discharge direction on the installation. 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.

3. UTILISATION

3.1 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
- discharge pressure :
 - C4 : 9 bar (130,50 psi)
 - C8 : 5 bar (72,50 psi)
- speed of rotation 750 rpm
- product viscosity of 1 cSt

The sound level reached for the C4 / C8 pump in good conditions without the drive is less than 79 dB(A).

3.2 Commissioning

Make sure that the circuit valves are open before starting the pump.

To avoid any risk of polluting the product to be pumped, rinse the whole installation before starting-up so as to eliminate any contaminants that may remain in the piping, tanks etc. at the time of installation.

| |
|---|
| For any pure water pumping during process or cleaning operations, consult Mouvex imperatively. |
|---|

3.3 Dry running

The C series pump is self priming and is capable of emptying the pipes. To do this, it can run dry for a maximum duration of 5 minutes.

3.4 Pump stop

So as not to damage the pump, make sure that the pump is completely stopped before closing the valves.

3.5 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. MAINTENANCE



4.1 Necessary tools



- Hexagonal socket wrench no. 6-8-10
- Socket wrench 16
- 10-14-18-19-24-26-38 Open-end spanner
- Monkey spanner (opening 50 mm)
- Hub puller
- Mallet



Tightened torques :



- M10 : 30 Nm
- M12 : 50 Nm
- M18 : 120 Nm



5. OPENING OF THE PUMP



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

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

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

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

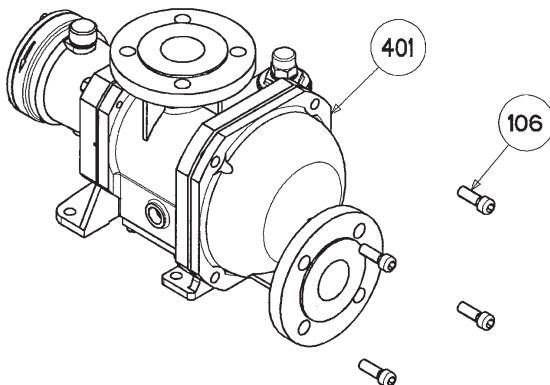
| | | |
|--|----------------|---|
|  | WARNING | |
|  | | |
| <p>The weight of the parts can be dangerous and may provoke bodily injuries or material damages.</p> | | <p>BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.</p> |

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

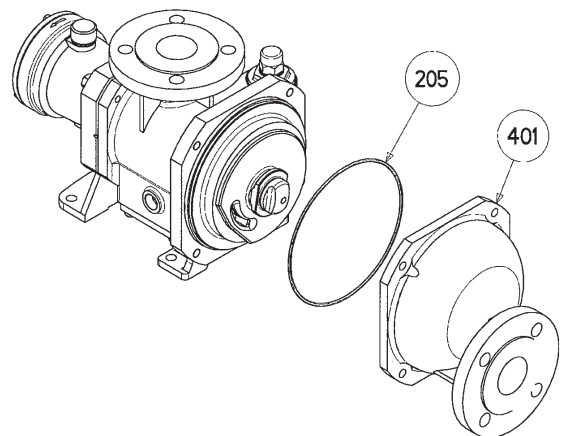
5.1 Assembly / Dismantling

Before any dismantling, make sure that the pump has been drained and take the necessary measures to avoid starting-up. No start-up, even accidental, must be allowed.

- Disconnect the pump from the discharge pipe.
- Unscrew the 4 screws **106**.
- Remove the front cover **401**



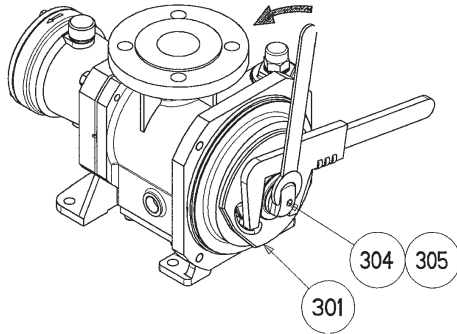
- Remove the front cover **401** with its seal **205**.



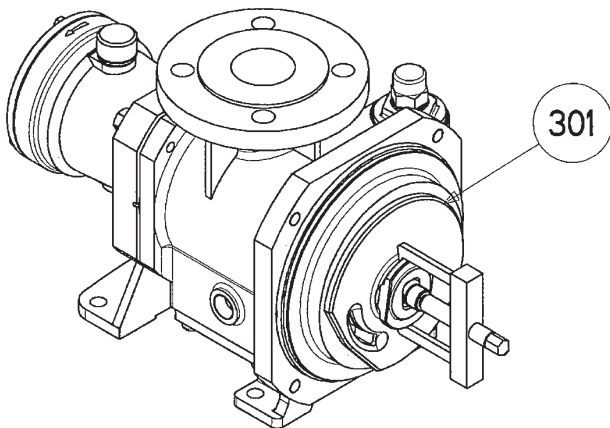
5. OPENING OF THE PUMP (continued)

- Hold the piston **301** with a monkey wrench (opening 50 mm) and unscrew the nut **304** and its seal **305**.

