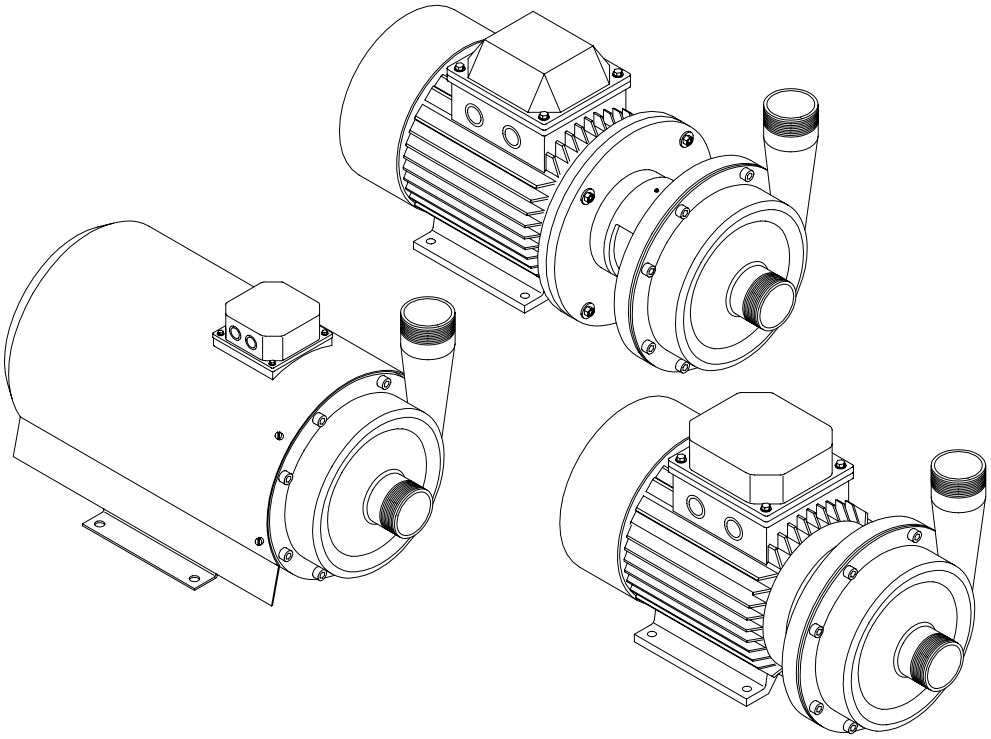
INOXPA
SOURCE OF SOLUTIONS

INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

ESTAMPINOX ES / ER / EFH / EFN



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BVQI
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MANUFACTURER DECLARATION

According the EC directive about machines 98/37/CE, Annex II B

The manufacturer:

INOXPA, S. A.
c/ Telers, 54
17820 Banyoles (Girona) - Spain

Hereby declares, that the pumps

CENTRIFUGAL PUMP	**ESTAMPINOX**	**2004**
Denomination	Type	Manufacturing year

Comply with the pertinent disposition, in the execution supplied by **INOXPA, S.A.** for the incorporation in a machine or installation, or for the assembly with other machines as a subunit of other higher order machine.
Harmonized norms used, particularly:

EN 292 part 1 and 2, EN 809

The machine above must not be put into service until the machinery into which it has been incorporated have been declared in conformity with the EC Machinery Directive. It must meet, particularly, the standards EN 294, EN 563, EN 809 y EN 953 in its respective current editions.

Year of CE marking: CE 95
Banyoles, January 1995

Marc Pons Bague Technical Manager

EC DECLARATION OF CONFORMITY

According the EC directive about machines 98/37/CE, Annex II A

The manufacturer:

INOXPA, S. A.
c/ Telers, 54
17820 Banyoles (Girona) - Spain

Hereby declares, that the pump

CENTRIFUGAL PUMP	**ESTAMPINOX**	**2004**
Denomination	Type	Manufacturing year

Are in conformity with the essential requirements of the Machinery Directive 98/37/CE (latest modifications included) and according the following Council Direcitves and harmonized norms:

- 72/23/CE Directive “low voltage”
- Norms EN 292 part 1 and 2, EN 809

Year of CE marking: CE 95
Banyoles, January 1995

Marc Pons Bague Technical Manager

1. Introduction

CHECK THE SHIPMENT.

The first thing to do when the pump is received is to check it and ensure that the contents conform to the shipping voucher.
INOXPA inspects all equipment prior to shipment, but it cannot guarantee that the merchandise reaches the user intact.
Therefore, the pump and any other article received should be checked and in the event the item in question did not conform to specifications and/or was missing a/some part(s), the transportation company should prepare a report as soon as possible.
If the pump is not put into service upon arrival, a complete revolution of the shaft should be made once a week.

INSTRUCTIONS MANUAL.

The information provided in the instruction manual refers to updated data.
We reserve the right to modify the design and/or manufacturing specifications of our products as required, devoid of any obligation on our part to adapt any product supplied prior to such alteration.
The technical information made available in this instruction manual, together with the graphs and technical specifications provided, shall continue to belong to us and should not be used (except for starting up this installation), copied, photocopied, made available or otherwise given to third parties without our prior written consent.
INOXPA is reservation the right to modifying this instructions manual without previous notice.

MAINTENANCE.

This pump, like any other machine, requires routine maintenance.

OPERATING PRINCIPLES.

S**afety.**

This symbol indicates those safety instructions contained in this manual which when not followed could jeopardize your safety

This symbol indicates potential problems with electrical safety.

This symbol indicates a compulsory measure to be taken by the user in compliance with specific instructions which serve to guarantee operating safety and/or protection of the pump.

SAFETY.

- It is absolutely necessary to place symbols on the pump, e.g., arrows which indicate the direction of rotation or other symbols indicating connections to fluids. All of these symbols should be clearly visible and legible.
- The personnel who are responsible for the operation, maintenance, inspection and assembly of the equipment should have the proper experience and training.
- Furthermore, the shop foreman should make sure that the contents of the instruction manual are fully understood by the operators.
- If the machine's components, whether in a cold or warm state, constitute some hazard, then accidental contact with the same should be avoided.
- When the machine is operating, be sure that the rotating parts are protected by a shield.
- In the event of a fire (e.g., mechanical seal) of hazardous fluids (e.g., explosives, toxic agents, hot products), the machine should be emptied to prevent any risk to persons or to the ambient conditions.
- Existing regulations should be strictly adhered to. Avoid any hazard which could be produced by the electrical circuits (e.g.: VDE specifications and regulations on the supply of local energy services).
- It is the shop foreman's responsibility to see to it that maintenance, inspection and assembly work is performed by qualified personnel once they have become familiar with the subject; they should read this manual very carefully.
- Work should only be done on this machine when it is stopped; it is extremely important that the procedure for stopping the machine be followed as set forth in this manual.
- Those pumps should be de-contaminated which may contain hazardous agents.
- Upon completion of the work, re-install the safety and protection devices.
- No modification can be made to the machine without the prior consent of the manufacturer. For your safety, use spare parts and accessories authorized by the manufacturer.

Unauthorized operations.

The machine's safety is only ensured if it is used properly in accordance with the instructions given in this manual.

The limits for values specified in the data sheet cannot be exceeded under any circumstances.
Any change in operating conditions can only be done with the prior written consent of INOXPA.

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

INOXPA SERVICE.

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

DESCRIPTION.

The centrifugal pumps, with single impeller, in the ESTAMPINOX ES, ER, EFH and EFN series are manufactured using AISI-316 stainless steel die-pressed steel plate with an electro-polished finish.
The ESTAMPINOX series has been designed to meet the auxiliary services in the Food, Chemical, Pharmaceutical, Beverage and Oenological Industries.
The impeller is of open design and made of one single piece. The friction surfaces are ceramic, graphite and NBR o-rings.
The motor has an extended shaft with a stainless steel lining (ES and ER versions), with stainless steel shroud (only ER).
The motor conforms to the IEC standard with a stainless steel facing, in the EFH version. IP-55 protection. Class-F insulation.
Three-phased power supply with 220-240 / 380-420 V at 50Hz.

MATERIALS USED IN CONSTRUCTION.

All pump parts which are in contact with the product are stainless steel, or are made of tasteless and odorless materials. This makes the pump resistant to corrosion and avoids contamination of the liquid being pumped.

SHAFT SEALING.

The following options for the mechanical seal are applicable to the entire range of pumps.

