someflu

Corrosion resistant centrifugal pumps

Operating instructions

These operating instructions must be handed over to the end user

Ranges ECO, ECO-B
Ranges ECO, ECO-B Ex

13.05 GB

Operating instructions
Plastic block-assembly pumps ECO, ECO-B

Revision	Date	Established by	Modification
b	16/09/2004	LM	Up date n°1

1) SECURITY INSTRUCTIONS

This document must be read imperatively by all persons intervening on the concerned material, that means the pumps ECO and ECO-B.

This manual contains important information for the fitter and the operator for reliable, proper and efficient maintenance, repair and operation 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, NF CR 13932. However, our specialists are at your disposal if questions about the different treated points remain.

For a better understanding of this manual, use the attached 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 at the disposal of the personal and close to the location of operation of the pump.

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 intervening on the installation and the pumps 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 (piping, handled liquid…) must be authorized by the manufacturer.

The use of the material furnished by SOMEFLU for purposes others than those foreseen in the specifications (defining the duty point, the physical-chemical characteristics of the pumped liquid, as well as the limits of the pump) invalidates the warranty.

Warnings and symbols shown in this operating instructions.

CAUTION ! This symbol points out the security measures to respect to avoid **damages of the material.**

This symbol points out the security measures to respect to avoid **personal damages.**

This symbol points out the measures to respect to ensure the **conformity of your material with ATEX directive** and the **required protection level.**

This symbol points out the measures to respect to ensure **the environmental respect.**

2) DESCRIPTION OF THE CENTRIFUGAL PUMP

The centrifugal pumps of the ECO and ECO-B (ECO) range are non-self priming, single stage, volute casing machines, for horizontal mounting, specially designed for the pumping of corrosive liquids.

The hydraulic and the 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 **(Parts N° 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.

2.2 Mechanical part (Part N° 343)

The mechanical part is made of cast iron, steel or plastics (support on demand).

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

2.3 Shaft sealing

Considering the aggresivity of the chemical products the sealing of the pump versus the atmosphere is done 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.

A pump must never be operated without liquid and with a badly lubricated or cooled mechanical seal. Dry running will destroy the mechanical seal and the surrounding parts and may cause risks for the personal and the environment. For this reason make sure that the pump will never unprime and that the circulation of the flushing or quench liquid (depends of 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 closed coupled electrical motor drives the ECO pumps. Pump and motor shafts are rigidly connected.

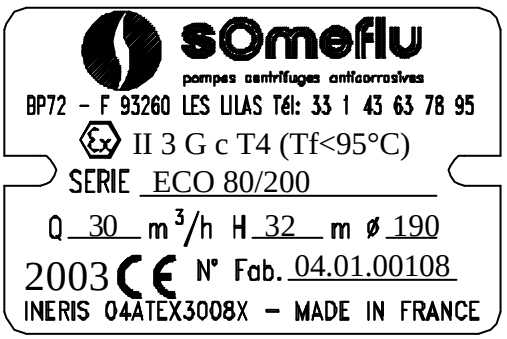
2.5 Marking of the pump

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

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 point
- 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 : for mining industry
  II : for the other industries.

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

  1 : for sites where an explosive atmosphere is present permanently.
  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**

  It signifies that your pump is suitable for a use in an explosive atmosphere due to the presence of gas or inflammable mist (letter **G :** Gas), or suitable for use in an explosive atmosphere due to the presence of inflammable dust (letter **D** : Dust). The double marking **GD** signifies that your pump can be operated in the 2 atmospheres.

- **The letter c**

  It signifies that the protective mode is la security by construction.

- **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 an atmosphere of 40°C but depends 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

- **The certification number INERIS 04ATEX3008X**

  Signifies that the motor/pump unit complies with the ATEX directive by type examination (voluntary certification).

  Example of marking :  3 G c T4 (Tf=95°C), T3 (Tf=160°C)

  Tf is maximum temperature of the pumped liquid.

3) RECEIPT OF GOODS AND STORAGE

Certain rules must be respected during receipt and for the storage of a pump.

3.1 Receipt

The handling of the pumps must be done accordingly to the instructions of 3.2.
- Check the conformity of the delivered goods with the delivery note before any other operation.
- 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 take 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 these 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 physical-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…) that may alter the physical-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 plastized 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…).

Competent and fully qualified personnel must carry out the installation of a centrifugal pump.

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 directive.

The suction and the discharge pipes must be connected to the free earthen conductors (part-nr. 020.1 and 020.4) foreseen for this duty.

Singularities (sharp bends (R<3ND), 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 DN or 1 m (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.

Provide for appropriated protective devices (pressure sensors, flow meters…) on the discharge line of the pump, as well as anti start-up systems to avoid dangerous operating phases (dry running…).

Provide for appropriated protective devices on the external flushing line of the mechanical seal (flow meter for lubrication by external sources with output signal for the operator).

■ Important :

- The pump itself must never support the weight of the pipelines. Provide for expansion bellows and pipelines independent from the pump.
- When pumping hot liquids (t>60°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*

- The horizontal section of suction lift lines should be laid with a rising slope towards the pump (provide for a self-priming tank). Suction head lines should be laid 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 shutdown 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 water hammer. If the pipeline is equipped with a quick closing shut-off valve (<1 s), provide for an 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 shutdown 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 a double seal with external lubricating*

- Provide for an appropriated diameter of the pipes.
- If necessary, provide for lagging and/or heating of the auxiliary piping of a mechanical seal with external lubrication.
- 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.

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 it's warping to avoid constraints on the foundries.

For the pumps ECO 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 suction and discharge side.

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 or O-rings, made of flexible elastomers and compatible with the pumped liquid, must be mounted (make sure that the flat gaskets do not show inside the pipes).
3) The tightening torques for the flanges, given in table § 9, must be respected.

Fill up your installation with water to test the tightness.

4.4.3 ***Connection of a double mechanical seal with external lubrication (see annexe 5)***

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

If a mechanical seal with external lubrication is used you have to provide for a appropriated device (flow meter…) to control permanently the lubricating of your mechanical seal. The auto-ignition temperature of the flushing liquid must be at least 50°C superior to the temperature class of your machine.

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

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 cable diameter is compatible with that of 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 colours 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 phase meter.

