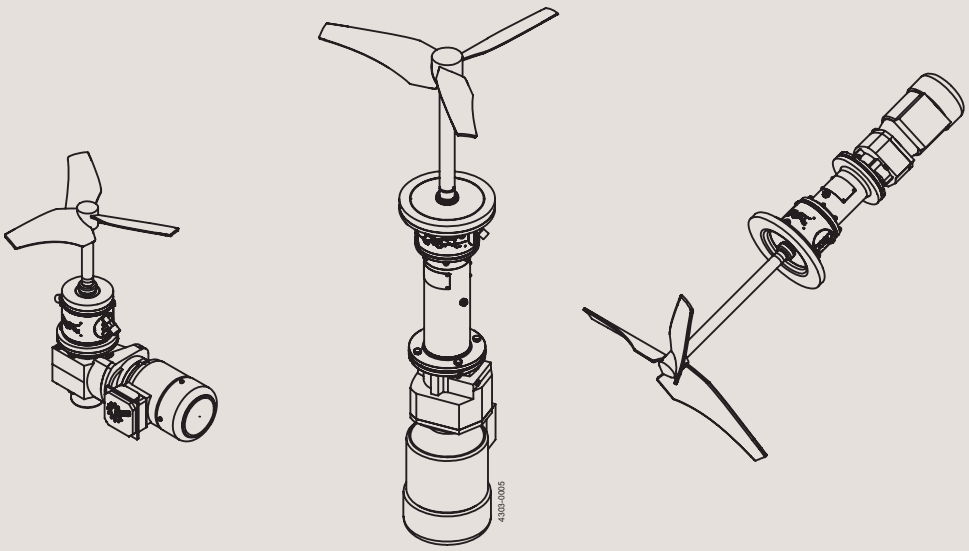
Instruction Manual

Alfa Laval Agitator - ALS / ALB



ESE03338-EN1 2016-12

Original manual

Table of contents

The information herein is correct at the time of issue but may be subject to change without prior notice

1 EC Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S
Company Name

Albuen 31, DK-6000 Kolding, Denmark
Address

+45 79 32 22 00
Phone No.

hereby declare that

Agitator - EnSaFoil
Designation

10.000 - 100.000
Serial no(s)

ALX-ME-(GX)-BC160D(H)/30(L)F-SX-SH-PXXXXYYYY
ALX-ME-(GX)-BC160/35(L)F-SX-SH-PXXXXYYYY
ALX-ME-(GX)-BXX/XX(L)F-SX-SH-PXXXXYYYY
ALX-ME-(GX)-BC160D(H)/30(L)F-D(C)-SH-PXXXXYYYY
ALX-ME-(GX)-BC160/35(L)F-D(C)-SH-PXXXXYYYY
ALX-ME-(GX)-BXX/XX(L)F-D(C)-SH-PXXXXYYYY
ALX-ME-(GX)-ZZ(L)F-SX-SH-PXXXXYYYY
ALX-ME-(GX)-ZZ(L)F-D(C)-SH-PXXXXYYYY
Type

ALX = ALB or ALS
GX = GC, GR or GP
BXX/XX = B25/30, B35, B35/40, B45, B45/50, B55, B55/60
SX = S1, S2, S3
SH = S200-S2000
PXXXX = P125, P150, P175, P200, P225, P250, P300, P350 P400, P450, P500, P550, P600, P650, P700, P750 P800, P900, P1000, P1100, P1300, P1500, P1700 P1900
YYYY = D2P, D2LP, D3P, D3LP, D2G, D2LG, D3G, D3LG U2P, U2LP, U3P, U3LP, U2G, U2LG, U3G, U3LG
ZZ = 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90
Type variation

is in conformity with the following directives:

Machinery Directive 2006/42/EC++
Regulation (EC) 1935/2004

The person authorised to compile the technical file is the signer of this document

Global Product Quality Manager
Pumps, Valves, Fittings and Tank Equipment
Title

Lars Kruse Andersen
Name

Kolding
Place

2016-01-01
Date


Signature

CE

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.
Always read the manual before using the Agitator!
Illustrations are only to illustrate the problem and is NOT a drawing of the current Agitator!

2.1 Important information

WARNING
Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION
Indicates that special procedures must be followed to avoid damage to the agitator!

NOTE
Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:

Dangerous electrical voltage:

2.3 Intended use

- The Alfa Laval Agitator is only for mixing/stirring of liquids in a tank.
- The Agitator is only for mounting positions as specified on the nameplate by the first group of letters of the type designation.

ALT(B)- is for top mounting, ALS- is for side mounting and ALB- is for bottom mounting.
The exact mounting angle is specified on the Name Plate and must be followed.

- The different duties and operation data like pressure, speed and media temperature, which the Agitator is designed for, can be found in the Alfa Laval quotation agreement and may not be exceeded by all means.

[1)] The Alfa Laval quotation agreement has been exchanged during the quote process between a technical purchaser and Alfa Laval. If you are not in hold of the Alfa Laval quotation agreement, please get through to your local Alfa Laval contact, inform the Agitator serial number and article number which is stated on the Name Plate and you will obtain the Alfa Laval quotation agreement.

2 Safety

All warnings in the manual are summarised on this page.
Pay special attention to the instructions below so that severe personal injury and/or damage to the Agitator are avoided.

2.4 Safety precautions

Installation:

Always read the technical data thoroughly. (See chapter 6 Technical Data)
Always follow installation instructions thoroughly. (See chapter 3 Installation)
Never expose the Agitator to undue vibrations or shocks.
Never start Agitator in the wrong rotation direction
Ensure that the tank media is not corrosive to the Agitator.
Only install the Agitator in environments within temperature limit: -20°C and +40°C.
Only install the Agitator in altitudes less than 1000 m above sea level.

Never touch the moving parts while the Agitator is connected to the power supply.

Operation:

Always read the technical data thoroughly. (See chapter 6 Technical Data)
Always read supplier instructions thoroughly. (See chapter 8 Appendix).
Never start Agitator in the wrong rotation direction.
Always rinse well with clean water after cleaning.
Beware of temperature limitations.
Beware of Agitator in operation can produce sound levels in excess of 85dB(A).
Never operate continuously within 20% of critical oscillation speed (see chapter 6 Technical Data).

Never touch the moving parts while the Agitator is connected to the power supply.

Maintenance:

Always read the technical data thoroughly. (See chapter 6 Technical Data)
Always follow the maintenance instruction thoroughly. (See chapter 5 Maintenance)
Always follow the maintenance instruction from drive unit supplier (see chapter 8 Appendix)
Always study the parts list and assembly drawing carefully. (See chapter 7 Part drawings, part lists and service kits)

Never touch the moving parts while the Agitator is connected to the power supply.
Always disconnect the power supply while servicing the Agitator.
Ensure correct rotation direction of impeller before startup and after any maintains there might have impact on the direction.

The instructions manual is part of the delivery.
Study the instructions carefully

3.1 Unpacking/delivery

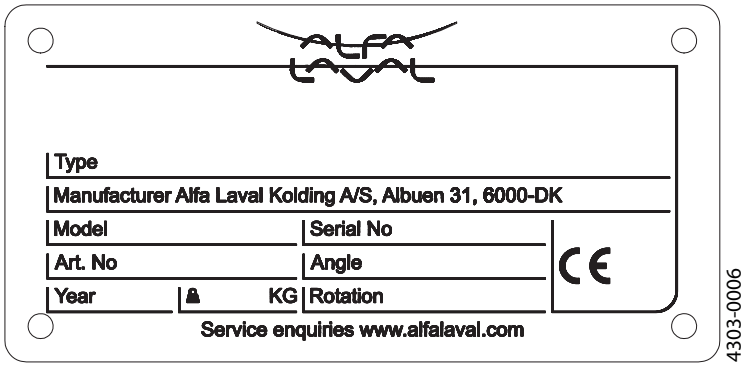
Always use lifting equipment when handling the Agitator (see step 3).

CAUTION!
Alfa Laval cannot be held responsible for incorrect unpacking.

Step 1

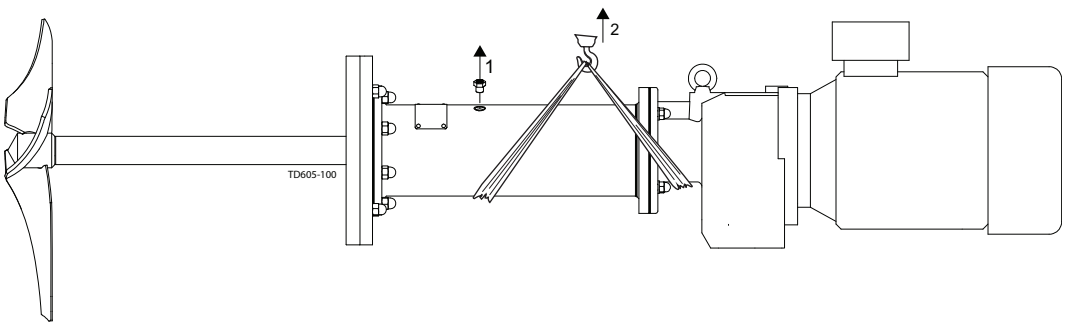
Inspect the delivery for visible transportation damages - all issues to be reported to carrier

Step 2
Check the delivery for:
1. Complete Agitator
2. Nameplate designations
3. Delivery note
4. Seperate instruction manuals from suppliers 8 Appendix



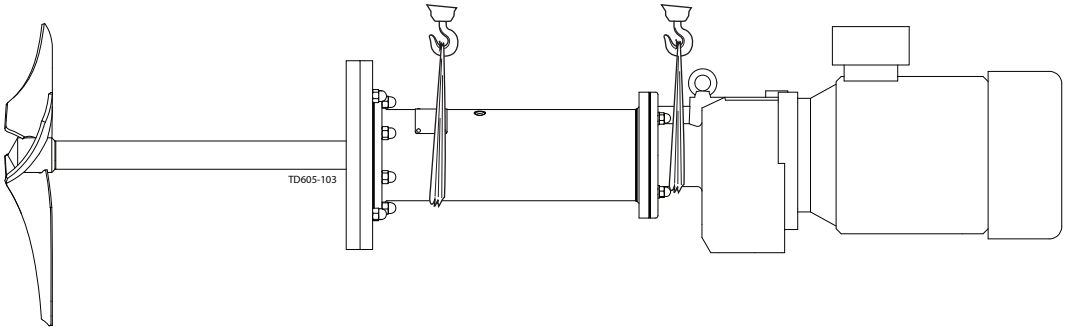
Step 3
Lifting instructions:

Always use the correct lifting equipment (see Agitator weight on name plate).
Locate Centre of gravity before moving the Agitator.

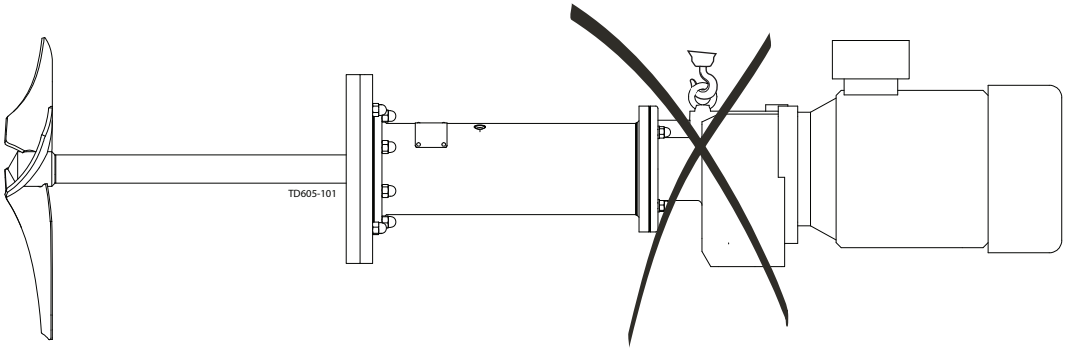


3 Installation

The instructions manual is part of the delivery.
Study the instructions carefully

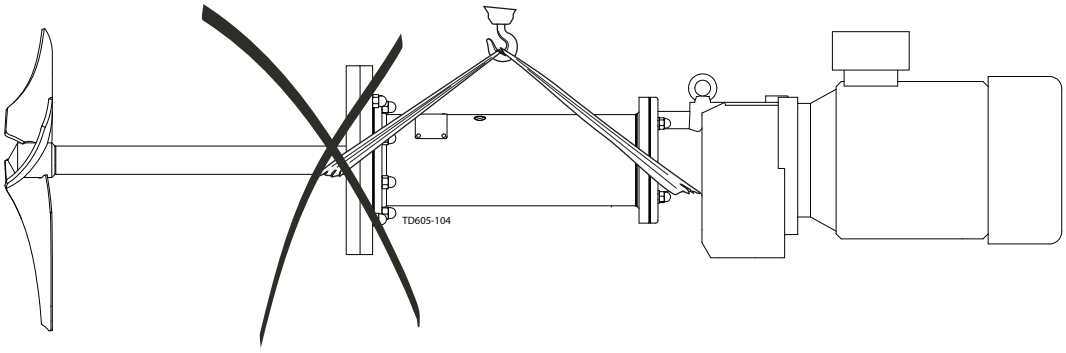


WARNING!
Do NOT use eye bolts on gear motor to lift the Agitator. They are only fir gear motor removal.



WARNING!
Do NOT use eye bolts on shroud (if any) to lift the Agitator. They are only for shroud removal.

CAUTION!
Alfa Laval highly recommends NOT to use shaft as lifting point.



The instructions manual is part of the delivery.
Study the instructions carefully

NOTE!
If possible, lift the Agitator in horizontal position, and in two points.

Step 4
During transportation

1. **Always** support the shaft adequately, to protect shaft and bearings
2. **Never** expose the Agitator to undue vibrations or shocks
3. Control for oil leakage on gears with vent screw

3 Installation

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

3.2 Installation

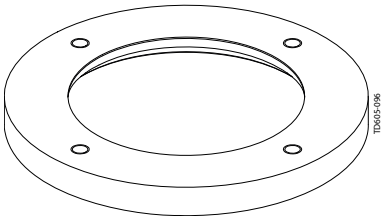
Always read the technical data thoroughly. (See chapter 6 Technical Data)
Only install this Agitator in mounting angle according to the name plate. (see chapter 6 Technical Data for illustration).
Always use lifting equipment when handling the Agitator. (See Step 3).
Always have safety elements removed by authorized personnel.
Never cover or remove the nameplate.

Never connect to power supply during installation or service.
Always have the Agitator connected to power supply by authorized personnel.

NOTE!
Alfa Laval highly recommend to install motor protection guard to protect the motor from overloading.
Never install a none Alfa Laval shroud on the agitator it can lead to a breakdown of the motor.

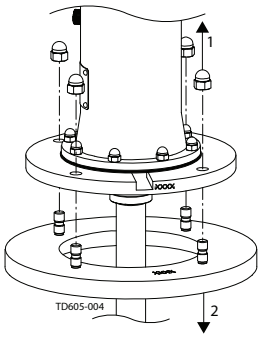
Welding flange - Flat Shaped Welding Flange (FSWF):

CAUTION!
Only authorized personnel to weld in flanges.
Alfa Laval cannot be held responsible for incorrect installation.



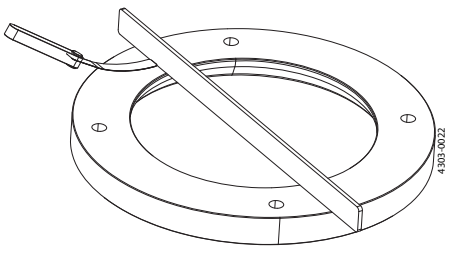
Step 1

Dismantle the FSWF if fitted onto the Agitator.



Step 2

Ensure that the flange surface flatness tolerance equals 0,1.
Use a solid straight ruler and a feeler gauge to determine the flatness.



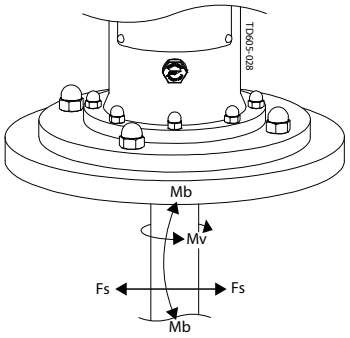
Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

Step 3

Ensure that the flange will accept forces applied by the drive unit.
Torque Mv, Bending torque Mb and Side thrust Fs.

The values are depending on the chosen configuration of impeller diameter, shaft length and the torque. The values can be calculated as follow:

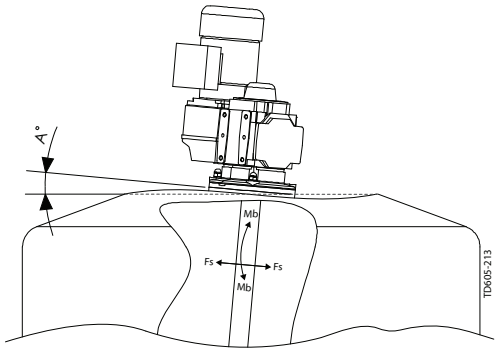
Mv = 23873 x P / n, [Nm]	P is the power of the motor in [KW] n is the speed of the shaft in [rpm]
Mb = Fs x S / 1000, [Nm]	S is the shaft length and is stated in the agitator type description as -Sxxxx-
Fs = 4,5 x M2 x 1000 / D, [N]	D is the impeller diameter and stated on the agitator type description as -Pxxxx…



Step 4

Ensure sufficient rigidity of the tank.
Ensure that the max. bending angle (A), at loads from Step 3 does not exceed according to below scheme

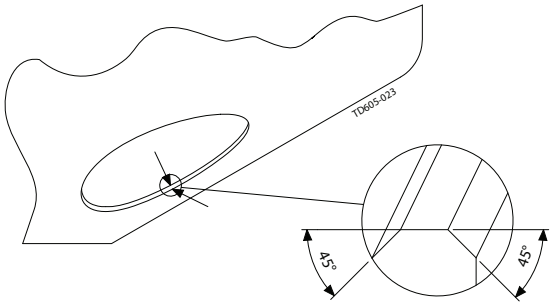
RPM:	<100	>100
A° (max bending angle at applied loads):	0.1	0.05



Guidelines for cutting hole in tank for Flat Shaped Welding Flange (FSWF)

CAUTION!
Alfa Laval recommend that all other welding tasks on the tank are finished before cutting the hole for the flange.

Chamfer inner and outer hole edge 45°.

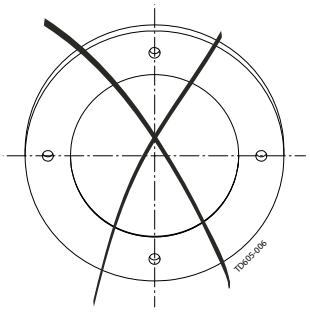


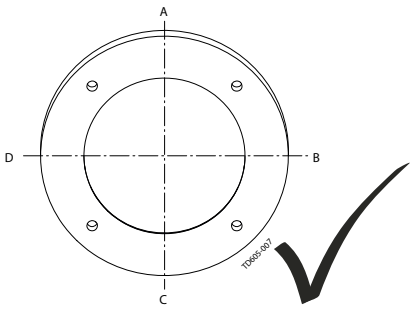
3 Installation

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

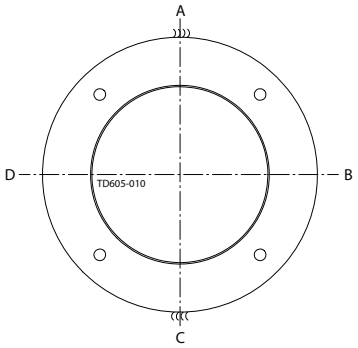
Welding procedure, flange (FSWF) without nose:

Step 1
Always allow flange to cool to ambient temperature after each section has been welded
Position the flange correctly

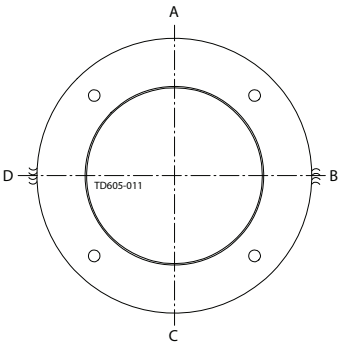




Step 2
Spot weld from outside.

