INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

SWFI PROLAC PUMP

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CE

EC DECLARATION OF CONFORMITY

(according to Directive 2006/37/CE, annex II, part A)

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

Hereby declares, that the product:

CENTRIFUGAL PUMP	**PROLAC SWFI**
Name	Type

conforms to the specifications of the Council Directive:

Machine Directive 2006/42/CE, and complies with the essential requirements of the Directive and Harmonised Standards:

UNE-EN ISO 12100-1/2:2004
UNE-EN 809/AC:2001
UNE-EN ISO 13857:2008
UNE-EN 953:1997
UNE-EN ISO 13732-1:2007

Low Voltage Directive 2006/95/EC (what repeal 73/23/CEE Directive), and are conforms with UNE-EN 60204-1:2006 and UNE-EN 60034-1:2004

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

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

Banyoles, 2012

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 SWFI PROLAC 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 familiarize 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

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 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 o 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 authorized 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.

All electrical work must be carried out by duly authorized 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 safety 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

The sanitary centrifugal pumps in the SWFI PROLAC series are manufactured using AISI 316(1.4404) stainless steel die-pressed steel plate with a Ra ≤ 0,5μm interior finish and Ra ≤ 0,8μm exterior finish, and later electro-polished finish.
The SWFI PROLAC centrifugal pump has a compact construction, monoblock, axial intake, radial discharge, and sanitary-type connections. These series have the discharge port at 45º for self- purging and a drainage in the bottom part of the pump casing. The standard connections are the Raccord Clamp. The impeller is of open design and made of one single piece. The mechanical seal is balanced and fully sanitary; the springs are external to avoid contact with the product.
The motor conforms to the IEC standard with a stainless steel facing. IP-55 protection. Class-F insulation. Three-phased power supply with 220-240 / 380-420 / 660 V at 50Hz, depending on the power source. The motors can be ordered for working in explosion hazardous environments. Depending on environmental conditions, the motors can be explosion-proof (EExd) or of enchanced safety (EExe).
The SWFI PROLAC series also can be ordered in NEMA version.
The SWFI PROLAC series has been specially developed to respond to all hygienic requirements in the food industry. For this reason, they are designed according to the American 3-A Sanitary Standards.
As regards hygiene, reliability and sturdiness, the complete range satisfies all requirements set by the aforesaid industry.
Thanks to its design, there is optimal interchangeability of parts between the different pumps.
This equipment is suitable for his use in food process.

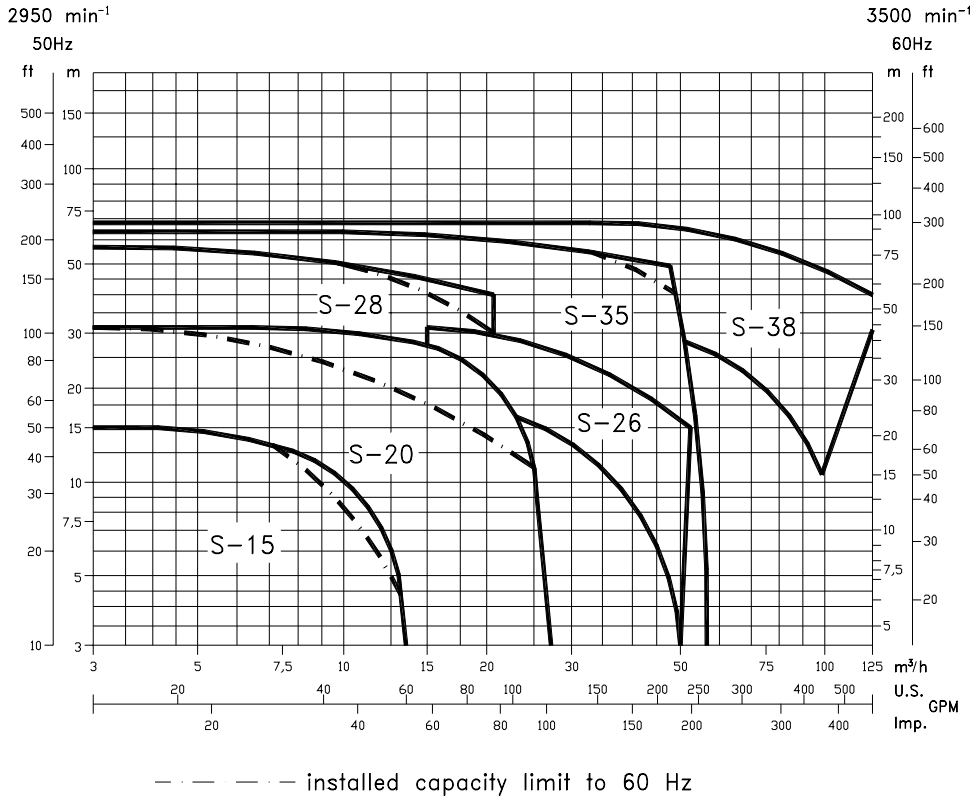
3.2. PRINCIPLE OF OPERATION

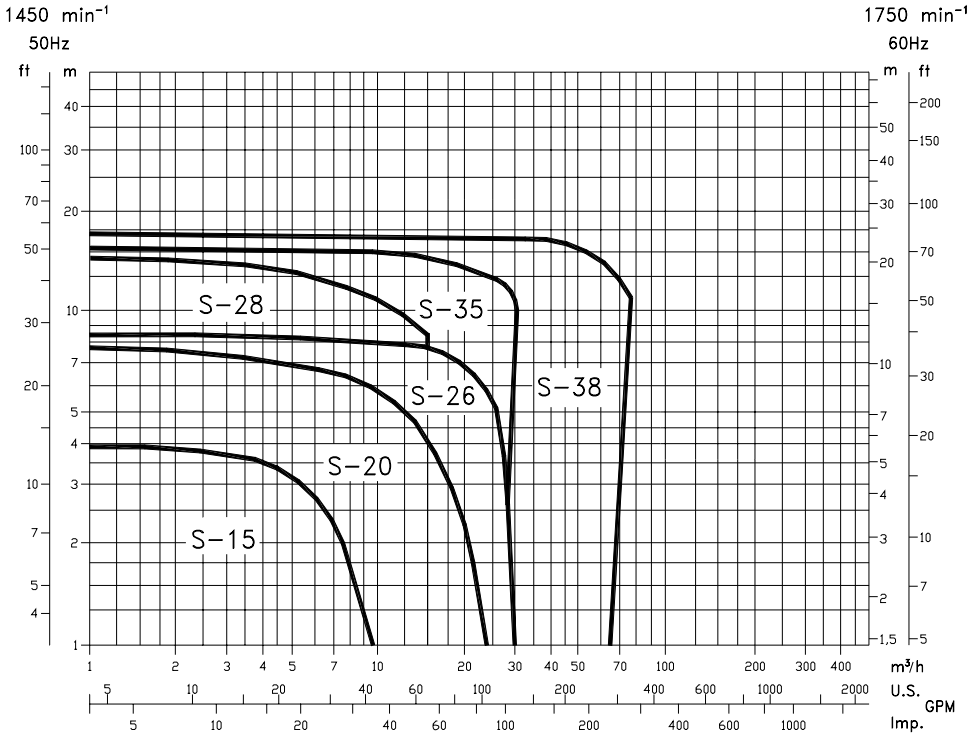
The rotor or impeller, situated in the housing, rotates solidly fixed to the pump shaft and consists of a given number of blades, depending on the pump model.
The impeller blades transmit energy to the fluid in the form of kinetic and pressure energy.
The pump is not reversible by simple inversion of the direction of rotation. The direction of rotation is clockwise when the pump is seen from the rear part of the motor.