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) with liquid (for pumps with suction head) or via the filling orifice, avoiding the formation of air pockets (vent the pump casing). If your pump is equipped with a priming tank (item. 148), fill it up via the filling plug (item 913.2) at a maximum and replace the plug respecting the tightening torques given in table 9.
- Check that there is no static leakage.
- Connect and feed the mechanical seal : injection, rinsing.
- Vent the mechanical seal.
- Secure the electrical connection of the motor.
- Install all control devices (temperature sensor, leakage control…).
- Make sure that there is suction head on the pump.
- Make sure that all lubricating devices (motor bearing, sealing) are installed and in working order.
- Make sure that the pump rotates easy by hand.
- Replace 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 the pump is mounted on a trolley you must connect the earthen 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 earthen clip remains connected during the whole operating time of the pump and must not be disconnected earlier than 10 minutes after the full standstill of the pump. The connections and disconnections must never be done in presence of explosive atmosphere. If this 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.***

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 the 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 motor bearing temperature.
- Check the flow rate, the suction and discharge pressures, the power consumption and verify if this values are corresponding to the required ones.
- If the start-up is made with liquid at 20°C and if the process temperature is superior, re-check all data after reaching pumping temperature.

5.2 Operation

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 material, it is important to protect the motor/pump unit against external attacks (shocks, streaks, leakage of aggressive or corrosive products…). The surrounding utilization conditions of the pump must be accordingly to the specifications (% of relative humidity, T°C, $P_{atmosphere}$, 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 = to 60°C it is 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 standstill and cooling down of the pump.
- Clean regularly the machine (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 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 motors instructions and the pumps test report must not be exceeded.
- The static pressure must not exceed the maximum allowable pump pressure.
- Check periodically :
  - hot points, in particular the bearings
  - absence of leakage
  - absence of abnormal noises
  - vibration level

  This symptoms are sign of working failures.
- Avoid overpressure due to water hammer.
- Avoid sudden changes of the duty point (e.g. if the pump is operated on several circuits).
- The pump must never be operated with a closed shut-off valve.
- During operation of the pump, make sure that the suction 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 nozzle).
- 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 liquid velocity (in m/s) and g to the acceleration of gravity = 9.81 m/s^2).
- The flow rate (± 20% of the duty point stipulated in the specification), the suction pressure, the discharge pressure, the motor's rotating speed and the unit's power consumption.
- The flow rate, the pressure and the temperature (< 40°C) of the sealing or flushing liquids.
- Each pump is designed to operate with a defined flow rate, which must be imperatively respected.

CAUTION ! ***The feeding of a mechanical seal with external lubrication must never be interrupted when the pump is running.***

5.2.3 Observance of physical-chemical characteristics

The observance of the physical-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 temperature of sealing, flushing or process liquids), viscosity, content of suspended solids, pH and the chemical composition are well those defined in the specification 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 physical-chemical characteristics is compulsory for the operation 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. Only competent and well-trained personnel with the requisite hydraulic know-how must execute them. 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 carried out by a firm having the necessary competences. It is the operator's responsibility to judge the qualification level of his maintenance personnel towards the concerned materials. On your demand we can propose training in our workshops.

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

Make sure that the equipotentiallity 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 shutdown 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 mechanical seal with grease filling, it is necessary to add grease every 1500 h using a silicone Molycot 33-medium grease. The right quantity is obtained when the grease comes out on the deflector side(Rep. 508).

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 stocking 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 seal

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 a silicone grease (type Molycot 33-Medium) must be used to avoid a chemical attack of the gaskets.

6.4 Maintenance of the driver part

OPERATING HOURS	OPERATIONS TO BE CARRIED OUT
4000 h	Check the tightening of the coupling (part-nr. 840). 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.

Our technical department cannot check a dismantled pump efficiently.

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 engages the responsibility of the intervenient. The repair of Atex certified pumps must be carried out by a firm having the necessary competences. It is the operators responsibility to judge the qualification level of his maintenance personnel towards the concerned materials. On your demand we can propose a training in our workshops. It is necessary to respect the repair proceedings established by SOMEFLU (available on demand). During the dismantling of the pump take all necessary precautions to avoid that an ignition source becomes active.

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

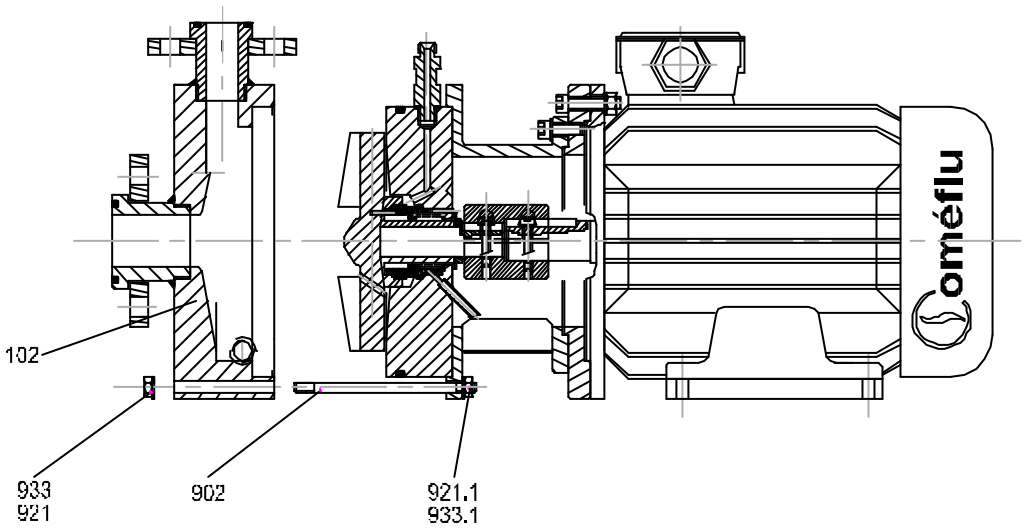
7.1 Dismantling of the volute

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 :

⓪ 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 921.1).
⑦ Remove the volute (part-nr.102).
⑧ Rinse the hydraulic parts.

Dismantling of a block assembly pump (ECO, ECO-B)