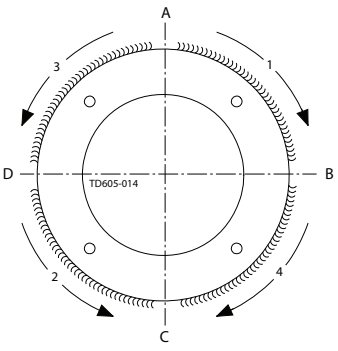


Adjust alignment!



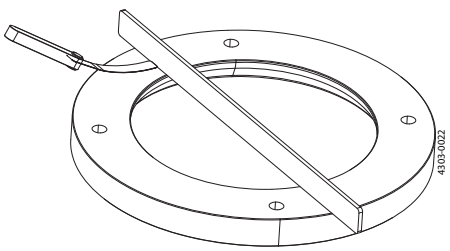
Step 3

Weld the following sections first from outside then from inside, and cool with air between each section.



Step 4

Ensure that the surface flatness tolerance equals 0,25 after welding.
Grind and polish the welding flange.
Use a solid straight ruler and a feeler gauge to determine the flatness.



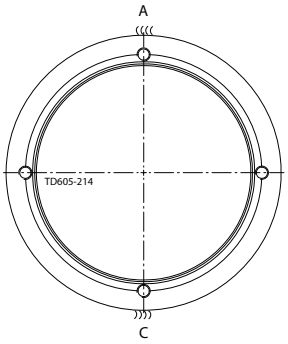
Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

Welding procedure, flange (FSWF) with nose:

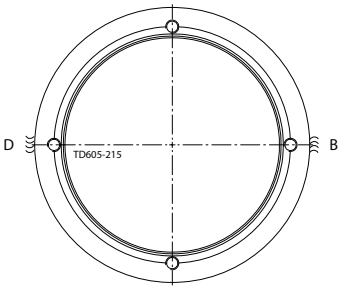
NOTE!
Alfa Laval recommend a welding tool to be made and fixed to the FSWF to ensure shape and form of the FSWF during welding and installation.

Step 1
Position the flange correctly.
Always allow flange to cool to ambient temperature after each section has been welded.

Step 2
Spot weld from outside.

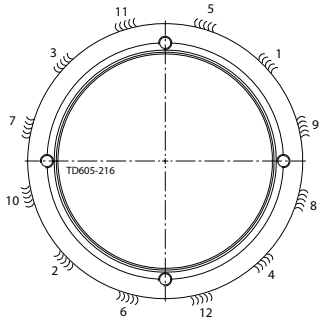


Adjust alignment!



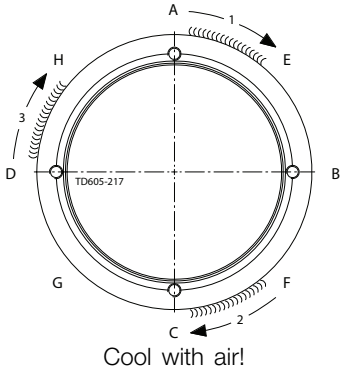
Step 3

Spot weld from inside



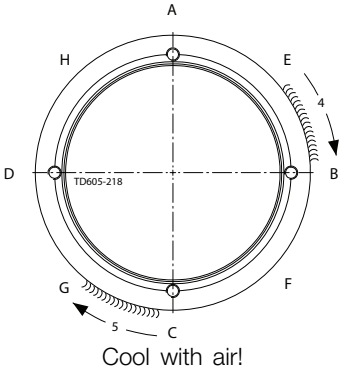
Step 4
Weld the following sections first from inside then from outside and cool to ambient temperature after each section has been welded

Step 1



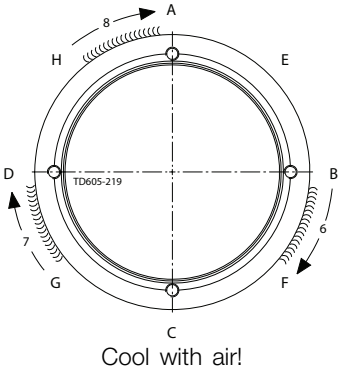
Cool with air!

Step 2



Cool with air!

Step 3



Cool with air!

3 Installation

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

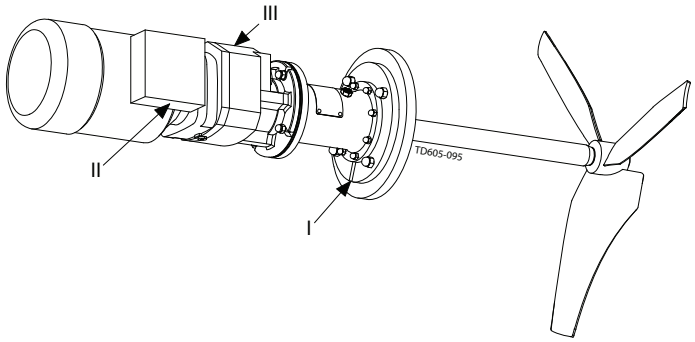
Step 5
Remove the welding tool.
Ensure that the surface flatness tolerance equals ±0.1mm.
Grind and polish the welding flange.

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

Mounting Agitator:

CAUTION!
Always ensure that mounting is carried out according to the assembly drawing in chapter 7 Part drawings, part lists and service kits.
Always refer to tightening torques in section 6.1 Technical datawhen tightening bolts.

Step 1
Place impeller device(s) in the tank.
Ensure that tank and Agitator surfaces are clean
Ensure that drain (I) is pointing downwards.

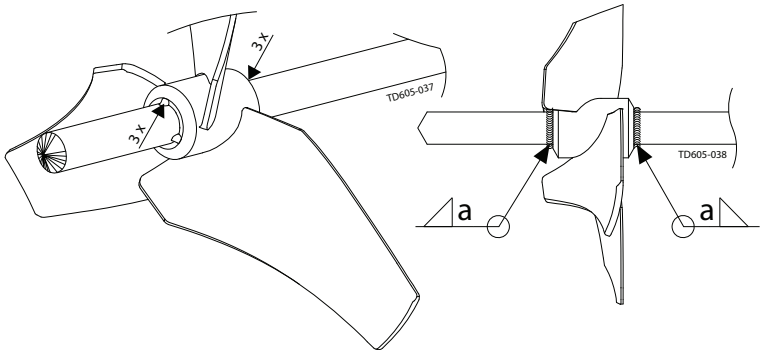


Step 2
Mount the Agitator onto the tank.

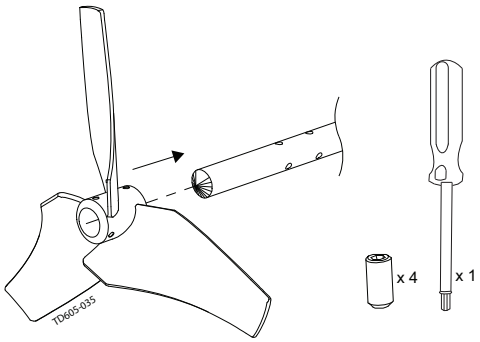
3 Installation

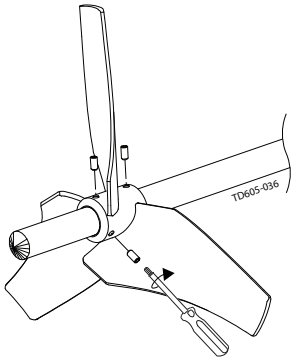
Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

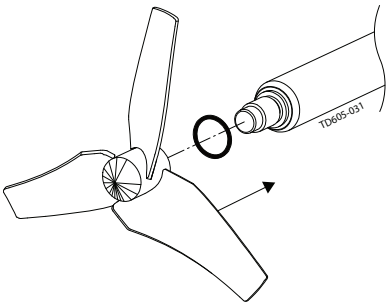
Step 3
Mount impeller device(s) onto shaft.

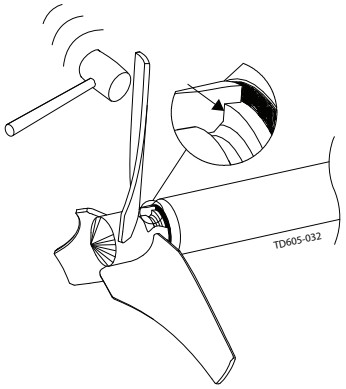


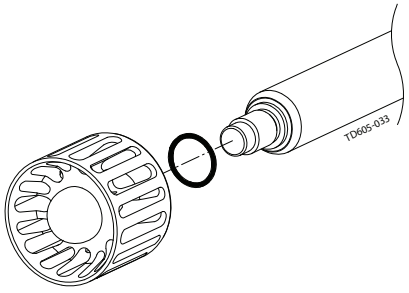
Hub diameter [mm]	a - dimension [mm]
Ø30	1,1
Ø40	1,8
Ø55, Ø80, Ø120	2,8

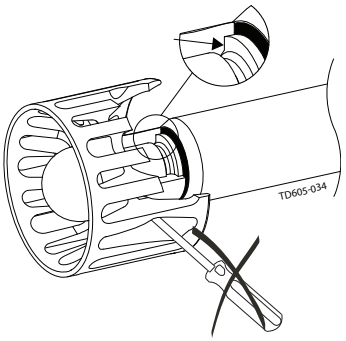












Step 4
Ensure the impeller device orientation is correct according to the direction of the desired flow. The direction is determined by the letter "D" or "U" in the last part of the agitator type description. E.g. -P400D3P has the letter "D" which means the flow direction is away from the drive unit. -P400U3P has the letter "U" which means the flow direction is towards the drive unit.

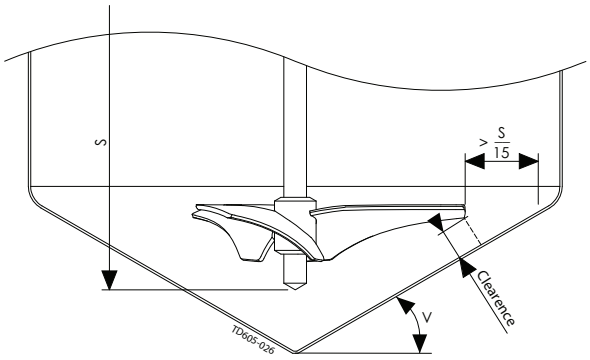
Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation - see section 3.3 Pre-use check.
The Agitator is for permanent fastening.
Make sure that the motor correspond to the environment.

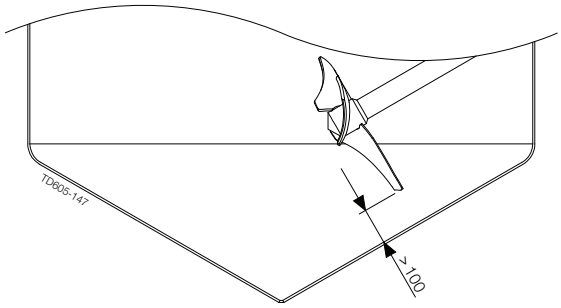
Step 5

Ensure the impeller is fitted, keeping minimum radial distance to the tank.

Further installation requirements regarding the position can be found in 6.1 Technical data to ensure optimum performance.

Clearence > S/15xsin(V)





NOTE!
In special cases Clearence can be reduce to 20mm+actual deflection, please advice with Alfa Laval.

Step 6

Align the shaft according to shaft alignment in section 6.1 Technical data.

NOTE!
When aligning shaft Alfa Laval offer guidance and direction.

WARNING!
Do **NOT** connect the power supply until installation is completed.

CAUTION!
Follow instructions in section 8.1 Drive Unit Instructions
Ensure that the rotation direction is according to nameplate.
Always perform pre-use check before operation. (See section 3.3 Pre-use check).

Note!
On closed tanks, Alfa Laval recommends installing a manhole circuit breaker, cutting power supply if hatch is open.

3 Installation

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation.
The Agitator is only designed to operate according to data given in section 6.1 Technical data
Check the rotation direction before operation

3.3 Pre-use check

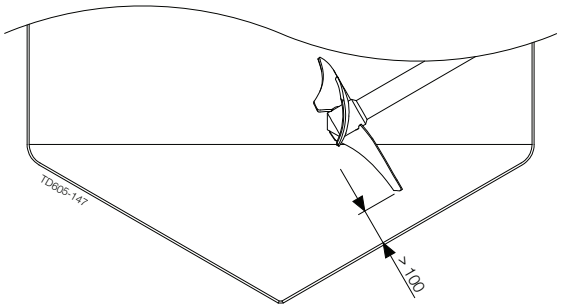
Never install the Agitator in environments which deviate from those given in section 6.1 Technical data
Always ensure that all alignment instructions given in section 6.1 Technical data are followed
Always make sure that the motor corresponds to the environment

Step 1
Go through section 2.4 Safety precautions.

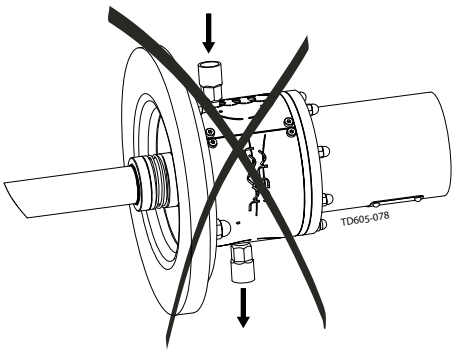
Step 2
Check the fastenings.

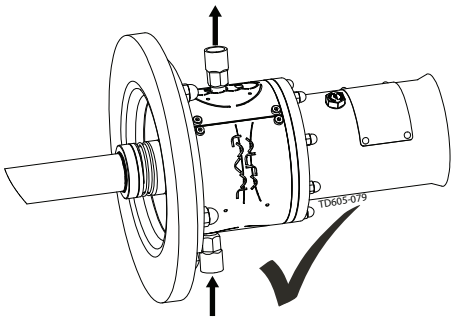
Step 3
Check o-ring and impeller are correctly fitted.

Step 4
Check impellers CANNOT collide with tank vessel at any point during a full rotation.



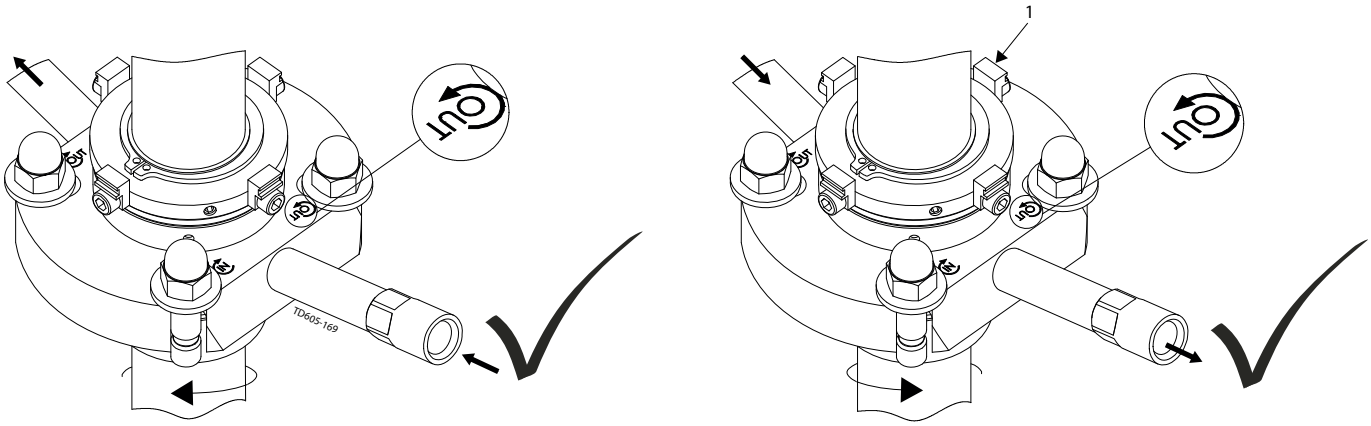
Step 5
Seal Type D
Ensure the sealing surfaces are not stuck together, by slowly turning shaft by hand.
Ensure that the seal never runs dry.
Ensure flush connections are installed in such way that air pockets are avoided.



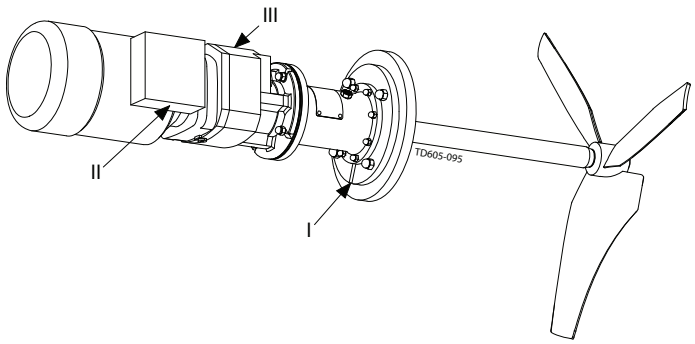


Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation.
The Agitator is only designed to operate according to data given in section 6.1 Technical data
Check the rotation direction before operation

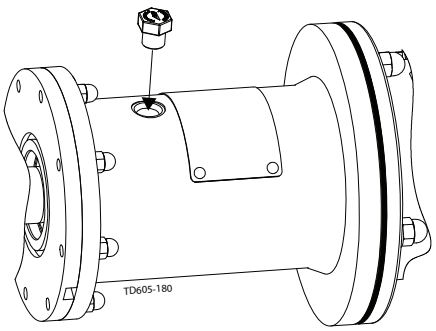
Step 6
Seal Type DC
Ensure the sealing surfaces are not stuck together, by slowly turning shaft by hand.
Ensure that the seal never runs dry.
Ensure flush connections are installed in such way that air pockets are avoided.
Ensure that the distance pieces on the seal are mounted as shown on illustration.



Step 7
Ensure that drain (I) is pointing downwards.
For gears with vent screw, ensure the vent is pointing upwards and the rubber plug is removed (III) (detail description see section 8.1 Drive Unit Instructions).
Position (II) refers to power cord entry location.



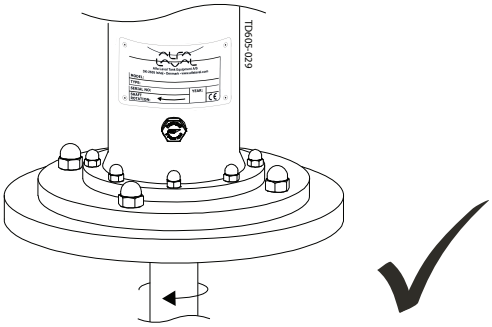
Step 8
(Only for agitators with bearing frame)
Ensure that the plug is refitted in the bearing frame

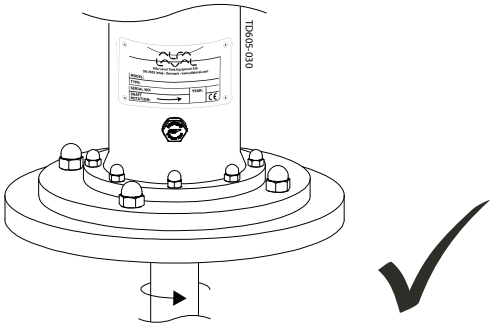


3 Installation

Study the instructions carefully and pay special attention to the warnings!
Always check the Agitator before operation.
The Agitator is only designed to operate according to data given in section 6.1 Technical data
Check the rotation direction before operation

Step 9
Ensure that the rotation direction is according to nameplate, before starting the Agitator.
Start and stop the Agitator momentarily.