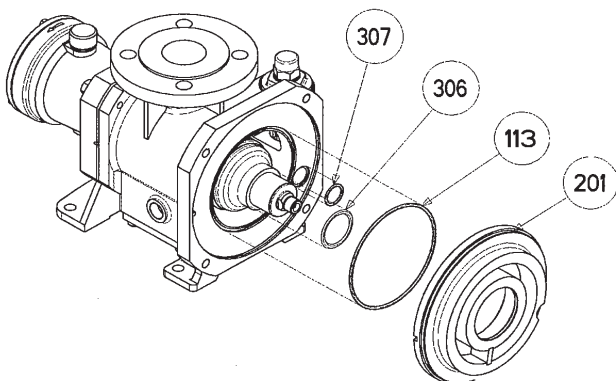
It is important to keep a good grip on the piston, its rotation could lead to deterioration of the bellows.



- With the help of a hub puller, extract the piston **301**.



- Remove the cylinder **201** and the seals **113**, **306** and **307**.



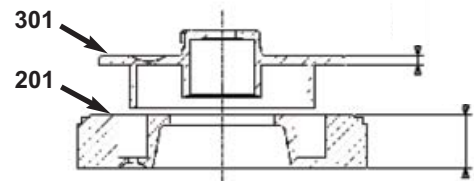
5.2 Checking of parts

The piston **301** and the cylinder **201** are active parts (wear parts) on which the pump's efficiency directly depends. It is therefore advisable to regularly check the pump's efficiency and replace the cylinder / piston if it decreases.

In addition, as using a cylinder / piston that is too worn may damage the pump's transmission system, it is advisable to replace the cylinder / piston if the maximum acceptable wear dimensions defined in the table below are reached.

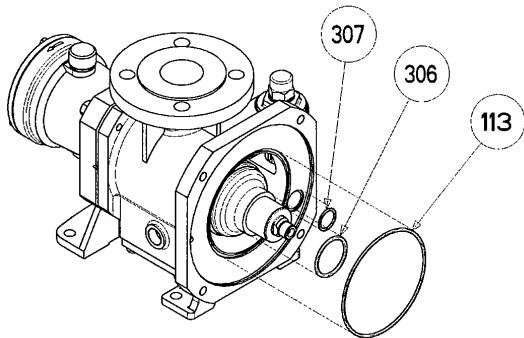
| | | Piston 301 mm (inch) | Cylinder 201 mm (inch) |
|----|-----------------------------------|-----------------------------------|-------------------------------------|
| C4 | New dimension | 7 (0,276) | 32 (1,260) |
| | Minimum wear dimension acceptable | 5 (0,197) | 30 (1,181) |
| C8 | New dimension | 7 (0,276) | 49 (1,929) |
| | Minimum wear dimension acceptable | 5 (0,197) | 47 (1,850) |

As changes in the pump's efficiency depend on the conditions of use (pressure, rotation speed, liquid pumped, etc.), MOUVEX recommends that users define the monitoring ranges and the preventive maintenance schedule according to their own experience.

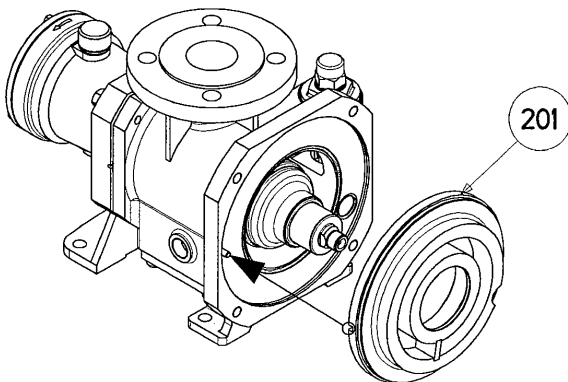


6. REASSEMBLY OF CYLINDER/PISTON

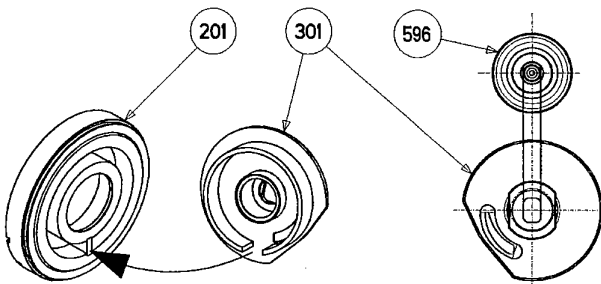
- Check the state of the seals **306**, **307** and **113**, replace them if necessary.
- Position the seals **113** and **307** on the main body and the seal **306** on the hub.