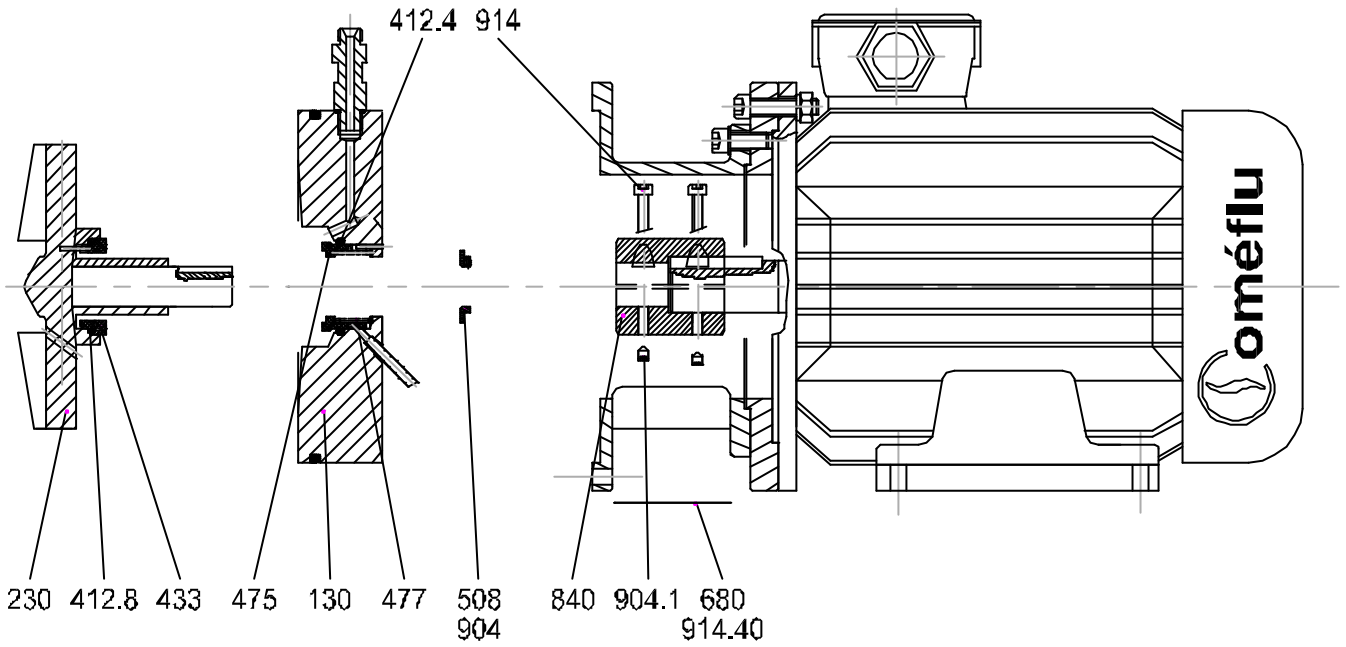


While draining the pump all precautions must be taken to avoid the introduction of the drained liquids into the environment. The drained liquid must be properly collected and disposed accordingly to the relevant environmental regulations.

7.2 Dismantling of the impeller and the mechanical seal

OPERATIONS :

⓪ Carry out completely the operations of 7.1.
① Remove the protector (part-nr. 680) fixed with screws (part-nr. 914.40).
② Remove the screws (part-nr. 904.1 and 914) from the coupling (part-nr. 840) and pull out the impeller (part-nr. 230) (see figure here below).
③ Unscrew the screw (part-nr. 904) of the deflector (part-nr. 508) to remove it.
④ Remove the impeller (part-nr. 230) with the rotating ring (part-nr. 433) and its gasket (part-nr. 412.8) from the rear casing (part-nr. 130) containing the stationary ring (part-nr. 475), the spring (part-nr.477) and the gasket l(part-nr. 412.4).
⑤ Remove the rotating ring from the impeller and the stationary ring from the rear casing taking care to not notch the mechanical seal components and to not damage the gasket seats.



Dismantling of the mechanical seal

7.3 Re-assembly

The re-assembly is made 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).

REMARKS :

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

Do not forget to re-install the mechanical seal protector (if existing) 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 of type ECO 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 (annex 8). The axial clearance is adjusted in our works and it is not possible to change it on site. It is this clearance that ensures the right compression of the mechanical seal.

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 nameplate 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 DESIGNATION : Pump ECO 80/200 serial n° : 04.07.0455

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 liquid.

8.2 Recommended spare parts stock for 2 years' operation

			Number of pumps (including stand-by)						
			2	3	4	5	6/7	8/9	10 et +
PART-NR.	**DENOMINATION**		**QUANTITY OF SPARE PARTS**						
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%
412.4/412.8		Gaskets	2	3	6	8	8	10	150%
477		Spring(s)	1	1	1	1	2	2	20%
412/400…	Set of 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 screws or nuts	921 or 921.1	2,2 - 2,5
Nuts (suction and discharge flanges)	921 & 921.1	3,0 - 3,2
Pipe connection 3/8"	731.0	1,0 - 1,2
Fixing screws lantern 343	914.1 or 914.2	3 - 3,2
Drain and fill-up plug	912, 912.2, 913.2	Tightening by hand

10) WARRANTIES

The plastic block assembly centrifugal pumps ECO 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

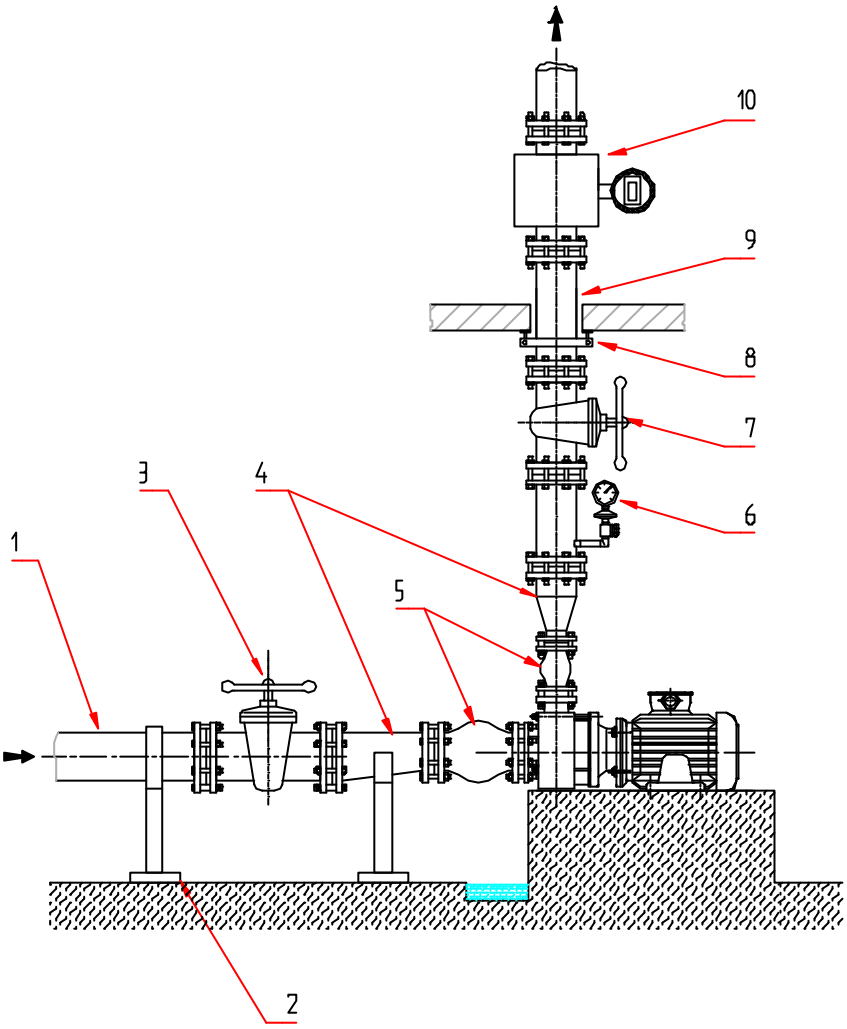
Annexe 1 : Trouble-shooting
Annexe 2 : Rational installation
Annexe 3 : Determination of pipelines
Annexe 4 : Pressure losses in straight pipelines
Annexe 5 : Sectional drawing ECO.
Annexe 6 : Sectional drawing ECO + mechanical seal with injection
Annexe 7 : Sectional drawing ECO + mechanical seal with grease filling
Annexe 8 : Re-assembly drawing for a ECO pump.