3.3. APPLICATION

In general terms, SWFI PROLAC pumps, at least in their standard version, are mainly used in the food industry to decant liquids.
Each different type of pump has special hydraulic features in accordance with the pump impeller diameter and various speeds.
In the curves reflecting the characteristics, we are also given the required NPSH and the absorbed power.

3.3.1. 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

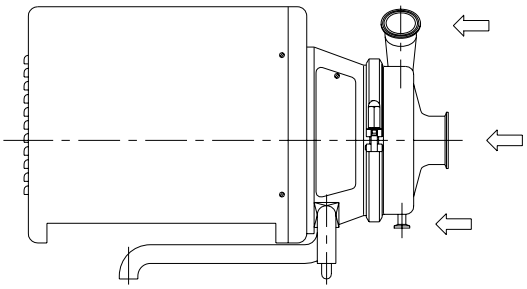
4.1. PUMP RECEPTION

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:

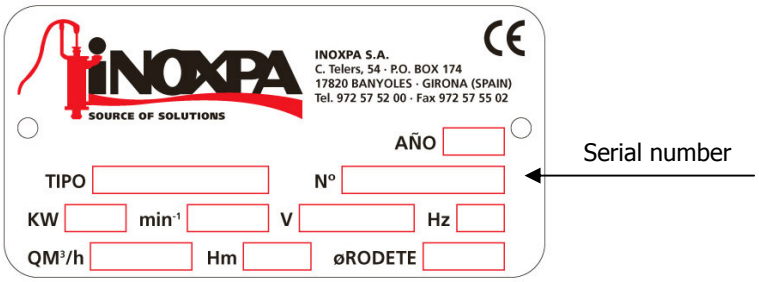
- Dispatch notes.
- Pump Instruction and Service Manual.
- Motor Instruction and Service Manual (*).
- (*) If the pump has been supplied with a motor from INOXPA.

Unpack the pump and check the following:



- The pump drainage connection and 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

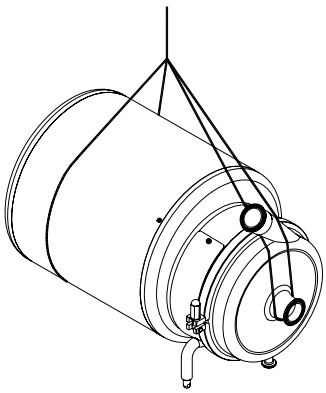


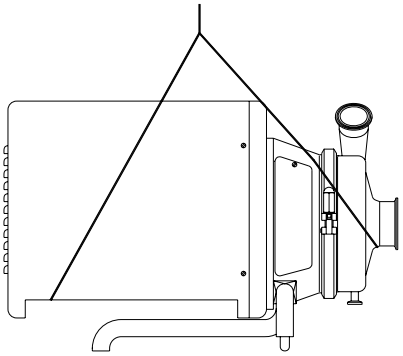
Pump plate

4.2. TRANSPORT AND STORAGE

SWFI PROLAC pumps are quite often too heavy to be put into their storage space manually.

Lift the pump as is shown below:





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.
The basement must be rigid, horizontal and against any vibration.

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.

4.4.1. Shut-off valves

The pump can be isolated for the purpose of carrying out maintenance work. To this end, shutoff valves should be fitted at the pump's suction and delivery connections.
These valves must ALWAYS be open whenever the pump is operating.

4.5. ELECTRICAL INSTALLATION

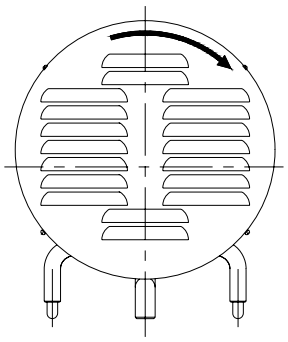
Leave the connecting of the electrical motors to qualified personnel.

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 maneuvering 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.

Check ALWAYS the direction of the motor's rotation with liquid inside the pump.

For the models with sealing chamber, make sure always that it is filed of liquid before checking the rotating direction.

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.

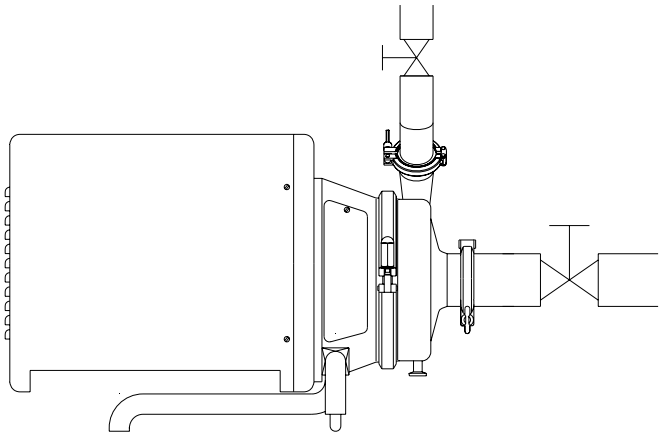
- Check that the rotation direction of the motor is correct.

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 cavitation in the pump. Consult the curve for the minimum required pressure above the steam pressure (NPSHr).
- 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, 20, 21.
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, 20, 21.
The pump gets clogged.	9, 10, 13, 15, 20, 21.
Overheating of the pump.	8, 9, 10, 13, 15, 20, 21.
Abnormal wear.	4, 5, 10, 15, 20, 21.
Leak in mechanical seal.	11, 12, 16.

Probable causes		Solutions
1	Wrong rotation direction.	Change the direction of the rotation.
2	Insufficient NPSH.	Increase the NPSH available: - Raise the suction tank. - Lower the pump. - Decrease the steam tension. - 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 and the filters, if there are any.
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. - Trim the impeller. - Decrease the speed.
9	The viscosity of the liquid is too high.	Decrease the viscosity by heating the liquid, for example.
10	The temperature of the liquid is too high.	Decrease the temperature of the liquid by cooling it.
11	Mechanical seal either damaged or worn.	Replace the seal.
12	Unsuitable O-ring gaskets for the liquid in question.	Fit more suitable O-ring gaskets by consulting the supplier with respect to the same.
13	The impeller is rubbing.	- Lower the temperature. - Lower suction pressure. - Adjust impeller / cover set.
14	Pressure in the pipes.	Connect the pipes to the pump without pressure.
15	There are foreign bodies in the liquid.	Place a filter at the suction piping.
16	The tension of the mechanical seal spring is too low.	Adjust in accordance with the instructions given herein.
17	The pump speed is too low.	Increase the speed.
18	The suction shutoff valve is closed.	Check and open.
19	Delivery pressure is too low.	Increase the pressure: - Increase the diameter of the impeller. - Increase pump speed.
20	Pressure on the pipes.	Connect the pipes to the pump without pressure and align the coupling.
21	Pump and/or motor not fixed to the base-plate.	Affix the pump and/or the motor to the base-plate, check to see if the pipes are connected without pressure and align the coupling.

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 *Pump disassembly / assembly*.

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 *Pump disassembly / assembly*.

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) a 70ºC (150ºF)

0,7 litres HNO_3 to 53% + 100 l. of 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).