- Simple sanitary mechanical seal.

Table 3.1: Materials for faces exposed to friction and internal mechanical seal elastomers

	Rotating part	Stationary part	Elastomers
standard	graphite	ceramic	NBR
options	tungsten carbide	tungsten carbide	viton
	stainless	graphite	viton

The elastomers of mechanical seal options can be of viton, NBR or EPDM.

FIELD OF APPLICATION.

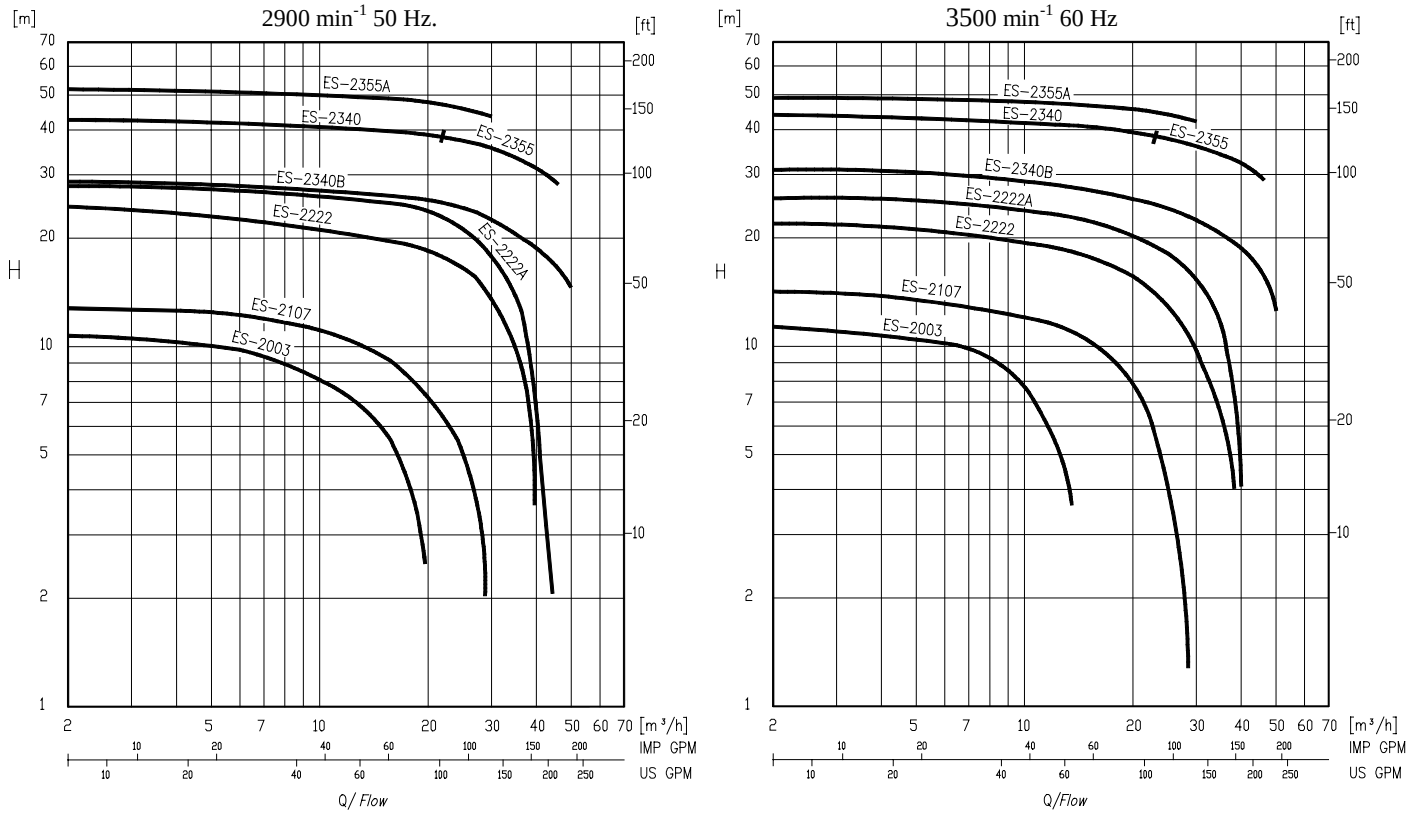


Figure 3.1 : field of application.

Table 3.2 : Description of the materials and aplications.

STANDARD APLICATION			ES / ER	EFH	EFN
Pumped product		Liquid type	clear water		
		Temperature	90ºC max.		
PUMP	Max. suction head		-6 m. to +35ºC		
	Max. working pressure		10 bar		
	Max. suction pressure		2 bar		
	Connections		GAS / BSP		
	Material	Pump housing	Stainless steel AISI-316		
		Impeller	Stainless steel AISI-316		
		Pump cover	Stainless steel AISI-316		
		Lantern	Aluminium	GG-18	
		Shaft	Stainless steel AISI-316		
Drive	Motor		extended shaft	IEC-34 norm	NEMA norm
	Isolating type		class-F	class-F	-
	Protection		IP-55	IP-55	-
	Frequency / Voltage		50 Hz 220-240/380-415 V		-

4. Installation

GENERAL CONSIDERATIONS.

This manual provides basic instructions which should be taken into account when proceeding to install the pump. It is of utmost importance that the shop foreman read this manual before assembly.

LOCATION.

Piping.

Place the pump as close as possible to the suction tank (refer to the chapter, "Pump Installation"), and if possible below the level of the liquid or even lower in relation to the deposit so that the static manometric suction head is at its maximum. Place the suction and discharge piping in straight runs with a minimum of elbows and fittings in order to reduce to the extent possible any loss of head caused by friction. This improves the suction conditions, thereby affording maximum performance of the pump.

Accessibility.

Place the pump so that access can be had to the pump and to the drive units so as to make inspections and revisions. Leave sufficient space around the pump for proper inspection, separation of the pump from other units and for maintenance operations. In order to disassemble the pump you should leave sufficient space in front of and behind it. (Chapter 9 deals with the dimensions).
Place the pump near the drain on the floor.
It is very important to be able to gain access to the pump connecting device (including when it is operating).

Excessive temperatures.

Depending on the fluid to be pumped, high temperatures can be reached inside and around the pump.

Over 70 ºC the operator should take protective measures and place warning notices advising of the danger which exists if the pump is touched. The type of protection selected should not isolate the pump entirely. It should allow for optimum cooling of the motor.

STABILITY.

Foundation.

Prepare the foundation so that the pump is level and well supported. Its emplacement should be rigid, horizontal, flat and resistant to vibrations, so as to avoid any warping (if the pump's alignment is maintained its operation is ensured during start-up).

HANDLING.

If the pump is supplied without a motor, the purchaser/user is responsible for the pump's start-up and assembly.

ELECTRIC MOTORS.

Regulations.

Prior to connecting an electric motor to the power supply, check local regulations on electrical safety and also refer to the EN 60204-1 standard.

Let qualified personnel perform the connection of electrical motors. Take the necessary steps to prevent faults in the connections and wiring.

Protection of the motor against overloads.

In order to protect the motor from overloads and short circuits, the use of thermal or magnetic relays is recommended. Adjust these relays to maximum rated current values as indicated on the data plate of the motor.

Connection.

Consult the supplier's instructions prior to connecting the motor to the power net.
For single-phase motors, use motors with an increased starting torque.
Ensure a starting torque which is sufficiently high for motors controlled by a frequency changer, and which provide for adequate cooling at low speeds. If necessary, install an independent fan.

The electrical equipment, the terminals and the control system components can continue to carry current when disconnected. Any contact with them can endanger the safety of the operators or cause irreparable damage to the material.

DIRECTION OF ROTATION.

The direction of rotation is clockwise viewing the pump from the rear part of the motor.

Make sure that the pump rotates in the direction indicated on the plate. If the pump rotates in the wrong direction its hydraulic performance will be lower.

Electrical diagram.

	Connection U=...	
	3x220	**3x380**
motor		
220/380	Δ	Y
380	-	Δ

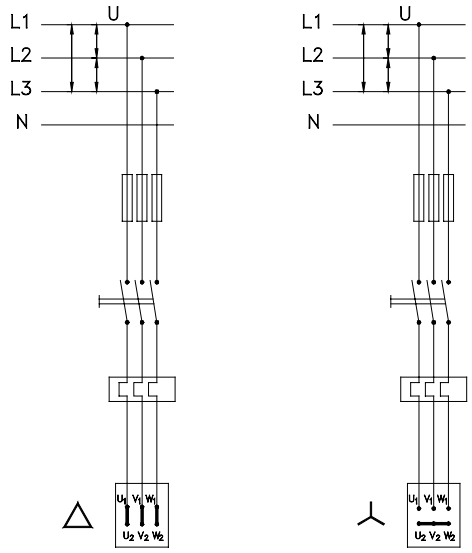


Figure 4.1: Electrical Connections

SUCTION AND DISCHARGE PIPES.