Step 10
If frequency converter drive is used, it must be ensured NOT to operate continuously within +/-20% of critical oscillation speed. (The critical oscillation speed can be found in the supplied Alfa Laval quotation agreement. In any doubt please advise with Alfa Laval.)

Study the instructions carefully and pay special attention to warnings! ***Always*** *check the Agitator before operation. – See 3.3 Pre-use check.*
Alfa Laval recommend a soft starter for the Agitator to reduce the load on tank and Agitator. For operation instructions from suppliers see 8 Appendix.

4.1 Operation/Control

If deviation from normal operation immediately switch off the Agitator and find the cause of failure (see section 4.2 Troubleshooting).
The Agitator is designed to max 5 starts per hour.

Inspect the Agitator regularly

	Inspect / Clean / Lubricate			
	Supplier instruction	Weekly	Monthly	Half-yearly
Drive unit				
Motor	x			
-Clean surfaces - to avoid overheating		x		
Gear	x			
-Clean vent screw (if any)		x		
-Check for oil leakage		x		
Flange				
Clean drain			x	
Sealing				
Mechanical seal				
-NOT flushed: S1, S2, S3			x	
-Flushed: DC, D	x		x	
Bearing frame				
Clean PreVent screw		x		
Check spider clearance				x
Check gaskets				x
Lubricate radial seals				x
Impeller device				
Sticky media				
-Clean impelle device			x	
Abrasive media				
-Check blade thickness*			x	
Check fastening of pointed set screws			x	

* If any suspicion of reduction in blade thickness, contact Alfa Laval and inform serial no stated on the name plate.

4 Operation

Study the instructions carefully and pay special attention to warnings! Always check the Agitator before operation. – See section 3.3 Pre-use check.
Alfa Laval recommend a soft starter for the Agitator to reduce the load on tank and Agitator. For operation instructions from suppliers see 8 Appendix

4.2 Troubleshooting

Problem	Cause/result	Remedy
Not starting		
Drive unit	- Defect - Fault at power supply	Dismantle drive unit, check for correct rotation. Replace drive unit Check power supply connection. Check voltage and frequency correspond with name plate. Check frequency converter adjustment correspond to name plate
Agitator	- Obstructed	Check Agitator can rotate freely without stricking anything.
Bearing frame		Ensure that retainer bolt has been removed.
Vibrations		
Impeller device	- Damaged - Unbalanced impeller - Damage to shaft seal	Contact Alfa Laval Clean impeller device Replace sealing
Shaft	- Damaged	Contact Alfa Laval
Other	- Deviation from normal operation - Increased / decreased temperature	Operation circumstances must equal to those it was designed for.[1]
Unuasual noise		
Bearing frame	- Bearing gap - Wear or damaged bearings	Replace bearings and all gaskets in bearing frame immediately Replace bearings and all gaskets in bearing frame
Drive unit	- Defect - Bearing gap - Increased / decreased power - No grease	Replace drive unit Renovate or change the drive unit immediately Switch of power supply Replace drive unit
Sealing	- Wear sealing - Seal are not flushed - Seal surfaces stick together	Replace sealing Replace sealing and ensure that the seal never run dry Separate surfaces carefully and check correct rotating
Other	- Deviation from normal operation - Circuit overload	Operation circumstances must be equal to those it was designed for.[1] Operation cirucmstances must be equal to those it was designed for.[1]
Leakage		
Gear	- Oil leakage	Renovate or change the gear immediately
Sealing	- CIP fluid or other	Replace sealing
Continuously breakdown		
Drive unit	- Defect - Too high frequency	Replace motor Regulate frequency down
Other	- Deviation from normal operation	Operation cirucmstances must be equal to those it was designed for.[1]
Performance		
Drive unit Agitator Other	- Wrong frequency - Reverse direction - Deviation from normal operation	Check frequency connection. Inspect the Agitator carefully Operation cirucmstances must be equal to those it was designed for.[1]

[1] The circumstances the agitator is designed for can be found in the supplied Alfa Laval quotation agreement. Otherwise, please advise with Alfa Laval.

Study the instructions carefully and pay special attention to warnings! Always check the Agitator before operation. – See section 3.3 Pre-use check.
Alfa Laval recommend a soft starter for the Agitator to reduce the load on tank and Agitator. For operation instructions from suppliers see 8 Appendix

4.3 Cleaning - recommendations

Ensure the drain in flange is not clogged up, by cleaning drain regularly

Ensure that all surfaces in contact with product are totally clean in order not to contaminate the product.
Pay special attention to:
- Impeller device surfaces
- Surfaces between impeller devices and shaft
- Surfaces around sealing
- Surfaces around weldings

CAUTION!
Mechanical seals are designed for cleaning in place (CIP) and sterilising in place (SIP).
CIP = Cleaning In Place. SIP = Sterilising In Place.

Always rinse well with clean water after cleaning.

5 Maintenance

Study the instructions carefully and pay special attention to warnings! Always check the Agitator before operation. – See section 3.3 Pre-use check.
Alfa Laval recommend a soft starter for the Agitator to reduce the load on tank and Agitator. For operation instructions from suppliers see 8 Appendix

Maintenance of the Agitator should only be performed by authorized personnel
For maintenance instructions from suppliers see 8 Appendix.
Ensure totally clean surfaces during maintenance.

If possible, **always** dismount the Agitator from tank before dismantling it.
For lifting instruction, please refer to chapter 3 Installation.

Always read the technical data thoroughly. (See chapter 6 Technical Data)
Always ensure that the mounting is according to the assembly drawing in chapter 7 Part drawings, part lists and service kits.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts
Always disconnect the power supply when servicing the Agitator.
Always use proper tools.
Always replace sealing elements before reassembling.

WARNING!
Follow the dismantling and assembly instructions to the letter.
After maintenance, section 3.3 Pre-use checkmust be read thoroughly before operation.

NOTE!
All scrap must be stored/disposed of in accordance with current rules/directives.
Use original Alfa Laval spare parts.

For maintenance instructions from suppliers see 8 Appendix
***Always** ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits.*
Ensure totally clean surfaces during mounting.
***Always** refer to tightening torques in section 6.1 Technical data when tightening bolts.*

5.1 General Maintenance

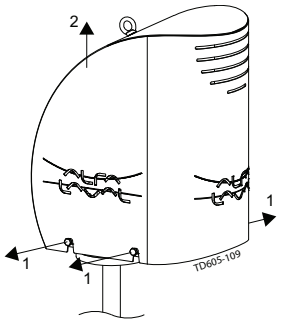
	Replace every:				
	500 hour or yearly	1000 hour or yearly	3000 hour or yearly	3000 hour or every 3rd year	6000 hour or every 3rd year
Sealing					
Mechanical seal					
-NOT flushed: **S1, S2, S3**				x	
-Flushed, rpm < 500: DC, D			x		
-Flushed, rpm > 500: DC, D		x			
Bearing frame					
Spider type coupling (if any)					x
Static seals					x
Radial seals			x		
Bearings, rpm < 700					x
Bearings, rpm > 700				x	

5 Maintenance

For maintenance instructions from suppliers see 8 Appendix
***Always** ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits.*
Ensure totally clean surfaces during mounting.
***Always** refer to tightening torques in section 6.1 Technical data when tightening bolts.*

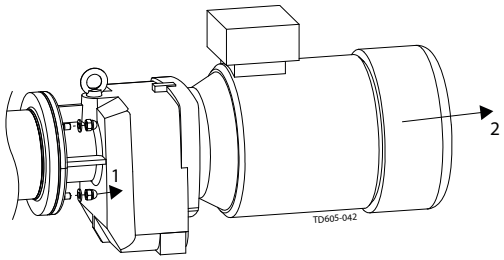
5.2 Replacement of drive unit (with bearing frame)

Step 1
Remove shroud, if any.



Step 2
Loosen cap nuts.

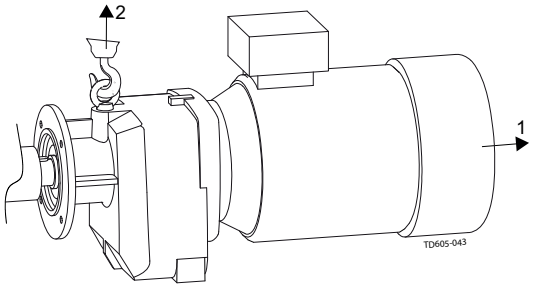
CAUTION!
If dismantling motor from gear:
Follow supplier instructions.
Ensure that the gear oil is contained.
A cog wheel may be mounted onto the motor shaft.



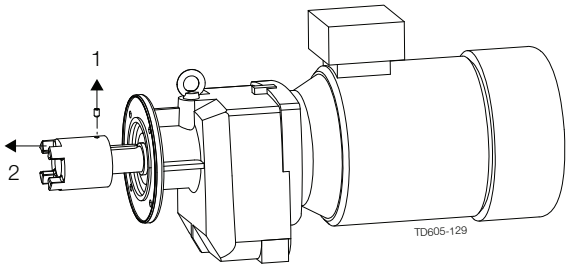
Step 3
Release the gear motor from the Agitator.

CAUTION!
There is a spider type coupling mounted onto the gear motor shaft.

Step 4
Lift up the drive unit and pull it away.



Step 5
1. Loosen coupling screws.
2. Pull the coupling of the gear motor shaft.

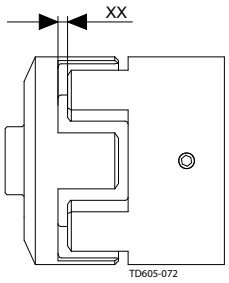


For maintenance instructions from suppliers see 8 Appendix
***Always** ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits.*
Ensure totally clean surfaces during mounting.
***Always** refer to tightening torques in section 6.1 Technical data when tightening bolts.*

Step 6
Replace drive unit.
Mount coupling

NOTE!
Coupling part can be heated to 80-120°C for easier mounting onto gear motor shaft

CAUTION!
Ensure that the axial position of the coupling is according to illustration. The value XX is to be found in section 6.1 Technical data.



Step 7
Replace spider if necessary.
Use Loctite® 243 before fastening screws.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

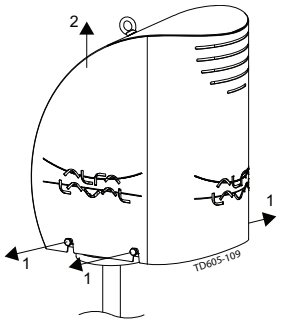
Step 8
Mount drive unit reverse as dismantling

5 Maintenance

For maintenance instructions from suppliers see 8 Appendix
***Always** ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits.*
Ensure totally clean surfaces during mounting.
***Always** refer to tightening torques in section 6.1 Technical data when tightening bolts.*

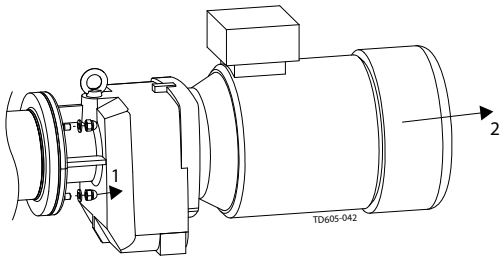
5.3 Replacement of drive unit (without bearing frame)

Step 1
Remove shroud, if any.

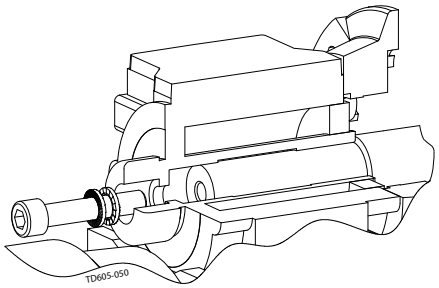


Step 2
Before dismantling drive unit, please see instructions in 5.10 Replacement of shaft seal, type D to 5.14 Replacement of shaft seal, type S3

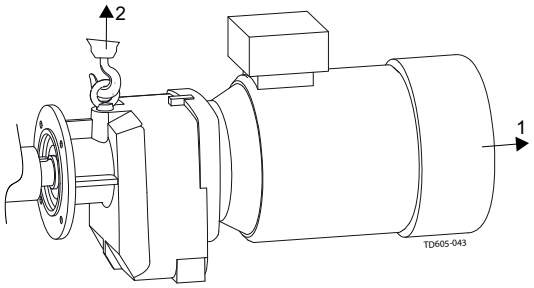
Step 3
Loosen cap nuts.
CAUTION!
If dismantling motor from gear:
Follow supplier instructions
Ensure that the gear oil is contained
A cog wheel may be mounted onto the motor shaft.



Step 4
Release the gear motor from the Agitator. Refer to supplier instructions
CAUTION!
There is a Nord-lock® washer mounted on the gear fastening the shaft



Step 5
Lift up the drive unit and pull it away.



Step 6
Replacement drive unit.

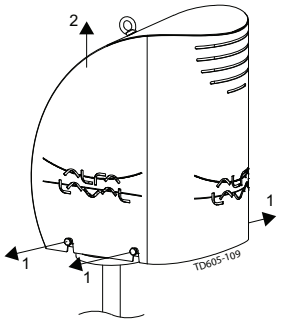
Step 7
Use Loctite® 243 before fastening screws.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

Step 8
Mount drive unit reverse as dismantling.

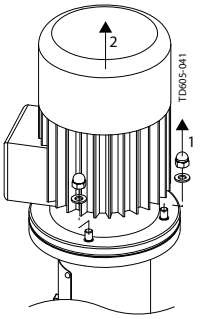
For maintenance instructions from suppliers see 8 Appendix
***Always** ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits.*
Ensure totally clean surfaces during mounting.
***Always** refer to tightening torques in section 6.1 Technical data when tightening bolts.*

5.4 Replacement of drive unit (Motor and shaft unit)

Step 1
Remove shroud, if any.



Step 2
Loosen cap nuts.



Step 3
Release the motor from the Agitator.

CAUTION!
Motor and shaft are one complete unit.

Step 4
Lift up the drive unit and pull it away.

Step 5
Replace drive unit.

Step 6
Use Loctite® 243 before fastening screws.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

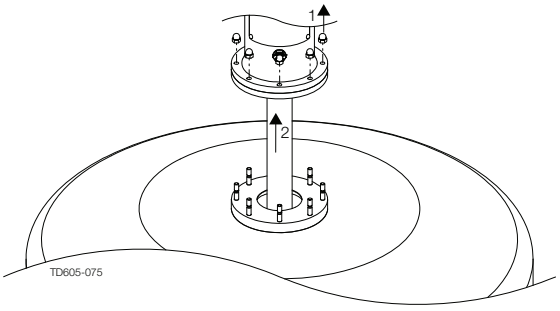
Step 7
Mount drive unit reverse as dismantling.

5 Maintenance

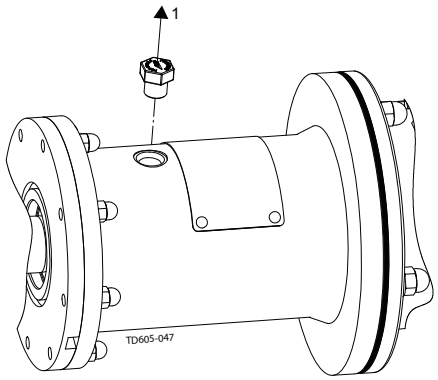
Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

5.5 Dismantling and mounting shaft (only for bearing frame)

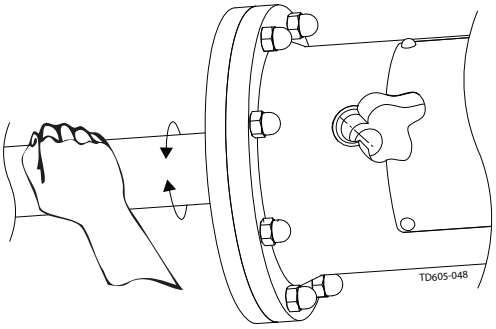
Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator.



Step 2
1. Dismantle drive unit as described in section 5.2 Replacement of drive unit (with bearing frame).
2. Remove PreVent valve.



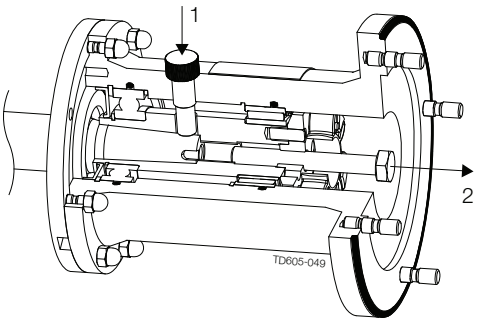
Step 3
Looking trough PreVent valve hole, rotate shaft until shaft locking hole aligns.



Step 4
1. Mount retainer bolt tool for shaft locking.
2. Remove centre bolt.

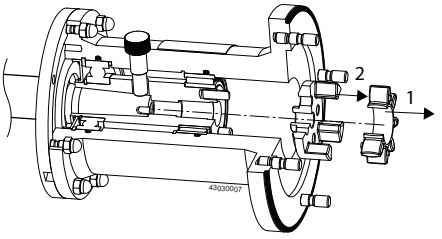
NOTE!

Extra retainer bolt tool can be acquired if needed. See section 7.10 Tools



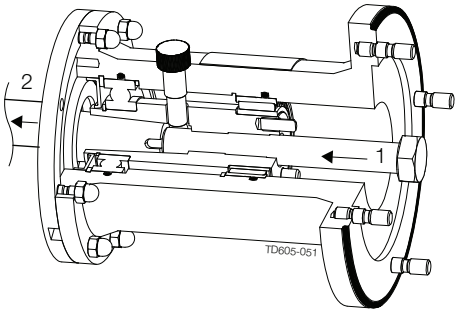
Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

Step 5
Remove spider and coupling part.



Step 6
Dismantle shaft by mounting extractor bolt tool
Keep turning extractor bolt until shaft is forced from the bearing frame.

NOTE!
Extra bolt tool can be acquired if needed. See section 7.10 Tools.



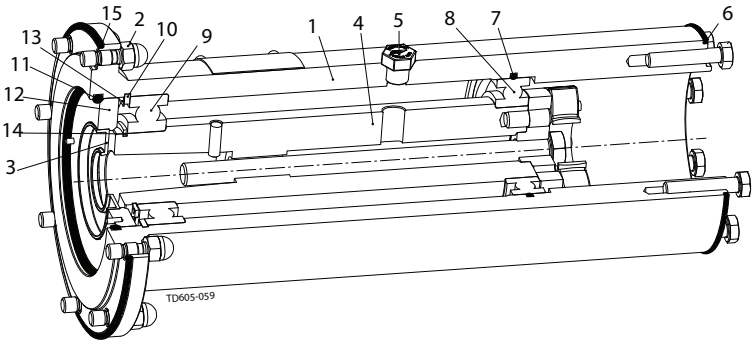
Step 7
Mount shaft reverse as dismantling

CAUTION!
Ensure that oil trap ring, if any, is refitted correct during mounting.

