



## INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

# ESTAMPINOX EFH / EFN PUMP



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ISO 9001

BUREAU VERITAS  
Certification





## EC DECLARATION OF CONFORMITY

(according to Directive 98/37/CE, annex II, part A)

Manufacturer: INOXPA, S.A.  
C/ Telers, 54  
17820 Banyoles (Girona) - SPAIN

Hereby declares, that the product:

|                         |                           |                     |
|-------------------------|---------------------------|---------------------|
| <u>CENTRIFUGAL PUMP</u> | <u>ESTAMPINOX EFH/EFN</u> | <u>2009</u>         |
| Name                    | Type                      | Year of manufacture |

conforms to the specifications of the Council Directive:

**Machine Directive** 98/37/CE, and complies with the essential requirements of the Directive and Harmonised Standards:

UNE-EN ISO 12100-1/2:2003  
UNE-EN 809/AC:2001  
UNE-EN 294:1993  
UNE-EN 953:1997  
UNE-EN 563/A1/AC:2000

**Low Voltage Directive** 2006/95/EC (what repeal 73/23/EEC Directive), and are conforms with UNE-EN 60204-1:1997 and UNE-EN 60034-1/A11:2002


**EMC Directive** 2004/108/EC (what repeal 89/336/EEC Directive), and are conforms with UNE-EN 60034-1/A11:2002

In compliance with the Regulations (CE) nº 1935/2004, relating to materials and articles intended to come into contact with foodstuff (repeal Directive 89/109/CEE), the materials in contact with the product do not transfer their components in quantities which may jeopardise consumer's health or safety

**Declaration of Incorporation** (Directive 98/37/CE, annex II, part B):

**The equipments above mentioned won't put to operation till the machine into or onto it will be installed must comply with the stipulations of the Machine Directive.**

Banyoles, February 2009

  
Marc Pons Bague    Technical Manager

# 1. Safety

## 1.1. INSTRUCTION MANUAL

This instruction manual contains information on the reception, installation, operation, fitting, stripping and maintenance for the ESTAMPINOX EFH-EFN pump.

The information given herein is based on the most up-to-date data available.

INOXPA reserves the right to modify this instructions manual without having to give prior notice.

## 1.2. START-UP INSTRUCTIONS

This instruction manual contains vital and useful information for properly operating the pump and for keeping it in good running condition.

Not only should the safety instructions set forth in this chapter be carefully read before putting the pump into operation, but those concerned must also familiarise themselves with the operating features of the pump and strictly adhere to the instructions given herein. It is extremely important that these instructions be kept in a set place near the installation.

## 1.3. SAFETY

### 1.3.1. Warning signs



Danger for people in general.



Danger of injury caused by rotating parts of the equipment.



Danger! Electricity.



Danger! Caustic or corrosive agents.



Danger! Suspended loads.



Danger to the proper operating of the machine.



Obligation to ensure safety at work.



Use of safety goggles obligatory.

## 1.4. GENERAL SAFETY INSTRUCTIONS



Please read the instruction manual carefully before installing and commissioning the pump. Should you have any doubts or queries, contact INOXPA.

### 1.4.1. During the installation



You must always bear in mind the *Technical Specifications* set forth in Chapter 8.

Do not put the pump into operation before connecting it to the pipes.

Do not put the pump into operation if the cover of the pump has not been fitted and the impeller fixed in the pump.

Check that the motor specifications are correct, especially if there is a special risk of explosion due to the work conditions.



During the installation procedure, all the electrical work must be carried out by duly authorised personnel.

### 1.4.2. During operation



You must always bear in mind the *Technical Specifications* set forth in Chapter 8. The limit values that have been set must NEVER be exceeded.

NEVER touch the pump or pipes whenever the pump is being used to decant hot liquids or during the cleaning procedure.



The pump has moving parts. Do not put your fingers into the pump when it is operating.



NEVER work with the suction and the delivery valves shut off.

NEVER directly sprinkle the electric motor with water. Standard motor protection is IP-55: dust and water sprinkling protection.

#### 1.4.3. During maintenance



You must always bear in mind the *Technical Specifications* set forth in Chapter 8.

NEVER strip the pump down until the pipes have been drained. Remember that there will always be some liquid left in the pump casing (if it has not been fitted with a drain). Always remember that the liquid that has been pumped may be dangerous or subject to high temperatures. For situations of this type, please consult the prevailing regulations in the country in question.

Do not leave loose parts on the floor.



ALWAYS turn the power supply to the pump off before embarking on maintenance work. Take out the fuses and disconnect the wires from the motor terminals.

All electrical work must be carried out by duly authorised personnel.

#### 1.4.4. In accordance with the instructions

Any failure to comply with the instructions could lead to a hazard for the operators, the atmospheric conditions of the room, and the machine, and it could lead to a loss to any right to make a claim for damages.

Such non-compliance could bring with it the following risks:

- Important operating failures of the machine / plant.
- Failure to comply with specific maintenance and repair procedures.
- Potential electrical, mechanical and chemical hazards.
- Atmospheric conditions in the room could be hazardous due to the release of chemical substances.

#### 1.4.5. Warranty

We wish to point out that any warranty issued will be null and void and that we are entitled to an indemnity for any civil liability claim for products which might be filed by third parties if:

- Operation and maintenance work has not been done following the corresponding instructions; the repairs have not been made by our personnel or have been made without our written authorization;
- Modifications are made to our material without prior written authorization;
- The parts or lubricants used are not original INOXPA parts/lubricants;
- The material has been improperly used due to error or negligence or have not been used according to the indications and the intended purpose.
- The parts of the pump have been damaged as a result of having been exposed to strong pressure as there was no pressure relief valve.

The General Delivery Terms which you have already received are also applicable.



No modification can be made to the machine without the prior consent of the manufacturer. For your safety, use spare parts and original accessories. The use of other parts exempts the manufacturer from any and all responsibility.

Any change in operating conditions can only be done with the prior written consent of INOXPA.

In the event of doubt or should you require a fuller explanation on particular data (adjustment, assembly, disassembly...), please do not hesitate to contact us

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# 3. General Information

## 3.1. DESCRIPTION

INOXPA ESTAMPINOX EFH-EFN series centrifugal pumps have designed for to pump water and compatible liquids with AISI 316L stainless steel.

The ESTAMPINOX series has been designed to meet the auxiliary services in the Food, Chemical, Oenological Industries.

The impeller is of open design and made of one single piece. The friction surfaces mechanical seal are ceramic, graphite and NBR o-rings in standard version.

Constructive options more significant for this pumps are:

- \* pump with trolley

- \* control panel with stop/start, contactor and emergency stop push button

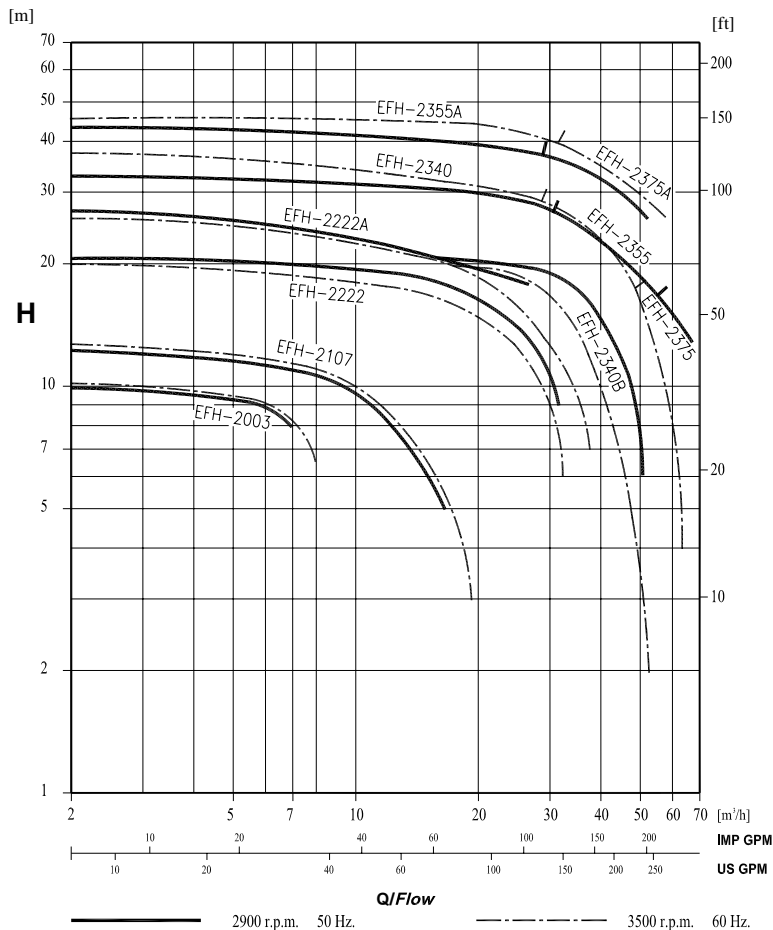
EFH: Motor IEC. IP-55 protection. Class-F insulation. Three-phased power supply with 220-240 / 380-420 V at 50Hz. 1450 or 2900 rpm.

