



INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

PROGRESSIVE CAVITY PUMP KIBER KSF for wine



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Original Manual

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EC Declaration of Conformity

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

herewith declares that the machine:

KIBER KSF for wine Progressive Cavity 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, 3 February 2016

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 pump Kiber KSF for wine.

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 must be kept in a safe location near the installation area.

1.3. SAFETY

1.3.1. Warning symbols



Danger 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* in Section 8 should always be observed.

Never start the pump before connecting it to the lines.

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* in Section 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 protection of the motor is IP55: Protection against dust and water spray.

1.4.3. During maintenance



The *Technical Specifications* in Section 8 should always be observed.

NEVER disassemble the pump until the pipes have been emptied. 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

Any failure to comply with the instructions may impose a risk for the operators, the environment and the machine, and may ultimately 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 Terms 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.).

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3. General Information

3.1. DESCRIPTION

With a compact and robust design, INOXPA's Kiber KSF progressive cavity pumps for wine form part of our range of positive displacement pumps intended for the wine industry.

The pump is made up of two hydraulic parts, the rotor and the stator. The rotor is a round-section worm screw. The stator has two ribs and its pitch doubles that of the rotor, which provides empty cavities between the stator and the rotor which are used to move the fluid along. The turning motion of the rotor inside the stator makes the cavities move longitudinally from the suction area to the discharge nozzle.

This type of pumps are suitable for pressures of up to 6 bar.

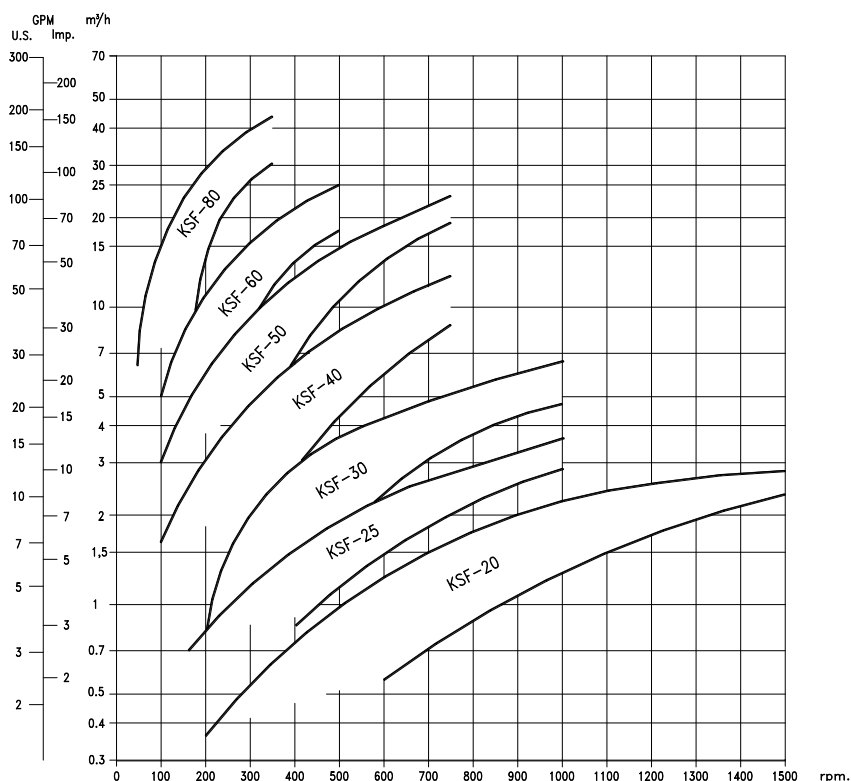
All the parts of the pump in contact with the product being pumped are made of stainless steel AISI 316L. The stator is made of PERBUNAN with a specific hardness for this application.

The most significant details of the design of this type of pump are as follows:

- Pump mounted on trolley with pneumatic wheels, depending on the model.
- Pump housing with drain port.
- Eccentric discharge port.
- Pump with mirror polished surface finish.
- Mechanical disk-type adjustable speed drive
- Control panel with start/stop, contactor and emergency stop.
- Pressure bypass (optional).
- Liquid detection sensor (optional).
- Gear motor with built-in frequency inverter (optional).

This unit is approved for use with food products.

3.2. FIELD OF APPLICATION



The field of application for each type of pump is limited. Each pump is ordered to meet specific pumping conditions. INOXPA shall not be liable for any damage that may occur if the information provided by the buyer is incomplete (specifications of the fluid to be pumped, RPM, etc.).

