INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

ESTAMPINOX EFI

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CE

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:

CENTRIFUGAL PUMP	ESTAMPINOX EFI	2009
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/CEE 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/CEE 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 EFI 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

2. Index

3. General Information

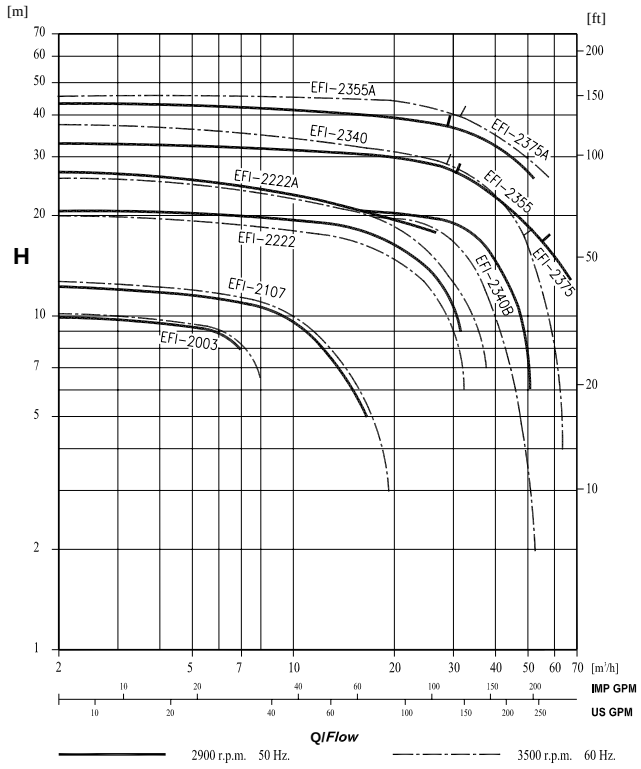
3.1. DESCRIPTION

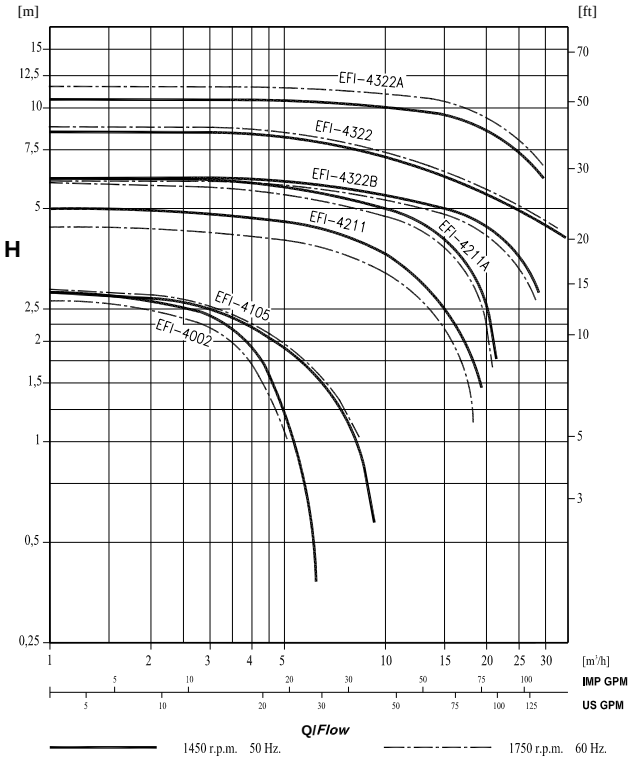
INOXPA ESTAMPINOX EFI series centrifugal pumps have designed for to pump water and compatible liquids with AISI 316L stainless steel.
The ESTAMPINOX EFI series has been especially designed to comply with auxiliary services required by the food industry.
The impeller is of open design and made of one single piece. Mechanical seal friction surfaces are ceramic, graphite and the NBR o-rings in the standard version.
Constructive options more significant for this pumps are:

* pump with stainless steel shroud
* pump with trolley
* control panel with stop/start, contactor and emergency stop push button

Motor IEC. Protection IP-55. Class F insulation. Three-phase 220-240 / 380-420 at 50 Hz.
This equipment is suitable for his use in food process.

3.2. FIELD OF APPLICATION





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

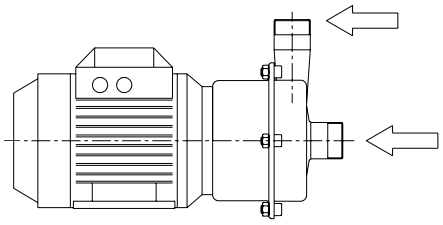
4.1. PUMP RECEPTION

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:

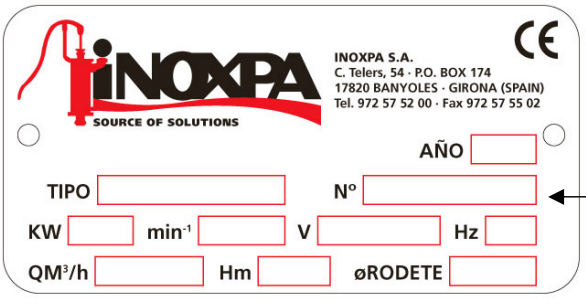
- Dispatch notes.
- Pump Instruction and Service Manual.
- Motor Instruction and Service Manual (*).
- (*) If the pump has been supplied with a motor from INOXPA.

