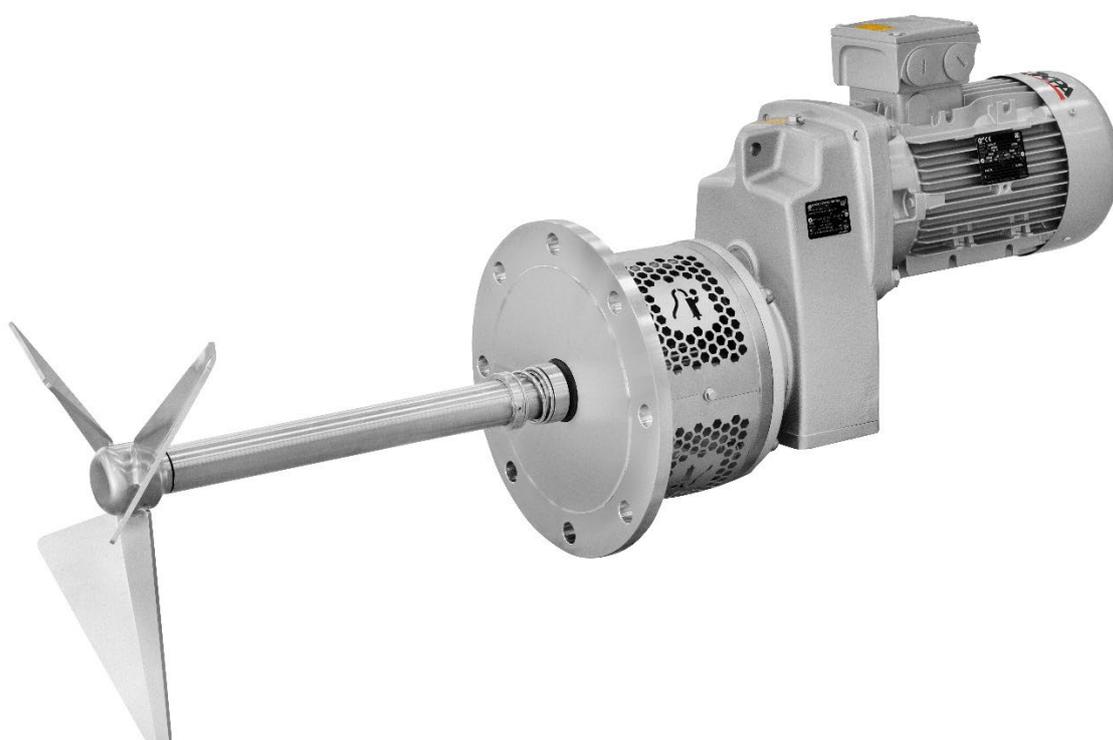


INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS

SIDE ENTRY AGITATOR

DINAMIX SMX



20.073.32.0010



Original Manual
20.073.30.01EN
(A) 2024/07

EC Declaration of Conformity



INOXPA S.A.U.

Telers, 60
17820 - Banyoles (Spain)

hereby declare under our sole responsibility that the

Machine: **SIDE ENTRY AGITATOR**

Model: **DINAMIX SMX**

Serial number: **IXXXXXXXXXX to IXXXXXXXXXX**
XXXXXXXXXXIINXXX to XXXXXXXXXXXIINXXX

fulfils all the relevant provisions of the following directive:

Machinery Directive 2006/42/EC
Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment
Regulation (EC) n° 1935/2004
Regulation (EC) n° 2023/2006

and with the following harmonized standards:

EN ISO 12100:2010
EN 60204-1:2018
EN ISO 14159:2008¹
EN 1672-2:2005+A1:2009¹
EN ISO 13857:2019
EN IEC 63000:2018

The technical file has been prepared by the signer of this document.

A handwritten signature in black ink, appearing to read "David Reyero Brunet".

David Reyero Brunet
Technical Office Manager
25th May 2024



Document: 20.073.30.02EN

Revision: (A) 2024/06

¹If the agitator is equipped with a hygienic mechanical seal

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fulfils all the relevant provisions of these regulations:

Supply of Machinery (Safety) Regulations 2008
The Restriction of the Use of Certain Hazardous Substances in
Electrical and Electronic Equipment Regulations 2012 (as amended)

and with the following designated standards:

EN ISO 12100:2010
EN 60204-1:2018
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EN 1672-2:2005+A1:2009¹
EN ISO 13857:2019
EN IEC 63000:2018

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David Reyero Brunet
Technical Office Manager
25th May 2024



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¹If the agitator is equipped with a hygienic mechanical seal

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2. Generalities

2.1. INSTRUCTIONS MANUAL

This manual contains information about the reception, installation, operation, assembly, disassembly and maintenance of the DINAMIX SMX side entry agitator.

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

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

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

2.2. COMPLIANCE WITH THE INSTRUCTIONS

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

This non-compliance may result in the following risks:

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

2.3. WARRANTY

The conditions of the warranty are specified in the General Sales Condition that has been delivered at the time of placing your order:



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 authorization from INOXPA.

The non-compliance of the prescribed indications in this manual means misuse of this gear on the technical side and the personal safety and this, exempt INOXPA of all responsibility in case of accidents and personal injuries and/or property damage. Also, excluded from the warranty all breakdowns caused by improper use of the gear.

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

3. Safety

3.1. WARNING SYMBOLS



Safety hazard for people in general and/or for equipment



Electric hazard

ATTENTION

Important instruction to prevent damage to the equipment and its functions

3.2. GENERAL SAFETY INSTRUCTIONS



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

3.2.1. During the installation

The [Technical Specifications](#) of [chapter 9](#) should always be observed.

The installation and use of the agitator should always be in accordance with applicable regulations regarding health and safety.



Before starting up the agitator, check that it is properly anchored and its shaft is perfectly aligned. Incorrect alignment and/or excessive stress during coupling can cause serious mechanical problems in the agitator.

Take all possible precautions when lifting the agitator. Always use properly attached slings when moving the agitator with a crane or other lifting device.

Keep the motor and the switchboard under control, particularly in areas where there is a risk of fire or explosion.



When cleaning, do not spray directly on the engine.

Do not disassemble the agitator until the switchboard has been disconnected. Remove the fuses and disconnect the power cable supplying the motor.

All electric work should be carried out by specialised personnel.

3.2.2. During operation



The [Technical Specifications](#) of [chapter 9](#) should always be observed. Under no circumstances can the specified limit values be exceeded.

Before starting up the agitator, remove all the tools used during the assembly.

Do not operate the agitator when the rotating parts are not equipped with their guards or are not properly assembled.



The agitator has rotating parts. Do not place hands or fingers in the agitator while it is operating. This may cause serious injuries.

Do not touch the parts of the agitator that are in contact with the fluid when in operation. When the agitator operates with hot fluids (temperatures above 50°C), there is a risk of skin burning. In such cases, collective-protection means (in this order or priority: separation, protective screen, heat-insulating material) or, in the absence of this, individual protection gear (gloves) must be used.



The agitator and its installation can generate sound levels above 85 dB(A) under unfavourable operating conditions. In such cases, the operators must use devices for protection against noise.

3.2.3. During maintenance



The [Technical Specifications](#) of [chapter 9](#) shall always be observed.

The agitator cannot operate without fluid. Standard agitators are not designed to work during the filling or emptying of tanks.

The maximum operating conditions of the agitator should not be exceeded. Nor should the operating parameters for which the agitator was initially designed be modified without written authorisations from INOXPA.



Do not leave loose parts on the floor.

Do not disassemble the agitator until the switchboard has been disconnected. Remove the fuses and disconnect the power cable supplying the motor.

All the electric work should be carried out by specialised personnel.

4. General Information

4.1. DESCRIPTION

The side entry agitator range relates to bottom side agitators with the agitator shaft fixed directly to the gearbox drive. It is attached to the tank by a stainless-steel flange and lantern. The shaft obturation is made using a mechanical seal.

All the parts in contact with the fluid are manufactured in stainless steel 1.4401 (AISI 316L).

The standard agitation element is a type-16 gamma impeller.

4.2. PRINCIPLE OF OPERATION

Side entry agitators are used for the homogenization of liquids stored in large volume tanks.

They are powered by means of a geared motor and are installed inclined in the lower part of the shell of the tank.

The rotation of the propeller creates a flow that pushes the product towards the bottom of the tank, making it rise to the surface of the liquid through the tank wall on the opposite side of the agitator. This effect is favoured if the closure has a dished head. Likewise, the agitator is installed off-centre with respect to the tank to favour a circular flow in the radial plane. In this way, a complete homogenization of the product is ensured.

4.3. APPLICATION

Lateral agitators are an economical solution for storage tanks in the food, pharmaceutical and cosmetic industries.

The most important application is the maintenance and homogenization in large volume tanks of low viscosity products such as wine, oil, milk, beer, alcohol, juices, soft drinks, etc.



Each agitator has performance limits. The agitator was selected for a given set of mixing conditions when the order was placed. INOXPA shall not be held responsible for any damage that might be suffered or malfunctioning of the equipment if the information provided by the buyer is incomplete or incorrect. (e.g. nature of the fluids or installation details).

5. Installation

5.1. RECEPTION OF THE AGITATOR



INOXPA is not liable for any deterioration of the material caused by its transport or unpacking. Visually check that the packaging has not been damaged.



If the agitator is supplied without a drive or other element, the purchaser shall be responsible for its assembly, installation, start-up and operation.

When receiving the agitator, check the packaging and its content to ensure that it matches the delivery note. INOXPA packs the agitators in their fully assembled form or disassembled on a case-by-case basis. Ensure that the agitator has not been damaged in any way. If it is not in good condition and/or any parts are missing, the carrier must submit a report as soon as possible.

The following documentation is included with the agitator:

- shipping documents,
- quick installation guide or instruction manual,
- instructions and servicing manual for the gear-motor when the agitator is supplied with a motor by INOXPA.

5.2. IDENTIFICATION OF THE AGITATOR

The agitator is identified using a rating plate fixed onto the motor. The type of agitator and the serial number appear on the nameplate.



50.32.0007

5.3. TRANSPORT AND STORAGE

ATTENTION



According to the model, the agitators are too heavy to be stored or installed manually. Use an appropriate mode of transport. Do not handle the agitator by the shaft as this may become deformed.

ATTENTION

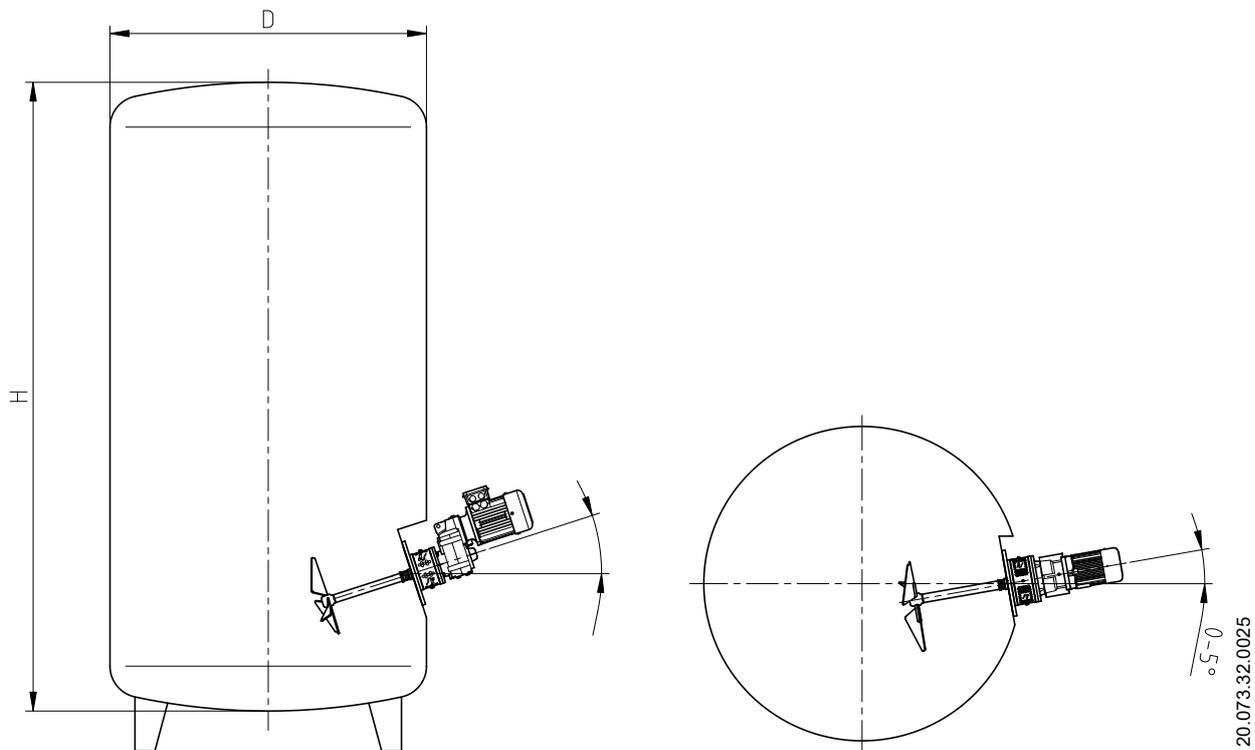


Take all possible precautions when lifting the agitator. Always use properly attached slings when moving the agitator with a crane or other lifting device.

If the agitator is not to be installed immediately, it must be stored in an appropriate place. The shaft must be stored in a horizontal position and placed on wooden supports or a similar material. In this position, the shaft will not become deformed but it must not be subject to any type of load.

5.4. LOCATION

Place the agitator in such a way as to facilitate inspections and checks. Leave enough room around the agitator for service, disassembly and maintenance operations. It is very important to be able to access the electric connection device of the agitator, even when in operation.



ANGLES OF ATTACK									
H/D Ratio	0,5	1	1,5	2	2,5	3	4	5	
α°	0°	8°	14°	18°	25°	30°	40°	50°	
Max visc (cPS)	3000	3000	1500	1500	500	300	150	100	
BOTTOMS		o	o	o	o	-	-	-	-
		o	o	o	o	o	o	o	o
		o	o	o	o	o	o	o	o

5.5. ELECTRICAL INSTALLATION

Before connecting the electrical motor to the mains, check local regulations on electrical safety as well as the applicable standards.

Check the instructions manual of the manufacturer of the motor for information on how to connect it to the mains.



Take the connection of the electrical motors must be performed by qualified personnel.

Take the appropriate measures to prevent any fault.

The motor must be provided with devices for protection against power overload and short-circuits.

The agitator cannot be used in areas where there is a risk of fire or explosion when this has not been specified in the order.

5.6. ASSEMBLY

To locate and fix the agitator in the support flange of the tank, the propeller must be removed from the shaft. Once the base of the agitator is placed on the supporting flange, the fixing nuts and screws will be assembled in their corresponding holes, without being tightened. When this operation has been carried out, the agitator must be levelled using the following method:

1. place a spirit level against the shaft.
2. check 4 points at 90° to each other around the circumference of the shaft and at the same height.
3. once the shaft is level, firmly tighten the fixing nuts and screws. Finally, the propeller is mounted on the end of the shaft. Be careful when assembling the shaft not to hit or strain it so as to avoid it being bent.

ATTENTION



Force should never be applied to the end of the agitator shaft, as it can easily suffer permanent damage.

ATTENTION



Check the alignment of the agitator shaft with the half shaft once its assembly is completed.

