



INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

ESTAMPINOX EFI



01.020.32.0003

INOXPA, S.A.

c/Telers, 54 Aptdo. 174

E-17820 Banyoles

Girona (Spain)

Tel. : (34) 972 - 57 52 00

Fax. : (34) 972 - 57 55 02

email: inoxpa@inoxpa.com

www.inoxpa.com



Original Manual

01.020.30.06EN

(0) 2015/01



EC Declaration of Conformity

The manufacturer: **INOXPA, S.A.**
c/ Telers, 57
17820 Banyoles (Girona), Spain

herewith declares that the machine:

ESTAMPINOX EFI centrifugal pump

with the serial number: _____

conforms to the relevant provisions of the following directives:

Machinery Directive 2006/42/EC (RD 1644/2008)
Low voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

Applicable harmonised Standards:

UNE-EN ISO 12100:2012
UNE-EN 809:1999+A1:2010

Identification of the person empowered to draw up the Declaration on behalf of the manufacturer, and qualified to compile the technical file established by the Community:

Banyoles, 20 February 2014

David Reyer Brunet
Technical Office Manager

1. Safety

1.1. INSTRUCTION MANUAL

This manual contains information regarding the reception, installation, operation, assembly, disassembly and maintenance of the ESTAMPINOX EFI pump.

The information published in the instruction manual is based on updated data.

INOXPA reserves the right to modify this instruction manual without prior notice.

1.2. INSTRUCTIONS FOR START-UP

This instruction manual contains essential and useful information for the correct handling and maintenance of your pump.

Carefully read the instructions prior to starting the pump, familiarise yourself with the installation, operation and correct use of the pump and strictly follow the instructions. These instructions should be kept in a safe location near the installation area.

1.3. SAFETY

1.3.1. Warning symbols



Safety hazard for people in general



Danger of injury caused by rotating equipment parts



Electric hazard



Danger! Caustic or corrosive agents.



Danger! Suspended loads



Danger for the correct operation of the equipment



Mandatory to ensure safety at the workplace



Mandatory use of safety goggles

1.4. GENERAL SAFETY INSTRUCTIONS



Read the instruction manual carefully before installing and starting the pump. Contact INOXPA in case of doubt.

1.4.1. During the installation



The *Technical Specifications* of Chapter 8 should always be observed.

Never start the pump before connecting it to the lines.

Do not operate the pump if the pump cover is not fitted.

Check for proper specifications of the motor, especially if its working conditions create an explosion hazard.



During the installation, all the electric work should be carried out by authorised personnel.

1.4.2. During operation



The *Technical Specifications* of Chapter 8 should always be observed. Under no circumstances can the specified limit values be exceeded.

NEVER touch the pump or the pipework during operation if the pump is being used for transferring hot liquids or during cleaning.



The pump contains moving parts. Never place your fingers inside the pump during operation.



NEVER operate with the suction and discharge valves closed.

NEVER spray water directly on the electrical motor. The standard motor protection is IP-55: protection against dust and water spray.

1.4.3. During maintenance



The *Technical Specifications* of Chapter 8 shall always be observed.

NEVER disassemble the pump until the pipes have been emptied. Remember that liquid will remain inside the pump's casing (if does not have a purge). Bear in mind that the pumped liquid may be hazardous or extremely hot. Consult the regulations in effect in each country for these cases.

Do not leave loose parts on the floor.



ALWAYS disconnect the electrical power to the pump prior to carrying out any maintenance. Remove the fuses and disconnect the cables from the motor's terminals.

All electrical work must be carried out by authorised personnel.

1.4.4. Compliance with the instructions

Not following the instructions may impose a risk for the operators, the environment and the machine, and may result in the loss of the right to claim damages.

This non-compliance may result in the following risks:

- Failure of important machine/plant functions.
- Failure of specific maintenance and repair procedures.
- Possible electrical, mechanical and chemical hazards.
- Risk to the environment due to the type of substances released.

1.4.5. Warranty

Any warranty will be void immediately and lawfully; additionally, INOXPA will be compensated for any civil liability claims submitted by third parties, in the following cases:

- The service and maintenance work have not been carried out in accordance with the service instructions, the repairs have not been carried out by our personnel or have been carried out without our written authorisation;
- Modifications have been carried out on our material or equipment without written authorisation;
- The parts or lubricants used are not INOXPA genuine parts;
- The material or equipment has been improperly used, has been used negligently, or has not been used according to the instructions and their intended;
- The pump parts are damaged because they have been subjected to high pressure due to not having used a safety valve.

The General Conditions of Delivery already in your possession are also applicable.



The machine may not undergo any modification without prior approval from the manufacturer. For your safety, only use original spare parts and accessories.

The usage of other parts will relieve the manufacturer of any liability.

Changing the service conditions can only be carried out with prior written authorisation from INOXPA

Please do not hesitate to contact us in case of doubts or if further explanations are required regarding specific data (adjustments, assembly, disassembly, etc.).