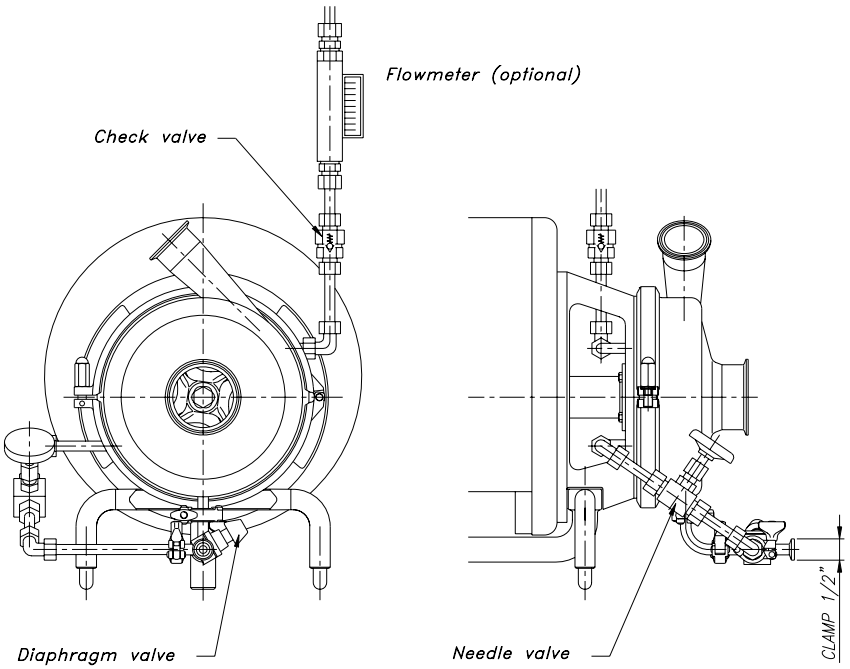
A flow by-pass is recommended to be used in order to assure the flow of sterile product after the pump.

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. FLUSHING CIRCUIT

The SWFI PROLAC pumps ordered with double mechanical seal also have the flushing circuit option (to be ordered apart). These series have the self-purging feature and moreover, all the flush circuit elements self-drain completely.
The circuit's components are:

- A needle valve to regulate the flow rate and the pressure of the mechanical seal to extend its working life.
- A check valve to prevent air form entering the circuit after vaporization.
- A manual diaphragm valve to drain the pump and the circuit.
- No "dead points". The pump has drainage in the bottom part of the pump casing and the discharge port located at the highest point of the volute.



7.5. PUMP DISASSEMBLY/ASSEMBLY

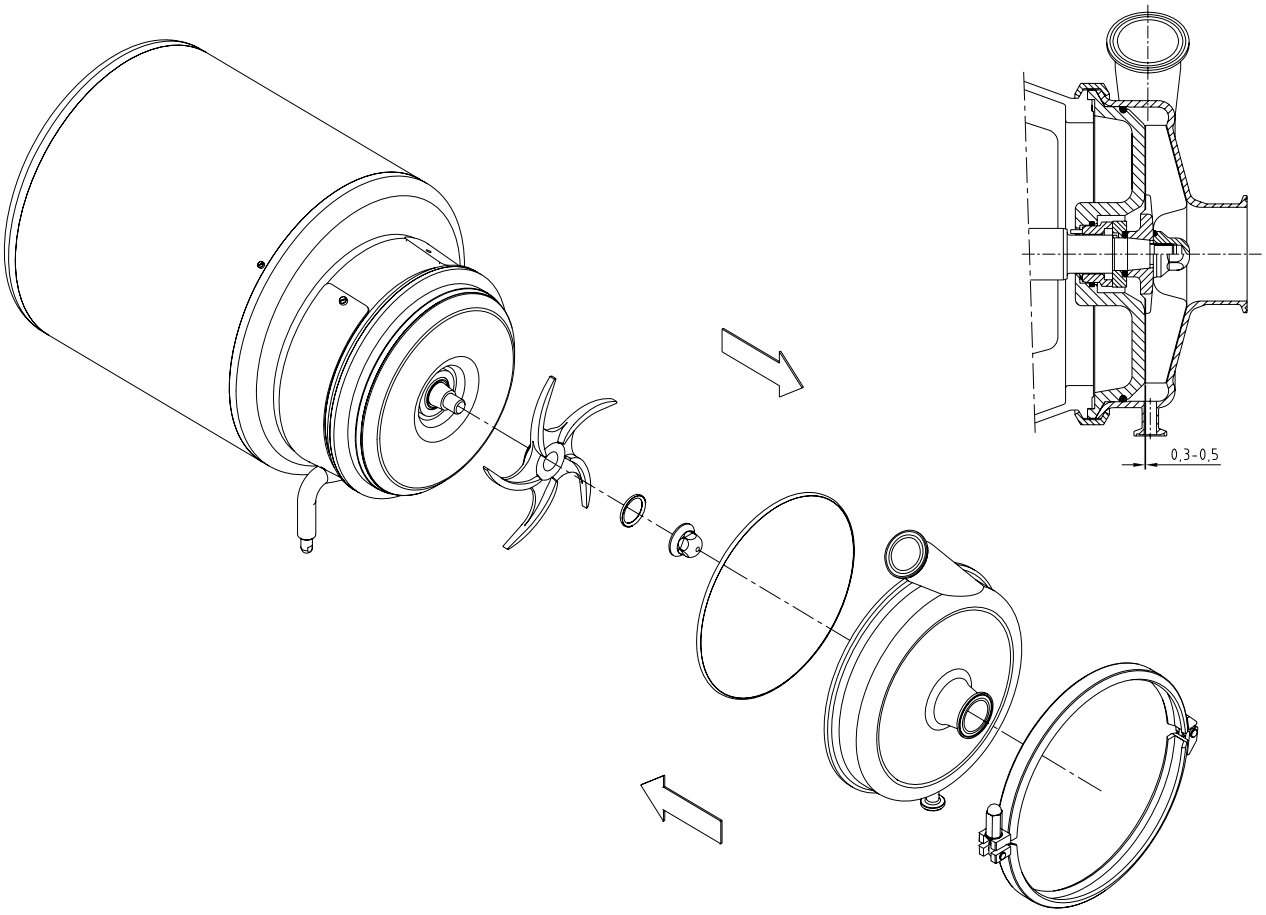
7.5.1. Pump casing and impeller

⇨ **Disassembly**

Remove the clamping ring (15) and disassemble the pump casing (01).
Check to see that the O-ring (80A) is still in good condition.
Remove the screws (50A) and the protections (47A).
Insert open-jaw wrench in the shaft flats (05) to keep it from rotation.
Remove the blind nut (45) and the O-ring (80D).
Remove the impeller (02). If necessary, hit it with a dead blow using a plastic mallet in order to drive off the cone.

⇦ **Assembly**

Slide the impeller (02) over the shaft up to the rotating part of the mechanical seal.
Mount the O-ring (80D) into place and tighten the blind nut (45)
Check that the clearance between the impeller and the cover (03) remains at 0,3 - 0,5 mm so that the working pressure of the seal would be the correct one. See the following detail. If the clearance is not correct, loosen the studs (55), place correctly the shaft (05) and secure the studs.
Insert the O-ring (80A).
Fit the body (01) and fix it to the lantern (04) with the clamping ring (15).



