OPERATING INSTRUCTIONS – K RANGE
00/20_rev.00

Contents:

1. INTRODUCTION

The following instructions contain important information on the operation, maintenance and installation of Sydex pumps. The observance of these directives is essential for the appropriate use of the machine.

1.1. Operating Instructions

Each pump is produced in relation to a specific order, and for this reason the serial number and the model indicated in this manual should be the same as the model no. and serial no. indicated on the machine nameplate.

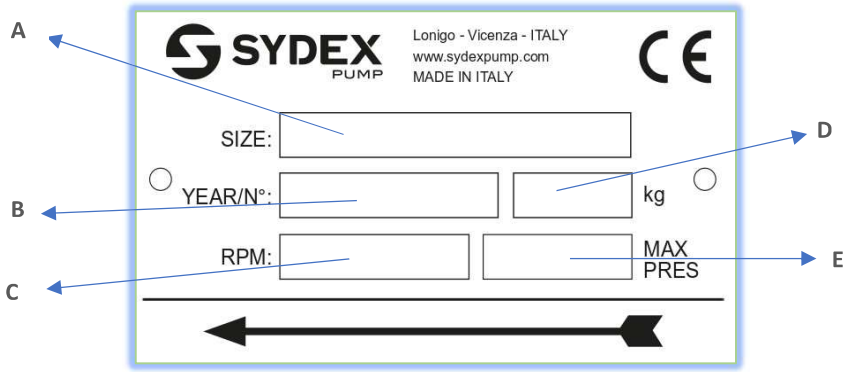
1.2. Manufacturer

The manufacturer of the pump is Sydex SRL.

1.3. Range, model, year of manufacture and serial number

The range, the model no., year of construction, and the serial number are indicated both in this manual, on the plate of the machine and in the Declaration of Conformity.

Nameplate data:



A: Pump model. B: Year of manufacture / Seral number. C: Speed in rpm. D: Weight. E: Pressure in bar.

1.4. Copy of the Operating Instructions

This manual is connected to a specific pump and a specific application, it must therefore only be edited and controlled by Sydex technical department. It is not allowed to reproduce without Sydex permission.

1.5. Essential information for enquiries and orders

This information is required when inquiring about spare parts or placing orders:

1. Model of the machine.
2. Year of construction and serial number.

1.6. Acoustic Level Pressure

The acoustic level pressure is measured in accordance with OSHA CFR 1910.95 to assure that our machines does not exceed 85 dB (A).
The noise emission generated by the drive and the pipes are not included in the above emission value.

1.7. Operating purpose

The pump must not operate outside of the parameters specified in the order.

2. SAFETY PRECAUTIONS

These operating instructions contain safety precautions that must be observed.
This manual should be read and understood by the mechanical fitter, as well other responsible operators prior to assembly and operation. The instructions should be safely kept at the operating site where the machine is being used.

Symbols commonly used to indicate areas of danger

General danger

Electrical hazard

Danger from possible Injury by machinery

Danger from suspended loads

Damage to machinery

Eyes protection sign

2.1. Personnel qualification and training

The end user must ensure that the personnel responsible for the operation, maintenance, inspection, and assembly are in possession of the appropriate qualifications for the tasks. Personnel lacking the appropriate skills and knowledge should receive the correct training and instruction.

2.2. Non-observance of safety precautions

Failure to comply with the safety instructions may lead to hazards to life, as well as dangers for the environment and for the pump.
The following are just some examples of possible dangers resulting from failure to comply with the safety instructions:

1. Failure of important machine/plant functions.
2. Premature failure of components or machine/equipment malfunction
3. Danger to the environment from leakage of dangerous materials.
4. Danger to personnel from electrical, mechanical, or chemical hazards.

2.3. Safety rules

During maintenance and repair work on the pump, please note the following:

1. Keep in mind the simple safety rules that we have included in this operating instruction.
2. Keep in mind and adhere to applicable local and international rules and regulations.
3. Keep in mind and adhere to the internal safety precautions and indications.

Non observance can void product warranty.

2.4. Safety instructions for the end user

1. Pump parts exposed to the external environment that are susceptible to particularly high or low temperatures (e.g., pump body, in case of high or low temperature fluids) must be equipped with appropriate protections and indications in order to avoid accidental contacts. Personnel should use the appropriate personal protection equipment.
2. Protective guards for moving parts (e.g., coupling) must never be removed whilst the machine is in operation.
3. Leakages (e.g., in the shaft seal) of hazardous liquids (e.g., explosive, toxic, hot) must be drained in such a way that no danger arises for persons or for environment. Always observe the relevant statutory requirements
4. The risk of exposure to electrical power must be eliminated.
5. Where appropriate risk assessments and/or methods statements should be provided prior to any work being carried out.

2.5. Safety instructions for maintenance, inspection, and assembly work

1. The end user must ensure that all maintenance, inspection and installation work is performed by authorised and qualified personnel who understand the operating instructions and are properly trained.
2. Pumps or units which transfer dangerous substances must be decontaminated.
3. Work on a pump/machine should only be performed when it is disconnected and safely isolated from its power source, pressure has been relieved, and the complete unit has returned to room temperature. It is imperative that these procedures are adhered to before attempting work on the machine.
4. Immediately following completion of work, all safety and protective devices must be replaced in position and, where applicable, re-activated.
5. Refer to section 5 Assembly and installation.
6. Where appropriate risk assessments and/or methods statements should be provided prior to any work being carried out.

2.6. Unauthorised use of spare parts and/or modifications

Modifications to the machines and/or its components are permitted only with the manufacturer's consent. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of the other components revokes any warrant and liability for consequences which may result.

2.7. Unauthorised applications

The operational safety of the machines supplied is warranted only for employment in accordance with the intended use. The machine should not be operated in any way exceeds design capacities.

2.8. Handling, storage and disposal of hazardous materials

The section gives information on handling, storage and disposal of materials used in the pumps which may be considered hazardous to your health.

The following table indicates what is used inside the pump:

WHERE USED	LIQUID - PRODUCT	DANGER FOR
Bearings	anti-seize compounds	releases vapour
Stator - rotor	grease – Vaseline	hands and skin
Oil - general lubrication	seal – gearbox	eyes and skin
Pump surface	Paint	releases dust and fumes if machined. Treat as fire hazardous.

Immediately seek for medical advice if you accidentally run into contact with the abovementioned substances and follow the following instructions:

Skin: Wash and rinse with soap and fresh water.

Inhalation: Immediately go outside and breath fresh, clean, air.

Eyes: Rinse with fresh water and seek for medical advice as soon as possible.

3. GENERAL DESCRIPTION OF SYDEX PUMP MODELS

The progressive cavity pump supplied, is part of the “volumetric pump family”.
The inventor of that system was the professor René Moineau.

The main components of the pump are:

- the stator- a stationary part, usually an alloy tube containing an injected elastomer.
- the rotor - a rotating part, usually made by a metallic material.

The rotor is a screw with a round thread and a large pitch (large thread height and small core diameter). The stator has a pitch length twice as long as the rotor, so that airtight discharge chambers are created between the stator and the rotor. When the rotor turns in the stator, the chambers are transferred to the discharge port. The flow is not pulsating because the volume contained in the chambers is always constant.

Sydex progressing cavity pumps combine many features of other types of pump families. Here are some examples:

- Like diaphragm pumps and peristaltic pumps, Sydex models can transfer inhomogeneous products containing gas and abrasive material, solid and fibrous substances.
- Like centrifugal pumps, Sydex pumps have no suction or discharge valves.
- Like piston pumps, Sydex models have a high suction capacity.
- Like gear or screw pumps, Sydex pumps can cope with highly viscous liquids.
- Such as piston, diaphragm, gear or screw pumps, Sydex models are capable of performing dosing tasks.

Sydex progressive cavity pumps have also the following advantages:

- Self-priming even if not containing 100% liquid.
- Gentle handling of shear-sensitive products.
- Capacity is direct proportional to the pump speed.
- No pulsation, low noise and vibration.
- No significant torque increase when reaching maximum performance.
- Compact style construction.

The Sydex pump operates according to the positive displacement principle. Operation of the pump against an excessive pressure caused by closed valves, by high pressure losses in the piping or by product sedimentation will lead to the destruction of the pump, drive, pipe work and downstream equipment. Every progressive cavity pump must therefore be protected against overpressure. Safety valves with oil-filled bypass pipes and contact manometers, that deactivate the pump, are appropriate protective devices.

4. PACKING, TRANSPORT AND STORAGE

4.1. Packing and Transport

In order to transport and store the pump it is necessary that the personnel know and employ the appropriate means, hoists and tools, always observing the safety instructions. Sydex pumps are shipped on skid-mounted wood-framed cardboard enclosures.
Upon receipt, inspect the pump for any transportation damage.

Check also:
- If the pump we supplied coincides with the model you ordered.
- If inside the packaging the 'Declaration of conformity' and the complete operating instructions are included.

Claims for damages should be reported to the freight carrier immediately.

Avoid suspending the complete pump unit by the bolts of the motor or gear-box. These eye bolts should be used for lifting the motor and/or the gear box only. Due to the variety of possible pump designs and applications, only general instructions can be given here. These should be adequate for experienced assembly or transportation personnel.

Use caution when lifting top heavy pumps. The centre of gravity may be above the points where the lifting gear is attached. If this is the case, secure additionally to prevent tipping over.

When moving the pump or unit on wheels, strictly adhere to the following:
- Lock out the motor drive to protect against unintended start-up;
- Move the pump unit carefully and slowly, especially where the ground is uneven. Hazards of tipping!
- Be careful not to allow flexible piping to bend or become kinked. Obstruction of flow will cause excessive discharge pressure;
- Where necessary, secure the pump unit with additional support blocks.

4.2. Storage

Pumps are packaged for transportation and short-term storage. In cases of prolonged storage, the pumps should be protected as follows until installation:

Stator:	When stored for a long period, the elastomer along the contact line between the rotor and stator may become temporarily distorted (compression-set). This will increase the required starting torque. For this reason, the stator should be removed and stored in a cool, dry place, in an air-tight package and protected from light.
Rotor:	Support with wooden blocks and protect against damage from mechanical impact. For tool steel rotors: coat the surfaces with protective grease to avoid rusting.
Purchased model:	Pack and store in a cool, dry place.

5. ASSEMBLY AND INSTALLATION

5.1. Mounting tools

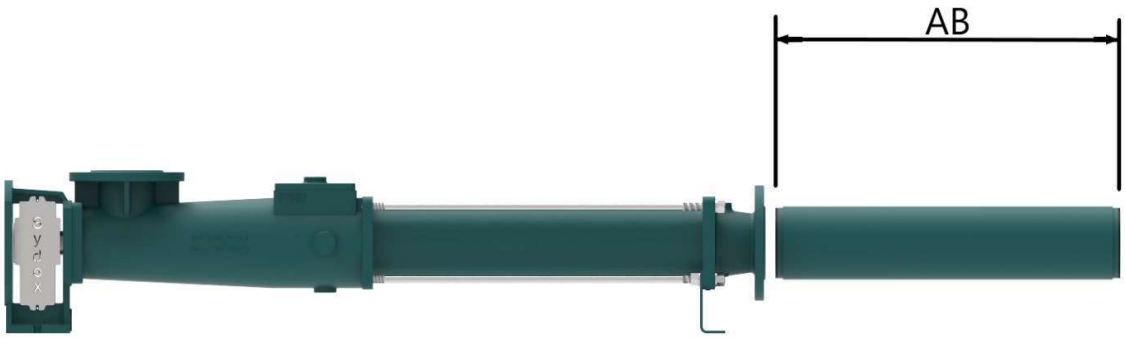
No special tools are required for the assembly and installation of the pump.

5.2. Space requirements

Customers are responsible for determining the space requirements. The following factors must be taken into consideration:

- Dimensions and weight of the machine.
- Required transportation and hoisting equipment.
- Freedom of movement to:
  - adjust pump speed (pump with drive speed variator);
  - properly lubricate the drive unit;
  - remove the guards;
  - handle disassembly and assembly pump tools.

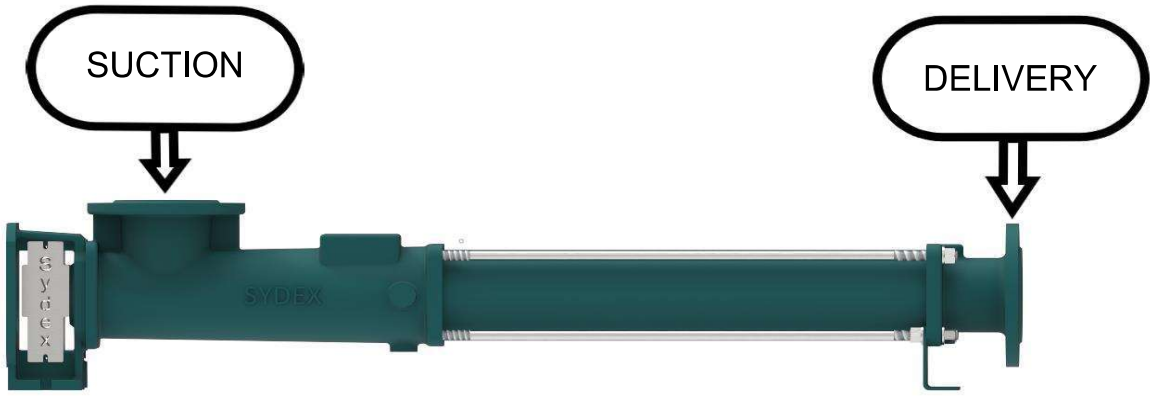
A specific space must be allowed for exchanging the stator. The required dimensions. See chart below for recommended disassembly dimensions:



5.3. Rotation direction

The direction of rotation of the pump determines the direction of the fluid and thus the suction and discharge port of the pump. The direction in which the drive shaft and rotor of the pump must rotate is indicated by an arrow on all models. For some versions the direction can be reversible; in this regard, check the technical data in the offer phase or, for further information contact our technical office.

In general, the suction and discharge are based as in the following diagram:



5.4. Piping

The diameter of the suction and discharge pipework must be sized in accordance with the pressure drop calculation on the pumping line and in relation to the performance of the model purchased. The correct choice of pipework is essential for the smooth operation of the Sydex pump. A general reference for sizing the pipework can be provided by the measurements of the suction and discharge ports. In any case, it is essential to calculate the pressure drop.

Before starting the pump, clean and flush all pipes.

5.5. Electrical drive connections

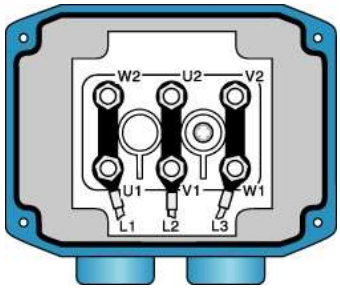
All work on electrical connections must be carried out by **authorised and specialized personnel,** following the relevant legal provisions as well as the drive manufacturer's instructions.

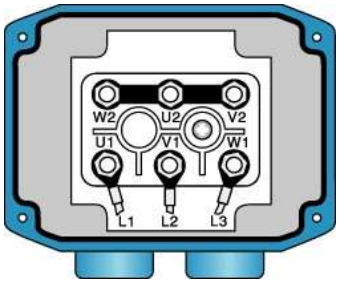
Voltage and frequency of the electric network must comply with the indications on motor and/or frequency converter plate.

The electric motor nameplate presents the following drive data: voltage, frequency, and drive power. The network voltage and frequency must match the data on the nameplate.

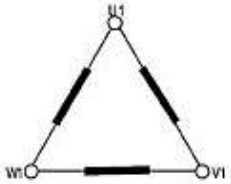
Diagram of the connection of three-phase AC motors:

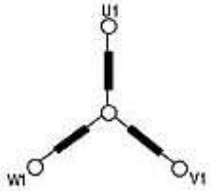
Delta connection **Star connection**





Delta connection **Star connection**





Switch on electric motor direct-on-line or use an adequate frequency inverter.

An increased starting torque is necessary due to the compression fit between the rotor and stator conveying elements. This means the electric motors that drive the progressive cavity pumps must always be started direct-on-line or with an adequate frequency inverter which is configured correctly for a constant torque application.

Ensure that customer-supplied frequency inverters comply with the starting torque and running power specified on the offer specifications.

Other important points to be observed:

- Always use a thermal motor safety switch.
- If possible, mount an isolating switch as close as possible to the pump.
- It is recommended to mount an earth leakage circuit breaker.

6. START-UP AND TEMPORARY SHUTDOWN

6.1. Start up

Sydex progressing cavity pumps must operate with the following precautions:

- Before initial start-up, regardless of rotation, make sure the pump housing and suction piping are filled with the medium. Priming of the pump is necessary to lubricate the stator.

Never run the pump dry! Even few rotations in dry condition will damage the stator.

If the fluid to be pumped is particularly high in viscosity, perform the first start with an easily flowing liquid (e.g. water).