5 Maintenance

Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

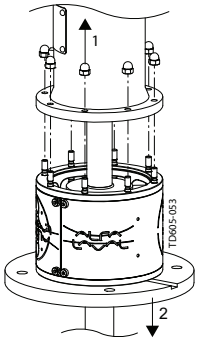
5.6 Replacement of bearings, type B25/30, B35, B35/40, B45, B45/50, B55, B55/60



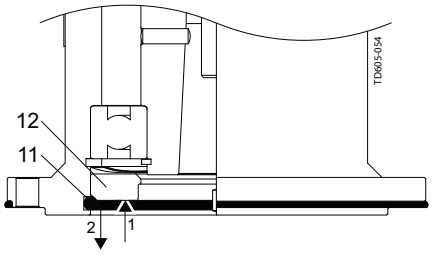
NOTE!
Positions referred to in following instructions can be seen in the above illustration.

Step 1
Dismantle shaft as described in section 5.5 Dismantling and mounting shaft (only for bearing frame).

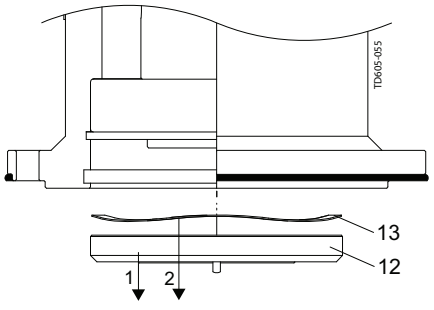
Step 2
1. Remove cap nuts (2).
2. Remove lantern from bearing frame.



Step 3
1. Push cover (12) into bearing frame.
2. Remove o-ring (11).

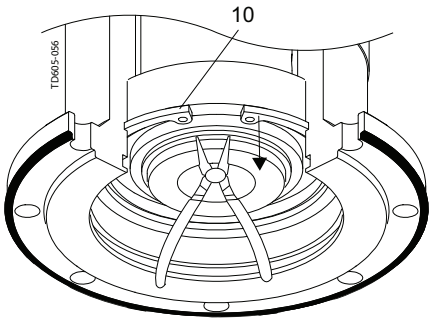


Step 4
Remove cover (12) including radial seal (3) and spring (13).

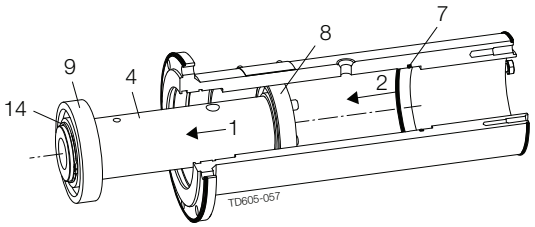


Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

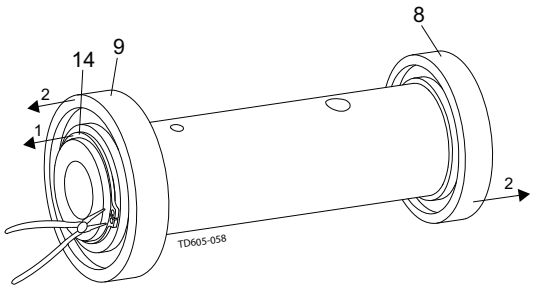
Step 5
Remove outer circlip (10) carefully. Use suited pliers.



Step 6
1. Pull out drive shaft (4) including bearings (8, 9).
2. Remove o-ring (7)



Step 7
1. Remove inner circlip (14) carefully. Use suited pliers.
2. Remover bearings (8, 9).



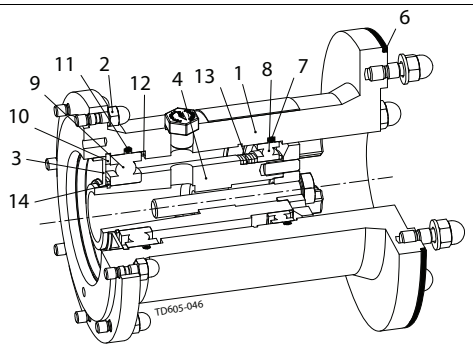
Step 8
1. Replace bearings (8, 9) and o-rings (6, 7, 11, 15).
2. Assembly of bearing frame is reverse as dismantling.

CAUTION!
Only apply force to inner bearing rings when mounting bearings on drive shaft.
Only apply force to outer bearing rings when mounting drive in bearing frame.

5 Maintenance

Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

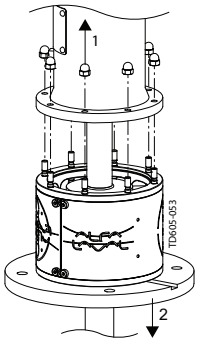
5.7 Replacement of bearings, type BC160DH



NOTE!
Positions referred to in following instructions can be seen in the above illustration.

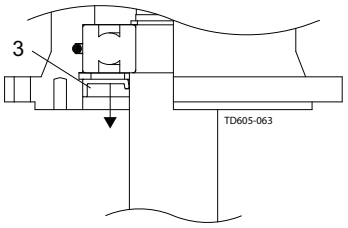
Step 1
Dismantle shaft as described in section 5.5 Dismantling and mounting shaft (only for bearing frame).

Step 2
1. Remove cap nuts (2).
2. Remove lantern from bearing frame

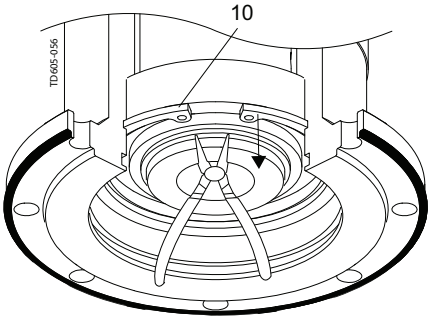


Step 3
Remove radial seal (3).

NOTE!
Alfa Laval recommends replacing the radial seal.

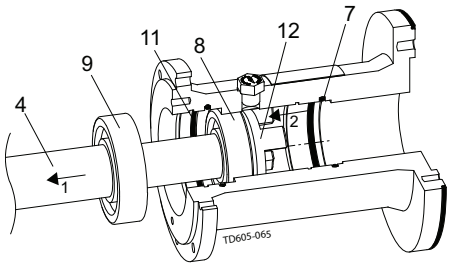


Step 4
Remove outer circlip (10) carefully. Use suited pliers.

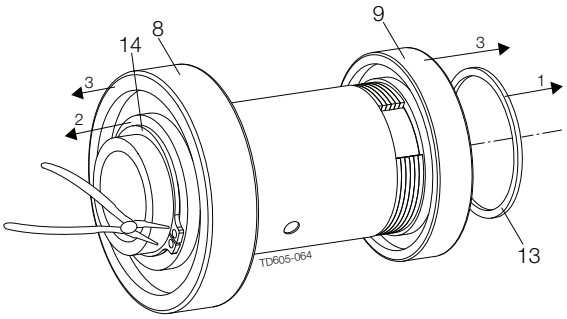


Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

Step 5
1. Pull out drive shaft (4) including bearings (8, 9).
2. Remove o-ring (7).



Step 6
1. Remove spring ring (13).
2. Remove inner circlip (14) carefully. Use suited pliers.
3. Remove bearings (8, 9).



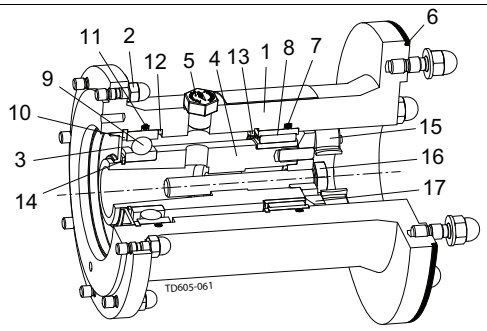
Step 7
1. Replace bearings (8, 9) and o-rings (6, 7, 11).
2. Assembly of bearing frame is reverse as dismantling.

CAUTION!
Only apply force to inner bearing rings when mounting bearings on drive shaft.
Only apply force to outer bearing rings when mounting drive shaft in bearing frame.

5 Maintenance

Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

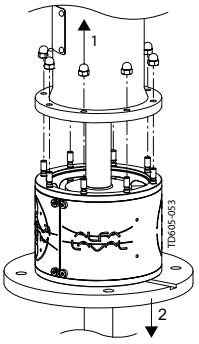
5.8 Replacement of bearing, type BC160D



NOTE!
Positions referred to in following instructions can be seen in the above illustration.

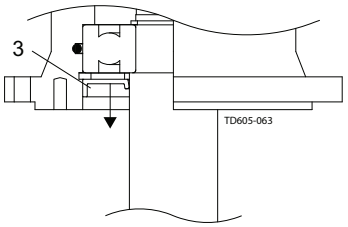
Step 1
Dismantle shaft as described in section 5.5 Dismantling and mounting shaft (only for bearing frame).

Step 2
1. Remove cap nuts (2).
2. Remove lantern from bearing frame

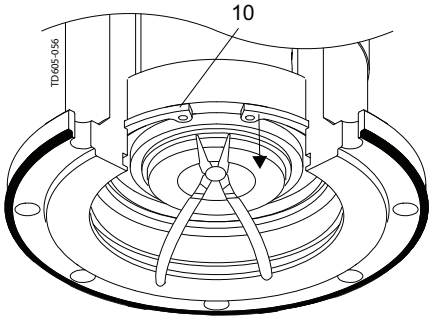


Step 3
Remove radial seal (3).

NOTE!
Alfa Laval recommends replacing the radial seal.



Step 4
Remove outer circlip (10) carefully. Use suited pliers.

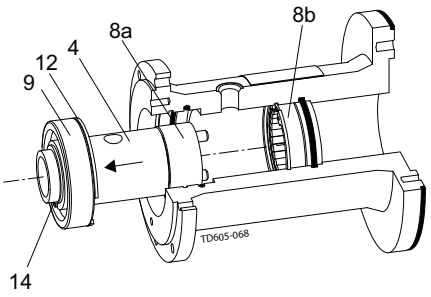


Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

Step 5

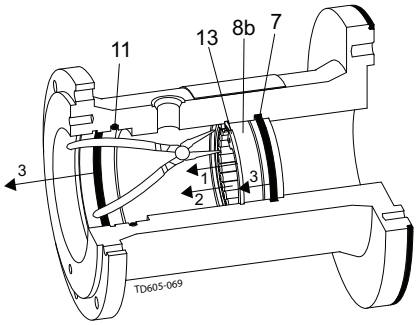
1. Pull out drive shaft (4) including bearings (pos 8a, 9).

NOTE!
Outer bearing ring (8b) should stay in bearing frame



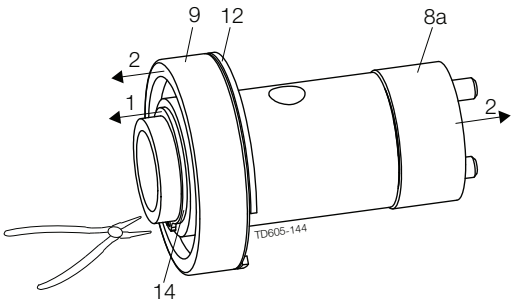
Step 6

1. Remove upper circlip (13) carefully. Use suited pliers
2. Pull out the outer bearing ring (8b).
3. Remove o-rings (7, 11).



Step 7

1. Remove inner circlip (14) carefully. Use suited pliers.
2. Remove bearings (8a, 9)



Step 8

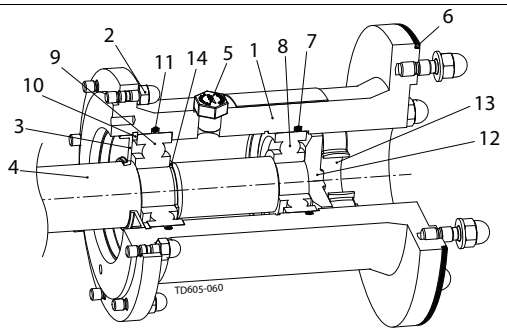
1. Replace bearings (8, 9) and o-rings (6, 7, 11).
2. Assembly of bearing frame is reverse as dismantling.

CAUTION!
Only apply force to inner bearing rings when mounting bearings on drive shaft.
Only apply force to outer bearing rings when mounting drive shaft in bearing frame

5 Maintenance

Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

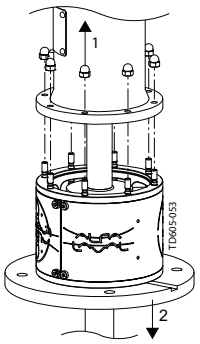
5.9 Replacement of bearings type BC160



NOTE!
Positions referred to in following instructions can be seen in the above illustration.

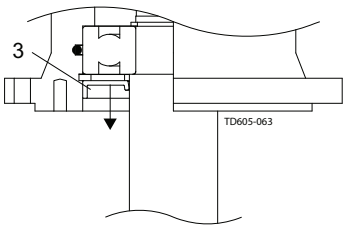
Step 1
Dismantle shaft as described in section 5.2 Replacement of drive unit (with bearing frame)

Step 2
1. Remove cap nuts (2).
2. Remove lantern from bearing frame

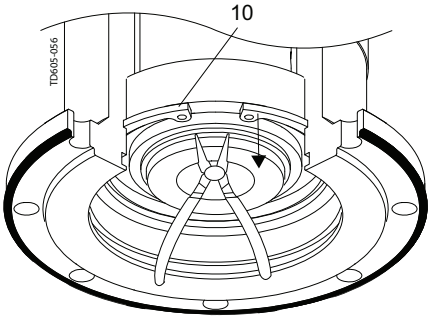


Step 3
Remove radial seal (3).

NOTE!
Alfa Laval recommends replacing the radial seal.

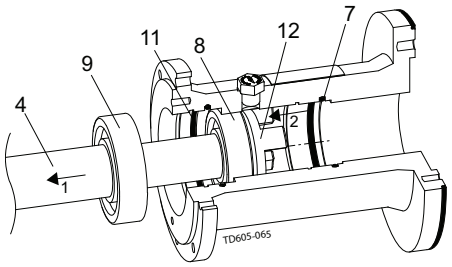


Step 4
Remove outer circlip (10) carefully. Use suited pliers.

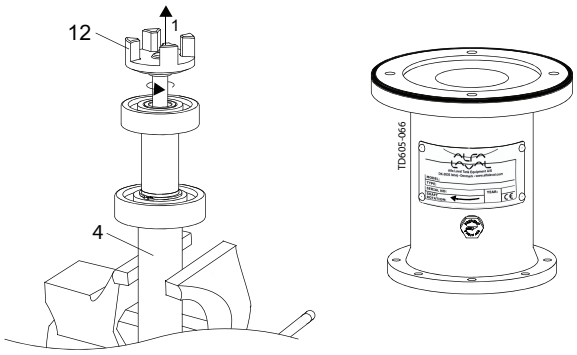


Always ensure that mounting is according to assembly drawing in chapter 7 Part drawings, part lists and service kits
Ensure totally clean surfaces during mounting.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.
If possible, always dismantle the Agitator from the tank before dismounting any parts (go to Step 2).

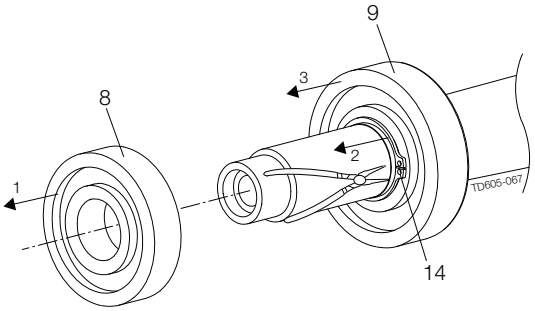
Step 5
1. Pull out drive shaft (4) including bearings (pos 8, 9).
2. Remove o-rings (7, 11).



Step 6
1. Secure shaft (4), without causing surface damage to it.
2. Remove coupling (12) by turning it the opposite direction indicated by arrow on nameplate



Step 7
1. Remove bearing (8).
2. Remove inner circlip (14) carefully. Use suited pliers.



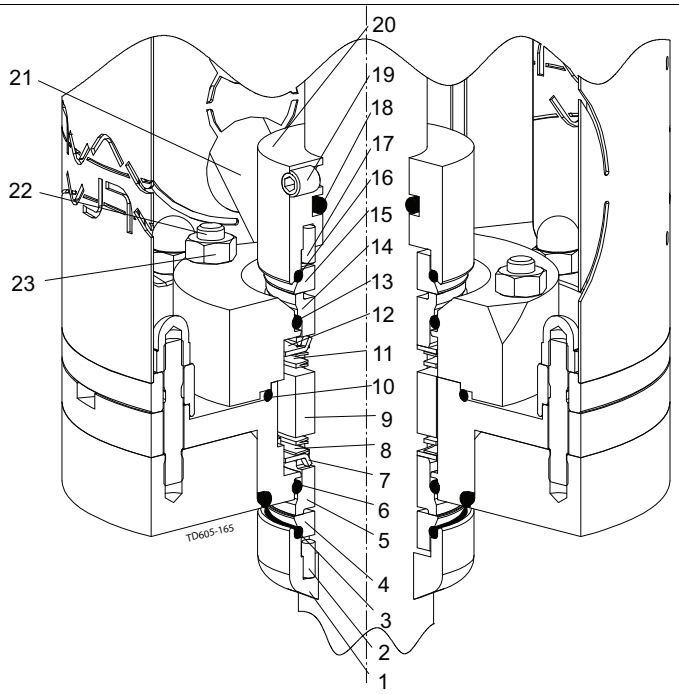
Step 8
1. Replace bearings (8, 9) and o-rings (6, 7, 11).
2. Assembly of bearing frame is reverse as dismantling.

CAUTION!
Only apply force to inner bearing rings when mounting bearings on drive shaft.
Only apply force to outer bearing rings when mounting drive shaft in bearing frame

5 Maintenance

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

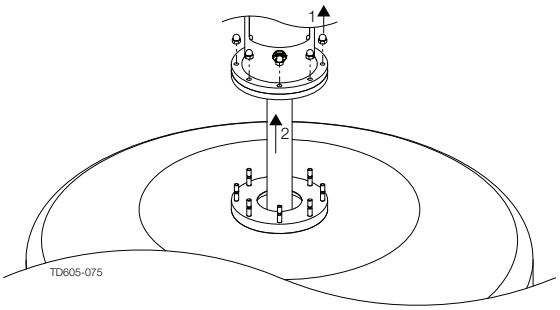
5.10 Replacement of shaft seal, type D



NOTE!
To replace seals easier, use detergent.
Ensure subsequent to seal replacement, that all seal faces are totally clean, using alcohol.

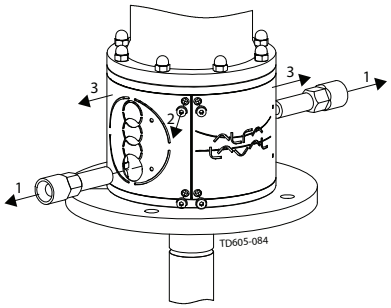
NOTE!
If possible, **always** dismantle the Agitator from the tank before dismounting any parts.

Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator

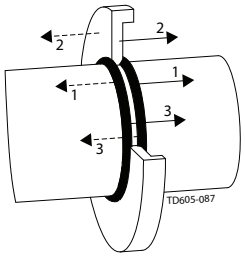


Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

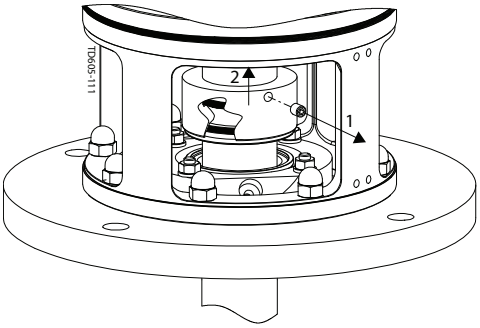
Step 2
1. Remove flush connections.
2. Remove guards from lantern.