EFN: Motor NEMA. IP-55 protection. Class-F insulation. Three-phased power supply with 220-440 V at 60Hz. 1750 or 3500 rpm.

This equipment is suitable for his use in food process.

## 3.2. FIELD OF APPLICATION

T



Each pump has a limited field of application. The pump in question was selected for certain pumping conditions at the time the order was made. INOXPA is not liable for any damages that might arise if the information furnished by the purchaser is incomplete (nature of the liquid, RPM...).

# 4. Installation

## 4.1. PUMP RECEPTION

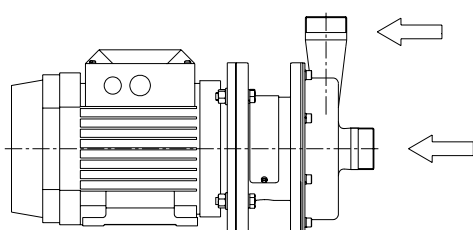


INOXPA is not responsible for any deterioration of the material as a result of its transportation or unpacking. Visually check that the packing has not suffered any damage.

The pump will be accompanied by the following documentation:


- Dispatch notes.
- Pump Instruction and Service Manual.
- Motor Instruction and Service Manual (\*).
- (\*) If the pump has been supplied with a motor from INOXPA.

Unpack the pump and check the following:



- The pump suction and delivery connections, removing the remains of any packing material.
- Check that the pump and the motor have not suffered any damage.
- Should the pump not be in proper condition and/or does not have all the parts, the haulier must draw up a report as soon as possible with regard to the same.

### 4.1.1. Pump identification and marking

|   |  |  |                         |
|---|--|--|-------------------------|
|  |  | INOXPA S.A.<br>C. Telers, 54 · P.O. BOX 174<br>17820 BANYOLES · GIRONA (SPAIN)<br>Tel. 972 57 52 00 · Fax 972 57 55 02 | CE                      |
| TIPO <input type="text"/>   |  | AÑO <input type="text"/>   | Serial number           |
| KW <input type="text"/>   | min <sup>-1</sup> <input type="text"/> | N° <input type="text"/>  |                         |
| QM <sup>3</sup> /h <input type="text"/>   | Hm <input type="text"/>                | V <input type="text"/>   | Hz <input type="text"/> |
| øRODETE <input type="text"/>  |  |  |                         |

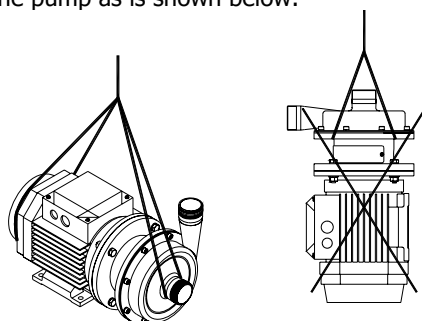
Pump plate

## 4.2. TRANSPORT AND STORAGE



ESTAMPINOX EFH-EFN pumps are quite often too heavy to be put into their storage space manually.

Lift the pump as is shown below:



Never lift the plant raising it by the pump.

#### 4.3. LOCATION

- Position the pump as near as possible to the suction tank, and whenever possible below the level of the liquid.
- Place the pump in such a way that there is enough space around it to provide access both to the same and to the motor. (See Chapter 8. *Technical Specifications* to consult dimensions and weights).
- Place the pump on a level and flat surface.



**Install the pump in such a way that it can be properly ventilated. If the pump is to be installed outside, it must be done so under cover. Its positioning must enable easy access for any inspection and maintenance operations that may need to be carried out.**

#### 4.4. PIPES

- In general, suction and delivery pipes should be fitted in straight stretches, with the minimum amount of elbows and accessories, in order to reduce, as far as possible, any load loss that might be produced by friction.
- Make sure that the pump mouths are well aligned with respect to the piping, and that they are similar in diameter to that of the pipe connections.
- Position the pump as near as possible to the suction tank, and whenever possible below the level of the liquid, or even lower with respect to the tank in order for the static suction head to be at its maximum.
- Place brackets for the piping as near as possible to the suction and delivery mouths of the pump.

#### 4.5. SHUT-OFF VALVES

The pump can be isolated for the purpose of carrying out maintenance work. To this end, shut-off valves should be fitted at the pump's suction and delivery connections.

These valves must ALWAYS be open whenever the pump is operating.

#### 4.6. ELECTRICAL INSTALLATION



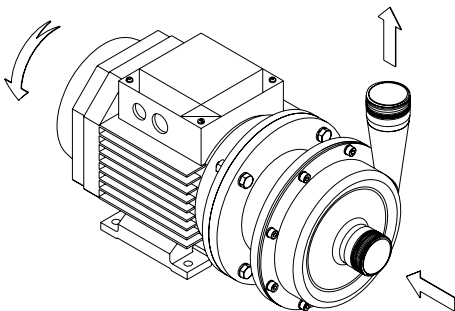
**Leave the connecting of the electrical motors to qualified personnel. Take the necessary measures to prevent any breakdowns in the connections and wires.**



**The electrical equipment, the terminals and the components of the control systems may still carry an electric charge even when disconnected. Contact with them may put the safety of operators at risk, or cause irreparable damage to the material.**

**Before manoeuvring the pump, make sure that the electric box is switched off.**

- Connect the motor in accordance with the instructions supplied by the manufacturer of the same.
- Check the direction of the rotation (see the signaling label on the pump).



Put the pump motor into operation momentarily. Make sure, by looking at the pump from the rear, that the motor's ventilator is rotating in a clockwise direction.



**NEVER check the direction of the motor's rotation with liquid inside the pump.**

# 5. Start-up



Before putting the pump into operation read carefully the instructions on installation given in Chapter 4. *Installation*.

## 5.1. START-UP



Read Chapter 8. *Technical Specifications* carefully. INOXPA will not assume responsibility for any improper or incorrect use of the equipment.



Do not touch the pump or the piping while it is pumping products at a high temperature.

### 5.1.1. Checks to be carried out before putting the pump into operation

- Completely open the pipes' suction and delivery shut-off valves.
- If the liquid fails to flow toward the pump, fill it with the liquid to be pumped.



The pump must **NEVER** rotate without liquid.

- Check that the rotation direction of the motor is correct.

### 5.1.2. Checks to be carried out on putting the pump into operation

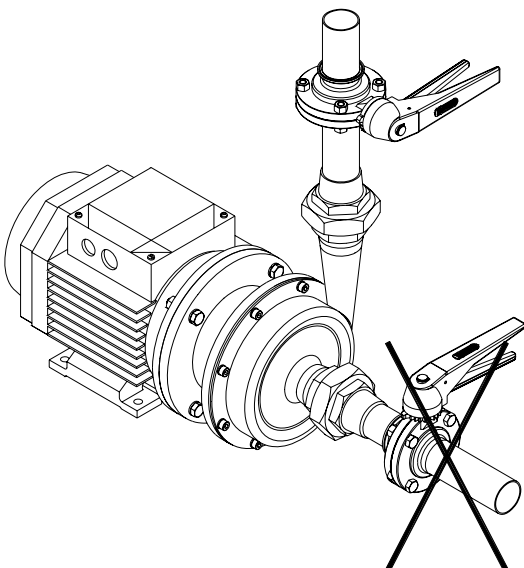
- Check to make sure that the pump is not making any strange noises.
- Check to see if the absolute inlet pressure is sufficient, in order to avoid cavitations in the pump. Consult the curve for the minimum required pressure above the steam pressure (NPIP<sub>r</sub>).
- Monitor the delivery pressure.
- Check that there are no leaks in the sealed areas.



A shut-off valve should not be used in the suction pipe to regulate the flow rate. It must be completely open during operation.



Monitor motor consumption in order to avoid a circuit overload.



Reduce the flow and the power consumed by the motor:

- Regulating the flow to the pump delivery.
- Decreasing motor speed.