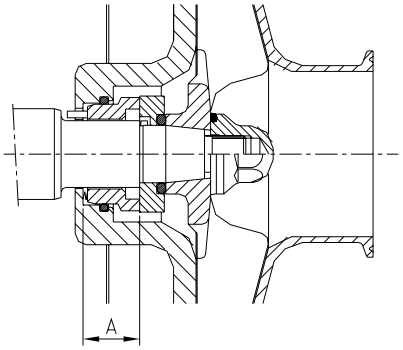
7.5.2. Simple mechanical seal

⇨ Disassembly

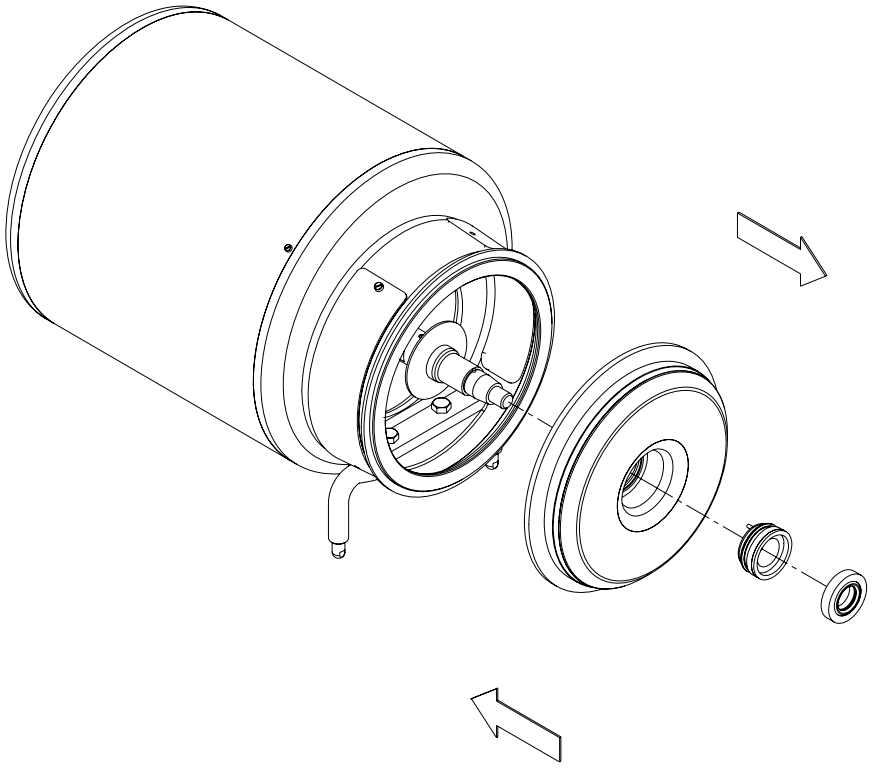
Remove the rotational part from the mechanical seal (08).
Take off the pump cover (03), the fixed part of the mechanical seal (08) will remain housed in the cover.
Remove the fixed part of the mechanical seal (08).

⇦ Assembly

Fit the pump cover (03) on the lantern (04).
Check that the seals fitting dimension is as indicated, see the following table. If the clearance is not correct, loosen the studs (55), place correctly the shaft (05) and secure the studs.
Insert the stationary part of the mechanical seal (08) into its location in the cover. Check the position of the pivot of the stationary part of the seal.
Slide the rotating part of the mechanical seal (08) over the shaft. Check that the shaft's dragging pivot encases in its position.



Seal diameter	A [mm]
5/8″	26
1″	26
1 ½″	31



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

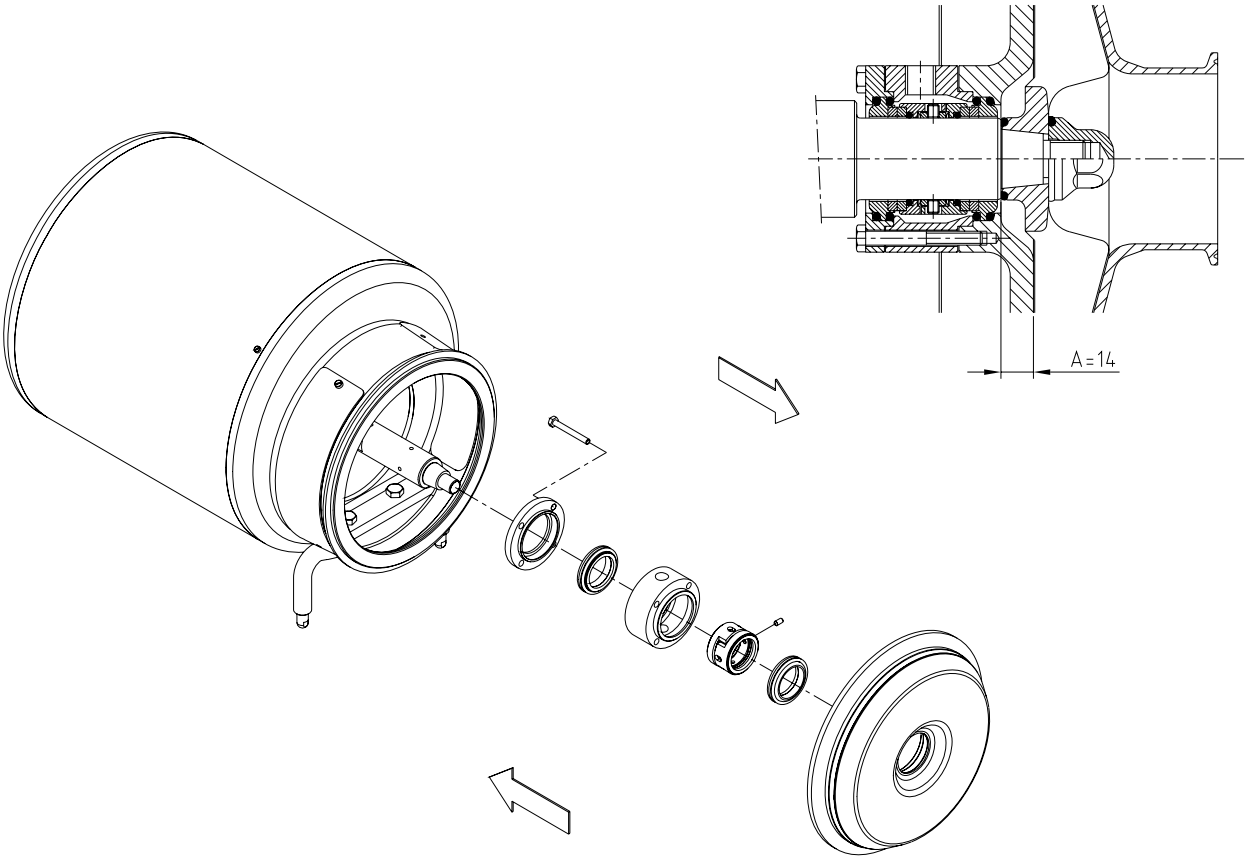
7.5.3. Double mechanical seal

⇨ **Disassembly**

Remove the screws (52), thus freeing the lids (10 y 10A).
Remove the double seal cover (03A) and the double seal lid (10). The fixed part of the inner mechanical seal (08B) will remain housed in the double seal cover (03A).
Loosen the studs from the rotating parts of the seals (08B) till it could be slidden over the shaft, then remove it.
Remove the outer lid (10A), the fixed part of the exterior mechanical seal (08B) will remain housed in the cover.

⇦ **Assembly**

Fit the fixed outer part of the seal (08B) into the outer lid housing (10A).
Position the outer lid (10A) with the screws (52) in their position, leaving it losse at the end of the shaft (05A).
Slide the rotating part of the mechanical seal (08B) over the shaft and fix the studs.
Check that the assembly dimension is correct. If the dimension is not correct, loosen the studs (55), place correctly the shaft (05) and secure the studs.
Position the lid (10) over the outer lid (10A) placing the screws (52).
Fit the fixed inner part of the mechanical seal (08B) into the double seal cover housing (03A).
Assemble the pump cover (03A) to the lantern (04) and fix it with the screws (52).