4. Installation

4.1. RECEPTION OF THE PUMP

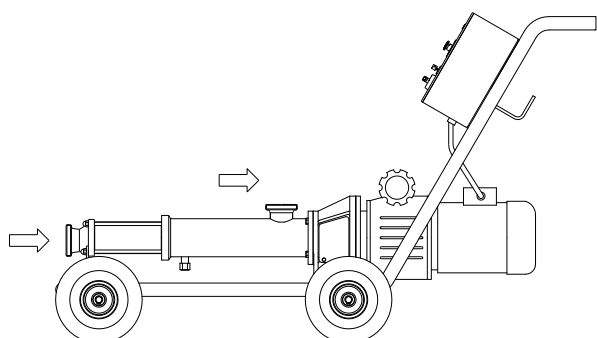


INOXPA will not be liable for any deterioration of the material occurred during shipping or unpacking. Visually check that the packaging has not been damaged.

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 the material is not in good condition and/or if any part is missing, the shipping carrier should submit a report as soon as possible.

4.1.1. Identification of the pump

		INOXPA S.A. C. Telers, 54 - P.O. BOX 174 17820 BANYOLES - GIRONA (SPAIN) Tel. 972 57 52 00 - Fax 972 57 55 02		CE
TIPO <input type="text"/>		AÑO <input type="text"/>		Serial number ←
Nº <input type="text"/>				
KW <input type="text"/>	min ⁻¹ <input type="text"/>	V <input type="text"/>	Hz <input type="text"/>	
QM ³ /h <input type="text"/>	Hm <input type="text"/>	øRODETE <input type="text"/>		

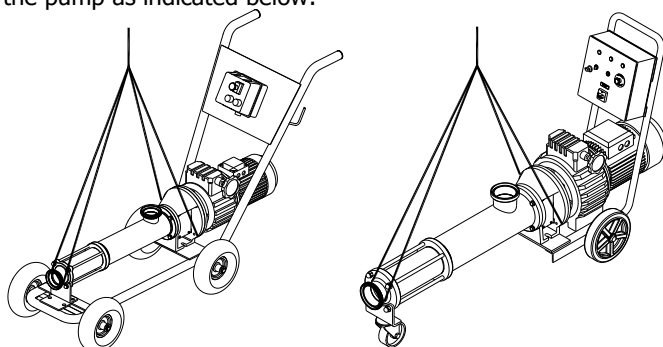
Pump plate

4.2. HANDLING AND STORAGE



The Kiber KSF pumps are too heavy to be handled and stored manually.

Lift the pump as indicated below:



Always use two support points placed as far apart as possible. Secure the points in a manner that prevents them from sliding or moving.

4.3. LOCATION

Place the pump as close as possible to the suction tank; if possible, below the fluid level.

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 as to allow proper ventilation.

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 bends and fittings in order to reduce as much as possible 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, if possible below the fluid level, or even below the tank, in order to achieve the largest possible static head for suction.

Place pipe supports as close as possible to the pump's suction and discharge ports.

4.5. 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.

4.6. ELECTRICAL INSTALLATION



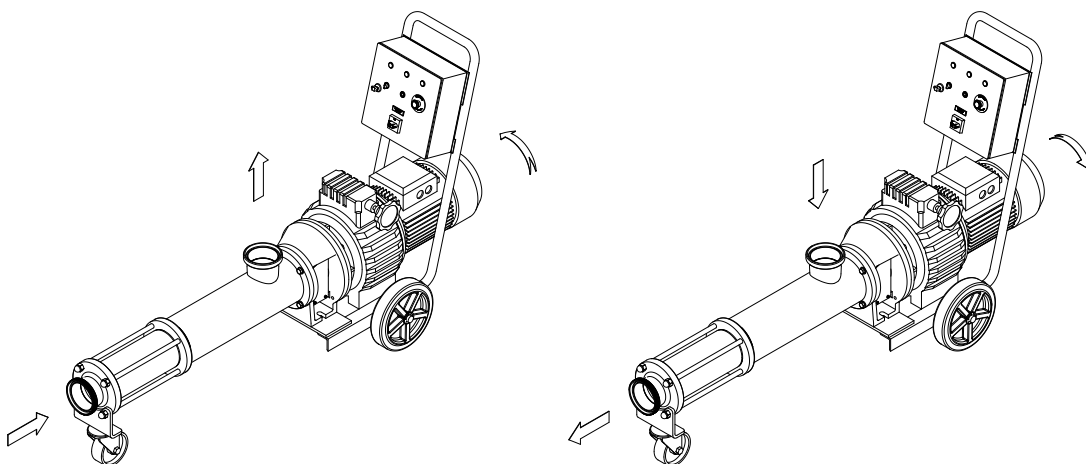
The connection of the electrical motors must be performed by qualified personnel. Take the necessary precautions to prevent damage to cables and connections.



Electrical equipment, terminals and components of the control systems may still bear electrical current when they are disconnected. Contact with them may be dangerous for operators or cause irreversible damage to equipment.

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 for proper direction of rotation (see the label located on the pump).



Start the pump motor briefly. Make sure the pumping direction is the right one. Running the pump in the wrong direction may cause serious damage.



