



# someflu

Corrosion resistant centrifugal pumps

## *Operating instructions*

**These operating instructions must be handed over to the end user.**



**Ranges HMP-TS, HMP-N, HMP-S, HMP-DE, HMP-H, HMP-A**

**Ranges HMP-TS, HMP-N, HMP-S, HMP-DE, HMP-H, HMP-A** 

# Operating instructions

## Plastic block assembly pumps HMP-TS, HMP-N, HMP-S, HMP-DE, HMP-H, HMP-A.

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| Revision | Date       | Made by | Modification |
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## 1) SECURITY INSTRUCTIONS

**This document must be read imperatively by all persons involved in the operation of the concerned material, that means the pumps HMP-TS, HMP-N, HMP-S, HMP-DE, HMP-H and HMP-A (called HMP-TS/-N/-S/-DE/-H/-A).**

This manual contains important information for the fitter and the operator for reliable and efficient operation, repair and maintenance of the pump. It is imperative to comply with the operating instructions of the electrical motor. More, it completes the recommendations of the standards NF E44-190, E44-203, NF-E44-204 and NF CR 13932. However, our specialists are at your disposal if any question about the different treated points remains.

For a better understanding of this manual, use the enclosed sectional drawings of the pump and the mechanical seal.

Our warranty is subject to the respect of the instructions of this manual. It must always be kept close to the location of operation of the pump for easy access.

These operating instructions do not take into account local regulations and general directives defined by laws and compulsory rules for prevention of accidents and environmental control. Therefore, all personal involved in the installation of the pumping material must be qualified accordingly. The applicable safety instructions concerning the marking and handling of chemical products must also be observed.

Any modification of the process (pipelines, handled liquid...) must be authorized by the manufacturer.

The warranty relating to the operation reliability and safety of the pump/unit by SOMEFLU is only valid if the machine is used in accordance with its designated use described in the order specifications.

### Warnings and signs used in this manual.

#### CAUTION !

This sign outlines the security measures to respect to avoid the **deterioration of the machine**.



This sign outlines the security measures to respect to avoid **damages to persons**.



This sign outlines the measures to respect to ensure the **compliance of your machine with the ATEX Directive** and the **required degree of protection**.



This sign outlines the measures to respect to ensure **environmental respect**.

## 2) DESCRIPTION OF THE CENTRIFUGAL PUMP

The centrifugal pumps HMP-TS/-N/-S/-DE/-H are single stage, non-self priming, horizontal pumps ((HMP-A is equipped with an integrated priming volute), specially designed for the pumping of corrosive liquids.

The hydraulic and mechanical parts are realized in such a way that they ensure with a maximum of reliability one of the main duties of our pumps, namely the **corrosion resistance**.

### 2.1 Hydraulic part

(Part-Nr. 102, 130 et 230)

The complete hydraulic part in contact with the pumped liquid is made of thermoplastic material with a perfect chemical resistance. As the mechanical resistance of this type of material is relatively weak, it is necessary to protect it against external stresses and too high thermal constraints.



**The plastic components of the pumps are made of conductive materials to meet the requirements of ATEX directive.**

## 2.2 Mechanical part

(Part-Nr. 343)

The mechanical part is made of cast iron, steel or plastics (base plate on request).

## 2.3 Shaft sealing

Considering the aggressiveness of the chemical products the tightening of the pump towards the atmosphere is made on the shaft side by a mechanical seal. This type of sealing ensures, when properly operated a minimum of repair and a maximum of lifetime.



**The pump must never be operated without liquid and with a badly lubricated or cooled mechanical seal, not even for short test. Dry running must be avoided by all means. Dry running will destroy the mechanical seal and the surrounding parts and may cause risks for the personal and the environment. For this reasons make sure that the pump will never un-prime and that the circulation of the flushing or quench liquid (depends of the installed mechanical seal type) will never be interrupted. Make also sure that the calories generated by the pump will be correctly evacuated.**

## 2.4 Driver part

A close-coupled electrical motor drives the pumps HMP-TS/-N/-S/-DE/-H/-A. Pump and motor shafts are rigidly connected.

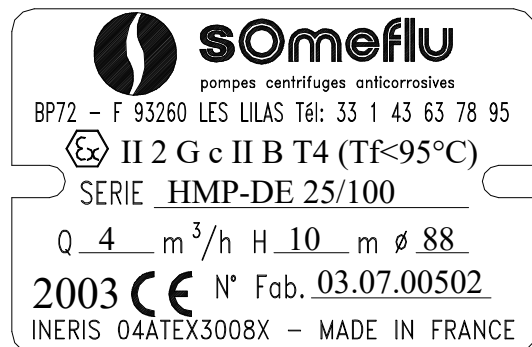
## 2.5 Marking of the pump

2 types of information can figure on your pump, the general information and specific information concerning the Atex directives.

### 2.5.1 General information

On the name plate you will find the following information :

- Name and address of SOMEFLU
- Atex marking, if applicable
- Pump type
- Rated points
- Impeller diameter
- Year of construction
- **CE**
- Serial N° of the pump
- Country of origin



### 2.5.2 Information about the Atex directive

If your pump is intended to operate in explosive atmosphere classified Atex, the SOMEFLU name plate will contain the following additional information :

- **The symbol  signifying that your pump complies with Atex directive 94/9/CE**

- **The group n° in Roman numerals : I or II**

I : mining industry.

II : other industries.

- **The category of your pump : 1, 2 or 3**

1 : for sites where an explosive atmosphere is present continuously.

2 : for sites where an explosive atmosphere is present incidentally.

3 : for sites where an explosive atmosphere is present accidentally.

- **The letter G and/or D**

**G** : for explosive atmospheres caused by gases, vapors or mist

**D** : for explosive atmospheres caused by dust

The double marking **GD** means that your pump can be operated in the two atmospheres.

- **The letter c**

It means that the protective mode is security by construction.

- **II B or II C**

Present when the pump is equipped with a flameproof motor. This marking indicated the subdivision of gas where the pump group can be installed (IIB: propane, IIC: hydrogen, acetylene).

- **The temperature class of your machine : T1, T2, T3, T4, T5, or T6**

The temperature class indicates the maximum allowable surface temperature of the pump. It is given for a room temperature of 40°C but depends primarily on the temperature of the pumped liquid. The correspondence between the temperature class and the temperature of the pumped liquid is given behind the temperature class.

**T1 : 450°C    T2 : 300°C    T3 : 200°C    T4 : 135°C    T5 : 100°C    T6 : 85°C**

- **INERIS number 04ATEX3008X**

Means that your Motor-pump group has been certified by an EC TYPE examination certificate (voluntary certification).

Example of marking :  **II 2 G c II B T4 (Tf≤95°C), T3 (Tf≤160°C)**

Tf is the maximum temperature of the pumped liquid.

### 3) **RECEIPT OF GOODS AND STORAGE**

During receipt and storage of pumps certain rules must be respected.

#### 3.1 **Receipt**

The handling of the pumps must be done accordingly to the instructions of 3.2.

- Before any other operation check the accordance of goods with the delivery note.
- Notify at latest 48 h after receipt all defects due either to transport or to delivery.
- Complaints received later than this cannot be taken in account.

### 3.2 Handling and storage

The lifting eyebolts of the motor must not be used for the transport of the unit. The lifting slings must be placed on the bearing lantern (Part-Nr. 343) or on the motor flange (Part-Nr. 181.2). The installation drawing of the unit gives as well the dimensions as the weights. Handling must taken them into account.

The handling of a pump must be made carefully :

- Do not let it fall down.
- Do not knock it.
- Do not scratch it.

If you do not respect this instructions damages will occur and shorten the service live of your pump (breakage, premature wear, corrosion of metal parts).

The storage too needs some precautions :

- The pump must be protected against splash of aggressive products who may alter the physico-chemical characteristics of the different materials.
- The pump must be stored free of frost with surrounding temperatures between 10°C and 40°C.
- The pump must be stored with a relative humidity of <70%.
- The pump must be stored dust free.
- The pump must be stored sheltered from radiations (radioactive, UV...) who may alter the physico-chemical characteristics of the different materials.

## 4) INSTALLATION

### 4.1 Identification of the pumps

Before starting any installation works you must proceed to the identification of the goods. The serial number and the item number of the pump must be in accordance with the order. Make sure that the equipment you will install fits well with the foreseen duty. For this, check if the site where the pump will be installed is corresponding to the service specified in the order.



**For pumps installed in a Atex zone check also if the markings on the pump are in accordance with the specified zone. The temperature class of your pump is a function of the temperature of the pumped liquid. You must take into consideration all exothermic reactions when you establish the specifications.**



**It is forbidden to add on Atex certified pumps plasticized labels (or labels made of insulating material) which may generate risks due to the static electricity.**

### 4.2 General instructions

Before installing a centrifugal pump worry about a judicious choice and an appropriate installation of the pipelines (Annexes 2 and 4). Wrong calculated sections as well as worse installation of the piping lead to a decrease of the efficiency and possibly to more or less damages of the pump (risk of cavitation...).

The installation of a centrifugal pump must be carried out by a competent and fully qualified personnel.