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

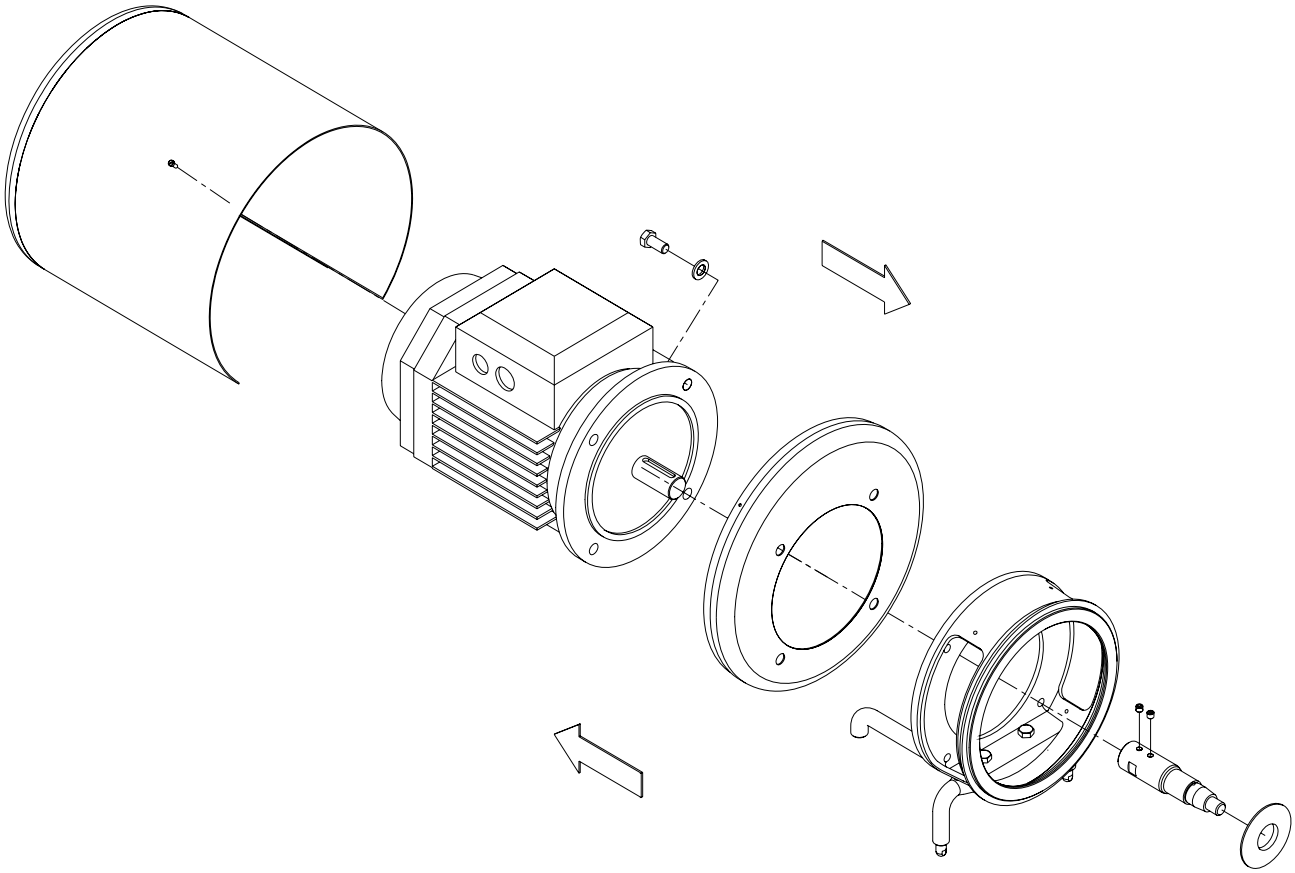
7.5.4. Motor replacement (IEC type)

⇨ **Disassembly**

Remove the splash ring (82).
Loosen the studs (55) and take the shaft (05) out.
Remove the screws (50) and take out the shroud (14).
Remove the screws (52) and take the lantern (04) out.

⇦ **Assembly**

Position the shroud cover (14) between the lantern (04) and the motor flange (93).
Fix the ensemble with the screws (52) and the flat washers (53).
Position the shroud body (14) on the shroud cover and fix it with the screws (50).
Slide the shaft (05) over the motor shaft and fix it with the studs (55) in the groove.
Position the splash ring (82).



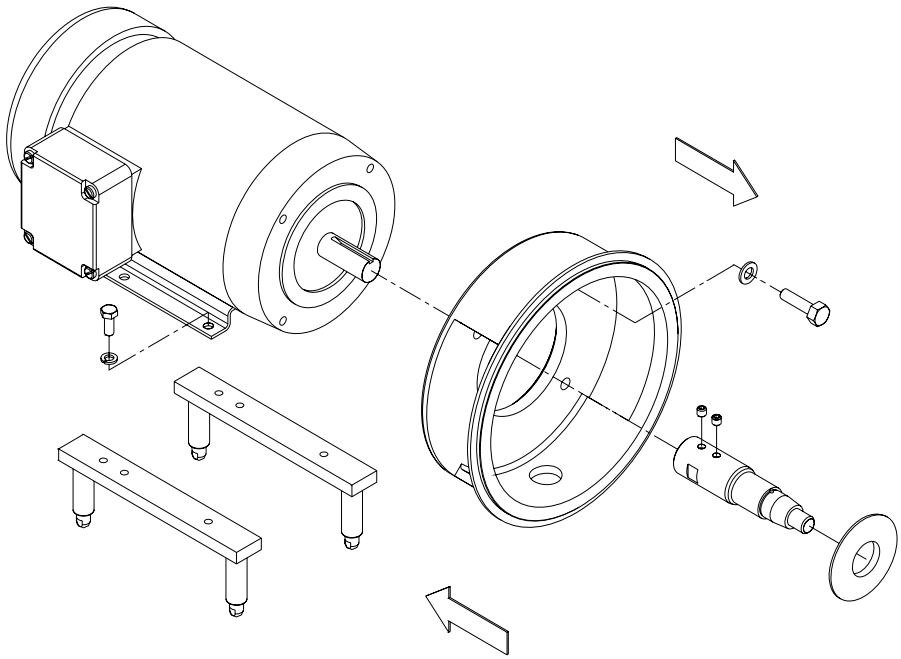
7.5.5. Motor replacement (NEMA type)

⇨ **Disassembly**

Remove the splash ring (82).
Loosen the studs (55) and take the shaft (05) out.
Remove the screws (52) and take the lantern (04) out.
Remove the screws (52A) and take the leggs (07) out.

⇦ **Assembly**

Position the leggs (07) into the motor (93) and fix with the screws (52A) and the spring washers (53A).
Fit the lantern (04) over the motor flange (93).
Fix the ensemble with the screws (52) and the flat washers (53).
Slide the shaft (05) over the motor shaft and fix it with the studs (55) in the groove.
Position the splash ring (82).