- Make sure that both discharge and suction pipes are correctly connected.
- Turn pump motor on and off briefly to check direction of rotation. Rotation direction must match the data indicated on the pump nameplate.
- In the event of incorrect rotation, modify the electrical connections of the motor so as to reverse the direction of rotation.
- Sydex pumps are positive displacement progressing cavity pumps and have the potential to generate very high pressure, capable of bursting vessels or pipes. Each progressing cavity pump must be protected against overpressure operation by, for example, a bypass with safety valves or pressure gauges with overpressure limits or other systems.

Excessive pressure can overload the drive train (shaft, joints, rotor) or exceed pressure limitations of the housing and their connections, resulting in damage or breakage. Exceeding the permissible and agreed pressure threshold may lead to breakage and bursting of the pump casing and other connecting elements.

Therefore, pump must never run with an inlet or outlet valve closed.

Before starting the pump, check:

- that the gate valves and valves on the pumping line are open;
- that the direction of rotation indicated on the pump is correct.

6.2. Temporary Shutdown. General considerations:

When the pump is stopped, it is recommended to empty and wash the purchased model, particularly:

- If the pump is installed in a location inside or outside where the medium has the potential to freeze;
- when the medium has a tendency to solidify or harden;
- if the medium tends to build up or become tacky on the shaft sealing area.

Other suggestions :

Stator: When stored for an extended period, the elastomer along the contact line between the rotor and stator may become temporarily distorted (compression-set). This will increase the required starting torque. For this reason, the stator should be removed and stored in a cool, dry place in an air-tight package and protected from light.

Rotor: After the stator has been removed. Cover the entire pump to protect from mechanical damage.

6.3. Stand-by pump

Stand-by pumps should be operated occasionally to keep properly them conditioned for use.

7. GENERAL MAINTENANCE

7.1. General considerations

The pumps should be regularly rinsed or cleaned if deposits of medium are likely to build up.

If the pump needs to be disassembled, ensure that the pump and motor are switched off and cannot be turned on accidentally.

7.2. Lubrification

Sydex pumps do not require frequent lubrification. Stator and rotor are lubricated by pumped medium, it is therefore necessary to always run progressive cavity pumps with the presence of fluid.

Maintenance and lubrication of the drive should be carried out according to the drive manufacturer's instructions.

7.3. Joint lubrification

We suggest checking and replacing the oil contained in the joints

- when replacing spare parts concerning the joints;
- whenever the pump is disassembled for any reason.

7.4. Preventive actions

- Empty the pump.
- Disconnect the power supply to the control unit and ensure that there is no possibility of an unintentional start.
- Wait for the pump temperature to reach room temperature.
- Check that there is no pressure in both suction and discharge (check the pressure gauges installed on the pumping line). Close all valves of all pipes.
- Slowly close all the valves and disconnect the pipework both on pump suction and discharge side.

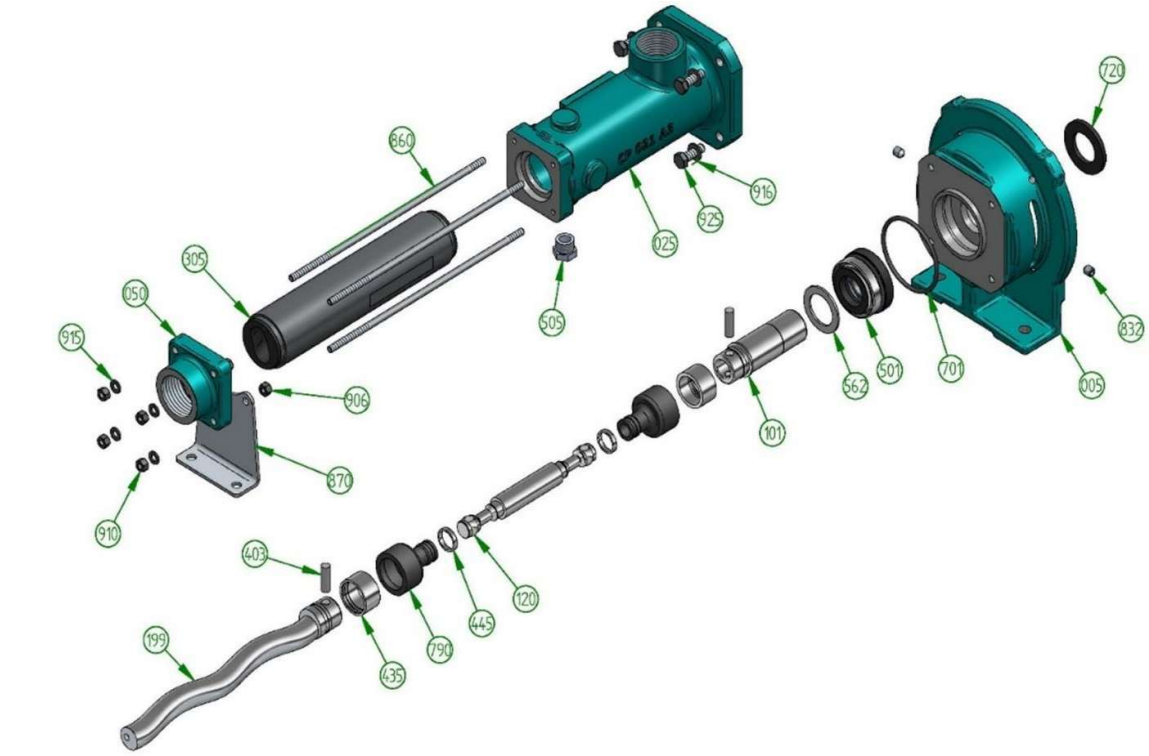
7.4.1. Cleaning

Pump can be cleaned:

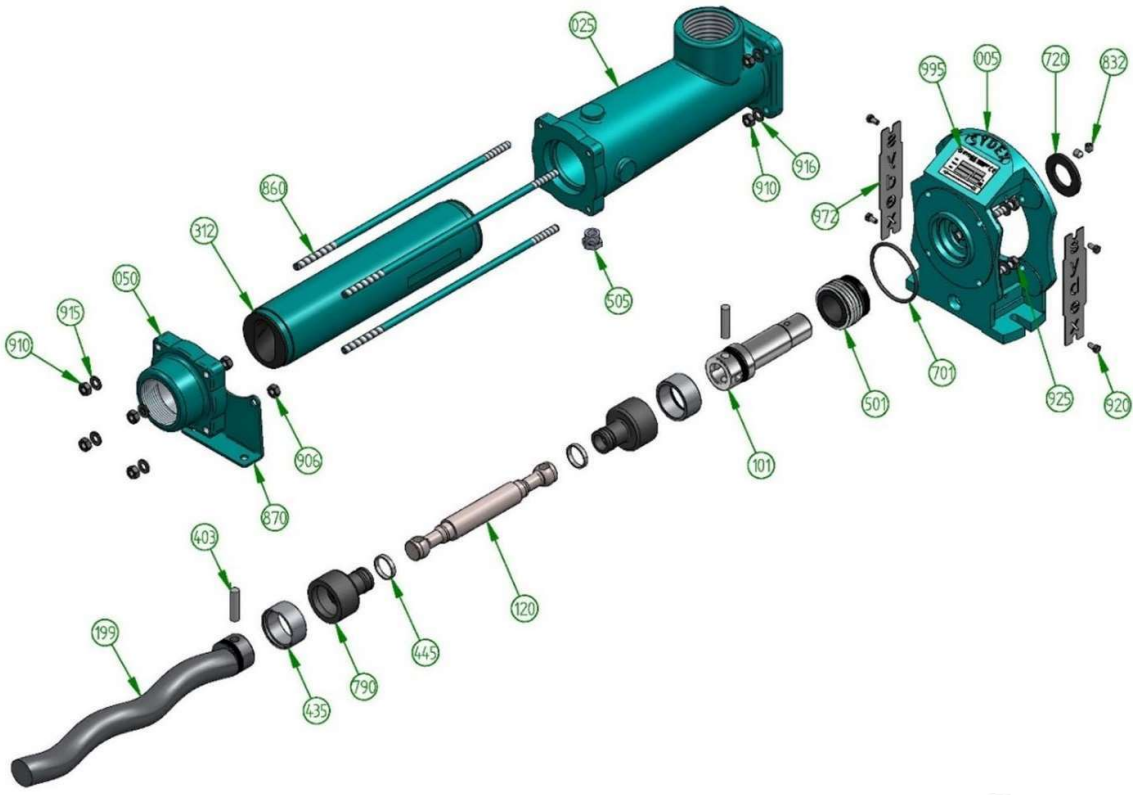
a) through the cleaning openings on the pump body;
b) directly by disassembling the pump.

7.5. Exploded views

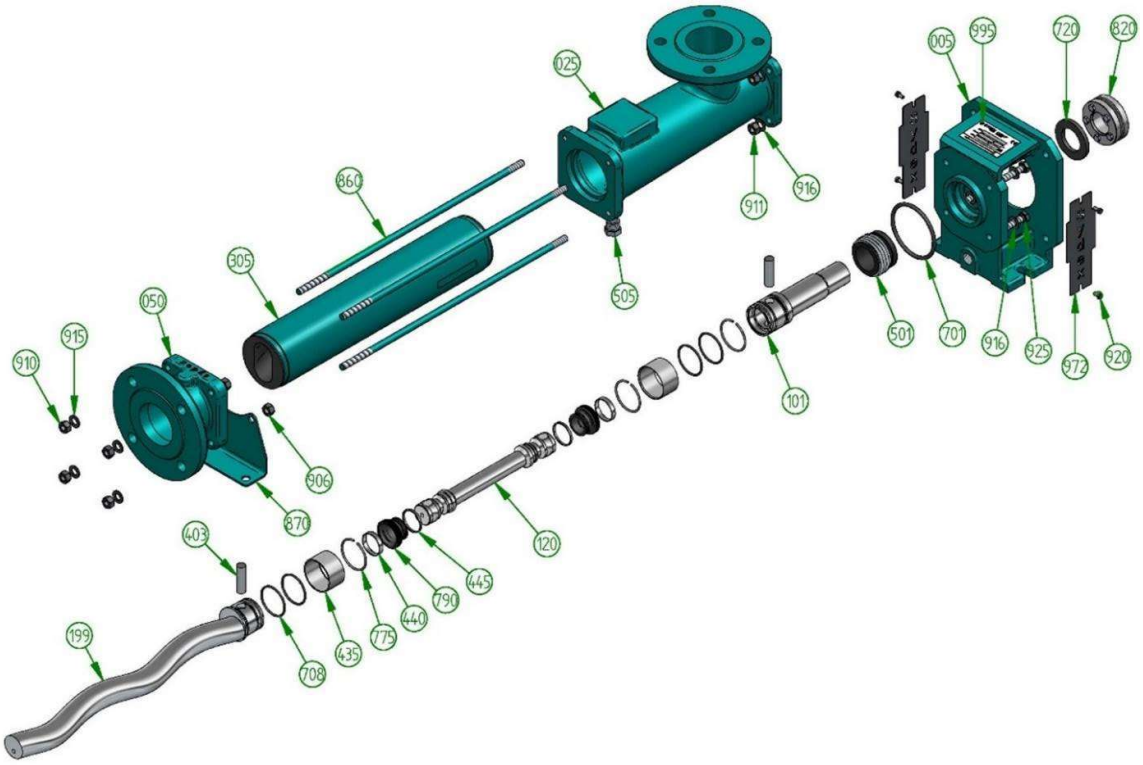
GROUP B (015-1L; 015-2S; 021-1S; 020-2S)



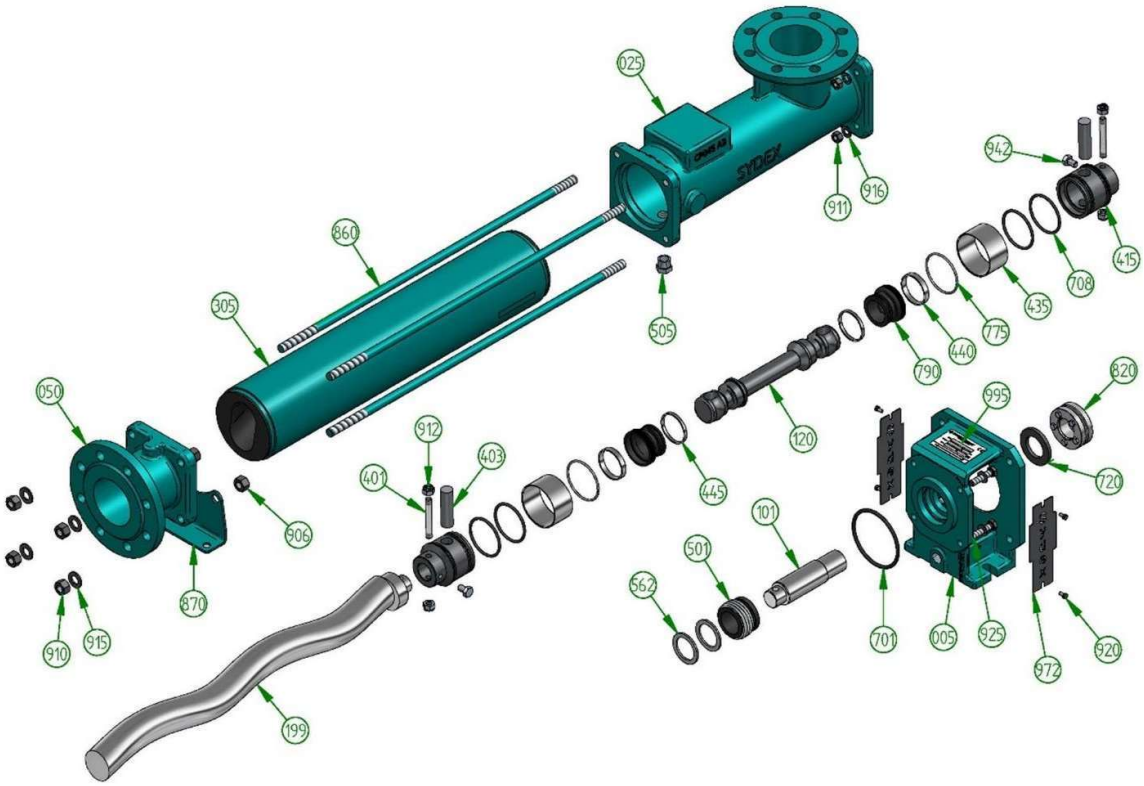
GROUP C (013-6S; 032-1S-1L-2S; 035-1S-1L-2S; 039-1S; 021-4S; 015-4S)



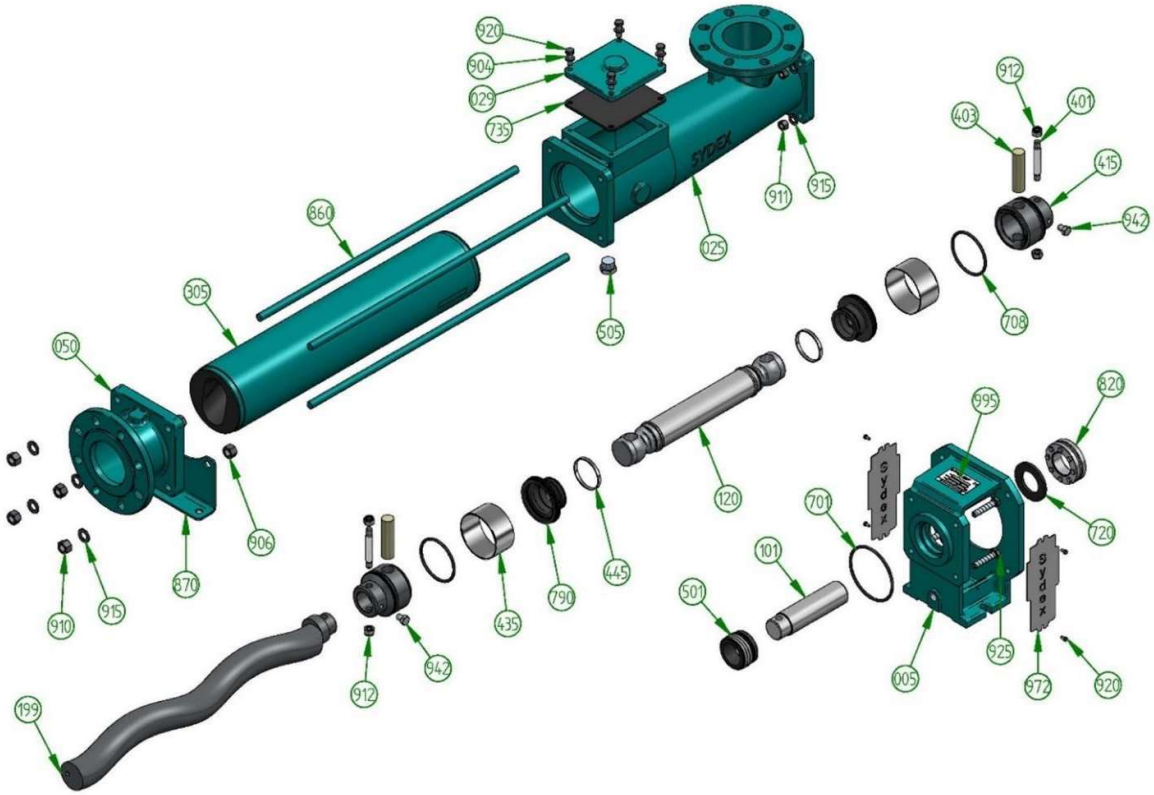
GROUP D (039-1L; 039-2S; 045-1S; 032-4S; 021-8S; 013-12S)