Pipes.

Use pipes with a diameter which is equal to or greater than that of the pump's connections. If the liquid to be pumped is viscous, the loss of head from the suction and discharge pipes can increase considerably. Other pipe components such as valves, elbows, filters and foot valves, can also cause a loss of head.
For this reason, the diameters and the length of pipes and other components should be selected so that the pump will operate within the minimum pressure limits allowed for the suction (refer to NPSH graph), the maximum working pressure (refer to chapter 3, "Field of Application"), and the rated motor power.

Suction pipe.

Liquids should be introduced into the pump from a higher level than that of the pump; the pipe should be inclined in its path to the pump and devoid of air pockets.
If a filter is installed in the suction mouth, a constant check for loss of load in the suction pipe should be made. Also check to see whether the suction pressure at the suction mouth of the pump is sufficiently high (see NPSH).
Check the tension of the suction pipe after its connection.

5. Start-up

GENERAL CONSIDERATIONS.

The pump can be started up so long as the instructions given in chapter 4 ("Installation") have been followed.

Prior to start-up, the persons responsible for the operation must be duly informed of the pump's operation and the safety instructions. This instruction manual should be available to personnel at all times.
Prior to start-up, check the pump for any possible failure. If a failure is found, the plant foreman should be notified immediately.

Also consult the section "Dimensions" in chapter 9.

CLEANING.

Prior to start-up, check to see that the pipes and the pump are completely clean and devoid of weld spatterings or other foreign particles.

Consult chapter 10 (cleaning and disinfection) on how to properly clean the pump and the methods and liquids which should be used.

START-UP.

- Completely open the shut-off valves in the suction and discharge pipes.
- If the liquid does not flow into the pump, fill it with liquid when pumping.

The pump should never rotate when empty.

- Check to see if the pump can be started up safely.
- Start the pump.
- Check to see whether the absolute suction pressure is sufficient, so that vapour cannot be produced inside the pump. Refer to the curve for the minimum pressure required above the vapour pressure (NPSH).
- Control the discharge pressure.

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

6. Maintenance

GENERAL CONSIDERATIONS.

Inadequate, wrong or improper maintenance could result in the faulty operation of the pump, high repair costs, and breakdown in the long run. For this reason the instructions given in this chapter should be followed.
During maintenance operations which are performed on the pump, whether due to inspections, preventive maintenance or the movement of the installation, the procedures indicated should always be followed.
Failure to comply with these instructions could endanger the operator and/or seriously damage the pump.
Maintenance work should only be done by qualified personnel. Wear appropriate clothing which provides adequate protection against high temperatures and hazardous and/or corrosive fluids. Make sure that the personnel read the entire instruction manual and, in particular, indicate to them the chapters which refer to work which needs to be done.
INOXPA does not assume responsibility for accidents and damage which might occur as a result of any failure to comply with the instructions indicated herein.

CONSERVATION.

Should the pump be taken out of service for a long period of time:

- First of all, empty the pump.
- Apply VG46 mineral oil to the internal parts.
- The pump should be worked on for a brief period of time once a week or the shaft rotated manually. This ensures the correct circulation of the protective oil.

EXTERNAL CLEANING.

Attempt to keep the exterior of the pump clean at all times. Cover all parts which should not enter into contact with the cleaning fluid.

Do not spray hot parts of the pump with water as some components could crack due to quick cooling and the fluid inside the pump could spill out.

ELECTRICAL INSTALLATION.

Maintenance work on electrical installations can only be done by qualified personnel and only when the power supply has been cut off. Carefully follow national safety regulations.

MAINTENANCE.

Periodically check suction and discharge pressures.
Inspect the motor in accordance with the manufacturer's instructions.
In general, a mechanical seal does not require maintenance; however, the seal should never be made to work when empty. Should a leak occur, replace the seal.

7. Operating Problems

Problems	Probable Causes
Overloading of motor.	8, 9, 13
Insufficient flow rate or pressure in pump.	1, 2, 4, 5, 7, 9, 10, 17, 19
No pressure on the discharge side.	2, 3, 6, 18
Irregular discharge flow rate / pressure.	1, 2, 4, 5, 6, 9
Noise and vibrations.	2, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15
The pump gets clogged.	9, 10, 13, 15
Overheating of the pump.	8, 9, 10, 13, 15
Abnormal wear.	4, 5, 10, 15
Leak in mechanical seal.	11, 12, 16

	Probable causes	Solutions
1	Wrong direction of rotation.	Invert the direction of rotation.
2	Insufficient NPSH.	Increase available NPSH: - Raise the suction deposit. - Lower the pump. - Reduce the vapour pressure. - Increase the diameter of the suction pipe. - Shorten and simplify the suction pipe.
3	Pump not purged.	Purge or fill.
4	Cavitation.	Increase suction pressure (also see 2)
5	The pump sucks in air.	Check the suction pipe and all its connections.
6	Suction pipe obstructed.	Check suction pipe and the filters, if any.
7	Discharge pressure too high.	If necessary, reduce head losses, for ex., by increasing the pipe diameter.
8	Flow rate too high.	Reduce the flow rate: - Reduce the flow rate using a diaphragm. - Partially close the discharge valve. - Trim the impeller. - Decrease the speed.
9	Viscosity of liquid too high.	Reduce the viscosity, for ex., by heating the liquid.
10	Temperature of the liquid too high.	Reduce the temperature by cooling the liquid.
11	Damaged or worn mechanical seal.	Replace the seal
12	O-rings not the right ones for the liquid.	Insert the proper O-rings; check with the supplier.
13	The impeller scrapes.	- Decrease the temperature. - Decrease the suction pressure. - Adjust the clearance between the impeller and the housing (only on EFH and EFN types).
14	Tension in the pipelines.	Connect the pipelines to the pump free of tension.
15	Foreign objects in the liquid.	Place a filter in the suction.
16	Mechanical seal spring tension too low.	Adjust as indicated in the manual.
17	Pump speed too low.	Increase the speed.
18	Suction shut-off valve closed.	Check and open.
19	Discharge pressure too low.	Increase the pressure: - Increase the diameter or the impeller. - Increase the speed of the pump.

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

8. Disassembly and Assembly

GENERAL CONSIDERATIONS.

The assembly and disassembly of the pumps should only be done by qualified personnel. Make sure that the personnel read carefully this instruction manual and, in particular, those instructions which refer to the work they will perform.

Incorrect assembly or disassembly may cause damage in the pump's operation and lead to high repair costs and a long period of down-time.
INOXPA is not responsible for accidents or damages caused by a failure to comply with the instructions in this manual.

SAFETY.

Prevent the motor from starting if you need to work on the pump.
Take steps to ensure that the motor cannot be started if the pump housing is removed, for ex., for cleaning operations.

NEVER clean the pump by hand when it is running.

Disconnection.

Before beginning disassembly and assembly work, disconnect the pump. Decompress the pump and the pumping unit.

If the fluid in the pump allows for it, let the pump cool off until reaching room temperature.

Electrical safety.

Prevent the motor from starting if you need to work on the pump. This is very important when working with electric motors that are connected from a certain distance.
Follow the procedure outlined below:

- Place the pump switch in the "Off" position.
- Disconnect the pump from the power supply.
- Block the electrical control panel or put a warning notice on it.
- Remove the fuses and take them with you to the work area.
- Do not remove the protection pieces located around the lantern until the pump is completely stopped.

DISASSEMBLY AND ASSEMBLY.

PUMP HOUSING.

- Close the suction and discharge valve.

ATTENTION! The liquid can spill out when the pump housing is removed.

- Remove the allen screws (51).
- Check to see that the O-ring (80) is still in good condition.
- Make sure that the O-ring is not inverted when inserted.
- Once the pump housing is assembled the allen screws needs to be inserted and tightened.

DISASSEMBLY OF THE IMPELLER AND THE PUMP COVER.

Remove the pump housing as indicated in the foregoing section.