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

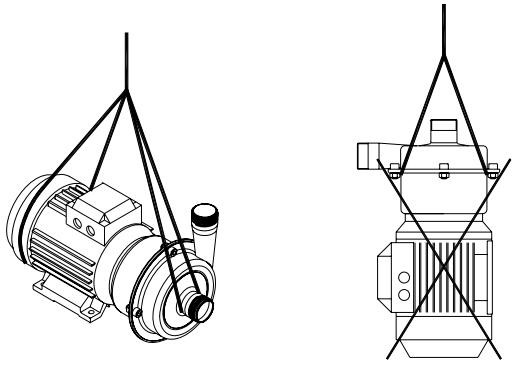


Pump plate

4.2. TRANSPORT AND STORAGE

ESTAMPINOX EFI 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 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 are 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 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.

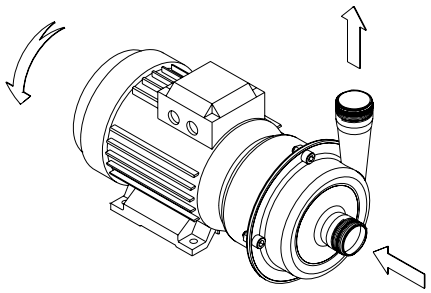
4.6. ELECTRICAL INSTALLATION

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.

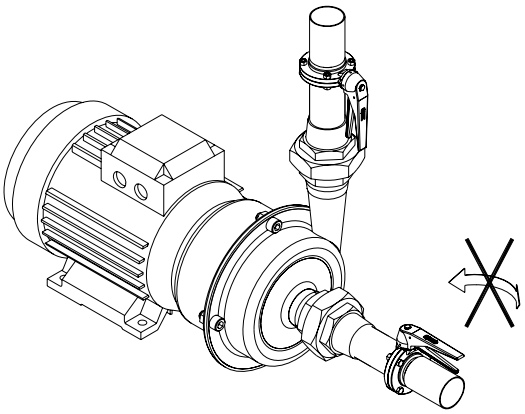
- Check that the rotation direction of the motor is correct.

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 (NPIPr).
- 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: - Raise the suction tank. - Lower the pump. - Increase the diameter of the suction piping. - 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: - Reduce the flow by means of a diaphragm. - Partially close off the delivery valve. - Decrease the speed.
9	The viscosity of the liquid is too high.	Decrease the viscosity by injecting the liquid or increase the diameter of the piping.
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. - 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 70ºC (150ºF)

1 Kg NaOH + 100 l. water = cleaning solution

or

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

b) Acid solution: 0.5% in weight of nitric acid (HNO_3) to 70ºC (150ºF)

0.7 liters HNO_3 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.

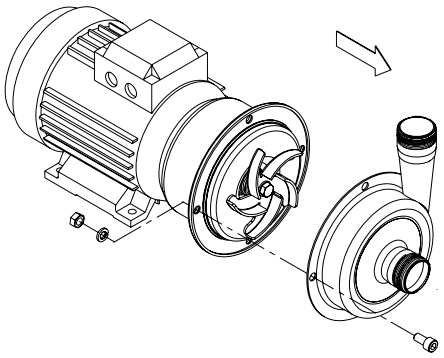
No cold liquid can enter the pump till the temperature of the pump is lower than 60°C (140°F).

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

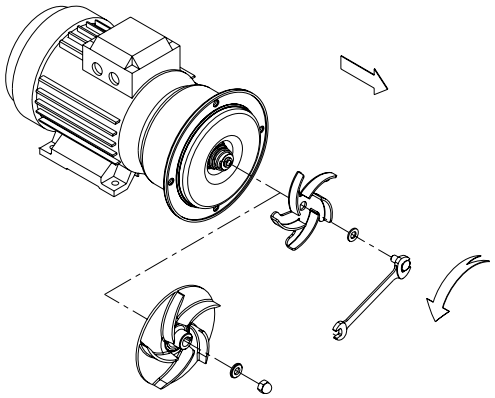
Maximum conditions during the SIP process with steam or overheated water		
a)	**Max. temperature:**	140°C / 284°F
b)	**Max. time:**	30 min
c)	**Cooling:**	Sterile air or inert gas
d)	**Materials:**	EPDM / PTFE (recommended) FPM / NBR (not recommended)

7.4. PUMP DISASSEMBLY

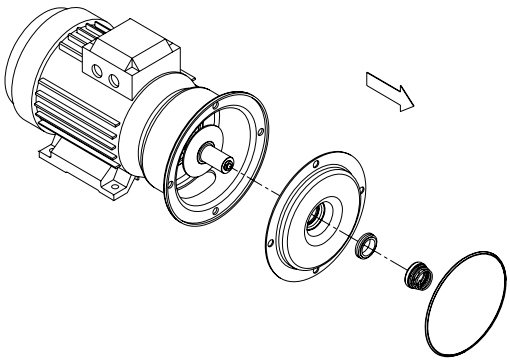
❶ Remove the screws (51), nuts (54), washers (53A), and take out the housing (01).



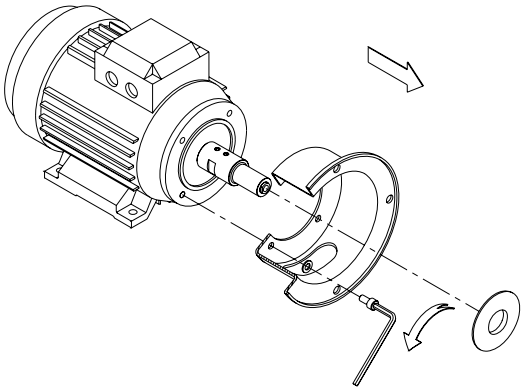
❷ Loosen the hexagonal screw (52A) of the pump impeller (02) with a fixed wrench while holding the impeller at the same time so that it does not turn. Remove the washer (53) and the impeller.
For sizes EFI-4322 up to 4322B, loosen the blind nut (54B) while holding the impeller at the same time so that it does not turn, and remove the washer (35). Take out the impeller and detach the key (61).