The observance of the following instructions is absolutely necessary for a proper and reliable operation of the motor/pump unit. The handling of the unit must be carried out accordingly to 3.2.

If the start-up of the pump is effected 2 years (or more) after the delivery, it is imperative to :

- dismantle the mechanical seal and to check the contact faces (clean them and grind them if necessary)
- change all O-rings (for reasons of deformation and ageing)
- change the grease of the bearings

After more than 3 years storage it is imperative to change the motor bearings and all pump gaskets.

## 4.3 Choice and installation of pipelines

### 4.3.1 General rules

Experience has shown that the pipe sections should be sized to obtain a flow velocity of :

- 0.5 to 1.5 m/s on suction side
- 1.0 to 3.0 m/s on discharge side (see Annexe 3).

The nominal diameter of the suction pipe should be at least equal to the nominal diameter of the pumps' suction nozzle. In case of long pipelines the appropriated diameter can be determined by a profitability calculation.

The maximum suction lift of the pump must never be exceeded, to avoid the phenomenon of cavitation and its injurious effects. Under extreme service conditions (high temperature, high vapour pressure) a suction head may be necessary.



**If the pump is installed on a Atex classified site, provide (accordingly to the zone) pipelines corresponding to the applicable directives.**



**The suction and the discharge pipes must be connected to the free earthing conductors (Part-Nr. 020.1, 020.4 and 020.5) foreseen for this duty.**

Singularities (sharp bends ( $R < 3 ND$ ), valves, shut-off devices...) must not be installed near to the pump nozzles. Fittings should, where possible, be mounted in the vertical section of the pipes in order to avoid deposits of scale or sediments. They should be installed, at least, at a distance of 10 ND or 1m (whichever is the greater one) from the pump nozzles. Where possible, sufficient straight sections (about 15 ND) should be foreseen to allow subsequent installation of measuring devices (e.g. flow meter). It is necessary to survey the low and high levels by means of sensors when the pump is sucking in a tank or a sump. This is to avoid all dry running capable to destroy your pump in a very short time.



**Install protective devices (temperature sensors, flow meter...) on the discharge line of the pump as well as anti start-up systems to avoid dangerous operating phases (dry running...).**



**Provide for protection devices in compliance with the external lubrication of the mechanical seal (level switch for lubrication vessel, flow meter for external lubrication) with an signal output to the operator.**

#### ■ **Important :**

- The weight of the pipelines must never be supported by the pump itself. Provide for expansion bellows and pipelines independent from the pump.
- When pumping hot liquids ( $t > 60^{\circ}\text{C}$ ) provide imperatively for expansion compensators.
- Provide for shut-off elements.
- Provide for pressure gauges on suction and discharge side of the pump.
- Clean carefully the pipelines before connection.
- Provide for drain valves between the pump and the shut-off valves.

### 4.3.2 Instructions for the installation of the suction pipe

- Suction lift lines should be laid with a rising slope towards the pump (provide for a self-priming tank) and suction head lines with a downward slope towards the pump. Provide for a straight horizontal section of, at least, 5 times the nominal diameter in order to "calm" the liquid before the pump entry.
- The pipeline must be perfectly tight and installed in such a way that the forming of air pockets will not be possible (install vents).
- Avoid the suction of foreign bodies or sludge. If necessary provide for large meshed filters or strainers in the suction pit or line. They must be cleaned frequently to avoid clogging. The passing



through section of a suction strainer must be at least 3 times the total section of the suction pipeline.

- The foot valve (or the strainer) must be installed at a minimum distance of 2 times its diameter from the tank wall and the bottom of the sump.
- If the pump is operated with an automatic level control device you have to make sure that the shut-down of the pump will be done before air enters into the suction pipe (take care of the forming of vortex).

**CAUTION !**

**The pump must never be subject to waterhammer. If the pipeline is equipped with a quick closing shut-off valve(< 1 s), provide for a air chamber in the suction line.**

#### **4.3.3 Instructions for the installation of the discharge pipe**

In the case of an important static head a non-return valve must be installed in the discharge line in order to avoid pressure surge and reversed running of the pump after the shut-down of the driver. To avoid air pockets a drain valve must be installed upstream the non-return valve.

#### **4.3.4 Instructions for the connection of the auxiliary piping of a double mechanical seal**

- Provide for an appropriated diameter of the pipes.
- Provide, if necessary, for lagging and/or heating of the inlet pipe of the double seal.
- Provide for control devices for the main characteristics (T°C, P, Q) of the sealing liquid of the mechanical seal.
- Use only flexible pipes for hydraulic connections.
- Comply with the instructions of the manufacturer for the mounting of a pressure vessel..

### **4.4 Installation of the pump**

#### **4.4.1 Fixing the pump and the motor to the ground**

Make sure that the surface of the foundation is truly horizontal and even. Control the placing of the pump/motor unit on the foundation with the help of a spirit level. Fasten the unit by means of anchor bolts or chemical dowels.

Remove the plastic caps on the suction and discharge nozzles only just before the connection of the pipelines.

- The pump must be fastened on a sufficiently rigid foundation.
- Provide for anti-vibration devices between the ground and the foundation.
- For pumps delivered with base plate take care of its warping to avoid constraints on the foundries.

For the pumps HMP-TS/-N/-S/-DE/-H/-A the pump shaft is directly connected to the motor shaft. So it is not necessary to align the unit. However, take care to not constrain the foundries while fixing the pump to the ground.

#### **4.4.2 Hydraulic connection**

The pipelines must absolutely be in the pump axis. The forces and moments caused by the piping must not be supported by the pump casing (see Annexe 2). Install appropriated compensation devices and piping supports on the suction and the discharge lines.

To avoid leaking between the flange connections the following recommendations must be observed :

- 1) The sealing surfaces of the pipe flanges and the pump nozzles must be perfectly parallel.
- 2) Flat gaskets made of flexible elastomers and compatible with the pumped liquid must be mounted (make sure that they do not show inside the pipes).
- 3) The tightening torques for the flanges (see table § 9) must be respected.

Fill up your installation with water to test the tightness.



#### 4.4.3 Connection of a double mechanical seal (see Annexe 5)

If a pump is equipped with a mechanical seal which needs an auxiliary liquid (double seal, flushing, injection...) use only flexible tubing to avoid stress on the sealing cover. Support this tubing to avoid any leakage.



**If a mechanical seal with external lubrication is used you must install a safety device in compliance with your application (low level switch, flow meter...) to control permanently the lubrication of the mechanical seal. The self-ignition temperature of the used sealing liquid must be at least 50°C superior to the temperature class of your machine.**



**For Atex classified pumps take the risks of static electricity, due to the pipes connected to the sealing cover, into consideration.**

#### 4.5 Connection to power supply

Before connecting the motor, check that the cross-section of the cables is compatible with the power consumption of the motor.

- Make sure that the  $\varnothing$  of the cable is compatible with the stuffing box gland.
- The electrical protective devices must be accordingly to the relevant standards.
- If existing, connect the earthen device of the base plate.
- Use a phase meter to identify the wire colors in order to realize the right connections and to ensure the right rotating direction of the motor.
- The rotating direction is indicated by an arrow on the pump casing and on the fan cover of the motor.

#### **CAUTION !**

**The control of the motor's rotating direction must be made by means of a phasemeter.**



**The rotating direction of an Atex classified Pump must imperatively be determined by locating the phases of the network and the wiring diagram inside the motor's terminal box. Atex classified pumps are delivered with an earthen connection, which must be connected imperatively.**

### 5) OPERATION OF A CENTRIFUGAL PUMP

#### **CAUTION !**

**Non-compliance during the start-up can lead to the destruction of the mechanical seal and/or the hydraulic part.**

#### 5.1 Start-up of the centrifugal pump

For the start-up respect scrupulously the following points :

- The unit must be connected to earth if equipped with an earthen device.
- Connect, if foreseen, the hydraulic part of the injection or the rinsing (standstill).
- Fill up the pump (shut-off valve in suction line fully open) or the casing (HMI-A) with liquid, avoiding the formation of air pockets (vent the pump casing). If your pump is equipped with a self-priming tank (item 148), you must fill it up at a maximum by the filling orifice and replace the filling plug (item 913.2) respecting the tightening torques given in table 9.
- Check that there is no static leakage.
- Connect and feed the mechanical seal : double, flushing. If the mechanical seal is equipped with a pressure vessel, check that it is properly pressurized and that the liquid contained in is appropriated (see the instructions of the manufacturer).
- Vent the mechanical seal..
- Secure the electrical connection of the motor.
- Install all control devices (temperature sensors, leakage control...).
- Make sure that there is suction head on pump.

- Make sure that all lubricating devices (motor bearings, sealing) are installed and in working order..
- Make sure that the pump rotates easy by hand.
- Re-install all protective devices
- Ensure that the personal cannot be endangered by the start-up of the pump.
- Start-up the pump with fully open suction valve and slightly open discharge valve. Open slowly the discharge valve and adjust to comply with the duty point.