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

The circuit diagrams of the electric panel are supplied separately from this manual.

5. Start-up



Prior to starting the pump, carefully read the instructions in Section 4. [Installation](#).

5.1. START-UP



Carefully read Section 8. [Technical specifications](#). INOXPA cannot be held responsible for the improper use of the equipment.



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

5.1.1. Checks before starting up the pump

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



The pump must NEVER rotate without a fluid inside it.

Check that the direction of rotation of the motor is correct.
Check that the electrical power supply matches the rating indicated on the motor plate.

5.1.2. Checks when starting up 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. Check the curve to determine the minimum pressure required above the vapour pressure (NPSHr).
Control the discharge pressure.
Check that there are no leaks through the sealed areas.



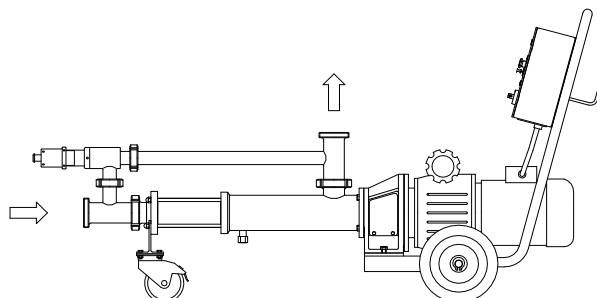
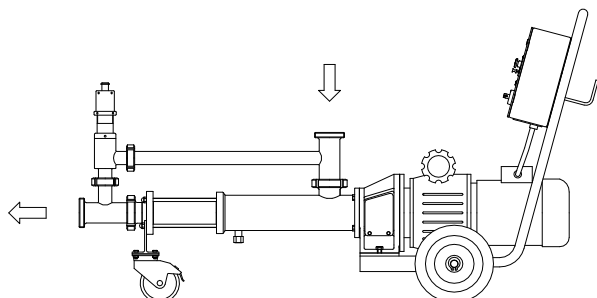
A shut-off valve shall not be used to regulate the flow in the suction line. All shut-off valves must be fully open during operation.



Control the motor consumption to prevent an electrical overload.

5.2. PRESSURE BY-PASS

If the pump is fitted with a pressure by-pass, the pump can only rotate in one direction. To invert the direction of rotation, mount a relief valve as indicated the next figure. The relief valve is set at 6 bar ex works (4 bar for the KSF-80 model).



The pump always leaves INOXPA with the by-pass installed so as to operate with suction in the pump casing and discharge ahead..

6. Operating problems

The following table provides solutions to problems that may arise while operating the pump. It is assumed that the pump has been properly installed and that it has been selected correctly for the specific application. Please contact INOXPA if technical assistance is required.

Operating problems	Probable causes
Motor overload	8, 9
The pump flow or pressure is insufficient.	1, 2, 4, 5, 7, 9, 10, 16, 17, 18.
There is no pressure on the discharge side.	2, 3, 6, 17, 17.
Uneven discharge flow rate / pressure.	1, 2, 4, 5, 6, 9, 19.
Noise and vibrations.	2, 4, 5, 6, 7, 8, 9, 10, 13, 14, 18.
The pump gets clogged.	9, 10, 14.
Pump overheated.	8, 9, 10, 14
Abnormal wear.	4, 5, 10, 14, 18.
The mechanical seal leaks.	11, 12, 15.

Probable causes	Solutions
1 Wrong direction of rotation	Reverse the direction of rotation
2 Insufficient NPSH	Increase the available NPSH: - Raise the suction tank. - Lower the pump. - Reduce the vapour pressure. - Increase the diameter of the suction pipe. - Shorten and simplify the suction line.
3 Pump not purged	Purge or fill
4 Cavitation	Increase the suction pressure.(see also 2)
5 The pump sucks in air	Check the suction line and all of its connections
6 Suction pipe obstructed	Check the suction line and the filters, if available
7 Discharge pressure too high	If necessary, reduce the pressure losses, for example, by increasing the pipe diameter.
8 Flow rate too high	Decrease speed
9 Viscosity of the liquid too high	Reduce the viscosity, for example, by heating the liquid
10 Liquid temperature is too high	Decrease the temperature by cooling the liquid
11 Mechanical seal worn or damaged	Replace the seal
12 Inadequate O-rings for the liquid	Install the correct O-rings after consulting the supplier
13 Stressed pipes.	Connect the pipes to the pump without tension
14 Foreign matter in the liquid	Install a filter in the suction pipe
15 Mechanical seal spring tension is too low	Adjust as indicated in this manual
16 Pump speed too low	Increase speed
17 Pump too small	Choose a larger pump size
18 The stator is worn out or has operated without a fluid	Replace the stator
19 Flow reduction	- Replace the stator - Increase speed



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

7. Maintenance

7.1. GENERAL CONSIDERATIONS

This pump, just like any other machine, requires maintenance. The instructions 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 Section 8. *Technical specifications*.