Step 3
Move oil trap ring and o-rings, if any, along the shaft.



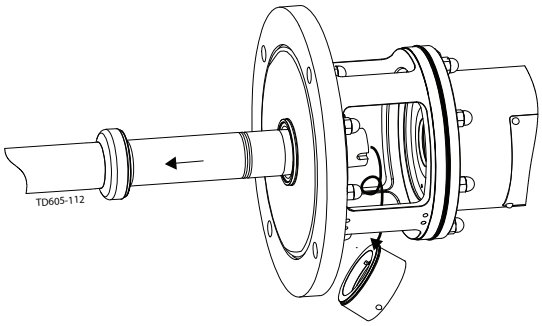
Step 4
1. Loosen pointed screw.
2. Move the rotary seal housing and rotary seal part carefully along the shaft.



Step 5
Dismantle drive unit as described in section 5.2 Replacement of drive unit (with bearing frame).

Step 6
1. Dismantle shaft as described in section 5.3 Replacement of drive unit (without bearing frame) or .
2. Remove shaft and rotary seal parts carefully, avoiding contact.

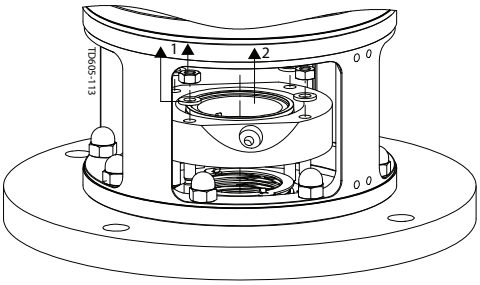
CAUTION!
Ensure rotary seal housing and rotary seal part do NOT fall when shaft is removed.



5 Maintenance

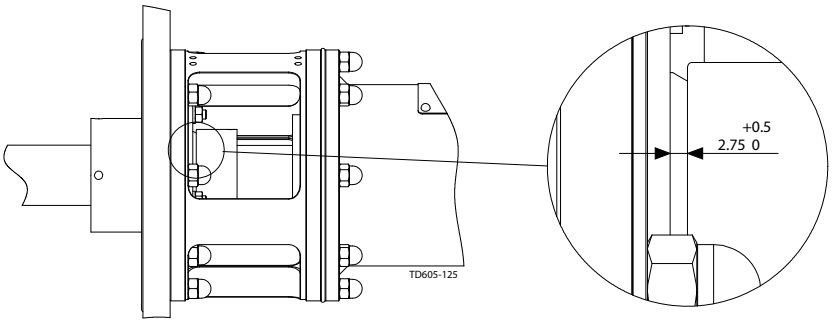
Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

Step 7
1. Remove nuts and washers, securing stationary seal housing.
2. Remove stationary seal housing



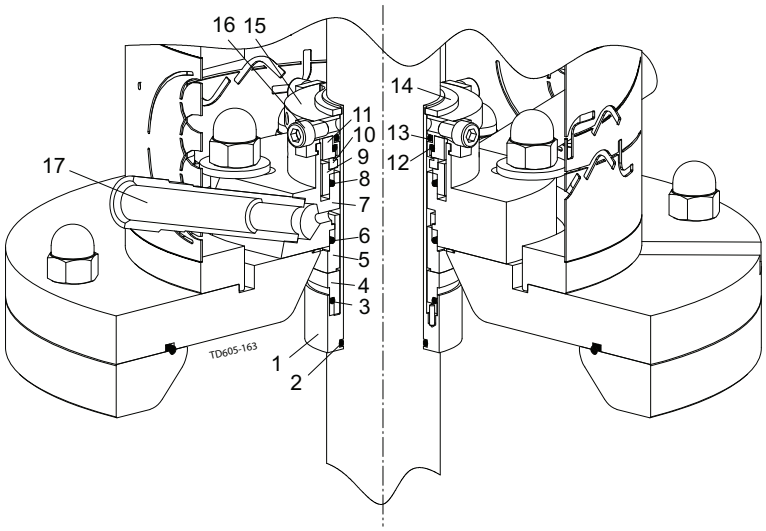
Step 8
1. Replace all seal parts.
2. Assemble Agitator reverse as dismantling.

CAUTION!
Ensure clearance between rotary and stationary seal housing is 2,75 mm.



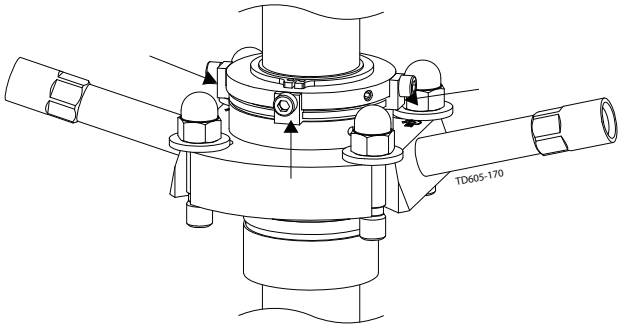
Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

5.11 Replacement of shaft seal, type DC

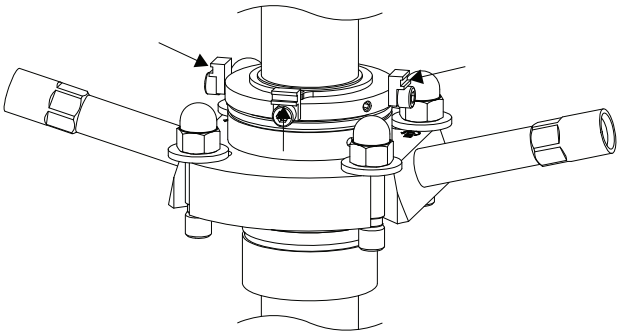


NOTE!
To replace seals easier, use detergent.
Ensure subsequent to seal replacement, that all seal faces are totally clean, using alcohol.

NOTE!
For seal renovation, please advise with Alfa Laval before during so. The renovation must be done by trained personnel in a clean environment.



During mounting/dismounting



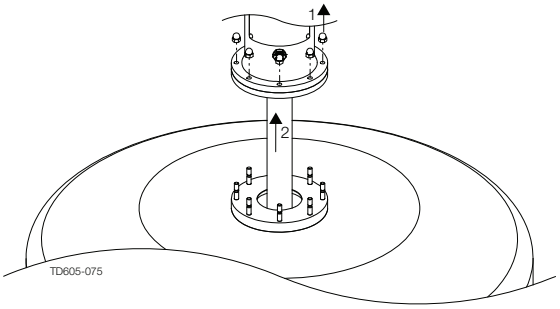
Before start

5 Maintenance

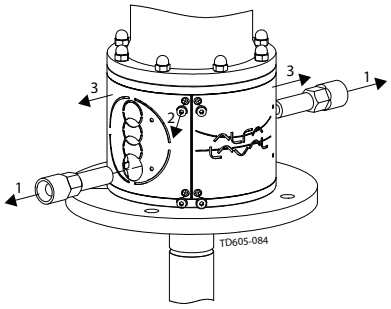
Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

NOTE!
If possible, always dismantle the Agitator from the tank before dismounting any parts.

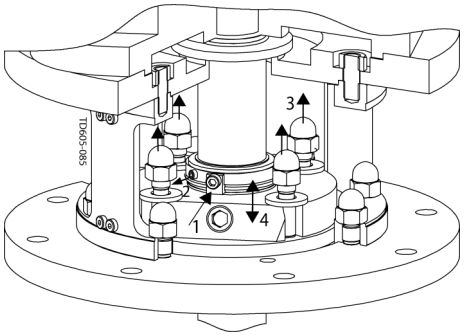
Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator



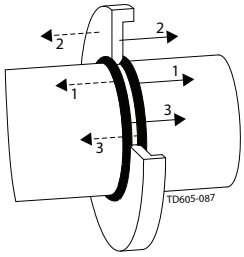
Step 2
1. Remove flush connections.
2. Remove guards from lantern.



Step 3
1. Mount 4 off distance pieces.
2. Loosen pointed screws.
3. Loosen cap nut, securing the seal
4. Ensure the seal can move along the shaft (up to 10 mm).

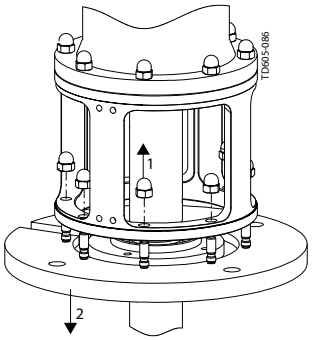


Step 4
Move oil trap ring and o-rings, if any, along the shaft.



Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

Step 5
1. Remove cap nuts, securing mounting flange.

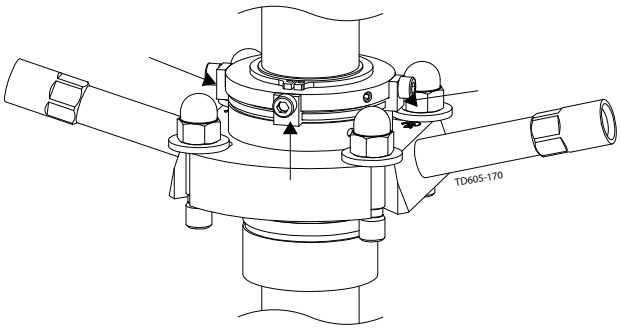


Step 6
Dismantle shaft, as described in section 5.3 Replacement of drive unit (without bearing frame) or 5.5 Dismantling and mounting shaft (only for bearing frame), and carefully remove lantern.

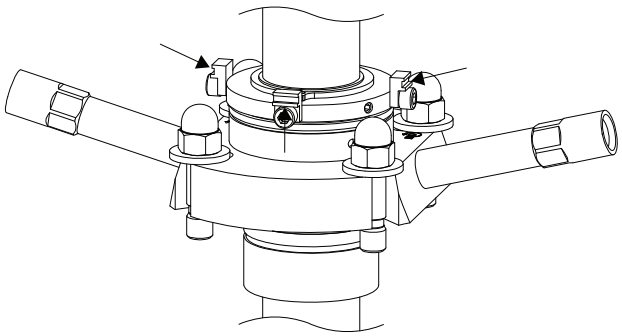
Step 7
Lift lantern and drive unit flange.

Step 8
Remove DC seal.

Step 9
1. Replace sealing.
2. Assemble Agitator reverse as dismantling.



During mounting / dismounting

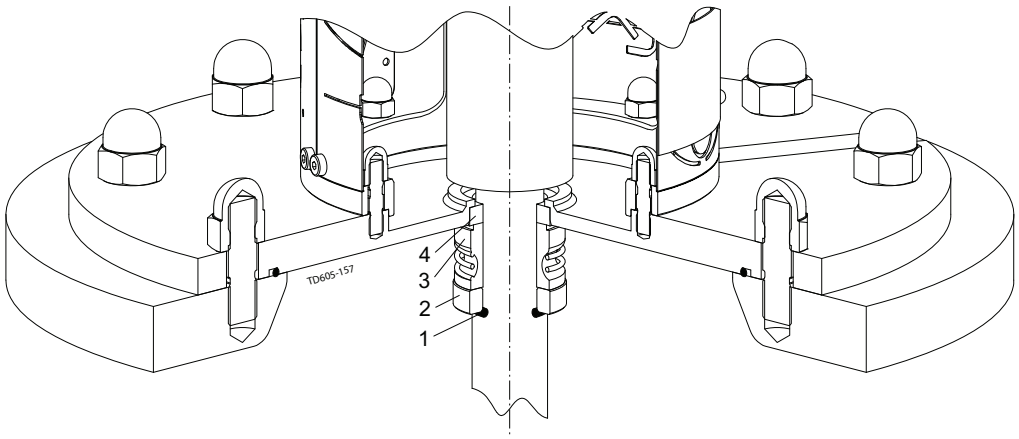

Before start

NOTE!
Ensure distance pieces are oriented correctly during mounting or dismounting.

5 Maintenance

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

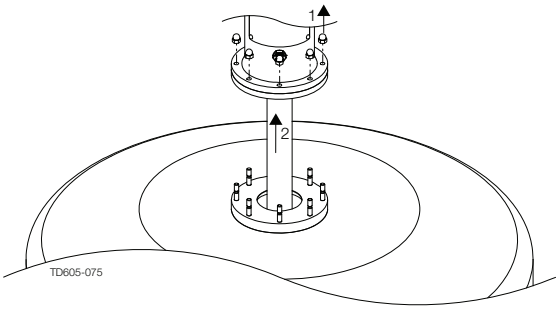
5.12 Replacement of shaft seal, type S1



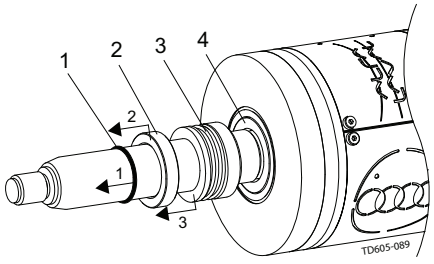
NOTE!
To replace seals easier, use detergent.
Ensure subsequent to seal replacement, that all seal faces are totally clean, using alcohol.

NOTE!
If possible, **always** dismantle the Agitator from the tank before dismounting any parts.

Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator.



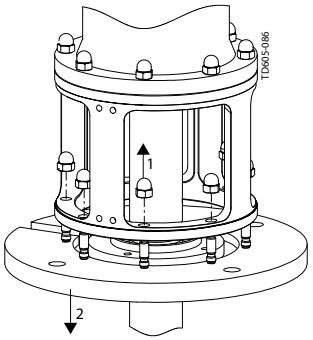
Step 2
1. Move o-ring (1) along the shaft.
2. Move counter ring along the shaft (2).
3. Move rotary seal ring along the shaft (3).



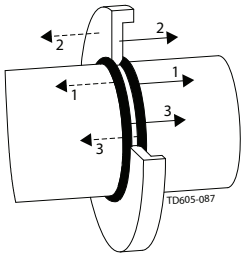
Step 3
Remove guards from lantern.

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

Step 4
1. Remove cap nuts (if still here).
2. Move the mounting flange, including stationary seal ring (4), carefully along the shaft.

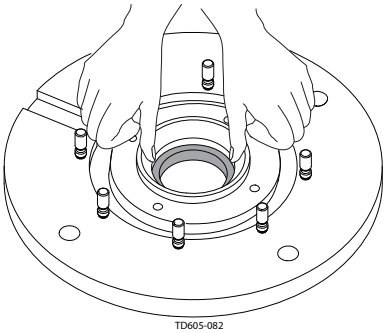


Step 5
Move oil trap ring and o-rings, if any, along the shaft.



Step 6
If necessary, dismantle drive unit as described in section 5.2 Replacement of drive unit (with bearing frame).

Step 7
Push stationary seal ring out of the mounting flange (4).



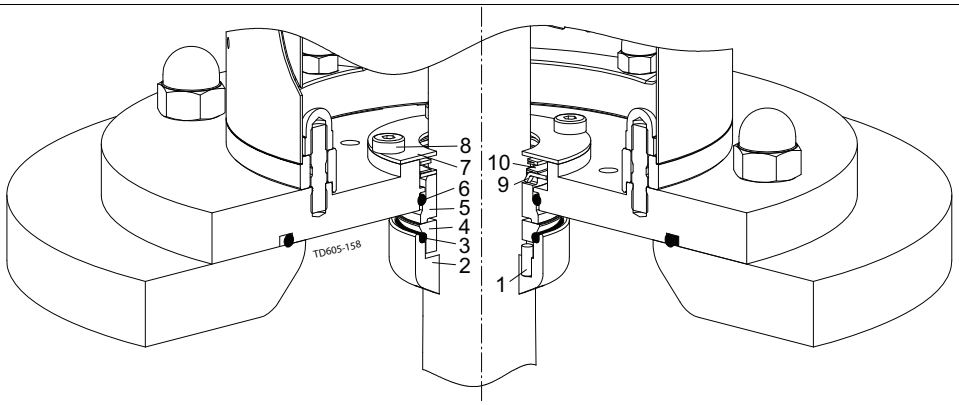
Step 8
Remove all seal parts from shaft.

Step 9
1. Replace all seal parts.
2. Assemble Agitator reverse as dismantling.

5 Maintenance

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

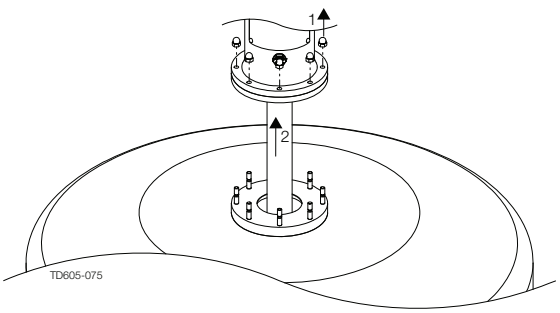
5.13 Replacement of shaft seal, type S2



NOTE!
To replace seals easier, use detergent.
Ensure subsequent to seal replacement, that all seal faces are totally clean, using alcohol.

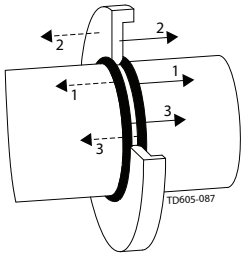
NOTE!
If possible, **always** dismantle the Agitator from the tank before dismounting any parts.

Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator



Step 2
Remove guards from lantern.

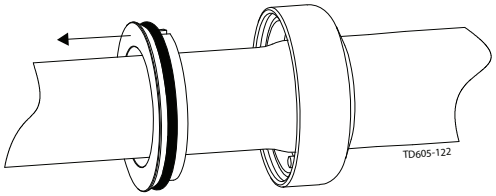
Step 3
Move oil trap ring and o-rings, if any, along the shaft.



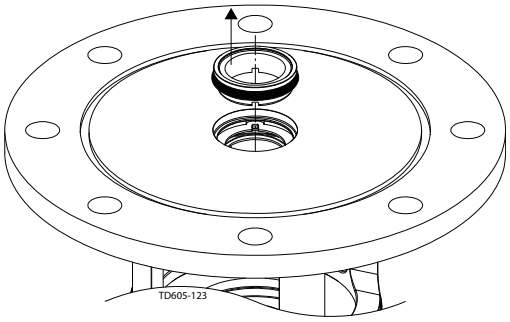
Step 4
Remove carefully the shaft without dismantling drive unit.

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

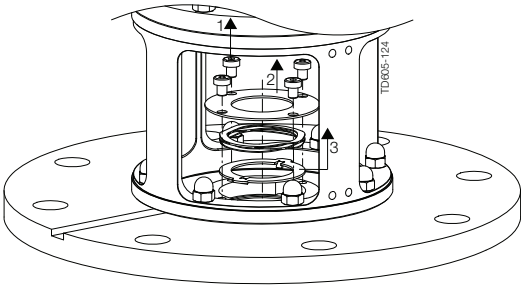
Step 5
Remove rotary seal part from shaft.



Step 6
Remove stationary seal part and o-ring from mounting flange.



Step 7
1. Remove screws.
2. Remove retainer ring.
3. Remover spring and stationary drive ring.

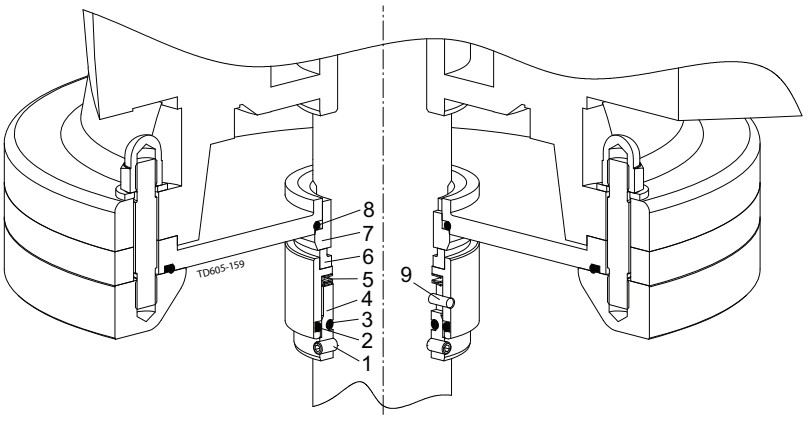


Step 8
1. Replace all seal parts.
2. Assemble Agitator reverse as dismantling.