- Position the cylinder **201** such that the locating pin fits **101** into the notch of the back of the cylinder.



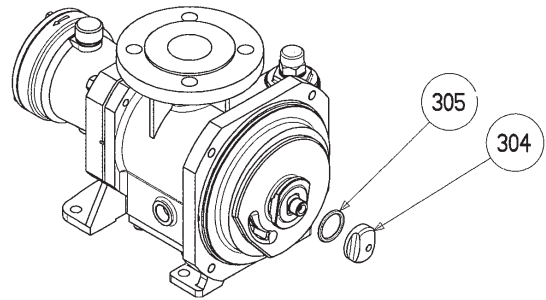
- Engage the piston **301** on the transmission hub **596**, the gap of the piston facing the cylinder partition **201**.



- Give a small push to the piston to centre it and engage it in the cylinder, then push it tight to the end while ensuring the oblong hole of the piston is engaged on the 2 flats of the end of the transmission hub **596**.

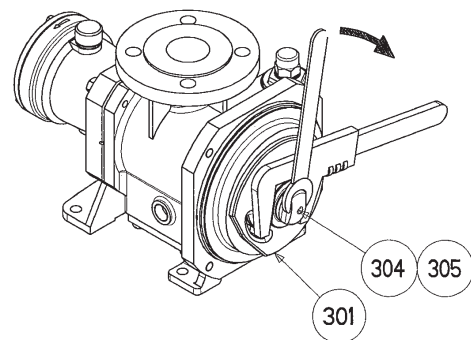
| | |
|--|---|
|  | WARNING |
|  | BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED. |
| <p>The weight of the parts can be dangerous and may provoke bodily injuries or material damages.</p> | |

- Check the state of the seal **305**, replace it if necessary.

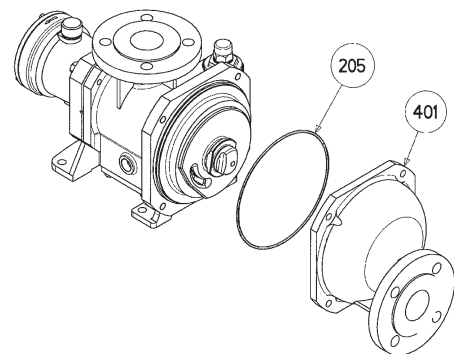


- Place thread locking adhesive (Loctite® 243* or equivalent) on the thread of the transmission hub **596**.
- Hold the piston **301** with a monkey wrench (opening 50 mm) and screw the nut **304** after first fitting the seal **305**.

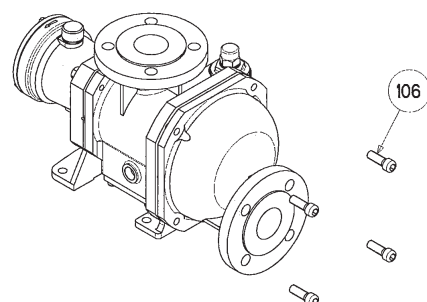
It is important to keep a good grip on the piston, its rotation could lead to deterioration of the bellows. When tightening the nut, comply with the assembly torque of 120 Nm.



- Check the state of the seal **205**, replace it if necessary.





- Re-mount the front cover **401** while positioning the outlet port desired, with its seal **205**.
- Screw the 4 screws **106** (4 x M12 assembly torque 50 Nm).



* Loctite® is a registered trademark.

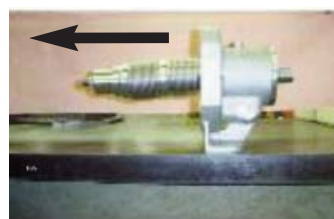
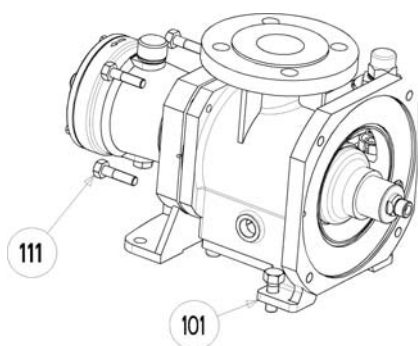
7. PROTECTION OF THE BELLOWS

| | |
|--|---|
|  WARNING | BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED. |
|  | |
| <p>The weight of the parts can be dangerous and may provoke bodily injuries or material damages.</p> | |