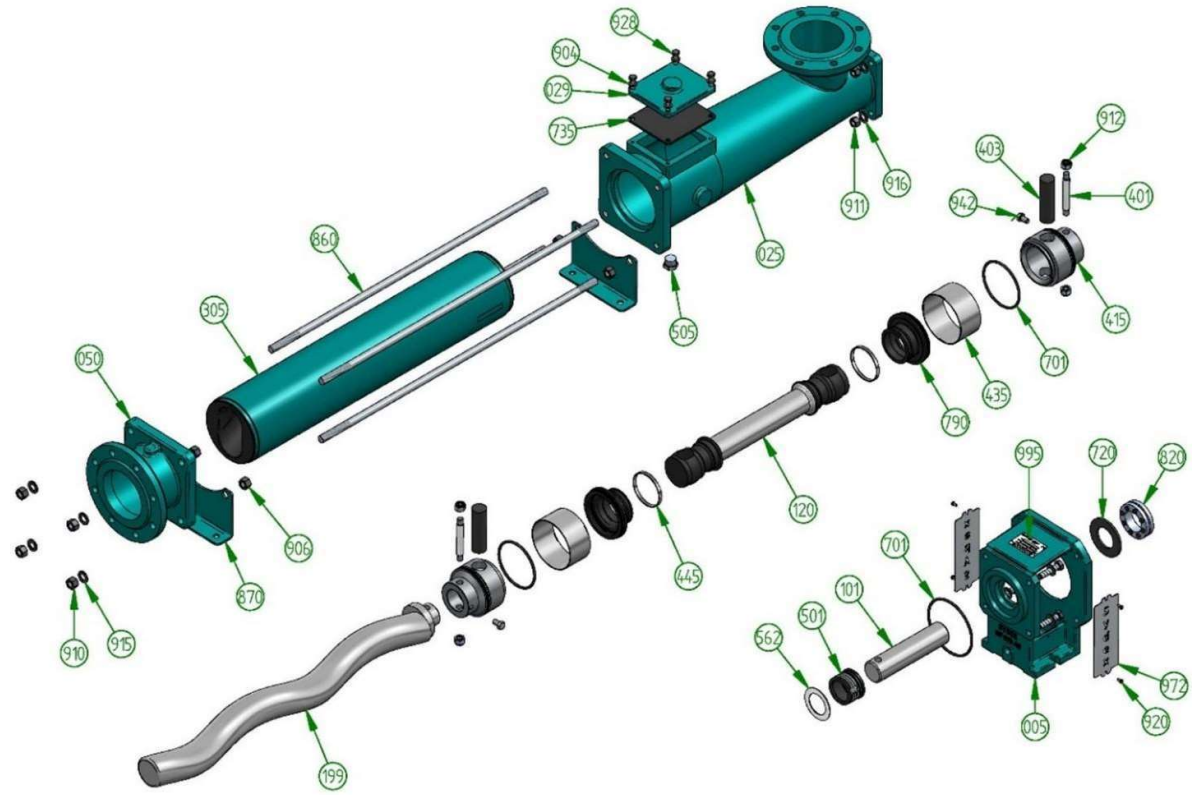
GROUP E (045-1L; 045-2S; 052-1S; 052-1L; 052-2S; 039-4S; 032-8S)



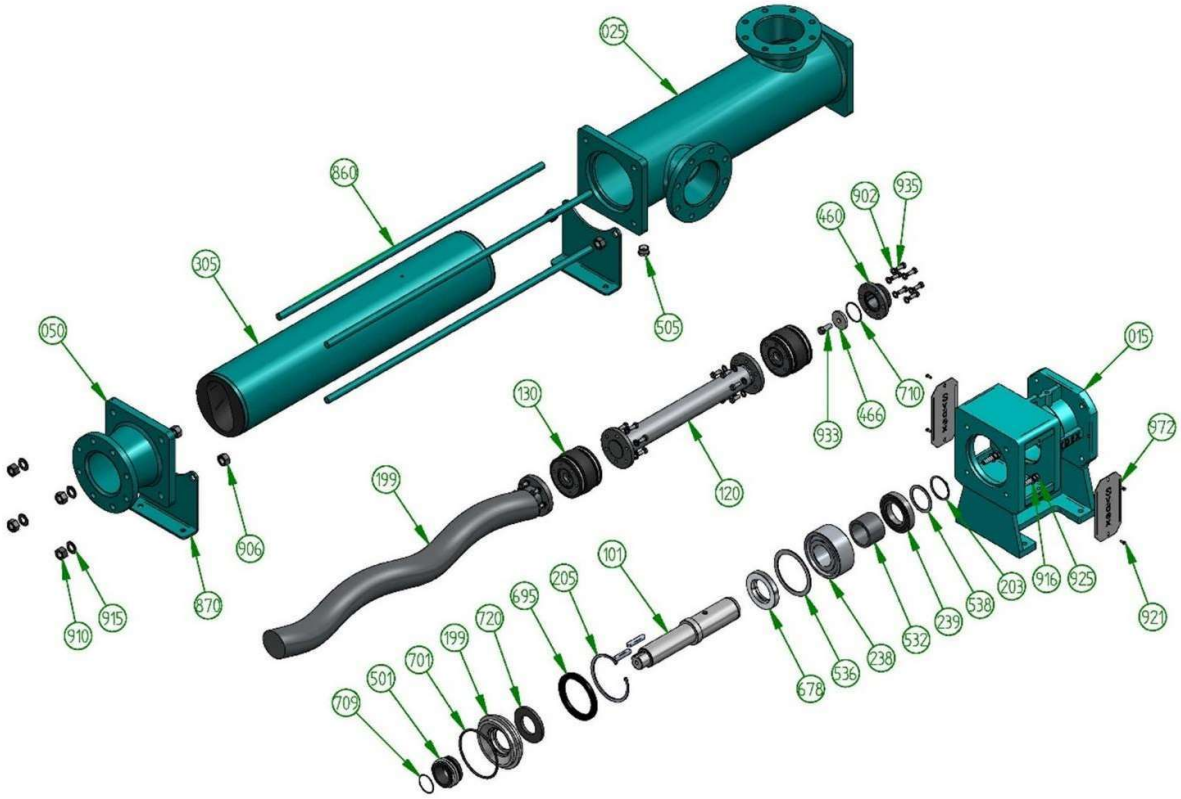
GROUP F (065-1L; 065-2S; 075-1S; 075-1LX; 052-4S; 039-8S; 052-2Y)



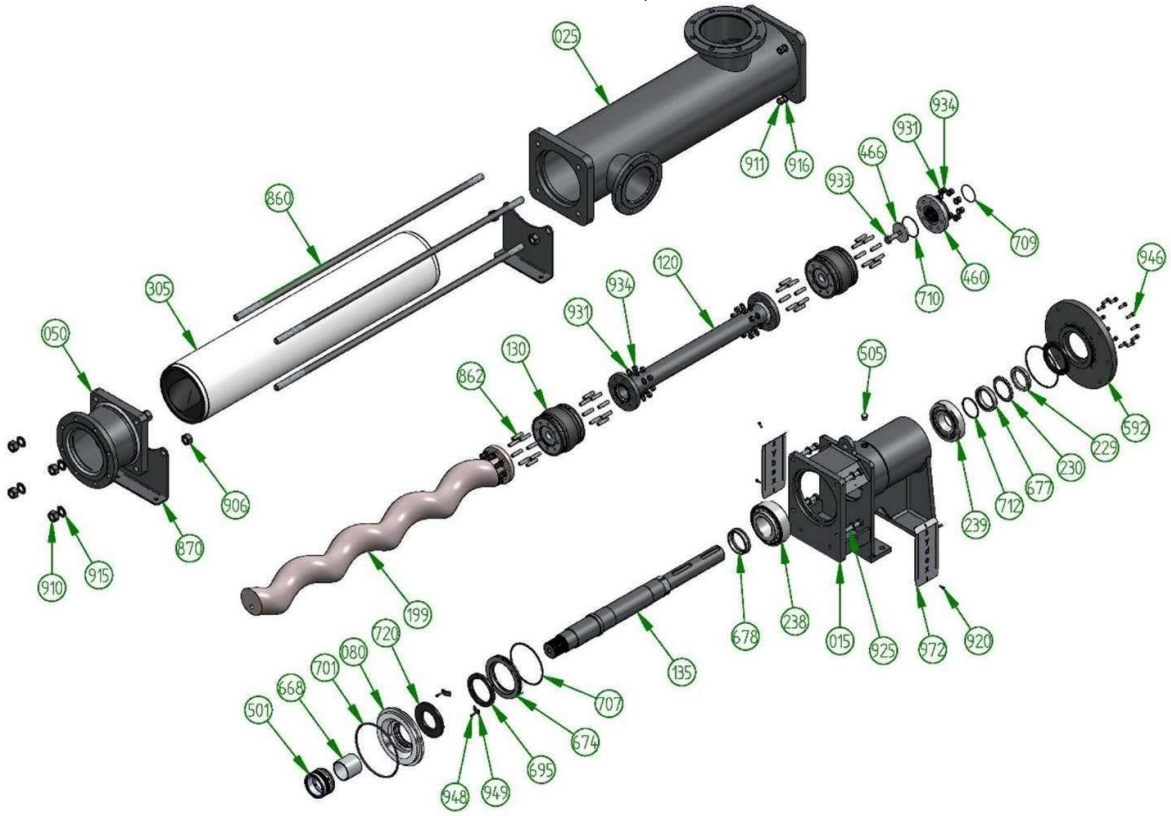
GROUP H (075-1L; 075-2S; 091-1S; 091-1L; 091-2S; 065-4S; 065-6S; 065-2SY)



GROUP L (102-1S; 102-2S; 102-1L; 130-1S; 075-4S; 065-8S; 075-2SY)



GROUP N - P (130-1L; 130-2S; 102-4S; 152-1S; 091-6S; 091-8S; 152-1L; 152-2S; 130-4S; 102-6S; 091-8S)



FOREWORD: Before disassembling the pump, remove pumped liquids and lubricate rotor and stator.

7.6. Disassembly

7.6.1. Removal of stator and pump body

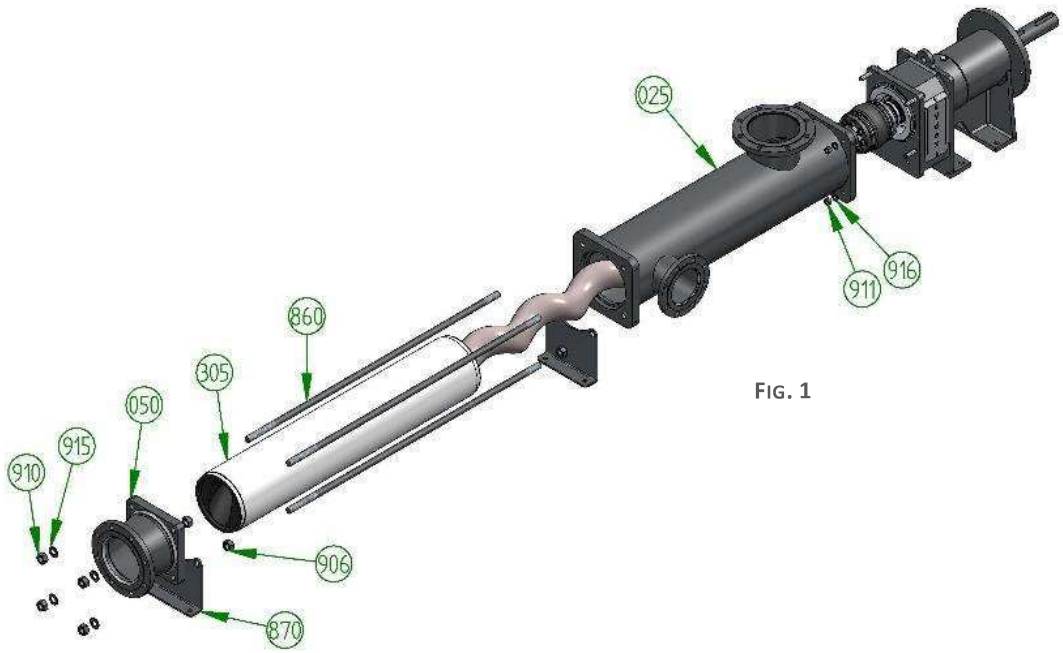


FIG. 1

1. Unscrew the nuts holding the support foot (870) to the baseplate.
2. Loosen the nuts (910) and washers (915), remove the discharge flange (050) and the support foot (870); extract the tie rods (860) as well as the stator (305);
3. Remove the stator (305) from the pump front side;
4. Take the guards out (972) from the pump block lantern (005 o 015);
5. Unscrew the nuts (911) and remove the pump body (025) acting on the pump front side;
6. Remove the O-Ring lantern (701) e check its conditions after every disassembly.

7.6.2. Removal of rotor

GROUP B - C

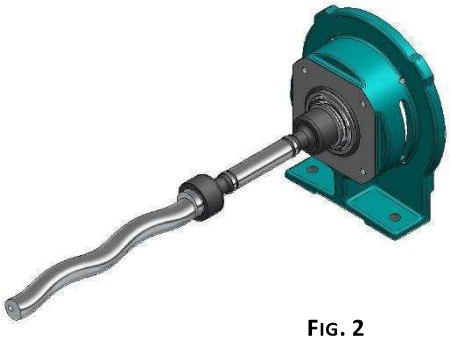


FIG. 2

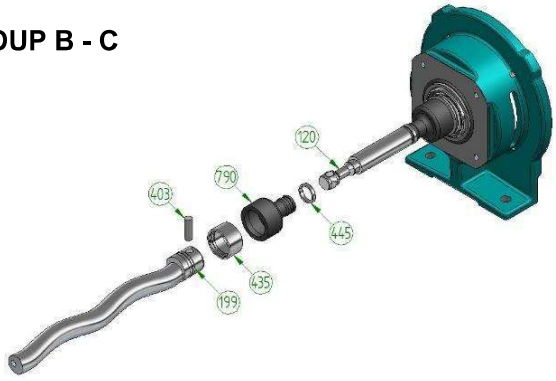


FIG. 3

1. Make sure that the disassembled pump lays on an adequate support in order to avoid any connecting rod oscillations. Proceed to remove the rotor by the joint side.
2. Push the sleeve (790) towards the connecting rod (120) until the pin (403) gets completely uncovered;
3. Take the pin out (403) and remove the connecting rod (120);
4. Remove the sleeve (790) and release the external ring cover for sleeve (445) from its housing by displacing it towards the connecting rod (120) in order to make the complete removal of the sleeve smoother (790);
5. Remove the ring cover for bell (435) from the sleeve (790);

GROUP D

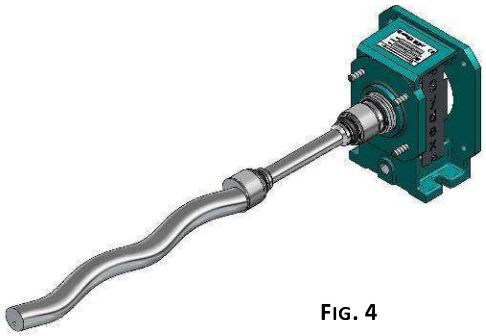


FIG. 4

FIG. 5

1. Make sure that the disassembled pump lays on an adequate support in order to avoid any connecting rod oscillations. Proceed to remove the rotor by the joint side.
2. Release the elastic joint (775) from its housing, take the ring cover for bell out (435) as well as the pin (403) paying attention to the lubrification oil;
3. Take the rotor out (199) from the connecting rod (120);
4. Extract the two O-rings (708).