6. Start-up



The start-up of the agitator can be carried out provided the instructions indicated in the chapter [5. Installation](#).

- Check that the power supply matches the rating indicated on the motor plate.
- Check the alignment of the agitator shaft.
- Check the level of fluid in the tank. When not specified in the order, the agitator cannot be operated during the filling or emptying of the tank.
- All the guards must be in place.
- Start up the agitator.
- Check that the direction of rotation of the propellers is correct (it must rotate clockwise when seen from the drive side). See the next figure:



Follow the direction of rotation of the agitation components as indicated by the arrow attached to the engine. An incorrect direction of rotations results in a loss of agitation performance.

- Check the electrical power draw of the motor.

ATTENTION

Do not modify the operating parameters for which the agitator was initially designed without written authorisation from INOXPA (risk of damage and user hazard).



Follow the instructions for use and the safety requirements described in the instructions manual for the tank in which the agitator is mounted.

Mechanical risks (e.g. drag, shear, cutting, impact, flattening and pinching). If the agitation element is accessible from the top or the tank inspections hatch, then the user will be exposed to the above-mentioned risks.

The tank must be fitted with protective devices and safety equipment. Consult the manufacturer's instructions manual.

ATTENTION



Introducing an object or solid raw material may cause the agitation component and other mechanical parts to break and compromise its safety or warranty.

7. Troubleshooting

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

Motor overload																									
↓	Insufficient agitation																								
↓	Vibrations and noise																								
↓	Leaks																								
↓	<table border="1"> <thead> <tr> <th>PROBABLE CAUSES</th> <th>SOLUTIONS</th> </tr> </thead> <tbody> <tr> <td>• Viscosity of the liquid too high</td> <td>Reduce the viscosity, e.g. by heating the liquid</td> </tr> <tr> <td>• High density</td> <td>Increase motor power</td> </tr> <tr> <td>• Tank too big for the chosen agitator</td> <td>Check with the technical department</td> </tr> <tr> <td>• Wrong direction of rotation</td> <td>Change direction of rotation</td> </tr> <tr> <td>• Agitator speed too low</td> <td>Increase the speed</td> </tr> <tr> <td>• Liquid level insufficient or none</td> <td>Check liquid level in the tank</td> </tr> <tr> <td>• Shaft bended</td> <td>Replace the shaft</td> </tr> <tr> <td>• Critical speed</td> <td>Check with the technical department</td> </tr> <tr> <td>• Worn bearings</td> <td>Replace the bearings agitator</td> </tr> <tr> <td>• Mechanical or lip seal worn or damaged</td> <td>If the seal is worn, replace it. If the seal is damaged, consult the technical department.</td> </tr> <tr> <td>• Damaged O-ring</td> <td>Check with the technical department</td> </tr> </tbody> </table>	PROBABLE CAUSES	SOLUTIONS	• Viscosity of the liquid too high	Reduce the viscosity, e.g. by heating the liquid	• High density	Increase motor power	• Tank too big for the chosen agitator	Check with the technical department	• Wrong direction of rotation	Change direction of rotation	• Agitator speed too low	Increase the speed	• Liquid level insufficient or none	Check liquid level in the tank	• Shaft bended	Replace the shaft	• Critical speed	Check with the technical department	• Worn bearings	Replace the bearings agitator	• Mechanical or lip seal worn or damaged	If the seal is worn, replace it. If the seal is damaged, consult the technical department.	• Damaged O-ring	Check with the technical department
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If the problems persist stop using the agitator immediately. Contact the agitator manufacturer or the representative.

8. Maintenance

8.1. GENERAL CONSIDERATIONS

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

Carefully read chapter 9. [Technical Specifications](#).



Maintenance work can only be carried out by qualified personnel that are trained and equipped with the necessary resources to carrying out this work.

Before beginning maintenance work, ensure that the electric motor is disconnected and that the tank is empty.

All parts or materials that are replaced must be properly disposed of/recycled in accordance with the current directives applicable in each area.



Before beginning maintenance work, ensure that the agitator is disconnected.



The symbol indicates that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

8.2. MAINTENANCE

- Inspect the agitator regularly.
- Do not fail to keep the agitator clean.
- Check the state of the motor or the gear motor.
- Check the state of the bearings.
- Check the sealing: seal and/or lip seal.

Motor or gear motor maintenance shall be carried out in accordance with the manufacturer's instructions, see the instructions manual.

8.3. LUBRICATION

Follow the manufacturer's indications when lubricating the geared motor's bearings.

8.4. SPARE PARTS

To order spare parts it is necessary to indicate the type and serial number included on the agitator's characteristics plate, as well as the position and description of the part as found in chapter 9. [Technical Specifications](#).

8.5. CONSERVATION

If the agitator is out of service for a considerable period of time, clean and treat the parts with VG46 mineral oil. The shaft must be stored in the horizontal position and on wooden supports or on supports of a similar material.

8.6. CLEANING



The use of aggressive cleaning products such as caustic soda and nitric acid may give raise to skin burns.

Use rubber gloves during cleaning procedures.

Always use protective goggles.

8.6.1. Automatic CIP (clean-in-place)

If the agitator is installed in a system with a CIP process its disassembly will not be required.

If the automatic cleaning process is not provided, proceed to disassemble the agitator as indicated in the chapter [8.7. Disassembly and assembly of the agitator](#).

Cleaning solutions for CIP processes:

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

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

1 kg NaOH + 100 l H₂O = cleaning solution

or

2,2 l NaOH at 33% + 100 l H₂O = cleaning solution

b. Acid solution: 0,5% by weight of nitric acid (HNO₃) at 70°C (150°F)

0,7 l HNO₃ at 53% + 100 l H₂O = cleaning solution

ATTENTION



Check the concentration of the cleaning solutions. Incorrect concentrations may lead to the deterioration of the agitator.

To remove any traces of cleaning products ALWAYS perform a final rinse with clean water at the end of the cleaning process.

8.6.2. Automatic SIP (sterilization-in-place)

The process of sterilization with steam is applied to all the equipment including the agitator.



Do NOT start the agitator during the process of sterilization with steam.

The parts/materials suffer no damage if the indications specified in this manual are observed.

No cold liquid touches the agitator till the temperature of the agitator is lower than 60°C (140°F).

Maximum conditions during SIP process with steam or overheated water:

- a) Maximum temperature: 140°C / 284°F
- b) Maximum time: 30 min
- c) Cooling: sterile air or inert gas
- d) Materials: EPDM/PTFE (recommended)
FPM (not recommended)

8.7. SHUT OF SYSTEM OPERATION



The disassembly and assembly of the agitators should only be carried out by qualified personnel using only appropriate tools. Ensure that staff read these instructions manual attentively, particularly the instructions that relate to their work.

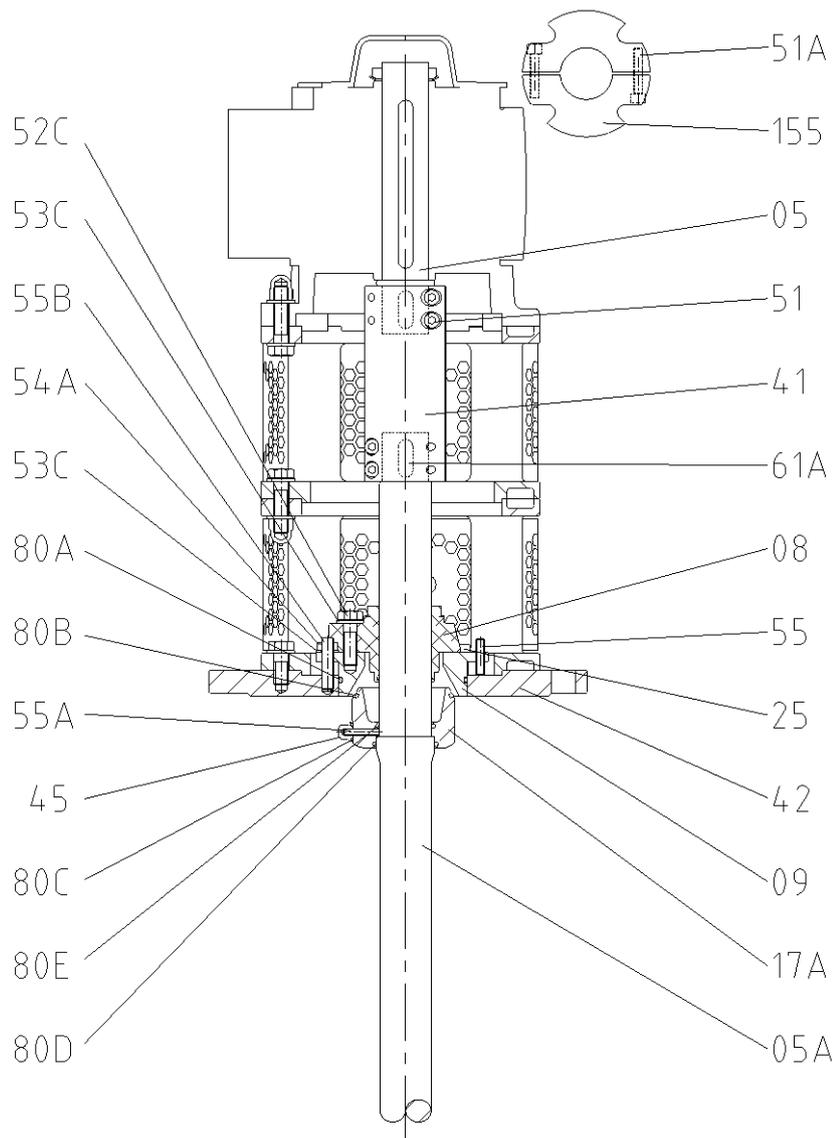


- Stop the motor from starting up when carrying out assembly and disassembly work on the agitator.
- Place the agitator switch in the “off” position.
- Lock out the electrical switchboard or place a warning sign.
- Remove the fuses and take them to the workplace.

8.7.1. Removal of damaged mechanical seal

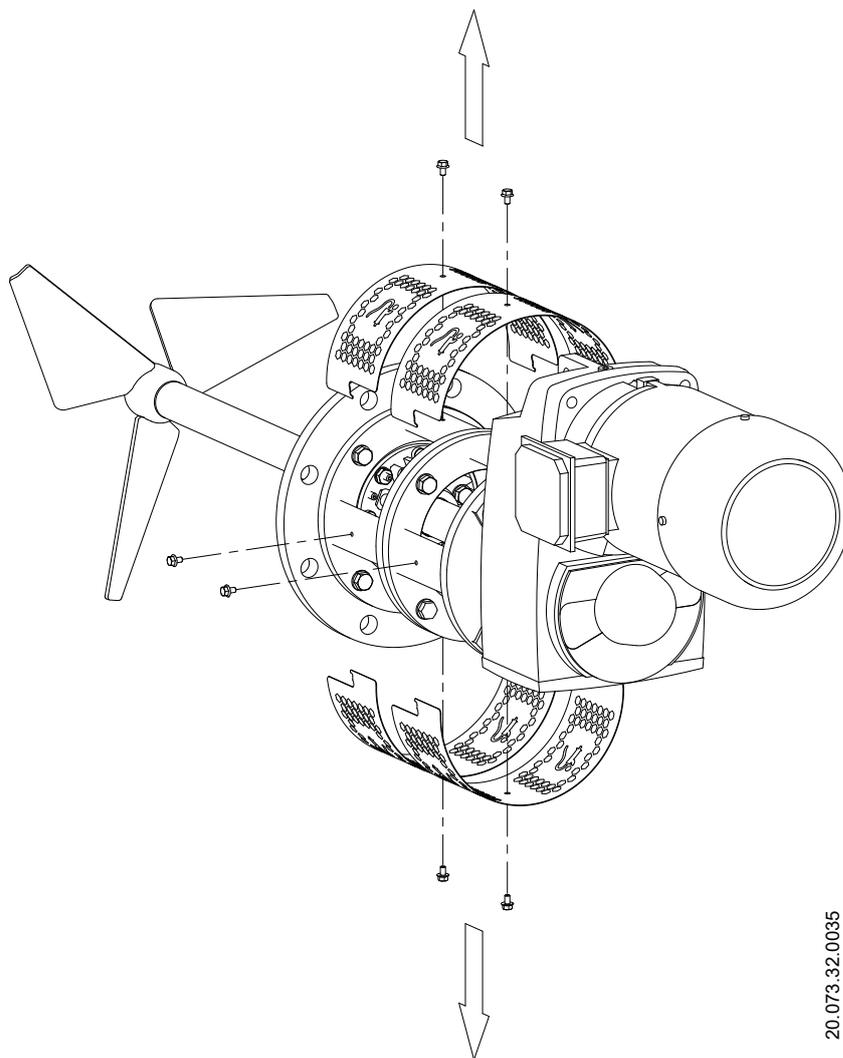
If your SMX agitator has the Shut-Off option, In the case of a mechanical seal failure, you can change de mechanical seal with the tank full of liquid and without disassembling the agitator using procedure detailed in the following pages.

First retrieve the mechanical seal’s distancing element (4 metal plates with screws for SMX-2 or red plastic strip for the rest) and the shaft fixing tool (155 + 51A). These should be removed at startup and stored securely for when the need arises.