2. Table of contents

1. Safety	
1.1. Instruction manual.....	3
1.2. Instructions for start-up.....	3
1.3. Safety	3
1.4. General safety instructions.....	3
2. Table of contents	
3. General Information	
3.1. Description.....	7
3.2. Application	7
4. Installation	
4.1. Reception of the pump	8
4.2. Transport and storage.....	9
4.3. Location.....	9
4.4. Pipes	9
4.5. Electrical installation.....	10
5. Starting the pump	
5.1. Start-up	11
6. Operating problems	
7. Maintenance	
7.1. General considerations	13
7.2. Storage.....	13
7.3. Cleaning.....	13
7.4. Assembly / disassembly of the pump	14
8. Technical Specifications	
8.1. Technical Specifications.....	16
8.2. Tightening torques.....	16
8.3. Cross section ESTAMPINOX EFI- 0 / 1 / 2.....	17
8.4. ESTAMPINOX EFI- 0 / 1 / 2 parts list	17
8.5. Cross section ESTAMPINOX EFI- 3.....	18
8.6. ESTAMPINOX EFI- 3 parts list	18
8.7. Cross section and ESTAMPINOX EFI parts list with shroud	19

3. General Information

3.1. DESCRIPTION

ESTAMPINOX EFI centrifugal pumps have designed for to pump water and compatible liquids with AISI 316L stainless steel.

This single-stage horizontal pump has a circular body with axial suction and tangential discharge. The main pump components are: pump casing, impeller, cover, lantern and a shaft which is rigidly coupled to the motor shaft.

The motor is IEC standard, B34 flange (B35 for motor frame 132). Protection IP-55. Class F insulation. Three-phase 220-240 / 380-420 a 50 Hz.

3.2. APPLICATION

EFI is designed to cater for the needs of auxiliary services in the food-processing, chemical, pharmaceutical and wine-making industries.

For each type of the pump, the hydraulic performance is given by the choice of impeller diameters and speeds. The characteristic curves also show the power requirements. The intended use of the pump is defined by its characteristic curve and operating limits provided in the [Technical Specifications](#) section.



Misuse of the pump or its use beyond the operating limits may be dangerous or cause permanent damage to the equipment.

4. Installation

4.1. RECEPTION OF THE PUMP

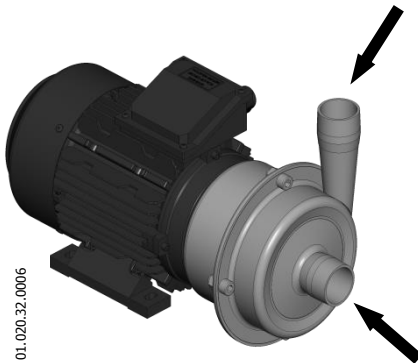


INOXPA will not be liable for any deterioration of the material due to transport or unpacking. Visually check that the packaging has not been damaged.

The following documentation is included with the pump:

- Shipping documents.
- Instructions and Servicing manual for the pump.
- Instructions and Servicing manual for the motor (*).
- (*) If the pump has been supplied with a motor from INOXPA.

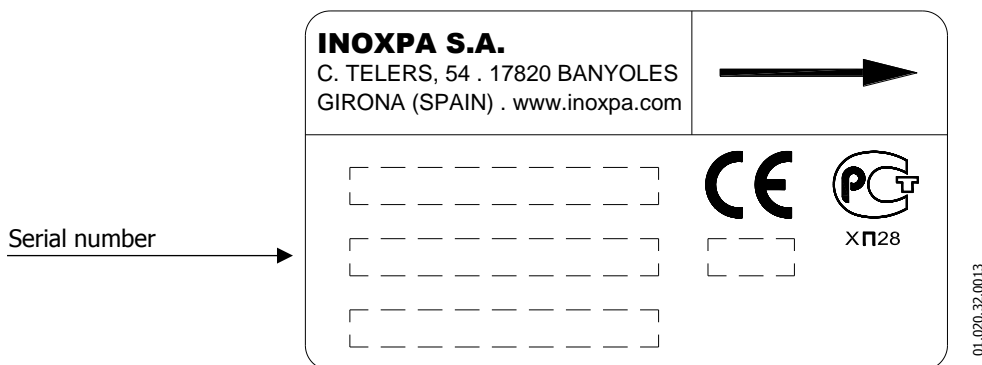
Unpack the pump and check the following:



- The suction and discharge connections on the pump, removing any remaining packaging material.
- Check that the pump and motor have not suffered any damage.
- If not in good material condition and/or if not all the parts are included, the shipping carrier should submit a report as soon as possible.

4.1.1. Identification of the pump

Each pump has a nameplate with the basic data required to identify the model.



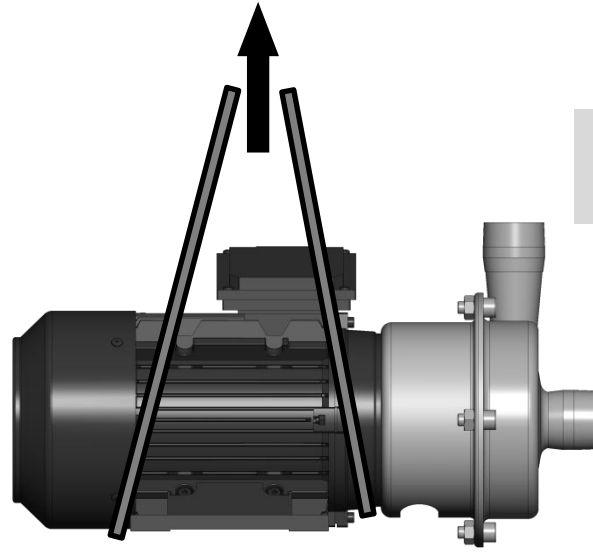
Pump plate

4.2. TRANSPORT AND STORAGE



The ESTAMPINOX EFI pumps are often too heavy to be stored manually.