**If your pump is mounted on a trolley you must connect the earthing clip (item 020.8) at least 10 minutes before the start-up of the pump, in order to allow the evacuation of the accumulated static electricity. The earthing clip remains connected during the whole operating time of your pump and must not be disconnected earlier than 10 minutes after the full standstill of the pump. The connections and disconnections must never be made in presence of explosive atmosphere. If this is impossible take all necessary precautions to avoid that a ignition source becomes active.**

#### **CAUTION !**

**Never use the suction valve for the adjustment of the duty point. You will risk the phenomenon of cavitation.**

A priming tank, if installed, has been calculated for the suction pipe diameter specified in the proposal. The minimum levels for start-up as well as the layout of the piping must not be modified without a previous consultation of SOMEFLU in order to check that the tank capacity remains sufficient.

If the start-up of the pump is made after a standstill period, make sure that there is no deposit, sludge or formation of plugs inside the pipelines or the pump casing. Grease, if necessary, the motor bearings (see § 6.4). There is allowed : 3 successive start-ups for pump in cold state and 2 in hot state. The switching frequency must be < 6 start-ups per hour.

After the start-up :

- Check : absence of noise, of vibration, of leakage and the bearing temperature .
- Control the flow rate, the suction and discharge pressure, the power consumption and verifie if this values are in accordance with the test report furnished with the pump.
- If the start-up is made with a temperature of 20°C and if the process temperature is higher than that, you must check all parameters once again when the pumping temperature is reached.

## **5.2 Utilization**

The following recommendations must be observed to ensure a reliable operation and an increased long life of your SOMEFLU pump.

### **5.2.1 General stipulations**

To ensure the long life of your materiel, it is important to protect the pump/motor unit against external attacks (shocks, streaks, leakage of aggressive or corrosive products...). The surrounding conditions of the pump must be accordingly to the specifications (% of relative humidity, T°C, P<sub>atmosphere</sub>, pH). Certain other recommendations must also be respected :

- Absence of loosening during operation, which would be a sign of vibrations.
- Respect imperatively the motor's operating instructions.
- All personnel involved in the operation, maintenance or inspection of the pump must be fully qualified, authorized and competent.
- Provide for an appropriated inspection program for the safety devices.
- Take imperatively advice of SOMEFLU for any change of operating or duty conditions (process, duty point, surrounding...) of the pump.
- If the pump is running with a temperature ≥ 60° C it will be necessary to control the tightening of the bolting of the casing flange of the hydraulic part. This must be done generally after 1 or 2 weeks operation or after the first stillstand and cooling down of the pump.
- Clean the machine regularly (dust layer must be < 5 mm).

### **5.2.2 Observance of the pump unit's duty point**

The observance of the duty point means the surveillance and the control of following parameters :

- Absence of overpressure irrelevant to the process, e.g. an injection of liquid exceeding the maximum allowable pump pressure (accordingly to standard NF EN 22858 : allowable pump pressure = 1.5 times maximum allowable discharge pressure).
- The operation limits of the unit (power, pressure, flow rate...) indicated in the motor instructions and the pumps test report must not be exceeded.
- The static pressure must not exceed the maximum allowable pump pressure.
- Control periodically :
  - hot points, in particular the bearings
  - absence of leakage
  - absence of abnormal noises
  - vibration level
 This symptoms are sign of working failures.
- Avoid overpressures due to waterhammer.
- Avoid sudden changes of the duty point (e.g. if pump is operated on several circuits).
- The pump must never be operated with closed shut-off valves.
- During operation, make sure that the suction head on the pump is sufficient (NPSH available sufficient).
- Make sure that there is no entry of air on the suction side (tank level must be sufficient to recover the suction).
- As a general rule the recovery height on the suction line must be equal to  $v^2/2g + 0.1$ , said in m (where v corresponds to the liquids velocity (in m/s) and g to the acceleration of gravity = 9.81 m/s<sup>2</sup>).
- The flow rate ( $\pm 20\%$  of the specified nominal flow rate), the suction pressure, the discharge pressure, the motor's rotating speed and the power consumption of the pump/motor unit.
- The flow rate, the temperature ( $< 40^\circ\text{C}$ ) and the pressure of the sealing or flushing liquids.
- Each pump is designed for function within a defined flow rate which must be respected imperatively.

#### CAUTION !

**The feeding of a mechanical seal with external lubrication must never be interrupted during the operation of the pump.**

### 5.2.3 Observance of the physico-chemical characteristics

The observance of the physico-chemical characteristics of the process and auxiliary fluids is an important factor for the safe keeping of your material. It is imperious to ensure that the values of specific weight, temperature (in- and outlet of the process, quench, flushing liquids), viscosity, content of suspended solids, pH and the chemical composition are those defined in the specifications and that they never derive. It is also necessary to ensure that there are no foreign bodies in the network.



**The observance of the duty point and the physico-chemical characteristics is compulsory for the operation of ATEX certified pumps.**

## 6) MAINTENANCE OF THE CENTRIFUGAL PUMP

*A frequent and careful maintenance of the pump is proved profitable and increases as well its reliability as its long life.*

### 6.1 General stipulations

The directives given in the following chapters will be for you a valuable help to carry out successfully your maintenance operations. They must be executed only by a competent and well trained personnel with the requisite hydraulic know-how. The maintenance of the pump needs only standard tools of a mechanical workshop. The operating hours indicated in the table § 6.4 must be respected, even in the case of a storage period or a longer standstill.

To ensure a reliable maintenance and repair check if you have all the necessary drawings. If not, contact our commercial department.



**The maintenance of Atex certified pumps must be realized by a firm in possession of the required competences. It is up to the operator to judge the degree of qualification of his maintenance personnel towards the machines to maintain. If required we can propose a training in our workshop.**



**The spare parts of Atex certified pumps must be original parts from SOMEFLU.**



**Make sure that equipotentiality of your pump is not deteriorated by corrosion.**

For trouble-shooting see Annexe 1.

For your security and for reliable maintenance do not use other spare parts than those from **SOMEFLU**.  
All dismantled gasket must be renewed.

## **6.2 Maintenance of the hydraulic part**

The hydraulic part does not require a particular maintenance. However, if the pumped liquid is hot with a propensity to crystallize, in case of shut-down of the pump and cooling down of the liquid, this can crystallize. To avoid this kind of problem, close, immediately on the stop of the pump, the valves, drain the volute by the means of the drain orifice (if existing) and rinse. Provide, upstream the discharge valve, for a filling orifice with a valve to allow the rinsing with water. The water pressure must not exceed the limits authorized by the pump (see 5.2.2).

The periodicity of the control of the hydraulic part's components (impeller, volute, rear casing) will be in accordance with the abrasive characteristics of the pumped liquid (content of solids).

## **6.3 Maintenance of the shaft sealing**

The mechanical seal being one of the most delicate elements of a pump needs a lot of precautions for their operation.

During operation the maintenance of a mechanical seal is limited to a regular functional control. When using a double mechanical seal, the pressure and the temperature of the flushing liquid must be checked regularly.

If a mechanical seal with grease filling is used it is necessary to add grease every 1500h. Use a silicone grease Molykote 33-medium. The necessary quantity is reached when the grease is coming out of the seal cover (part-Nr. 471).

Even if the pumped liquid does not contain solids it may happen, with newly installed pipelines, that the contact surfaces are damaged by rust particles, welding spatters and so on remaining in every pipeline after the installation. It is recommended to check the mechanical seal after the cleaning of the pipeline.

### **6.3.1 Storage**

Our mechanical seals are delivered in packages intended to protect them against dust and slight knocks during handling.

We recommend to stock the mechanical seals in their original packing in a dry local, not subject to temperature changes. This is a particularly important point to avoid the deformation of the contact faces and the premature ageing of the O-rings.

### **6.3.2 Handling and control of a mechanical seal**

Before of the mounting of a mechanical seal the different handlings must be made very carefully concerning its vital parts : contact faces and O-rings.

- Never put the grinded faces on an indifferent surface (protect them with a non-fluffy tissue or clean paper).
- Check that there are no dust or alien elements on the mechanical seal's components. If so, clean the parts by means of a non-fluffy, absorbent tissue and solvent.
- Check that there are no cracks or streaks on the contact faces.
- Check that there are no burrs or alien elements on the shaft sleeve or in the lodging of the stationary ring.

### 6.3.3 Maintenance of the mechanical seals

- If you observe unceasing leakage, it would be necessary to check while dismantling the pump :
- If there are impurities on the periphery of the contact faces.
  - If the contact faces are worn out or streaked (a new grinding of the faces may extend the life time of the mechanical seal : contact our technical department)
  - The lubrication conditions of the mechanical seal.
  - The operating conditions of the pump (pressure, flow rate, vibrations, noises...).

As a general rule, after each dismantling of a mechanical seal, it is necessary to proceed at least to a grinding of the contact faces and to change the O-rings.

For mechanical seals with grease filling use a silicone grease (type Molykote 33-Medium) to avoid possible chemical attacks of the gaskets.