## 6. Operating problems

The table given below provides solutions to problems that might arise during pump operation. With respect to the same, it is assumed that the pump has been properly installed and has been correctly selected for the application in question. Should there be a need for technical service please contact INOXPA.

| Operating problems                          | Probable causes                  |
|---|----------------------------------|
| Overloading of motor.                       | 8, 9, 13.                        |
| Insufficient flow rate or pressure in pump. | 1, 2, 4, 5, 7, 9, 10, 15, 17.    |
| No pressure on the discharge side.          | 2, 3, 6, 16.                     |
| Irregular discharge flow rate / pressure.   | 1, 2, 4, 5, 6, 9.                |
| Noise and vibrations.                       | 2, 4, 5, 6, 7, 8, 9, 10, 13, 14. |
| The pump gets clogged.                      | 9, 10, 13.                       |
| Overheating of the pump.                    | 8, 9, 10, 13.                    |
| Abnormal wear.                              | 4, 5, 10.                        |
| Leak in mechanical seal.                    | 11, 12.                          |

| Probable causes                                  | Solutions  |
|--|--|
| 1 Wrong rotation direction.                      | Change the direction of the rotation.  |
| 2 Insufficient NPIP.                             | Increase the NPIP available:<br>- Raise the suction tank.<br>- Lower the pump.<br>- Increase the diameter of the suction piping.<br>- Shorten and simplify the suction piping. |
| 3 Non-purged pump.                               | Purge or fill.   |
| 4 Cavitation.                                    | Increase the suction pressure.( See Number 2 also)   |
| 5 The pump is sucking air.                       | Check the suction piping and all of its connections.   |
| 6 Obstructed suction piping.                     | Check the suction piping.  |
| 7 Delivery pressure is too high.                 | If necessary, decrease the load losses by increasing the diameter of the piping, for example.  |
| 8 Flow is too high.                              | Decrease the flow:<br>- Reduce the flow by means of a diaphragm.<br>- Partially close off the delivery valve.<br>- Decrease the speed.   |
| 9 The viscosity of the liquid is too high.       | Decrease the viscosity by heating the liquid or increasing the diameter of the piping, for example.  |
| 10 The temperature of the liquid is too high.    | Decrease the temperature of the liquid by cooling it.  |
| 11 Mechanical seal either damaged or worn.       | Replace the seal.  |
| 12 Unsuitable O-ring for the liquid in question. | Fit more suitable O-ring by consulting the supplier with respect to the same.  |
| 13 The impeller is rubbing.                      | - Lower the temperature.<br>- Lower suction pressure.  |
| 14 Pressure in the pipes.                        | Connect the pipes to the pump without pressure.  |
| 15 The pump speed is too low.                    | Increase the speed.  |
| 16 The suction shutoff valve is closed.          | Check and open.  |
| 17 Delivery pressure is too low.                 | Increase pump speed.   |



**If the problems persist stop using the pump immediately. Contact the pump manufacturer or his representative.**

# 7. Maintenance

## 7.1. GENERAL MAINTENANCE

This pump, as with any other machine, needs to be maintained. The instructions contained in this manual deal with the identification and replacement of the spare parts. These instructions have been drawn up by maintenance staff and are destined for those people who are responsible for supplying spare parts.



Read carefully Chapter 8. *Technical specifications*.

All the parts or materials that are changed must be duly eliminated/recycled in accordance with the prevailing directives in each area.



ALWAYS disconnect the pump before starting out on any maintenance work.

### 7.1.1. Check the mechanical seal

Periodically check that there are no leaks in the shaft area. Should there be any leaks in the mechanical seal area, replace the same pursuant to the instructions given in the section entitled *Stripping and Assembly* of the pump.

## 7.2. STORAGE

Before being stored the pump must be completely emptied of liquids. Avoid, as far as possible, the exposure of the parts to excessively damp atmospheres.

## 7.3. CLEANING



The use of aggressive cleaning products such as caustic soda and nitric acid may give rise to skin burns.

Use rubber gloves during the cleaning process.



Always use protective goggles.

### 7.3.1. Automatic CIP (cleaning-in-place)

If the pump is installed in a system fitted with a CIP process, there will be no need for stripping.

If it is not fitted with an automatic cleaning process, strip the pump pursuant to the instructions given in the section entitled *Stripping and Assembly* of the pump.

#### Cleaning solutions for CIP processes.

Only use clear water (chloride free) to mix with the cleaning agents:

**a) Alkaline solution:** 1% in weight of caustic soda (NaOH) to 70°C (150°F)

1 Kg NaOH + 100 l. water = cleaning solution

or

2.2 l. NaOH at 33% + 100 l. of water = cleaning solution

**b) Acid solution:** 0.5% in weight of nitric acid (HNO<sub>3</sub>) to 70°C (150°F)

0.7 liters HNO<sub>3</sub> to 53% + 100 l. water = cleaning solution



Monitor the concentration of cleaning solutions, it could give rise to the deterioration of the pump sealing gaskets.

In order to remove any remains of cleaning products, ALWAYS rinse the element in question with clean water after completing the cleaning process.

### 7.3.2. Automatic SIP (sterilization-in-place)

The process of sterilization with steam is applied to all the equipment including the pump.



**Do NOT start the pump during the process of sterilization with steam. The parts/materials suffer no damage if the indications specified in this manual are observed.**

**No cold liquid can enter the pump till the temperature of the pump is lower than 60°C (140°F).**

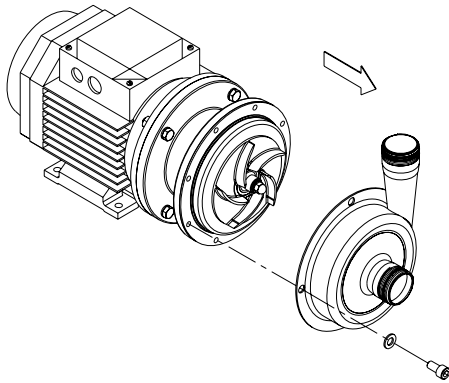
**A flow by-pass is recommended to be used in order to assure the flow of sterile product after the pump.**

#### Maximum conditions during the SIP process with steam or overheated water

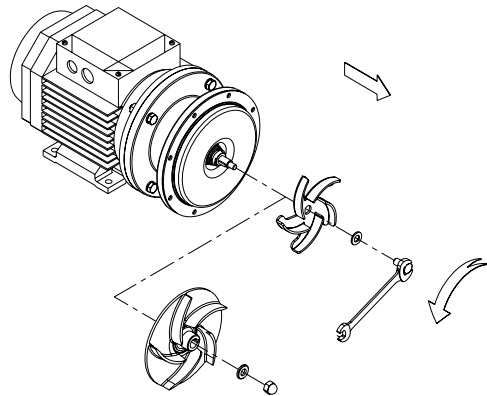
|    |                   |  |
|----|-------------------|--|
| a) | Max. temperature: | 140°C / 284°F  |
| b) | Max. time:        | 30 min   |
| c) | Cooling:          | Sterile air or inert gas                                 |
| d) | Materials:        | EPDM / PTFE (recommended)<br>FPM / NBR (not recommended) |

### 7.4. PUMP DISASSEMBLY

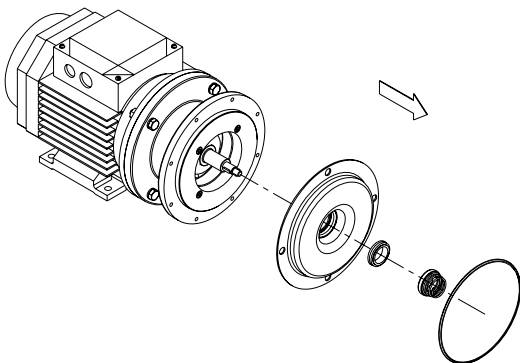
- ❶ Remove the screws (51), nuts (54), washers (53A), and take out the housing (01)



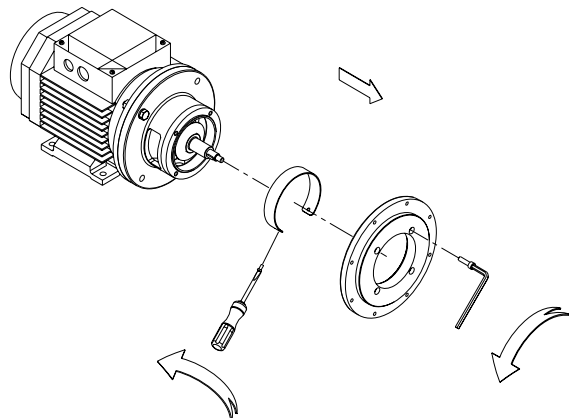
- ❷ Loosen the hexagonal screw (52A) of the pump impeller (02) with a fixed wrench while holding the impeller at the same time so that it does not turn. Remove the washer (53) and the impeller.  
For sizes EFH-2340 up to 2375A, loosen the blind nut (54B) while holding the impeller at the same time so that it does not turn, and remove the washer (35). Take out the impeller and detach the key (61).



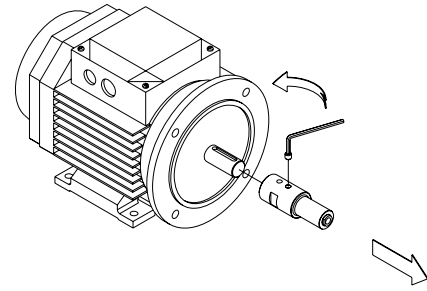
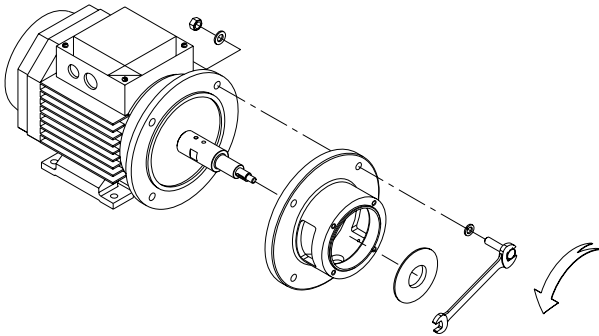
- ❸ Remove the rotary part of the mechanical seal (08) by sliding it along the shaft from the front. Then take off the pump cover (03) with the gasket (80), and the fixed part of the seal remaining housed in the cover.