- Remove the hexagonal screw (50A) and the flat washer (53A).
- Remove the impeller (02).
- Remove the rotating part of the mechanical seal (08).
- Remove the pump cover (03). The stationary part of the mechanical seal (08A) remains in place on the pump cover.

MECHANICAL SEAL.

Disassembly of the mechanical seal.

Disassemble the simple mechanical seal as indicated in the section on "Disassembly of the impeller and the pump cover".

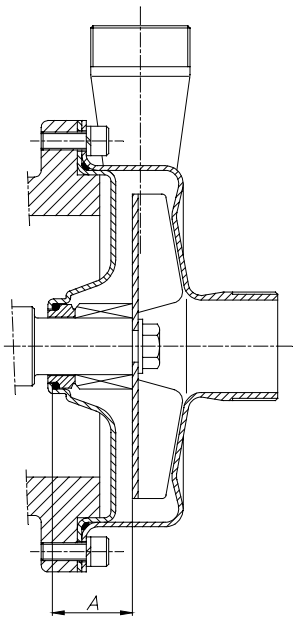
- When the impeller is removed, the rotating part of the mechanical seal (08) remains attached to the shaft of the pump. Check that the sealing surface of the rotating face and the seal are in good condition.
- When the pump cover is disassembled, the stationary part of the mechanical seal (08A) comes off from the cover. Check to see that the sealing surface and the O-ring are not damaged.

Assembly of the mechanical seal.

- Fit the pump cover (03) on the lantern (04). The stationary part of the mechanical seal (08A) needs to be inserted first into its location in the cover.
- Check that the seals fitting dimension is as indicated in table 8.1.
- Slide the rotating part of the mechanical seal (08) over the shaft.
- Mount the impeller as is explained in the next section.

Table 8.1: the mechanical seal fitting dimension.

PUMP TYPE	A (mm.)
2003 / 2107	33
2222 / 2222A **2340 / 2340B** **2355 / 2355B**	35,5



WARNING! When fitting the new seals, be sure to wet the O-rings with soapy water so that the fixed parts slide easily into their locations and the rotating parts onto the shaft.

ASSEMBLY OF THE IMPELLER.

- Slide the impeller (02) over the shaft up to the rotating part of the mechanical seal (08). There is only one possible position to mounting right the impeller.
- Slide the impeller washer (53) into place ant tighten the hexagonal washer (52A).

MOTOR REPLACEMENT.

In order to replace the motor (93), follow the indications as given in the section "Disassembly of the impeller and the cover".

ES type

- Remove the splash ring (82).

ER type

- Remove the splash ring (82).
- Remove the screws (50) and take the shroud (14) out.
- Remove the motor legs : loosen the nuts (54) and take the screws (51) and washers (53A) out.

EFH / EFN type

- Take the adaptor (30) out - only on the 2003 version -.
- Remove the splash ring (82).
- Loosen the studs (55) and take the shaft (05) out.
- Remove the screws (52) and the washers (53B).
- Take the lantern (04) out.
- Remove the allen screws (51B) and the counter-flange (23) - only on the EFH 2003 version -.

Replace the motor or its ball bearings as indicated in the manufacturer's instruction manual.

9. Technical Specifications

TECHNICAL SPECIFICATIONS.

PUMP TYPE	motor acr. IEC 50 Hz [kW] 2900 min^{-1}	sealing shaft seal diameter R-3	impeller diameter 50 Hz.	impeller diameter 60 Hz	weight with motor [Kg] (*)
ES - 2003	0,37	20	90	75	9
ES - 2107	0,75		98	85	12
ES - 2222	2,2	25	125	100	20
ES - 2222A	2,2		135	110	20
ES - 2340	4		155	130	29
ES - 2340B	4		130	110	29
ES - 2355	5,5		155	130	40
ES - 2355A	5,5		180	150	40
ER - 2003	0,37	20	90	75	10
ER - 2107	0,75		98	85	13
ER - 2222	2,2	25	125	100	22
ER - 2222A	2,2		135	110	22
ER - 2340	4		155	130	31
ER - 2340B	4		130	110	31
ER - 2355	5,5		155	130	42
ER - 2355A	5,5		180	150	42
EFH - 2003	0,37	20	90	75	10
EFH - 2107	0,75		98	85	17
EFH - 2222	2,2	25	125	100	30
EFH - 2222A	2,2		135	110	30
EFH - 2340	4		155	130	42
EFH - 2340B	4		130	110	42
EFH - 2355	5,5		155	130	54
EFH - 2355A	5,5		180	150	54
EFN - 2003	-	20	-	75	4,5
EFN - 2107	-		-	85	9
EFN - 2222	-	25	-	100	13,5
EFN - 2222A	-		-	110	13,5
EFN - 2340	-		-	130	16
EFN - 2340B	-		-	110	16
EFN - 2355	-		-	130	17
EFN - 2355A	-		-	150	17

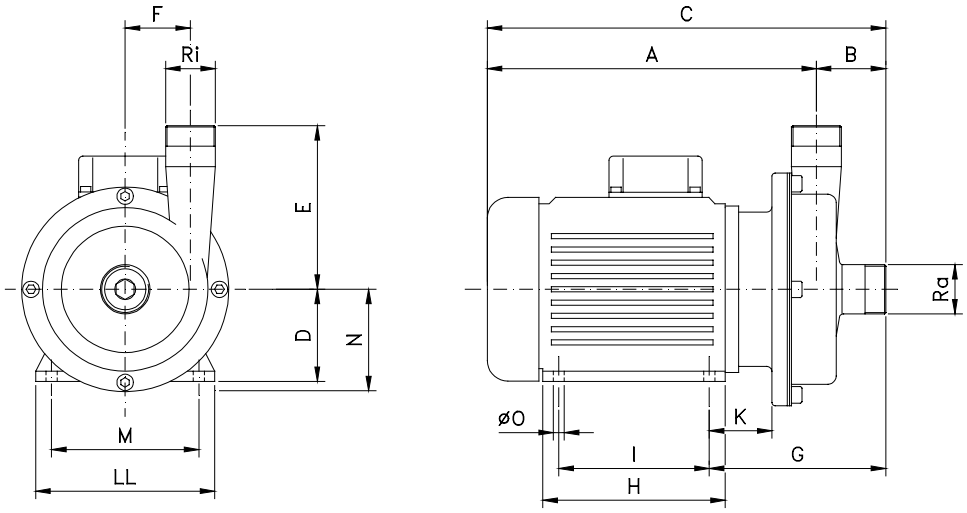
(*) Weights on the EFN version are without motor.

MATERIALS.

Parts in contact with the liquid

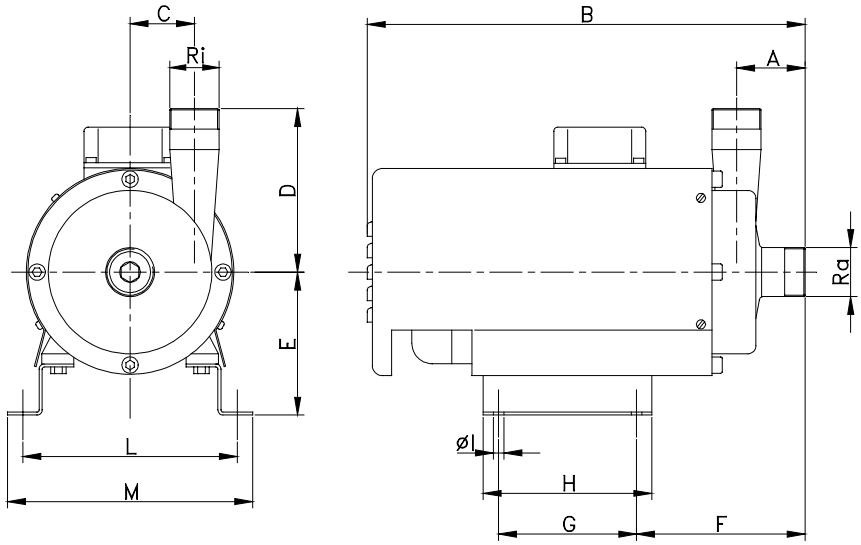
Part	Item	Material	Material n.
Pump housing	01	AISI - 316	1.4401
Impeller	02	AISI - 316	1.4401
Pump cover	03	AISI - 316	1.4401
Shaft	05	AISI - 316	1.4401
Impeller washer	53	AISI - 316	1.4401
Hexagonal screw	52A	AISI - 316	1.4401

Estampinox ES pump dimensions.