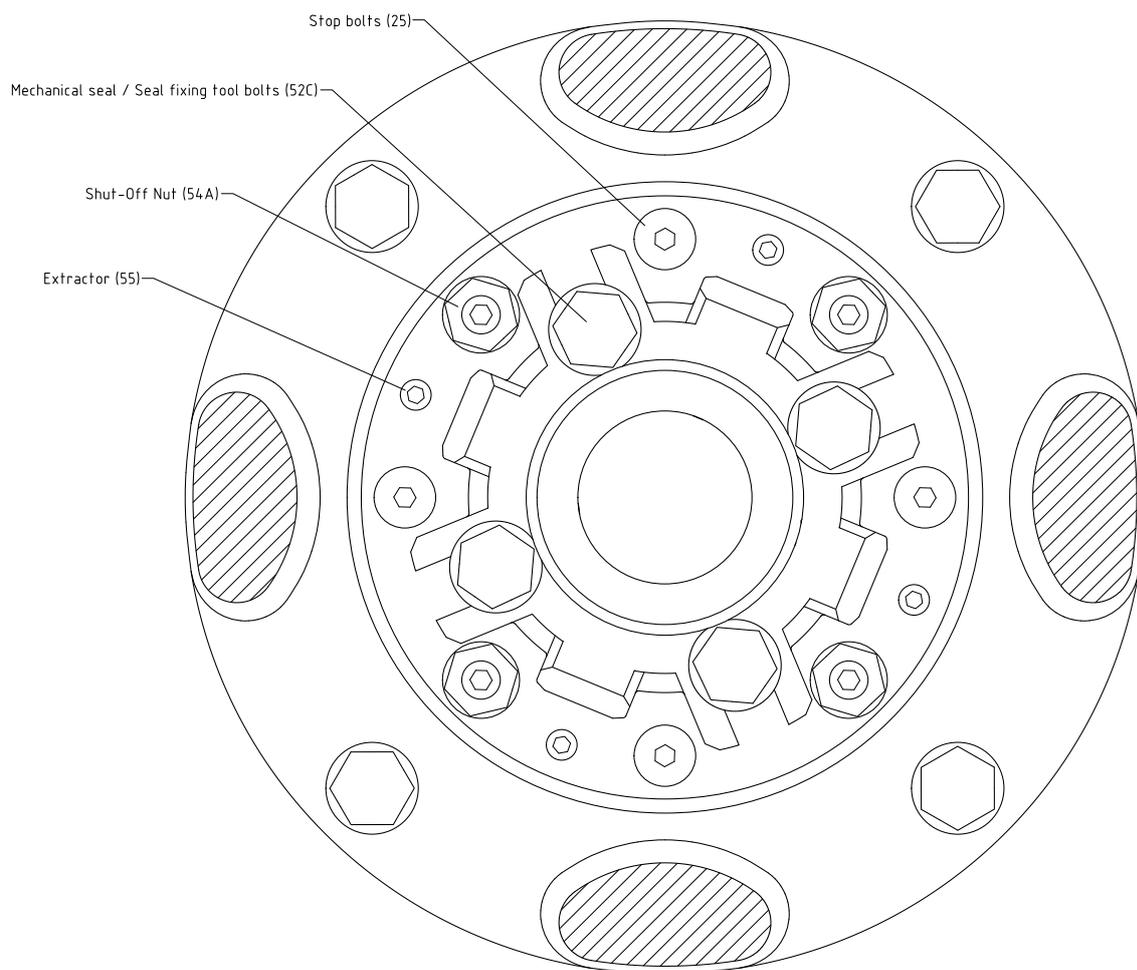
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1. Remove the four lantern protectors in order to have easy access to the mechanical seal and shaft



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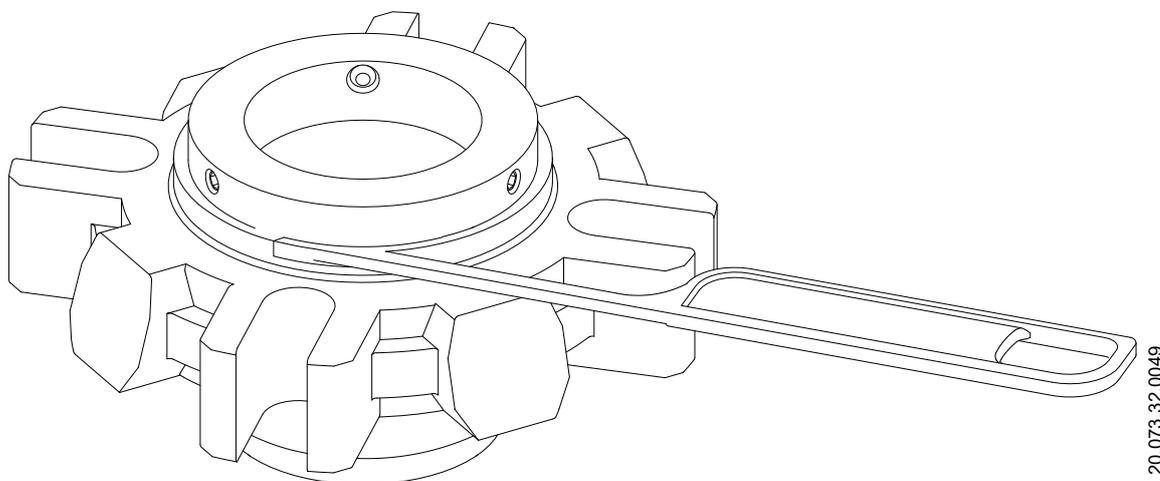
2. The shut-off mechanism consists of the following elements for operation:



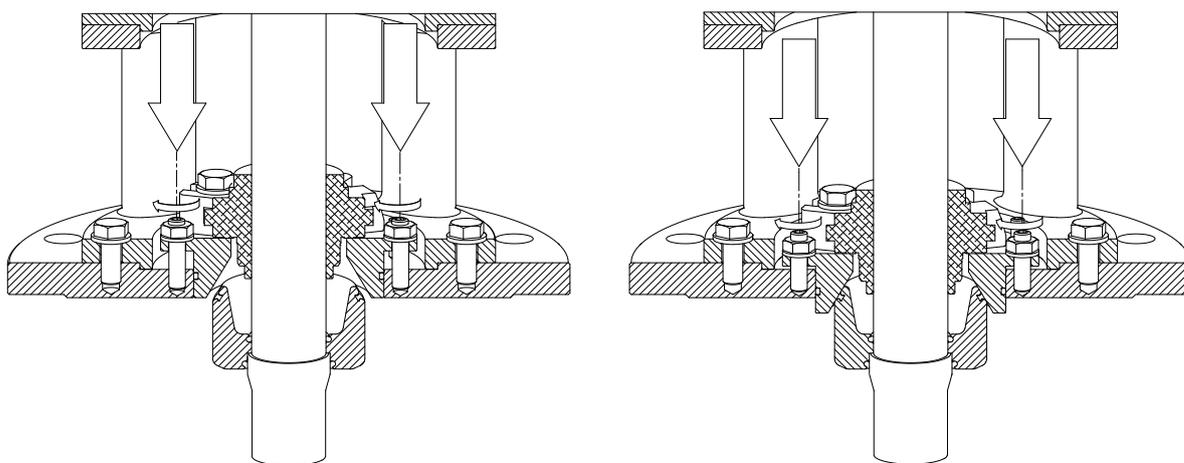
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- Stop bolts: Not to be unscrewed, they provide the axial position of the mechanical seal at working conditions.
- Shut off Nut: Tightening these bolts will close the shut-off system, allowing the disassembly of the mechanical seal.
- Extractor: These set screws are used to open the shut-off system once the mechanical seal has been replaced in order to continue using the agitator.
- Mechanical seal bolts: These hexagonal screws are used to fix the mechanical seal in place, as well as the shaft fixing tool after the seal is removed.

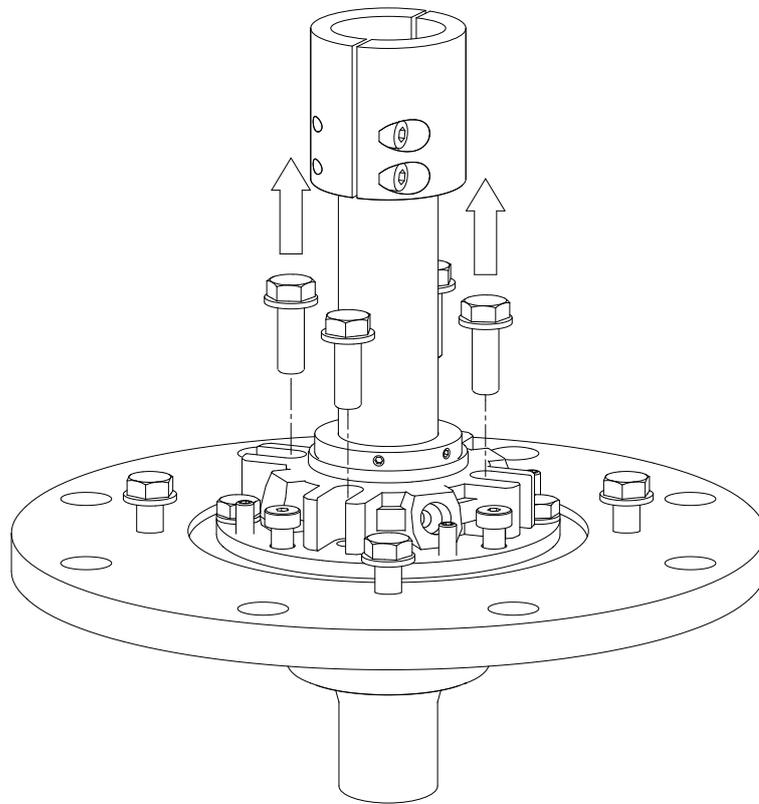
3. To start the shut-off procedure, unscrew the extractor set screws so the shut-off flange can be pushed towards the shaft cap.
4. Insert the red strip in order to maintain the axial position of the mechanical seal during the procedure. Then loosen the 3 setscrews on the mechanical seal's sleeve.



5. Tighten the shut-off nuts 2-3 turns at time and in a cross pattern to lower the shut-off flange until there is clear resistance in all 4 nuts.

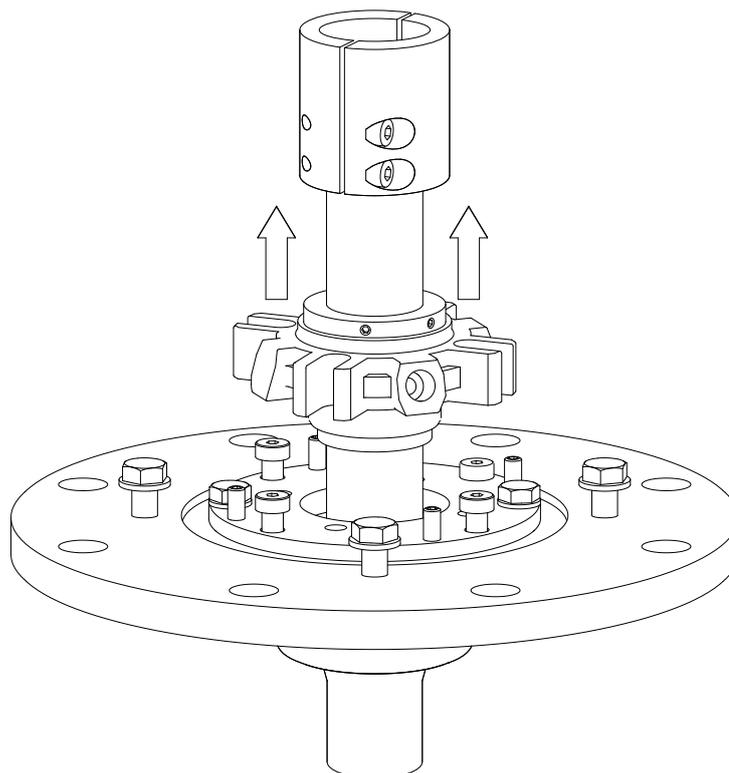


6. Carefully remove the 4 bolts fixing the mechanical seal to the flange.
 - A small amount of product is trapped between the shut-off components and will be released when removing the mechanical seal, but if there is a continuous flow, the shut-off procedure was not done correctly. In this case tighten the mechanical seal again and review previous steps.



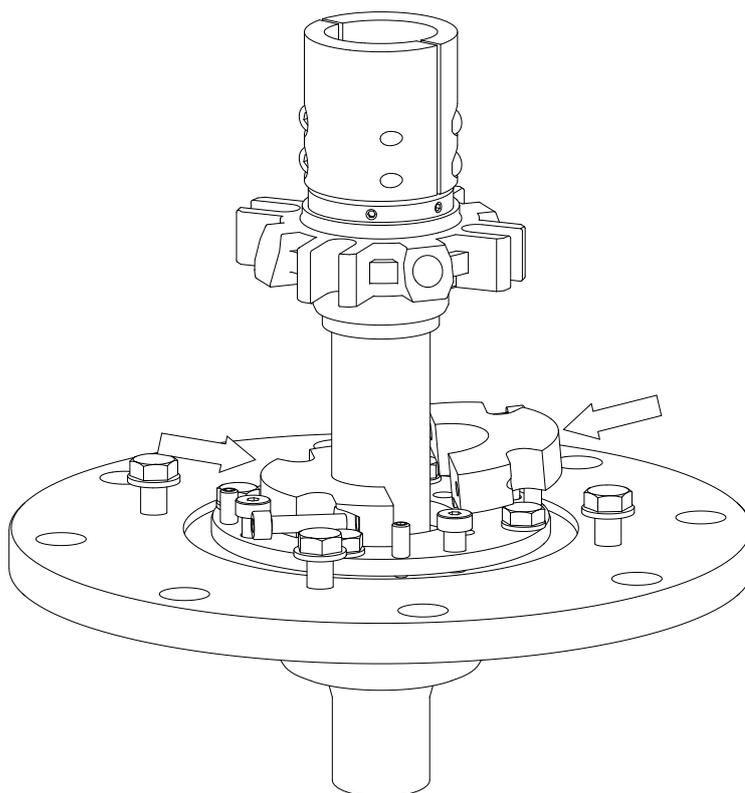
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7. Slide the mechanical seal along the shaft away from the flange and tighten one of the set screws to fix the seal next to the shaft coupling and allow space for the following steps.



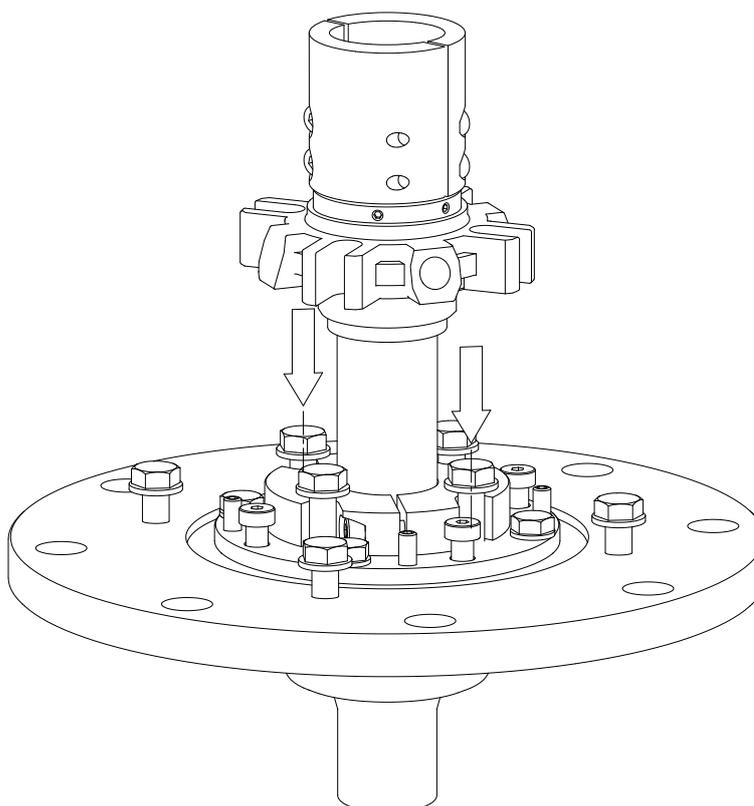
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8. Place the shaft fixing tool in the position of the mechanical seal and insert the 2 screws in the fixing tool, screwing them in without tightening



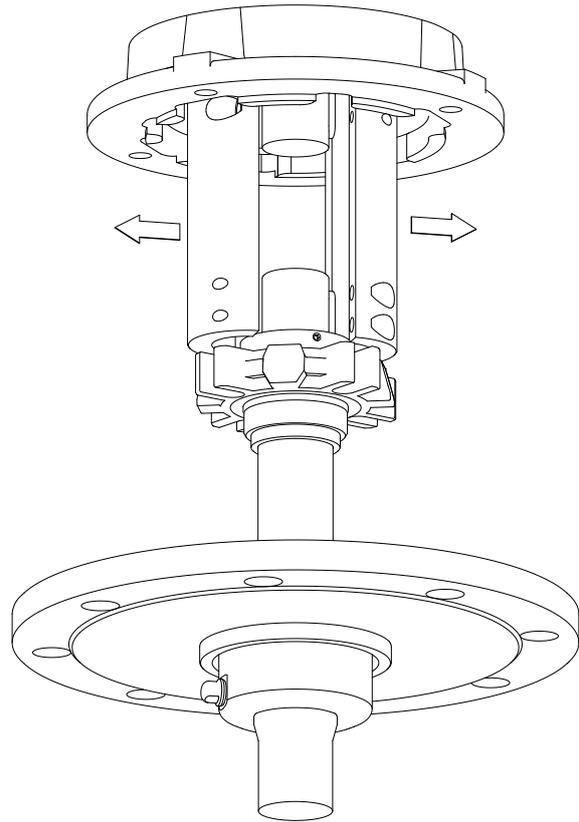
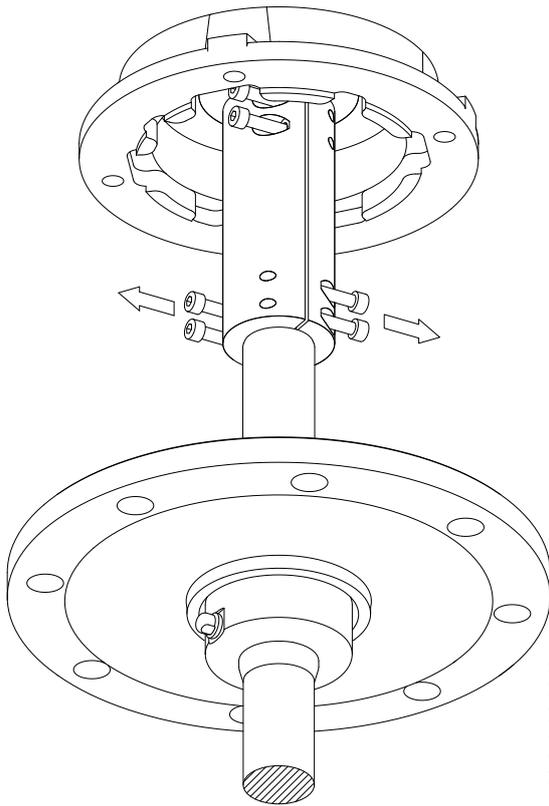
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9. Screw the fixing bolts in and slightly tighten them so that the fixing tool is flat against the flange. Then, tighten the Allen screws and after that, tighten the hexagonal screws to completely fix the tool to the flange. This will fix the shaft to the agitator flange so the coupling can be removed so it is important to follow the instructions correctly.