- ❹ Loosen the screws of the lantern protector (50A) with a screw driver and loosen the screws of the flange (51A) with an allen key.

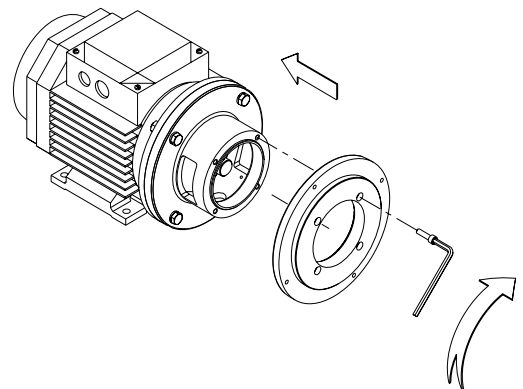
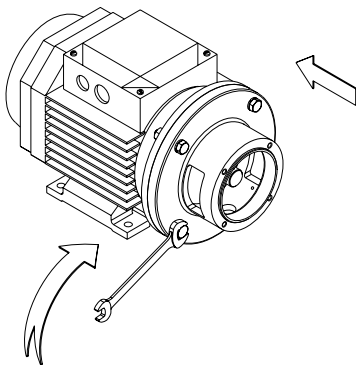


- ⑤ Remove the splashring (82). Loosen the screws (51B) with an Allen key to detach the lantern (04).
- ⑥ Loosen the pins (55) and take out the shaft (05).

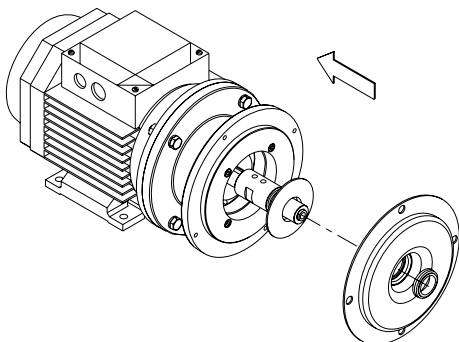


### 7.5. PUMP ASSEMBLY

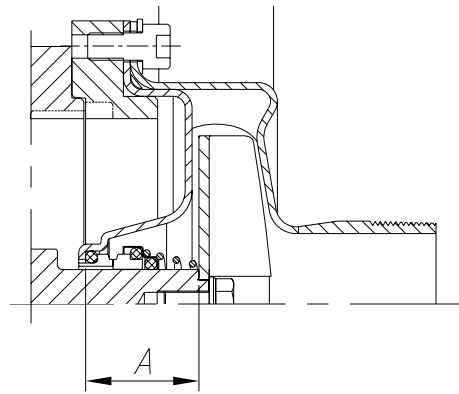
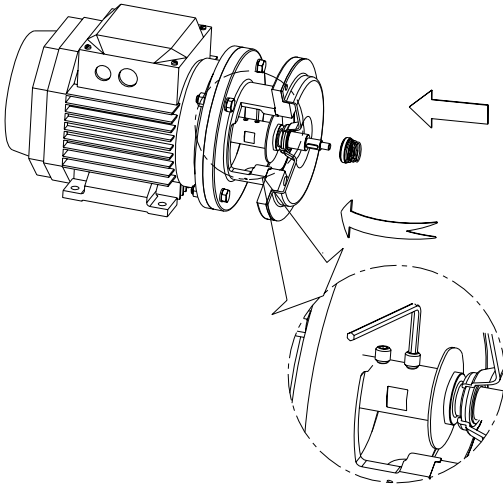
- ① Mount the lantern (04) and fix it to the motor (93) with the Allen keys (51B) and washers (53A/53B).
- ② Mount the flange (04A) to the allen screws (51A) fixing it to the lantern.



- ③ Slide the shaft (05) over the motor shaft without fixing it yet with the pins. Attach the splashring (82). Attach the pump cover (03), with the fixed part of the mechanical seal mounted in its housing, on the lantern (04).



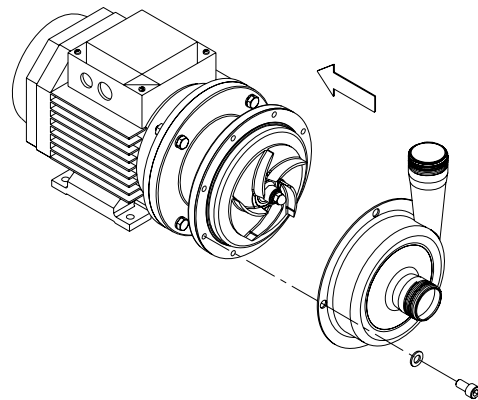
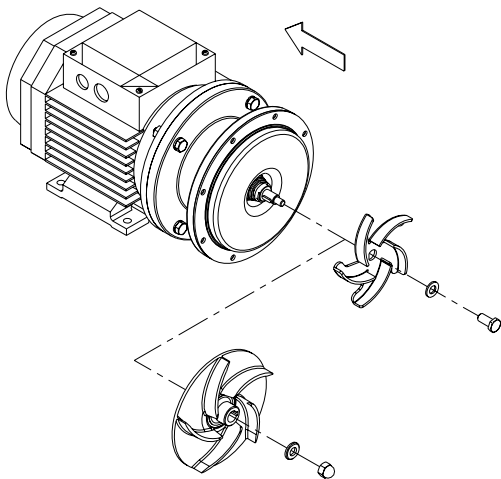
- ④ Slide the rotary part of the mechanical seal (08) along the shaft and check the assembly dimensions according to the following table. Then fix the shaft (05) with the pins (55).



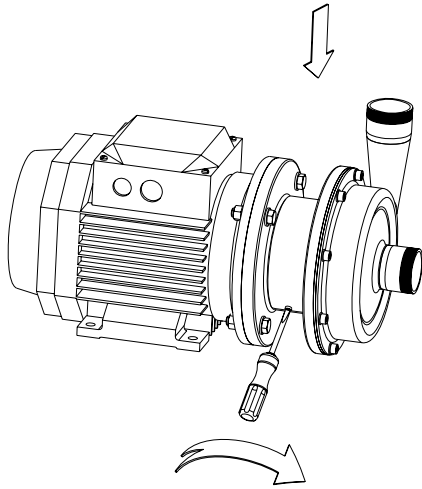
| Pump type  | A (mm.) |
|--|---------|
| EFH-2003/2107  | 33      |
| EFH-2222/2222A<br>EFH-2340/2340B<br>EFH-2355/2355B<br>EFH-2375/2375A | 35      |

- ⑤ Slide the impeller (02) over the shaft into its recess. Fix it on with the washer (53) and screw (52A) while holding the impeller (02) so that it does not turn.  
For sizes EFH-2340 up to 2375A, insert the key (61) into the shaft (05) and impeller (02), and fix it on with the washer (35) and blind nut (54B) while holding the impeller (02) so that it does not turn.

- ⑥ Place the O-ring (80) over the pump cover (03) and fit the housing (01). Fit the screws (51), washers (53A), and nuts (54).



- ⑦ Finally mount the protector (47A) to the screws (50A) with a screw driver.



**¡IMPORTANT!** When assembling the new seal, be careful and mount the parts and the O-rings with soapy water in order to allow an easy glide of the parts, either the stationary part and the rotary part on the shaft.

# 8. Technical Specifications

## 8.1. TECHNICAL SPECIFICATIONS

|                                      |   |
|--------------------------------------|---|
| Maximum suction pressure .....       | 2 bar (29 PSI)                                |
| Maximum temperature .....            | -10 °C a +90 °C (NBR)<br>14 °F a 194 °F (NBR) |
| Noise level .....                    | 60-80 dB(A)                                   |
| Suction / delivery connections ..... | GAS (BSP) (standard)                          |



**Whenever the noise level in the area of operation exceeds 85 dB(A) use special protection.**

### Materials

|  |                              |
|--|------------------------------|
| Parts in contact with the product .....              | AISI 316L                    |
| Other parts in stainless steel .....                 | AISI 304                     |
| Gaskets and joints in contact with the product ..... | EPDM and Silicone (standard) |
| Other optional joints materials .....                | Consult your supplier        |
| Surface finish .....                                 | Finish Ra 0,8                |