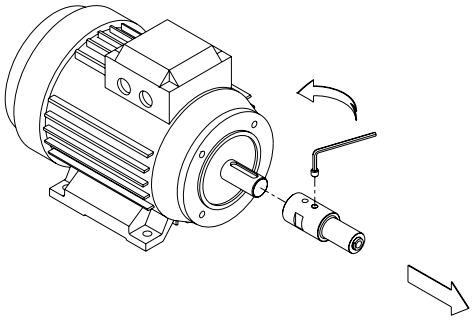
❸ Remove the rotary part of the mechanical seal (08) by sliding it along the shaft from the front. Then take off the pump cover (03) with the gasket (80), and the fixed part of the seal remaining housed in the cover.



❹ Remove the splashring (82). Loosen the screws (51A) with an Allen key to detach the lantern (04).

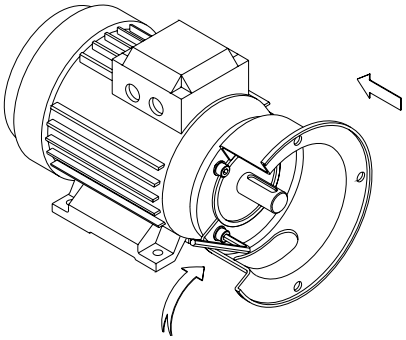


❺ Loosen the pins (55) and take out the shaft (05).

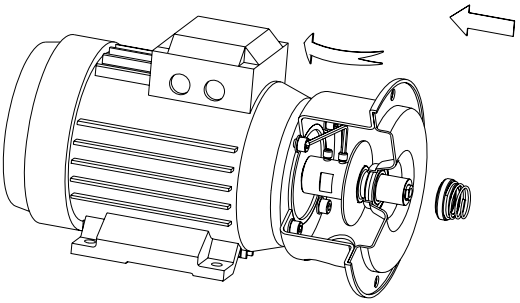


7.5. PUMP ASSEMBLY

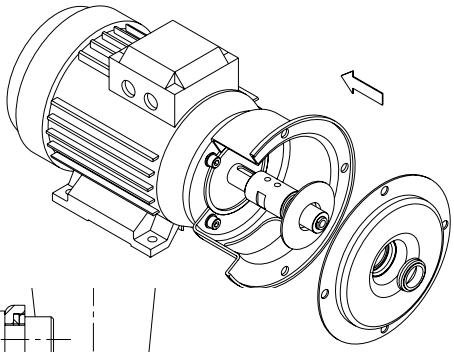
❶ Mount the lantern (04) and fix it to the motor (93) with the Allen keys (51A) and washers (53A/53B).

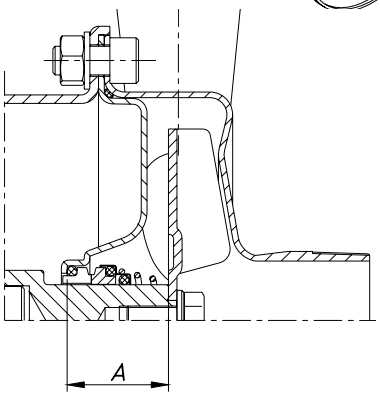


❸ Slide the rotary part of the mechanical seal (08) along the shaft and check the assembly dimensions according to the following table. Then fix the shaft (05) with the pins (55).



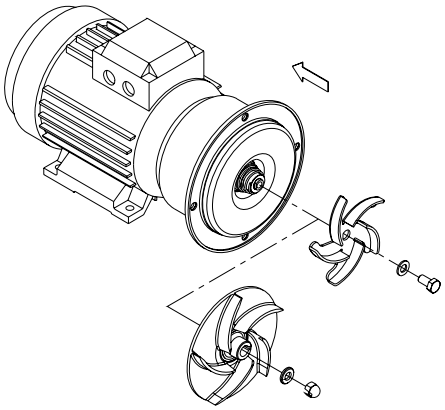
❷ Slide the shaft (05) over the motor shaft without fixing it yet with the pins. Attach the splashring (82). Attach the pump cover (03), with the fixed part of the mechanical seal mounted in its housing, on the lantern (04).



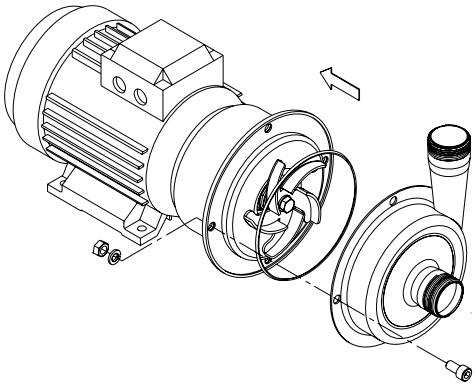


Pump type	A (mm.)
EFI-2003/2107 EFI-4002/4105	33
EFI-2222/2222A EFI-2340/2340B EFI-2355/2355B EFI-2375/2375A EFI-4211/4211A EFI-4322/4322A/4322B	35

❹ 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 EFI-4322 up to 4322B, 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.