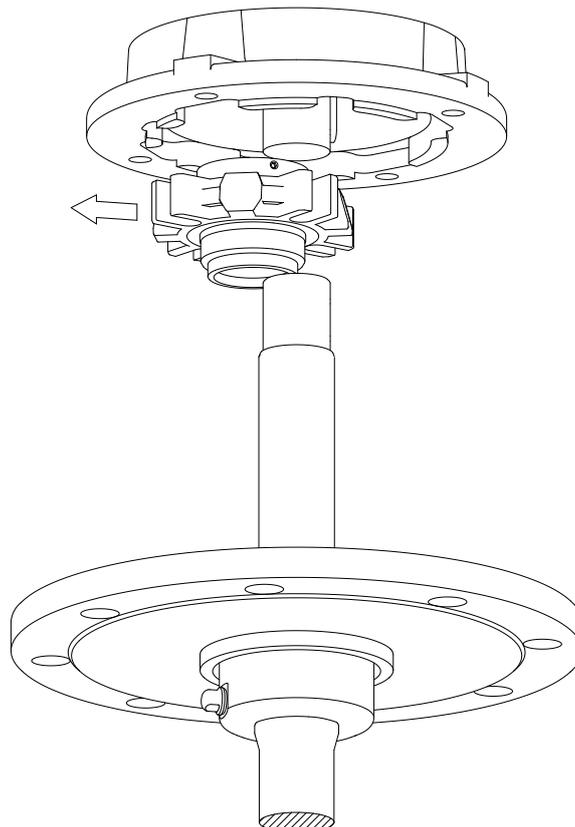


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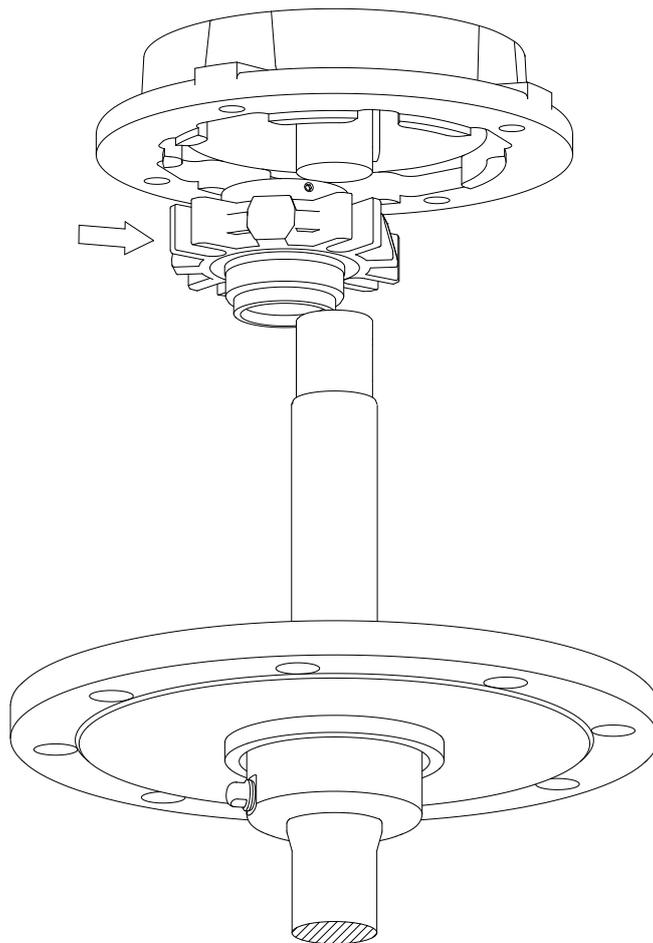
10. Once the bottom shaft is properly fixed, the shaft coupling can be removed. First remove the Allen keys and use a flat screwdriver or similar tool to pry open both halves of the coupling.



11. Removing the coupling leaves an open space that allows the extraction of the mechanical seal. Extract the lower shaft key so that the mechanical seal can slide out of the shaft. Loosen the set screws on the seal and remove it from the shaft.

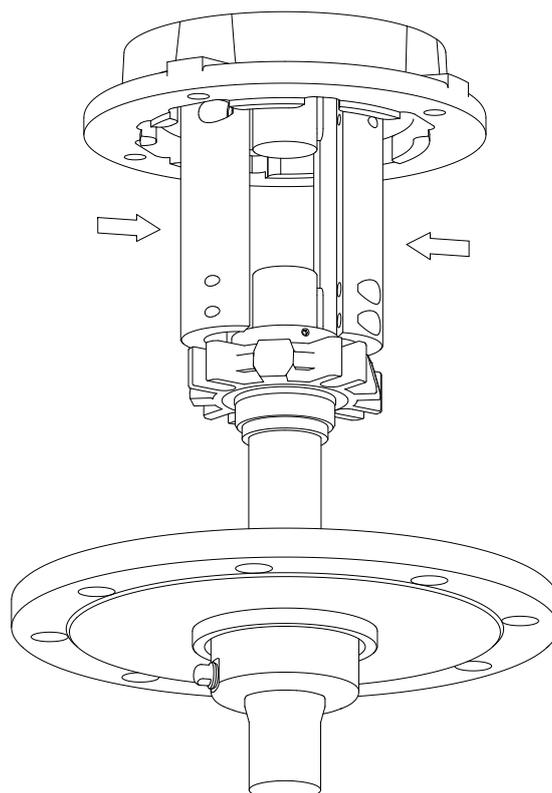


12. Insert the new mechanical seal in the shaft and slide it to a position that will allow the removal of the fixing tool and reinstalling the coupling.



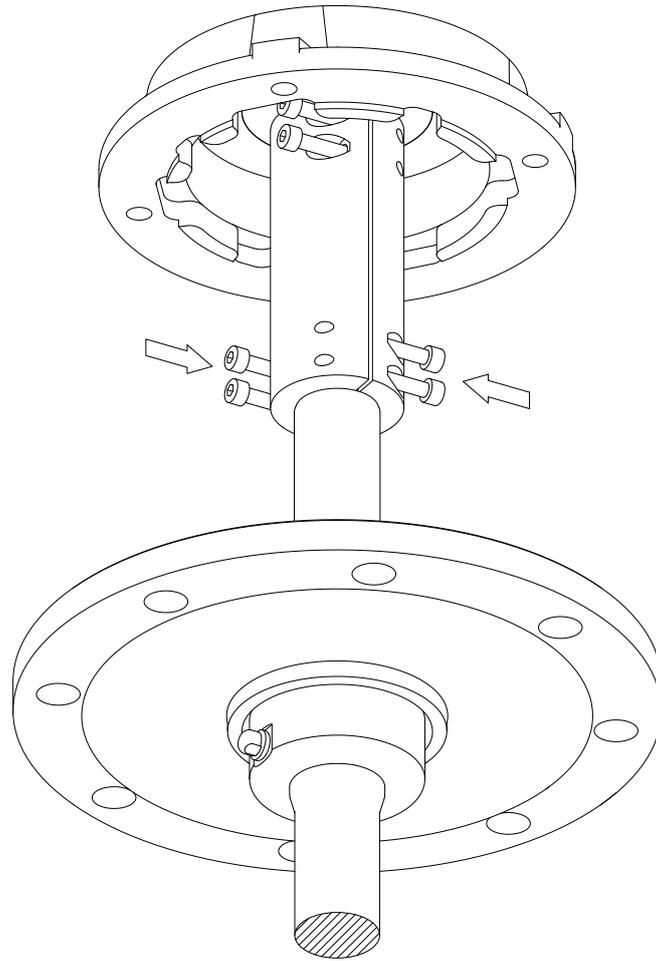
20.073.32.0043

13. Insert the key in the lower shaft and reinstall the shaft coupling making sure the keys are aligned and correctly inserted in the coupling. The coupling faces should be parallel to each other before starting to tighten.



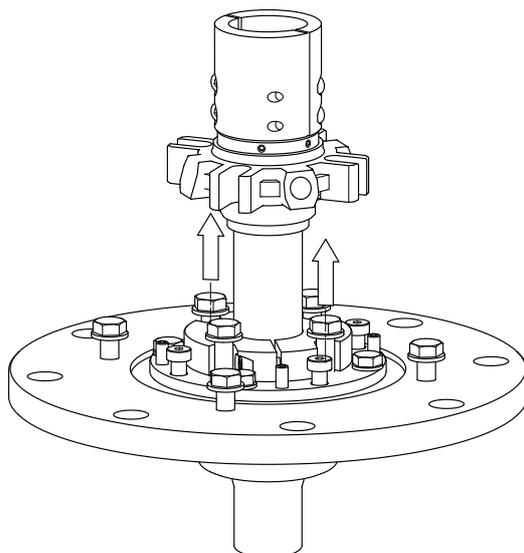
20.073.32.0045

Place the Allen bolts in the coupling and tighten carefully in a cross pattern maintaining the coupling faces parallel to each other. Separation between the faces when tightened should be around 2mm.

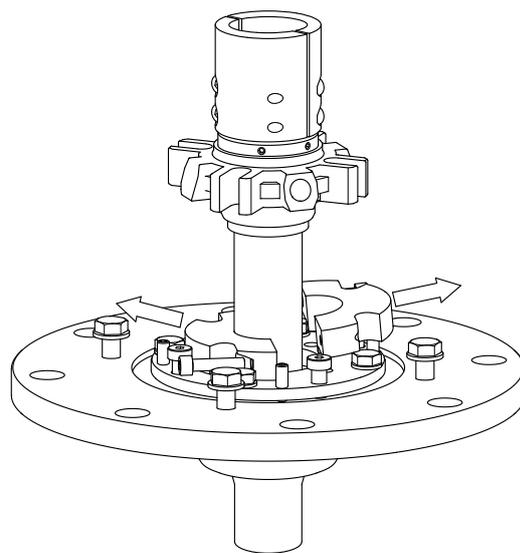


20.073.32.0052

14. Once the coupling is correctly fixed, remove the shaft fixing tool by unscrewing the 2 Allens and 4 hex bolts and using a flat screwdriver to pry open the 2 parts of the tool.

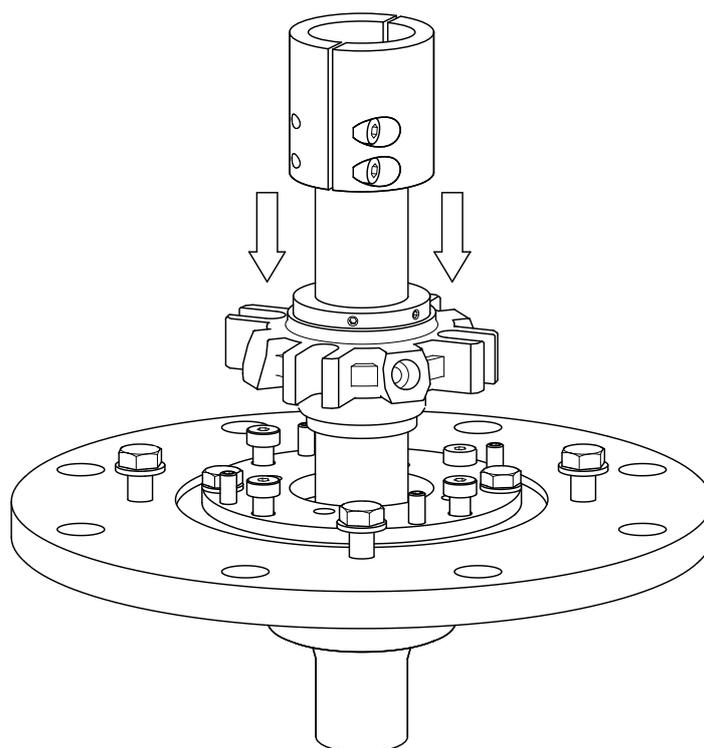


20.073.32.0056



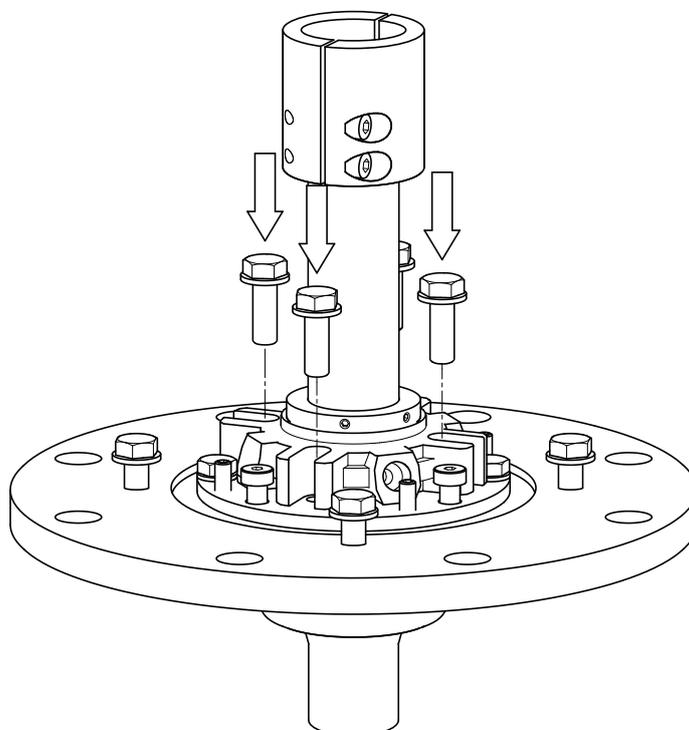
20.073.32.0055

15. Install the new mechanical seal in place, preferably with the plastic strip insertion point oriented upwards for ease of access.