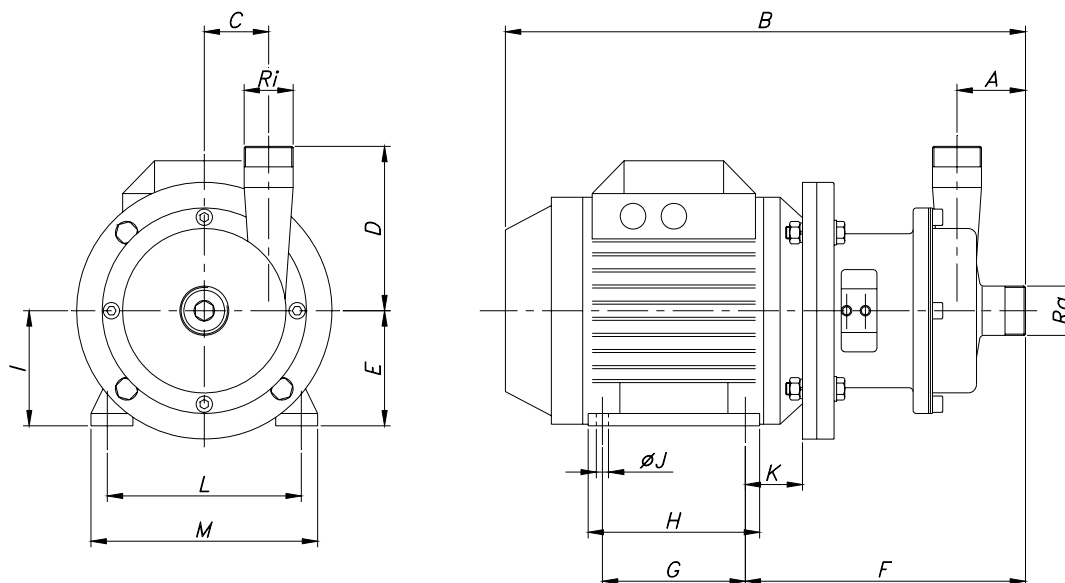
### Mechanical seal

|                               |                                 |
|-------------------------------|---------------------------------|
| Seal type .....               | Single internal mechanical seal |
| Stationary part material..... | Ceramic (standard)              |
| Rotary part material .....    | Graphite (standard)             |
| Joints material. ....         | NBR (standard)                  |

## 8.2. WEIGHTS

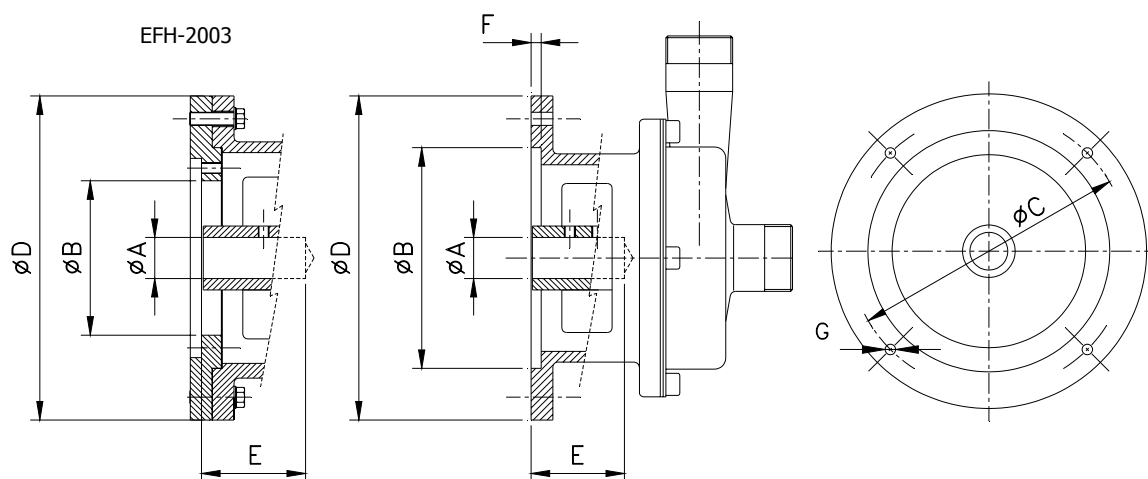
| Pump type      | weight [Kg] | weight [lbs] |
|----------------|-------------|--------------|
| EFH-2003       | 10          | 22           |
| EFH-2107       | 17          | 38           |
| EFH-2222/2222A | 30          | 66           |
| EFH-2340/2340B | 42          | 93           |
| EFH-2355/2355A | 54          | 119          |
| EFH-2375/2375A | 69          | 152          |
| EFN-2003       | 4,5         | 10           |
| EFN-2107       | 9           | 20           |
| EFN-2222/2222A | 13,5        | 30           |
| EFN-2340/2340B | 16          | 35           |
| EFN-2355/2355A | 17          | 38           |

### 8.3. ESTAMPINOX EFH DIMENSIONS



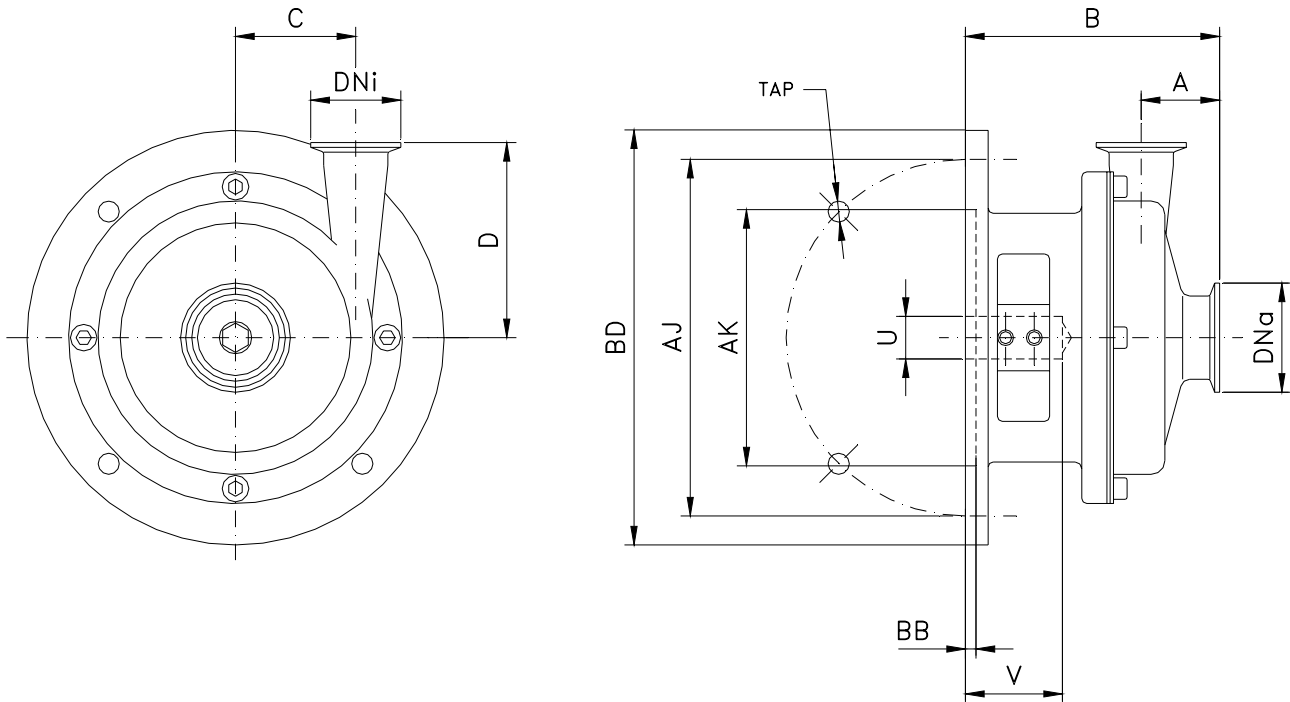
| PUMP TYPE             | Motor |      | GAS/BSP |     | A  | B   | C  | D   | E   | F   | G   | H   | I   | ØJ | K   | L   | M   |
|-----------------------|-------|------|---------|-----|----|-----|----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
|                       | Tam.  | kW   | Ra      | Ri  |    |     |    |     |     |     |     |     |     |    |     |     |     |
| EFH-2003              | 71    | 0,37 | 1"      | ¾"  | 60 | 385 | 36 | 100 | 71  | 223 | 90  | 112 | 85  | 7  | 38  | 112 | 135 |
| EFH-2107              | 80    | 0,75 | 1½"     | 1"  | 63 | 405 | 50 | 110 | 80  | 220 | 100 | 125 | 100 | 9  | 40  | 125 | 153 |
| EFH-2222<br>EFH-2222A | 90L   | 2,2  | 1½"     | 1½" | 64 | 450 | 66 | 160 | 90  | 234 | 125 | 150 | 100 | 10 | 46  | 140 | 170 |
| EFH-2340<br>EFH-2340B | 112   | 4    | 2"      | 2"  | 70 | 510 | 92 | 192 | 112 | 276 | 140 | 168 | 125 | 12 | 57  | 190 | 222 |
| EFH-2355<br>EFH-2355A | 112   | 5,5  |         |     |    | 535 |    |     |     |     |     |     |     |    |     |     |     |
| EFH-2375<br>EFH-2375A | 132   | 7,5  |         |     |    | 610 |    |     |     |     |     |     |     |    |     |     |     |
|                       |       |      |         |     |    |     |    |     | 132 | 329 | 178 | 212 | 150 | 75 | 216 | 262 |     |