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
PUMP DOES NOT DELIVER FLOW RATE	
● Pump or pipeline are not completely vented or primed	➲ Vent and/or prime the pump and/or the pipeline
● Shut-off valve on suction or discharge side closed	➲ Open the shut-off valve
● Suction pipeline contains air pockets for reason of non appropriated layout	➲ Give a downward slope towards the pump for suction head lines and a rising slope towards the pump for suction lift lines.
● Static head of installation is higher than discharge head of the pump at zero flow rate	➲ Increase the impeller diameter or modify the installation
● Air intake in the pump	➲ Check the tightness of the suction pipeline
VIBRATIONS DURING PUMP OPERATION	
● Defective bearings	➲ Fit new bearings
● Pump is running outside its operating limits	➲ Contact the electrical department
● Cavitation	➲ Increase the available NPSH
PUMP DELIVERS INSUFFICIENT FLOW RATE	
● Pump is not completely vented	➲ Fill up the pump completely and vent
● Suction or discharge shut-off valve is not entirely open	➲ Open the shut-off valve completely
● Liquid level is temporarily too low	➲ Adjust with the shut-off valve on discharge side
● Suction line is not tight	➲ Tighten the suction line
● Pipelines, impeller, valves or filters are clogged or furred up	➲ Clean the elements
● Increase of the axial clearance due to a long time operation or to wear (abrasion or erosion)	➲ Adjust axial clearance or replace, if necessary, the worn components (impeller and volute)
● NPSH available too low	➲ Check suction head or lift. Ensure that friction losses in suction line are not too high (install pipe with greater diameter) Check the fully opening of shut-off elements in the suction line Check the suction temperature of the pumped liquid
● Reverse rotation	➲ Interchange two of the phases of the power supply cable
● Motor speed is too low due to insufficient voltage	➲ Increase the voltage
● Pump discharge pressure is higher than stated in the order	
a) Back pressure too high	➲ Increase the impeller diameter
b) Friction losses in discharge line too high	➲ Install pipeline with appropriated diameter
● Viscosity of the liquid is higher than stated in the order	➲ Contact our technical department
MOTOR IS OVERLOADED	
● Pump back pressure is lower then stated in the order	➲ Adjust duty point by means of the shut-off valve on discharge side or reduce the impeller diameter
● The pump is constraint	➲ Connect the pipelines without stress (install compensators)
● Density or viscosity of the pumped fluid is higher than stated in the order	➲ Install motor with higher power output
● Impeller is clogged by foreign bodies (fibers, crystals...)	➲ Clean impeller
PUMP DELIVERS TOO HIGH FLOW RATE	
● Pump back pressure is lower then stated in the order	
a) temporarily	➲ Adjust by means of the shut-off valve in the discharge line
b) as a result of new calculation	➲ Contact our technical department to see if the impeller can be turned down or if it is necessary to install a smaller one
● Speed is too high	➲ Reduce motor speed
EXCESSIVE BEARING TEMPERATURE	
● Pump is constraint by the pipeline	➲ If necessary , modify the pipelines to obtain a flange connection without stress. Re-align the unit.
● Load on bearing too high(suction pressure or density of pumped fluid are different to those stated in the order)	➲ Contact technical department to find solution (e.g. modification of impellers' back vanes)
● Insufficient quantity of grease or bearing damaged	➲ Top-up with grease or fit new bearings
NOISES DURING PUMP OPERATION	
● Bearings damaged	➲ Fit new bearings
● Cavitation	➲ Increase the available NPSH
LEAKAGE AT THE SHAFT SEAL	
● Contact faces of mechanical seals are worn	➲ Fit new contact faces
● O-rings are damaged	➲ Fit new O-rings