Lift the pump as indicated below:



ATTENTION!

Always remove the motor shroud before hoisting.

01.020.32.0007

4.3. LOCATION

Place the pump in a position that allows enough space around it to provide access to the pump as well as to the motor. (Refer to Section 8. [Technical Specifications](#) for dimensions and weights.)

Place the pump on a flat and level surface.



Install the pump so that it can be properly ventilated.

If the pump is installed outdoors, it must be sheltered under a roof. Its location must allow for easy access during any inspection or maintenance tasks.

4.4. PIPES

- As a general rule, install the suction and discharge lines in straight sections, with the minimum possible number of elbows and fittings in order to reduce any pressure losses that may be caused by friction.
- Make sure that the pump's ports are properly aligned with the pipework and have a diameter similar to that of the pump connections.
- Place the pump as close as possible to the suction tank and whenever possible below the liquid level, or even below the tank level in order to achieve the largest possible static head for suction.
- Install support brackets for the lines as close as possible to the pump's suction and discharge ports.

4.4.1. Shut-off valves

The pump may be isolated for maintenance. To accomplish this, shut-off valves must be installed and connected to the pump's suction and discharge connections.

These valves must ALWAYS be open during operation of the pump.

4.5. ELECTRICAL INSTALLATION



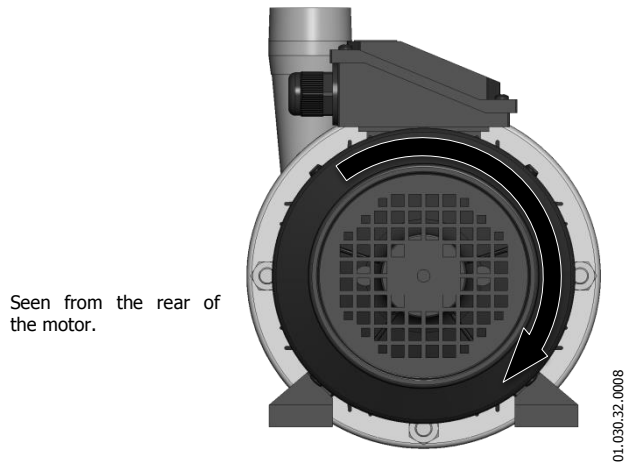
Only qualified personnel can connect the electric motors.
Take the necessary measures to prevent damage to cables and connections.



Electrical equipment, terminals and components of the control systems may still carry current when they are disconnected. Contacting them may impose a hazard to operators or cause irreparable material damage.

Prior to handling the pump, make sure that the electrical panel is disconnected.

- Connect the motor in accordance with the instructions supplied by the motor manufacturer.
- Check the direction of rotation.



ATTENTION!
See indicator label on the pump.

Start and stop the pump motor momentarily. Make sure, looking at the pump from behind, that the motor fan rotates in a clockwise direction.



ALWAYS check the direction of rotation of the motor with liquid inside the pump.

5. Starting the pump



Prior to starting the pump, carefully read the instructions in Section 4. *Installation*.

5.1. START-UP



Carefully read Section 8. *Technical Specifications*. INOXPA will not be liable for improper use of the equipment.



NEVER touch the pump or the lines if hot liquids are being pumped.

5.1.1. Checks before starting the pump

- Completely open the shut-off valves on the suction and discharge lines.
- If liquid does not flow towards the pump, fill it with the liquid to be pumped.



The pump must never turn dry.

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

5.1.2. Checks when starting the pump

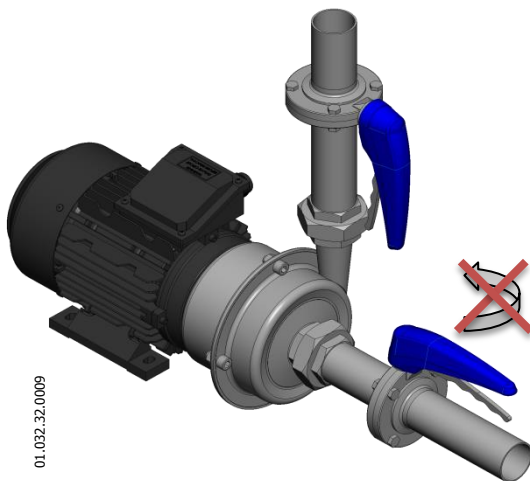
- Check that the pump is not making any strange noises.
- Check if the absolute inlet pressure is sufficient to prevent cavitation in the pump.
- Control the discharge pressure.
- Check for leaks in the sealing areas.



A shut-off valve shall not be used to regulate the flow in the suction line. All shut-off valves must be fully open during operation.



Control the motor consumption to prevent an electrical overload.



Reduce the flow rate and the electrical power consumed by the motor:

- by regulating the pump's discharge flow.
- by decreasing the motor speed.

01.032.32.0009



Use special protection when the sound pressure in the operation area exceeds 80 dB (A).

6. Operating problems

The attached table lists solutions to problems that may arise while operating the pump. It is assumed that the pump has been properly installed and that is has been selected correctly for the specific application. Contact INOXPA if technical assistance is required.