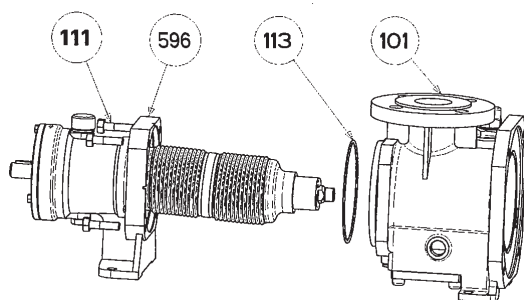
The spare transmissions delivered are equipped with a tubular foam protection. We advise leaving this protection around the bellows until remounting of the piston and cylinder.

| | |
|---|---|
|  | DO NOT FORGET TO REMOVE THE PROTECTION BEFORE MOUNTING THE CYLINDER. |
|---|---|

- Dismantle the cylinder/piston couple (see corresponding §).
- Remove the 2 fixing screws from the base frame of the main body **101**.
- On the drive side, remove the 4 screws **111**.





- With the help of a mallet, lightly tap the main body **101** to free it from the transmission **596**.
- Remove the main body **101** while taking care of impact.
- Remove the seal **113** (change it if necessary).
- Inspect the bellows : any impact, scratch or distortion necessitates its replacement.



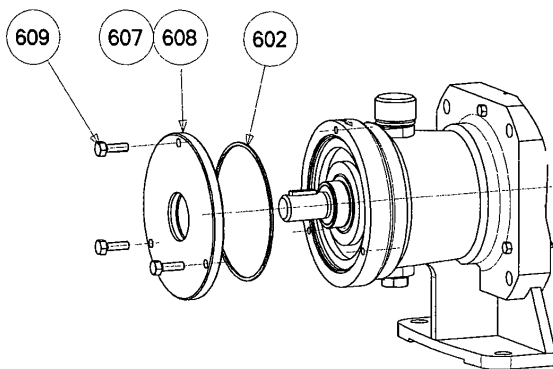
- Assembly is undertaken in the reverse order of dismantling, taking care to correctly position the seal **113** and main body **101**. The screws **111** must be re-mounted with thread locking adhesive (Loctite® 243* or equivalent) : 4 x M10 : Assembly torque 30 Nm.

* Loctite® is a registered trademark.


8. CHANGING THE LIP SEALS

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

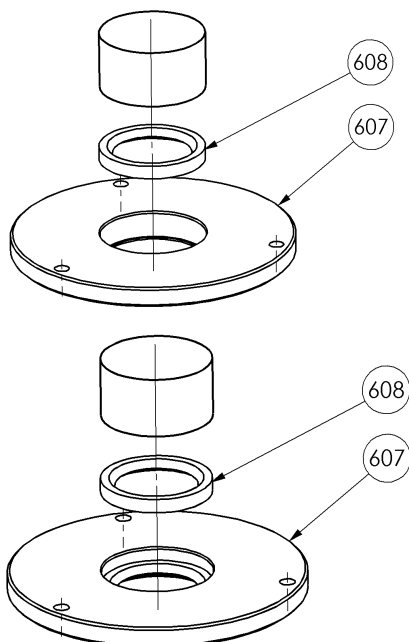
- Drain the pump bearing (see corresponding §).
- Unscrew the 3 screws **609**.
- Remove the cover **607** with its lip seals **608** and the seal **602**.



- Extract the 2 lip seals **608**, grease the lips of the seals and grease between the 2 seals **608**.

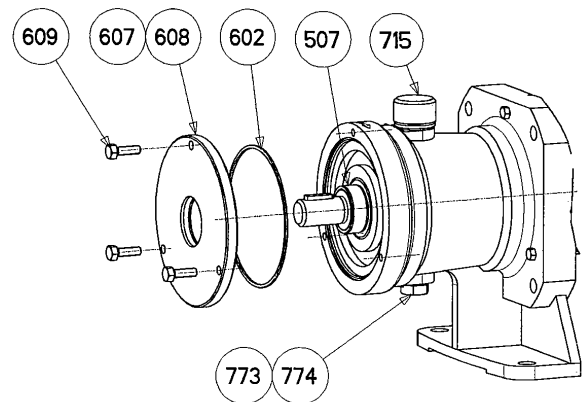
| | |
|---|---|
|  | <p>FOOD SYNTHETIC GREASE : Compulsory reference because compatible with the standard MOUVEX bearing oil.</p> |
|---|---|

- Fit, one by one, 2 new seals **608**, on the same side, lip directed towards the interior of the transmission.