ANNEXE 2
RATIONAL INSTALLATION

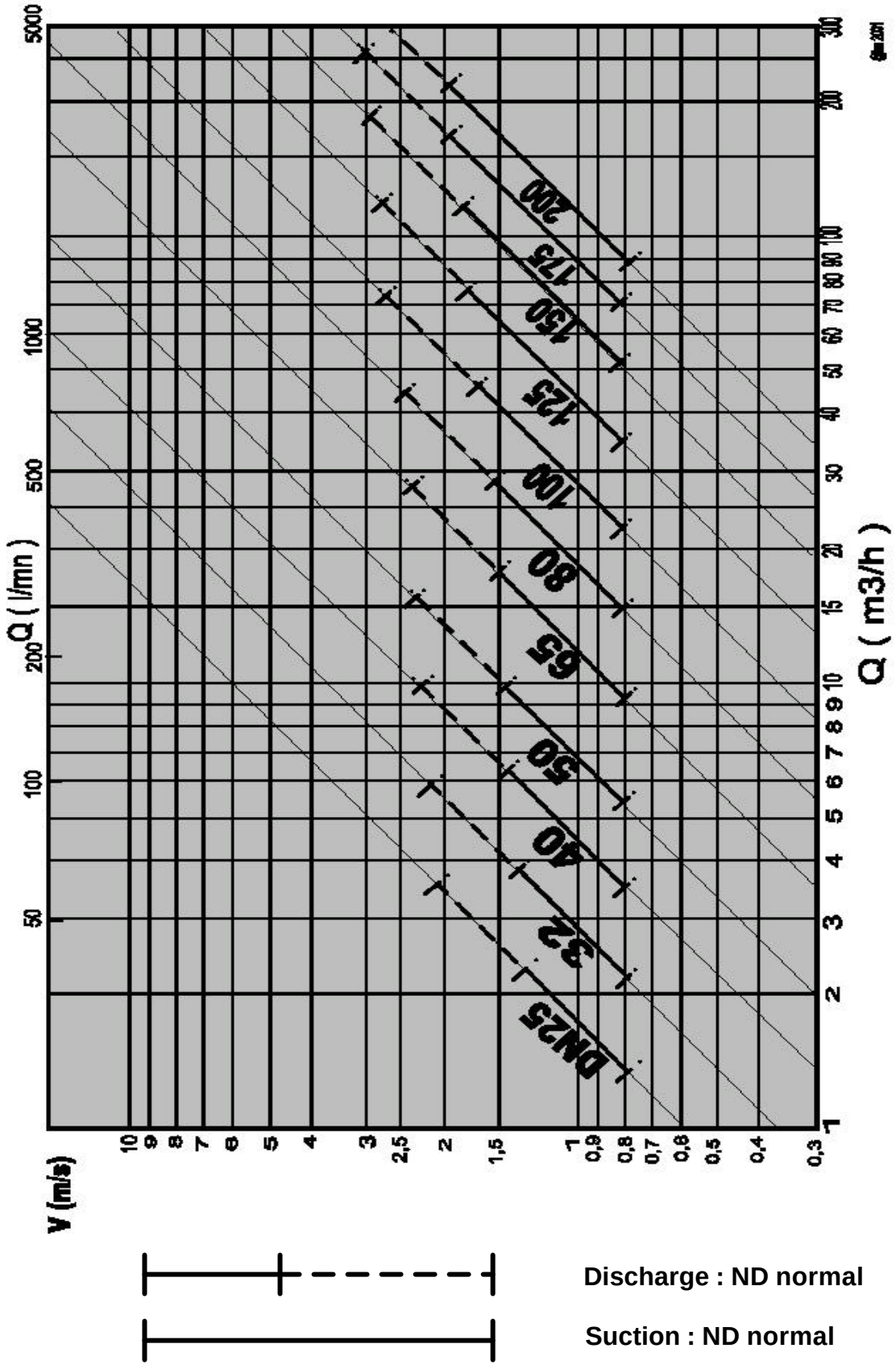


1 and 9 : Well dimensioned pipelines – see annexe 3.
2 and 8 : Provide for piping supports

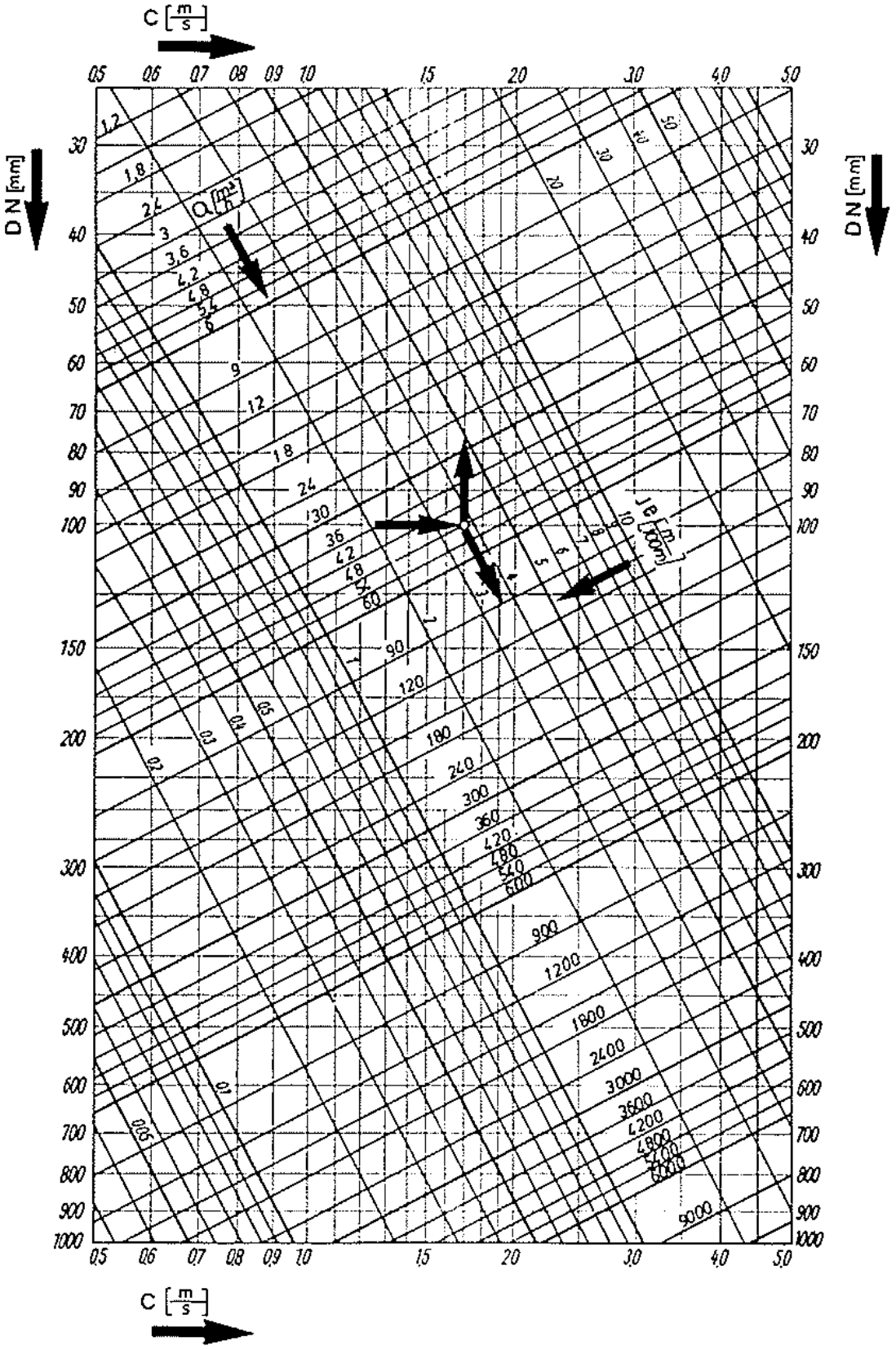
- The pump must never support the weight of the pipelines.
- The supports must be designed to accept the important expansions of plastic pipes.
- Make the connection without stress.
- It is recommended to limit the moving of the expansion device after its mounting to decrease the efforts on the pump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

3 and 7 : Provide for well dimensioned shut-off valves. Never use the suction valve to adjust the flow rate.
4 : Divergent and convergent (asymmetrical on pump inlet, 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 control the pressure on suction (upstream the valve) and discharge (downstream the valve) of the pump.
10 : Flow meter