### 6.4 Maintenance of the driver part

| OPERATING HOURS | OPERATIONS TO BE CARRIED OUT                                                                                                                     |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 4000 h          | Control the tightening of the pump shaft on the motor shaft<br>Maintenance of the electrical motor accordingly to the manufacturers instructions |

### 7) REPAIR WORKS

Before dismantling your pump check if it is out of the warranty period or not. During this period warranty claims and repairs can only be taken in charge if the complete pump is examined by **SOMEFLU** or an agreed workshop.

A dismantled pump cannot be checked efficiently by our technical department.

If your pump is damaged and out of the warranty period you can carry out yourself the following operations.



**All intervention on an ATEX certified pump involves the responsibility of the intervenient. The repair of ATEX certified pumps must be realized by a firm in possession of the required competences. Its up to the operator to judge the degree of qualification of his maintenance personnel towards the machines to repair. If required we can propose a training in our workshop. It is necessary to respect the repair proceedings established by SOMEFLU (available on demand). During the dismantling of a pump take all necessary precautions to avoid that an ignition source becomes active.**

**SOMEFLU is not liable for problems occurred during an operation carried out by an other company.**

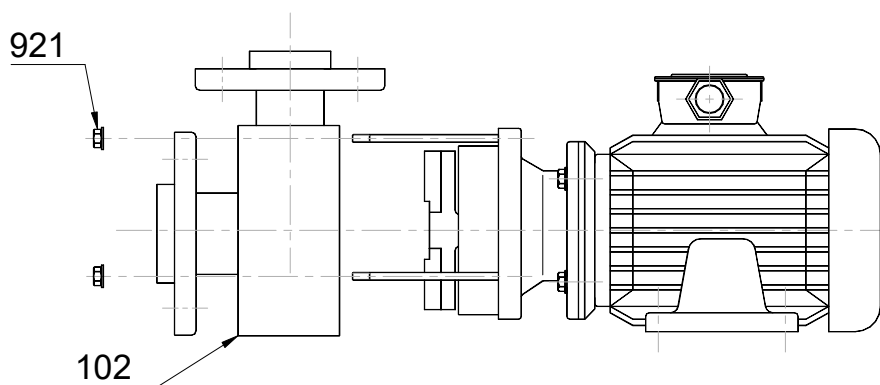
### 7.1 Dismantling of the volute



**Before dismantling, secure the pump so as to make sure it cannot be switched on accidentally (see the electrical department). The personnel must be equipped with the appropriated individual protective equipment (gloves, goggles, masks...).**

#### OPERATIONS :

- ① Secure the pump and itemize it.
- ① Close the shut-off valves (including the feeding of the mechanical seal).
- ② Drain the pipelines by opening the drain valve downstream the shut-off valve on the suction side.
- ③ Drain the pump (by opening the drain plug Part-Nr. 912 of the pump, if existing).
- ④ Remove the suction and discharge pipes.
- ⑤ Unscrew anchor bolts of motor and remove the pump from the basement.
- ⑥ Unscrew the nuts (Part-Nr. 921) or the screws (Part-Nr. 901.3).
- ⑦ Remove the volute (Part-Nr. 102).
- ⑧ Rinse the volute.



Dismantling of a block assembly pump  
(HMP-TS/-N/-S/-DE/-H/-A)

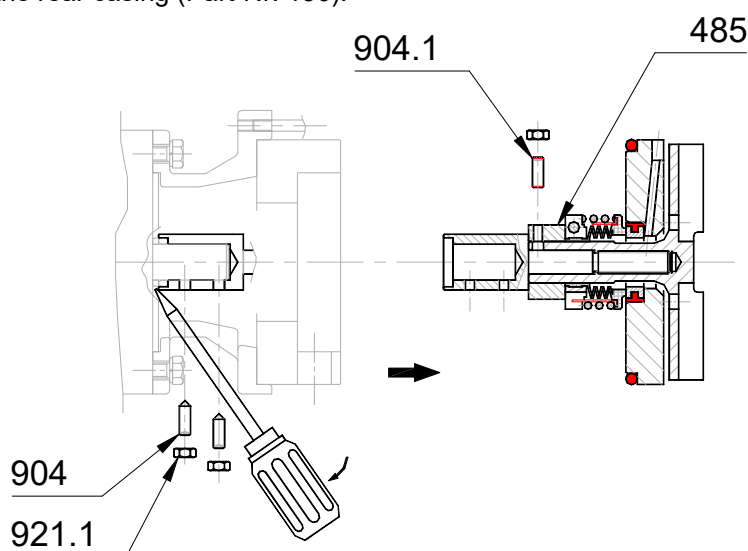


**While draining the pump all precautions must be taken to avoid the introduction of the drained liquids into the environment. The drained liquids must be properly collected and disposed accordingly to the relevant environmental regulations.**

## 7.2 Dismantling of the impeller and the mechanical seal

### OPERATIONS :

- ⑥ Carry out completely the operations of 7.1.
- ① Loosen the screw (Part-Nr. 904) and remove the shaft with the impeller and the mechanical seal (see figure below).
- ② For mechanical seal type E8 loosen the screw (Part-Nr. 904.1) of the driver ring (Part-Nr. 485)
- ③ If existing, remove the impeller cap (Part-Nr. 260) and the pin (Part-Nr. 934).
- ④ Remove the impeller (Part-Nr. 230) by unscrewing it, the rear casing (Part-Nr. 130) and the mechanical seal from the pump shaft (Part-Nr. 215).
- ⑤ Remove the mechanical seal from the impeller axis. In case of mechanical seal types E5, E8, E11, E19, U33 loosen the screws of the rotating ring (Part-Nr. 433).
- ⑥ Remove the rear casing (Part-Nr. 130).



Use a screwdriver as lever to remove the shaft.



### 7.3 Re-assembly

The re-assembly is effected in reverse order to dismantling respecting the relevant rules of mechanical works. You must specially pay attention to the tightening torques of the screws and bolts and respect the torques given in the table § 9.

Concerning the adjustment of the mechanical seal, see the mounting instructions corresponding to the installed type (contact our commercial department).

#### **REMARK :**

It is necessary, for each re-assembly, to fit new gaskets.

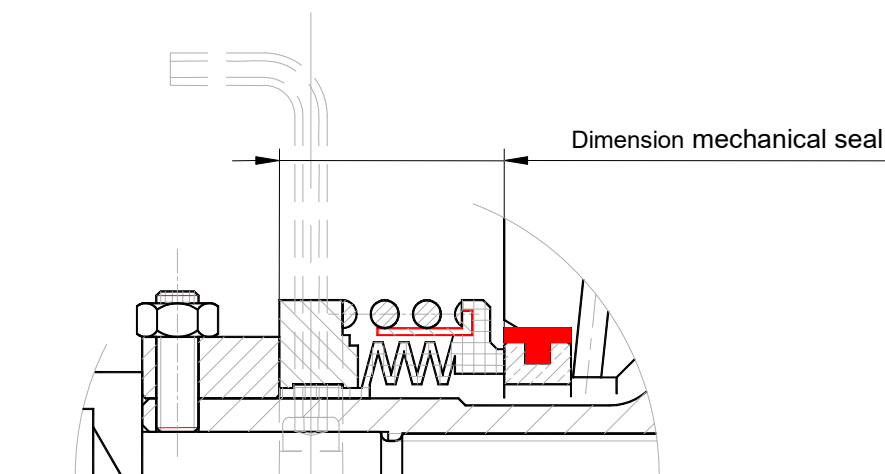


**Do not forget to re-install the mechanical seal protection before re-start.**

### 7.4 Adjustment of the axial clearance and the mechanical seal's compression

At each replacement of volute, impeller, shaft or motor on a pump de type HMP-TS/-N/-S/-DE/-H/-A the axial clearance must be checked and, if necessary, adjusted. This clearance is depending on the impeller type installed and it is imperative to contact our commercial department or to refer to the drawing. The axial clearance is adjusted in our works and it is not possible to change it on site without drilling again the motor shaft. It is this clearance who ensures the right compression of the mechanical seal.

Each operation on the mechanical seal makes an adjustment of its compression necessary. It must be done accordingly to the manufacturers' specifications.



Compression of a mechanical seal

#### **CAUTION !**

**For interventions on other types of mechanical seals contact our commercial department. For pumps equipped with double mechanical seals type E20 or E19 the modification of the impeller position inside the pump casing (the volute) must inevitably lead to balancing of the sealing in the seal chamber.**



## 8) SPARE PARTS ORDER

### 8.1 Order

The spare parts must satisfy the technical requirements of the manufacturer : this is always guaranteed with the original spare parts.

When ordering, please give imperiously the following indications :

- Type of pump

- Serial N° of the pump

You will find these indications on the name plate of the pump and on the bill of delivery. The serial number is also recorder on the side of the SOMEFLU base plate, if existing.