Motor overload							
↓	The pump flow or pressure is insufficient.						
↓	There is no pressure on the discharge side.						
↓	Irregular discharge flow rate / pressure.						
↓	Noise and vibrations.						
↓	The pump gets clogged.						
↓	Pump overheated.						
↓	Abnormal wear.						
↓	Leak through the mechanical seal.						
							↓
						PROBABLE CAUSES	SOLUTIONS
					•	Wrong direction of rotation.	Reverse the direction of rotation .
					•	Insufficient NPSH	Raise the suction tank. Lower the pump. Reduce the vapour pressure. Widen the diameter of the suction pipe. Shorten and simplify the suction line.
					•		Pump not purged
					•	Cavitation.	Increase the suction pressure.
					•	The pump sucks in air.	Check the suction line and all of its connections.
					•	Suction pipe obstructed	Check the suction line and the filters, if available.
					•	Discharge pressure too high	If necessary, reduce the pressure losses, for example, by increasing the pipe diameter.
					•	Flow rate too high	Reduce the flow by means of a diaphragm. Partially close the discharge valve. Trim the impeller. Decrease speed.
					•	Viscosity of the liquid too high.	Reduce the viscosity, for example, by heating the liquid.
					•	Liquid temperature is too high	Decrease the temperature by cooling the liquid.
					•	Mechanical seal worn or damaged.	Replace the seal.
					•	Inadequate O-rings for the liquid.	Install the correct O-rings after consulting the supplier.
					•	The impeller scrapes	Lower the temperature. Reduce the suction pressure. Adjust the impeller/cover play.
					•	Tension in the lines.	Connect the pipes to the pump without tension.
					•	Foreign matter in the liquid.	Install a filter in the suction pipe.
					•	Mechanical seal spring tension is too low.	Adjust as indicated in this manual.

7. Maintenance

7.1. GENERAL CONSIDERATIONS

This pump, just like any other machine, requires maintenance. The instructions contained in this manual cover the identification and replacement of spare parts. The instructions are aimed at maintenance personnel and those responsible for the supply of spare parts.



Carefully read Chapter 8. *Technical Specifications*.



All replaced material should be duly disposed of/recycled according to the directives in force in each area.

ALWAYS disconnect the pump before beginning any maintenance work.

7.1.1. Check the mechanical seal

Periodically check that there are no leaks around the shaft. If leakage is detected through the mechanical seal, replace it following the instructions in the section Assembly and Disassembly.

7.2. STORAGE

Before storing the pump it should be completely drained. Prevent as far as possible exposing the parts to excessively humid environments.

7.3. CLEANING



The use of aggressive cleaning products such as caustic soda and nitric acid may burn the skin.

Use rubber gloves during the cleaning process.



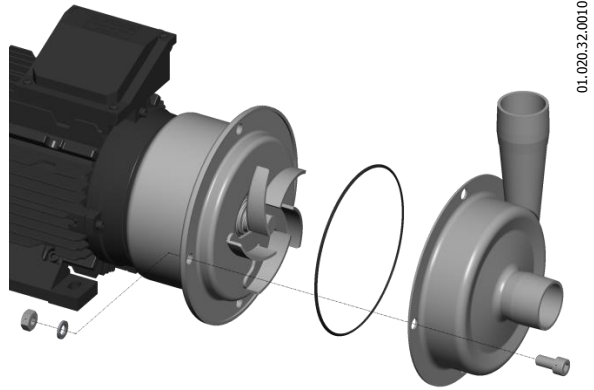
Always use protective goggles.

7.4. ASSEMBLY / DISASSEMBLY OF THE PUMP

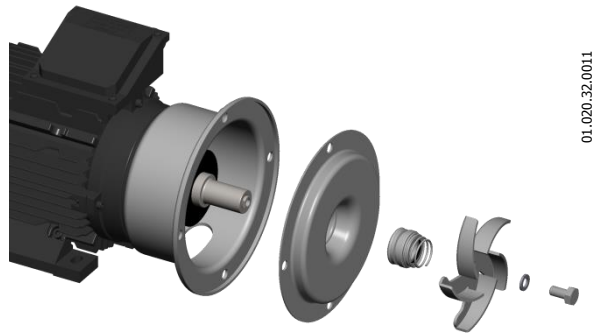
7.4.1. Pump and single mechanical seal

⇒ Disassembly

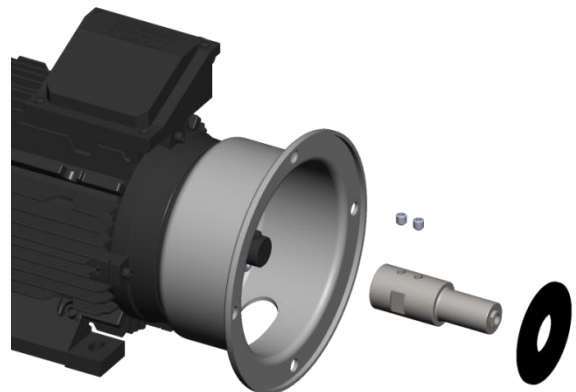
1. Remove the screws, nuts and washers (51) (53A) (54) and disassemble the pump casing (01).
2. Check the condition of the O-ring (80) on the pump casing and replace if damaged.



3. Place an open-end wrench on the flat sides of the shaft (05) to prevent it from rotating. For EFI-3 place a pin into the shaft hole (05).
4. Pull out the impeller (02) disassembling the screw (52A) and washer (53). For the EFI-3, quit the blind nut (45) and washer (35).
5. Remove the rotating part of the seal (08) sliding in front of the shaft (05).
6. Remove the pump cover (03) from the lantern (04).
7. Manually remove the stationary part of the seal (08) which is located in the pump cover (03).