### 8.4. ESTAMPINOX EFH PUMP MOTOR COUPLING DIMENSIONS



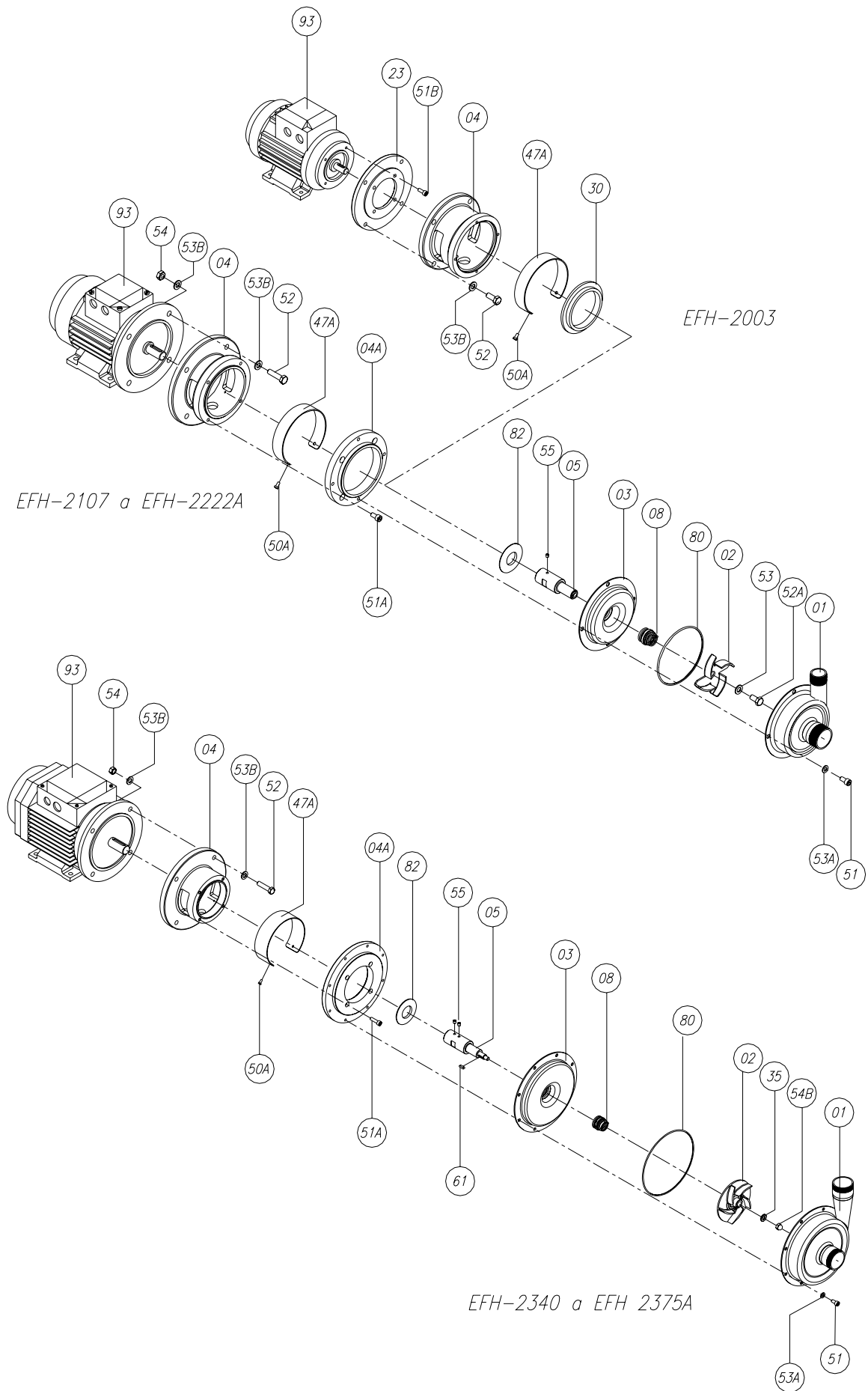
| PUMP TYPE             | Motor size | A  | B   | C   | D   | E  | F   | G  |
|-----------------------|------------|----|-----|-----|-----|----|-----|----|
| EFH-2003              | 71         | 14 | 70  | 85  | 168 | 32 | -   | 7  |
| EFH-2107              | 80         | 19 | 130 | 165 | 200 | 42 | 3,5 | 11 |
| EFH-2222<br>EFH-2222A | 90L        | 24 | 130 | 165 | 200 | 52 | 3,5 | 11 |
| EFH-2340<br>EFH-2340B | 112        | 28 | 180 | 215 | 250 | 62 | 4   | 13 |
| EFH-2355<br>EFH-2355A | 112        |    |     |     |     |    |     |    |
| EFH-2375<br>EFH-2375A | 132        |    |     |     |     |    |     |    |

### 8.5. ESTAMPINOX EFN DIMENSIONS

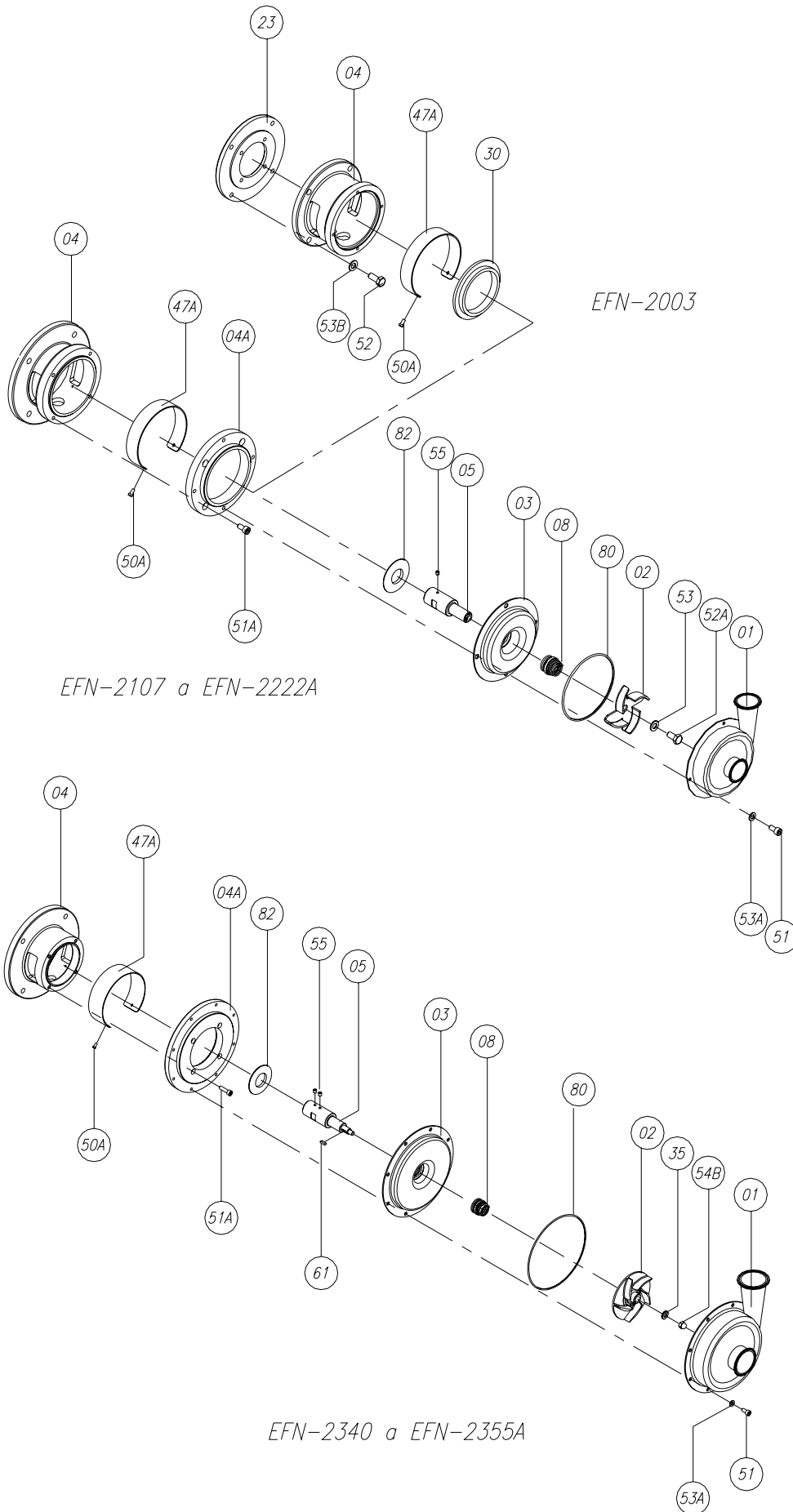


| PUMP TYPE | Motor size | GAS/BSP   |     | A   | B  | C   | D  | U   | V     | AJ | AK    | BB    | BD | TAP |    |
|-----------|------------|-----------|-----|-----|----|-----|----|-----|-------|----|-------|-------|----|-----|----|
|           |            | Ra        | Ri  |     |    |     |    |     |       |    |       |       |    |     |    |
| EFN-2003  | A          | 56C       | 1"  | 1"  | 52 | 167 | 36 | 106 | 15,88 | 55 | 149,2 | 114,3 | 4  | 168 | 11 |
|           | B          | 143/145TC |     |     |    |     |    |     | 22,23 | 56 |       |       |    |     |    |
| EFN-2107  | A          | 56C       | 1½" | 1½" | 52 | 159 | 50 | 105 | 15,88 | 55 | 149,2 | 114,3 | 4  | 168 | 11 |
|           | B          | 143/145TC |     |     |    |     |    |     | 22,23 | 56 |       |       |    |     |    |
| EFN-2222  | B          | 143/145TC | 1½" | 1½" | 54 | 166 | 66 | 122 | 28,58 | 75 | 184,2 | 215,9 | 6  | 230 | 14 |
| EFN-2222A | C          | 182/184TC |     |     |    | 185 |    |     |       |    |       |       |    |     |    |
| EFN-2340  | C          | 182/184TC | 2"  | 2"  | 54 | 190 | 92 | 156 | 34,93 | 88 | 184,2 | 215,9 | 6  | 230 | 14 |
| EFN-2340B | D          | 213/215TC |     |     |    | 208 |    |     |       |    |       |       |    |     |    |
| EFN-2355  | C          | 182/184TC |     |     |    | 190 |    |     |       |    |       |       |    |     |    |
| EFN-2355A | D          | 213/215TC |     |     |    | 208 |    |     |       |    |       |       |    |     |    |