EXAMPLE OF DENOMINATION: Pump HMP-S 40/150 Serial n° : 01.02.0455

For all removal or return of material, the address of our works :

SOMEFLU : 21 rue de la Fraternité - 93170 BAGNOLET – Phone +33 (0)1 43 60 27 00 – Fax +33 (0)1 43 60 27 10



**When returning material for expertise or repair take care to drain, to rinse, to clean or to decontaminate the pump and to pack it properly. Inform the forwarder as well as our technical personnel about the risks due to the pumped fluid.**

### 8.2 Recommended spare parts stock for 2 years' operation

|                                 |                          |                    | Number of pumps(including stand-by pumps) |   |   |   |     |     |         |
|---------------------------------|--------------------------|--------------------|-------------------------------------------|---|---|---|-----|-----|---------|
|                                 |                          |                    | 2                                         | 3 | 4 | 5 | 6/7 | 8/9 | 10 or + |
| Part-Nr.                        | DENOMINATION             |                    | QUANTITY OF SPARE PARTS                   |   |   |   |     |     |         |
| 215                             | Shaft                    |                    | 1                                         | 1 | 1 | 2 | 2   | 3   | 30%     |
| 230                             | Impeller                 |                    | 1                                         | 1 | 2 | 2 | 2   | 3   | 30%     |
| 433                             | Complete mechanical seal | Rotating ring(s)   | 2                                         | 3 | 4 | 5 | 6   | 7   | 90%     |
| 475                             |                          | Stationary ring(s) | 2                                         | 3 | 4 | 5 | 6   | 7   | 90%     |
| 411/412.4/412.8/<br>412.5/412.9 |                          | Gaskets            | 2                                         | 3 | 6 | 8 | 8   | 10  | 150%    |
| 477                             |                          | Spring(s)          | 1                                         | 1 | 1 | 1 | 2   | 2   | 20%     |
| 412/400...                      | O-rings and flat gaskets |                    | 4                                         | 6 | 8 | 8 | 9   | 12  | 150%    |

## 9) TIGHTENING TORQUES

**(TO RESPECT IMPERATIVELY)**

| DENOMINATION                         | PART-NR.               | TORQUE (m.daN)     |
|--------------------------------------|------------------------|--------------------|
| Casing screw or nut                  | 901.3 or 921 or 921.10 | 2,2 - 2,5          |
| Screw of seal chamber                | 901.2                  | 1,3 - 1,5          |
| Nuts (suction and discharge flanges) | 921 & 921.1            | 3,0 - 3,2          |
| Pipe connection 3/8"                 | 731.0                  | 1,0 - 1,2          |
| Fixing screw lantern 343             | 901                    | 3 - 3,2            |
| Drain or fill-up plug                | 912, 912.2, 913.2      | Tightening by hand |

## 10) WARRANTIES

The plastic block assembly centrifugal pumps HMP-TS/-N/-S/-DE/-H/-A are built and delivered in all points in accordance with the purpose they are assigned for. SOMEFLU guarantees their manufacture accordingly to the clauses defined in § 8 of its current general sales conditions. Damages due to the non-compliance with the present directives and instructions will be entirely to the charge of the customer. Possible repairs (or modifications) during the warranty period can only be realized by our technical personnel.

## 11) ANNEXES

- Annexe 1 : Trouble-shooting.
- Annexe 2 : Rational installation.
- Annexe 3 : Determination of pipelines.
- Annexe 4 : Pressure losses in straight pipelines.
- Annexe 5 : Hydraulic connection of pump and double mechanical seal.
- Annexe 6 : Sectional drawing of HMP-N.
- Annexe 7 : Sectional drawing of HMP-S.
- Annexe 8 : Sectional drawing of HMP-H.
- Annexe 9 : Sectional drawing of HMP-DE.

Contact our commercial department for the sectional drawings of the pump and the mechanical seal (specific to your pump).