8. Technical Specifications

8.1. TECHNICAL SPECIFICATIONS

	50Hz	60Hz
Maximum flow rate (1450 min^{-1})	140 m^3/h	150 m^3/h
Maximum differential pressure	6,8 bar (100 PSI)	9,5 bar (140 PSI)
Maximum suction pressure	4 bar (58 PSI)	4 bar (58 PSI)
Maximum operating pressure	10,8 bar (157 PSI)	13,5 bar (196 PSI)
Operating temperature	-10 ºC a +140ºC (EPDM)	-10 ºC a +140ºC (EPDM)
	14 ºF a 284 ºF (EPDM)	14 ºF a 284 ºF (EPDM)
Noise level	60-80 dB(A)	60-80 dB(A)
Suction / delivery connections	CLAMP-ISO 2852	CLAMP-ISO 2852

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 in contact with the product	EPDM (standar)
Other optional joint materials	Consult your supplier
Surface finish	Standard finish

Mechanical seal

Seal type	Single internal mecanical seal
Stationary part material	Tungsten carbide (standar)
Fixed part material	Silicon carbide (standar)
Gaskets material	EPDM (standar)

Double mechanical seal

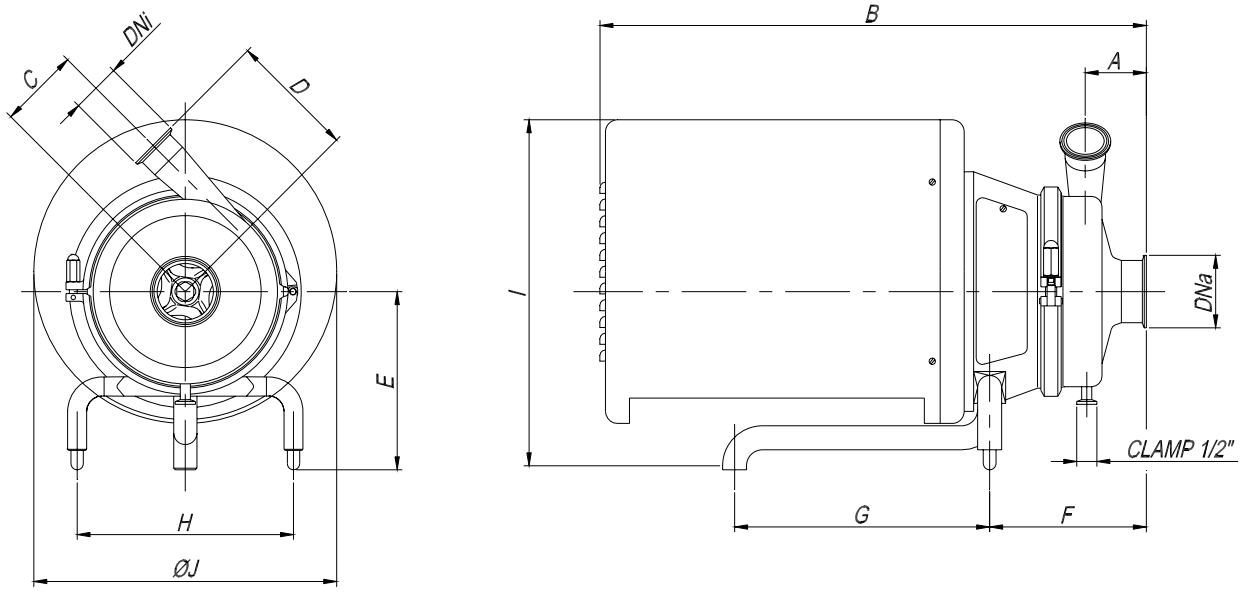
Operating pressure	1,5~2 bar (22~29 PSI) over the pump operating pressure
Circulation flow	0,25-0,5 l/min
Temperature	85º-90ºC at atmospheric pressure

8.2. WEIGHTS

PUMP TYPE		IEC Motor Kw	IEC Motor min^{-1}	Pump without motor [Kg]	Pump with motor [Kg]
S-20	B	0,75	1450	11	24
		1,1	2950		24
	C	1,5	2950		28
		2,2	2950		30
S-26	B	0,75	1450	12	25
	E	3	2950	13	38,5
		4	2950		50,5
		5,5	2950		52,5
S-28	B	0,75	1450	15	28
		1,1	2950		28
	C	1,5	2950		32
		2,2	2950		34
	E	3	2950	16	42
		4	2950		54
		5,5	2950		56
S-35	C	1,5	1450	15,5	34,5
	F	5,5	2950	20	71
		7,5 - 9	2950		80
		11	2950		86
S-38	C	1,5	1450	17	34,5
	E	2,2	1450	21,5	47
		3	1450		50
		4	1450		57
	G	11	2950	33	120
		15	2950		127
		18,5	2950		139
	H	22	2950		166

PUMP TYPE		NEMA Motor Size	Pump without motor [Kg]
S-20	B	145 TC	10
	C	182/184 TC	14
	D	213/215 TC	15
S-26	B	145 TC	11
	C	182/184 TC	15
	D	213/215 TC	16
S-28	B	145 TC	15
	C	182/184 TC	19
	D	213/215 TC	20
S-35	B	145 TC	16
	C	182/184 TC	20
	D	213/215 TC	21
S-38	C	182/184 TC	22
	D	213/215 TC	23
	E	254/256 TC	25
	F	284/286 TC	27
	G	324/326 TC	33

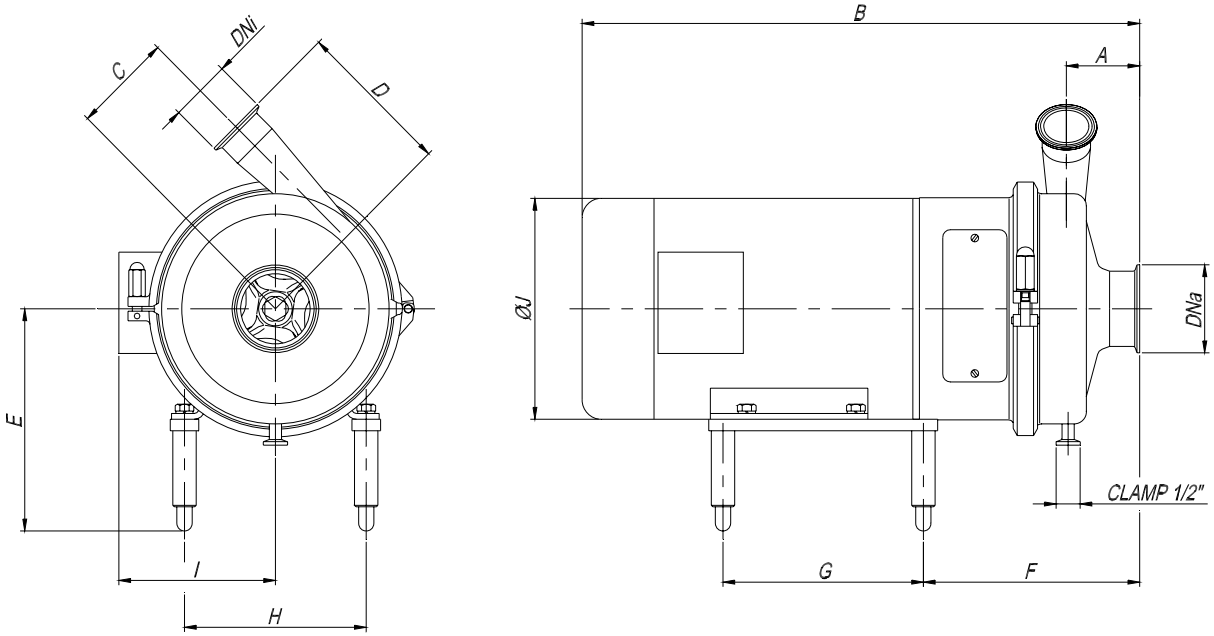
8.3. SWFI PROLAC PUMP WITH IEC MOTOR DIMENSIONS