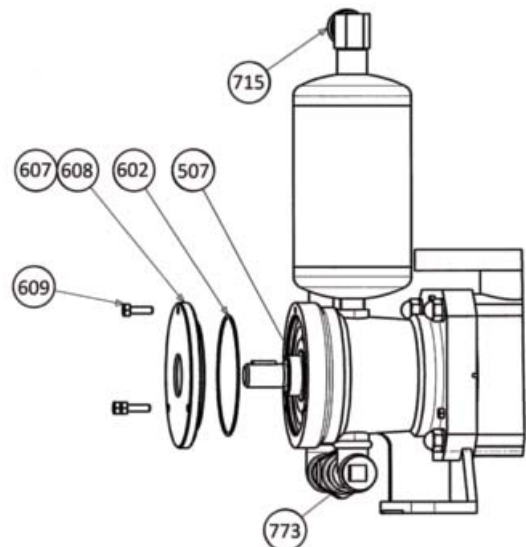


- If the seal face is marked, change the ring **507**. Break the ring with a chisel then fit a new ring after heating it at 95°C (in an oil bath or at HF).
- Re-mount the cover **607** with the 3 screws **609** after placing the seal **602**.
- After replacing the drain plug **773** with its lip seal **774**, fill the bearing with :
 - 0,7 litre of oil (C4 A - C8 A)*.
 - 2 litres of oil (C4 A HT - C8 A HT)*.
 See § DRAINING OF BEARING.
- Screw back the breather **715**.

C4 A - C8 A





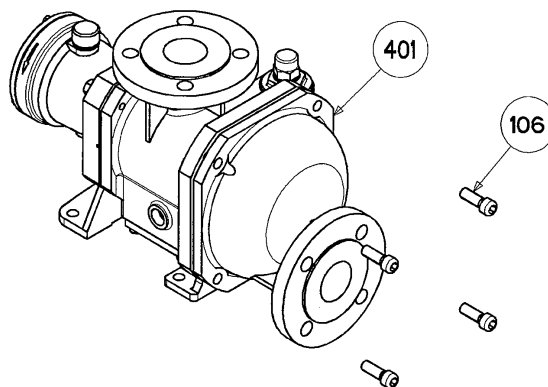
C4 A HT - C8 A HT



- * **Standard oils provided by MOUVEX** (Safety data sheet is supplied on inquiry) :
 - CS05 Food synthetic oil
 - CS23 Silicone free oil for transmission
- * **Other oil provided by customer.**

9. CHANGING THE ORIENTATION OF THE DISCHARGE PORT

| | |
|--|---|
|  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. | |

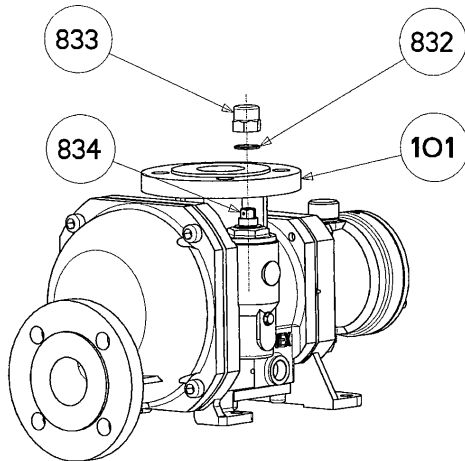


- Unscrew the 4 screws **106**.
- Turn the front cover **401** so as to position the outlet port in the desired position.
- Replace the 4 screws **106** (6 x M12 : assembly torque 50 Nm).

10. BYPASS

10.1 Bypass adjustment

- Remove the plug **833** as well as the seal **832**.
- Using a flat spanner, turn nut **834** clockwise to obtain a greater pressure (tightening of the spring) or counter-clockwise to obtain a lower pressure (loosening of the spring).
- Refit plug **833** and its seal **832**.



| Spring | Adjustment range (bar) | C4 | C8 |
|--------|------------------------|----|----|
| C 2,5 | 1,5 - 2,5 | X | X |
| C 3,5 | 2,1 - 3,5 | X | X |
| C 5 | 3 - 5 | | X |
| C 8 | 3 - 8 | X | X |

10.2 Changing the spring

| | |
|--|---|
| | WARNING |
| | FAILURE TO RELIEVE SYSTEM PRESSURE PRIOR TO PERFORMING PUMP SERVICE OR MAINTENANCE CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. |
| Hazardous pressure can cause personal injury or property damage. | |

- Loosen the spring (see § BYPASS ADJUSTMENT).
- Loosen the pressure screw nut **828** of main body **101** taking care to the thrust produced by spring **804** (do not remove any associated parts).
- Remove the spring **804**.
- Replace spring **804** and carry out reassembly in reverse order of disassembly.