5 Maintenance

Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

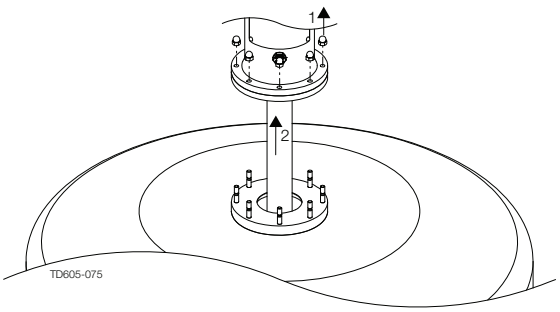
5.14 Replacement of shaft seal, type S3



NOTE!
To replace seals easier, use detergent.
Ensure subsequent to seal replacement, that all seal faces are totally clean, using alcohol.

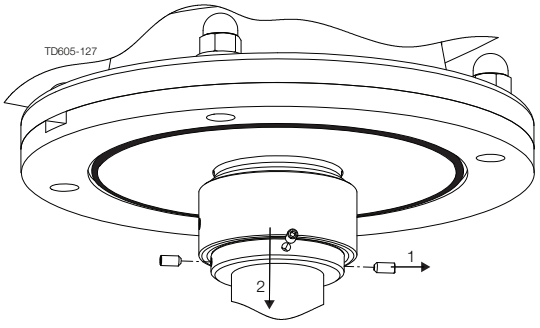
NOTE!
If possible, **always** dismantle the Agitator from the tank before dismounting any parts.

Step 1
1. Dismantle Agitator from welding flange.
2. Lift up Agitator



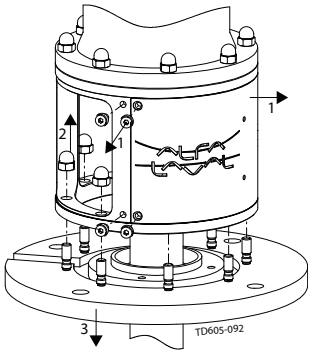
Step 2
1. Loosen pointed screws, securing rotary seal housing onto the shaft.
2. Move the seal housing, including rotary seal part, by pulling it carefully along the shaft, avoiding contact

NOTE!
Use mild detergent to reduce friction.

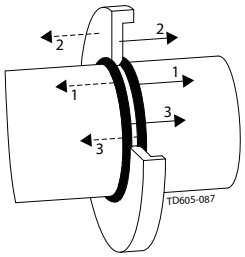


Always ensure that mounting is according to assembly drawing in.
Ensure totally clean surfaces during seal replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

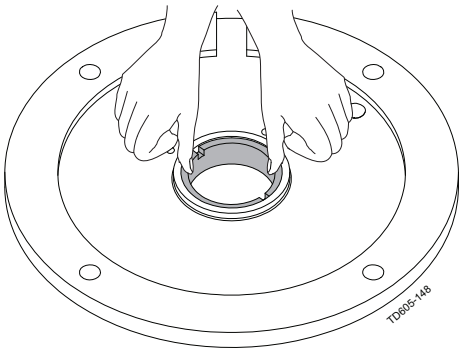
Step 3
1. Remove guards from lantern.
2. Remover cap nuts
3. Move the mounting flange, including stationary seal ring, carefully along the shaft, avoiding contact.



Step 4
Move oil trap ring and o-rings, if any, along the shaft.



Step 5
1. Push stationary seal ring out of the mounting flange.



Step 6
Remove all seal parts from shaft.

Step 7
1. Replace all seal parts.
2. Assemble Agitator reverse as dismantling.

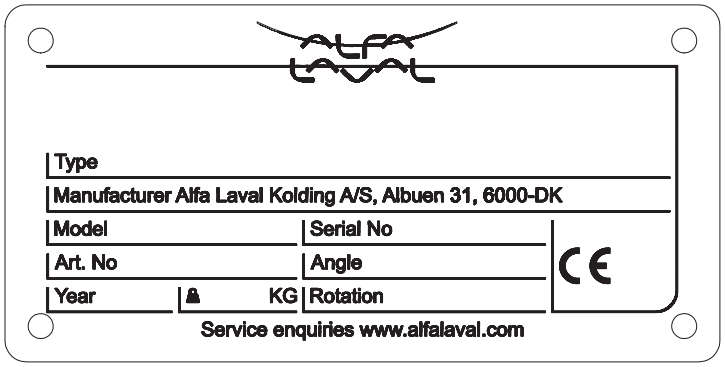
6 Technical Data

All dimenstions in mm unless otherwise stated.

6.1 Technical data

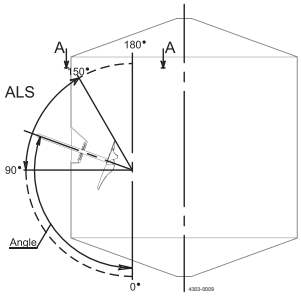
The Alfa Laval agitator is available in various configurations and is configured to solve the specific application. Therefore specific information like weight, size, critical oscillation speed and duties can be found in the supplied Alfa Laval quotation agreement.

Important installation information about weight and mounting angle can be found on the supplied agitator name plate as shown on the illustration.

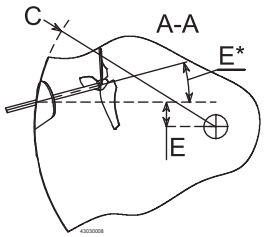


Mounting angle for side mounting agitator type ALS:

To ensure optimal agitation the side mounted agitator must be installed in the mounting angle specified on the name plate as shown on the illustration.



The side mounted agitator must also be installed in either a offset distance (E) from the center of the tank or it must be installed a offset angle (E*) from the center of the tank as shown on illustration section A-A



The distance (E) can be calculated as follow:
E = C x tan(5-7°), where C = tank radius

If the offset angle is chosen it must be as follow:E* = 5-7°

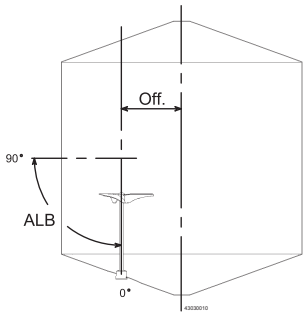
Note!
In certain cases the offset angle E* is recommended to be larger - e.g. 10-12°.
- it will be communicated via the Alfa Laval quotation agreement.

All dimenstions in mm unless otherwise stated.

Mounting angle for bottom mounting agitator type ALB:

To ensure optimal agitation, the bottom mounted agitator must be installed in the mounting angle specified on the name plate as shown on the illustration.

The Off center distance is to be found on the supplied Alfa Laval quotation agreement.



6 Technical Data

All dimenstions in mm unless otherwise stated.

Connecting flush - Seal type D:

Step 1
CAUTION!

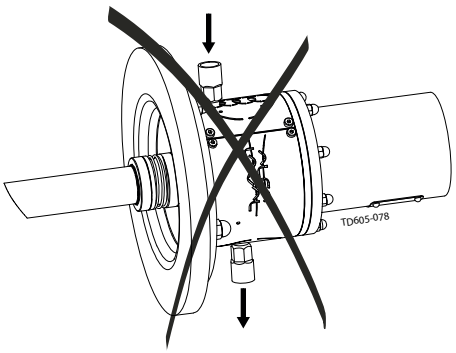
Flush media pressure recommendation to prevent flush media contamination by the product media:
- Flushing pressure max. 6.1 bar(g)
- Tank pressure max. 6.0 bar(g)
- (Tank pressure + 0.1 bar) ≤ Flushing pressure ≤ (Tank pressure + 2 bar)

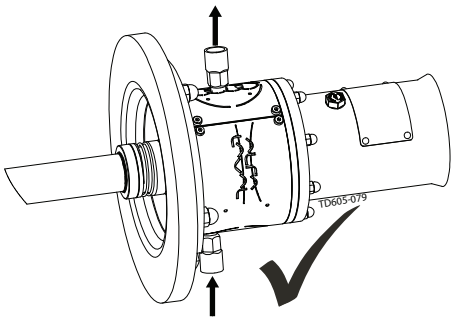
Flush media pressure recommendation to prevent product media contamination by the flush media:
- Flushing pressure max 6.1 bar(g)
- Tank pressure max 6 bar(g)
- Flushing pressure ≤ (Tank pressure - 0,1 bar)

Flush media flow recommendation:
- Flushing flow rate > 0.25 l/min.
- Or Temperature difference between in- and outlet < 10°C.
Always use partly condensed steam, when steam is used as flushing fluid.

Flush media temperature recommendation:
- Inlet temperature during operation < 80°C.
- Inlet temperature during cleaning with Agitator running < 121°C.
- Inlet temperature during cleaning with Agitator in standstill < 143°C.
- Always use appropriately in- and outlet temperatures given for current seal elastomers.
- During operation and with product in the tank, never use continuously higher inlet flush temperature than appropriated for the combination of the current stainless steel type and product media (seal housing is heated up by the flushing temperature and exposed to product media).

Step 2
CAUTION!
Ensure flush connections are not installed or oriented in such way that air pockets will appear. In some cases initial air pockets near the seal surfaces (e.q. at bottom mounted agitators ALB) can not be avoided it has been tested and verified that an initial flow rate without air at 5 ltr/minute lasting for 30 seconds while the agitator is running ensures that all air in seal and flushing chamber will be flushed out.





NOTE!
Alfa Laval recommends installing a pressure relief valve to ensure pressure never exceed specifications.
Alfa Laval recommends installing a non-return valve onto the inlet connection, to ensure that the seal never runs dry.
If higher flushing pressure is desired, please contact Alfa Laval for advice.

All dimenstions in mm unless otherwise stated.

Connecting flush - Seal type DC:

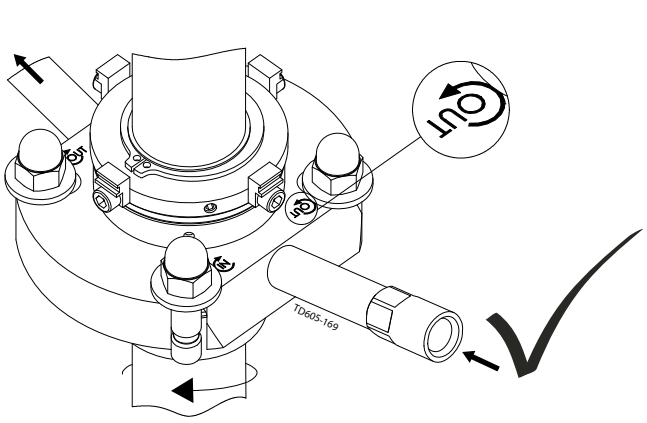
Step 1
Flush media pressure recommendation to prevent flush media contamination by the product media:
- Tank pressure max. 6.0 bar(g)
- Ensure flushing pressure ≥ (Tank pressure + 2 bar)

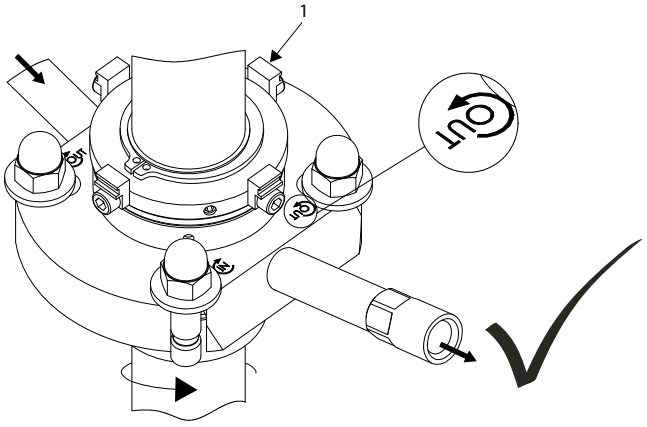
Flush media pressure recommendation to prevent product media contamination by the flush media:
- Tank pressure max 6.0 bar(g)
- Ensure flushing pressure ≤ (Tank pressure - 0,5 bar)

Flush media flow recommendation:
- Flushing flow rate > 0.25 l/min
- Or Temperature difference between in- and outlet < 10°C.

Flush media temperature recommendation:
- Inlet temperature during operation < 60°C.
- Inlet temperature during cleaning with Agitator running < 60°C. (Higher inlet temperature during operation can lead to dry running)
- Inlet temperature during cleaning with Agitator in standstill < 121°C.
- Always use appropriately in- and outlet temperatures given for current seal elastomers.
- During operation and with product in the tank, never use continuously higher inlet flush temperature than appropriated for the combination of the current stainless steel type and product media (seal housing is heated up by the flushing temperature and exposed to product media).

Step 2
CAUTION!
Ensure that connection of outlet and inlet is correct, with regard to Agitator rotation direction!
Ensure that the distance pieces (1) on the seal are mounted as shown on illustration.





6 Technical Data

All dimenstions in mm unless otherwise stated.

Tightening torques for **bolt** connections:

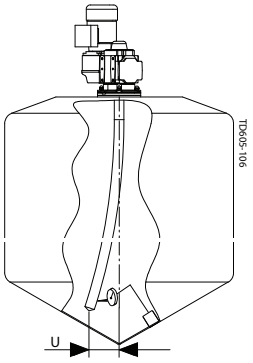
CAUTION!
Use Loctite® before fastening.
Do NOT use air powered tools.

M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
3Nm	6Nm	11Nm	26Nm	51Nm	88Nm	141Nm	218Nm	308Nm	439Nm	582Nm	724Nm

Shaft alignment:

Shaft to be aligned in bearing frame or in gear motor.

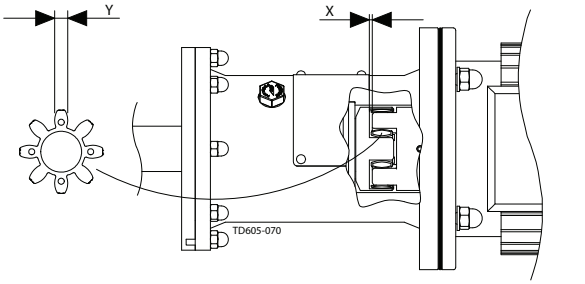
RPM up to:	50	100	500	1000	2800
U (max radial tolerance)	0.4	0.3	0.2	0.1	0.05



Spider coupling:

Axial alignment and tooth thickness [mm]

	Bearing frame type:				
	BC160/35 BC160D/30 BC160DH/30	B25/30	B35 B35/40	B45 B45/50	B55 B55/60
X:	2	2	2.5	3	3.5
Ynew:	8.5	8.5	10.9	13.3	17.7
Ymin:	5.6	5.6	7.9	10.3	13.7



CAUTION!
During check of spider ensure that all dust is removed before reassembly.

All dimenstions in mm unless otherwise stated.

6.2 Storage

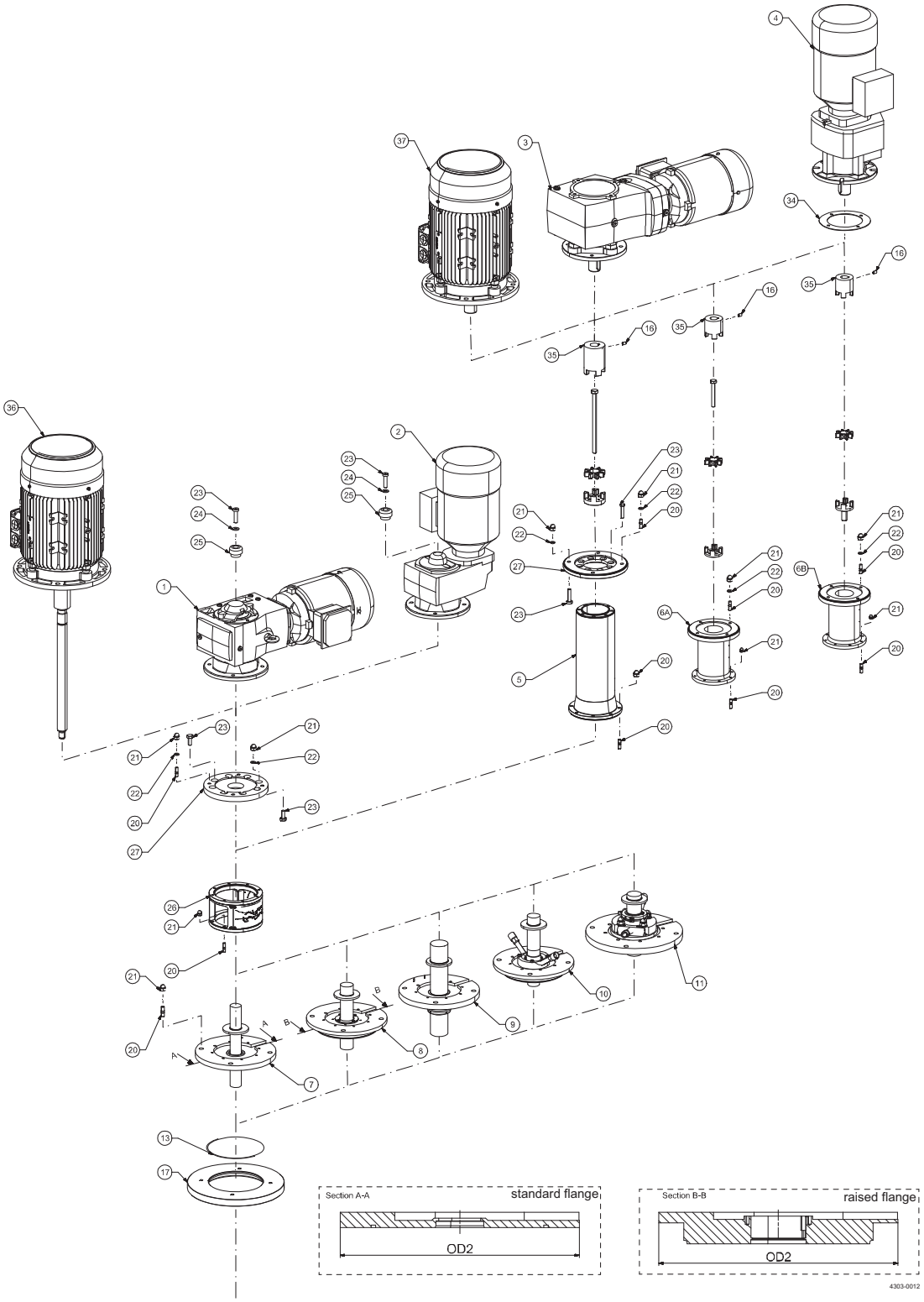
Store the Agitator in dry and clean environments.

Rotate shaft every second week to ensure seal not seizing up.