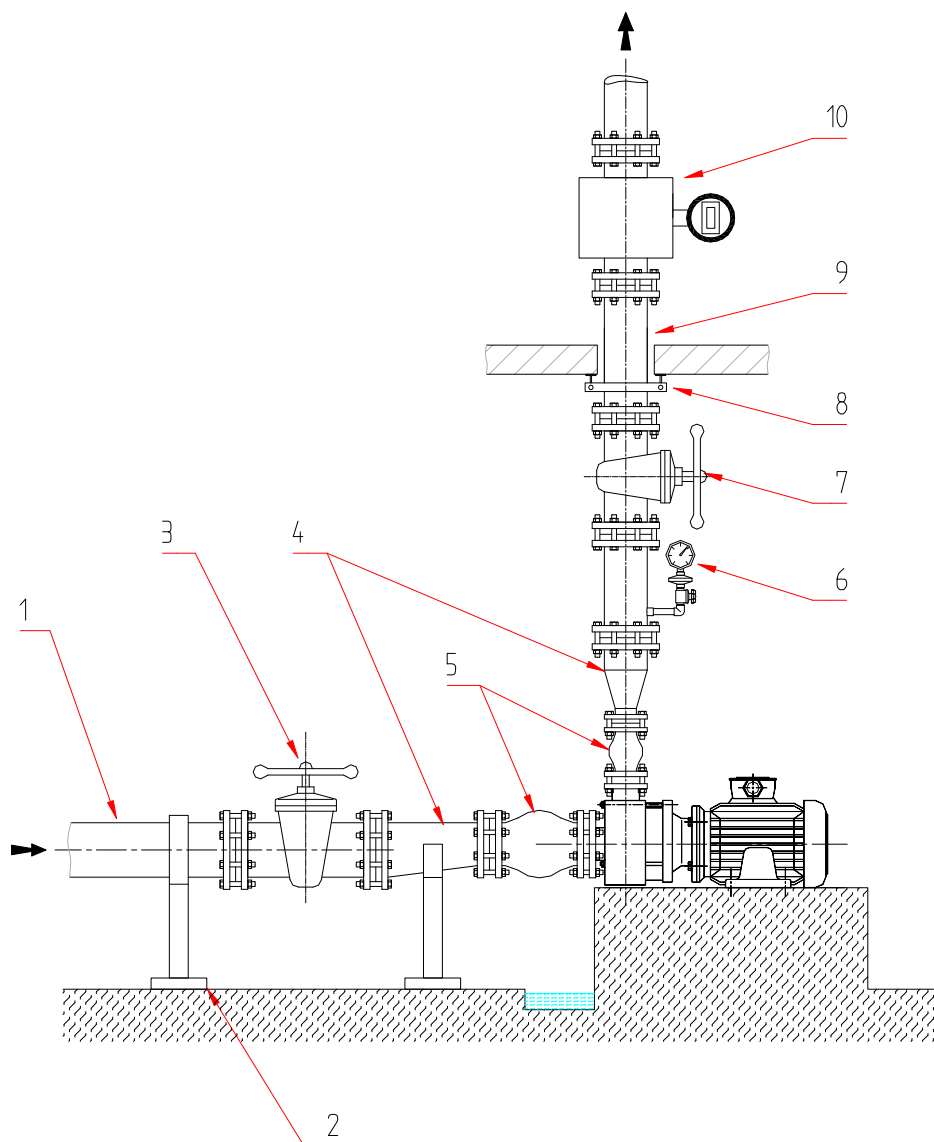
# ANNEXE 1

## Trouble-shooting

| CAUSES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | REMEDIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PUMP DOES NOT DELIVER FLOW RATE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Pump or pipeline are not completely vented or primed</li> <li>● Shut-off valve on suction or discharge side closed</li> <li>● Suction pipeline contains air pockets for reason of non appropriated layout</li> <li>● Static head of installation is higher than discharge head of the pump at zero flow rate</li> <li>● Air intake in the pump</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>☞ Vent and/or prime the pump and/or the pipeline</li> <li>☞ Open the shut-off valve</li> <li>☞ Give a downward slope towards the pump for suction head lines and a rising slope towards the pump for suction lift lines.</li> <li>☞ Increase the impeller diameter or modify the installation</li> <li>☞ Check the tightness of the suction pipeline</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>VIBRATIONS DURING PUMP OPERATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Defective bearings</li> <li>● Pump is running outside its operating limits</li> <li>● Cavitation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>☞ Fit new bearings</li> <li>☞ Contact the electrical department</li> <li>☞ Increase the available NPSH</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>PUMP DELIVERS INSUFFICIENT FLOW RATE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Pump is not completely vented</li> <li>● Suction or discharge shut-off valve is not entirely open</li> <li>● Liquid level is temporarily too low</li> <li>● Suction line is not tight</li> <li>● Pipelines, impeller, valves or filters are clogged or furred up</li> <li>● Increase of the axial clearance due to a long time operation or to wear (abrasion or erosion)</li> <li>● NPSH available too low</li> <li>● Reverse rotation</li> <li>● Motor speed is too low due to insufficient voltage</li> <li>● Pump discharge pressure is higher than stated in the order               <ul style="list-style-type: none"> <li>a) Back pressure too high</li> <li>b) Friction losses in discharge line too high</li> </ul> </li> <li>● Viscosity of the liquid is higher than stated in the order</li> </ul> | <ul style="list-style-type: none"> <li>☞ Fill up the pump completely and vent</li> <li>☞ Open the shut-off valve completely</li> <li>☞ Adjust with the shut-off valve on discharge side</li> <li>☞ Tighten the suction line</li> <li>☞ Clean the elements</li> <li>☞ Adjust axial clearance or replace, if necessary, the worn components (impeller and volute)</li> <li>☞ Check suction head or lift.<br/>Ensure that friction losses in suction line are not too high (install pipe with greater diameter)<br/>Check the fully opening of shut-off elements in the suction line<br/>Check the suction temperature of the pumped liquid</li> <li>☞ Interchange two of the phases of the power supply cable</li> <li>☞ Increase the voltage</li> <li>☞ Increase the impeller diameter</li> <li>☞ Install pipeline with appropriated diameter</li> <li>☞ Contact our technical department</li> </ul> |
| <b>MOTOR IS OVERLOADED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Pump back pressure is lower then stated in the order</li> <li>● The pump is constraint</li> <li>● Density or viscosity of the pumped fluid is higher than stated in the order</li> <li>● Impeller is clogged by foreign bodies (fibers, crystals...)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>☞ Adjust duty point by means of the shut-off valve on discharge side or reduce the impeller diameter</li> <li>☞ Connect the pipelines without stress (install compensators)</li> <li>☞ Install motor with higher power output</li> <li>☞ Clean impeller</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>PUMP DELIVERS TOO HIGH FLOW RATE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Pump back pressure is lower then stated in the order               <ul style="list-style-type: none"> <li>a) temporarily</li> <li>b) as a result of new calculation</li> </ul> </li> <li>● Speed is too high</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>☞ Adjust by means of the shut-off valve in the discharge line</li> <li>☞ Contact our technical department to see if the impeller can be turned down or if it is necessary to install a smaller one</li> <li>☞ Reduce motor speed</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>EXCESSIVE BEARING TEMPERATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Pump is constraint by the pipeline</li> <li>● Load on bearing too high (suction pressure or density of pumped fluid are different to those stated in the order)</li> <li>● Insufficient quantity of grease or bearing damaged</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>☞ If necessary, modify the pipelines to obtain a flange connection without stress. Re-align the unit.</li> <li>☞ Contact technical department to find solution (e.g. modification of impellers' back vanes)</li> <li>☞ Top-up with grease or fit new bearings</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>NOISES DURING PUMP OPERATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Bearings damaged</li> <li>● Cavitation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>☞ Fit new bearings</li> <li>☞ Increase the available NPSH</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>LEAKAGE AT THE SHAFT SEAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>● Contact faces of mechanical seals are worn</li> <li>● O-rings are damaged</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>☞ Fit new contact faces</li> <li>☞ Fit new O-rings</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## ANNEXE 2

### Rational installation



1 and 9 : Well dimensioned pipelines – see Annexe 3.

2 and 8 : Provide for piping supports.

- The pump must never support the weight of the pipelines.
- The supports must be designed to accept the expansions.
- Make the connections without stress.
- It is recommended to limit the moving of the expansion device after its mounting to decrease the efforts on the pump casing when setting under pressure (contact the manufacturer of the compensation device)

3 and 7 : Provide for well dimensioned shut-off valves. Never use them on suction side to adjust the flow rate.

4 : Divergent and convergent (asymmetrical on pump inlet, with the straight side parallel to the horizontal axis).

5 : Provide for expansion compensators on suction and discharge side of the pump.

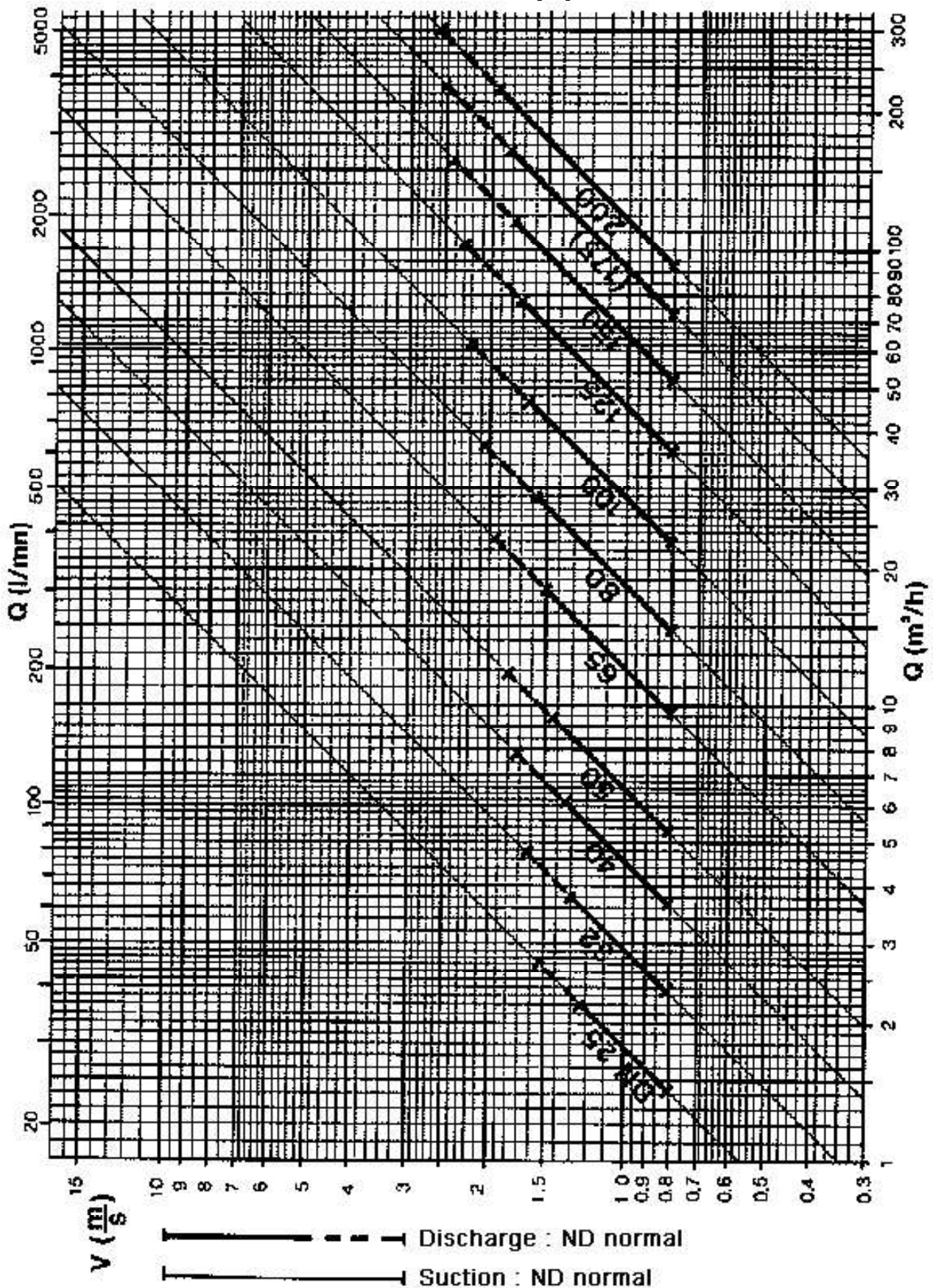
6 : Provide for connections on the pipeline to install pressure gauges on suction (upstream the shut-off valve) and discharge (downstream the shut-off valve) of the pump.

10 : Flowmeter.