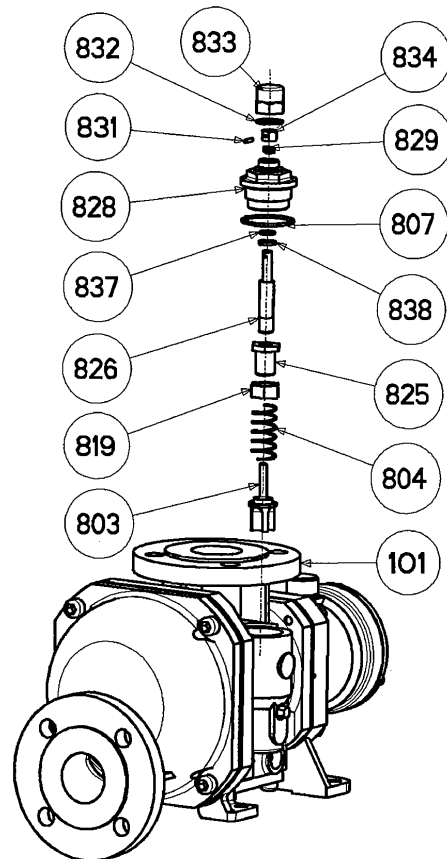
10.3 Replacement of the seals

| | |
|--|---|
| | WARNING |
| | FAILURE TO RELIEVE SYSTEM PRESSURE PRIOR TO PERFORMING PUMP SERVICE OR MAINTENANCE CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. |
| Hazardous pressure can cause personal injury or property damage. | |

- Loosen the spring (see § BYPASS ADJUSTMENT).
- Loosen the pressure screw nut **828** of main body **101** taking care to the thrust produced by spring **804**.
- Block the unit comprising the pressure screw nut **828** in a vice.
- Using a pin drift, remove pin **831**.
- Remove the nut **834**.
- Remove the screw **826**, the spring **829**, the seal **837** and the washer **838**.
- Replace seals and reinstall in reverse order of disassembly.

NOTICE :



When assembling seal **837**, we recommend covering the pin hole on shaft **826** with adhesive tape to avoid damaging the seal.



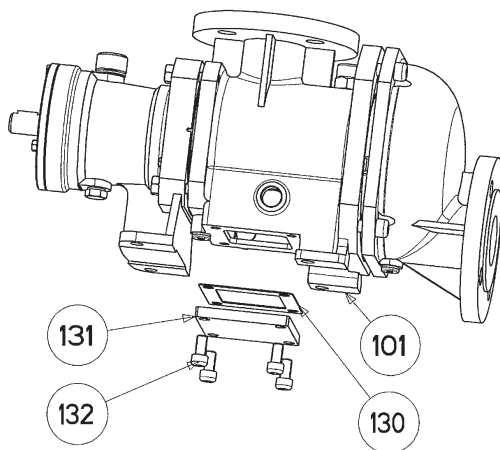
11. HEATING JACKET (option)

11.1 Replacement of the jacket seal

Before carrying out any work, make sure that no fluid flows in the casing (heating / cooling circuit valve closed) and that the pump is at ambient temperature.

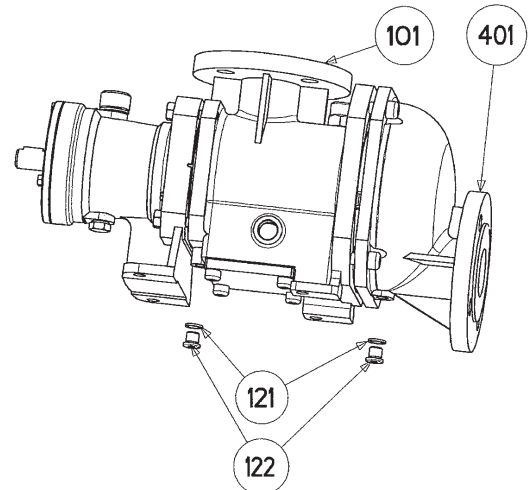
| | |
|---|---|
|  | WARNING |
|  | DISCONNECTING THE FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE. |
| Hazardous pressure can cause personal injury or property damage. | |

- Remove the 4 screws **132** from the main body **101** as well as the main body plate **131** and the seal **130**.
- Reassembly is in reverse order of disassembly.







11.2 Bleed (included with jacket option)

- A bleed is provided on the main body **101** and the front cover **401** (only in position 2 or 4 for the front cover - see board "Possible positions" § INSTALLATION).
- Using an Allen key, unscrew the screws **122**.
- Check the state of the seal **121**, replace it if necessary.
- Reassembly is in reverse order of disassembly.