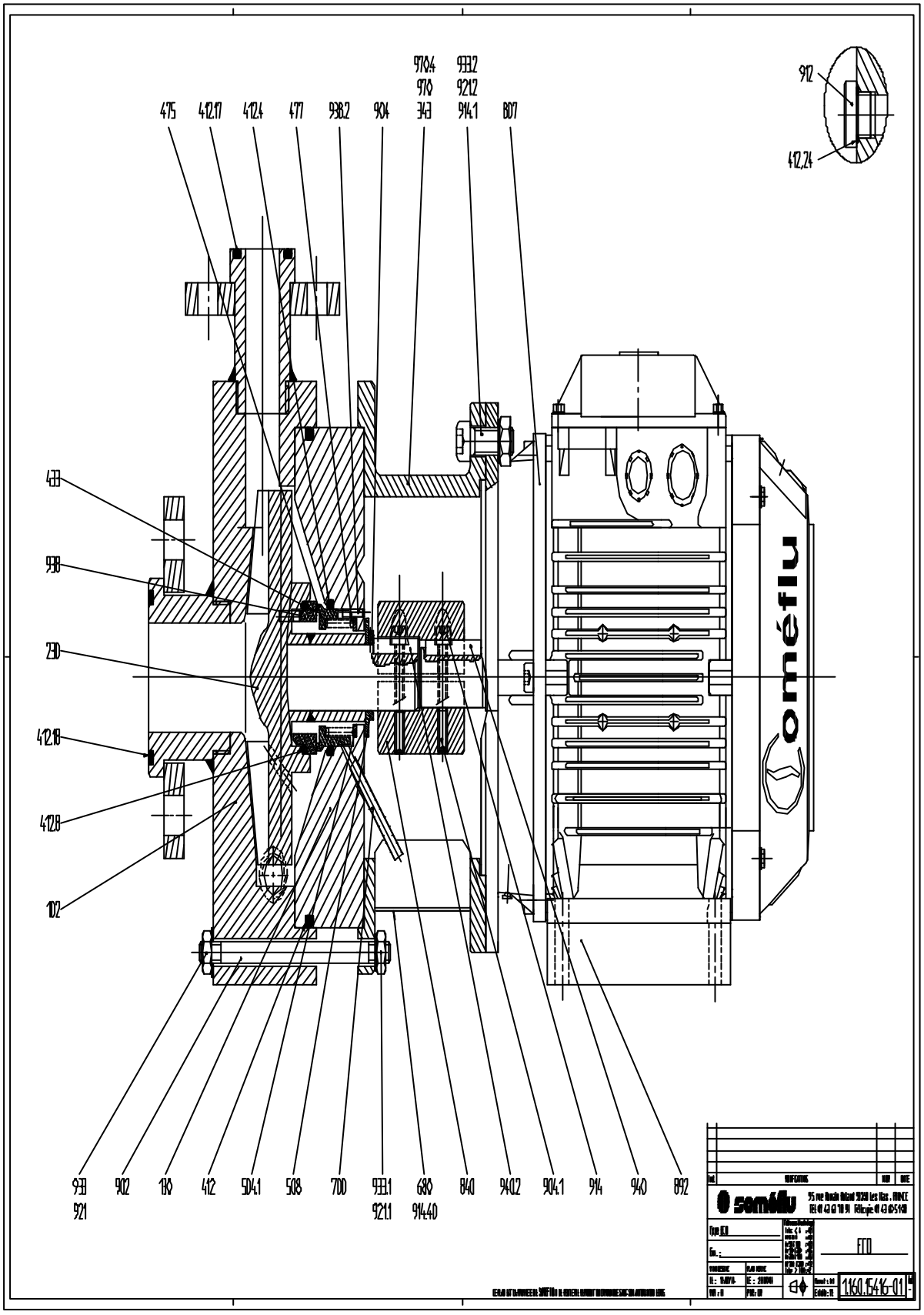
ANNEXE 3
DETERMINATION OF PIPELINES



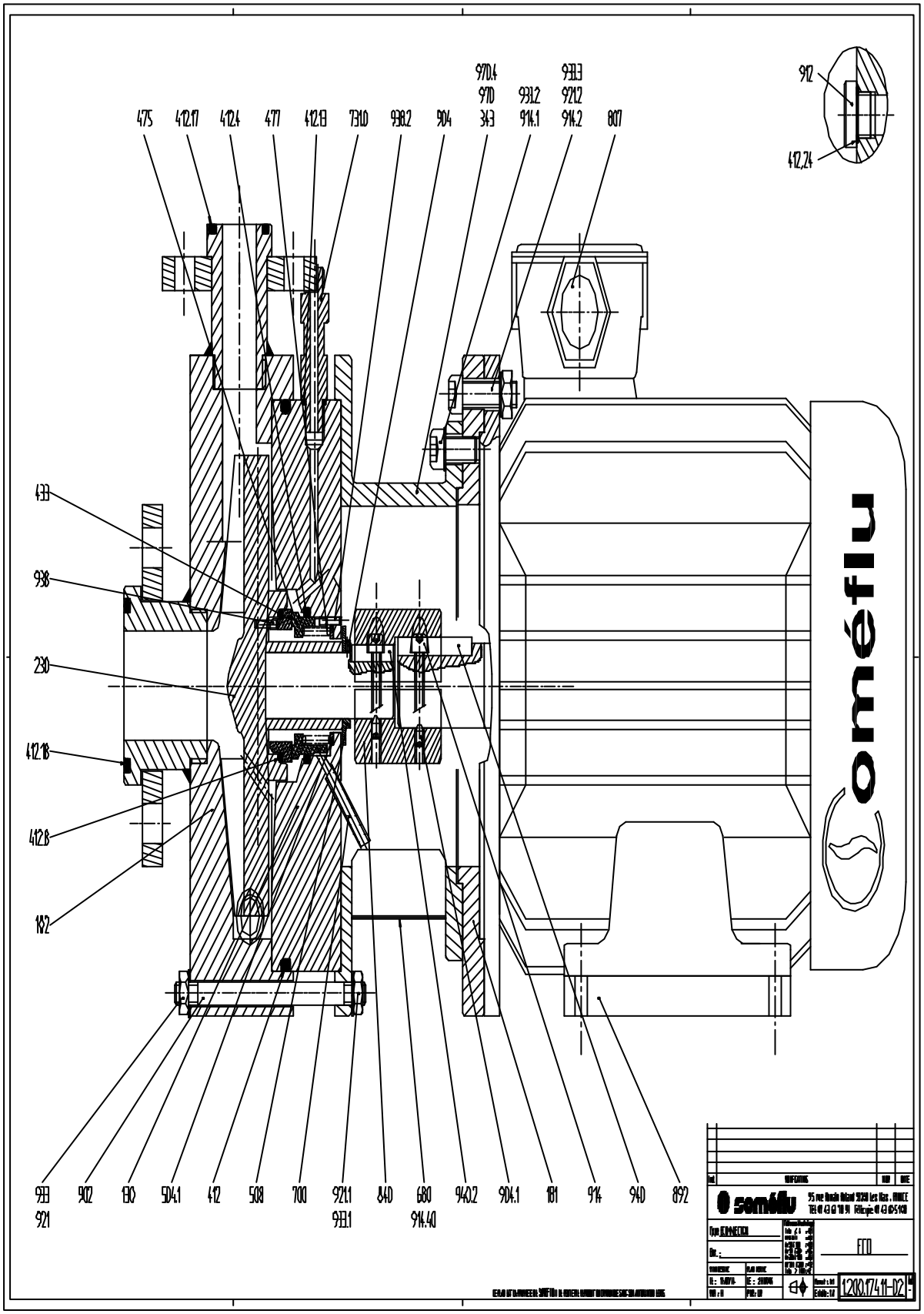
ANNEXE 4
PRESSURE LOSSES IN STRAIGHT PIPELINES