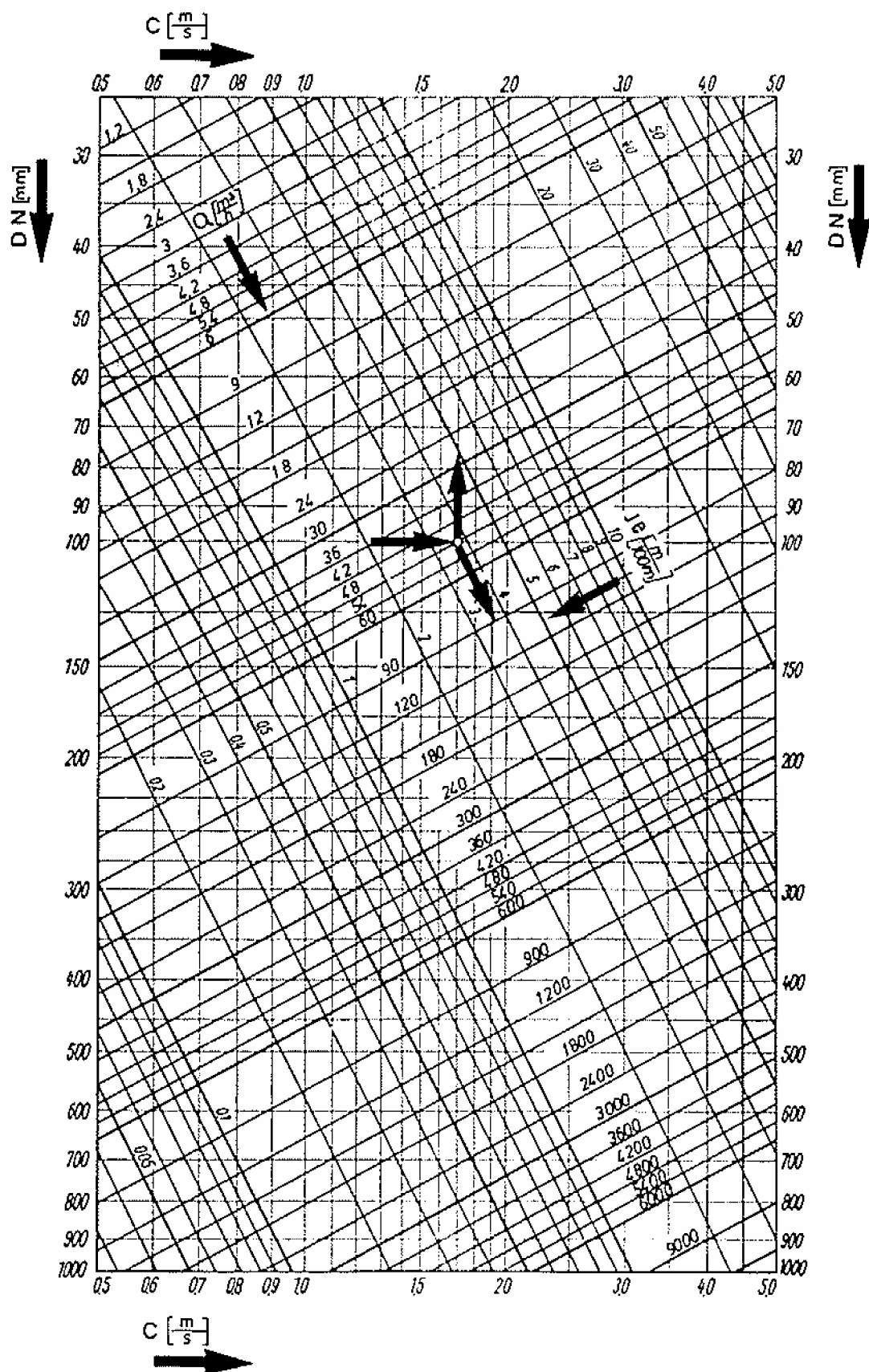
## ANNEXE 3

### Determination of pipelines



## ANNEXE 4

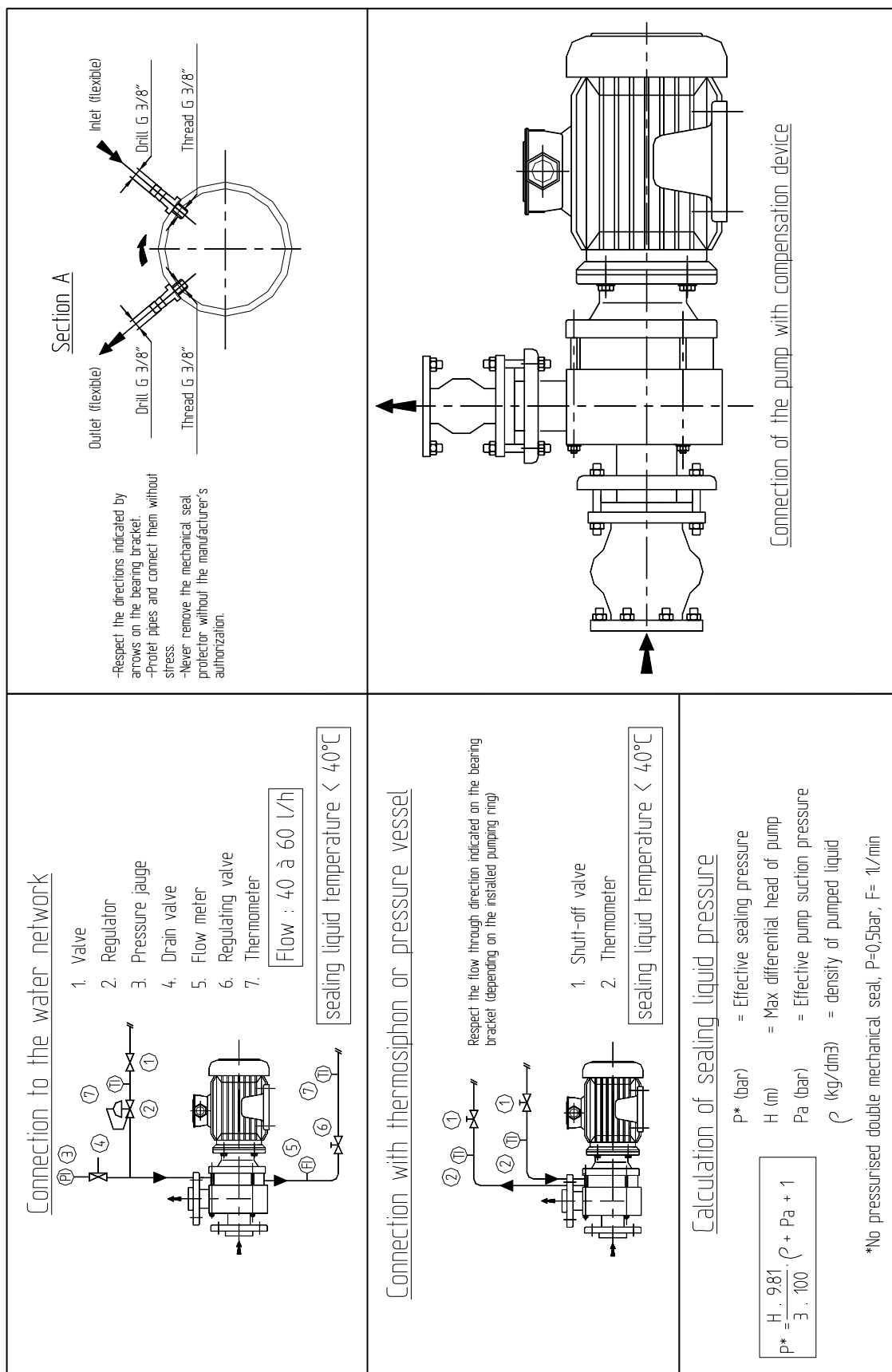
### Pressure losses in straight pipelines