7 Part drawings, part lists and service kits

Agitator type ALS / ALB, main components - Drive end

7.1 Agitator Main Components, Drive end



Agitator type ALS / ALB, main components - Drive end

Parts list

Pos.		Qty	Denomination
1	□	1	GR gear motor, hollow shaft
2	□	1	GP gear motor, hollow shaft
3	□	1	GR gear motor, output shaft
4	□	1	GC gear motor, output shaft
5	◆	1	Bearing frame B25/30, B35, B35/40, B45, B45/50, B55, B55/60
6	◆	1	Bearing frame BC160/35, BC160D/30, BC160DH/30
7	◆	1	Shaft seal type S1
8	◆	1	Shaft seal type S2
9	◆	1	Shaft seal type S3
10	◆	1	Shaft seal type D
11	◆	1	Shaft seal type DC
13		1	O-ring
16	□		Screw, pointed
17	□	1	Welding flange
18	□	1	Mounting flange (standard)
19	□	1	Mounting flange, raised
20	□		Stud
21	□		Cap nut
22	□		Washer
23	□		Screw
24	□	1	Washer, Nord Lock
25	□	1	Fixing element
26	□	1	Lantern, complete
27	□	1	Drive unit flange
34	□	1	Disc spacer
35	□	2	Coupling
36	□	1	Motor and shaft unit
37	□	1	Motor

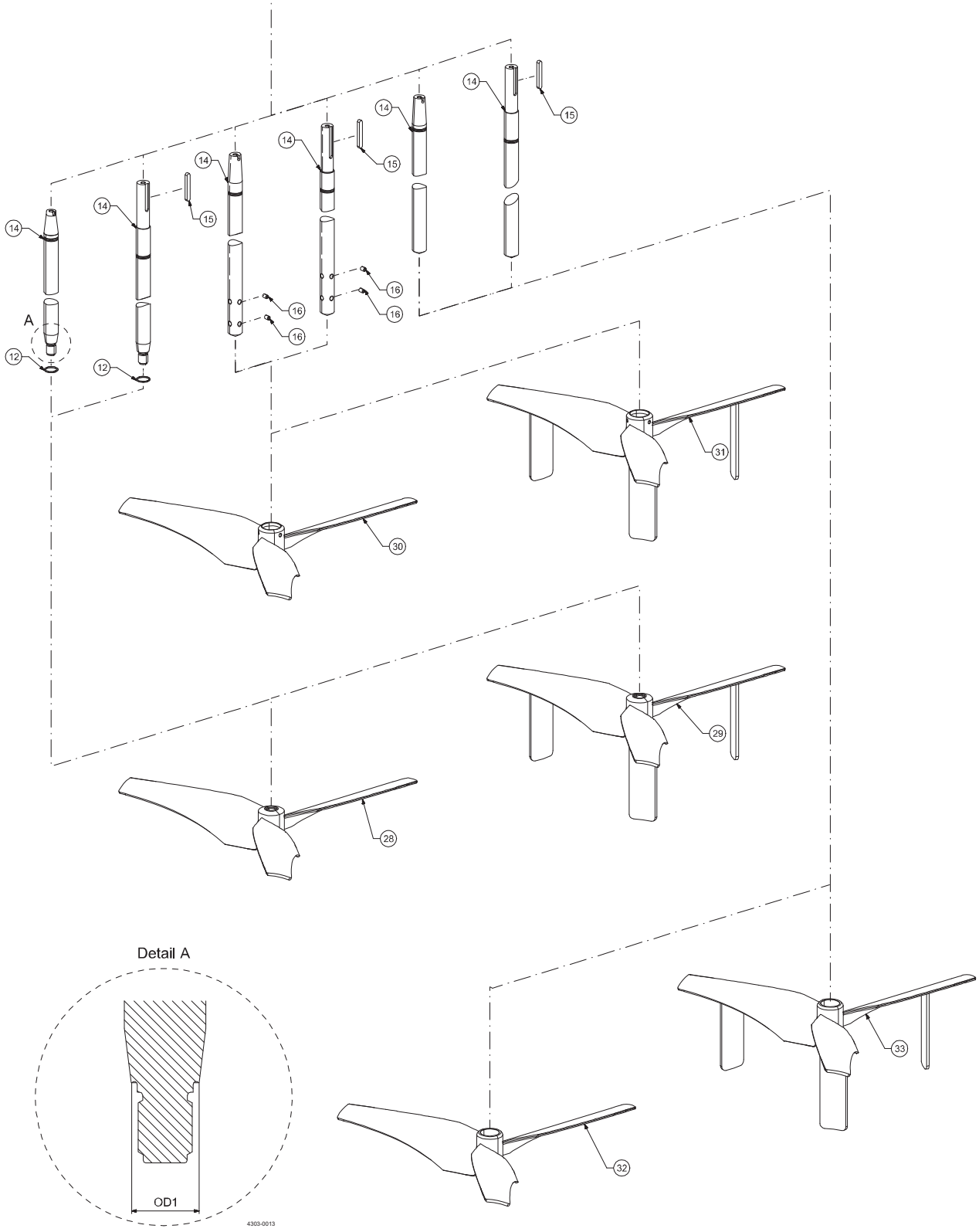
□ Article number available upon request by serial number or article number of the agitator.

◆ Article number is to be found in the Spare part manual ESE03339, available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

7 Part drawings, part lists and service kits

Agitator type ALS / ALB, main components - Wet end

7.2 Agitator Main Components, Wet end



Agitator type ALS / ALB, main components - Wet end

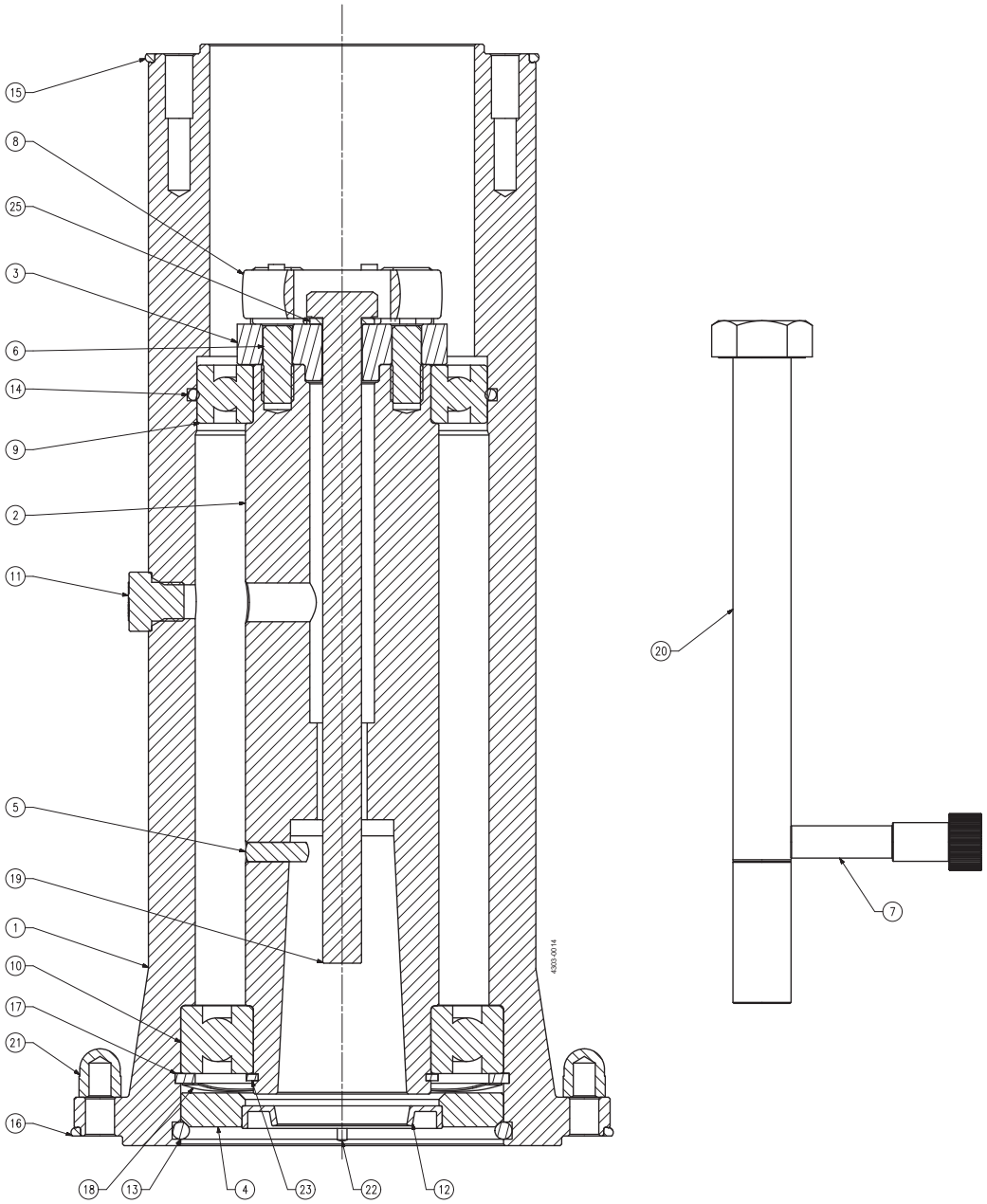
Parts list

Pos.		Qty	Denomination
12		1	O-ring
14	□	1	Shaft
15	□	1	Parrallel key
16	□		Screw, pointed
28	□	1	Impeller device, EnSaFoil, (ESF), w. thread
29	□	1	Impeller device, EnSaFoil Low level, (ESFL), w. thread
30	□	1	Impeller device, EnSaFoil, (ESF), w. screws
31	□	1	Impeller device, EnSaFoil Low level, (ESFL), w. screws
32	□	1	Impeller device, EnSaFoil, (ESF), welding
33	□	1	Impeller device, EnSaFoil Low level, (ESFL), welding

❑ Article number available upon request by serial number or article number of the agitator.

◆ Article number is to be found in the Spare part manual ESE03339, available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

7.3 Bearing frame, B25/30, B35, B35/40, B45, B45/50, B55, B55/60



Bearing frame, standard

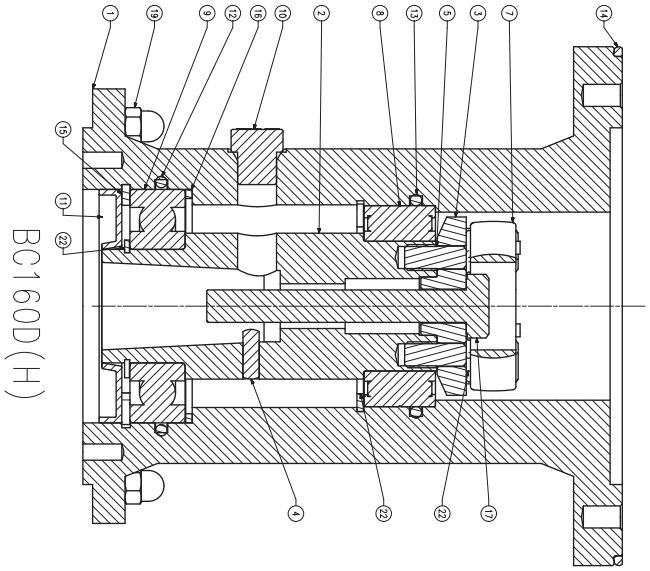
Parts list

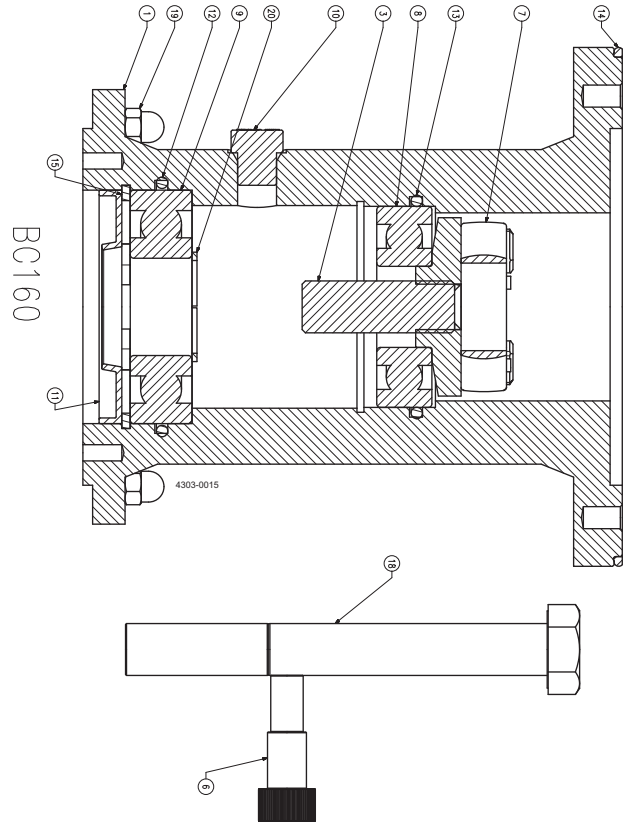
Pos.		Qty	Denomination
1		1	Bearing frame - housing
2		1	Drive shaft
3		1	Coupling
4		1	Cover
5		1	Pin
6		2	Pin
7		1	Tool, retainer bolt
8	□	1	Spider
9	□	1	Bearing
10	□	1	Bearing
11	□	1	Air vent valve
12	□	1	Seal, radial
13	□	1	O-ring
14	□	1	O-ring
15	□	1	O-ring
16	□	1	O-ring
17		1	Circlip, inner
18		1	Spring, wave
19		1	Screw
20		1	Screw
21		8	Cap nut
22		2	Pin
23		1	Circlip, outer
24		4	Rivet
25		1	Washer

Service kits

	Denomination	B25/30	B35	B35/40
Assembly Kit				
□	**Assembly Kit, Bearing frame B25/30, B35, B35/40, B45, B45/50, B55, B55/60**	TE2613066880	TE261301269C	TE261304566B

7.4 Bearing frame, BC160/35, BC160D/30, BC160DH/30





Bearing frame, compact

Parts list

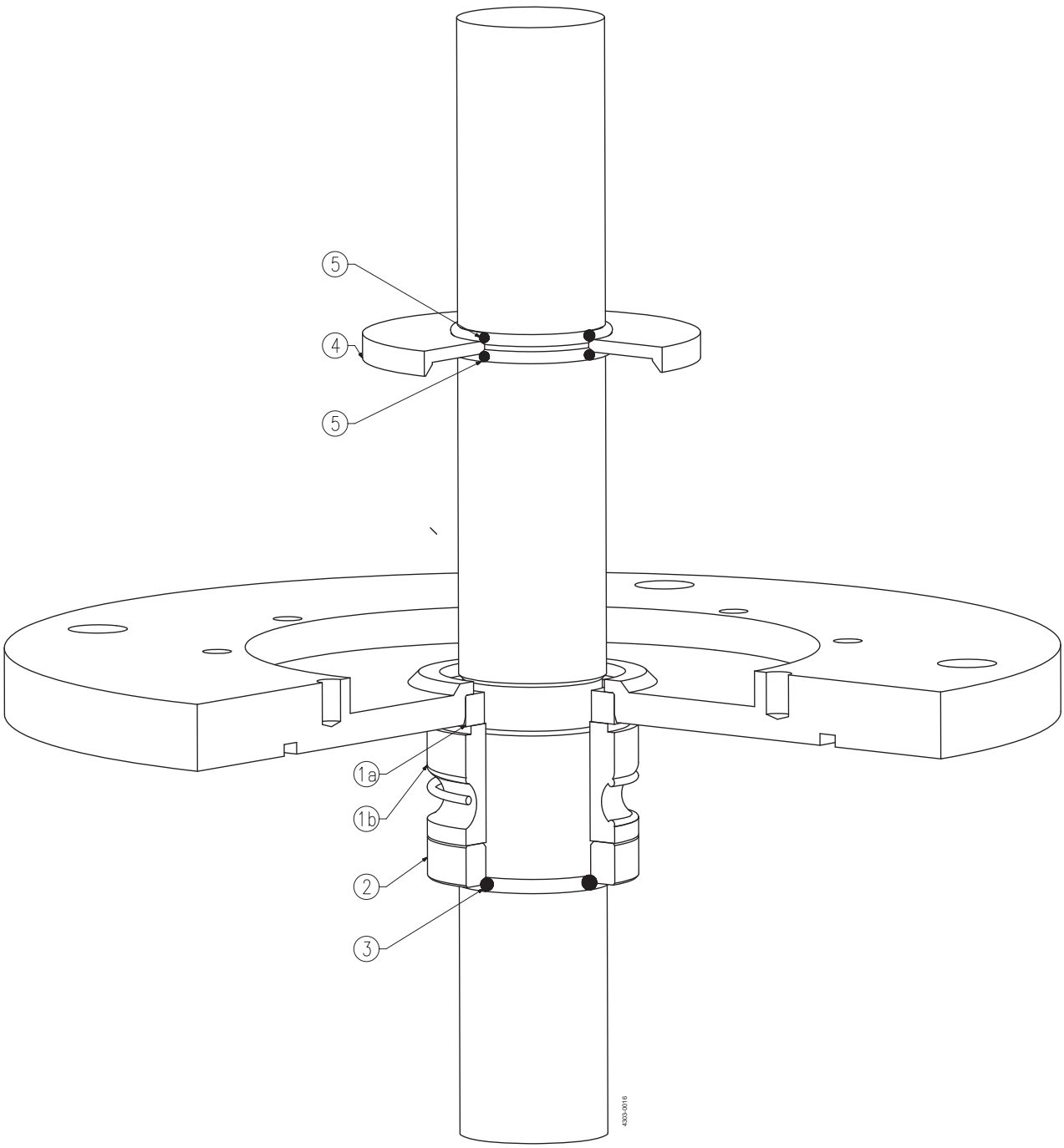
Pos.		Qty	Denomination
1		1	Bearing frame - housing
2		1	Drive shaft
3		1	Coupling
4		1	Pin
5		2	Pin
6		1	Tool, retainer bolt
7	□	1	Spider, PUR
8	□	1	Bearing
9	□	1	Bearing
10	□	1	Air vent valve
11	□	1	Seal, radial
12	□	1	O-ring, FPM
13	□	1	O-ring, FPM
14	□	1	O-ring, FPM
15		1	Circlip, inner
16		1	Seeger ring
17		1	Screw
18		1	Screw
19		8	Cap nut
20		1	Circlip, outer
21		4	Rivet
22		7	Seeger ring
23		1	Circlip, inner

Service kits

	Denomination	BC160/35 (right)	BC160/35 (left)	BC160D/30	BC160DH/30
Assembly Kit					
□	Assembly Kit, Bearing frame BC160/35, BC160D/30, BC160DH/30	TE261303783B	TE261303783B	TE261303672B	TE2613071680