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

Wear rubber gloves during all cleaning procedures.



Always wear protective goggles.

7.3.1. CIP (Clean-in-Place) cleaning

If the pump is installed in a system with a CIP process, its removal will not be required.

If an automatic cleaning process is not available, disassemble the pump as indicated in the section *Assembly and Disassembly*.

Cleaning solutions for CIP processes.

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

a) Alkaline solution: 1% by weight of caustic soda (NaOH) at 70°C (150°F)

1 kg NaOH + 100 litres of water = cleaning solution
or

2.2 litres of 33% NaOH + 100 litres of water = cleaning solution

b) Acid solution: 0.5% by weight of nitric acid (HNO₃) at 70°C (150°F)

0.7 litres of 53% HNO₃ + 100 litres of water = cleaning solution



Check the concentration of the cleaning solutions; incorrect concentrations may lead to the deterioration of the pump seals.

To remove any remains of cleaning products, **ALWAYS** perform a final rinse with clean water upon completion of the cleaning process.

7.3.2. Automatic SIP (Sterilization-in-Place)

Sterilization with steam is applied to all equipment including the pump.



Do NOT start the equipment during the sterilization with steam.

The parts/materials will not be damaged if the indications specified in this manual are observed.

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

The pump generates an important load loss through the sterilization process, we recommend using a bypass circuit that uses a discharge valve to ensure the overheated steam / water sterilizes the entire circuit.

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. DISASSEMBLY / ASSEMBLY OF THE PUMP

7.4.1. Stator, rotor and connecting rod



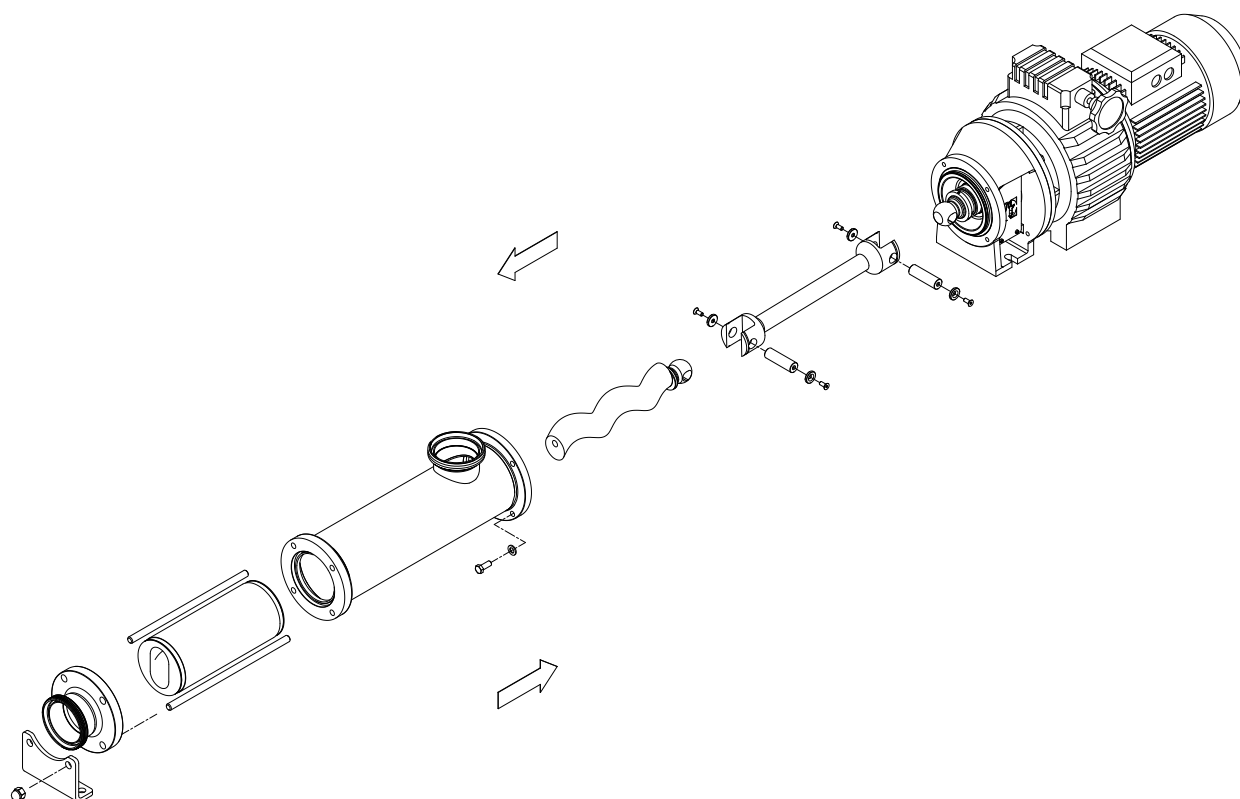
Disassembly

Loosen the nuts (54) and remove the foot (07) and the discharge flange (34). Pull out the tie bars (29/29A) and then remove the stator (22); if necessary, secure the rotor (21) by holding the shaft complement (26) through the support flange window (06A). Remove the screws (52) and washers (53). Pull out the pump casing (01) from the front end. Loosen the countersunk screws (50) to remove the hollow bolt (27) and the rotor (21). Proceed likewise on the other end of the connecting rod (24) in order to remove it.