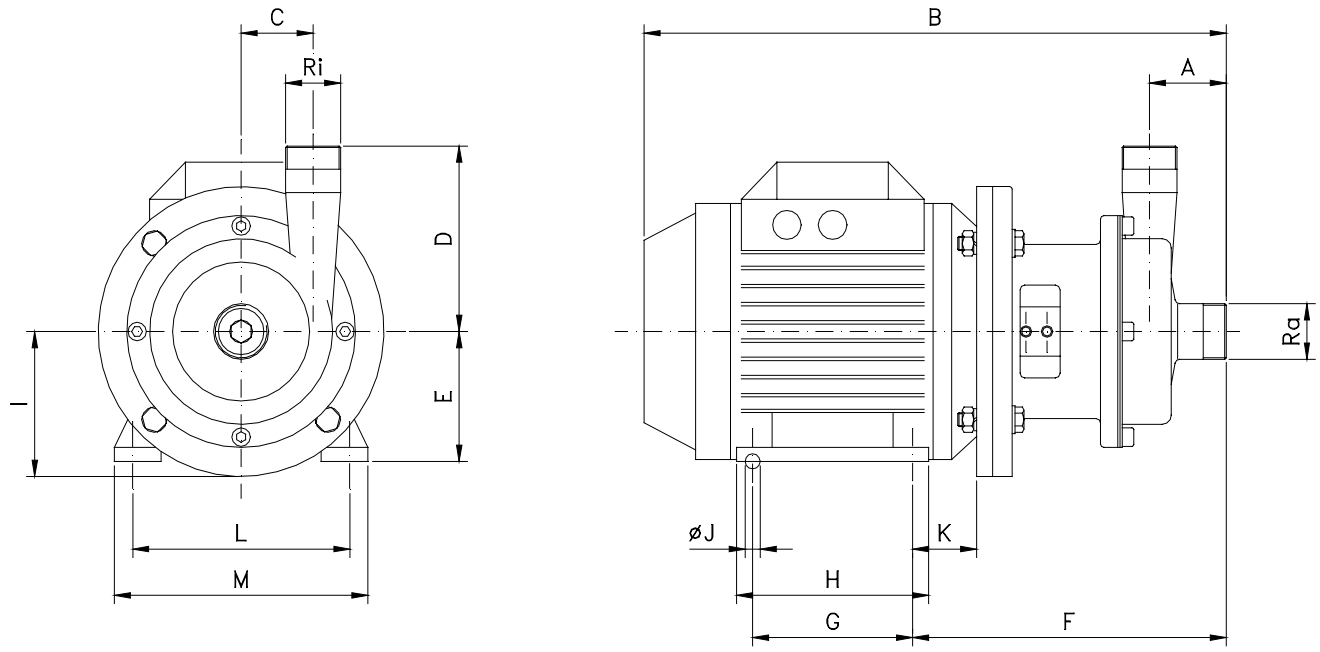
TYPE	Motor		GAS/BSP		A	B	C	D	E	F	G	H	I	K	LL	M	N	øO
	Tam.	kW	Ra	Ri														
ES - 2003	71	0,37	1"	¾"	270	60	330	71	100	36	163	108	90	45	140	112	70	7
ES - 2107	80	0,75	1½"	1"	282	63	345	80	110	50	162	125	100	50	160	125	82,5	10
ES - 2222 **ES - 2222A**	90L	2,2	1½"	1½"	328	64	392	90	160	66	172	155	125	56	182	140	100	
ES - 2340 **ES - 2340B**	100	4	2”	2”	362	70	432	100	192	92	189	175	140	63	200	160	125	12
ES - 2355 **ES - 2355A**	112	5,5			380		450	112			196			70	235	190		

Estampinox ER pump dimensions.



TYPE	Motor		GAS/BSP		A	B	C	D	E	F	G	H	øI	L	M
	Tam.	kW	Ra	Ri											
ER - 2003	71	0,37	1"	¾"	60	390	36	100	106	163	90	110	7	168	188
ER - 2107	80	0,75	1½"	1"	63	405	50	110	130	162	100	130	11	195	225
ER - 2222 **ER - 2222A**	90L	2,2	1½"	1½"	64	450	66	160	140	172	125	155	11	210	240
ER - 2340 **ER - 2340B**	100	4	2”	2”	70	540	92	192	160	189	140	170	13	242	272
ER - 2355 **ER - 2355A**	112	5,5							172	196				272	302

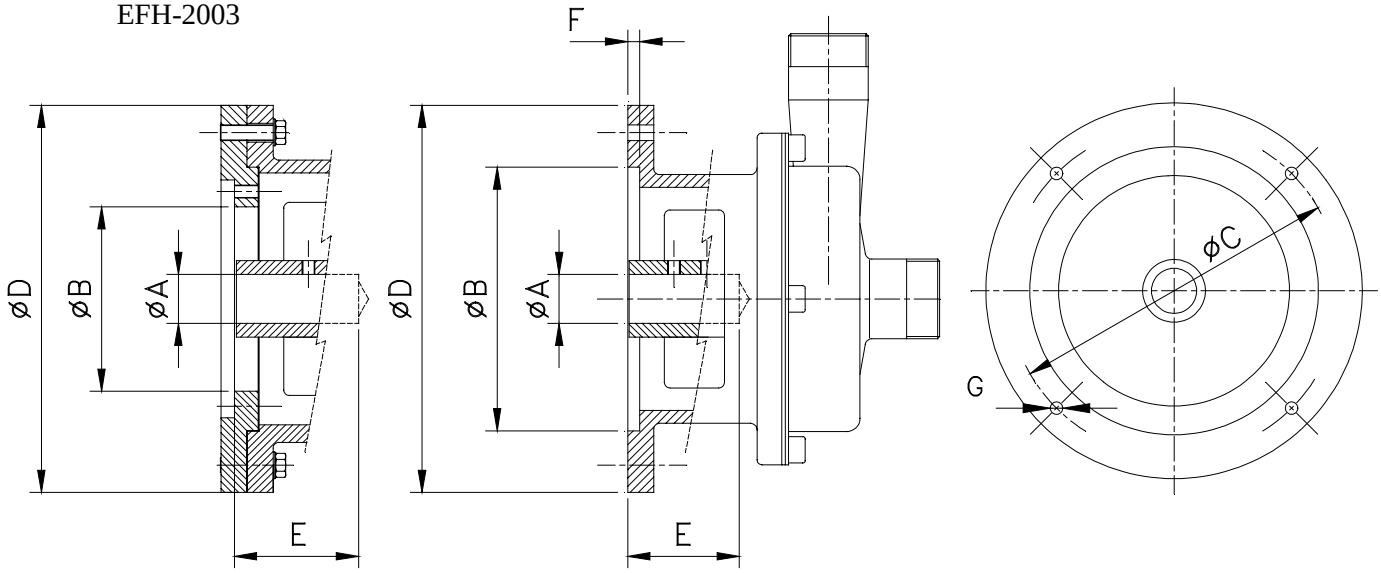
Estampinox EFH pump dimensions.



TYPE	Motor		GAS/BSP		A	B	C	D	E	F	G	H	I	ϕJ	K	L	M
	frame	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 **EFH - 2222A**	90L	2,2	1½"	1½"	64	450	66	160	90	234	125	150	100	10	46	140	170
EFH - 2340 **EFH - 2340B**	112	4	2”	2”	70	510	92	192	112	276	140	168	125	12	57	190	222
EFH - 2355 **EFH - 2355A**	112	5,5				535											