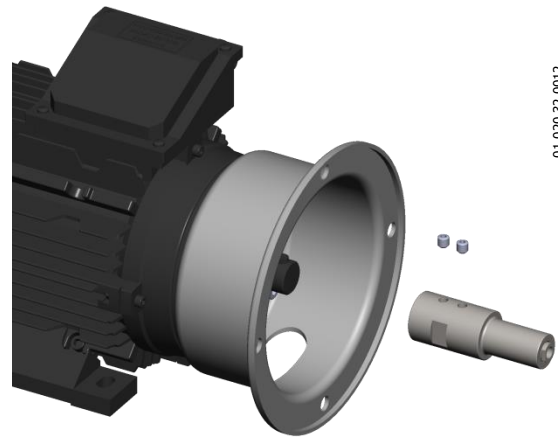


8. Remove the splash ring (82).
9. Loosen the studs (55) from the shaft (05) and take it off from the motor (93).



← Assembly

1. Place the shaft (05) on the motor (93).
2. Fix the shaft (05) with the studs (55) to the motor (93) leaving it to gauge the impeller (02) with the pump cover (03).

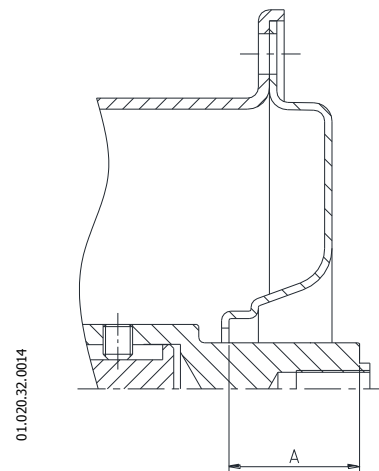


01.020.32.0012

3. Hold the pump cover (03) on the lantern (04) with the hand and gauge the assembly position according to the distance A.

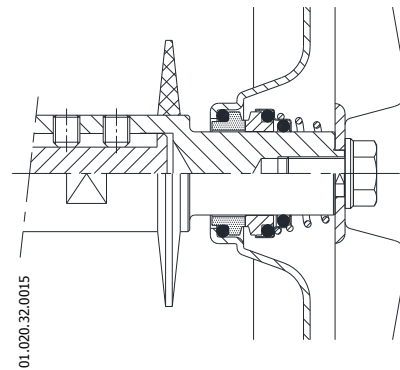
Pump model	A (mm.)
EFI - 0 / 1	33
EFI - 2 / 3	35

4. Now, tighten the studs (55) strongly that fix the shaft (05) to the motor (93) from the bottom lantern window (04).



01.020.32.0014

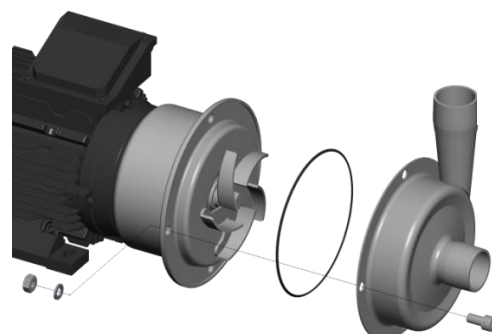
5. Take off the pump cover (03).
6. Place the splash ring (82) in the shaft (05).
7. Fit the stationary part of the mechanical seal (08) on the pump cover (03).
8. Put the pump cover (03) on the lantern (04).
9. Fit the rotating part of the mechanical seal (08) in the shaft (05) and place the impeller (02).
10. Fix the impeller (02) with the screw (52A) and washer (53). For the EFI-3, fix it with the washer (35) and blind nut (54B).



01.020.32.0015

ATTENTION! When installing the new seal, use soapy water when fitting the different parts and gaskets to allow them to slide better; apply to the stationary as well as the rotating parts.

1. Mount the o-ring (80) on the pump cover (03) taking care that it is not twisted.
2. Put the pump casing (01) and secure it on the lantern (04) by the screws, nuts and washers (51) (53A) (54).



01.020.32.0010

8. Technical Specifications

8.1. TECHNICAL SPECIFICATIONS

Maximum operating pressure	600 kPa (6 bar)
Temperature range	-10 to 90 °C (EPDM)
Maximum speed	3000 rpm (50 Hz) 3600 rpm (60 Hz)

Materials

Parts in contact with the product	AISI 316L (1.4404)
Other steel parts	AISI 304 L (1.4306)
Gaskets in contact with the product	EPDM (standard)
Other gaskets	Consult with the supplier
Surface finish	Electropolished

Mechanical seal

Type	Single internal seal
Material of rotating part	Ceramic (Cer) (standard)
Material stationary part	Graphite (C) (standard)
Gasket material	EPDM (standard)