GRUOP E – F – H

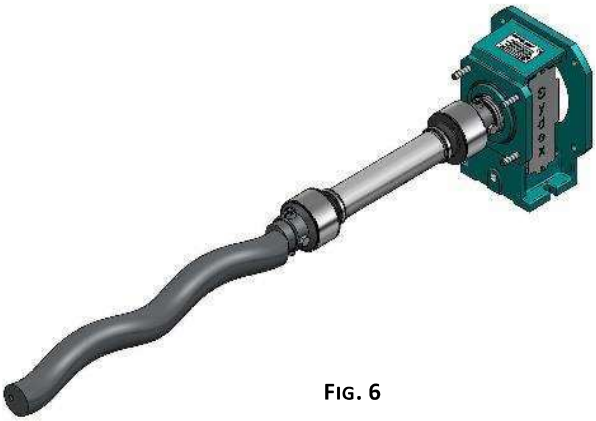


FIG. 6

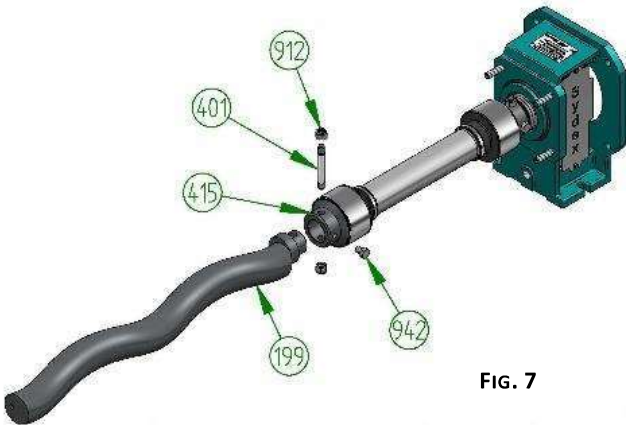


FIG. 7

1. Make sure that the disassembled pump lays on an adequate support in order to avoid any connecting rod oscillations;
2. Unscrew the connecting plug nuts (912) and separate the pin (401) from the bell (415);
3. Loose the fixing screw (942);
4. Remove the rotor (199).

GROUP L – N – P

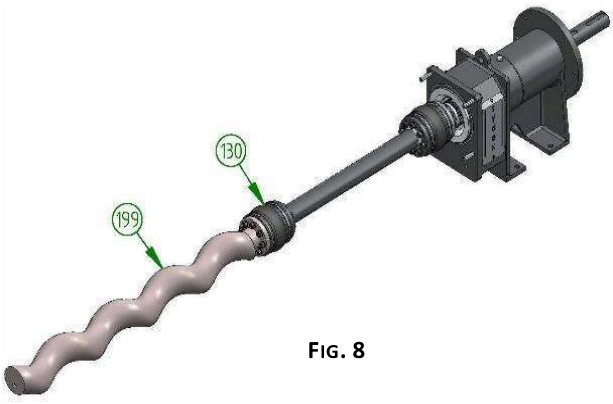


FIG. 8

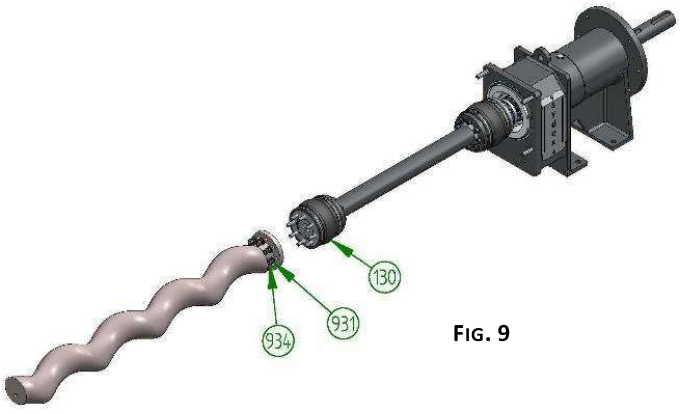


FIG. 9

1. Make sure that the disassembled pump lays on an adequate support in order to avoid any connecting rod oscillations;
2. Unscrew the nuts (934) as well as the washers (931) from the cross joint (130);
3. Remove the rotor (199).

7.6.3. Complete connecting rod dismantling

GROUP B - C

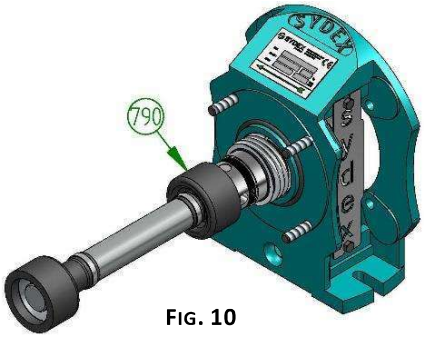


FIG. 10

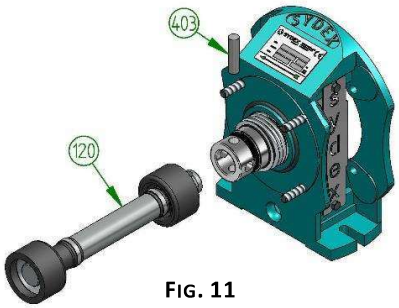


FIG. 11

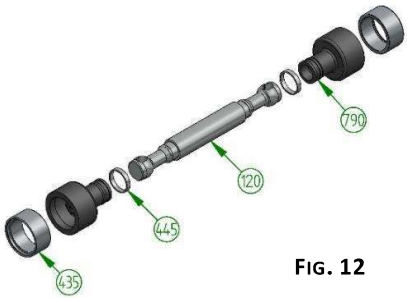


FIG. 12

1. Start disassembling the connecting rod starting from the pump block lantern (005) by pushing the sleeve (790) towards the connecting rod (120) until the joint pin is fully uncovered (403);
2. Remove the joint pin (403) and release the connecting rod (120);
3. Separate the sleeve (790) and release the outer ring for sleeve (445) from its position by moving it towards the connecting rod (120) in order to make the sleeve (790) extraction smoother;
4. Remove the ring cover for bell (435) from the sleeve (790);
5. Follow all the directions listed above for the other sleeve.

GROUP D

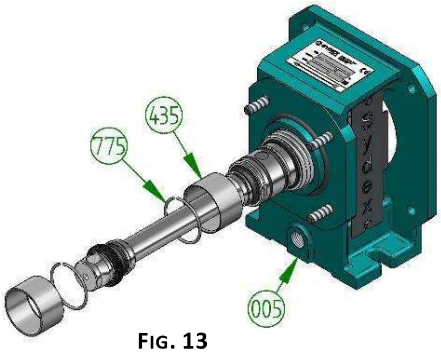


FIG. 13

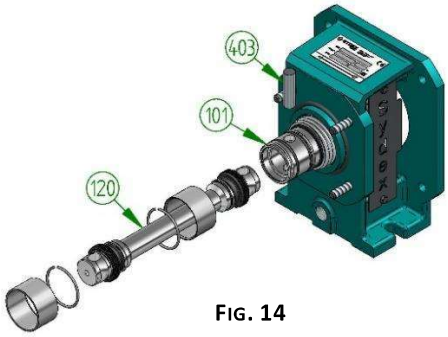


FIG. 14

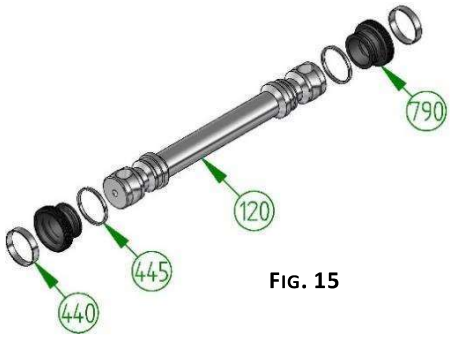


FIG. 15

1. Start disassembling the connecting rod starting from the joint facing to the block lantern (005);
2. Release the circlip (775) by using a screwdriver, next remove the ring cover for bell (435) and the joint pin (403);
3. Take the whole connecting rod out (140);
4. Separate the sleeve (790) and release the outer ring for sleeve (445) from its position by moving it towards the connecting rod (120) in order to make the sleeve (790) extraction smoother;
5. Remove the intern ring for sleeve (440) from the sleeve (790);
   Follow all the directions listed above for the other joint

GROUP E

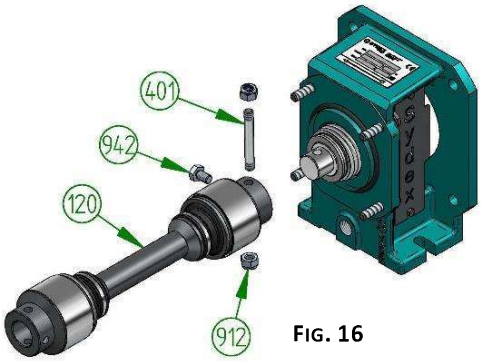


FIG. 16

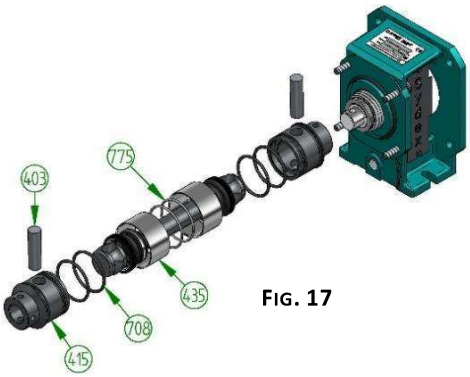


FIG. 17

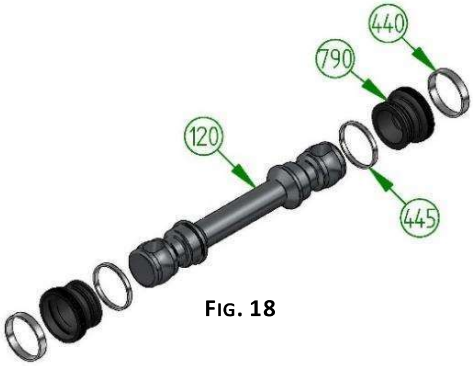


FIG. 18

1. Unscrew the connecting plug nut (912) and separate the pin of joint that faces the block lantern from its housing (401), next loosen the bell screw (942);
2. Remove the complete connecting rod (120);
3. Release the circlip (775) from its position, remove the ring cover for bell (435) and take the joint pin out (403);
4. Remove the joint O-ring (708) from the bell (415);
5. Extract the sleeve (790) and release the outer ring for sleeve (445) from its position by moving it towards the connecting rod (120) in order to make the sleeve extraction smoother (790);
6. Remove the intern sleeve ring (440) from the sleeve (790);
7. Follow all the directions listed above for the other joint.

GROUP F – H

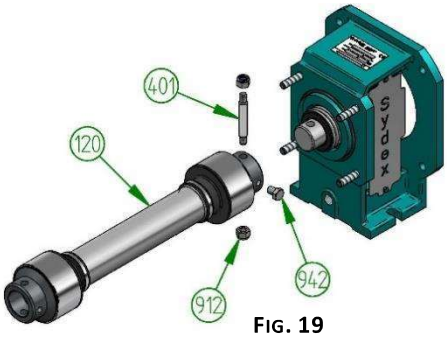


FIG. 19

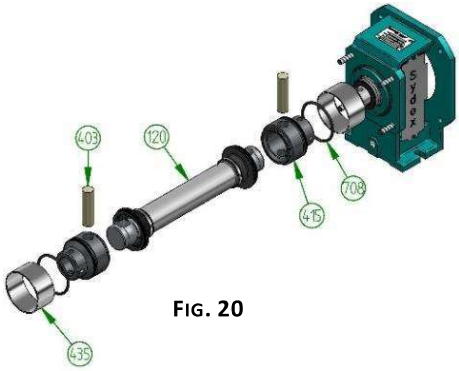


FIG. 20

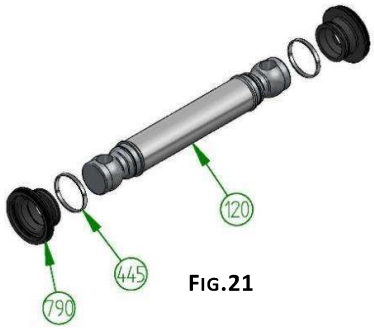


FIG.21

1. Unscrew the connecting plug nut (912) and separate the pin of joint that faces the block lantern (401), next loosen the bell bolt (942);
2. Remove the complete connecting rod (120);
3. Release the blocking system by raising the bell (415) and the ring cover for bell (435) by using a screwdriver (see detailed picture above);
4. Extract the ring cover for bell (435) and remove the joint pin (403), next take the bell out (415);
5. Extract the sleeve (790) and release the outer ring for sleeve (445) from its position by moving it towards the connecting rod (120) in order to make the sleeve extraction smoother (790);
6. Follow all the directions listed above for the other joint.

GROUP L – N – P

FIG. 20.1

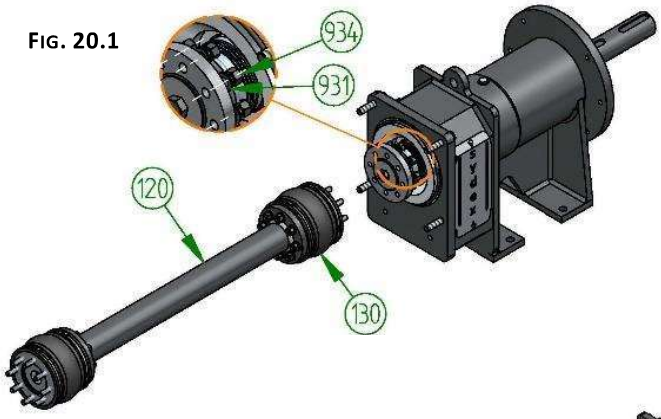


FIG. 22

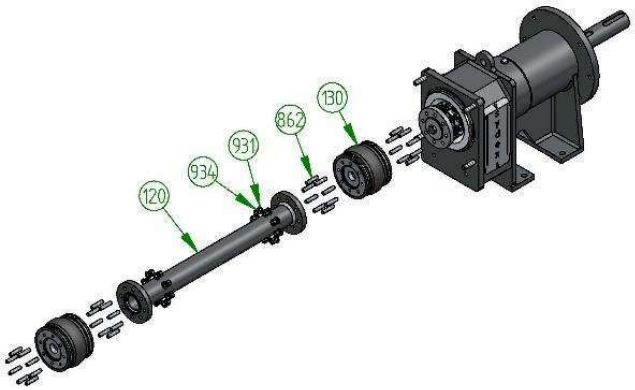


FIG. 23

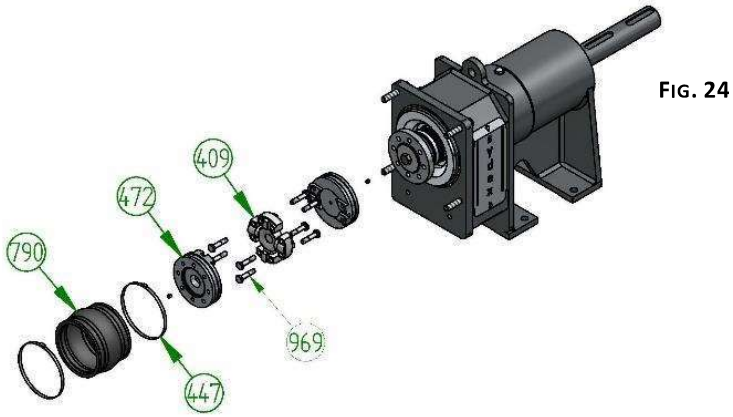


FIG. 24

1. Unscrew the nuts (934) as well as the washers (931) from the cross joint (130) starting from those facing the pump block lantern (see the detailed image 20.1);
2. Remove the complete male drive shaft (120);
3. Unscrew the nuts (934) as well as the washers (931) from the stud bolts (862) and from the connecting rod (120), next take the cross joint out (130);
4. If it is necessary to disassembly the cross joint (130), remove joint rings (447), as well as the sleeve (790), loosen the screws (969) [use the required tool ¾"] and release the cardanic joint (409) from flange (472);
5. If the cardanic cross (409) is damaged, replace it.