Assembly

Connect the connecting rod (24) to the shaft complement (26) using the hollow bolt (27) and secure then with the washers (35) and countersunk screws (50), is need to add sealing threaded fasteners LOCTITE 270 to ensure no loosens. Attach the rotor (21) to the other end of the connecting rod (24) using the second hollow bolt (27). Introduce the pump casing (01) and fasten it with the screws (52) and washers (53). Install the stator (22) and, if necessary, secure the rotor (21) by holding the shaft complement (26). Install the tie bars (29/29A), the discharge flange (34) and the foot (07), securing everything with the nuts (54).



7.4.2. Mechanical seal



Disassembly

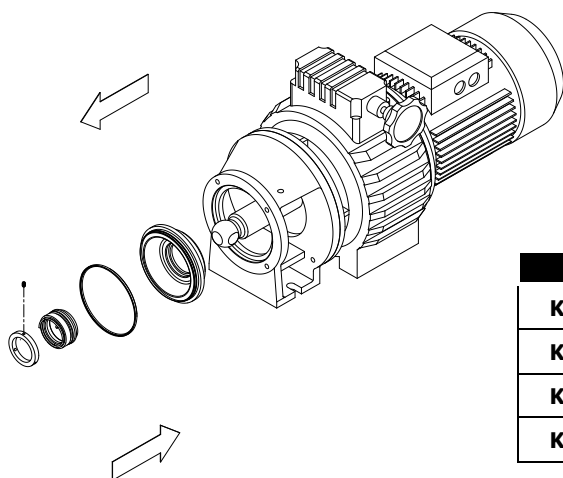
First proceed to the disassembly according to the preceding section.

Loosen the studs (55) and pull out the seal ring (31). Remove the rotating part of the mechanical seal which can be found in the shaft complement (26). Remove the seal cover (09) to pull out the seal at the same time as the mechanical seal (08). Finally, gently remove the stationary part of the seal, which has remained housed inside the seal cover.

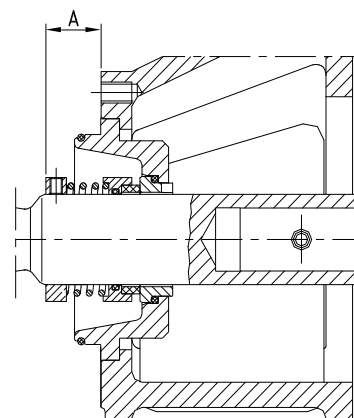


Assembly

Fit the stationary part of the mechanical seal (08) and the O-ring (80) on the seal cover (09). Place the cover on the support flange (06A). Slide the rotary part of the mechanical seal on the shaft complement (26). Place the seal ring (31) on the shaft complement and fasten it with the studs (55) according to the following assembly dimensions



Pump type	A
KSF-20	12
KSF-25/30	16.5
KSF-40/50	23
KSF-60/80	25.5



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.

7.4.3. Change of drive



Disassembly

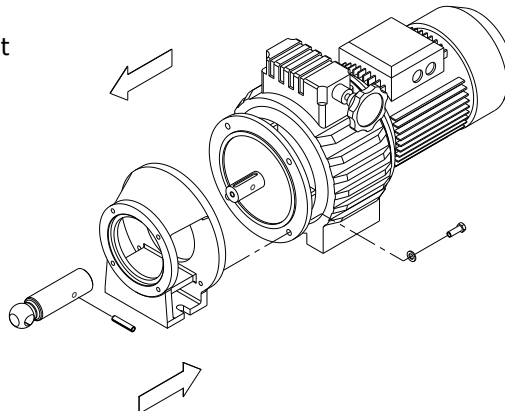
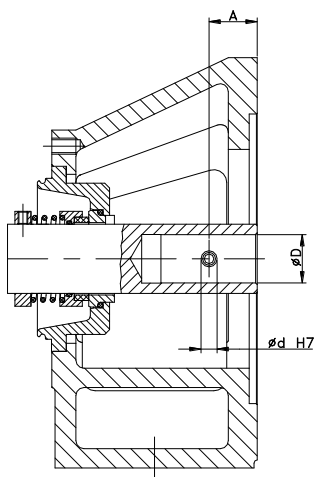
First proceed to the disassembly according to the preceding section.