Motor

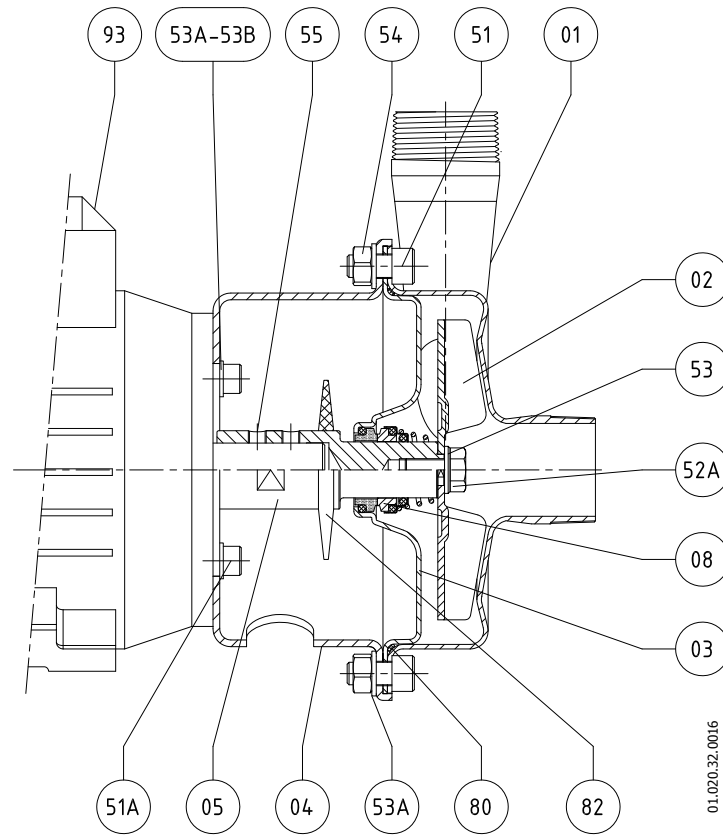
Type	Three-phase asynchronous motor, flange B34 (B35 for motor frame 132), 2 or 4 poles, IP55 protection, Class-F insulation
Power	0.37 to 7.5 kW
Voltage and frequency	220-240 V Δ / 380-420 V Y, ≤ 4 kW 380-420 V Δ / 660-690 V Y, ≥ 5.5 kW

8.2. TIGHTENING TORQUES

If not stated otherwise, the torques listed in the following table should be applied on the nuts and bolts of this pump.

Size	Nm	lbf·ft
M6	10	7
M8	21	16
M10	42	31
M12	74	55
M16	112	83

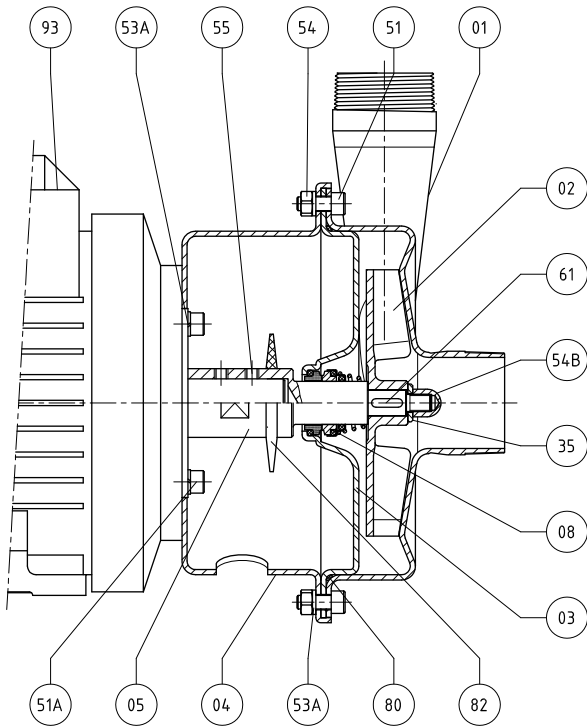
8.3. CROSS SECTION ESTAMPINOX EFI- 0 / 1 / 2



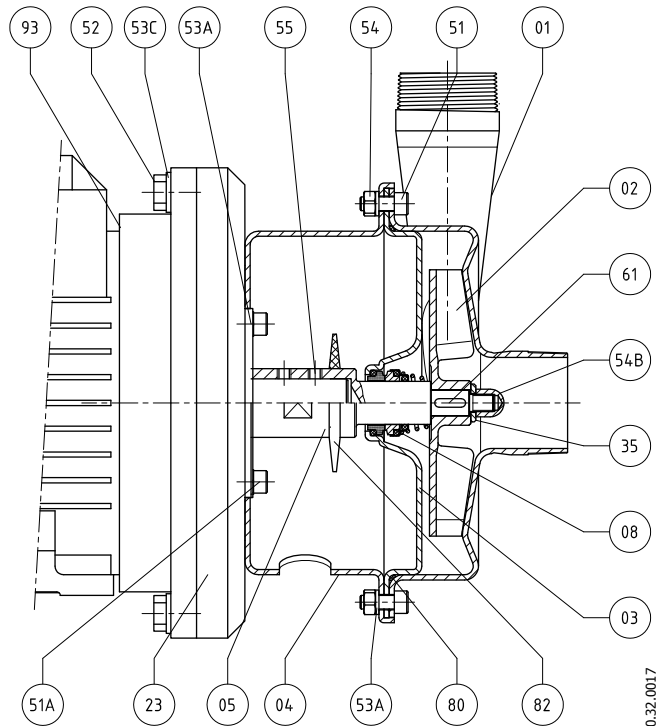
8.4. ESTAMPINOX EFI- 0 / 1 / 2 PARTS LIST