20.073.32.0058

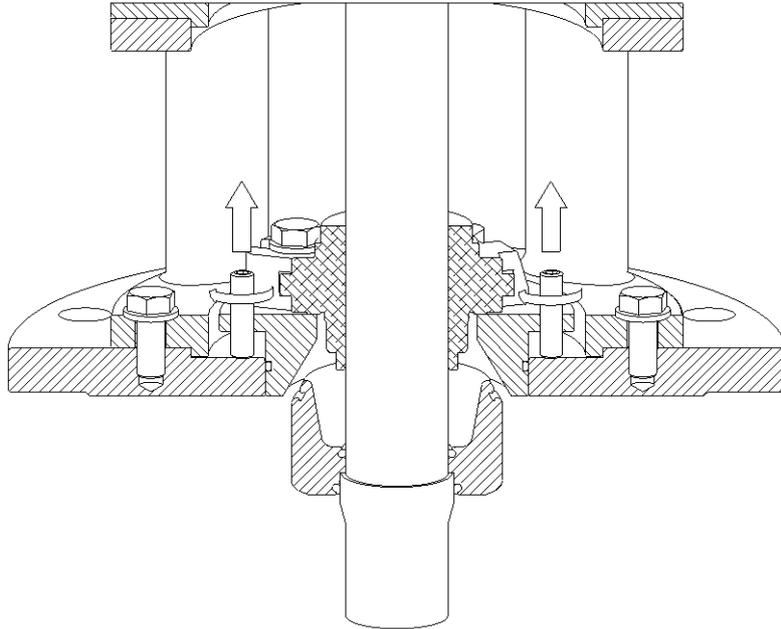
16. Tighten the 4 hex bolts but leave the set screws loose.



20.073.32.0057

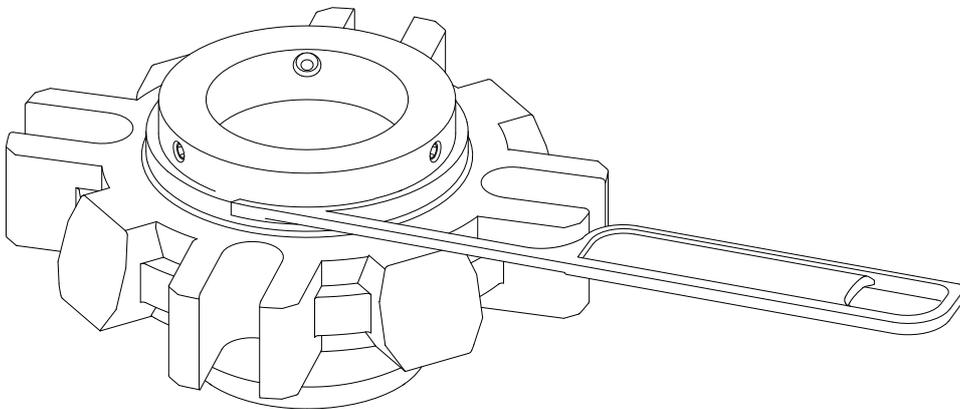
17. Loosen the Shut-off nuts so that the shut-off flange can be opened to operating position. Use the set screw extractors tightening 2 or three turns at a time in a cross pattern to pull the flange away until it contacts the stop bolts.

- If the pressure in the tank is high enough, it will push out the flange when loosening the nuts.
- Once the flange is in the open position, tighten the set screws so that the flange sits firmly against the stop nuts. Then tighten the shut off nuts against the flange to provide additional stability.



20.073.32.0054

18. Tighten the mechanical seal set screws and remove the plastic strip or metal tabs. The agitator is now ready to operate.



20.073.32.0049

8.8. DISASSEMBLY AND ASSEMBLY OF THE AGITATOR



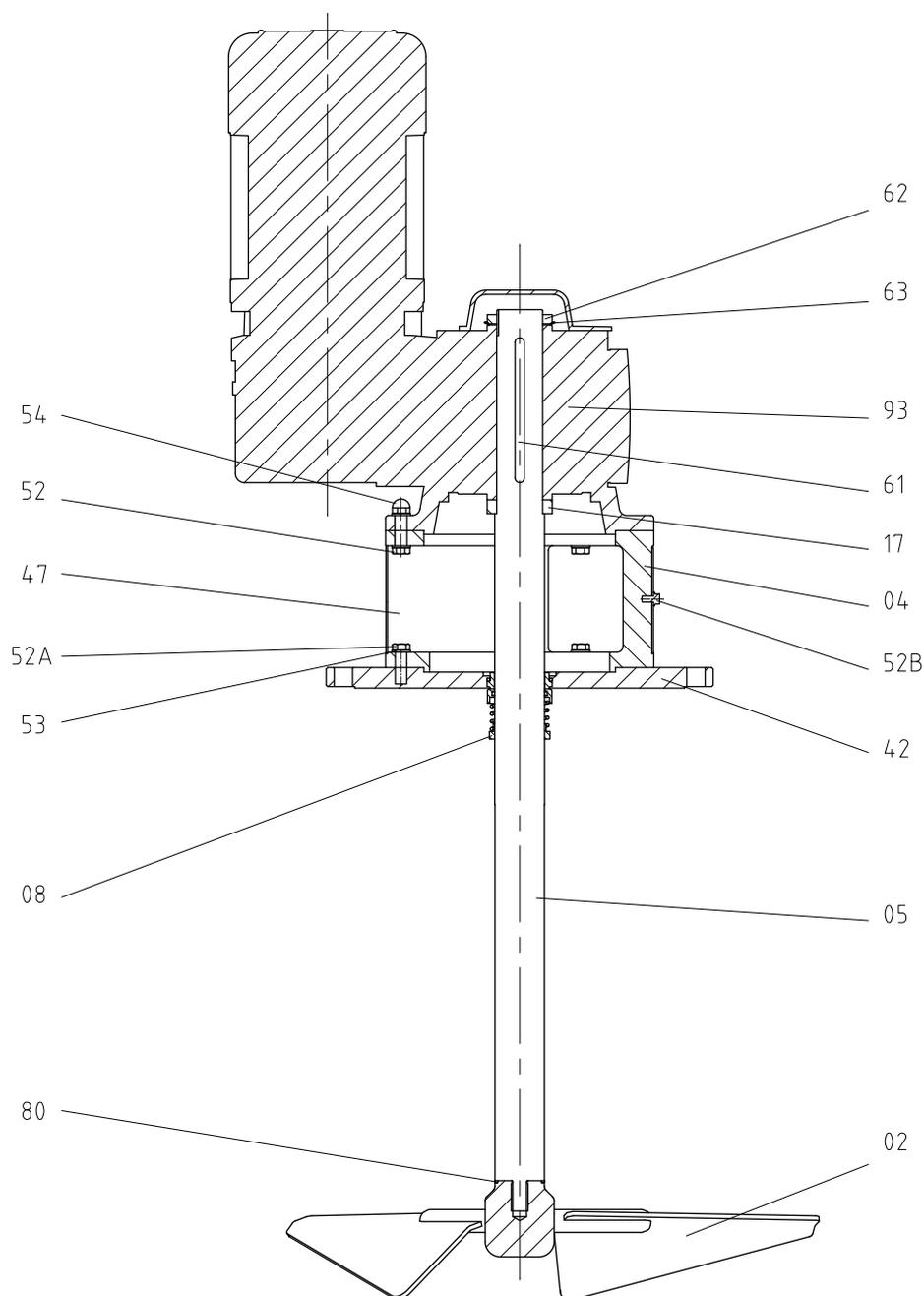
The disassembly and assembly of the agitators should only be carried out by qualified personnel using only appropriate tools. Ensure that staff read these instructions manual attentively, particularly the instructions that relate to their work.



Stop the motor from starting up when carrying out assembly and disassembly work on the agitator.
Place the agitator switch in the “off” position.
Lock out the electrical switchboard or place a warning sign.
Remove the fuses and take them to the workplace.

8.8.1. Disassembly of the agitator

Once the motors have been disconnected, disassembly work on the agitator may begin.
Remove the cover of the agitator.

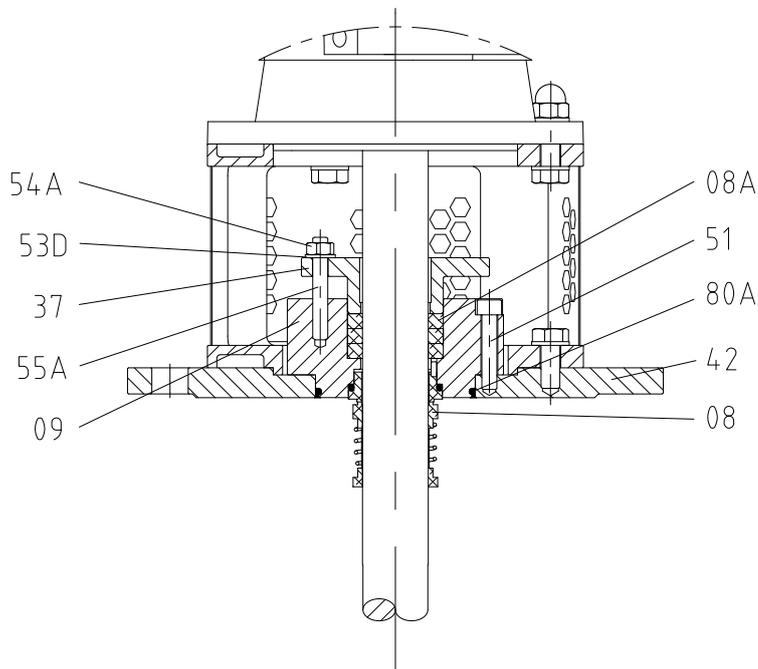


20.073.32.0004

For agitators with safety gland packing:

6. Remove gland packing press

- Remove nuts (54A) and washers (53D).
- Slide the press (37) out of the seal support (09).
- Remove the gland packing string (08A).
- Disassemble the mechanical seal /gland packing support (09) by removing the screws (51).

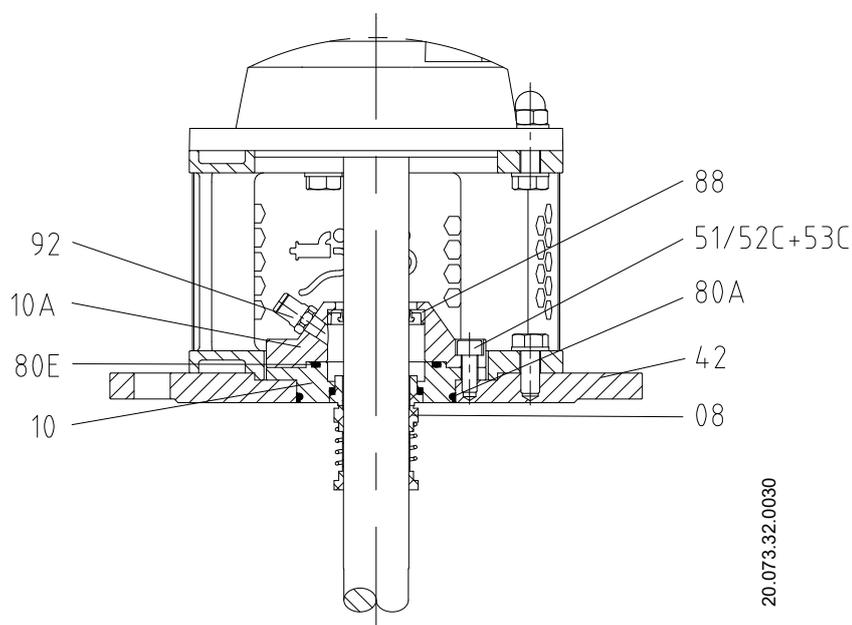


20.073.32.0029

For agitators with quenched seal:

7. Remove gland packing press

- Remove screws (51/52C) and washers (53C).
- Disassemble the quench seal cover (10A).
- Extract the used seal (88)
- Disassemble the mechanical seal support (09).

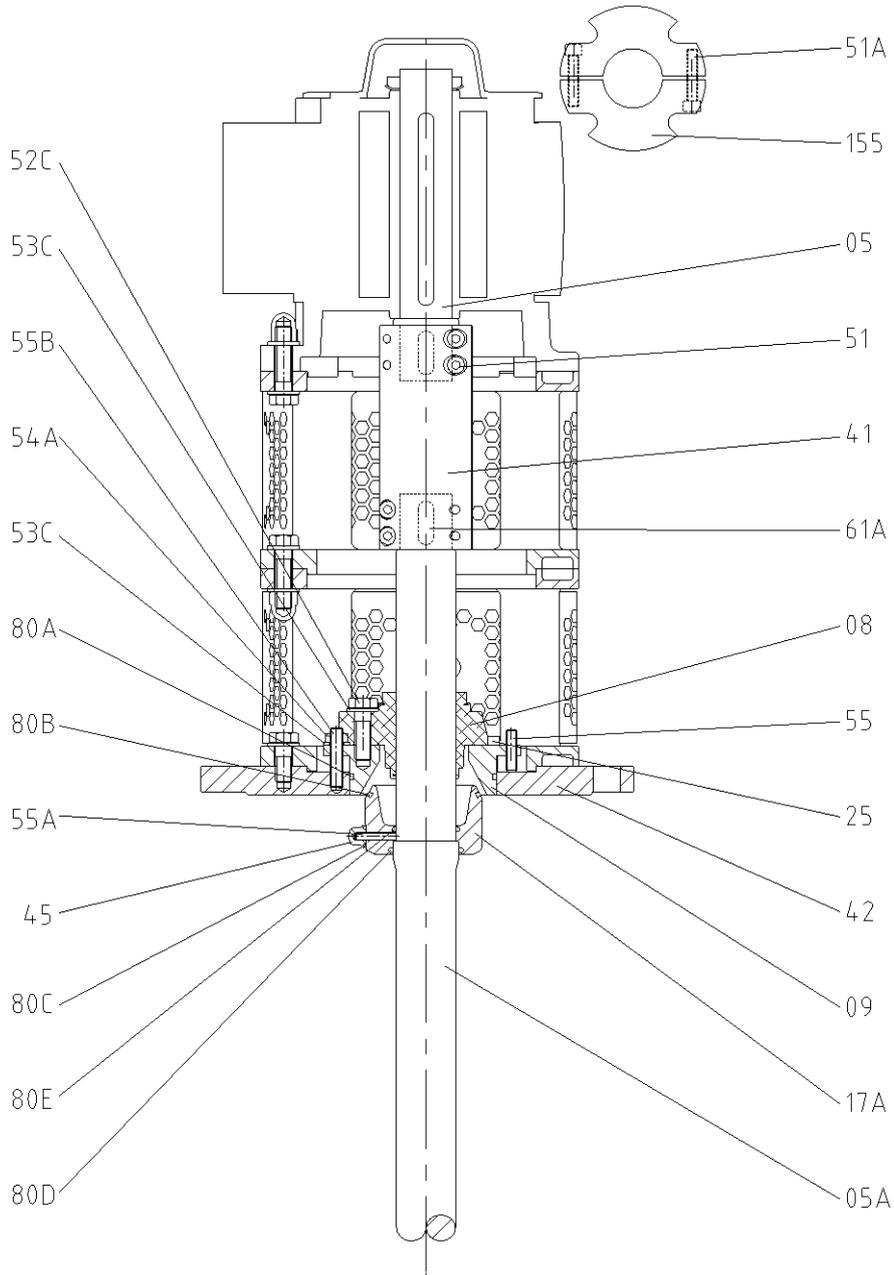


20.073.32.0030

8.8.2. Disassembly of the agitator with Shut-off option

1. Remove the impeller and remove the agitator from tank

- Remove impeller (02) and impeller O-ring (80) from inside the tank by unscrewing it counterclockwise. If necessary, tap the impeller blades with a rubber mallet to loosen it.
- Remove the agitator from the tank flange using a crane or other lifting equipment. Handle with care and avoid damaging the mechanical seal during the extraction.
- Disassemble the shaft cover from the drive removing the 4 screws.
- Remove the lantern protectors (47) by unscrewing the screws.