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



¡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 ºC a +90ºC (NBR)
	14 ºF a 194 ºF (NBR)
Noise level	60-80 dB(A)
Suction / delivery connections	GAS (BSP) (estándar)

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	Ra 0,8

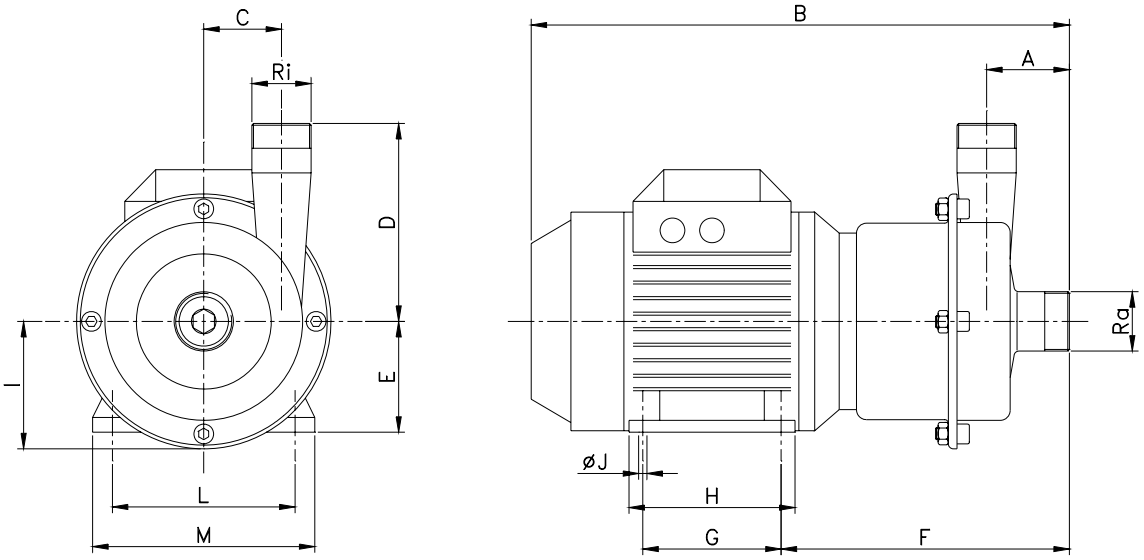
Mechanical seal

Seal type	Single internal mechanical seal
Stationary part material	Ceramic (standard)
Rotary part material	Graphite (standard)
Gaskets material	NBR (standard)

8.2. WEIGHTS

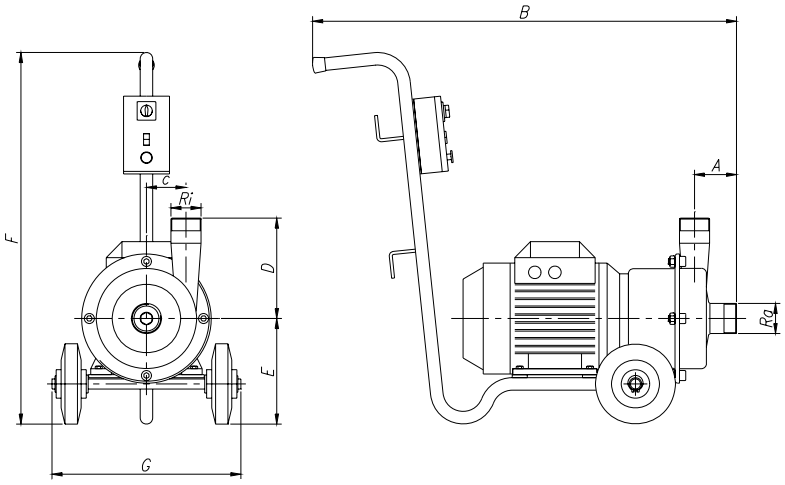
Pump Type	Weight [Kg]	Weight [lbs]
EFI-2003	10	22
EFI-2107	13	29
EFI-2222/2222A	21	46
EFI-2340/2340B	30	66
EFI-2355/2355A	38	84
EFI-2375/2375A	53	117
EFI-4002	10	22
EFI-4105	14	31
EFI-4211/4211A	18	40
EFI-4322/4322A/4322B	26	57

8.3. ESTAMPINOX EFI DIMENSIONS



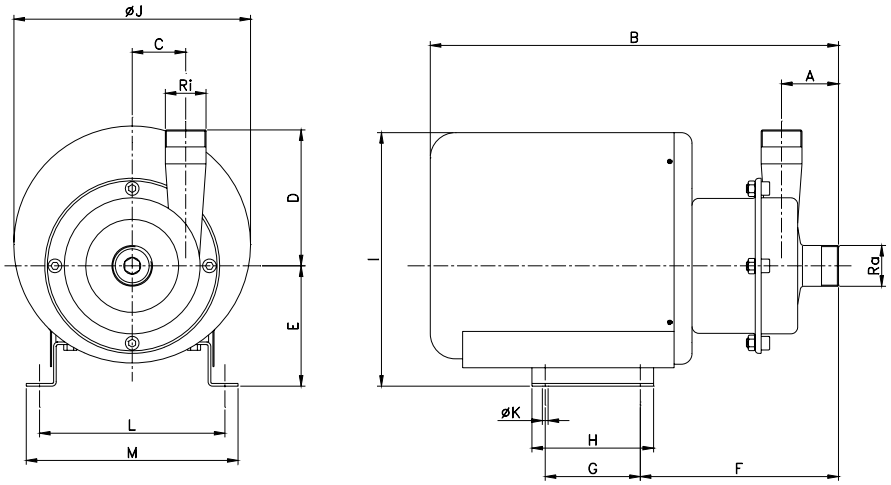
PUMP TYPE	Motor			GAS/BSP		A	B	C	D	E	F	G	H	I	øJ	L	M
	Tam	kW	RPM	Ra	Ri												
EFI-2003	71	0,37	2900	1″	¾″	60	365	36	100	71	198	90	112	73	7	112	135
EFI-2107	80	0,75		1½″	1″	64	380	48	110	80	204	100	125	86	9	125	153
EFI-2222 **EFI-2222A**	90L	2,2		1½″	1½″	67	430	66	160	90	227	125	150	103	10	140	170
EFI-2340 **EFI-2340B**	100	4		2″	2″	70	480	92	192	100	251	140	172	128	12	160	197
EFI-2355 **EFI-2355A**	112	5,5					520			112	258		168			190	222
EFI-2375 **EFI-2375A**	132	7,5					580			132	300	178	212	150		216	262
EFI-4002	71	0,25	1450	1″	¾″	60	365	36	100	71	198	90	112	73	7	112	135
EFI-4105	80	0,55		1½″	1″	64	380	48	110	80	204	100	125	86	9	125	153
EFI-4211 **EFI-4211A**	90S	1,1		1½″	1½″	67	405	66	160	90	227	100	125	103	10	140	170
EFI-4322 **EFI-4322A** **EFI-4322B**	100	2,2		2″	2″	70	480	92	192	100	251	140	172	128	12	160	197