Dimensions with Clamp-ISO 2852

PUMP TYPE		Motor size	DNa	DNi	A	B	C	D	E	F	G	H	I	ØJ
S-20	**B**	80	2"	11/2"	53	503	74	131	165	149	235	205	325	270
	C	90												
S-26	**B**	80	3"	2"	61	521	72	145	165	168	235	205	325	270
	E	100/112				581			190	178	275	205	375	330
S-28	**B**	80	11/2"	11/2"	61	498	107	137	165	150	235	205	325	270
	C	90												
	E	112				564			190	160	275		375	330
S-35	**C**	90	3"	2"	77	522	104	163	165	172	235	205	325	270
	F	132				757			230	195	320	280	445	380
S-38	**C**	90	4"	3"	59	539	98	184	165	189	235	205	325	270
	E	100/112				605			190	199	275		375	330
	G	160				936			280	218	355	320	555	465
	H	180									425			

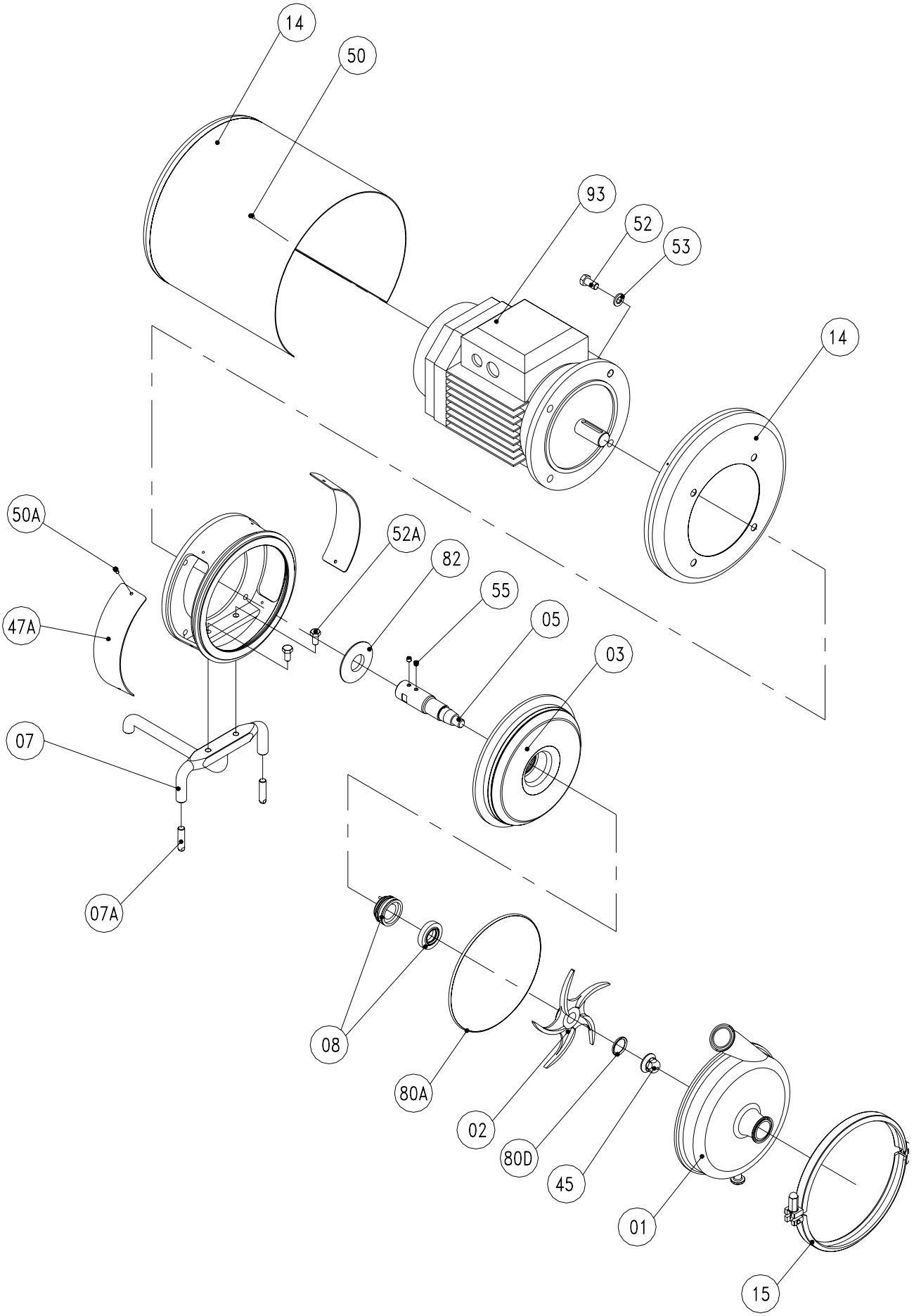
8.4. SWFI PROLAC PUMP WITH NEMA MOTOR DIMENSIONS



Dimensions with Clamp connections

PUMP TYPE		Motor size	DNa	DNi	A	B	C	D	E	F	G	H	I	ØJ
S-20	B	145 TC	2″	1 1/2″	53	440	74	131	180	200	185	140	135	170
	C	182/184 TC				520			218	205	230	190	150	200
	D	213/215 TC				610			235	250	260	216	190	245
S-26	B	145 TC	3″	2″	61	460	72	145	180	220	185	140	135	170
	C	182/184 TC				540			218	220	230	190	150	200
	D	213/215 TC				630			235	265	260	216	190	245
S-28	B	143/145 TC	11/2″	1 1/2″	61	440	107	137	180	200	185	140	135	170
	C	182/184 TC				520			218	200	230	190	150	200
	D	213/215 TC				610			235	250	260	216	190	245
S-35	B	145 TC	3″	2″	77	460	104	163	180	225	185	140	135	170
	C	182/184 TC				540			218	225	230	190	150	200
	D	213/215 TC				630			235	275	260	216	190	245
S-38	C	182/184 TC	4″	3″	59	520	98	184	218	205	230	190	150	200
	D	213/215 TC				610			235	255	260	216	190	245
	E	254/256 TC				720			262	290	340	254	245	306
	F	284/286 TC				795			280	295	380	280	335	356
	G	324/326 TC				850			308	305	420	318	360	408