20.073.32.0050

2. Remove the mechanical seal and shaft

- Loosen the mechanical seal set screws and remove the hex screws (52C) and washers (53C)
- Slide the mechanical seal (08) away from the base plate (42).
- Remove the shaft coupling (41) by loosening the 8 Allen screws (51) from the shaft coupling giving enough space to extract the lower shaft (05A).
- Once the bottom shaft is out of the coupling, remove the key (61A) and slide the mechanical seal (08) out of the shaft before removing the shaft (05A) out through the mechanical seal flange (09).
- Remove hygienic nut (45) and O-ring (80C) to access and remove the set-screw (55A) fixing the shut-off cap (17A). Slide the Shut-Off cap (17A) and O-rings (80D) and (80E).
- Remove safety nut (62) and washer (63) from the upper shaft (05) and then slide the shaft out of the drive (93).

3. Remove the Drive and lanterns from the base plate

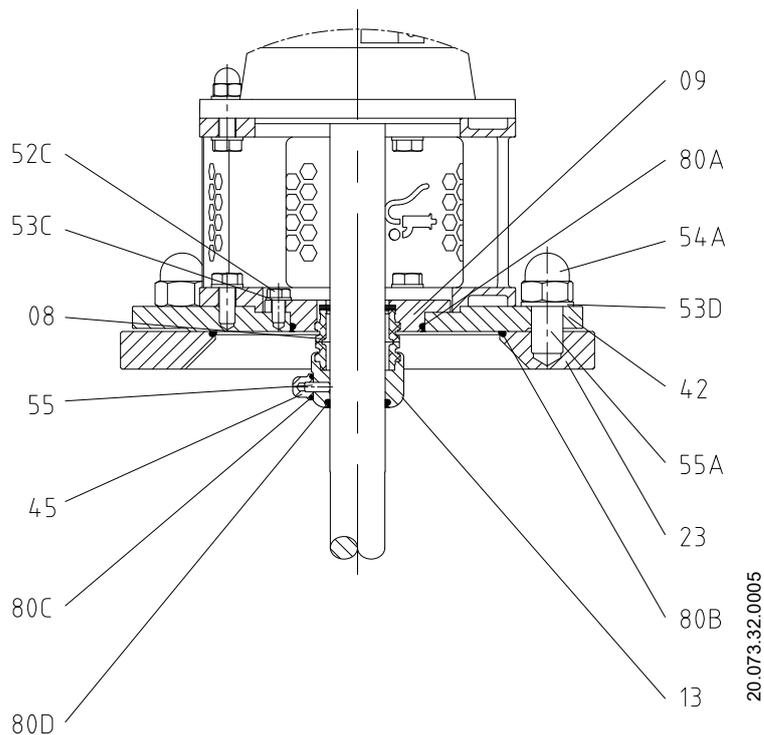
- Unscrew the drive's nuts (54), screws (52) and washers (53) and remove the drive (93) from the lantern (04). Repeat to remove the top lantern from the bottom lantern.
- Remove hex screw (52A) and washer (53) and separate the bottom lantern (04) from the base plate (42).

4. Disassemble the mechanical seal support flange

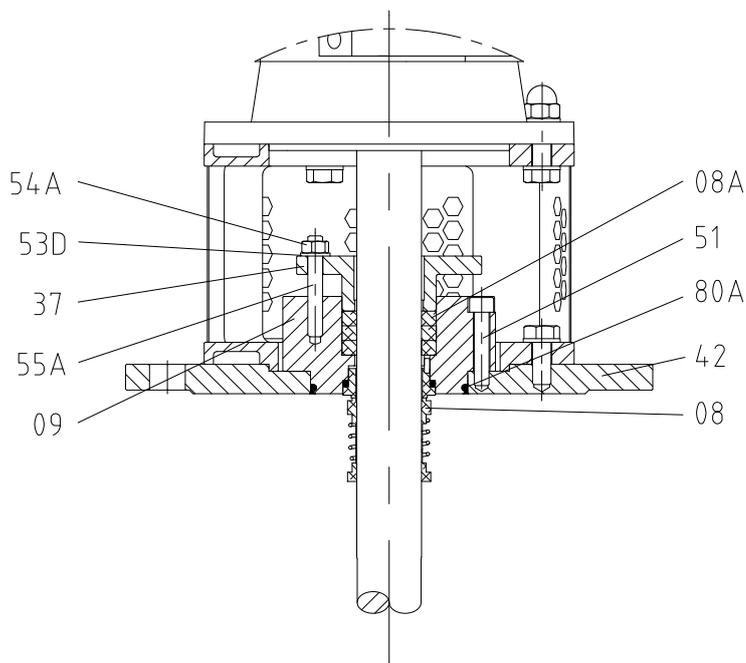
- Unscrew the stop screws (25).
- Remove the shut-off nuts (54A).
- Tighten the extractor set screws (55) until the mechanical seal support flange (09) and O-ring (80A) are out of the base plate (42).

For agitators with hygienic mechanical seal:

- Place the O-rings (80A) on the seal cover (09) and insert in position on the base plate (42).
- Screw screws (52C) and washers (53C) to fix the cover to the base plate.

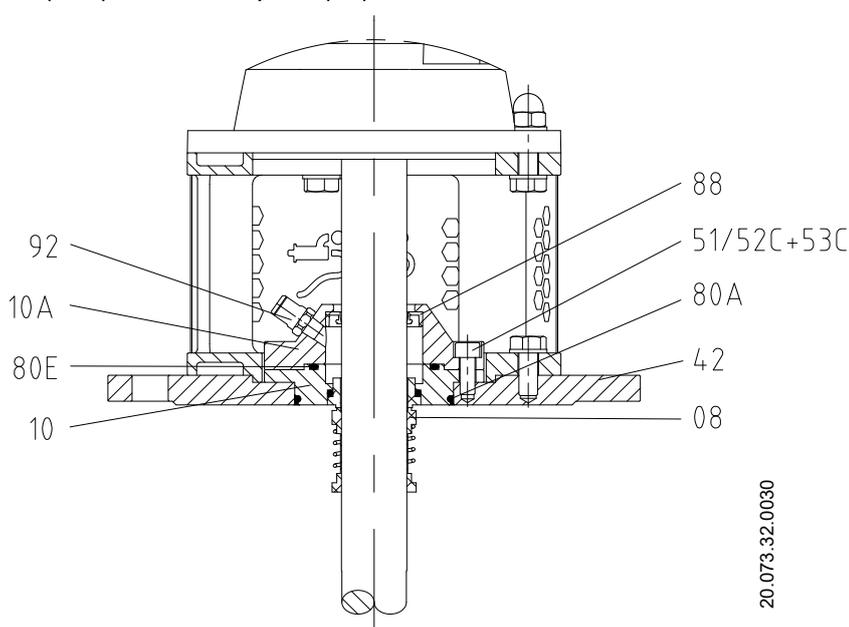
**For agitators with safety gland packing:**

- Place the O-rings (80A) on the seal cover (09) and insert in position on the base plate (42).
- Insert and tighten the screws (51) to fix the cover (09) to the base plate (42).
- Insert the threaded studs (55A) until completely threaded in.
- Insert the gland packing press (37) aligned with the threaded studs (55A).
- Place the washers (53D) and nuts (54A).



For agitators with quenched seal:

- Place the O-rings (80A) on the seal cover (10) and insert in position on the base plate (42).
- Insert the seal (88) in the quench seal cover (10A) using a press or a tool so it goes in evenly.
- Insert and tighten the screws (51/52C) and washers to fix the mechanical seal cover (10) and the quenching seal cover (10A) to the base plate (42).



- Center the lantern (04) on top by inserting the male centering ring in the base plate (42) and align the screw holes.
- Screw in the screws (52A) and washers (53) to fix the lantern (04) to the base plate (42).
- Center the drive (93) on top of the lantern (04) and align the screw holes.
- Insert the screws (52) with washers (53) from inside the lantern and screw in the cap nuts (54) with washers (53) from the drive side.

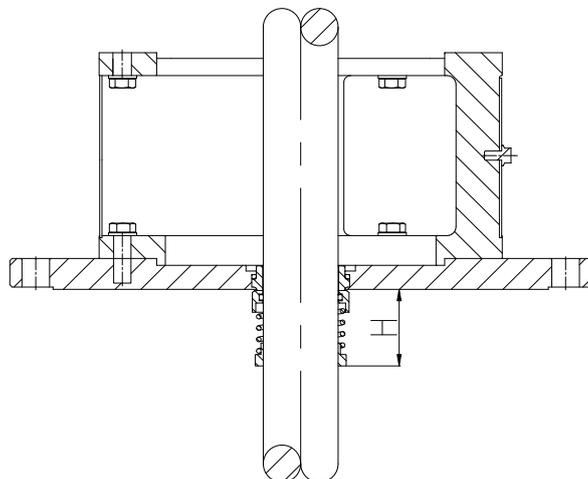
2. Shaft installation

- Place the agitator head sideways and make sure the drive's shaft cover is off.
- Insert the shaft (05) through baseplate (42) or seal cover (09) and into the drive (93).
- Fix the shaft (05) to the drive (93) using the security lock nut (62) and washer (63). Once torqued, bend one of the washer's tabs into the shaft's recess to lock it in place.

3. Mechanical seal installation

For agitators with standard mechanical seal:

- Slide the stationary part of the mechanical seal (08) up the shaft (05) and make sure the groove on the seal aligns with the positioning pin on the base plate (42).
- Push firmly to insert the seal's O-ring into the housing.
- Lubricate the shaft (05) and slide the rotating part of the seal (08) until it contacts the stationary part.
- Push the seal closed and tighten the set screw making sure that the distance between the lock ring and the base plate is the one indicated in the following table:

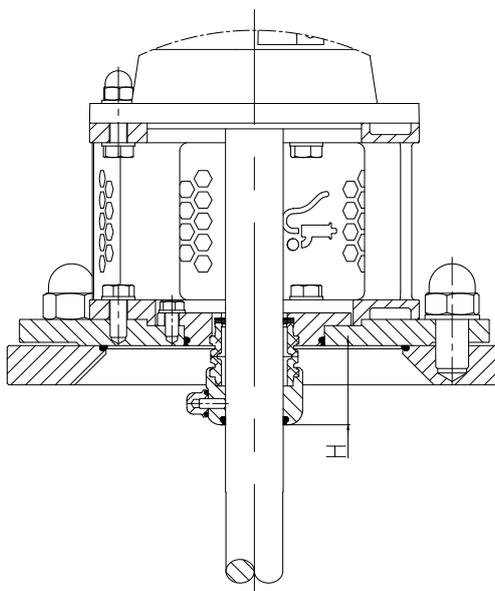


20.073.32.0006

	SMX-1	SMX-2	SMX-3	SMX-4	SMX-5
H (mm)	45	47,8	49,2	59,5	67

For agitators with hygienic mechanical seal:

- Slide the stationary part of the mechanical seal (08) up the shaft (05) and insert in the base plate (42).
- Push firmly to insert the seal's O-ring into the housing.
- Insert the rotating part of the seal into the support sleeve (13) inserting the seal's pins in the holes.
- Insert the O-ring (80D) in the sleeve's housing.
- Lubricate the shaft (05) with soapy water.
- Slide the sleeve with the rotating part of the seal (08) until it contacts the stationary part.
- Push the seal closed and tighten the set screw (55) making sure that the distance between the sleeve and the base plate is the one indicated in the following table:



20.073.32.0007

	SMX-1	SMX-2	SMX-3	SMX-4	SMX-5
H (mm)	40	48,4	45,4	53,4	53,4

4. Gland packing installation**For agitators with safety gland packing:**

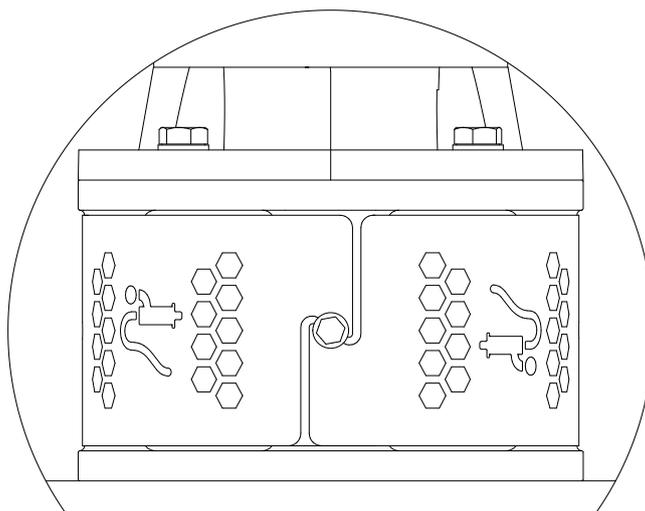
- Remove the nuts (54A) and washers (53D).
- Separate the gland packing press (37) and fix away from the gland packing support (09).
- Measure the gland packing string (08A) by placing it around the shaft. Cut 3 pieces of equal length.
- Insert the 3 pieces, one on top of the other, in the housing.
- Slide the press (37) down into the housing.
- Install the nuts (54A) and washers (53D) and slightly tighten to eliminate vibrations.

5. Impeller installation (once the agitator is installed on the tank)

- Place the O-ring (80) on the impeller's housing.
- Lubricate the thread with assembly paste or grease to avoid galling.
- Align the impeller (02) with the shaft and carefully turn it clockwise making sure that it screws smoothly.
- Use a mallet to lightly tap on the impeller blades to tighten the impeller.

6. Lantern protector installation

- Place the lantern protectors (47) on the lantern (04) aligning the lantern column holes with the protector's slot.