8.4. ESTAMPINOX EFI DIMENSIONS WITH TROLLEY



PUMP TYPE	Motor		GAS/BSP		A	B	C	D	E	F	G
	Tam.	kW	Ra	Ri							
EFI-2003	71	0,37	1″	¾″	60	705	36	100	170	650	310
EFI-2107	80	0,75	1½″	1″	64	730	50	110	180		
EFI-2222 **EFI-2222A**	90L	2,2	1½″	1½″	67	785	66	160	190	740	380
EFI-2340 **EFI-2340B**	100	4	2″	2″	70	825	92	192	200	740	380
EFI-2355 **EFI-2355A**	112	5,5				830			210		

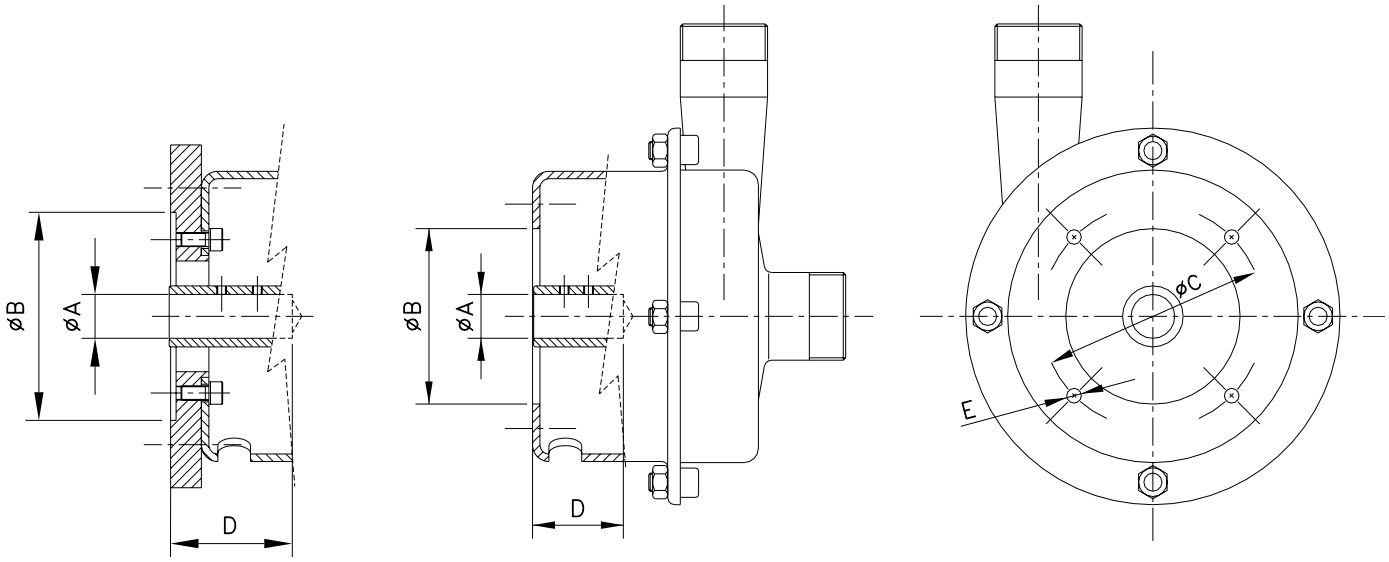
8.5. ESTAMPINOX EFI MR DIMENSIONS



PUMP TYPE	Motor		GAS/BSP		A	B	C	D	E	F	G	H	I	øJ	øK	L	M
	Tam.	kW	Ra	Ri													
EFI-2003	71	0,37	1″	¾″	60	395	36	100	106	198	90	110	235	220	7	168	188
EFI-2107	80	0,75	1½″	1″	64	450	48	110	130	204	100	130	290	270	9	195	225
EFI-2222 **EFI-2222A**	90L	2,2	1½″	1½″	67	465	66	160	140	227	125	155	300	270	10	210	240
EFI-2340 **EFI-2340B**	100	4	2″	2″	70	555	92	192	160	251	140	170	353	330	12	242	272
EFI-2355 **EFI-2355A**	112	5,5							172	258			365			272	302
EFI-2375 **EFI-2375A**	132	7,5				665			192	305	170	220	410	380	13	310	350