Shaft seal type S1

7.5 Shaft seal, type S1



Shaft seal type S1

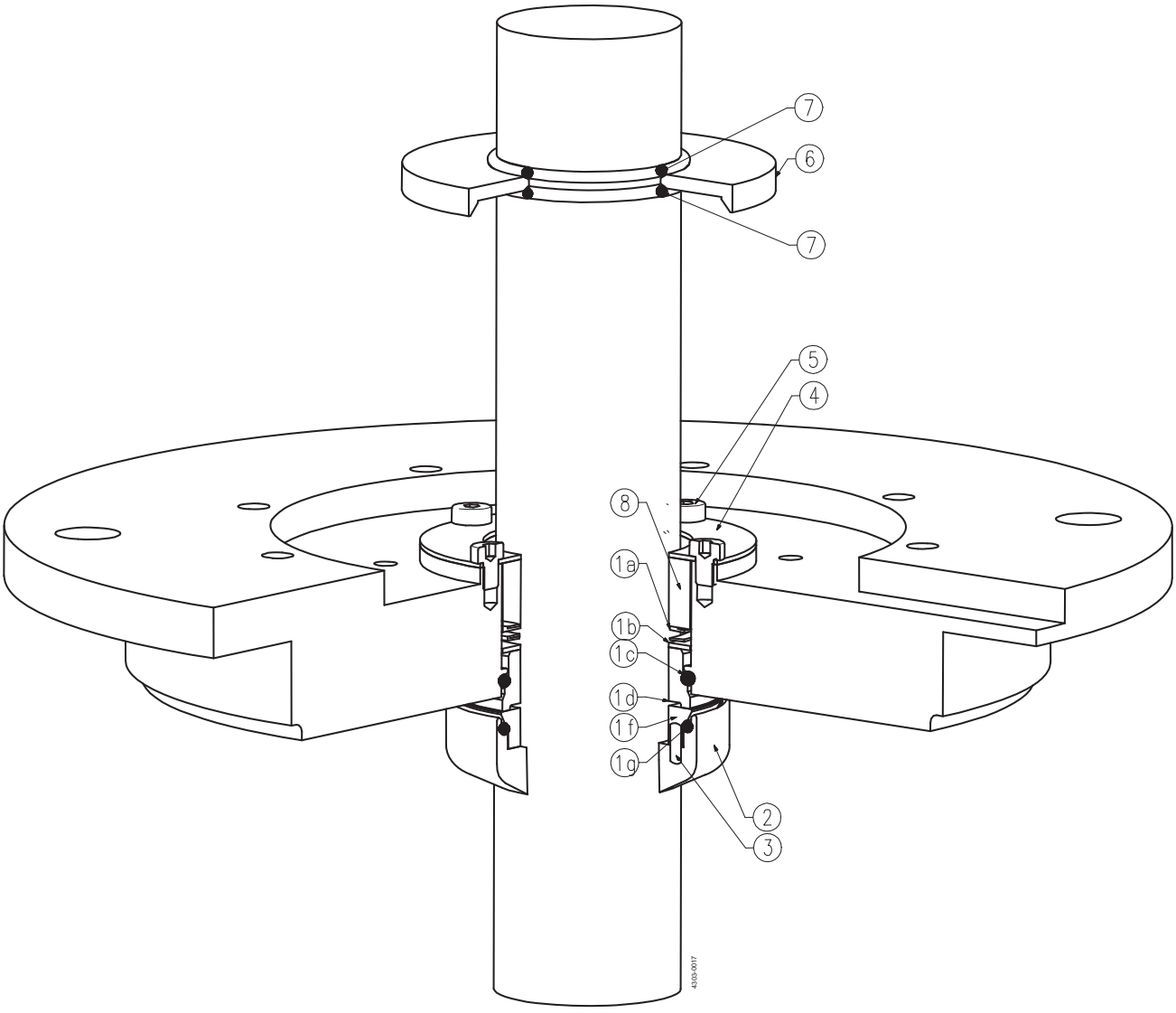
Parts list

Pos.		Qty	Denomination
1	□	1	S1 seal
2		1	Ring, retainer
3	○★	1	O-ring, FPM
	□♦	1	O-ring, EPDM
4		1	Oil / Fluid trap
5	□♦○★	2	O-ring

Service kits

	Denomination	size: Ø30	size: Ø35	size: Ø40	size: Ø45
Seal Kits					
□	Seal Kit, S1, SiC/SiC, EPDM	TE2613000050	TE2613000051	TE2613000052	TE2613000053
♦	Seal Kit, S1, C/SiC, EPDM	TE2613000054	TE2613000055	TE2613000056	TE2613000057
○	Seal Kit, S1, SiC/SiC, FPM	TE2613000058	TE2613000059	TE2613000060	TE2613000061
★	Seal Kit, S1, C/SiC, FPM	TE2613000062	TE2613000063	TE2613000064	TE2613000065

7.6 Shaft seal, type S2



Shaft seal type S2

Parts list

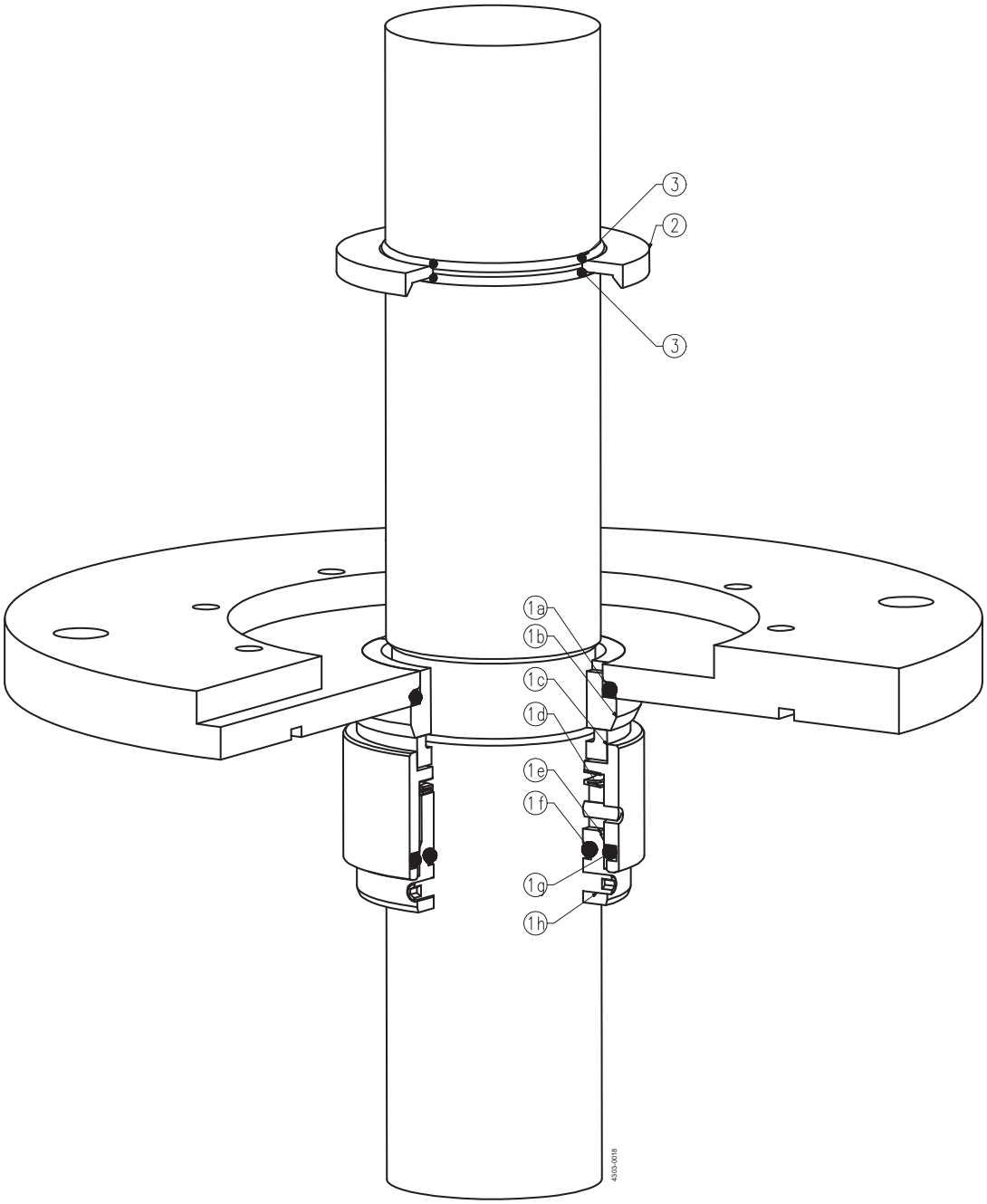
Pos.		Qty	Denomination
1	□	1	S2 seal
2		1	Ring, counter*
3		2	Pin
4		1	Ring, retainer
5		4	Screw
6		1	Oil / Fluid trap
7	□♦○★	2	O-ring, FPM
8		1	Spacer

Service kits

	Denomination	size: Ø30	size: Ø40
Seal kits			
□	Seal Kit, S2, C/SiC, EPDM	TE2613000066	TE2613000068
♦	Seal Kit, S2, SiC/SiC, EPDM	TE2613000067	TE2613000069
○	Seal Kit, S2, C/SiC, FPM	TE2613000070	TE2613000072
★	Seal Kit, S2, SiC/SiC, FPM	TE2613000071	TE2613000074

* If the counter ring or the shaft needs to be replaced, the maintenance must be carried out by Alfa Laval.

7.7 Shaft seal, type S3



Shaft seal type S3

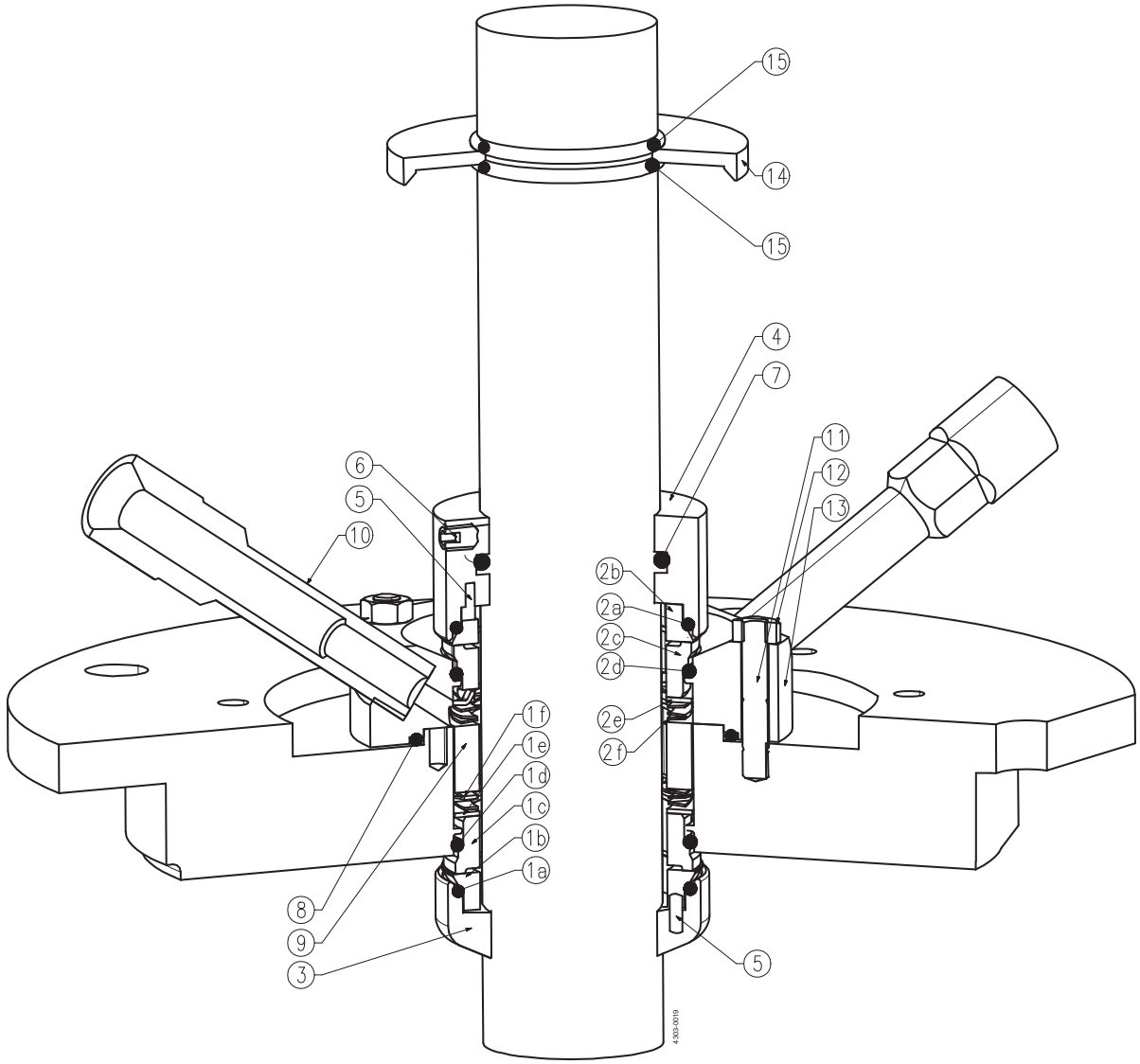
Parts list

Pos.		Qty	Denomination
1	□	1	S3 seal
2		1	Oil / Fluid trap
3	□♦○★	2	O-ring, FPM

Service kits

	Denomination	size: Ø30	size: Ø35	size: Ø40
Seal kits				
□	Seal Kit, S3, C/SiC, EPDM	TE2613000075	TE2613000076	TE2613000077
♦	Seal Kit, S3, SiC/SiC, EPDM	TE2613000078	TE2613000079	TE2613000080
○	Seal Kit, S3, C/SiC, FPM	TE2613000081	TE2613000082	TE2613000083
★	Seal Kit, S3, SiC/SiC, FPM	TE2613000084	TE2613000085	TE2613000086

7.8 Shaft seal, type D



Shaft seal type D

Parts list

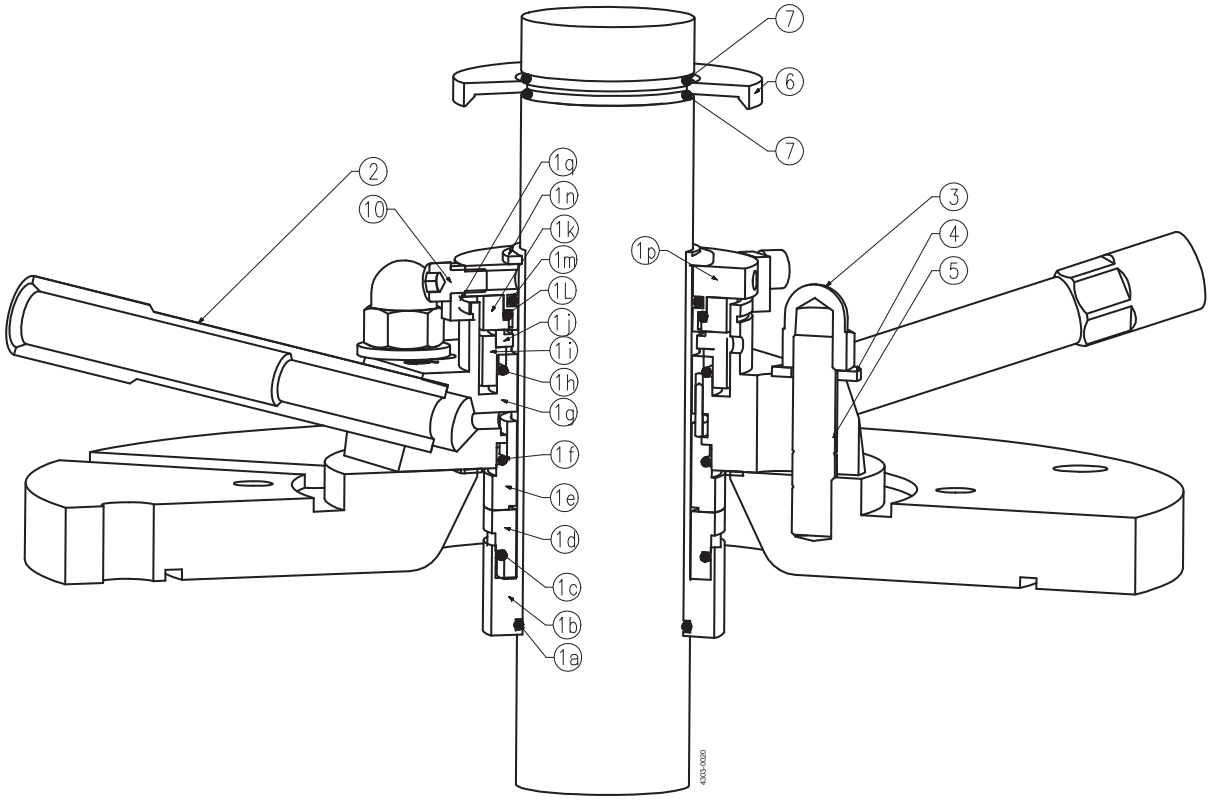
Pos.		Qty	Denomination
1	□	1	S2 seal
2	♦★	1	S2 seal, Q1BEGG
	□○	1	S2 seal, Q1BVGG
3		1	Ring, counter*
4		1	Ring, counter
5		4	Pin
6		1	Screw, pointed
7	□○	1	O-ring, FPM
8	□○	1	O-ring, FPM
9		1	Spacer
10		2	Flush, connection
11		4	Stud
12		4	Nut
13		1	Seal housing
14		1	Oil / Fluid trap
15	□♦○★	2	O-ring, FPM

Service kits

	Denomination	size: Ø30	size: Ø40
Seal kits			
□	Seal Kit, D, Q1BVGG-Q1BVGG	TE2613000121	TE2613000122
♦	Seal Kit, D, Q1BEGG-Q1BEGG	TE2613000123	TE2613000124
○	Seal Kit, D, Q1Q1VGG-Q1BVGG	TE2613000125	TE2613000126
★	Seal Kit, D, Q1Q1EGG-Q1BEGG	TE2613000127	TE2613000128

* If the counter ring or the shaft needs to be replaced, the maintenance must be carried out by Alfa Laval.

7.9 Shaft seal, type DC



Shaft seal type DC

Parts list

Pos.		Qty	Denomination
1	□	1	DC seal
2		2	Flush, connection
3		4	Cap nut
4		4	Washer
5		4	Stud
6		1	Oil trap
7	□♦○⋆	2	O-ring

Service kits

	Denomination	size: Ø30	size: Ø35	size: Ø40
Seal kits				
□	Seal Kit, DC, C/SiC-C/SiC, EPDM	TE2613000137	TE2613000138	TE2613000139
♦	Seal Kit, DC, C/SiC-C/SiC, FPM	TE2613000144	TE2613000145	TE2613000146
○	Seal Kit, DC, SiC/SiC-C/SiC, EPDM	TE2613000151	TE2613000152	TE2613000153
⋆	Seal Kit, DC, SiC/SiC-C/SiC, FPM	TE2613000158	TE2613000159	TE2613000160

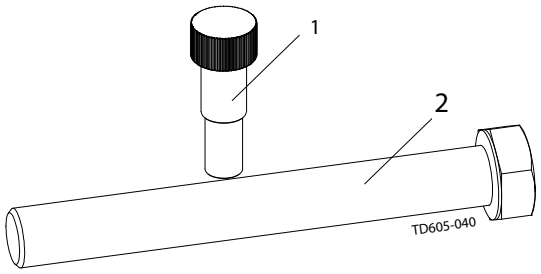
7 Part drawings, part lists and service kits

Always ensure that mounting is according to assembly drawing in ???
Ensure totally clean surfaces during real replacement.
Always replace all surrounding gaskets during shaft seal replacement.
Always refer to tightening torques in section 6.1 Technical data when tightening bolts.

7.10 Tools

Retainer bolt and extractor bolt for bearing frame:

Pos	Denomination	BC160D(H)/30 Item no.	B25/30 Item no.	B35, B35/40 Item no.	B45, B45/50 Item no.	B55, B55/60 Item no.
1 2	Retainer bolt Extractor bolt	TE2608020560	TE2608019880	TE2608020050	TE2608020220	TE2608020390



8.1 Drive Unit Instructions

The drive unit is supplied by sub supplier and all important installation requirement is transferred to the agitator instruction manual. For further information regarding maintenance and storage of the drive unit please find the drive unit instruction manual by below links

For agitators with gears please find the drive unit instruction manual by below link:
https://www.nord.com/cms/en/documentation/manuals/details_1139/detail_42075.jsp

For agitators with direct drive (motor only) please find the motor instruction manual by below link:
http://www.hoyermotors.com/Catalogues-30304.htm

How to contact Alfa Laval
Contact details for all countries are
continually updated on our website.
Please visit www.alfalaval.com to access the information directly.