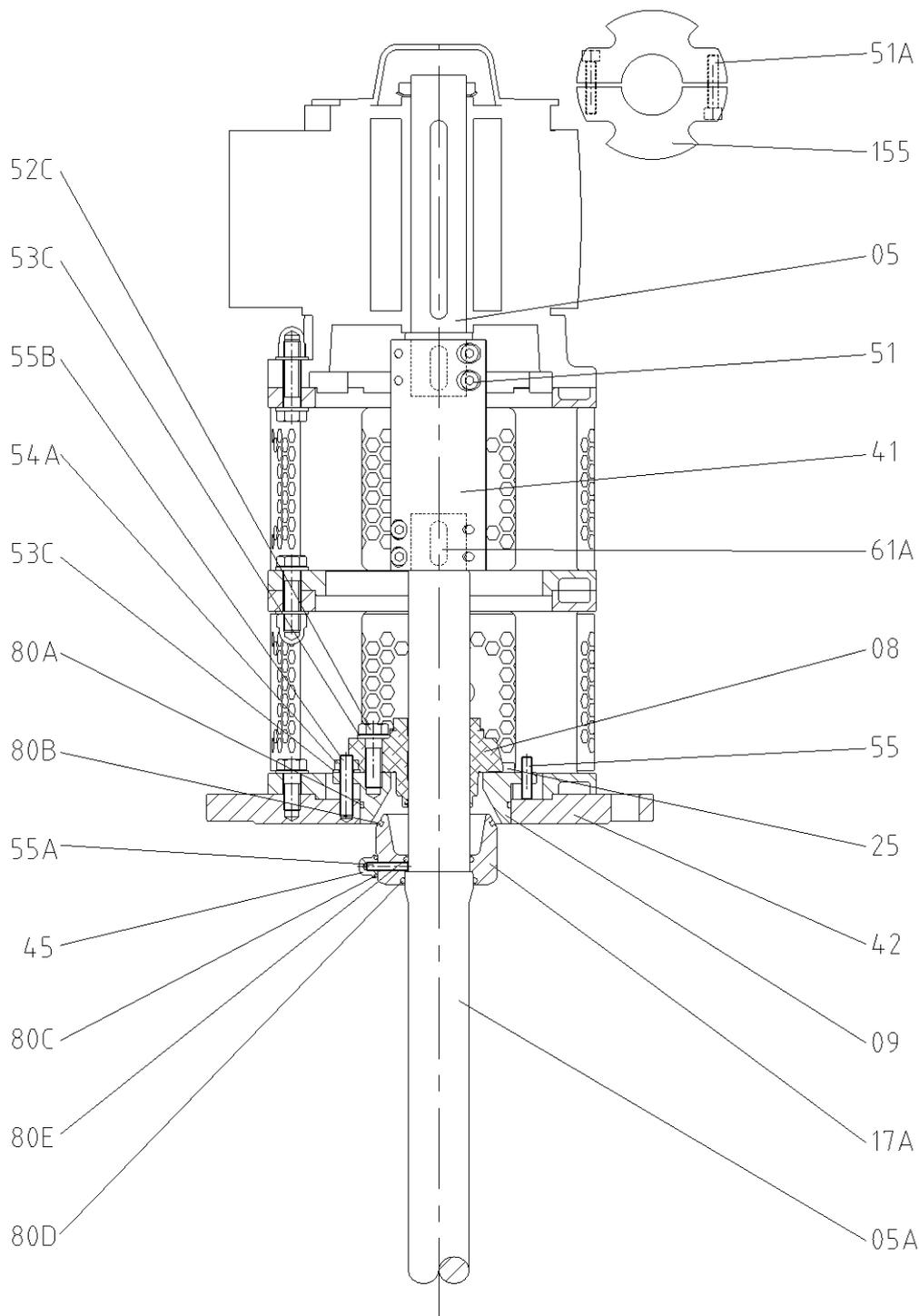


20.073.32.0008

8.8.4. Assembly of the agitator with Shut-off option

1. Assemble the mechanical seal support flange on the base plate

- Place the base plate (42) on a soft surface to not damage the flat face that will be in contact with the product.
- Use lubrication on all threads to avoid galling.
- Tighten the shut-off set screws (55B) in the base plate (42).
- Place the O-ring on the mechanical seal support flange (09) and insert them in the base plate (42) using the set screws (55B) to align the holes.
- Screw in and tighten the stop screws (25).
- Insert the extractor set screws (55) and tighten until the mechanical seal support flange (09) contacts the stop screws (25).
- Insert the Shut-Off nuts (54A) and washers (53C) and tighten to fix the support flange in place (09).



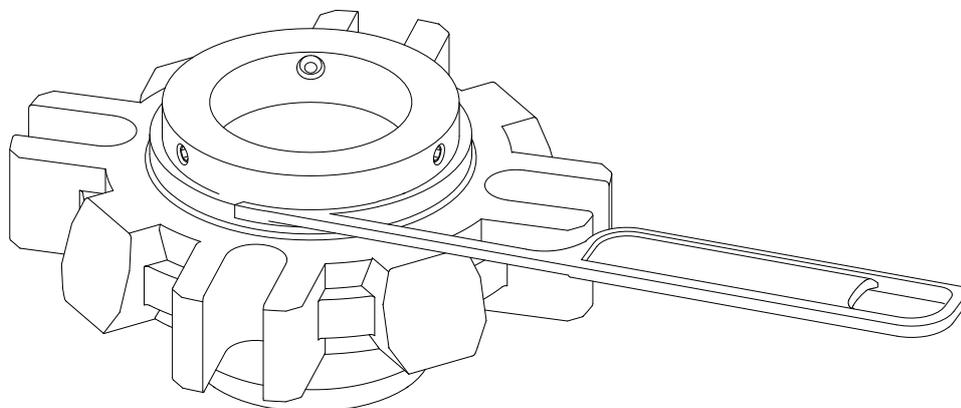
20.073.32.0050

2. Install lanterns and drive unit

- Center the lantern (04) over the base plate (42) and align the screw holes. Then apply pressure on the lantern until it is completely seated. Fix the lantern with the hex screws (52A) and washers (53).
- Repeat to attach the second lantern to the first and fix with screws (52) washers (53) and nuts (54).
- Place key (61) on the upper shaft (05) and slide the long side of the shaft inside the drive unit (93).
- Place the security lock nut (62) and washer (63) and tighten with a hook wrench. Once tightened bend one of the washer tabs into the lock nut recesses.
- Secure the drive unit and install the lantern (04) and base plate (42) assembly on to the drive unit (93) flange. Fix the two with the screw (53), washer (53) and nut (54).

3. Install lower shaft and mechanical seal

- Place the small key (61A) on the upper shaft (05).
- Assemble the shaft coupling (41) only engaging the screws (51) slightly, leaving enough free movement between both parts so that it is possible to insert the upper shaft (05) with the key (61A) in place.
- Place the O-rings (80D) and (80E) on the Shut-Off cap (17A). Slide them on to the bottom shaft (05A) and make sure it is properly seated on the shaft shoulder. Fix in place using the set screw (55A) Cover the set screw (55A) with the hygienic nut (45) and O-ring (80C).
- Turn the upper shaft (05) so that the key is facing upwards and insert the shaft coupling (41) on to it making sure the key is seated on the keyhole on the coupling (41).
- Insert the bottom shaft (05A) through the hole in the mechanical seal support flange (09). From inside the lantern slide the mechanical seal (08) and key (61A) on the lower shaft. Then insert the lower shaft into the shaft coupling (41).
- Secure the lower shaft (05A) and make sure the coupling (41) is correctly seated on both shafts. Then start tightening the screws (51) in a cross pattern making sure both parts of the coupling are symmetrical and parallel. Before completely fixing the coupling (41), push the lower shaft (05A) towards the drive (93) with a mallet to correctly seat the coupling on the shaft shoulders.
- Fix the mechanical seal (08) to the support flange (09) with the screws (52C) and washers (53C)
- Fix the mechanical seal (08) to the shaft with the 3 set screws.
- Remove the mechanical seal's positioning plastic strip or metal tabs before starting operation of the agitator.



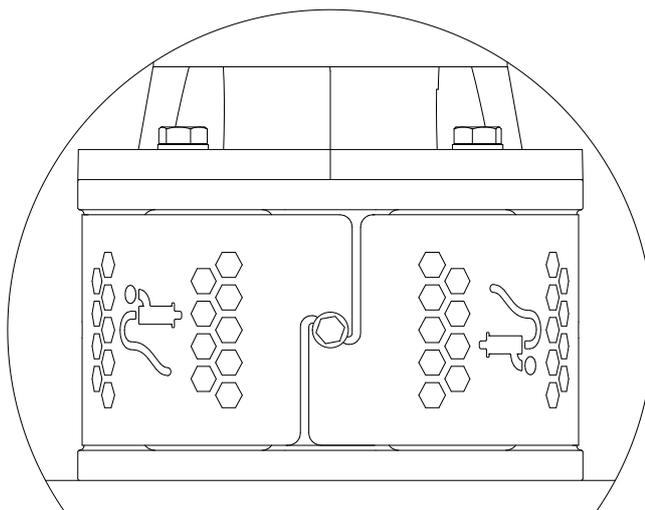
20.073.32.0049

7. Impeller installation (once the agitator is installed on the tank)

- Place the O-ring (80) on the impeller's housing.
- Lubricate the thread with assembly paste or grease to avoid galling.
- Align the impeller (02) with the shaft and carefully turn it clockwise making sure that it screws smoothly.
- Use a mallet to lightly tap on the impeller blades to tighten the impeller.

8. Lantern protector installation

- Place the lantern protectors (47) on the lantern (04) aligning the lantern column holes with the protector's slot.



20.073.32.0008

9. Technical Specifications

9.1. MATERIALS

Parts in contact with the product	1.4404 (AISI 316L)
Other steel parts	1.4307 (AISI 304L)
Elastomers	EPDM
Sealing system	C/SiC/EPDM
Surface finish	Ra ≤ 0,8 µm
Working pressure	-1 to 10 bar
Working temperature	-5 to 130 °C

9.2. OTHER FEATURES

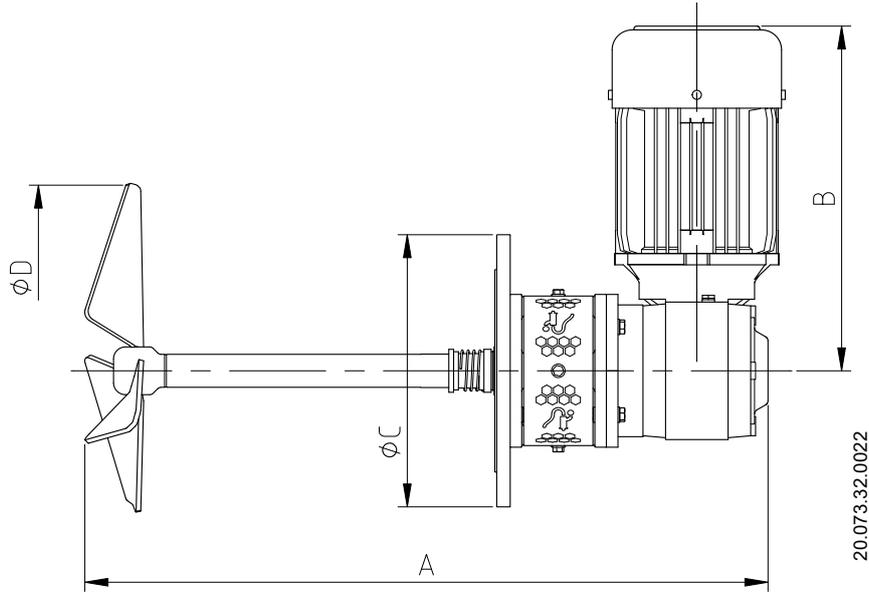
Worm gear drives

Agitator	Flange Ø [mm]	Power [kW]	Speed [rpm]	Impeller Ø [mm]	Flow rate [m³/h]	Weight (kg)
SMX-1/W 1.16-27001-250	220	0,18	274	250	155	16
SMX-1/W 1.16-27002-300	220	0,25	274	300	270	16
SMX-2/W 1.16-19005-400	285	0,55	189	400	435	31
SMX-2/W 1.16-28007-400	285	0,75	280	400	645	32
SMX-2/W 1.16-19011-500	285	1,1	189	500	855	37

Parallel shaft drive

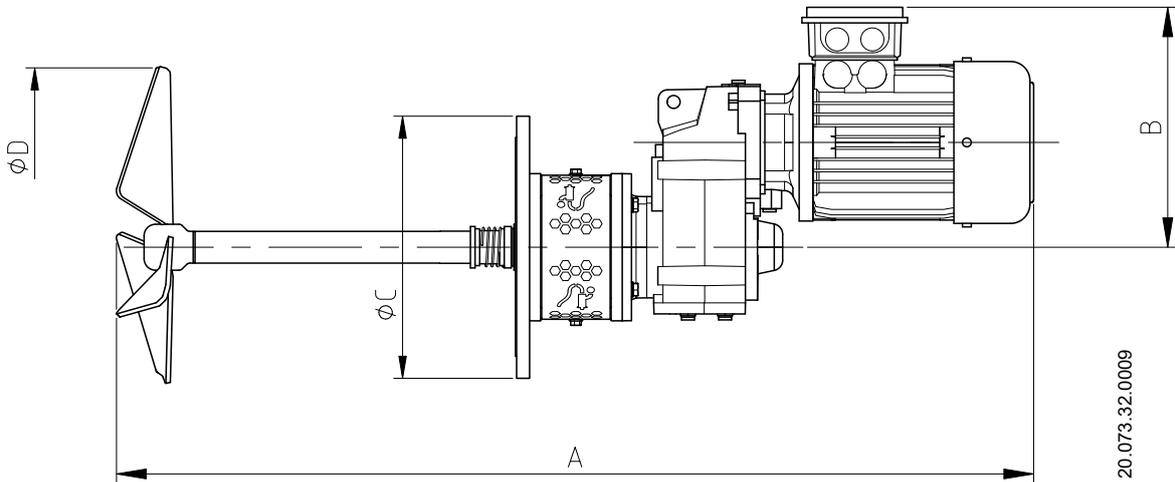
Agitator	Flange Ø [mm]	Power [kW]	Speed [rpm]	Impeller Ø [mm]	Flow rate [m³/h]	Weight (kg)
SMX-2/P 1.16-29007-400	285	0,75	292	400	675	33
SMX-2/P 1.16-22015-500	285	1,5	222	500	1000	42
SMX-2/P 1.16-28030-500	285	3	279	500	1300	63
SMX-2/P 1.16-36040-500	285	4	357	500	1650	71
SMX-3/P 1.16-32075-600	340	7,5	321	600	2500	140
SMX-4/P 1.16-210110-800	395	11	206	800	3800	209
SMX-5/P 1.16-280220-800	505	22	280	800	5200	351

9.3. DIMENSIONS



Worm gear drives

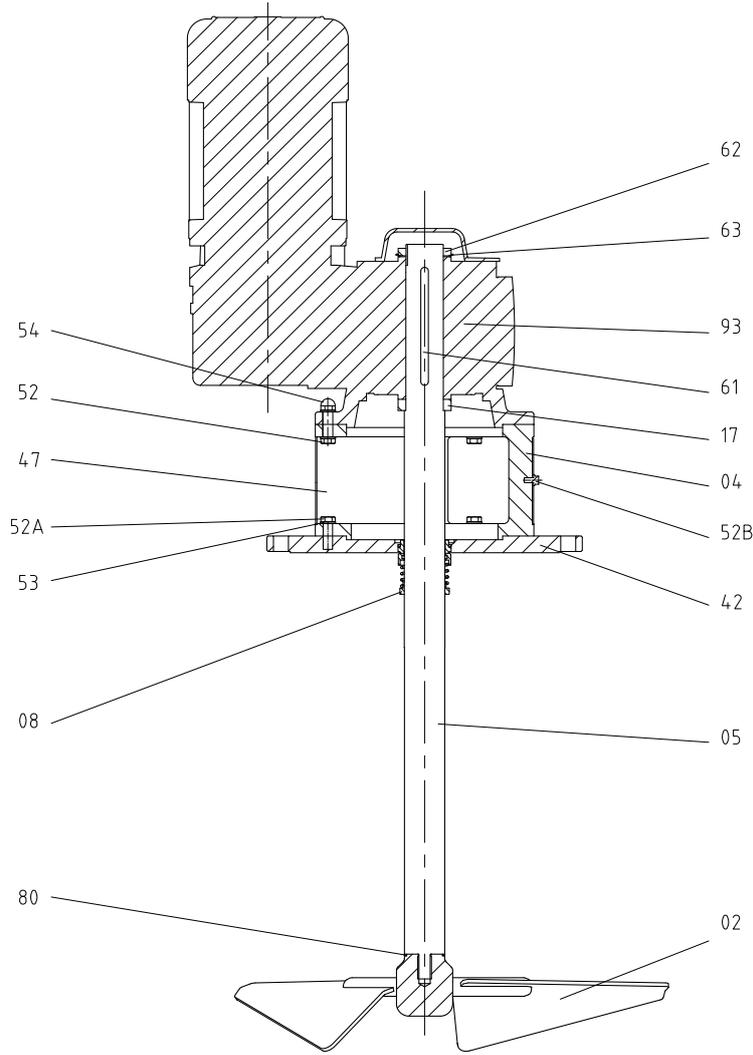
Agitator	kW	ØA		ØB	ØC	ØD
		Standard	W/O lantern			
SMX-1/W 1.16-27001-250	0,18	693	603	295	220	400
SMX-1/W 1.16-27002-300	0,25	702	612	320	220	400
SMX-2/W 1.16-19005-400	0,55	743	643	345	285	400
SMX-2/W 1.16-28007-400	0,75	743	643	345	285	400
SMX-2/W 1.16-19011-500	1,1	748	648	385	285	500