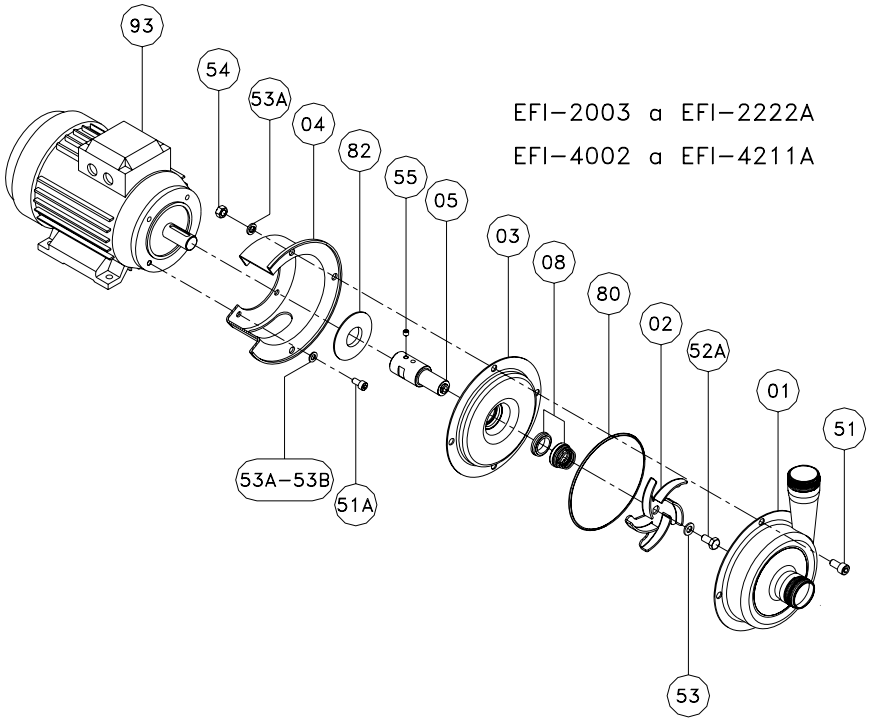
8.6. ESTAMPINOX EFI PUMP MOTOR COUPLING DIMENSIONS

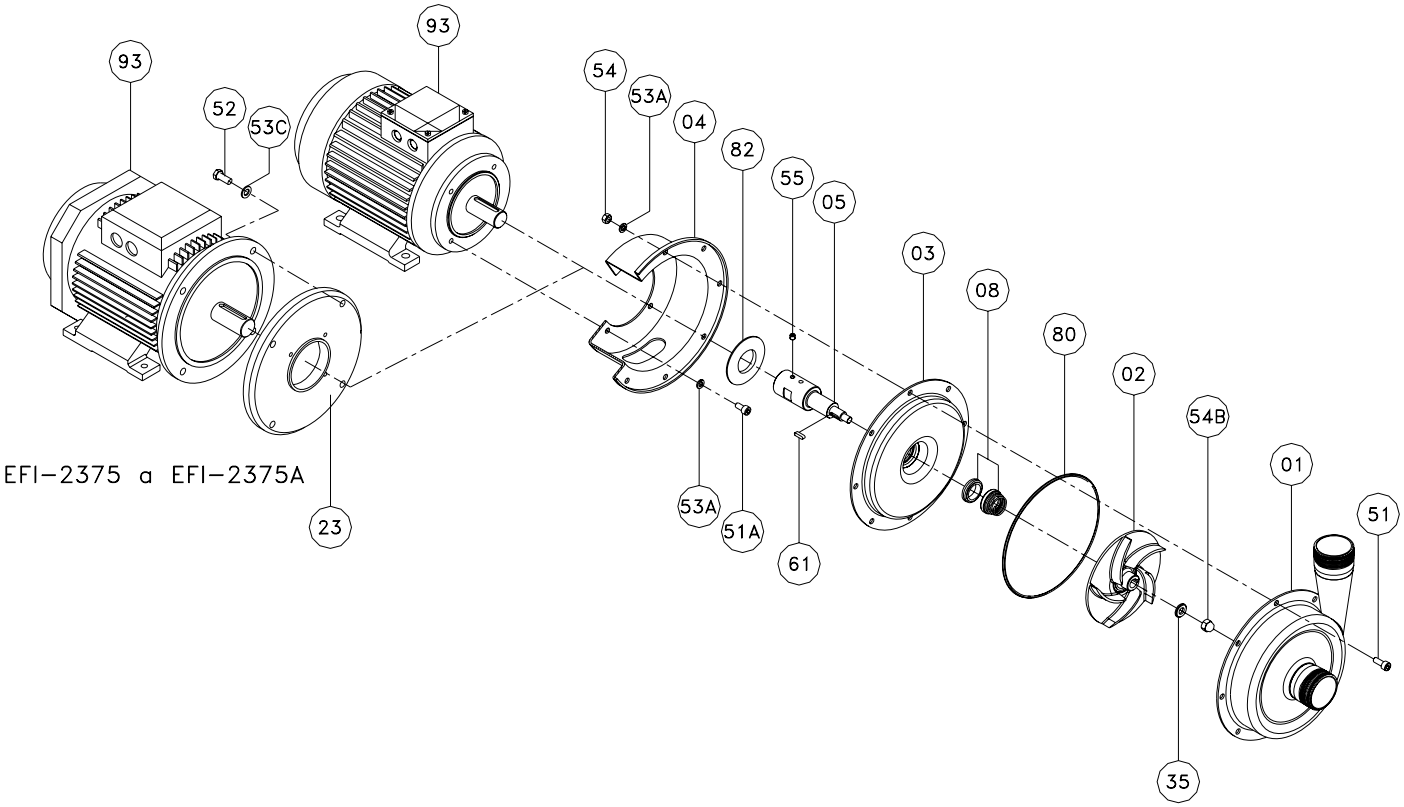
Motor size 132



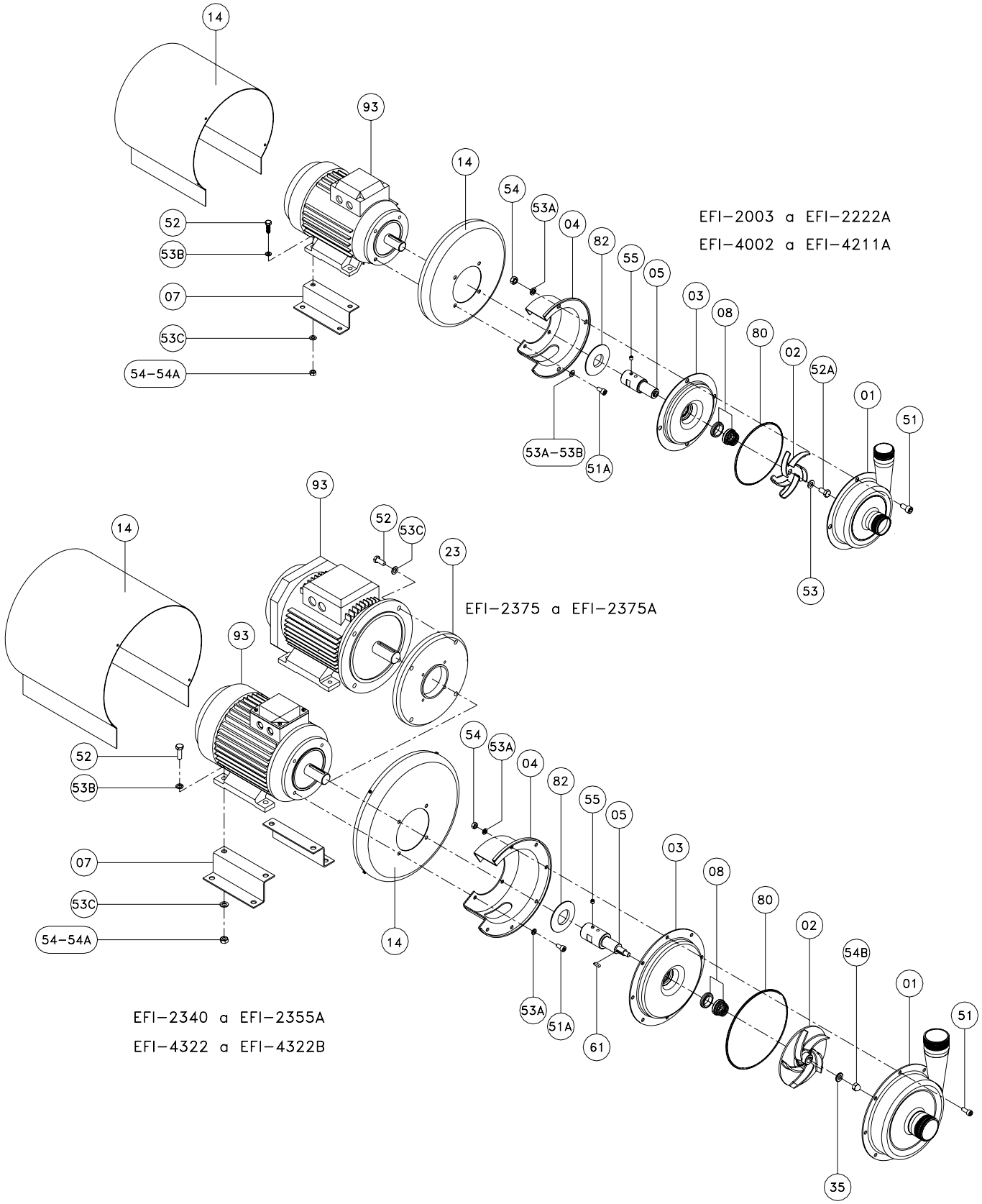
TYPE	Motor Size			A	B	C	D	E
	size	model	Ø flange					
EFI-2003	71	B3/B14	105	14	70	85	32	7
EFI-2107	80		120	19	80	100	42	7
EFI-2222 **EFI-2222A**	90L		140	24	95	115	52	9
EFI-2340 **EFI-2340B**	100		160	28	110	130	62	9
EFI-2355 **EFI-2355A**	112		160					
EFI-2375 **EFI-2375A**	132	B3/B5	300	38	230	265	80	12
EFI-4002	71	B3/B14	105	14	70	85	32	7
EFI-4105	80		120	19	80	100	42	7
EFI-4211 **EFI-4211A**	90S		140	24	95	115	52	9
EFI-4322 **EFI-4322A** **EFI-4322B**	100		160	28	110	130	62	9