FOREWORD: Before disassembling the pump, remove pumped liquids and lubricate rotor and stator

7.6.4. Separation of the pump from the drive

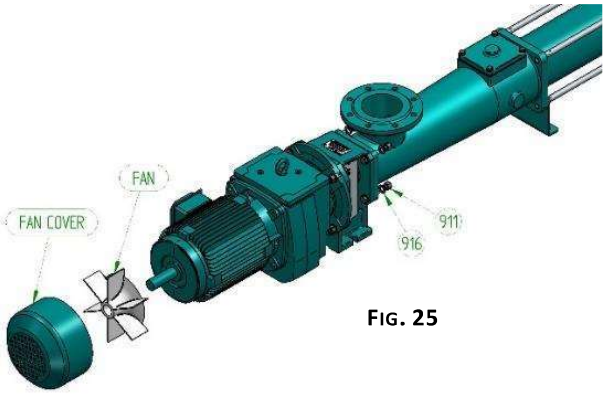


FIG. 25

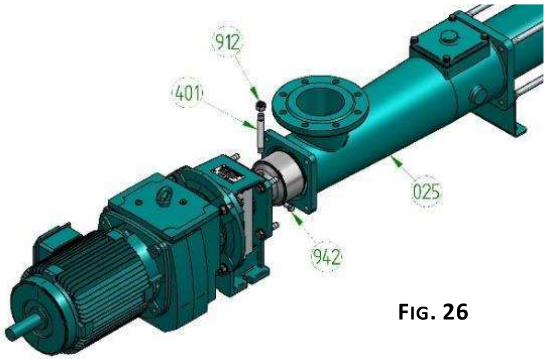


FIG. 26

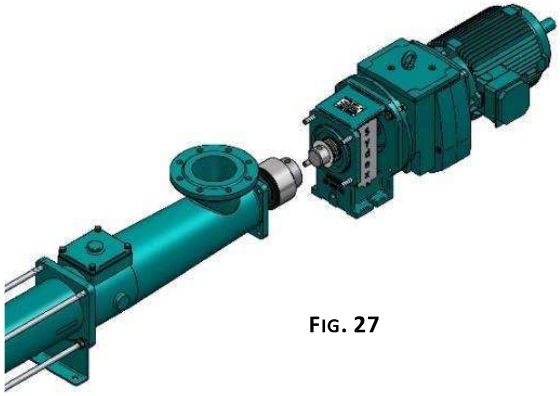


FIG. 27

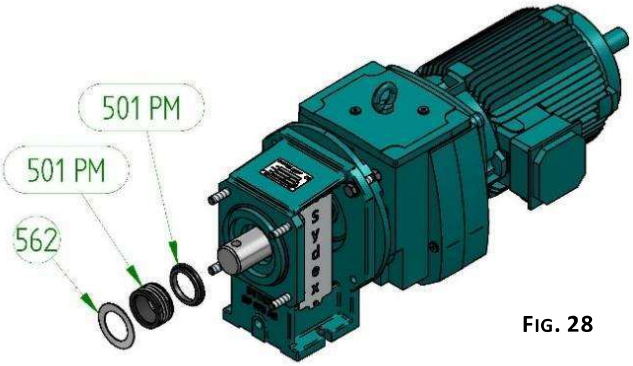


FIG. 28

1. Unscrew pump foot from the baseplate;
2. Unscrew nuts (911) from pump body (025);
3. Remove the fan cover and the fan;
4. Rotate the motor drive shaft by using a spanner in order to uncover the joint;
5. Unscrew the connecting plug nuts (912) as well as the screws fixing the bell (942);
6. Remove pump body (025) and take the connecting rod out (120).

7.6.5. Dismantling of mechanical seal [GENERIC]

1. Separate the rotating part of the mechanical seal (501 PM) from the female/male drive shaft (101 or 135);
2. Remove the fixed component of the mechanical seal (501 PF) from the pump block lantern (005) or from the mechanical seal housing (080, 081, 082, 083);
3. Wash properly the mechanical seal (501 PM/PF) and check its conditions; when damaged, replace it.

7.6.6. Dismantling of single mechanical seal

GROUP B – C – D

FIG. 29 – CAST IRON

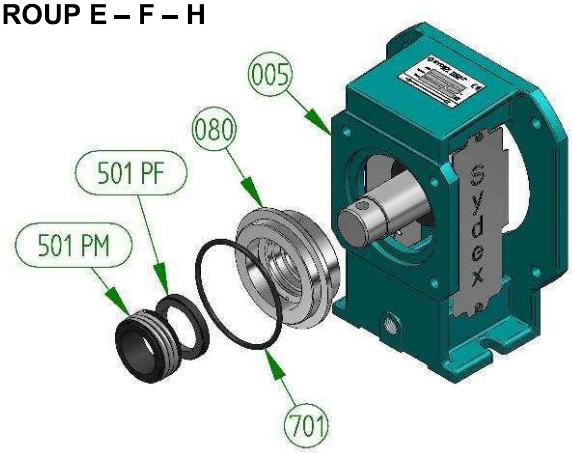
FIG. 30 - INOX

1. Unscrew the grub screws (832) and loosen the locking assembly (820);
2. Remove the female drive shaft (101) as well as the moving component of the mechanical seal (501 PM), from the drive shaft. Pay attention not to damage the mechanical seal (501);
3. If the pump material is inox steel, remove the fixed component of the mechanical seal (501 PF) from the mechanical seal housing (080); on the contrary, if the pump material is cast iron, remove the fixed component from the block lantern (005);
4. Check the conditions of the single mechanical seal (501 PM/PF) and properly clean the mechanical seal housing;
5. Remove and replace, if necessary, the O-ring lantern (701).

GROUP E – F – H

FIG. 31 – CAST IRON

FIG. 32 - INOX



- **CAST IRON**

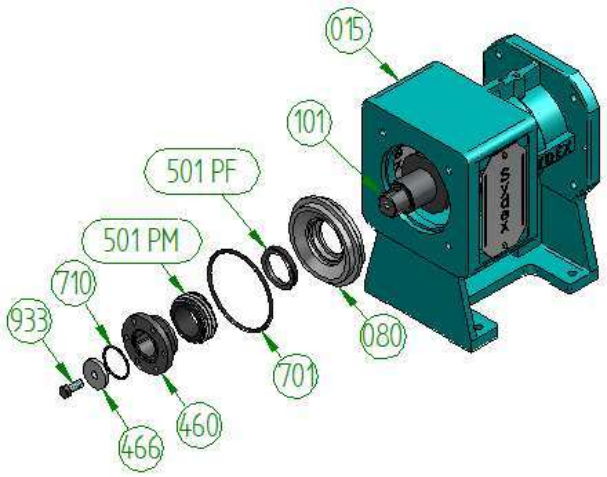
1. Unscrew the grub screws (832) and loosen the locking assembly (820);
2. Remove the female drive shaft (101) as well as the moving component of the mechanical seal (501 PM), from the drive shaft. Pay attention not to damage the mechanical seal (501);
4. Check the conditions of the single mechanical seal (501 PM/PF) and properly clean the mechanical seal housing;
5. Remove and replace, if necessary, the O-ring lantern (701).

- **INOX**

1. Remove the single mechanical seal plate (080) as well as the mechanical seal (501 PM/PF) and the spacer rings (562) (if present) from the drive shaft (101);
2. Check the conditions of the single mechanical seal (501 PM/PF) and properly clean the mechanical seal housing;
3. Remove and replace, if necessary, the O-ring lantern (701).

GROUP L

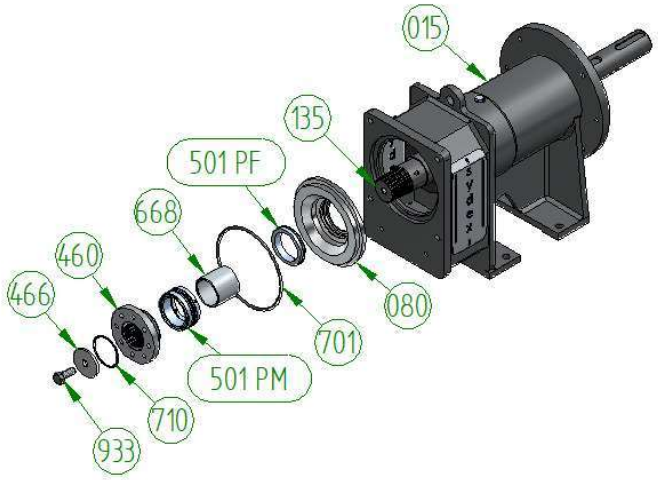
FIG. 33



1. Remove the screw (933) as well as the washer (466) and the O-ring flange/joint (710);
2. Separate the male shaft flange (460) and the O-ring (709);
3. Release the moving component of the mechanical seal (501 PM) paying attention not to displace the mechanical seal housing (080);
4. Remove the mechanical seal housing (080); as well as the mechanical seal fixed component (501 PF) and O-ring lantern (701);
5. Check the conditions of the single mechanical seal (501 PM/PF) and properly clean the mechanical seal housing;

GROUP N – P

FIG. 34



1. Remove the screw (933) as well as the washer (466) and the O-ring flange/joint (710);
2. Separate the male shaft flange (460) and the O-ring flange (709);
3. Release the moving component of the mechanical seal (501 PM) paying attention not to displace the mechanical seal housing (080);
4. Take the anti-wearing bushing out (668);
5. Remove the mechanical seal housing (080); as well as the mechanical seal fixed component (501 PF) and O-ring lantern (701);
6. Check the conditions of the single mechanical seal (501 PM/PF) and properly clean the mechanical seal housing;

7.6.7. Double mechanical seal dismantling

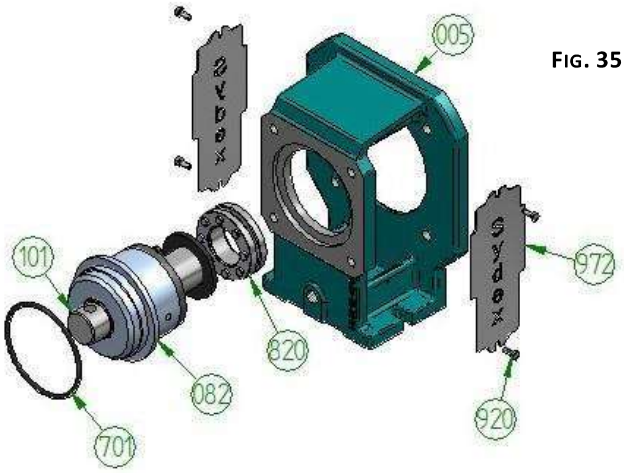
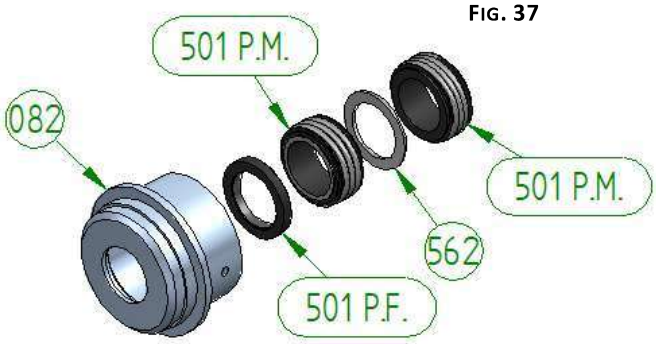


FIG. 35

FIG. 36

FIG. 37



1. Loosen the locking assembly nuts (820), and remove the double mechanical seal blocking system (501);
2. Separate the O-ring lantern (701) from the double mechanical seal housing (082);
3. Separate the locking assembly (820) from the female drive shaft (101);
4. Take the splash guard ring out (720);
5. Unscrew the clamp screws (967), remove the double seal cover (277
6. Remove the mechanical seal (501) and the spacer ring (562);
7. Take the double mechanical seal housing out (082) in order to remove the female drive shaft (101) and the mechanical seal (501) (check the conditions of the mechanical seal intern components);
8. Properly clean the double mechanical seal housing (082) and check the level of wearing of the mechanical seal (501), if needed, replace it.

7.6.8. Dismantling of soft gland packing

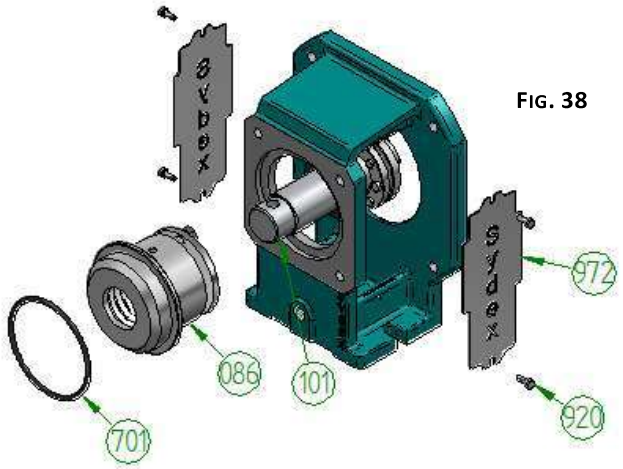


FIG. 38

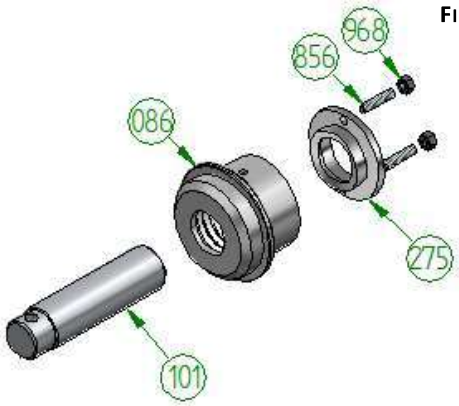


FIG. 39

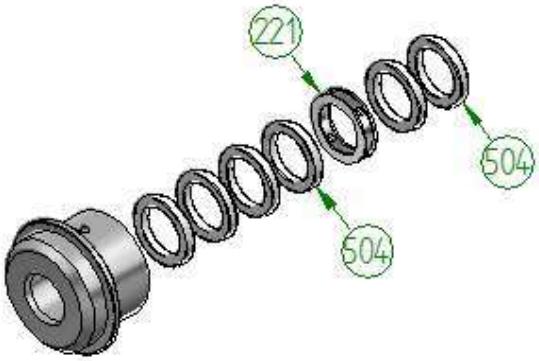


FIG. 40

1. Remove the soft gland packing system (504) from the female drive shaft (101) and the O-ring (701);
2. Loosen the soft gland packing stud bolt nuts (968) and remove the packing gland (275);
3. Remove the soft gland packing rings (504) and, if equipped with it, separate the flushing ring (221) from the soft packing housing (085);
4. Properly clean the soft packing housing (085) and replace the soft gland packing rings (504).

7.6.9. Lip seal dismantling

GROUP B – C – D

FIG. 41

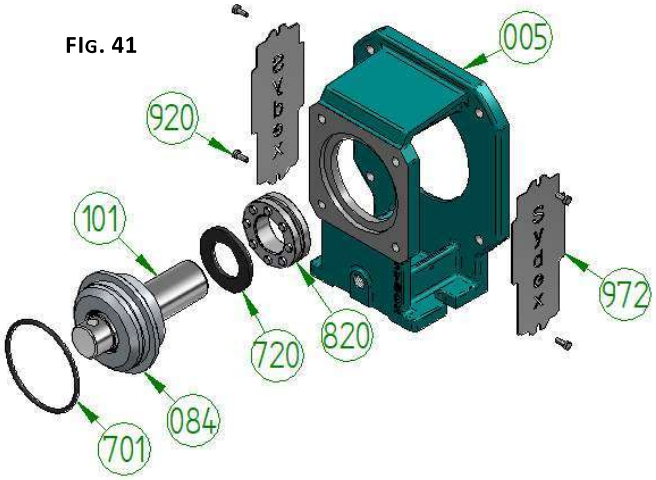
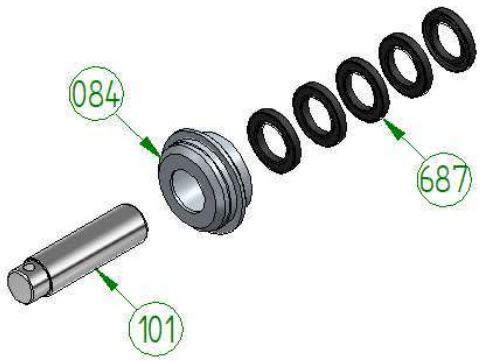


FIG. 42



OTHER GROUPS

FIG. 43

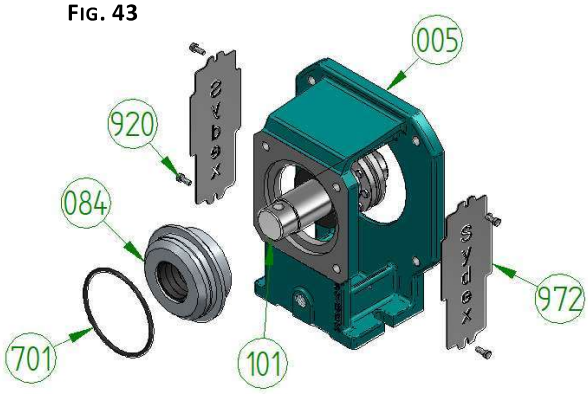


FIG. 44

GROUP B – C – D:

1. Loosen the locking assembly nuts (820) in order to separate the female drive shaft (101) from the motor drive shaft;
2. Extract the soft packing gland from the oil seal housing (084), the seal rings (687) as well as the female drive shaft (101) and the O-ring lantern (701);
3. Take the locking assembly out (820);
4. Separate the ring for oil seal housing (687) from the oil seal housing (084);
5. Properly clean the oil seal housing (084) and replace the ring for oil seal housing (687).