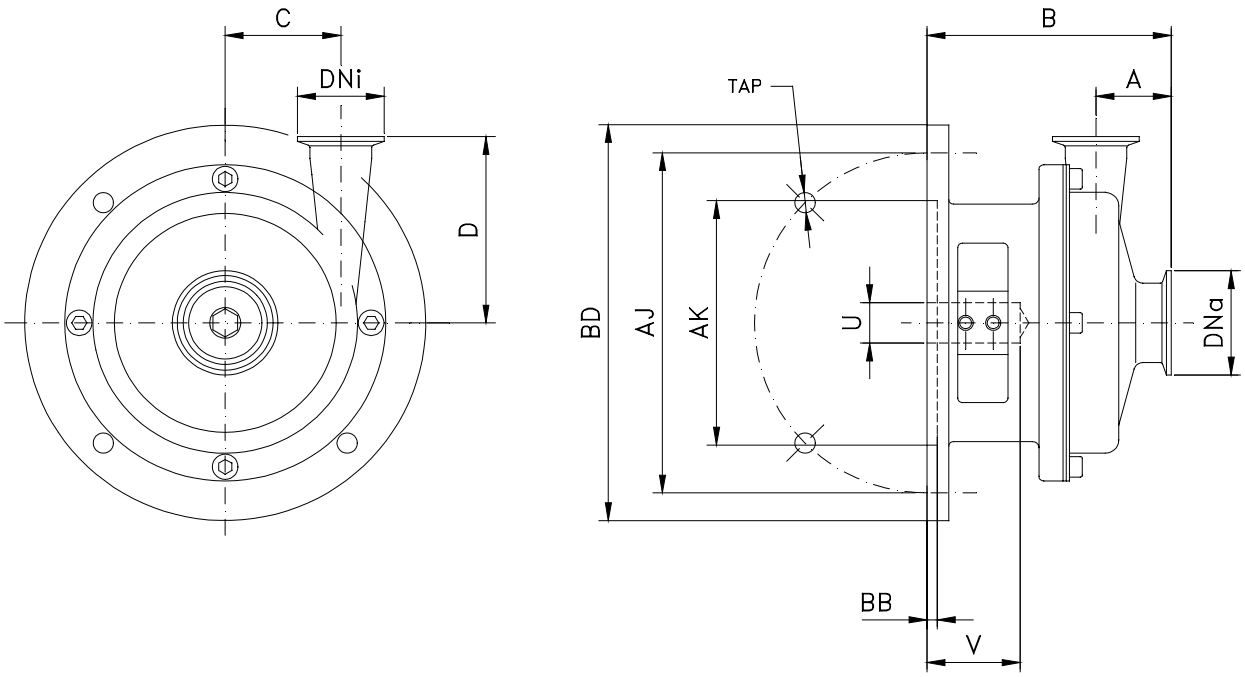
Estampinox EFH pump motor coupling dimensions.

EFH-2003



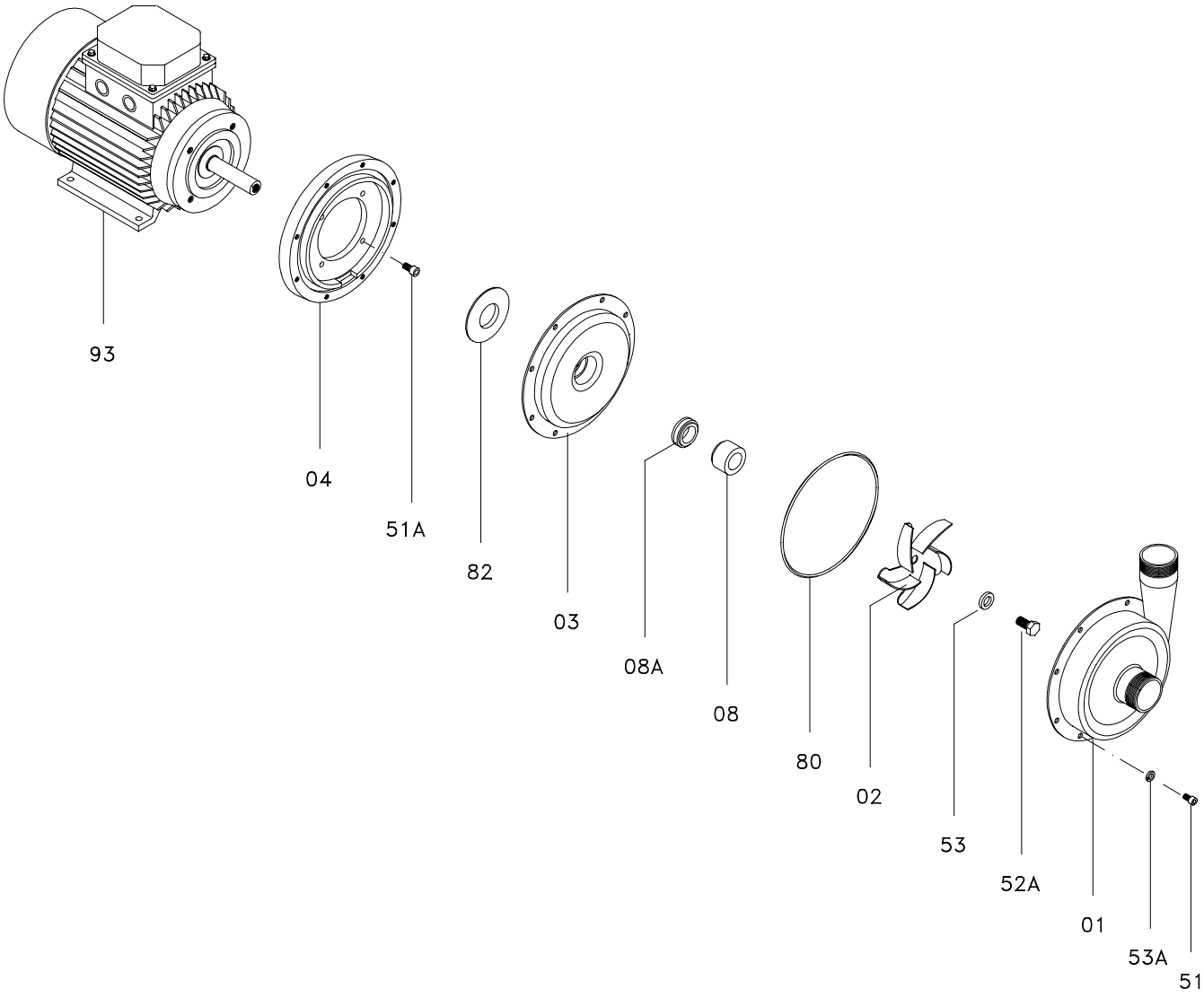
TYPE	Motor frame	A	B	C	D	E	F	G
EFH - 2003	71	14	70	85	168	32	-	7
EFH - 2107	80	19	130	165	200	42	3,5	11
EFH - 2222 **EFH - 2222A**	90L	24	130	165	200	52	3,5	11
EFH - 2340 **EFH - 2340B**	112	28	180	215	250	62	4	13
EFH - 2355 **EFH - 2355A**	112							

Estampinox EFN pump dimensions.



PUMP TYPE		Motor frame	DNa	DNi	A	B	C	D	U	V	AJ	AK	BB	BD	TAP
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	22.23	56	149.2	114.3	4	168	11
EFN - 2222A	**C**	182 / 184TC				185			28.58	75	184.2	215.9	6	230	14
EFN - 2340	**C**	182 / 184TC	2”	2”	54	190	92	156	28.58	75	184.2	215.9	6	230	14
EFN - 2340B	**D**	213 / 215TC				208			34.93	88					
EFN - 2355	**C**	182 / 184TC	2”	2”	54	190	92	156	28.58	75	184.2	215.9	6	230	14
EFN - 2355A	**D**	213 / 215TC				208			34.93	88					

Estampinox ES pump.