12. DRAINING OF BEARING

| | |
|---|---|
|  | CAUTION |
|  | <p>THE SURFACES OF THE PUMP AND OIL TRANSMISSION CAN BE AT A TEMPERATURE LIABLE TO CAUSE INJURY OR SEVERE DAMAGE.</p> |
| <p>Excessive temperature- can cause injury or severe damage.</p> | |

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

- Drain the transmission following the board below :

- Data with **MOVEX Standard oil CS05*** :

| Temperature of product pumped / heating product | Draining interval (running hours) |
|---|-----------------------------------|
| 150 °C < T ≤ 160 °C | 800 |
| 135 °C < T ≤ 150 °C | 1 500 |
| 120 °C < T ≤ 135 °C | 3 000 |
| 100 °C < T ≤ 120 °C | 6 000 |
| 80 °C < T ≤ 100 °C | 12 000 |
| T ≤ 80 °C | 24 000 |

- Data with **MOVEX Silicone free oil CS23*** :

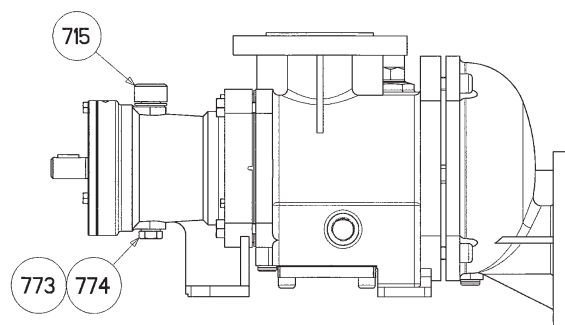
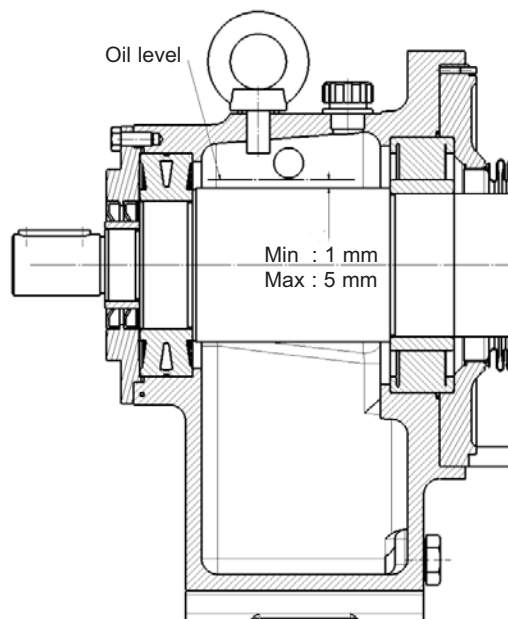
| Temperature of product pumped / heating product | Draining interval (running hours) |
|---|-----------------------------------|
| T < 100 °C | 5 000 |

- Data with **other customer oil** : the drawing interval is defined by the customer (tests results) regarding the oil specifications and the pump conditions.

- Drain the pump by removing the drain plug with its seal **773-774** and the breather **715**.
- Replace the drain plug and its seal.

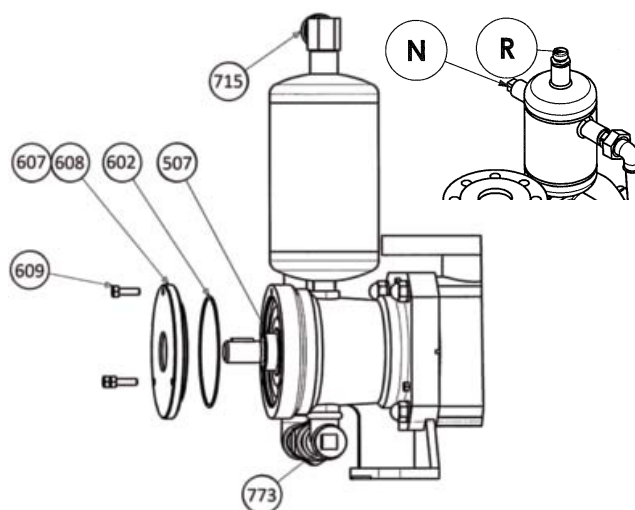
C4 A - C8 A :

- Fill the transmission with 0,7 litre of oil*.
- Check oil level that the level is between 1 and 5 mm above the shaft.
- Screw back the breather **715**.



C4 A HT - C8 A HT :

- Fill the transmission with 2 litres of oil*.
- Check that oil level reaches plug **N**.
- Screw back the breather **715**.



* **Standard oils provided by MOVEX** (Safety data sheet is supplied on inquiry) :



CS05 Food synthetic oil
CS23 Silicone free oil for transmission

* **Other oil provided by customer.**

13. STORAGE

If necessary, refer to § MAINTENANCE for pump disassembly.

13.1 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.
- pump is stored in an area sheltered from bad weather and sun.

13.2 Long duration (> 1 month)

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 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.

If storage was made after a period of operation, the transmission oil must be replaced before storage (see § DRAINING).

The transmission will be filled with oil at breather level (see § DRAINING).

If pump storage lasted more than one year, the oil should be replaced in time to prevent an excessive degradation of its qualities.

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.

The pump should be turned a few revolutions manually every two months.

13.3 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.

If the storage duration has exceeded one year, replace the oil transmission (see § DRAINING for removal instructions).

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

In all cases, the oil should be replaced after more than two years after its commissioning.