OTHER GROUPS:

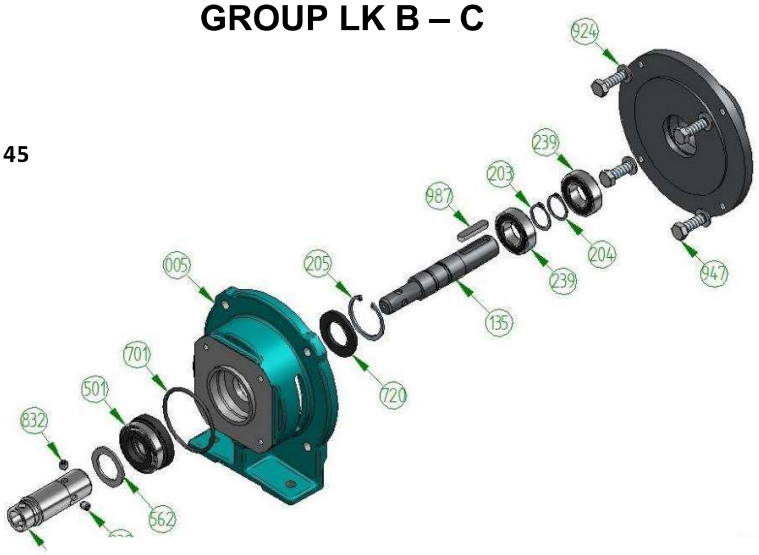
1. Extract the soft packing gland from the oil seal housing (084), the seal rings (687) as well as the female drive shaft (101) and the O-ring lantern (701);
2. Separate the ring for oil seal housing (687) from the oil seal housing (084);
3. Properly clean the oil seal housing (084) and replace the ring for oil seal housing (687).

7.6.10. Dismantling of block lantern bearings

FOREWORD: For the LK pumps, it is necessary to separate the elastic joint from the male drive shaft (135) .

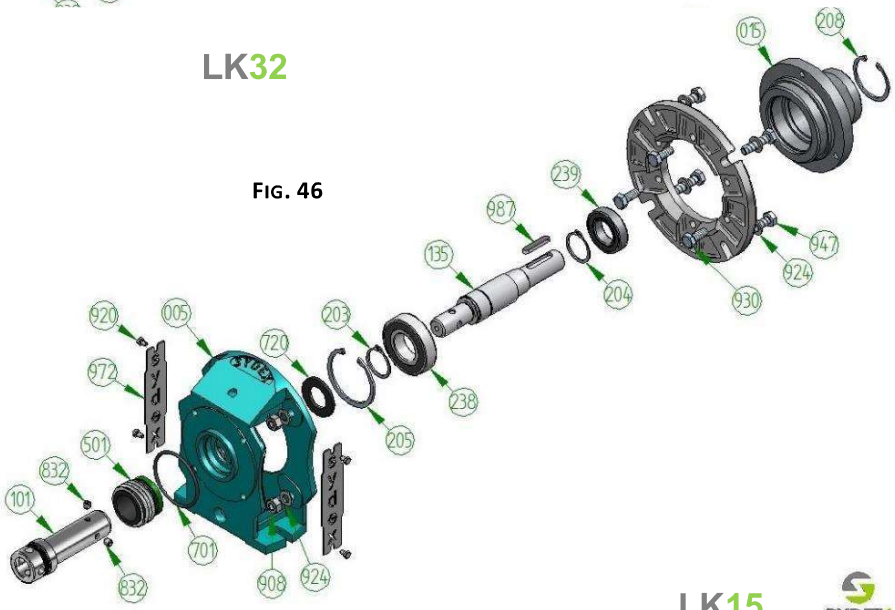
GROUP LK B – C

FIG. 45



LK32

FIG. 46

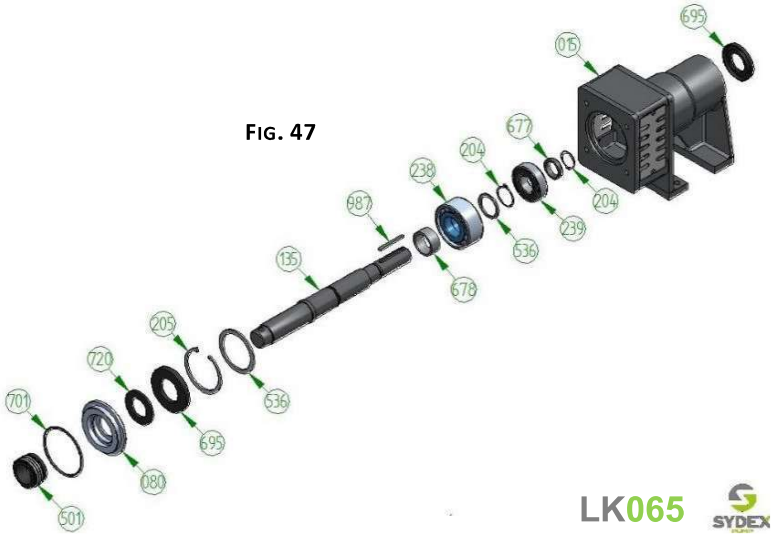


LK15

1. Remove the protections (972) from the block lantern (005);
2. Unscrew the grub screws (832), remove the drive shaft (101) as well as the mechanical seal moving component (501 PM) and if any, the spacer (562);
3. Unscrew the bearing retainer screws (947) and separate the bearing retainer (015) from the monobloc bearing housing (005);
4. Remove rear Seeger ring (205) and extract the male shaft (135) from the bearing housing (015) [using a plastic hammer] towards the pump;
5. Remove the Seeger ring from the male shaft front part (204), and if any, pull the rear bearing out (238) verso towards the pump;
6. Extract the front bearing (239) from the male shaft (135).

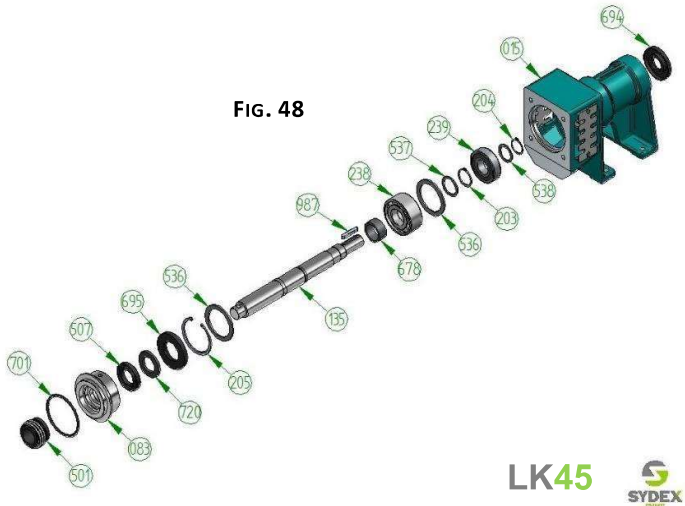
GROUP LK D – E – F – H – L

FIG. 47



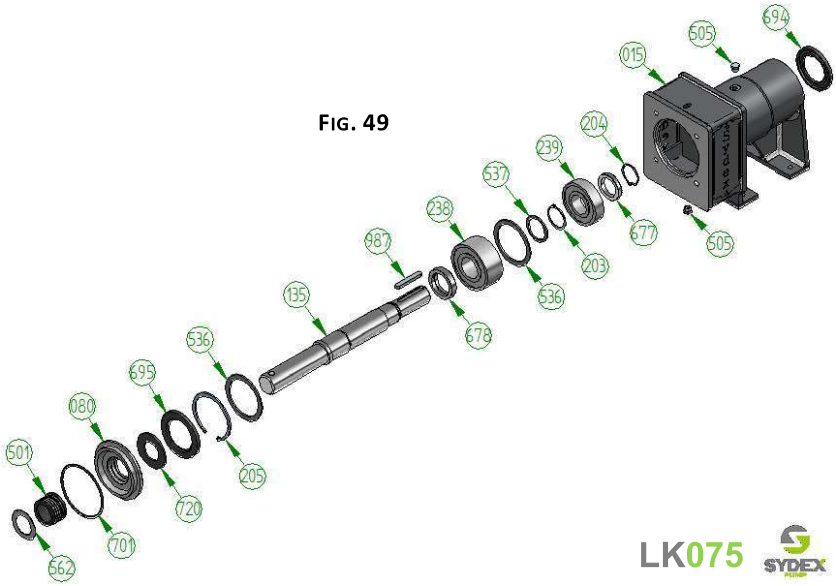
LK065

FIG. 48



LK45

FIG. 49

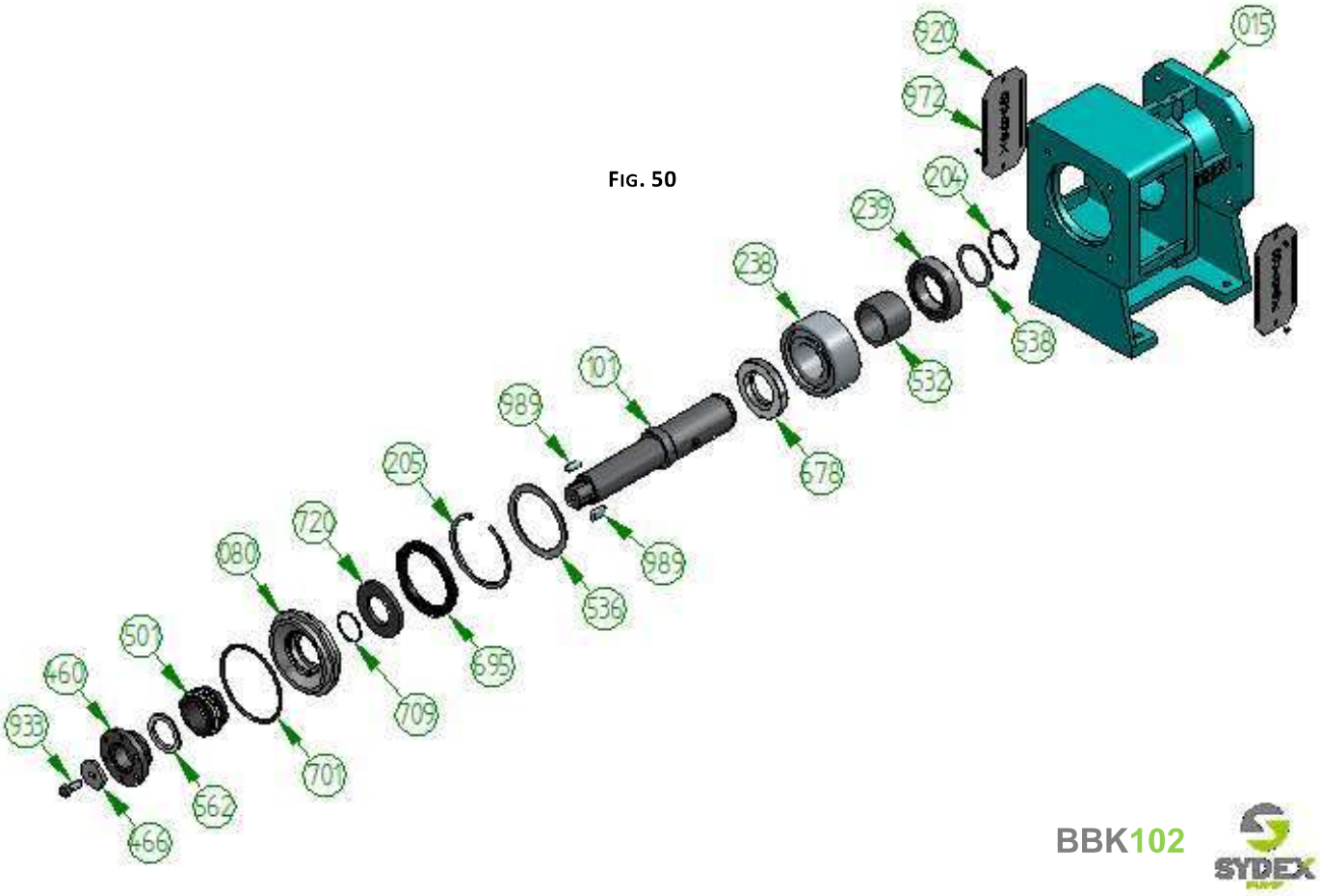


LK075

1. Extract the rear oil ring (694)/(695) as well as the elastic ring Seeger (rear) (205). Remove the male shaft (135), as well as the bearings, towards the pump side.
2. Remove the spacer ring (536) from the bearing housing (015);
3. Overturn the male shaft (135);
4. Pull the Seeger ring out (204) and remove the front anti-wearing ring (677), we will now be able to extract the bearing (239);
5. Take the Seeger ring out (203), remove the male shaft spacer rings (537 and 536); in order to extract the bearing (238). Next release the rear anti-wearing ring (678).

BBK GROUP H – L – N – P

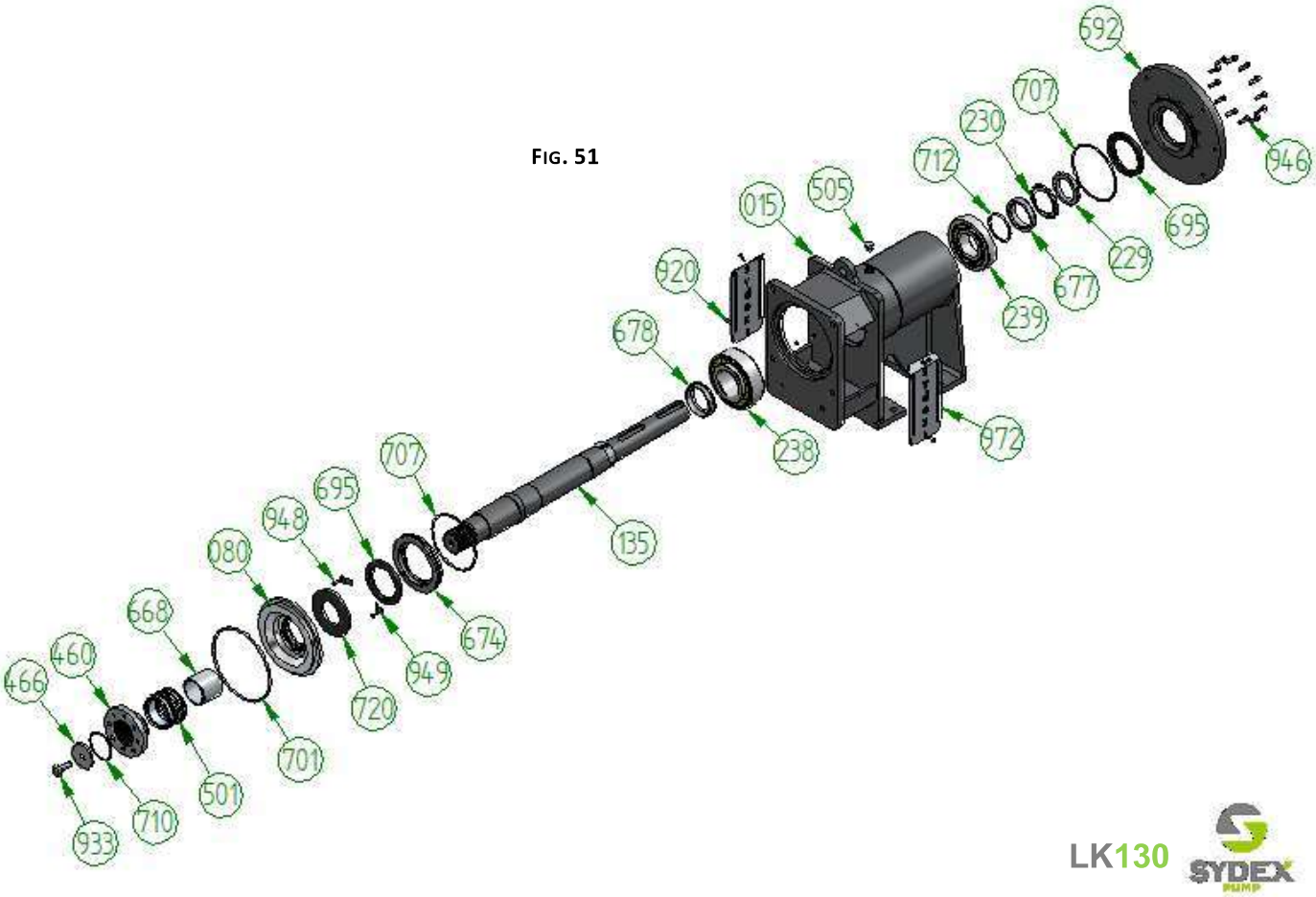
FIG. 50



1. Remove the rear oil ring (695), as well as the Seeger ring (205) and the spacer ring (536);
2. Take the male drive shaft out (135) acting on the pump side.
3. Overturn the male shaft (135);
4. Take the Seeger ring (204) and the spacer ring (538) out from the shaft;
5. Extract the bearing (239), the spacer packing (532) and the second bearing (238).

GROUP LK N – P

FIG. 51



1. Unscrew the self-blocking wheel bearing (229), remove the wheel bearing washer (230) acting on the motor side;
2. Remove the front anti-wearing ring (677) and the O-ring (712) [pay attention not to break it!];
3. Unscrew the nuts (948), remove the thin plates (949) in order to extract the male shaft (135); remove the oil housing ring (674), unscrew the flange screws (946), next, extract the flange (592), rear oil ring (695) and mechanical seal ring (707);
4. Pull the male shaft out (135) [pay attention not to displace the bearing (239)];
5. Remove the bearing (238) as well as the rear anti-wearing ring (678).