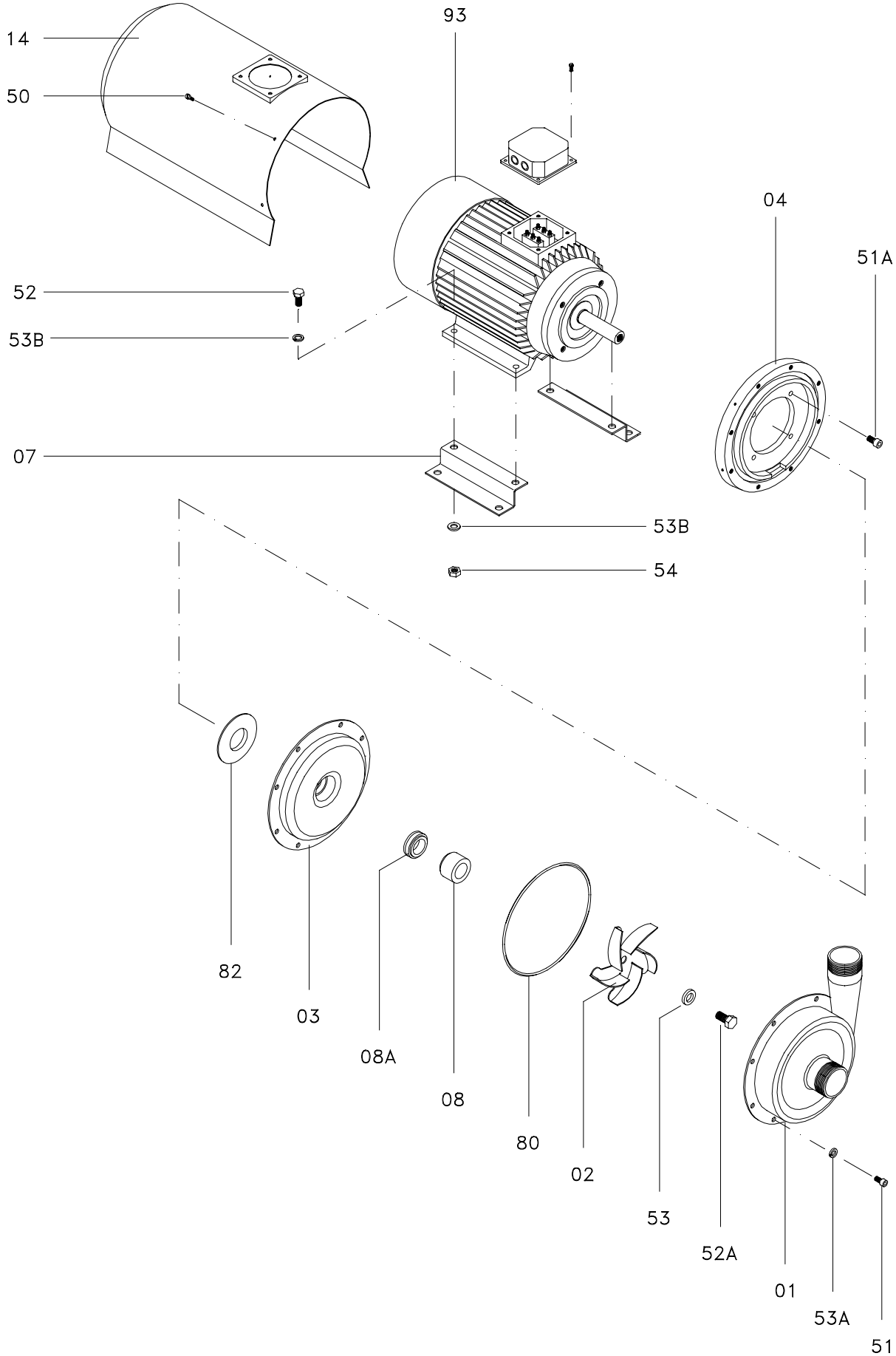


Parts list Estampinox ES.

Quantity for each type of pump.

Position	Description	2003	2107	2222 / 2222A	2340 / 2340B	2355 / 2355A	Material
01	Pump housing	1	1	1	1	1	AISI - 316
02	Impeller	1	1	1	1	1	AISI - 316
03	Pump cover	1	1	1	1	1	AISI - 316
04	Motor lantern	1	1	1	1	1	Aluminium
08	Mechanical seal -rotating part-	1	1	1	1	1	-
08A	Mechanical seal -stationary part-	1	1	1	1	1	-
51	Allen screw	4	4	4	8	8	A2
51A	Allen screw	4	4	4	4	4	8.8
52A	Hexagonal screw	1	1	1	1	1	AISI-316
53	Conical washer	1	1	1	1	1	AISI-316
53A	Spring washer	4	4	4	8	8	A2
80	O-ring	1	1	1	1	1	Silicone
82	Splash ring	1	1	1	1	1	EPDM
93	Motor	1	1	1	1	1	-

Estampinox ER pump.

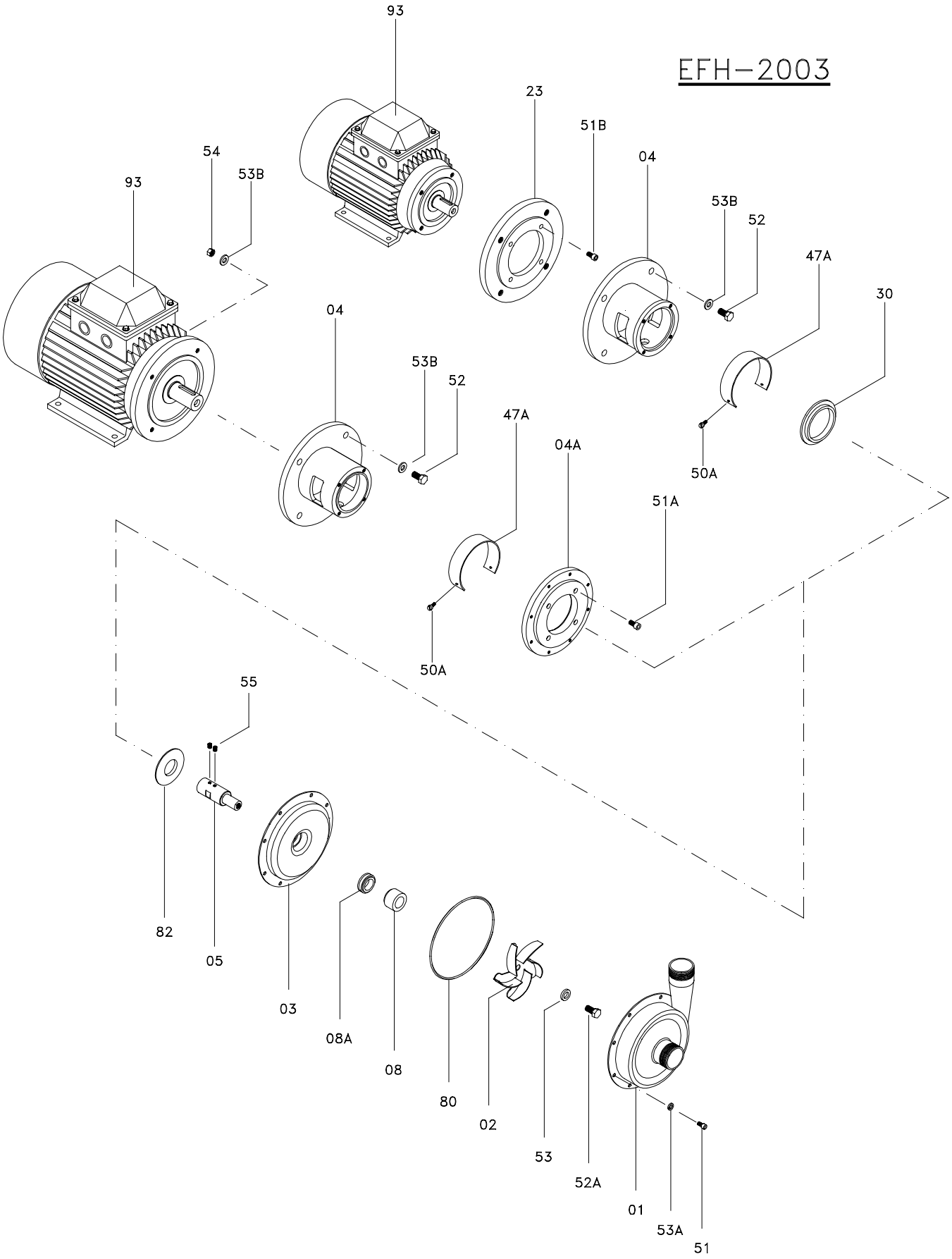


Parts list Estampinox ER.

Quantity for each type of pump.

Position	Description	2003	2107	2222 / 2222A	2340 / 2340B	2355 / 2355A	Material
01	Pump housing	1	1	1	1	1	AISI - 316
02	Impeller	1	1	1	1	1	AISI - 316
03	Pump cover	1	1	1	1	1	AISI - 316
04	Lantern	1	1	1	1	1	Aluminium
07	Pump leg	2	2	2	2	2	AISI - 304
08	Mechanical seal -rotating part-	1	1	1	1	1	-
08A	Mechanical seal -stationary part-	1	1	1	1	1	-
14	Shroud	1	1	1	1	1	AISI - 304
50	Screw	4	4	4	4	4	A2
51	Allen screw	4	4	4	8	8	A2
51A	Allen screw	4	4	4	4	4	A2
52	Hexagonal screw	4	4	4	4	4	A2
52A	Hexagonal screw	1	1	1	1	1	AISI - 316
53	Conical washer	1	1	1	1	1	AISI - 316
53A	Spring washer	4	4	4	8	8	A2
53B	Flat washer	8	8	8	8	8	A2
54	Hexagonal nut	4	4	4	4	4	A2
80	O-ring	1	1	1	1	1	Silicone
82	Splash ring	1	1	1	1	1	EPDM
93	Motor	1	1	1	1	1	-

Estampinox EFH pump.