Position	Description	EFI - 0	EFI - 1	EFI - 2	Material
01	Pump casing		1		AISI 316L
02	Impeller		1		AISI 316L
03	Pump cover		1		AISI 316L
04	Lantern		1		AISI 304
05	Shaft		1		AISI 316L
08	Mechanical seal		1		-
51	Allen screw		4		A2
51A	Allen screw		4		A2
52A	Hexagonal screw		1		A4
53	Flat washer		1		A4
53A	Grower washer	8	4		A2
53B	Grower washer	-	4		A2
54	Hexagonal nut		4		A2
55	Stud	1	2		A2
80	O-ring		1		EPDM
82	Splash ring		1		EPDM
93	Motor		1		-

8.5. CROSS SECTION ESTAMPINOX EFI- 3



Motor size 100 / 112



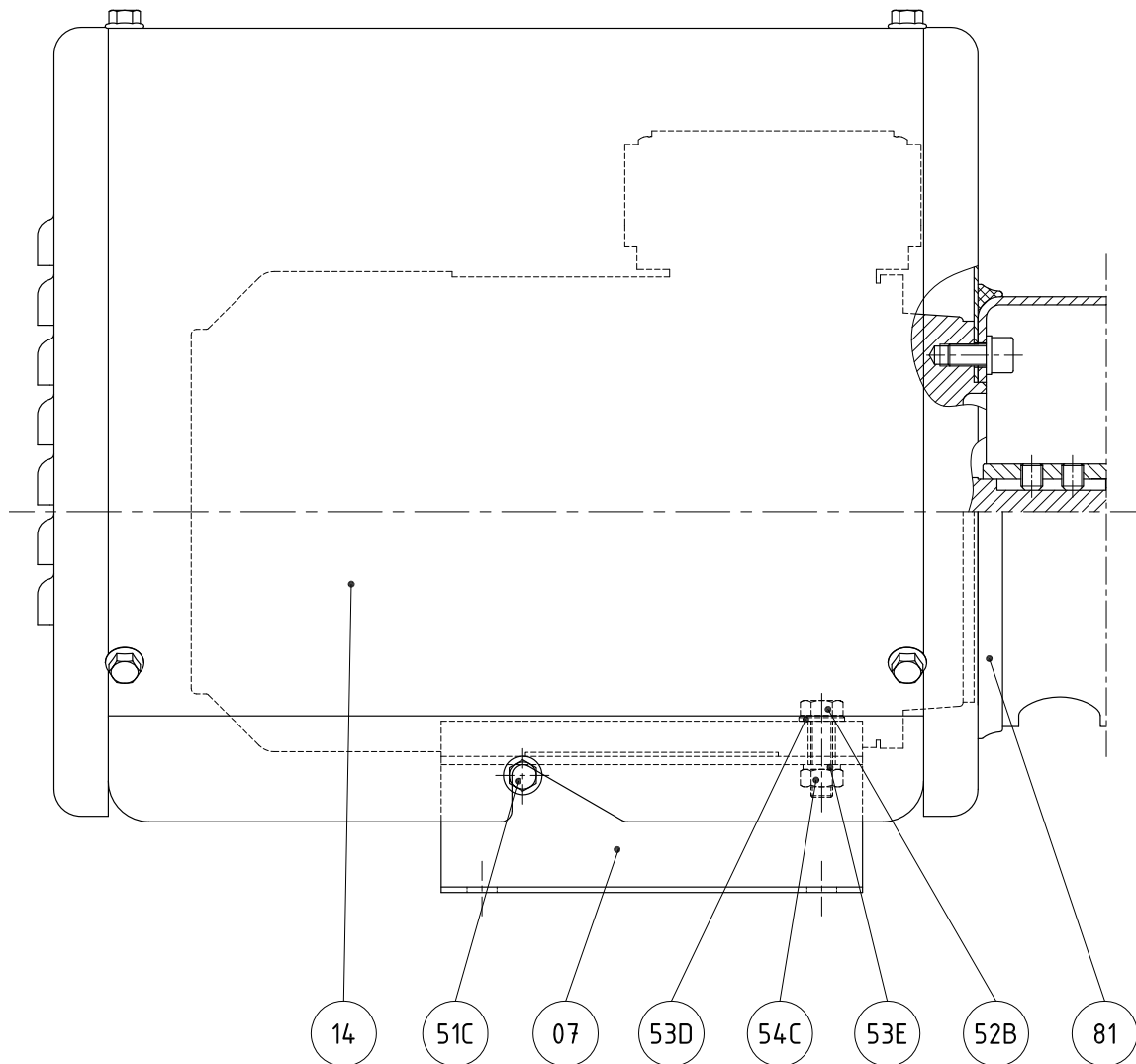
Motor size 132

01.020.32.0017

8.6. ESTAMPINOX EFI- 3 PARTS LIST

Position	Description	EFI-3 (motor 100/112)	EFI-3 (motor 132)	Material
01	Pump casing	1		AISI 316L
02	Impeller	1		AISI 316L
03	Pump cover	1		AISI 316L
04	Lantern	1		AISI 304
05	Shaft	1		AISI 316L
08	Mechanical seal	1		-
23	Counterflange	-	1	LM4
35	Impeller washer	1		A4
51	Allen screw	8		A2
51A	Allen screw	4		A2
52	Hexagonal screw	-	4	A4
53A	Grower washer	12		A2
53C	Flat washer	-	4	A2
54	Hexagonal nut	8		A2
54B	Blind nut	1		A4
55	Stud	2		A2
61	Key	1		AISI 316L
80	O-ring	1		EPDM
82	Splash ring	1		EPDM
93	Motor	1		-