Remove the elastic pin (05) from the shaft complement (26). Remove the screws (52A) and the washers (53A) and pull out the drive (93).



INSTALLATION

Drill a hole in the drive shaft as shown in the figure below. Mount the drive (93) on the flange support (06A) and fasten it with the screws (52A) and washers (53A). Slide the shaft complement (26) over the drive shaft (93) and fasten it with the pin (56).



Pump type	A	ØD	Ød
KSF-20	20	19/20 24	6 8
KSF-25/30	20	24/25/28	8
KSF-40/50	30	24/25/28 30/32/35	8 10
KSF-60/80	35	35/38 40/42	10 12

8. Technical Specifications

8.1. TECHNICAL SPECIFICATIONS

Range of operating temperatures	-10 °C to +85°C (14 °F to +185 °F)
Noise level	60-80 dB(A)
Suction / discharge connections	DIN 11851 (standard)



Use special protection if the noise level in the work area exceeds 85 dB(A).

Pump type	With mechanical variable speed drive				With variable frequency drive			
	Flow rate (1) [m³/h]	Pressure [bar] (2)	Speed [RPM]	Power [kW]	Flow rate (1) [m³/h]	Pressure [bar] (2)	Speed [RPM]	Power [kW]
KSF-20	0.3 - 1.65	max. 6	190-1000	0.75	0.35 - 1.65	max. 6	200-1000	0.75
KSF-25	0.7 - 4			1.85	0.75 - 4			2.2
KSF-30	1.1 - 6				1.2 - 6			
KSF-40	2.5 - 10		190-650	3	1.75 - 10		125-650	3
KSF-50	5 - 15		190-550	4	3.5 - 15		125-550	4
KSF-60	7 - 20	max. 4	150-400	5.5	5 - 20		100-400	5.5
KSF-80	20 - 45		190-400	7.5	10 - 45	max. 4	100-400	7.5

(1) Nominal flow for liquids at a maximum pressure of 2 bar

(2) Maximum pressure with the power indicated above

Materials

Parts in contact with the product	AISI 316L
Other stainless steel parts	AISI 304
Stator and seals in contact with the product	NBR
Other optional materials	Contact the supplier
Surface finish	Ra 0.8 polished

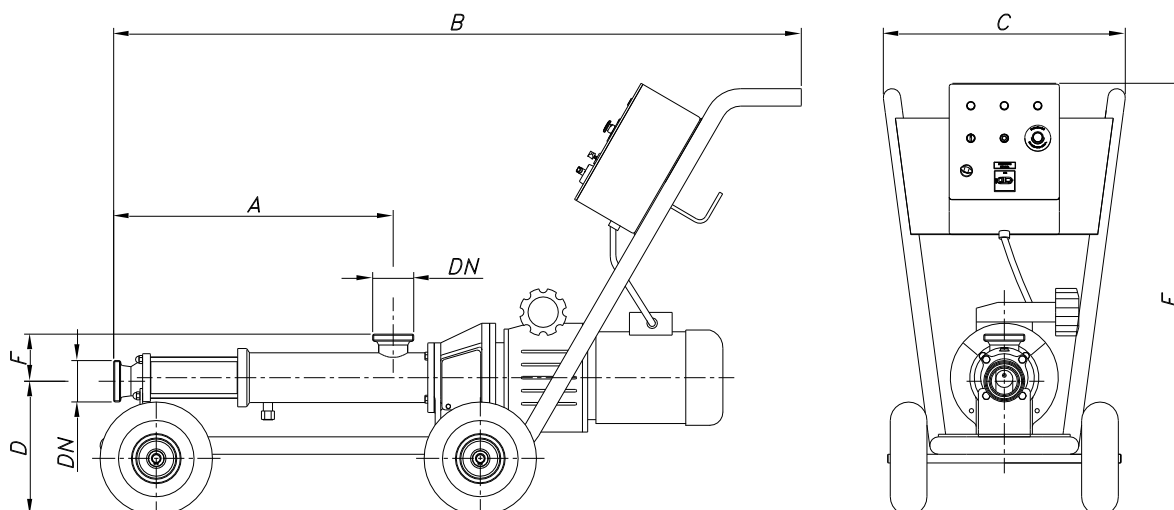
Mechanical seal

Type of seal	Simple internal seal
Material of the stationary part	ceramic
Material of the rotary part	graphite
Material of stator and seals	NBR

8.2. WEIGHTS

Pump type	Weight [kg]	Weight [lbs]
KSF-20	62	137
KSF-25	79	174
KSF-30	80	176
KSF-40	130	287
KSF-50	145	320
KSF-60	265	584
KSF-80	285	628