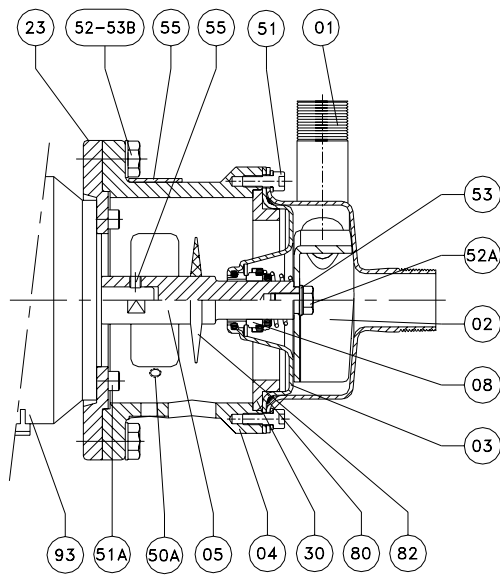
8.6. ESTAMPINOX EFH



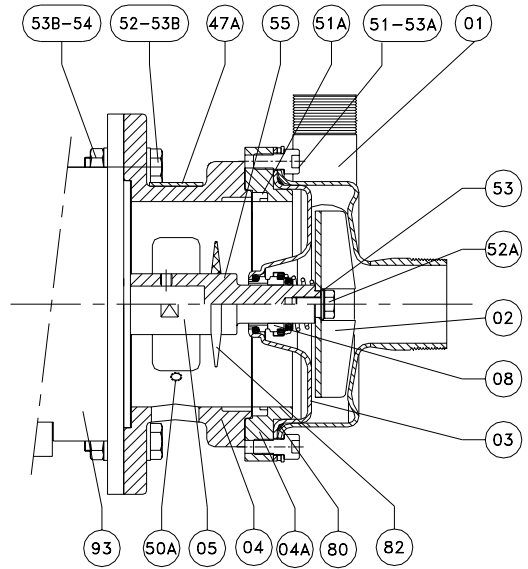
8.7. ESTAMPINOX EFN



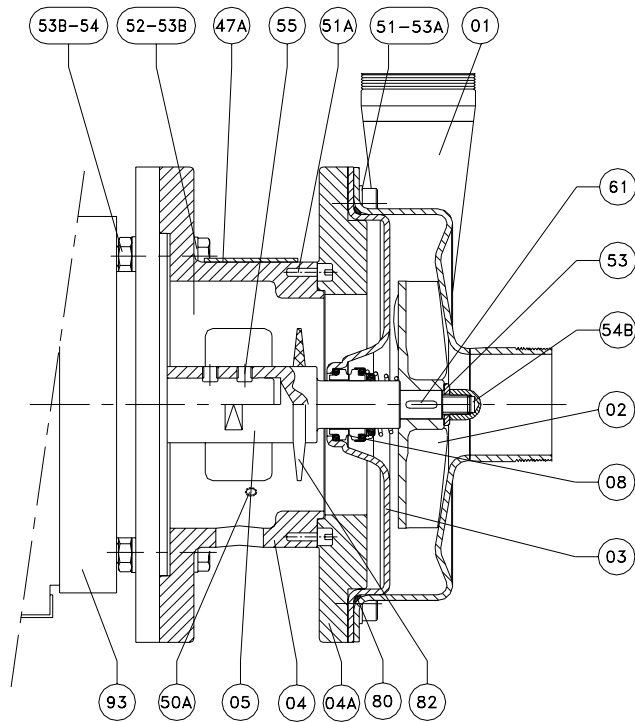
### 8.8. ESTAMPINOX EFH PUMP SECTION



*EFH-2003*



*EFH-2107 a EFH-2222A*



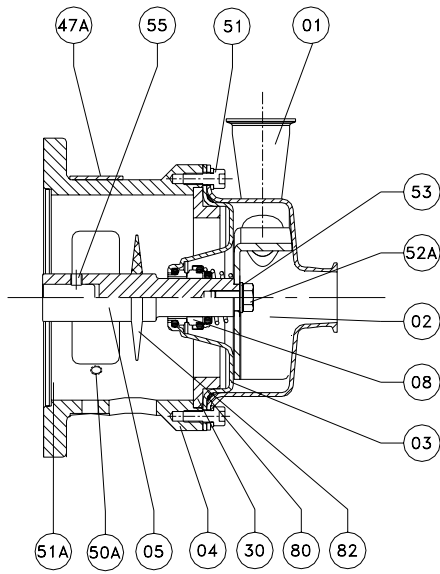
*EFH-2340 a EFH-2375A*

### 8.9. PARTS LIST ESTAMPINOX EFH PUMP

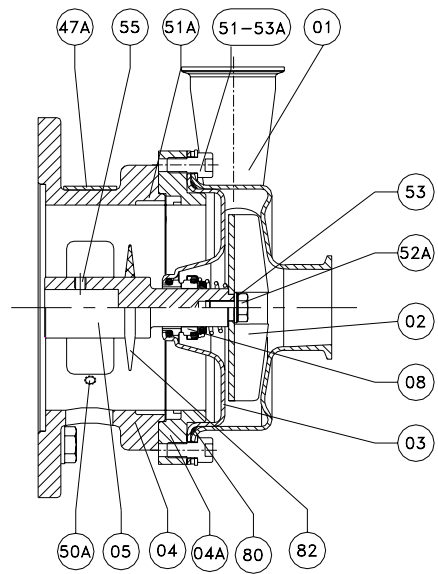
| Position | Description     | EFH-2003 | EFH-2107 | EFH-2222<br>EFH-2222A | EFH-2340<br>EFH-2340B | EFH-2355<br>EFH-2355A | EFH-2375<br>EFH-2375A | Material       |
|----------|-----------------|----------|----------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| 01       | Rotor case      | 1        | 1        | 1                     | 1                     | 1                     | 1                     | AISI 316L      |
| 02       | Impeller        | 1        | 1        | 1                     | 1                     | 1                     | 1                     | AISI 316L      |
| 03       | Pump cover      | 1        | 1        | 1                     | 1                     | 1                     | 1                     | AISI 316L      |
| 04       | Lantern         | 1        | 1        | 1                     | 1                     | 1                     | 1                     | GG 15          |
| 04A      | Lantern flange  | -        | 1        | 1                     | 1                     | 1                     | 1                     | GG 15          |
| 05       | Shaft           | 1        | 1        | 1                     | 1                     | 1                     | 1                     | AISI 316L      |
| * 08     | Mechanical seal | 1        | 1        | 1                     | 1                     | 1                     | 1                     | Ceram/Graf/NBR |
| 23       | Counter flange  | 1        | -        | -                     | -                     | -                     | -                     | GG 15          |
| 30       | Lantern ferrule | 1        | -        | -                     | -                     | -                     | -                     | GG 15          |
| 35       | Impeller washer | -        | -        | -                     | 1                     | 1                     | 1                     | A4             |
| 47A      | Protector       | 1        | 1        | 1                     | 1                     | 1                     | 1                     | Plastic        |
| 50A      | Screw           | 2        | 2        | 2                     | 2                     | 2                     | 2                     | A2             |
| 51       | Allen screw     | 4        | 4        | 4                     | 8                     | 8                     | 8                     | A2             |
| 51A      | Allen screw     | 4        | 4        | 4                     | 4                     | 4                     | 4                     | A2             |
| 52A      | Hexagonal screw | 1        | 1        | 1                     | -                     | -                     | -                     | A4             |
| 53       | Conical washer  | 1        | 1        | 1                     | -                     | -                     | -                     | A4             |
| 53A      | Spring washer   | 8        | 4        | 4                     | 12                    | 12                    | 12                    | A2             |
| 53B      | Spring washer   | -        | 8        | 8                     | 8                     | 8                     | 8                     | A2             |
| 54       | Hexagonal nut   | 4        | 4        | 4                     | 4                     | 4                     | 4                     | A2             |
| 54B      | Blind nut       | -        | -        | -                     | 1                     | 1                     | 1                     | A4             |
| 55       | Pin             | 1        | 1        | 2                     | 2                     | 2                     | 2                     | A2             |
| 61       | Key             | -        | -        | -                     | 1                     | 1                     | 1                     | AISI 316L      |
| * 80     | O-ring          | 1        | 1        | 1                     | 1                     | 1                     | 1                     | Silicone       |
| 82       | Splash ring     | 1        | 1        | 1                     | 1                     | 1                     | 1                     | EPDM           |
| 93       | Motor           | 1        | 1        | 1                     | 1                     | 1                     | 1                     | -              |