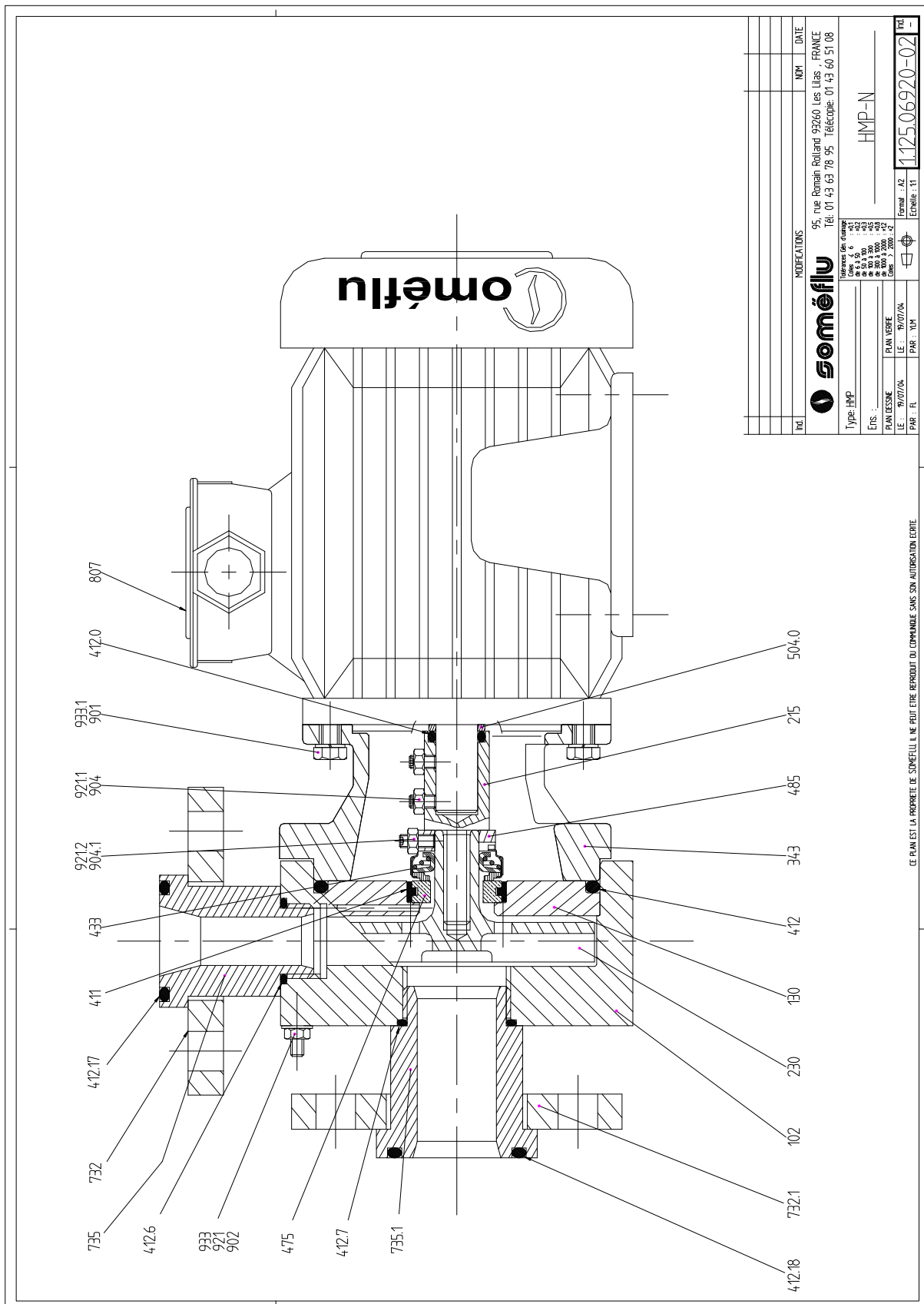
## ANNEXE 5

### Hydraulic connection pump and double seal



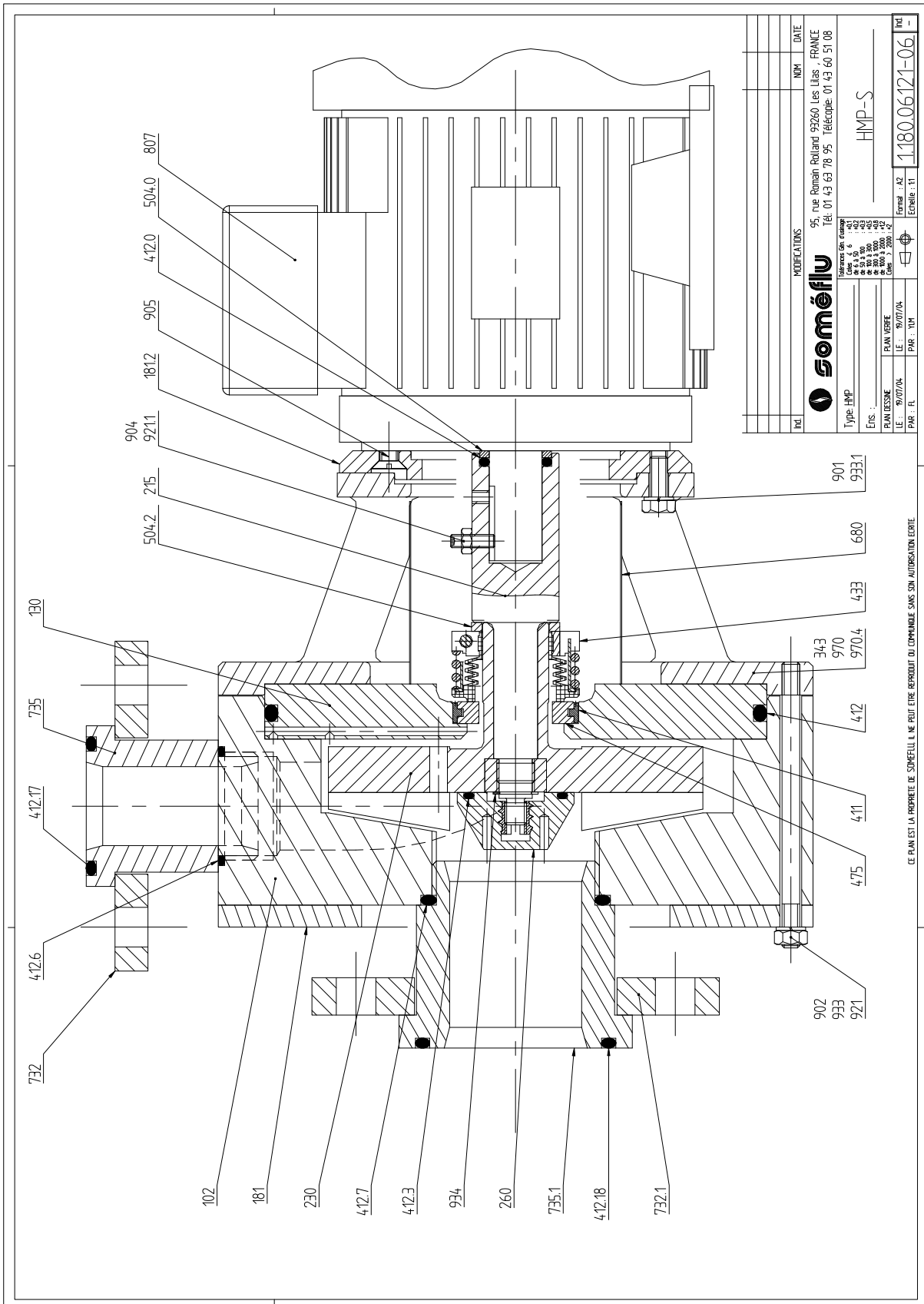
## ANNEXE 6

### Sectional drawing of HMP-N



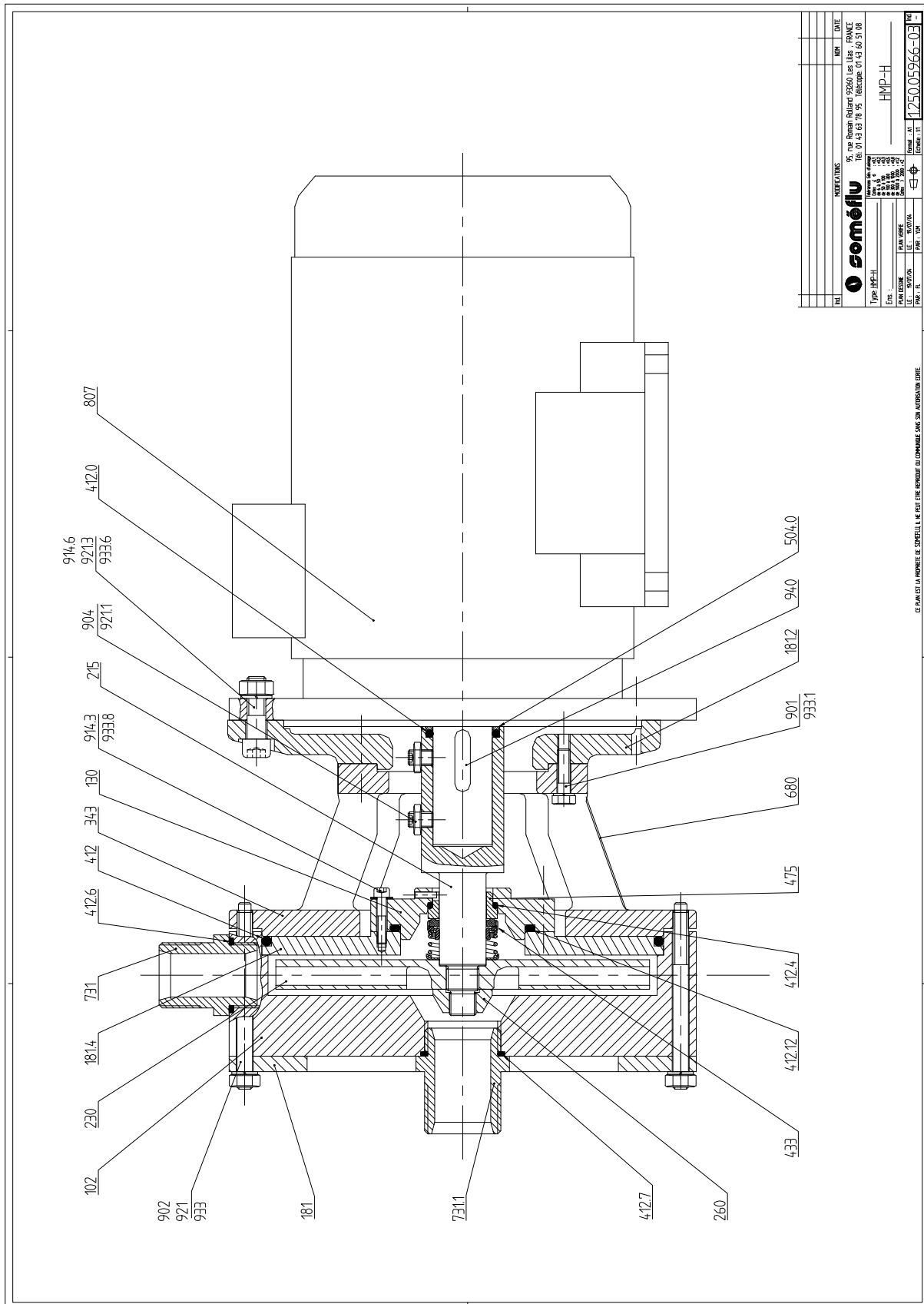
## ANNEXE 7

### Sectional drawing of HMP-S



## ANNEXE 8

### Sectional drawing of HMP-H







## Notes

[illegible]



## **CONTACTS**

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[www.someflu.com](http://www.someflu.com)

### **Services**

Our Services division is mainly composed of technical sales representatives. They have in-depth knowledge both of the construction and the assembly of our products. They are focuses on the technical and sales support missions for operational machines.

End-Users & Partners  
Phone: + 33 (0) 1 43 63 27 04  
[services@someflu.com](mailto:services@someflu.com)

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