7.7. Assembly

7.7.1. Assembly of stator and pump body

1. Insert the bearing housing (015) into the pump body (025), fix it with pump body lantern screws (925), washers (916) and nuts (911);
2. Screw the stator (305) on the rotor (199) until it is flush; the bevelled stator side must face the pump body (025); fix the tie rods and, if present, insert the second foot (870) acting on the pump body side (025);
3. On the lower tie rods (860) insert the discharge flange foot (870) and fix it with washers (915) and nuts (910) to the discharge flange (050) until it is flush.

7.7.2. Assembling connecting rod, rotor and joint maintenance

FOREWORD: Block lantern (005), female drive shaft (101) and mechanical seal (501) must already be assembled.

GROUP B – C

1. Insert ring covers for bell (435) in the sleeves (790);
2. Insert the connecting rod (120) and the outer ring for sleeve (445);
3. Embed the sleeve (790) on the connecting rod (120), next move the intern ring for sleeve (445) to its position in the sleeve (790). Push the sleeve until it is flush (790);
4. Follow all the directions listed above on the pump support side;
5. Join the rotor (199) to the connecting rod (120), by inserting the rotor into the sleeve (790). Make sure the rotor's hole (199) matches the connecting rod hole (120);
6. Push the joint pin (403) halfway through the hole and fill in the remaining space with oil by using a syringe. Once the operation is done, insert the joint pin completely (403);
7. In order to eliminate the air that has remained into the sleeve (790), lower the external ring for sleeve (445) allowing the air to exit;
8. Follow all the directions listed above for the other joint.

GROUP D

1. (Acting on the pump side) Insert the connecting rod (120), insert the outer ring for sleeve (445), insert the sleeve (790) on the connecting rod ball (120); move the outer ring for sleeve (445) on the connecting rod (120) insert the sleeve (790) until it is flush;
2. Embed the intern ring for sleeve (440) into the sleeve (790);
3. Follow the directions listed above (1. – 2.) acting on the block lantern side (005);
4. Slide the two O-rings (708) into the rotor head (199)
5. Join the rotor (199) to the connecting rod (120), by inserting the rotor into the sleeve (790). Make sure the rotor's hole (199) matches the connecting rod hole (120);
6. Push the joint pin (403) halfway through the hole and fill in the remaining space with oil by using a syringe. Move the rotor in an oscillatory movement (199) in order to allow the excess air to exit the joint and let the oil come in. Next, close the sleeve (790);
7. Close the joint with the ring cover (435) and lock it with the circlip (775);
8. (Acting on the support side) insert the circlip (775) in its housing and repeat the above-mentioned instructions.

GROUP E

1. (Acting on the pump side) Insert the connecting rod (120), the outer ring for sleeve (445), and the sleeve (790) on the connecting rod ball (120); move the outer ring for sleeve (445) on the connecting rod (120). Insert the sleeve (790) until it is flush;
2. Embed the intern ring for sleeve (440);
3. Follow the directions listed above acting on the block lantern side (005);
4. Insert the ring cover for bell (435) as well as the circlip (775) on the connecting rod (120);
5. Slide O-ring (708) into the appropriate seats on the housing (415);
6. Centre the bell (415) on the connecting rod (120) matching the holes. Push the joint pin (403) halfway through the hole and fill in the remaining space with oil by using a syringe. Move the rotor in an oscillatory movement (199) in order to allow the excess air to exit the joint and let the oil come in.
7. Completely insert the pin (403), and lock it with the ring cover for bell (435) that was previously inserted, and close with the circlip (775);
8. Follow the directions listed above acting on the block lantern side (005);
9. Assembly the connecting rod (120) to the rotor (199) by blocking it using the pin (401), fixing the connecting plug nuts (912) and fastening the screw (942) on the female drive shaft (101) and on the rotor (199).

GROUP F – H

1. (Acting on the pump side) Insert the connecting rod (120), insert the outer ring for sleeve (445), insert the sleeve (790) on the connecting rod ball (120); move the outer ring for sleeve (445) on the connecting rod (120) insert the sleeve (790) until it is flush;
2. Insert joint O-ring (708) into its position on the bell (415);
3. Embed the bell (415) to the connecting rod (120). Make sure that the sleeve rubber (790) is completely flush into the bell (415);
4. Push the joint pin (403) halfway through the hole and fill in the remaining space with oil by using a syringe. Move the rotor in an oscillatory movement (199) in order to allow the excess air to exit the joint and let the oil come in.
5. Correctly replace the pin (403) into the joint and cover it with the ring cover for sleeve (435);
6. With the assistance of a screwdriver/hammer hit on the outer engravings positioned in order to make the blocking of the ring cover for bell possible (435);
7. Assembly the connecting rod (120) to the rotor (199) by blocking it using the pin (401), fixing the connecting plug nuts (912) and fastening the screw (942) on the female drive shaft (101) and on the rotor (199).

GRUOP L – N – P

1. Take the cross joint (130) and fasten the stud bolts (862) on both sides;
2. Assembly the cross joints (130) on the connecting rod flanges (120) by tightening the stud bolts (862). Once the stud bolts are positioned in the centre, fasten the washers (931) and the nuts (934);
3. Insert the stud bolts (862) from the cross joint (130) to the male shaft flange (460) and fasten the stud bolts with the washers (931) and the nuts (934);
4. Follow all the directions listed above on the discharge flange.

7.7.3. Assembly from “drive side”

1. --- See direction for the assembly of the mechanical seal ---
2. Connect the pump body (025) to the connecting rod;
3. Connect the bell (415) to the female drive shaft (101);
4. Insert the pin (401) and fasten the connecting plug nuts (912);
5. Tighten the screw (942);
6. With the aid of spanner turn clockwise the motor drive shaft in order to make the pump body flush to the block lantern;
7. Fasten again the nuts (911);
8. Assemble the fan and the fan cover on the drive;
9. Fix the pump on its baseplate.

7.7.4. Single mechanical seal assembly

GROUP B – C – D

1. Insert the spacer ring (562) and the moving component of the mechanical seal (501 PM) on the female drive shaft (101);
2. Insert the fixed component of the mechanical seal (501 PF) in the mechanical seal housing (080) or in the support lantern (050);
3. If the pump is equipped with a mechanical seal housing (080), insert it into the support lantern (005)
4. Connect the female drive shaft (101) and the moving part of the mechanical seal (501 PM) paying attention to match the two non-metal sides and checking that they are properly clean.
5. Push the female drive shaft (101) into the drive flange until it is flush, and charge the mechanical seal (501) by fixing the grub screws (832) into the related holes on the shaft (101).

GROUP E – F – H

Cast iron pumps:

1. Temporarily insert the locking assembly (820) and the anti-splash guard ring (720) onto the motor drive shaft. Partially insert the female drive shaft (101);
2. Move the splash guard ring (720) and the locking assembly (820) on the female drive shaft (101);
3. Completely insert the female drive shaft (101) in order to make it reach the motor drive flange;
4. Insert the mechanical seal moving component (501 PM paying attention to match the two non-metal sides; the non-metal side of the mechanical seal moving component (501 PM) must face the non-metal side of the mechanical seal fixed component (501 PF);
5. Fasten the locking assembly cross screws, and, if present, insert the spacer rings (562).

Inox pumps:

1. Insert the locking assembly (820) and the splash guard ring (720) onto the motor drive shaft.
2. Completely slide the female drive shaft (101) onto the motor drive shaft;

3. Move the splash guard ring (720) and the locking assembly (820) on the female drive shaft (101);
4. Insert the mechanical seal fixed component (501 PF) in the housing (080);
5. Insert the housing (080) on the female drive shaft (101) and move it to its position on the block lantern (005);
6. Insert O-ring lantern (701) in the block lantern (005). Insert the mechanical seal moving part (501 PM) on the female drive shaft (101), additionally, if present, insert the spacer ring (562).

GROUP L – N – P

1. Insert the mechanical seal fixed component in the mechanical seal housing (080);
2. Put the housing (080) into the bearing housing (015);
3. Insert the O-ring lantern (701) in the housing (080);
4. Mount the anti-wearing bushing (668) and the mechanical seal moving component (501 PM) on the male drive shaft (135), paying attention to match the two non-metal sides;
5. Place the O-ring flange (709) onto the male shaft flange (460) and insert in the male drive shaft (135);
6. Position the washer (466) onto the male shaft flange (460) and fix the screws (933) into the male drive shaft (135);
7. Insert O-ring flange/joint (710) into male shaft flange (460)

7.7.5. Double mechanical seal assembly

1. Block the female drive shaft vertically (101);
2. Insert mechanical seal fixed component (501 PF) into the double mechanical seal housing (082), next insert it into the female drive shaft (101);
3. Insert mechanical seal moving component (501 PM) as well as the spacer ring (562) into the female drive shaft (101);
4. Insert mechanical seal moving component (501 PM) into the female drive shaft (101) and into the housing (082);
5. Insert mechanical seal fixed component (501 PF) into the double seal cover (277). Insert the O-ring lantern (701) into its position on the double seal cover (277);
6. Close the housing (082) with its cover (277) by fixing the clamp screws (967);
7. Push the splash guard ring (720) until it is flush;
8. Mount the locking assembly (820);
9. Insert female drive shaft (101) with the mechanical seal into the motor drive shaft, making sure to centre it with the lantern and making sure that the female drive shaft (101) is flush on the drive flange;
10. Fasten the locking assembly screws (820);
11. Insert O-ring (701) into double mechanical seal housing (082).

N.B. In presence of QUENCH, periodically check the quench tank liquid level (093). In case of maintenance: disassembly quench pipe extension (094) and re-assembly it once the operation is over.

7.7.6. Soft gland packing assembly

1. Block the female drive shaft vertically (101);
2. Insert soft packing housing (085) into the female drive shaft (101);

3. Insert gland packing rings (504), and, if present, insert the flushing ring (221) matching it with the housing flushing holes (085);
4. Insert the packing gland (275) and fix the nuts (968) on the stud bolts (856);
5. Mount the locking assembly (820);
6. Insert female drive shaft (101) with the soft gland packing into the moto reducer drive shaft, making sure that the female drive shaft (101) is flush with the drive;
7. Push the housing (085) into the block lantern (005) until it is flush;
8. Fix the locking assembly screws (820);
9. Fasten nuts (968) on the packing gland (275);
10. Place the O-ring lantern (701) into the soft packing housing (085).

7.7.7. Lip seal assembly

1. Block the female drive shaft vertically (101);
2. Insert oil seal housing (084) into the female drive shaft (101);
3. Lubricate with grease the seal rings (687) and the housing inner side (084);
4. Insert ring for oil seal housing (687) into the female drive shaft (101), making sure the flat surface is facing the pump. Push them into the oil seal housing (084) until they are flush;
5. Check that the flat surface of the last ring, ring for oil seal housing, (687) is facing the drive;
6. Insert the locking assembly (820);
7. Insert female drive shaft (101) with the soft gland packing into the moto-reducer drive shaft, making sure that the female drive shaft (101) is flush with the drive;
8. Push the oil seal housing (084) into the block lantern (005);
9. Fasten the locking assembly screws (820);
10. Place the O-ring lantern (701) into the oil seal housing (084).

7.7.8. Bearing housing assembly

GROUP B – C

1. Acting on the pump side, insert on the male drive shaft (135) and the following components as listed: elastic ring Seeger (203) in its housing, the bearing (238) until it is flush onto the Seeger ring (203). Insert the second Seeger ring (203) in order to lock the bearing (238);
2. Acting on the key side, insert the bearing (front) (239) into the male drive shaft;
3. Insert the elastic ring Seeger (male shaft – rear) (203) into the bearing housing (015);
4. Push the complete male drive shaft (135) acting on the pump side until is fully flush, next block it with the elastic ring Seeger (rear) (205);

GROUP D – E – F – H – L

1. From the key side, insert the anti-wearing ring (678) onto the male drive shaft and lock it using a sealing product (medium Loctite). Push the bearing (238), spacer ring (537) and Seeger ring (204);
2. Acting on the pump side, insert the spacer rings (rear) (536) into the block lantern as well as the male drive shaft (135) that was previously assembled until stop;
3. From the pump side, insert spacer rings (rear) (536) and next block it with the elastic ring Seeger (rear) (205). Insert oil ring (rear) (695);
4. Acting on the drive side: insert the bearing (front) (239), the anti-wearing ring (front) (677), the elastic ring Seeger (male shaft – rear) (203) and the oil ring (front) (694);

BBK GROUP H – L – N – P

1. Insert the connecting rod (101) from the drive side. Insert the anti-wearing ring (678) and lock it using a sealing product (medium Loctite). Insert the bearing (238);
2. Embed the spacer packing (532), the bearing (239), the spacer ring (538) and lock everything with the Seeger ring (204);
3. Insert the connecting rod (101) as well as the bearings, into the bearing housing (015);
4. Acting on the pump side, insert the spacer ring (536), Seeger (205) and the mechanical seal ring (695) that was previously greased.

GROUP N – P

1. Insert the anti-wearing ring (678) into the male drive shaft (135) and lock it using a sealing product (medium Loctite). Embed the inner side of the bearing (238);
2. Slide the bearing ring nut (238), into the bearing housing (015);
3. Embed the male drive shaft (135) into the bearing housing (015);
4. From the drive side, insert into the male drive shaft (135) the bearing (239) previously greased, the O-ring (712), and the anti-wearing ring (677);
5. Slide into the housing the mechanical seal plate (674), the O-ring (707) as well as the oil ring (695) and insert the bearing housing (015);
6. Into the male drive shaft (135), insert: the bearing washer (230) and lock the self-blocking wheel bearing (229) [pre-charge it];
7. Insert into the housing as follows: seal rings housing (674), oil ring (695) and O-ring (707);
8. Lock the seal rings housing (674) using thin plates (949) and screws (948);

8. TROUBLE SHOOTING GUIDE

Sydex pumps are subjected to a hydraulic test prior to final dispatch in accordance with the conditions laid down in the offer.
A guide to identifying and solving common problems and issues follows.
Sydex progressive cavity pumps will be operate trouble-free if they are used in accordance with the offer and with this manual.
If operating problems arise, use this chart as a guide in locating the problem

Trouble-shooting guide										
Pump will not start	No suction capability	Discharge output low	Discharge pressure low	Discharge output fluctuates	Pump is noisy	Pump jammed	Drive overloaded	Stator and Rotor service life too short	Shaft seal leaks	Possible cause and remedies
x							x			**Pump or stator is new, to much static friction.** 1) Fill the pump and If possible, run the pump in one way and in another way till unblock the pump. 2) If necessary, lubricate the rotor and the stator.
x		x	x				x			**Power supply incorrect.** 1) Check motor nameplate data. Test voltage, phase and frequency.
		x					x	x		**Discharge pressure too high.** 1) Measure actual discharge pressure and compare to your specification.
x						x	x			**Foreign matter or debris in pump.** 1) Remove debris and correct any damage.
x						x	x	x		**Temperature of pumped liquid too high, stator swells.** 1) Reduce liquid temperature, if liquid temperature cannot be reduces, use an undersized rotor.
x						x	x	x		**Liquid contains too many solids, causing blockages.** 1) Check specification, increase liquid-to-solids ratio.
x						x	x	x		**Chemical attack on the stator.** 1) Check specification, If necessary change the stator with a correct one.
x						x	x	x	x	**Liquid settles and hardens at pump shut-down.** 1) Clean pump and rinse out after each use.
		x	x	x						**Air in suction piping.** 1) Check connections – If necessary, increase NPSH.
	x	x	x	x						**Suction pipe leaks.** 1) Check seals and connections.

Trouble-shooting guide										
Pump will not start	No suction capability	Discharge output low	Discharge pressure low	Discharge output fluctuates	Pump is noisy	Pump jammed	Drive overloaded	Stator and Rotor service life too short	Shaft seal leaks	Possible cause and remedies
		x	x							**Pump speed too low.** 1) If drive is variable speed, increase speed at pump.
		x	x	x	x			x		**Discharge too high or suction head too low (cavitation).** 1) Reduce suction losses; lower liquid temperature, install pump at lower elevation.
		x	x		x	x	x	x		**Pump running dry.** 1) Fill pump: provide dry run protection: relocate suction piping.
	x	x	x		x			x		**Stator or rotor worn out.** 1) Check rotor and stator. Replace the worn out parts.
					x					**Joints worn.** 1) Replace the worn out pieces.
							x			**Pump speed too high.** 1) If drive is variable, set at lower speed.
							x			**Viscosity too high.** 1) Measure specific gravity and compare to specified specific gravity.
x		x				x	x		x	**Pressure head too high.** 1) Check pressure head with manometer. Reduce the pressure head by increasing the pressure pipe diameter or by shortening the pressure pipe.
	x								x	**Wrong direction of rotation.** 1) Reverse polarity of drive motor.
	x								x	**Mechanical seal worm or damage.** 1) Replace the mechanical seal.
					x				x	**Pump bearing worn (Housing bearing version).** 1) Replace bearings, lubricate seal

9. RECOMMENDED SPARE PARTS

In general, we have all spare parts subject to wear in stock. Our subsidiaries and exclusive representatives also hold a certain stock. We recommend keeping an amount of spare parts, corresponding to the pump, in stock on site as follows:

Description	Small Set	Large Set	Position Code
Stator	**1**	**1**	**305**
Rotor / Connecting rod assembly		**1**	**(101-120-199- 403-447-790)**
Mechanical seal		**1**	**501**
O-ring lantern	**1**	**1**	**701**

To ensure that you receive the part quickly, please provide the following information with your order:

- Specify the model number of your pump, serial number, and Year of construction (see the plate on the pump).
- Identification part code – as per the parts drawing.