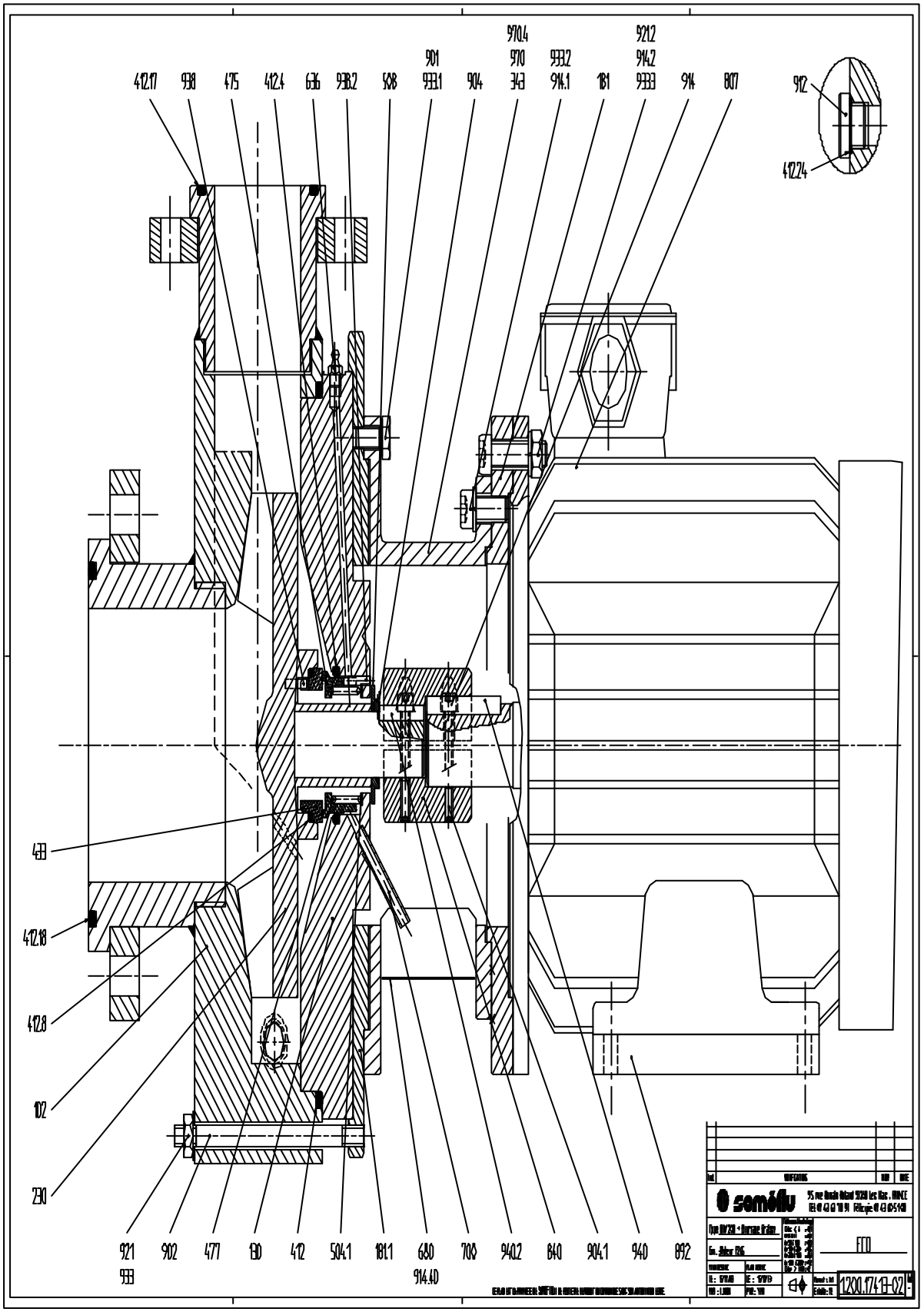
ANNEXE 5
SECTIONAL DRAWING ECO



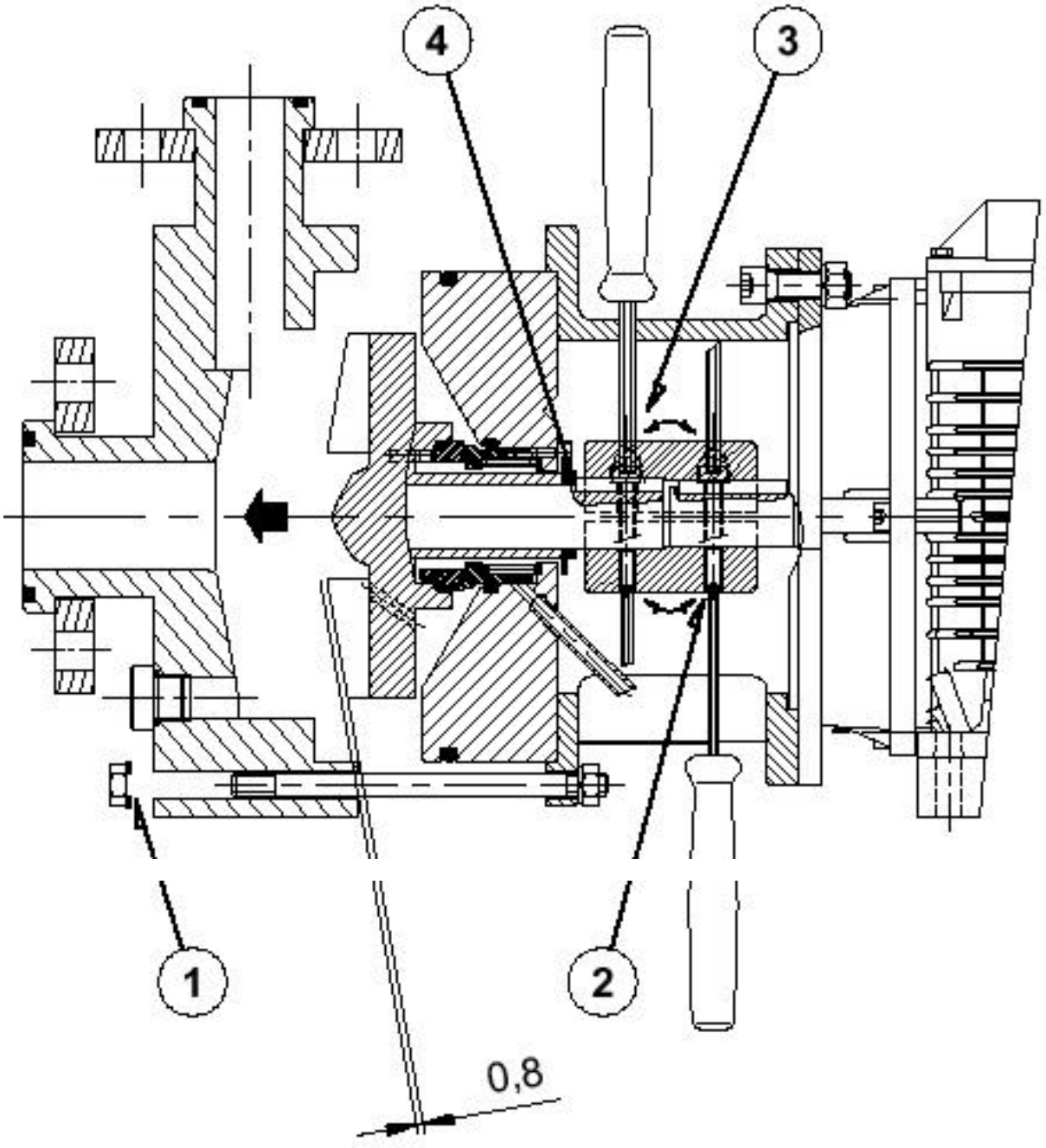
ANNEXE 6
SECTIONAL DRAWING ECO + INJECTION