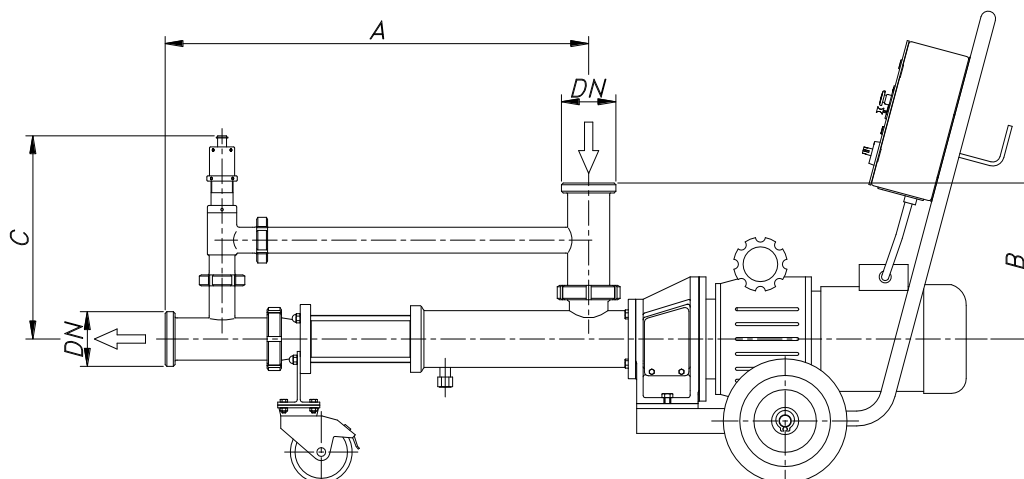
8.3. DIMENSIONS KIBER KSF FOR WINE PUMP WITH TROLLEY



PUMP TYPE	DN	A	B	C	D	E	F
KSF-20 *	40 (1½")	325	1040	500	216	905	83
KSF-25	50 (2")	439	1340	560	293	980	93
KSF-30					290		96
KSF-40	65 (2½")	637	1625		308		108
KSF-50	80 (3")	712	1675		304		132
KSF-60 *	100 (4")	864	1790	530	345	975	135
KSF-80 *		984	1910				