10. SPARE PARTS

GROUP B (015-020)

GHISA / CAST IRON		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto / Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica / Mech. Seal
505	01	Tappo di scarico G 3/8" / Drain Plug
562	01	Anello di spessore / Spacer Ring
701	01	O ring supporto / O-ring Lantern
720	01	Anello paraspruzzo / Spash Guard Ring
790	02	Manicotto / Sleeve
832	02	Grano / Headless Screw
860	04	Tirante M6 / Tie Rod
870	01	Piedino / Support Foot
884	01	Basamento / Baseplate
910	06	Dado M6 alto / Nut
915	04	Rondella / Washer
916	04	Rondella / Washer
925	04	Vite / Screw

INOX / STAINLESS STEEL		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto / Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica / Mech. Seal
562	01	Anello di spessore / Spacer Ring
701	01	O ring supporto / O-ring Lantern
720	01	Anello paraspruzzo / Spash Guard Ring
790	02	Manicotto / Sleeve
832	02	Grano M8X10 / Headless Screw
860	04	Tirante M6/ Tie Rod
870	01	Piedino / Support Foot
875	01	Piedino / Support Foot
910	04	Dado M6 cieco / Nut
915	04	Rondella d.6 / Washer

GROUP C (035-1L 2S 039-1S)

GHISA / CAST IRON		
POS.	Q.TY	DESCRIPTION
005	01	Supporto / Block Lantern
025	01	Corpo pompa / Body Pump
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta Meccanica d.32 / Mech. Seal
505	01	Tappo Drenaggio G 3/8" / Drain Plug
701	01	O-Ring Supporto/ O-ring Lantern
720	01	Anello Paraspruzzi/ Spash Guard Ring
790	02	Manicotto / Sleeve
832	02	Grano 8x10 Testa Conica / Headless Srew
860	04	Tiranti M8 / Tie Rod
870	01	Piede Supporto / Support Foot
910	06	Dado M8 Alto / Nut
911	04	Dado M8 Medio / Nut
915	04	Rondella d.8 / Washer
916	04	Rondella d.8 / washer
920	04	Vite / Screw
925	04	Vite Lanterna / Screw
972	02	Protezione / Protection

INOX / STAINLESS STEEL		
POS.	Q.TY	DESCRIPTION
005	01	Supporto / Block Lantern
025	01	Corpo pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta Meccanica d.32 / Mech.Seal
505	01	Tappo Drenaggio G 3/8" / Drain Plug
701	01	O-Ring Supporto/ O-ring Lantern
720	01	Anello Paraspruzzi/ Spash Guard Ring
790	02	Manicotto / Sleeve
832	02	Grano 8x10 Testa Conica / Headless Srew
860	04	Tiranti M8 / Tie Rod
870	01	Piede Supporto / Support Foot
910	06	Dado M8 Alto / Nut
911	04	Dado M8 Medio / Nut
915	04	Rondella d.8 / Washer
916	04	Rondella d.8 / Washer
920	04	Vite TE / Screw
925	04	Vite Lanterna / Screw
972	02	Protezione / Protection

GROUP D (039-1L/2S; 045-1S)

GHISA / CAST IRON		
POS.	Q.TY	DESCRIPTION
005	01	Supporto / Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
440	02	Anello manicotto interno / Ring for sleeves inner
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta Meccanica / Mech. Seal
505	01	Tappo G ½" / Drain Plug
701	01	O-Ring Supporto / O-ring Lantern
708	04	O-Ring Campana / O-ring
720	01	Anello Paraspruzzi / Spash Guard Ring
775	03	Anello Elastico / Circlip
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tiranti M10 / Tie Rod
870	01	Piede Supporto / Support Foot
910	06	Dado M10 alto / Nut

INOX / STAINLESS STEEL		
POS.	Q.TY	DESCRIPTION
005	01	Supporto / Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
403	02	Spinotto / Pin
435	02	Anello coprisnodo / Ring Cover for bell
440	02	Anello manicotto interno / Ring for sleeves inner
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta Meccanica / Mech.Seal
505	01	Tappo G 3/8" / Drain Plug
701	01	O-Ring Supporto / O-ring Lantern
708	04	O-Ring Campana / O-ring
720	01	Anello Paraspruzzi / Spash Guard Ring
775	03	Anello Elastico / Circlip
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tiranti M10 / Tie Rod
870	01	Piede Supporto / Support Foot

911	04	Dado M10 medio / Nut
915	04	Rondella d.10 / Washer
916	04	Rondella d.10 / Washer
920	04	Vite TE M5x8 / Screw
925	04	Vite TE M10x40 / Screw
972	02	Protezione / Protection

910	06	Dado M10 alto / Nut
911	04	Dado M10 medio / Nut
915	04	Rondella d.10 / Washer
916	04	Rondella d.10 / Washer
920	04	Vite TE / Screw
925	04	Vite TE / Screw
972	02	Protezione / Protection

GROUP E (BK 045-052 JOINT A)

GHISA / CAST IRON		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto/ Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / Pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
440	02	Anello manicotto interno / Ring for sleeves inner
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica d.40 / Mech. Seal
505	01	Tappo di scarico G 1/2" / Drain Plug
562	02	Anello di spessore / Spacer Ring
701	01	O ring supporto 94,62x5,34 / O-ring lantern
708	04	O-ring 62x4 / O-ring
720	01	Anello Paraspruzzi / Spash Guard Ring
775	02	Anello elastico / Circlip
790	02	Manicotto / Sleeve
820	01	Calettatore d.36/72 / Locking Assembly
860	04	Tirante / Tie Rod
870	01	Piedino / Support Foot
910	06	Dado / Nut
911	04	Dado M10 medio / Nut
912	04	Dado M10 autobloccante inox / Nut
915	04	Rondella / Washer
916	04	Rondella d.10 / Washer
920	04	Vite M5X8 / Screw
925	04	Vite M10X45 / Screw
972	02	Protezione / Protection

INOX / STAINLESS STEEL		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto/ Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / Pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
440	02	Anello manicotto interno / Ring for sleeves inner
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica d.40 / Mech. Seal
505	01	Tappo di scarico G 1/2"/ Drain Plug
562	02	Anello di spessore / Spacer Ring
701	01	O ring supporto 94,62x5,34 / O-ring lantern
708	04	O-ring 62x4 / O-ring
720	01	Anello paraspruzzo 39x65x6 / Spash Guard Ring
775	02	Anello elastico / Circlip
790	02	Manicotto / Sleeve
820	01	Calettatore d.36/72 / Locking Assembly
860	04	Tirante / Tie Rod
870	01	Piedino / Support Foot
910	06	Dado / Nut
911	04	Dado M10 medio / Nut
912	04	Dado M10 autobloccante inox / Nut
915	04	Rondella / Washer
916	04	Rondella d.10 / Washer
920	04	Vite M5X8 / Screw
925	04	Vite M10X45 / Screw
972	02	Protezione / Protection

GROUP F (BK 065-1S/1L/2S; 075-1S)

GHISA / CAST IRON		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto/ Block Lantern
025	01	Corpo Pompa / Body Pump
029	01	Coperchio d'ispezione
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / Pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica / Mech. Seal
505	01	Tappo di scarico G ¾" / Drain Plug
701	01	O ring supporto / O-ring Lantern
708	02	O ring snodo / O-ring
720	01	Anello paraspruzzo / Spash Guard Ring
735	01	Guarnizione coperchio / Gasket
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tirante / Tie Rod
870	01	Piedino / Support Foot
904	04	Rondella d.10 / Washer
910	06	Dado M16 Alto / Nut
911	04	Dado M12 Alto / Nut
912	04	Dado M12 Autobloccante / Nut
915	04	Rondella d.16 / Washer
916	04	Rondella d.12 / Washer
920	04	Vite TE M5x8 / Screw
925	04	Vite TE M12x55 / Screw
942	02	Vite Campana / Screw
963	04	Vite TE M10x35 / Screw
972	02	Protezione / Protection

INOX / STAINLESS STEEL		
POS.	**Q.TY**	**DESCRIPTION**
005	01	Supporto / Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / Pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
445	02	Anello manicotto esterno / Ring for sleeves outer
501	01	Tenuta meccanica / Mech. Seal
505	01	Tappo di scarico / Drain Plug
701	01	O ring supporto / O-ring Lantern
708	02	O ring snodo / O-ring
720	01	Anello paraspruzzo / Spash Guard Ring
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tirante / Tie Rod
870	01	Piedino / Support Foot
910	06	Dado M16 Alto / Nut
911	04	Dado M12 / Nut
912	04	Dado M12 Autobloccante / Nut
915	04	Rondella d.16 / washer
916	04	Rondella d.12 / Washer
920	04	Vite TE M5x8 / Screw
925	04	Vite TE M12x55/ Screw
942	02	Vite Campana / Screw
972	02	Protezione / Protection

GROUP H (BK 075-2S/1L, 091-1S/2S/1L)

GHISA / CAST IRON		
POS.	Q.TY	DESCRIPTION
005	01	Supporto/ Block Lantern
025	01	Corpo Pompa / Body Pump
029	01	Coperchio d'ispezione
050	01	Bocchello / Discharge Flange
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
447	02	Fascetta\ snodo / Band
501	01	Tenuta meccanica / Mech. Seal
505	01	Tappo di scarico / Drain Plug
562	01	Anello di spessore / Spacer Ring
701	01	O ring supporto 139,7x5,34 / O-ring lantern
708	02	O ring snodo 113,7x5,34 / O-ring
717	02	Anello ferma manicotto / O-ring for Sleeves
720	01	Anello paraspruzzo 54x85x6 / Spash Guard Ring
735	01	Guarnizione coperchio / Gasket
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tiranti M18 / Tie Rod
870	02	Piede Supporto / Support Foot
910	08	Dado M18 / Nut
915	04	Rondella d.18 / Washer
911	04	Dado M14 / Nut
912	04	Dado M14/ Nut
916	04	Rondella d.14 / Washer
920	04	Vite TE M5x8 / Screw
925	04	Vite TE M10x40 / Screw
951	12	Vite TE M6x16 / Screw
963	04	Vite TE M10x35 / Screw
972	02	Protezione / Protection

INOX / STAINLESS STEEL		
POS.	Q.TY	DESCRIPTION
005	01	Supporto/ Block Lantern
025	01	Corpo Pompa / Body Pump
050	01	Bocchello / Discharge Flange
080	01	Alloggiamento Ten. Mecch./Mech. Seal Plate
101	01	Albero di comando / Female Drive Shaft
120	01	Albero di trasmissione /Connecting Rod
199	01	Rotore / Rotor
305	01	Statore / Stator
401	02	Spina di collegamento / Pin
403	02	Spinotto / Pin
415	02	Campana / Bell
435	02	Anello coprisnodo / Ring Cover for bell
447	02	Fascetta snodo / Band
501	01	Tenuta meccanica d.55 / Mech. Seal
505	01	Tappo di scarico G 1" / Drain Plug
562	01	Anello di spessore / Spacer Ring
701	01	O ring supporto 139,7x5,34 / O-rin Support
708	02	O ring snodo 113,7x5,34 / O-ring
717	02	Anello ferma manicotto / O-ring for Sleeves
720	01	Anello paraspruzzo 54x85x6 / Spash Guard Ring
790	02	Manicotto / Sleeve
820	01	Calettatore / Locking Assembly
860	04	Tiranti M18 / Tie Rod
870	02	Piede Supporto / Support Foot
910	08	Dado M18/ Nut
915	04	Rondella d.18 / Washer
911	04	Dado M14/ Nut
912	04	Dado M14/ Nut
916	04	Rondella d.14 / Washer
920	04	Vite TE M5x8 / Screw
925	04	Vite TE M10x40 / Screw
951	12	Vite TE M6x16 / Screw
972	02	Protezione / Protection

GROUP L (102-1L/S, 130-1S, 075-4S)

POS.	Q.TY	DESCRIPTION
015	1	Supporto cusicinetti/Bearing Housing
025	1	Corpo Pompa / Body Pump
029	1	Coperchio di ispezione / Inspection Cover
050	1	Bocchello / Discharge Flange
080	1	Alloggiamento ten.mec. / Mech.seal Plate
101	1	Albero di comando / Female Drive Shaft
120	1	Albero di trasmissione /Connecting Rod
199	1	Rotore / Rotor
204	1	Anello elastico da esterno / Circlip outer
205	1	Anello elastico da interno/ Circlip inner
238	1	Cuscinetto 3316 / Bearing 3316
239	1	Cuscinetto 6216 / Bearing 6216
305	1	Statore / Stator
406	2	Crociera / Cross
447	4	Fascetta snodo / Band
460	1	Flangia albero maschio / Male drive shaft flange
466	1	Rondella mezzo snodo / Washer
472	4	Flangia crociera / Cross Flange
501	1	Tenuta meccanica / Mech. Seal
532	1	Bussola di spessore / Spacer Ring
536	1	Anello di spessore / Spacer Ring
538	1	Anello di spessore / Spacer Ring
678	1	Anello sede paraolio / O-Ring
695	1	Paraolio / Anti-wearing
701	1	O-Ring alloggiamento / O-ring
709	1	O-Ring 32.50 / O-ring
710	1	Guarnizione tubo copri statore / Gasket Stator
720	1	Guarnizione NBR / Gasket
790	2	Manicotto / Sleeve
832	4	Grano Din 906 / Headless Screw
860	4	Tirante 102-12 / Tie Rod
870	2	Piedino / Support Foot
901	4	Dado esagonale ISO 4034 / Nut
903	8	Dado esagonale ISO 4034 / Nut
904	16	Rondella ISO 7091 / Washer
910	4	Dado esagonale / Nut
915	4	Rondella / Washer
916	4	Rondella / Washer
920	4	Vite a testa esagonale / Screw
925	4	Vite a testa esagonale / Screw
933	1	Vite a testa esagonale / Screw
935	24	Vite a testa esagonale / Screw
963	8	Vite a testa esagonale / Screw
972	2	Protezione / Protection

GROUP N -P (130-1L, 130-2S, 152-1S, 152-1L)

POS.	Q.TY	DESCRIPTION
015	1	Supporto cusicinetti/Bearing Housing
025	1	Corpo Pompa / Body Pump
050	1	Bocchello / Discharge Flange
080	1	Alloggiamento ten.mec. / Mech.seal Plate
120	1	Albero di trasmissione /Connecting Rod
130	2	Pacco crociera / Cross Joint
135	1	Albero di comando / Male Drive Shaft
199	1	Rotore / Rotor
229	1	Ghiera / Ferrule
230	1	Rondella bloccaggio Ghiera / Washer
238	1	Cuscinetto posteriore (grosso) / Bearing
239	1	Cuscinetto anteriore (piccolo) / Bearing
305	1	Statore / Stator
460	1	Flangia albero di comando / Drive Shaft Flange
466	1	Rondella centraggio / Washer
501	1	Tenuta meccanica / Mech. Seal
505	1	Tappo di scarico gas / Drain Plug
592	1	Flangia ANSI + Flangia Motorid. / Flange
668	1	Bussola Antiusura per Baderna / O-ring
674	1	Anello alloggiamento Paraolio / / O-ring
677	1	Anello antiusura anteriore / Anti-wearing ring front
678	1	Anello antiusura posteriore / Anti-wearing ring back
695	1	Anello paraolio posteriore / O-ring
701	1	O-ring supporto/ O-ring
707	2	O-ring anello di tenuta/ O-ring
709	1	O-ring flangia/Am. 102/ O-ring
710	1	O-ring flangia/snodo 102/ O-ring
712	1	O-ring rosetta di sicurezza / O-ring
720	1	Anello paraspruzzi / Spash Guard Ring
860	4	Tiranti / Tie Rod
862	16	Prigioniero / Stud Bolt
870	1	Piede bocchettone / Discharge Foot
906	4	Dado / Nut
910	4	Dado bocchello / Nut
911	4	Dado supporto / Nut
915	12	Rondella bocchello / Washer
916	1	Rondella supporto / Washer
920	4	Vite protezione / Screw
925	4	Vite supporto / Screw
931	16	Rondella prigioniero crociera / Washer
933	1	Vite albero di comando / Screw
934	16	Dado prigioniero crociera / Nut
946	12	Vite flangia supporto cuscinetti / Screw
948	1	Vite premi anello supporto / Screw
949	1	Rondella premi anello supporto / Washer
972	1	Protezione / Protection

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