(\*) Spare parts recommended

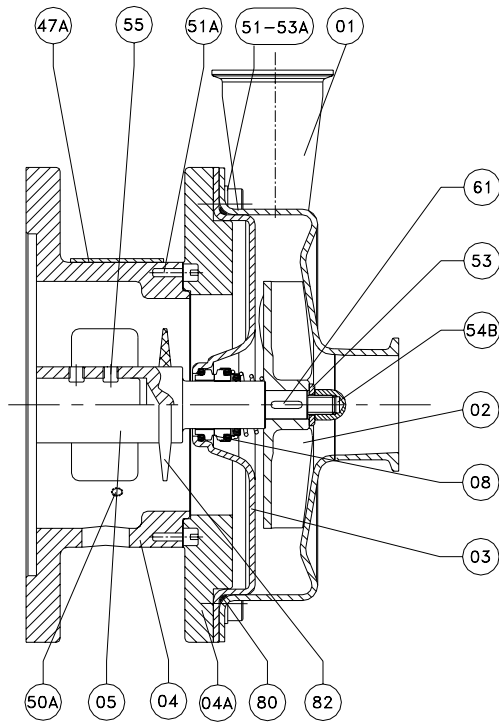
**8.10. ESTAMPINOX EFN PUMP SECTION**



*EFN-2003*



*EFN-2107 a EFN-2222A*



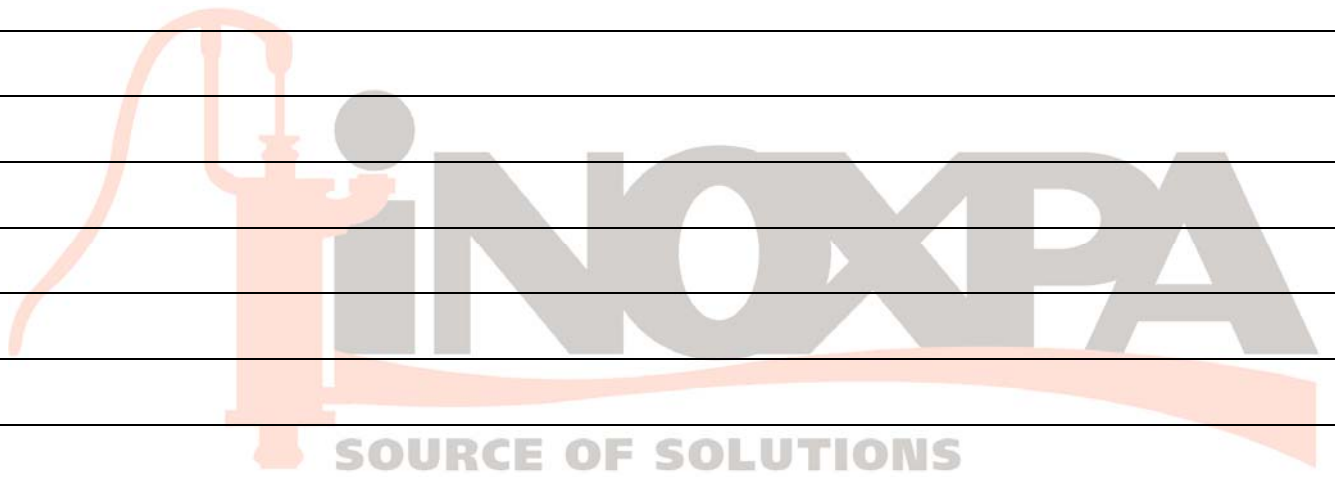
*EFN-2340 a EFN-2355A*

**8.11. PARTS LIST ESTAMPINOX EFN PUMP**

| Position | Description     | EFN-2003 | EFN-2107 | EFN-2222<br>EFN-2222A | EFN-2340<br>EFN-2340B | EFN-2355<br>EFN-2355A | Material       |
|----------|-----------------|----------|----------|-----------------------|-----------------------|-----------------------|----------------|
| 01       | Rotor case      | 1        | 1        | 1                     | 1                     | 1                     | AISI 316L      |
| 02       | Impeller        | 1        | 1        | 1                     | 1                     | 1                     | AISI 316L      |
| 03       | Pump cover      | 1        | 1        | 1                     | 1                     | 1                     | AISI 316L      |
| 04       | Lantern         | 1        | 1        | 1                     | 1                     | 1                     | GG 15          |
| 04A      | Lantern flange  | -        | 1        | 1                     | 1                     | 1                     | GG 15          |
| * 05     | Shaft           | 1        | 1        | 1                     | 1                     | 1                     | AISI 316L      |
| 08       | Mechanical seal | 1        | 1        | 1                     | 1                     | 1                     | Ceram/Graf/NBR |
| 30       | Lantern ferrule | 1        | -        | -                     | -                     | -                     | GG 15          |
| 35       | Impeller washer | -        | -        | -                     | 1                     | 1                     | A4             |
| 47A      | Protector       | 1        | 1        | 1                     | 1                     | 1                     | Plastic        |
| 50A      | Screw           | 2        | 2        | 2                     | 2                     | 2                     | A2             |
| 51       | Allen screw     | 4        | 4        | 4                     | 8                     | 8                     | A2             |
| 51A      | Allen screw     | -        | 4        | 4                     | 4                     | 4                     | 8.8            |
| 52A      | Hexagonal screw | 1        | 1        | 1                     | -                     | -                     | AISI 316L      |
| 53       | Conical washer  | 1        | 1        | 1                     | 1                     | 1                     | AISI 316L      |
| 53A      | Spring washer   | 4        | 4        | 4                     | 8                     | 8                     | A2             |
| 54B      | Blind nut       | -        | -        | -                     | 1                     | 1                     | A4             |
| 55       | Pin             | 2        | 1        | 2                     | 2                     | 2                     | A2             |
| 61       | Key             | -        | -        | -                     | 1                     | 1                     | AISI 316L      |
| * 80     | O-ring          | 1        | 1        | 1                     | 1                     | 1                     | Silicone       |
| 82       | Splash ring     | 1        | 1        | 1                     | 1                     | 1                     | EPDM           |

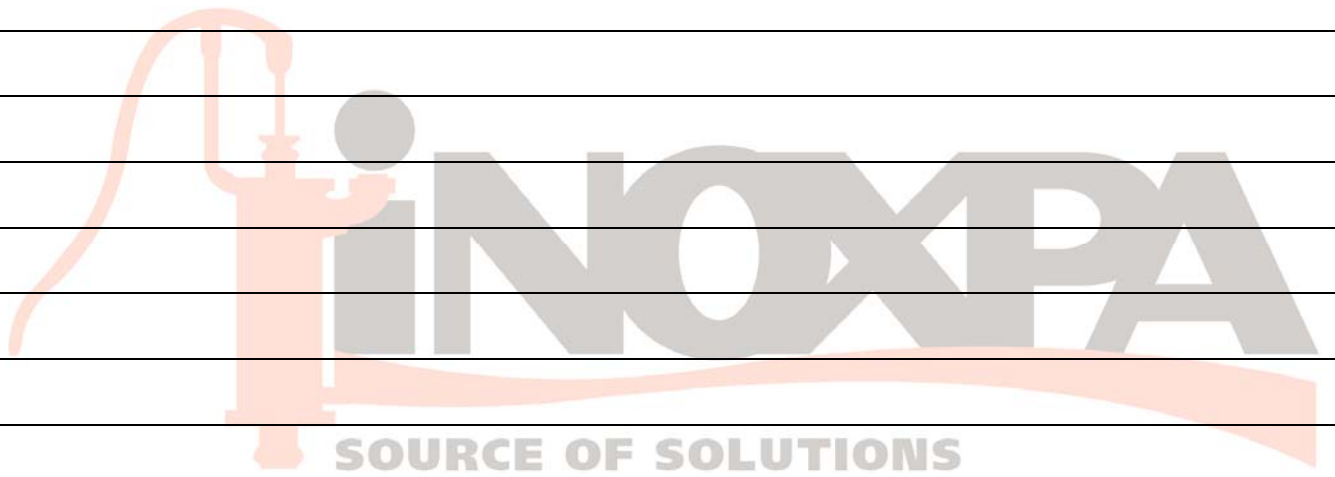
(\*) Spare parts recommended

NOTES





NOTES



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