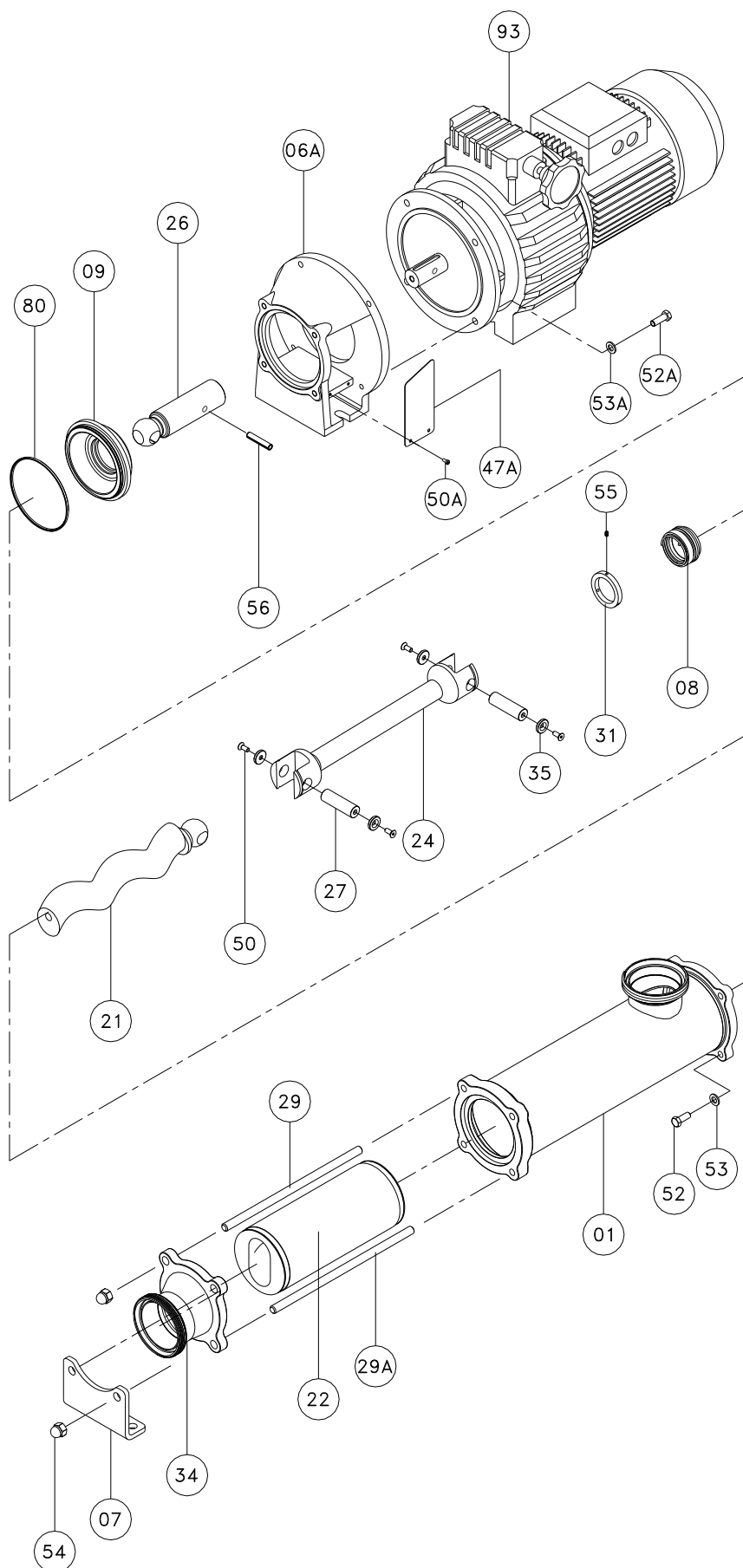
* With three-wheel trolley

8.4. DIMENSIONS KIBER KSF FOR WINE PUMP WITH BY-PASS



PUMP TYPE	DN	A	B	C
KSF-20	40 (1½")	475	230	330
KSF-25	50 (2")	613	262	360
KSF-30				
KSF-40	65 (2½")	831	294	385
KSF-50	80 (3")	913	334	420
KSF-60	100 (4")	1104	375	475
KSF-80		1224		

8.5. EXPLODED VIEW OF KIBER KSF FOR WINE PUMP

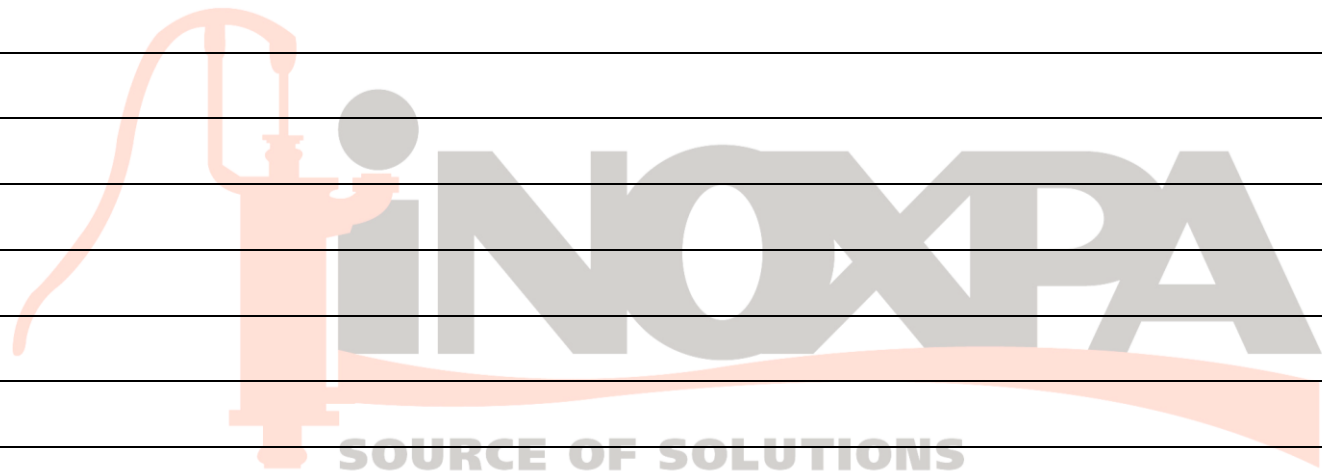


8.6. PARTS LIST KIBER KSF FOR WINE PUMP

Item	Description	Quantity	Material
01	Body	1	AISI 316L
06A	Flange support	1	GG-15
07	Foot	1	AISI 304
08	Mechanical seal *	1	-
09	Seal cover	1	AISI 304
21	Rotor	1	AISI 316L
22	Stator *	1	-
24	Connecting rod	1	AISI 316L
26	Shaft complement	1	AISI 316L
27	Hollow bolt *	2	AISI 316L
29	Upper tie bar	2	AISI 304
29A	Lower tie bar	2	AISI 304
31	Seal stop ring	1	AISI 316L
34	Discharge nozzle	1	AISI 316L
35	Pin washer	4	AISI 316L
47A	Protection	2	Plastic
50	Countersunk screw	4	A2
50A	Screw	4	A2
52	Hexagonal screw	4	A2
52A	Hexagonal screw	4	A2
53	Grower washer	4	A2
53A	Grower washer	4	A2
54	Cap nut	4	A2
55	Stud	3	A2
56	Pin	1	Steel
80	O-ring *	1	NBR
93	Drive	1	-

(*) Recommended spare parts.

NOTES



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