14. TROUBLESHOOTING

| ZERO OR INSUFFICIENT FLOW | | |
|----------------------------------|-------|--|
| 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, sliding belt, 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. |
| | 1-3 | 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 | The pump is worn, this will also affect the suction capacity of the pump (cf 3-2-2 b). |
| 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 metres WC (0.6 to 0.7 bara i.e. about 45 or 50 cm of mercury), this can result in pump noise. The cause could be : |
| | 3-1-1 | a. the suction lift is too high (reduce it by taking the pump down closer to the level of the liquid). b. the dynamic suction losses are too high : 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 liquid vapour pressure is too high (or has become too high following, for example, a change of temperature). 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 metres WC (i.e. about 20 cm of mercury), check for leaks on the inlet pipe, 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 with the isolating valve closed on suction line, e.g. higher than or equal to 6 or 7 metres WC (i.e. about 45 to 50 cm of mercury), the pump is not the cause : a. there must be an air inlet upstream of the pump isolating valve. b. the liquid vapour pressure is or has become too elevated due to a change of temperature (cf 3-1-3). |
| | 3-2-2 | If the vacuum is low or non-existent, the reason could be : a. air is entering the pump (check the front cover seals, flanges, etc...) b. the pump is worn and the internal tightness is out of specification (the piston bushings are worn, worn piston and cylinder, broken piston wear compensation springs, worn partition, broken shaft). |

14. TROUBLESHOOTING (continued)

| ABNORMAL HEATING OF BEARINGS | | |
|-------------------------------------|-----|--|
| 4 | | This heating can be caused by : |
| | 4-1 | - excessive tension in the transmission (belt or chain) on the pump shaft. |
| | 4-2 | - 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). |
| | 4-3 | - poor alignment of the pump - due for example to 4-2 (the pump is partially or totally uncoupled, the pump shaft and drive shaft are not aligned with each other). |
| | 4-4 | - 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). |
| ABNORMAL NOISES | | |
| | | These noises can be caused by hydraulic and mechanical sources. They can be distinguished by the fact that only the former disappear (or at least lessen) when air is allowed into the inlet pipe. |
| 5 | | HYDRAULIC NOISES |
| | | These noises can come from insufficient product being supplied to the pump, or : |
| | 5-1 | - 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.). |
| | 5-2 | - that 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., |
| | 5-3 | - an increase of the vapour pressure with a rise of temperature. |
| 6 | | MECHANICAL NOISES |
| | | These can stem from : |
| | 6-1 | - abnormal stress on the pump : the transmission is pulling on the shaft, pulling on the flanges by the piping. |
| | 6-2 | - a broken part or foreign body has entered the pump. |
| EXCESS POWER CONSUMPTION | | |
| 7 | | The most spectacular event occurs when the power to an electric motor is shut off. |
| | 7-1 | If this incident occurs when closing the discharge line, the cause may be the motor protection is adjusted too low or wrong circuit breaker have been fitted. |
| | 7-2 | 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. head losses higher than expected - following higher viscosity or specific gravity than planned initially (in this case, the discharge pressure is higher than that planned. The pressure can be reduced by loosening the relief valve adjustment screw - the flow is decreased). c. excessive speed of rotation. d. a fault of the equipment (faulty alignment, deformation of the chassis, stress exerted by the piping on the flanges, seizing, etc.). |
| | | Excessive consumption of electricity can also be due to a poor motor connection (e.g. a 3 phase 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 : _____ (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 : _____
Für die Fa Mouvex sas - Datum : _____

Responsible Quality Clients
Customer Quality Manager / Qualitätsbeauftragter

- Configuration : _____
Konfiguration
- Type / Geräteart :
- Pompe à mvt excentré (Eccentric Disc Pump / Ringkolbenpumpe)
 - Pompe péristaltique (Peristaltic Pump / Schlauchpumpe)
 - Pompe centrifuge (Centrifugal Pump / Kreiselpumpe)
 - Compresseur à Vis (Screws compressor / Schraubenverdichter)
 - Compresseur à palettes (Vaness compressor / Flügelzellenverdichter)
 - Refroidisseur Hydraulique (Hydraulic oil cooler / Hydraulikkühler)
- Pompe / Compresseur arbre nu (Pump / Compressor « bare-shaft »)
- Groupe de pompage / de compression (Pumping Unit / Compressor Unit)
- Pompe à lobes (Lobes Pump / Drehkolbenpumpe)
- Pompe à palettes (Vaness Pump / Flügelzellenpumpe)
- Autre pompe (Other Pump / Andere Pumpe)

Est conforme aux dispositions suivantes :

- Directive « MACHINES » 2006/42/CE et aux législations nationales (à transposer, 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:

- „Machines-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 Anwendungsbedingungen 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.