8.7. PARTS LIST ESTAMPINOX EFI PUMP

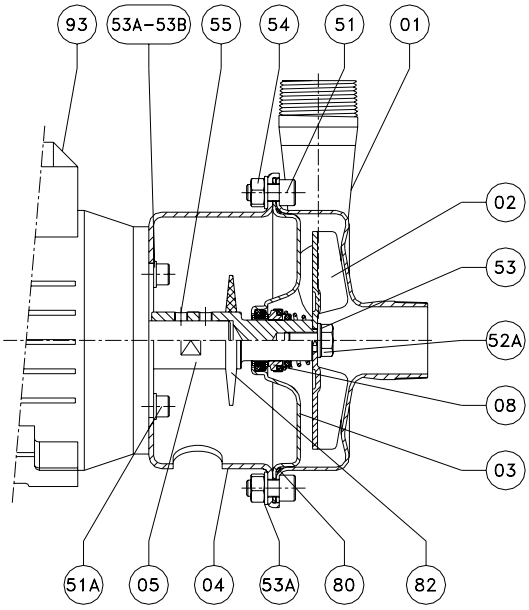




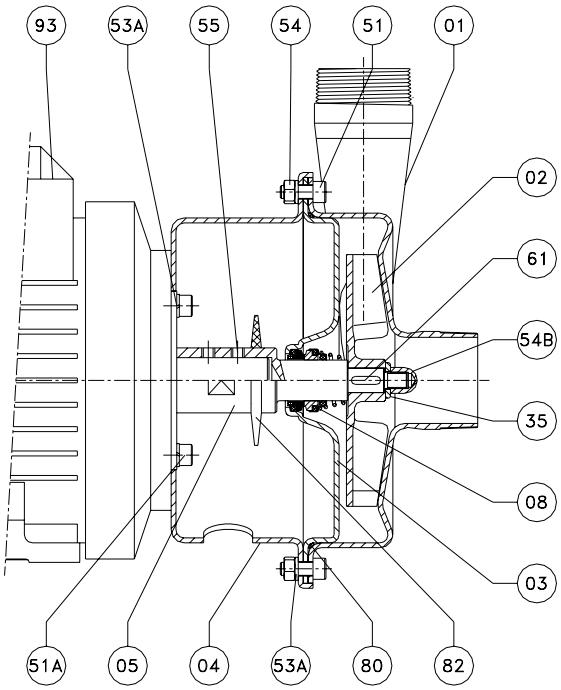
8.8. PARTS LIST ESTAMPINOX EFI MR PUMP



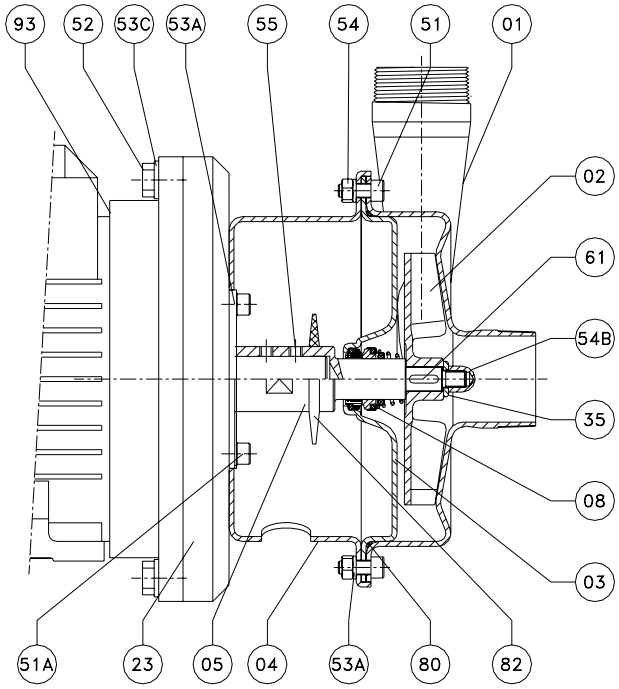
8.9. ESTAMPINOX EFI PUMP SECTION



EFI–2003 a EFI–2222A
EFI–4002 a EFI–4211A



EFI–2340 a EFI–2355A
EFI–4322 a EFI–4322B



EFI 2375 – EFI 2375A

8.10. PARTS LIST ESTAMPINOX EFI PUMP

	Position	Description	EFI-2003 EFI-4002	EFI-2107 EFI-4105	EFI-2222 EFI-2222A EFI-4211 EFI-4211A	EFI-2340 EFI-2340B EFI-4322 EFI-4322A EFI-4322B	EFI-2355 EFI-2355A	EFI-2375 EFI-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	AISI 304
	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
	35	Impeller washer	-	-	-	1	1	1	A4
	51	Allen screw	4	4	4	8	8	8	A2
	51A	Allen screw	4	4	4	4	4	4	A2
	52	Hexagonal screw	-	-	-	-	-	4	A4
	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	-	4	4	-	-	-	A2
	53C	Flat washer	-	-	-	-	-	4	A2
	54	Hexagonal nut	4	4	4	8	8	8	A2
	54B	Blind nut	-	-	-	1	1	1	A4
	55	Pin	1	1	2	2	2	1	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

8.11. PARTS LIST ESTAMPINOX EFI MR PUMP

	Position	Description	EFI-2003	EFI-2107	EFI-2222 EFI-2222A	EFI-2340 EFI-2340B	EFI-2355 EFI-2355A	EFI-2375 EFI-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	AISI 304
	05	Shaft	1	1	1	1	1	1	AISI 316L
	07	Leg	2	2	2	2	2	2	AISI 304
*	08	Mechanical seal	1	1	1	1	1	1	Ceram/Graf/NBR
	14	Shroud	1	1	1	1	1	1	AISI 304
	23	Counter flange	-	-	-	-	-	1	GG-15
	35	Impeller washer	-	-	-	1	1	1	A4
	51	Allen screw	4	4	4	8	8	8	A2
	51A	Allen screw	4	4	4	4	4	4	A2
	52	Hexagonal screw	4	4	4	4	4	8	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	-	4	4	-	-	-	A2
	53C	Flat washer	4	4	4	4	4	8	A2
	54	Hexagonal nut	4	4	4	8	8	8	A2
	54A	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

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