8.7. CROSS SECTION AND ESTAMPINOX EFI PARTS LIST WITH SHROUD



Position	Description	Quantity	Material
07	Leg	2	AISI 304
14	Shroud	1	AISI 304
51C	Screw with flange	2	A2
52B	Hexagonal screw	4	A2
53D	Flat washer	4	A2
53E	Grower washer	4	A2
54C	Hexagonal nut	4	A2
81	Lantern joint	1	EPDM

**INOXPA, S.A.**

c/ Telers, 54 – PO Box 174
17820 BANYOLES (GIRONA)
Tel: 34 972575200
Fax: 34 972575502
e-mail: inoxpa@inoxpa.com
www.inoxpa.com

DELEGACIÓN STA

GALDACANO (BILBAO)
Tel: 944 572 058
Fax: 944 571 806
e-mail: sta@inoxpa.com

DELEGACIÓN CENTRO

ARGANDA DEL REY (MADRID)
Tel: 918 716 084
Fax: 918 703 641
e-mail: inoxpa.centro@inoxpa.com

INOXPA SOLUTIONS LEVANTE

PATERNA (VALENCIA)
Tel: 963 170 101
Fax: 963 777 539
e-mail: isf@inoxpa.com

INOXPA COLOMBIA SAS

BOGOTA
Tel: 571 4208711
Fax: 571 4190562
e-mail: colombia@inoxpa.com

INOXPA ALGERIE

ROUIBA
Tel: 213 21856363 / 21851780
Fax: 213 21854431
e-mail: inoxpalgerie@inoxpa.com

INOXPA UK LTD

SURREY
Tel: 44 1737 378 060 / 079
Fax: 44 1737 766 539
e-mail: inoxpa-uk@inoxpa.com

INOXPA SKANDINAVIEN A/S

HORSENS (DENMARK)
Tel: 45 76 286 900
Fax: 45 76 286 909
e-mail: inoxpa.dk@inoxpa.com

**INOXPA SPECIAL PROCESSING
EQUIPMENT, CO., LTD.**

JIAXING (China)
Tel.: 86 573 83 570 035 / 036
Fax: 86 573 83 570 038

INOXPA UCRANIA

KIEV
Tel: 38 050 720 8692
e-mail: kiev@inoxpa.com

DELEGACIÓN NORD-ESTE

BARBERÀ DEL VALLÈS (BCN)
Tel: 937 297 280
Fax: 937 296 220
e-mail: inoxpa.nordeste@inoxpa.com

LOGROÑO

Tel: 941 228 622
Fax: 941 204 290
e-mail: sta.rioja@inoxpa.com

DELEGACIÓN SUR

JEREZ DE LA FRONTERA (CÁDIZ)
Tel / Fax: 956 140 193
e-mail: inoxpa.sur@inoxpa.com

INOXPA SOLUTIONS FRANCE

GLEIZE
Tel: 33 474627100
Fax: 33 474627101
e-mail: inoxpa.fr@inoxpa.com

INOXPA MIDDLE EAST FZCO

DUBAI - U.A.E
Tel. +971 (0)4 372 4408
sales.ae@inoxpa.com

INOXPA SOUTH AFRICA (PTY) LTD

JOHANNESBURG
Tel: 27 117 945 223
Fax: 27 866 807 756
e-mail: sales@inoxpa.com

S.T.A. PORTUGUESA LDA

VALE DE CAMBRA
Tel: 351 256 472 722
Fax: 351 256 425 697
e-mail: comercial.pt@inoxpa.com

IMPROVED SOLUTIONS PORTUGAL LDA

VALE DE CAMBRA
Tel: 351 256 472 140 / 138
Fax: 351 256 472 130
e-mail: isp.pt@inoxpa.com

INOXRUS

MOSCOW (RUSIA)
Tel / Fax: 74 956 606 020
e-mail: moscow@inoxpa.com

DELEGACIÓN LEVANTE

PATERNA (VALENCIA)
Tel: 963 170 101
Fax: 963 777 539
e-mail: inoxpa.levante@inoxpa.com

LA CISTÉRNIGA (VALLADOLID)

Tel: 983 403 197
Fax: 983 402 640
e-mail: sta.valladolid@inoxpa.com

CHAMBLY (PARIS)

Tel: 33 130289100
Fax: 33 130289101
e-mail: isf@inoxpa.com

INOXPA AUSTRALIA PTY (LTD)

MORNINGTON (VICTORIA)
Tel: 61 3 5976 8881
Fax: 61 3 5976 8882
e-mail: inoxpa.au@inoxpa.com

INOXPA USA, Inc

SANTA ROSA
Tel: 1 7075 853 900
Fax: 1 7075 853 908
e-mail: inoxpa.us@inoxpa.com

INOXPA ITALIA, S.R.L.

BALLO DI MIRANO – VENEZIA
Tel: 39 041 411 236
Fax: 39 041 5128 414
e-mail: inoxpa.it@inoxpa.com

INOXPA INDIA PVT. LTD.

Maharashtra, INDIA.
Tel: 91 2065 008 458
inoxpa.in@inoxpa.com

SAINT PETERSBURG (RUSIA)

Tel: 78 126 221 626 / 927
Fax: 78 126 221 926
e-mail: spb@inoxpa.com