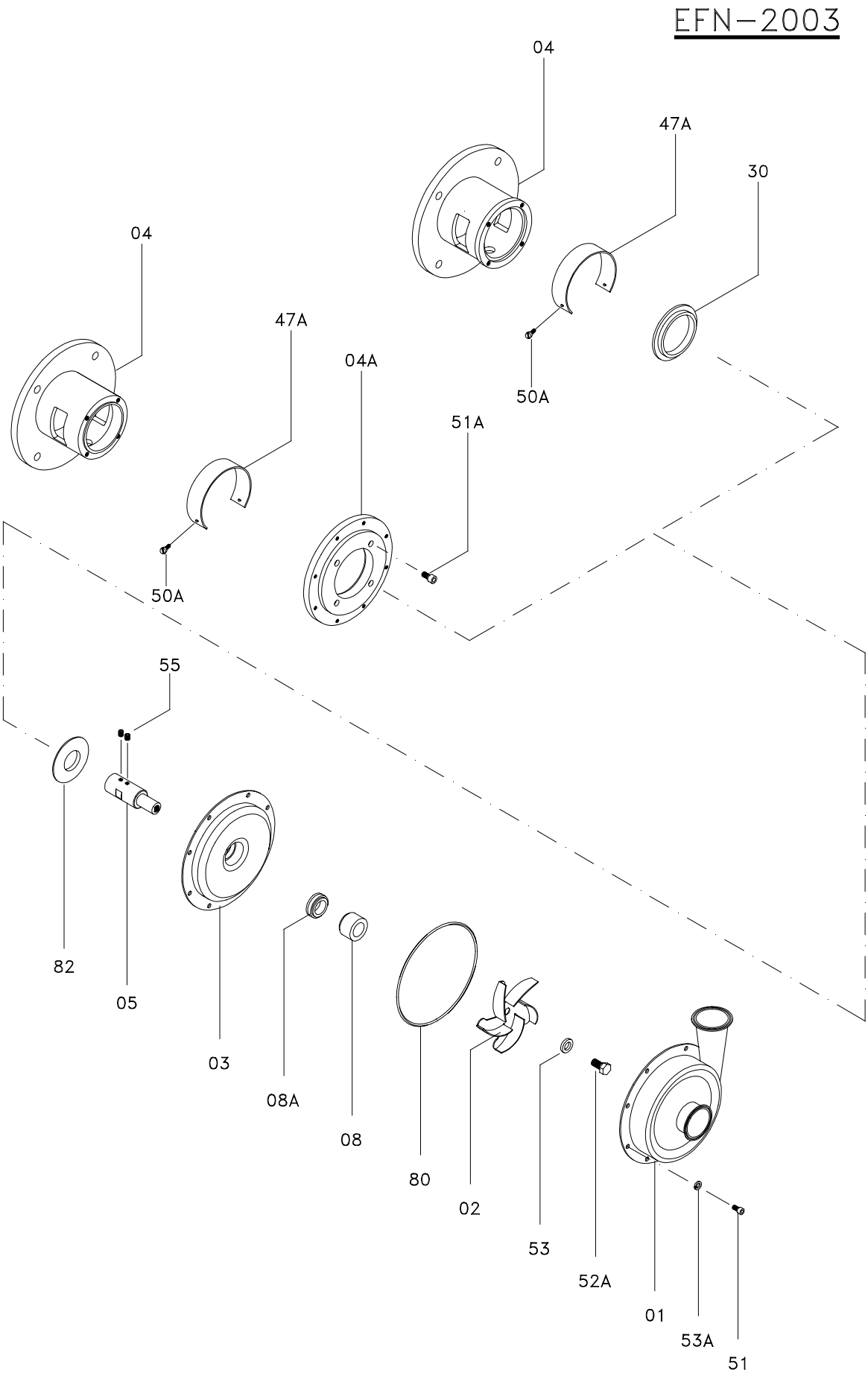


Parts list Estampinox EFH.

Quantity for each type of pump.

Position	Description	2003	2107	2222 / 2222A	2340 / 2340B	2355 / 2355A	Material
01	Pump housing	1	1	1	1	1	AISI - 316
02	Impeller	1	1	1	1	1	AISI - 316
03	Pump cover	1	1	1	1	1	AISI - 316
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 - 316
08	Mechanical seal -rotating part-	1	1	1	1	1	-
08A	Mechanical seal -stationary part-	1	1	1	1	1	-
23	Counter-flange	1	-	-	-	-	GG-15
30	Adaptor	1	-	-	-	-	F-1
47A	Protection	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
51B	Allen screw	4	-	-	-	-	8.8
52	Hexagonal screw	4	4	4	4	4	8.8
52A	Hexagonal screw	1	1	1	1	1	AISI - 316
53	Conical washer	1	1	1	1	1	AISI - 316
53A	Spring washer	4	4	4	8	8	A2
53B	Flat washer	4	8	8	8	8	St
54	Nut	-	4	4	4	4	8.8
55	Stud	1	1	2	2	2	A2
80	O-ring	1	1	1	1	1	Silicone
82	Splash ring	1	1	1	1	1	EPDM
93	Motor	1	1	1	1	1	-

Estampinox EFN pump.



Parts list Estampinox EFN.

Quantity for each type of pump.

Position	Description	2003	2107	2222 / 2222A	2340 / 2340B	2355 / 2355A	Material
01	Pump housing	1	1	1	1	1	AISI - 316
02	Impeller	1	1	1	1	1	AISI - 316
03	Pump cover	1	1	1	1	1	AISI - 316
04	Lantern	1	1	1	1	1	GG-15
04A	Counter-flange	-	1	1	1	1	GG-15
05	Shroud	1	1	1	1	1	AISI - 316
08	Mechanical seal -rotating part-	1	1	1	1	1	-
08A	Mechanical seal -stationary part-	1	1	1	1	1	-
30	Adaptor	1	-	-	-	-	F-1
47A	Protection	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	1	1	AISI - 316
53	Conical washer	1	1	1	1	1	AISI - 316
55	Stud	2	1	2	2	2	A2
80	O-ring	1	1	1	1	1	Silicone
82	Splash ring	1	1	1	1	1	EPDM

10. Cleaning and Disinfection

GENERAL CONSIDERATIONS.

Cleaning and disinfection of the installations is necessary and mandatory on completing any manufacturing process in the food industry. The use of an installation which is NOT cleaned or disinfected can cause contamination of the products.
The cleaning cycles as well as the chemical products and procedures used will vary depending on the product and the manufacturing process.
It is the user's responsibility to establish an appropriate cleaning or disinfection program according to his needs. Such a program needs to take into account all applicable laws, regulations and standards pertinent to public health protection and safety in the use of chemical products.

Cleaning.

The pump can be cleaned easily and thoroughly in one of two ways:

- without disassembling it, for ex., using steam or water, referred to as CIP ("Cleaning in Place).
- by simply disassembling the pump housing, the impeller and the mechanical seal (see Assembly and Disassembly).

It is important that the pump be running during the CIP process in order to obtain the most thorough cleaning.
During the automated CIP processes the pump could be started up unexpectedly because of some remote signal. This could cause serious damage to anyone who is in contact with the pump.

SAFETY IN CLEANING AND DISINFECTION.

Manual cleaning.

- **Disconnect the motor starting system before cleaning the pump.**
- **Provide cleaning personnel with the most appropriate protective equipment -clothing, footwear, safety glasses.**
- **Do not use toxic or inflammable solvents for cleaning the pump.**
- **Clean up any water spilled around the pump as soon as possible.**
- **With the pump running, NEVER clean it by hand**.

CIP Procedure.

- **Make sure that all cleaning circuit connections are securely tightened so as to avoid splashing of hot water or cleaning solutions.**
- **Establish a safety device in the event of any failure in the automatic process and avoid automatic start-up.**
- **Check to see that the housing and the clamp are well-positioned and securely tightened.**
- **Do not disassemble any pipes, fittings or the pump without being sure that the cleaning cycle is completely finished.**

For reference purposes for the user, the cleaning methods and products used can be those mentioned in the DIN 11483 standard