Parallel shaft drives

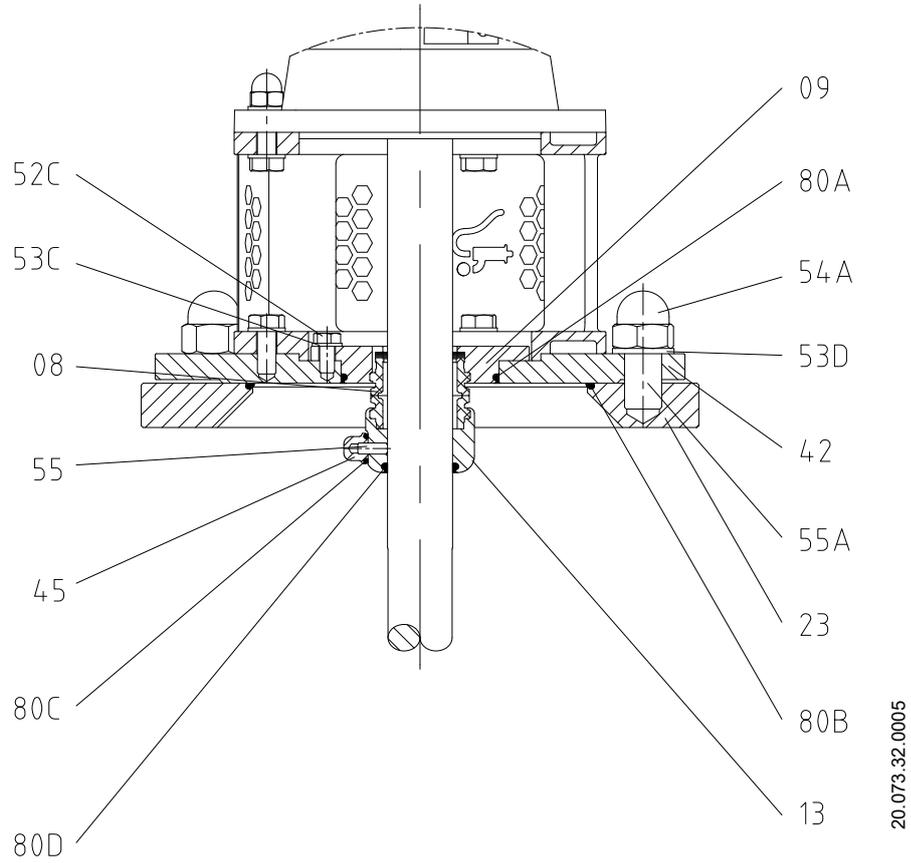
Agitator	kW	ØA			ØB	ØC	ØD
		Standard	W/O lantern	Shut-Off			
SMX-2/P 1.16-29007-400	0,75	900	800	-	245	285	400
SMX-2/P 1.16-22015-500	1,5	960	860	-	265	285	500
SMX-2/P 1.16-28030-500	3	1035	915	1155	310	285	500
SMX-2/P 1.16-36040-500	4	1085	965	1205	320	285	500
SMX-3/P 1.16-32075-600	7,5	1400	-	1550	385	340	600
SMX-4/P 1.16-210110-800	11	1500	-	1665	450	395	800
SMX-5/P 1.16-280220-800	22	1835	-	2015	540	505	800

9.4. PARTS LIST

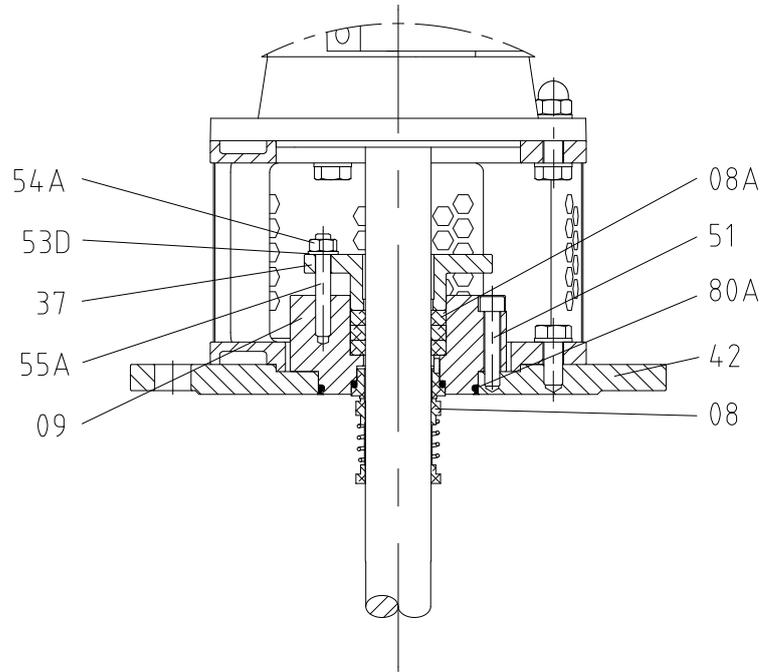


20.073.32.0004

Position	Description	Quantity	Material
02	Impeller	1	1.4404 (AISI 316L)
04	Lantern	1	1.4307 (AISI 304L)
05	Shaft	1	AISI 316L
08	Mechanical seal	1	C/SiC/EPDM
17	Spacer ring	1	1.4307 (AISI 304L)
42	Base plate	1	AISI 316L
47	Lantern protection	2	PETP
52	Screw	4	A2
52A	Screw	4	A2
52B	Screw	4	A2
53	Washer	4	A2
54	Cap nut	4	A2
61	Key	1	1.4404 (AISI 316L)
62	Lock nut	1	Steel
63	Lock washer	1	Steel
80	O-ring	1	EPDM
93	Gear motor	1	-

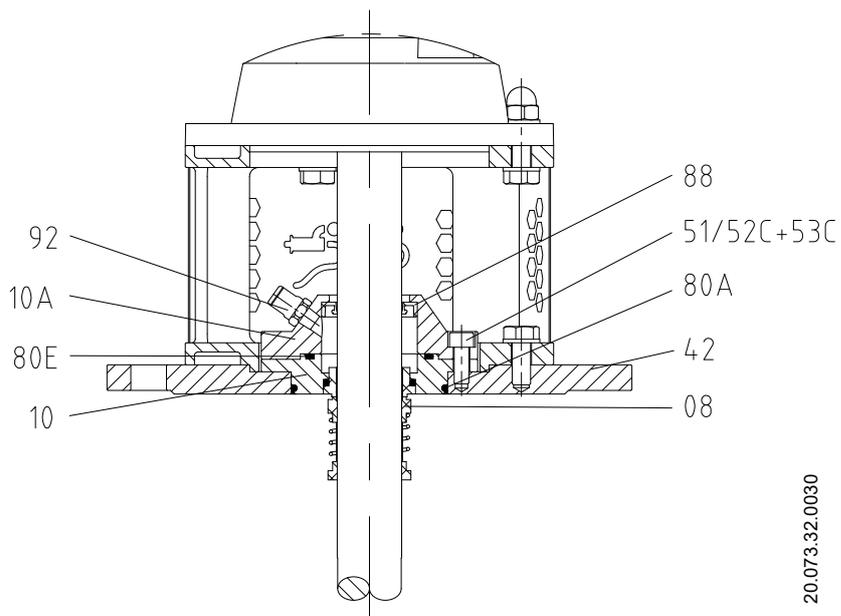


Position	Description	Quantity	Material
08	Mechanical seal	1	C/SiC/EPDM
09	Mechanical seal cover	1	1.4404 (AISI 316L)
13	Mechanical seal support sleeve	1	1.4404 (AISI 316L)
23	Hygienic tank flange	1	1.4404 (AISI 316L)
42	Base plate	1	1.4404 (AISI 316L)
45	Hygienic cap nut	1	1.4404 (AISI 316L)
52C	Screw	4	A2
53C	Washer	4	A2
55	Set screw	1	A4
80A	O-ring	2	EPDM
80B	O-ring	1	EPDM
80C	O-ring	1	EPDM
80D	O-ring	1	EPDM



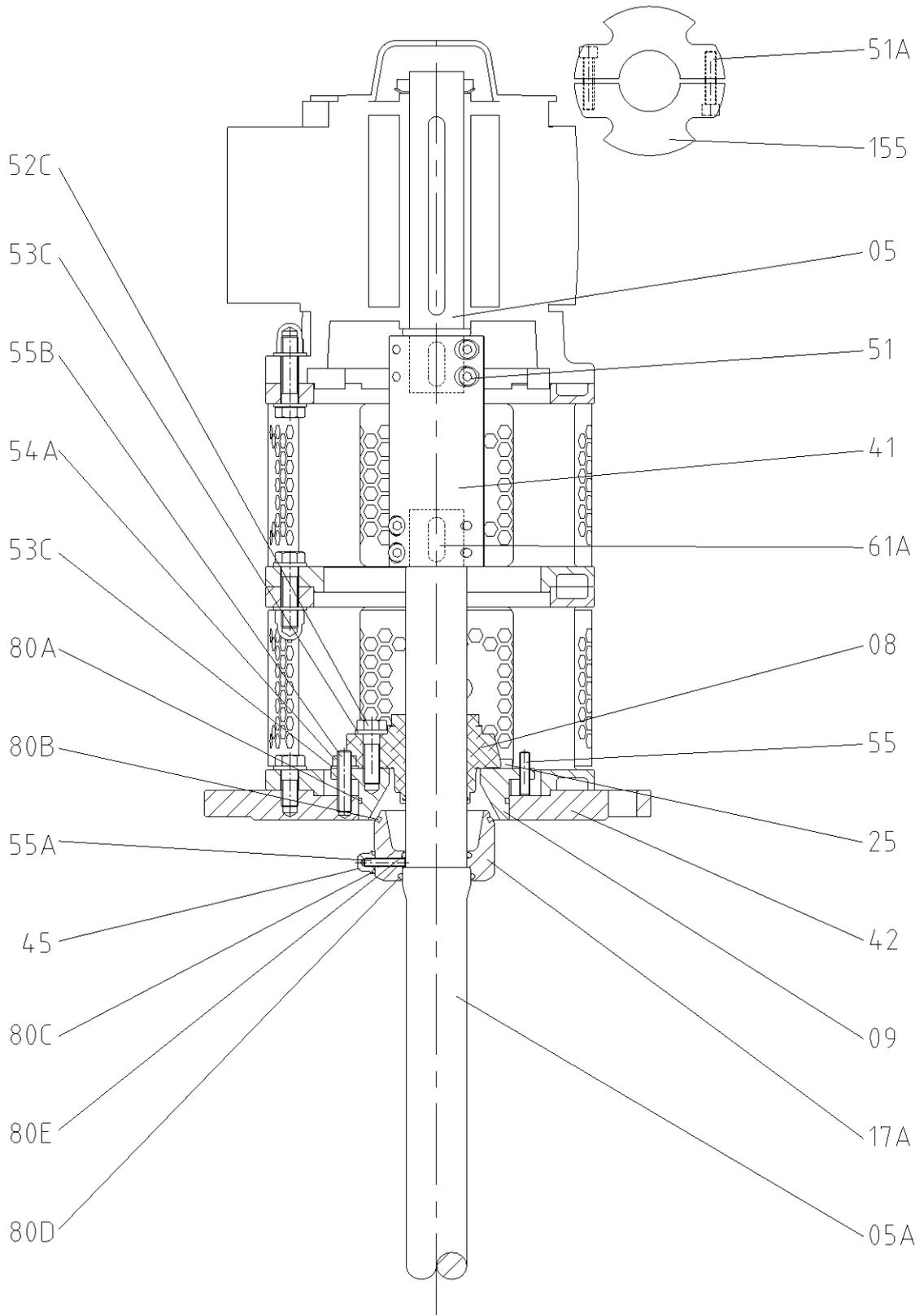
20.073.32.0029

Position	Description	Quantity	Material
08	Mechanical seal	1	C/SiC/EPDM
08A	Gland packing string	-	ARAMID PTFE
09	Mechanical seal / gland packing support	1	1.4404 (AISI 316L)
37	Gland packing press	1	1.4307 (AISI 304L)
42	Base plate	1	1.4404 (AISI 316L)
51	Screw	4	A2
53D	Washer	2	A2
54A	Nut	2	A2
55A	Threaded stud	2	A2
80A	O-ring	1	EPDM



Position	Description	Quantity	Material
08	Mechanical seal	1	C/SiC/EPDM
10	Mechanical seal support	1	1.4404 (AISI 316L)
10A	Refrigeration seal support	1	1.4404 (AISI 316L)
42	Base plate	1	1.4404 (AISI 316L)
51	Screw*	4	A2
52C	Screw*	4	A2
53C	Washer*	4	A2
80A	O-ring	1	EPDM
80E	O-ring	1	EPDM
88	BA seal	1	A2
92	Straight fitting	1	EPDM

*Depending on model



20.073.32.0050

Position	Description	Quantity	Material
05	Upper shaft	1	1.4307 (AISI 304L)
05A	Lower Shaft	1	1.4404 (AISI 316L)
08	Mechanical seal	1	C/SiC/EPDM
09	Mechanical seal support	1	1.4404 (AISI 316L)
17A	Shut-off seal	1	1.4307 (AISI 304L)
25	Shut-off stop screw	1	A2
41	Shaft coupling	1	1.4307 (AISI 304L)
42	Base plate	1	1.4404 (AISI 316L)
45	Hygienic nut	1	1.4404 (AISI 316L)
51	Screw	8	A2
51A	Screw	2	A2
52C	Screw	4	A2
53C	Washer	4	A2
54A	Nut	4	A2
55	Set screw	4	A2
55A	Set screw	1	A2
55B	Set screw	4	A2
61A	Key	2	A2
80A	O-ring	1	EPDM
80B	O-ring	1	EPDM
80C	O-ring	1	EPDM
80D	O-ring	1	EPDM
80E	O-ring	1	EPDM
155	Screw	4	A2

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