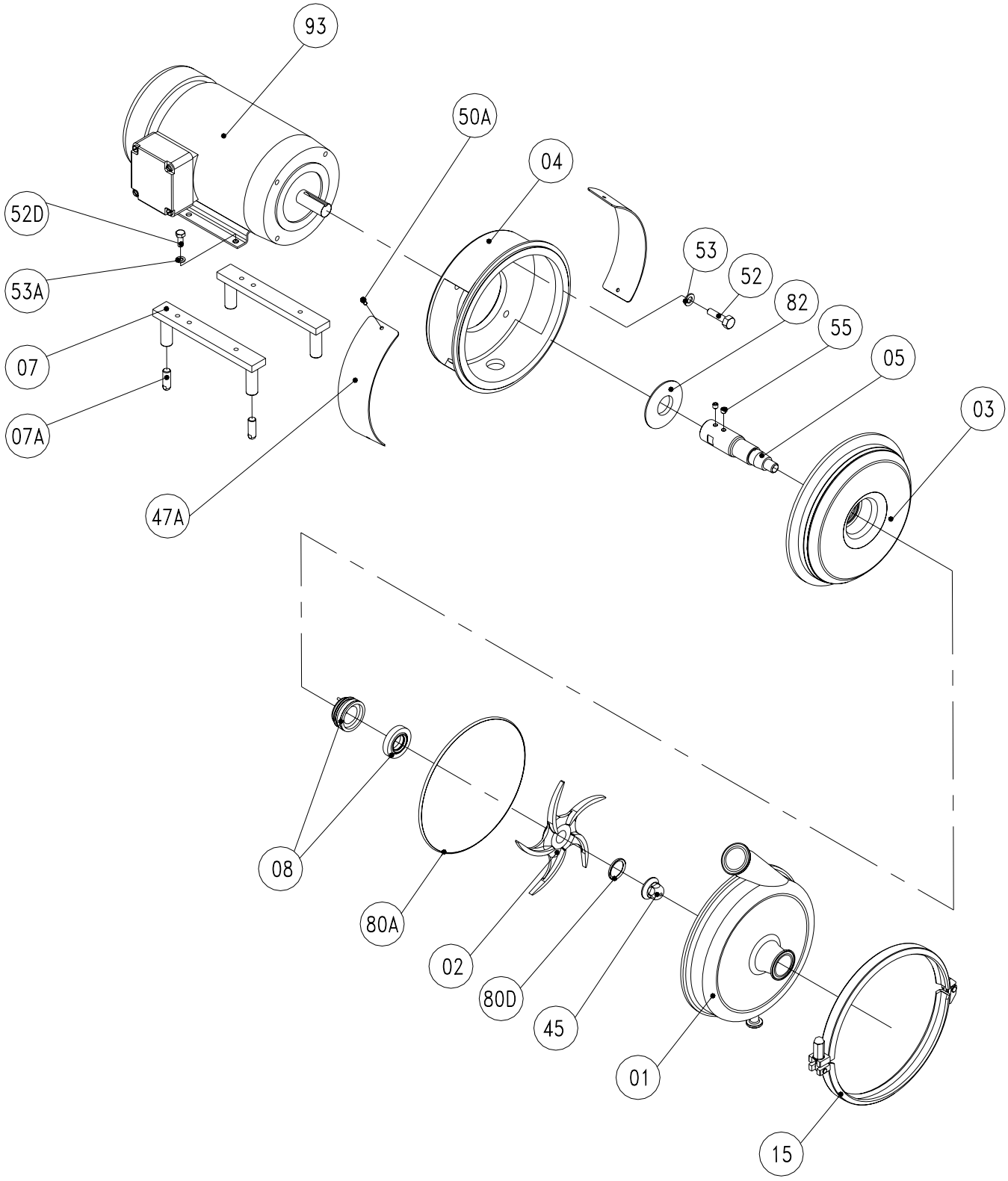
8.5. SWFI PROLAC PUMP WITH IEC MOTOR



8.6. SWFI PROLAC PUMP WITH IEC MOTOR PARTS LIST

Position	Description	Description	Material
01	Pump housing	1	AISI 316L
02	Impeller	1	AISI 316L
03	Pump cover	1	AISI 316L
04	Lantern	1	AISI 304
05	Shaft	1	AISI 316L
07	Legs	1	AISI 304
07A	Adjustable leg	2	AISI 304
08	Mechanical seal	1	-
14	Shroud	1	AISI 304
15	Clamping ring	1	AISI 304
45	Blind nut	1	AISI 316L
47A	Protection	2	Plastic
50	Screw	4	A2
50A	Screw	4	A2
52	Hexagonal screw	4	A2
52A	Hexagonal screw	2	A2
53	Flat washer	4	A2
55	Stud	2	A2
80A	O-ring	1	EPDM
80D	O-ring	1	EPDM
82	Splash ring	1	EPDM
93	Motor	1	-

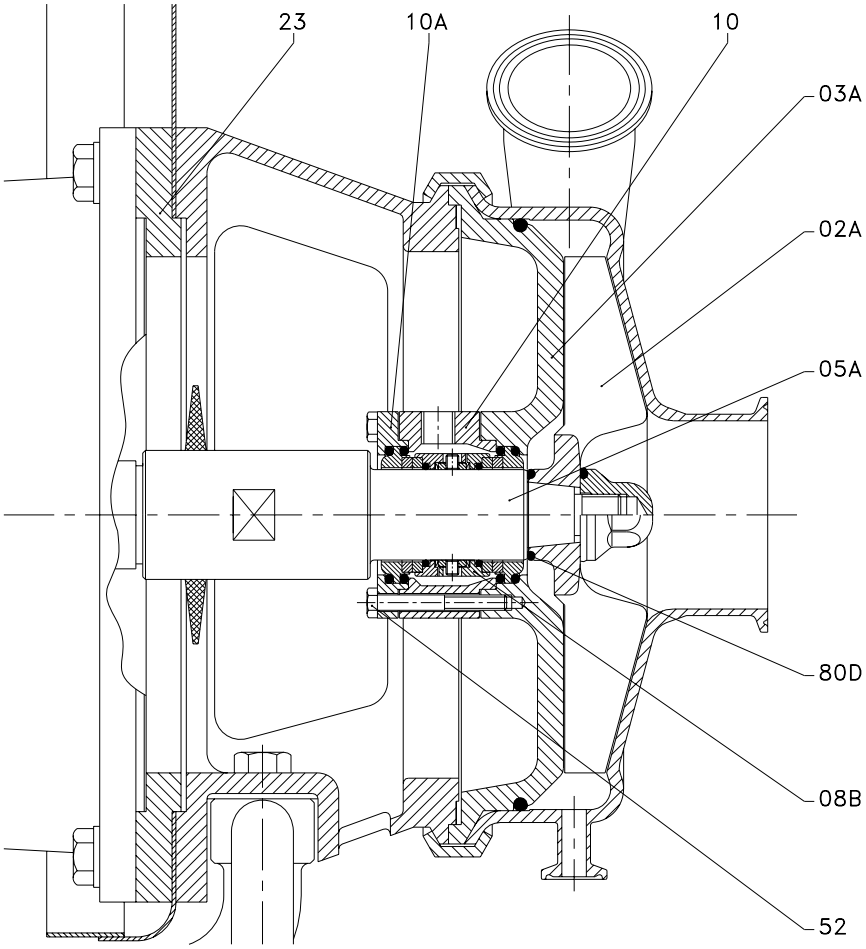
8.7. SWFI PROLAC PUMP WITH NEMA MOTOR



SWFI PROLAC PUMP WITH NEMA MOTOR PARTS LIST

Position	Description	Description	Material
01	Pump housing	1	AISI 316L
02	Impeller	1	AISI 316L
03	Pump cover	1	AISI 316L
04	Lantern	1	AISI 304
05	Shaft	1	AISI 316L
07	Legs	2	AISI 304
07A	Adjustable leg	4	AISI 304
08	Mechanical seal	1	-
14	Shroud	1	AISI 304
15	Clamping ring	1	AISI 304
45	Blind nut	1	AISI 316L
47A	Protection	2	Plastic
50	Screw	4	A2
50A	Screw	4	A2
52	Hexagonal screw	4	A2
52D	Hexagonal screw	4	A2
53	Flat washer	4	A2
53A	Spring flat	4	A2
55	Stud	2	A2
80A	O-ring	1	EPDM
80D	O-ring	1	EPDM
82	Splash ring	1	EPDM
93	Motor	1	-

8.8. SWFI PROLAC PUMP DOUBLE MECHANICAL SEAL



Position	Quantity	Description	Material
02A	1	Impeller	AISI 316L
03A	1	Double seal cover	AISI 316L
05A	1	Shaft	AISI 316L
08B	1	Double mechanical seal	-
10	1	Lid	AISI 316L
10A	1	Outer lid	AISI 316L
23*	1	Counter flange	AISI 304
52	4	Hexagonal screw	A2
80D	1	O-ring	EPDM

* Only for S-35F version.

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