ANNEXE 7
SECTIONAL DRAWING ECO + GREASE FILLING



ANNEXE 8
RE-ASSEMBLY OF A PUMP ECO



RE-ASSEMBLY : clearance 0,8 mm

3 **Tightening torque 25 to 30 Nm**

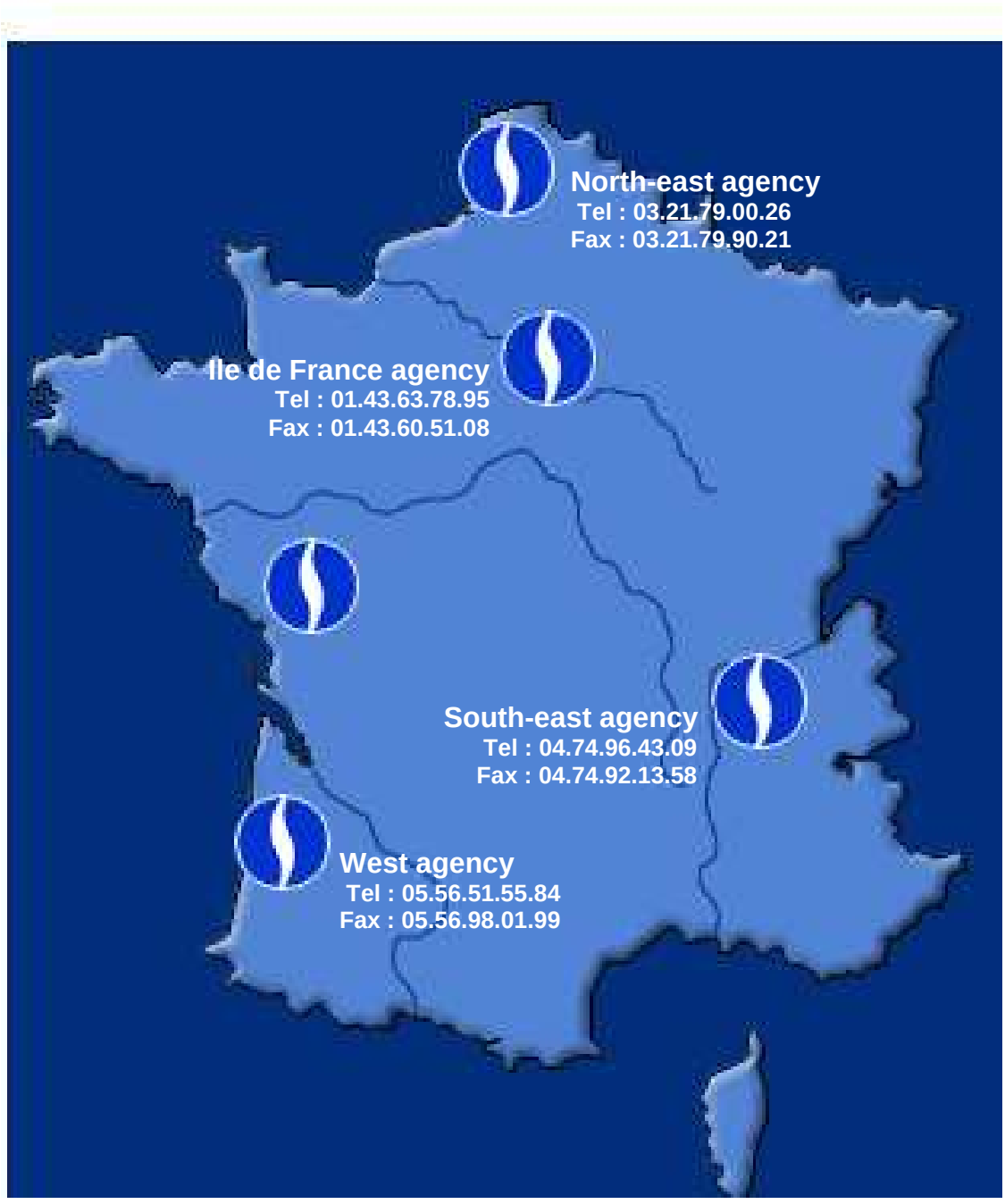
sOmeflu
pompes centrifuges autoamorcantes
B.P. 72 F 93261 Les Lilas Cedex -France-
Phone : +33 (0)1.43.63.78.95 – Fax : +33 (0)1.43.60.51.08 Web site : www.someflu.com

Notes

Notes

B.P. 72 F 93261 Les Lilas Cedex -France-
Phone : +33 (0)1.43.63.78.95 – Fax : +33 (0)1.43.60.51.08 Web site : www.someflu.com

SOMEFLU in France



SOMEFLU North-East : Centre Euralogistic 2 - Plate-forme multimodale Delta 3
62954 Hénin Beaumont Cedex

SOMEFLU Ile de France : 21 rue de Fraternité - 93170 Bagnolet

SOMEFLU South-east : 235 rue Denis Papin - 38090 Villefontaine

SOMEFLU West : 74 rue Georges Bonnac Tour 3 n°375 - 33000 Bordeaux