

Dry installed Mixer

Here you will find technical documentation for Landia dry installed mixers in the form of schematic drawing, service instructions and more.

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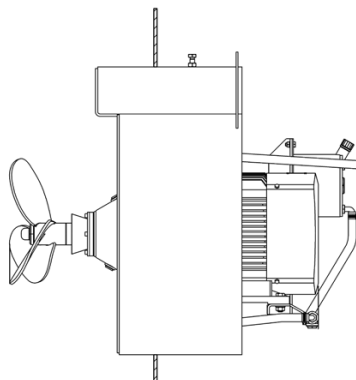


PODTR-I

Schematic drawing

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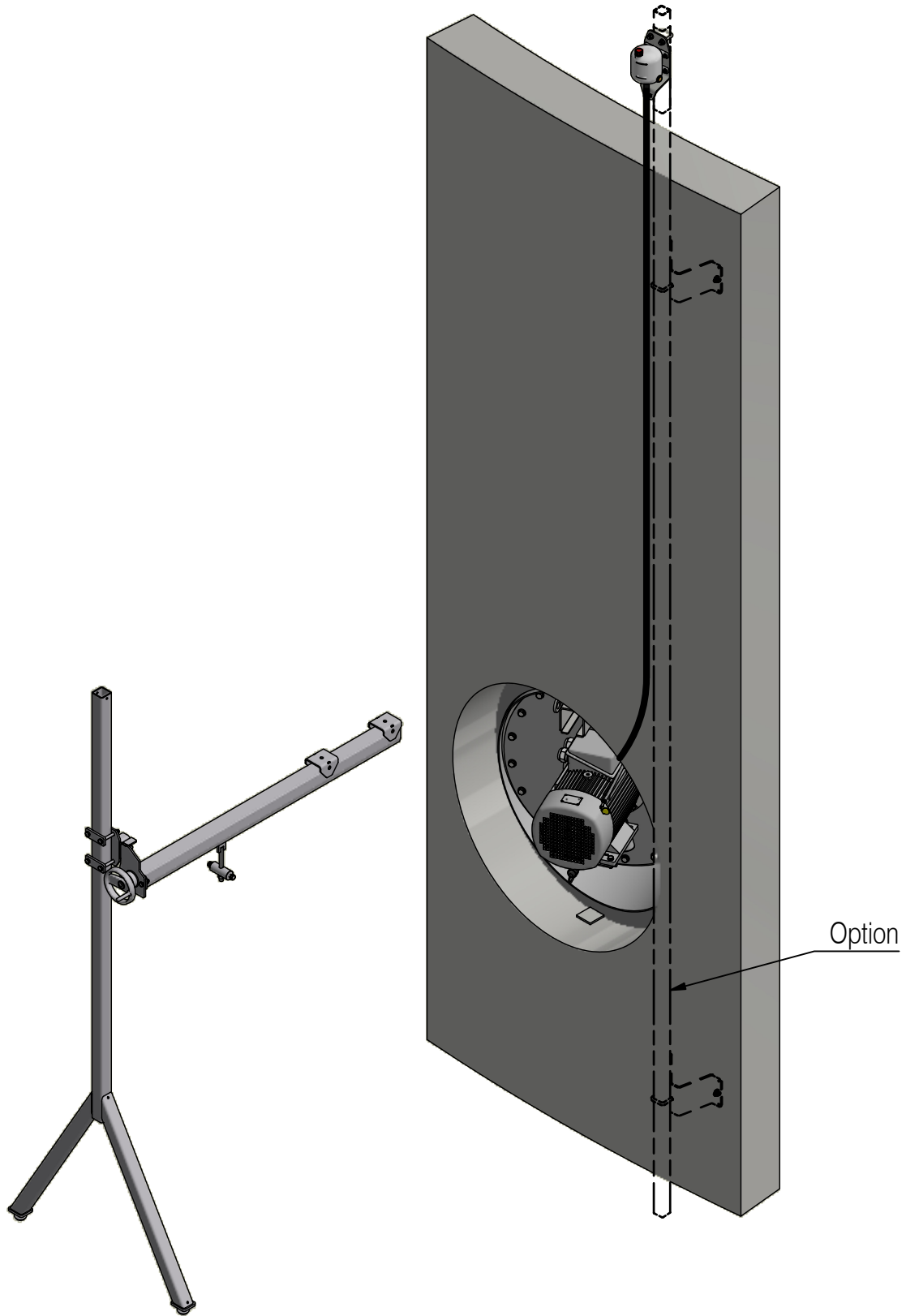
Styret dokument

Landia[®]

POPTR-I
Principtegning - Schematic drawing
Prinzipskizze - Dessin de principe

Scale:	Sign.:	Date:
1 : 25	BNV KSK	26-04-2021
Dwg.no.:		3741006

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POPTR-I
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Dwg.no.:		3741007

POPTR-I/POPTR-I Ex

POPTR-I is a flexible and efficient mixer that is mounted through the side of the tank wall. The three-blade propeller and the relatively low propeller speed, makes it well-suited for mixing liquids with a high viscosity, such as drained or digested sludge. The optimal motor cooling function makes it an ideal choice for liquids with high temperatures.



APPLICATION EXAMPLES

- ▶ Sludge tanks
- ▶ Mixing system for digestion tanks
- ▶ Hot liquids

PROPELLER RPM

300 rpm – gear 1:4.5 or 1:5

MATERIAL OF CONSTRUCTION

Motor housing	Cast iron EN-GJL-250
Oil chamber	W1.4404/AISI316
Propeller	Stainless steel W1.4301 W1.4404/AISI316 (optional)
Protection jacket over gear box	W1.4404/AISI316
Gear	Cast iron EN-GJL-250 (no contact with the liquid)
Gear output shaft	Shaft steel W1.6511/9840 (no contact with the liquid)
Bolts	A4
Exterior sealing system	1 oil sealing ring made of nitrile Wear bush made of stainless steel W1.4301/AISI304 with ceramic coating Mechanical shaft seal: silicon carbide/silicon carbide
Interior sealing system	Mechanical shaft seal: silicon carbide/silicon carbide
Oil type	Liquid temperature 0–30 °C SP 100 Liquid temperature 30–60 °C GS 220 GS 220 (with moisture detection)
Grease type	High temperature grease

SERVICE AND MAINTENANCE

Recommended service interval/oil change	Maximum 4,300 operational hours/minimum once a year. After a maximum of 12,900 operating hours, the mixer must be disassembled from the
Grease lubrication/inspection	Every three days
Motor	Lifetime lubricated bearings
Gear	Periodic oil change Calculated service life >100,000 operating hours
Propeller	Periodic grease lubrication

SURFACE TREATMENT

Machinery enamel: RAL 9005 (Jet Black)	Jet Black
2-component coating: RAL 7005 (Mouse Grey) (optional)	Mouse Grey

MONITORING FUNCTIONS

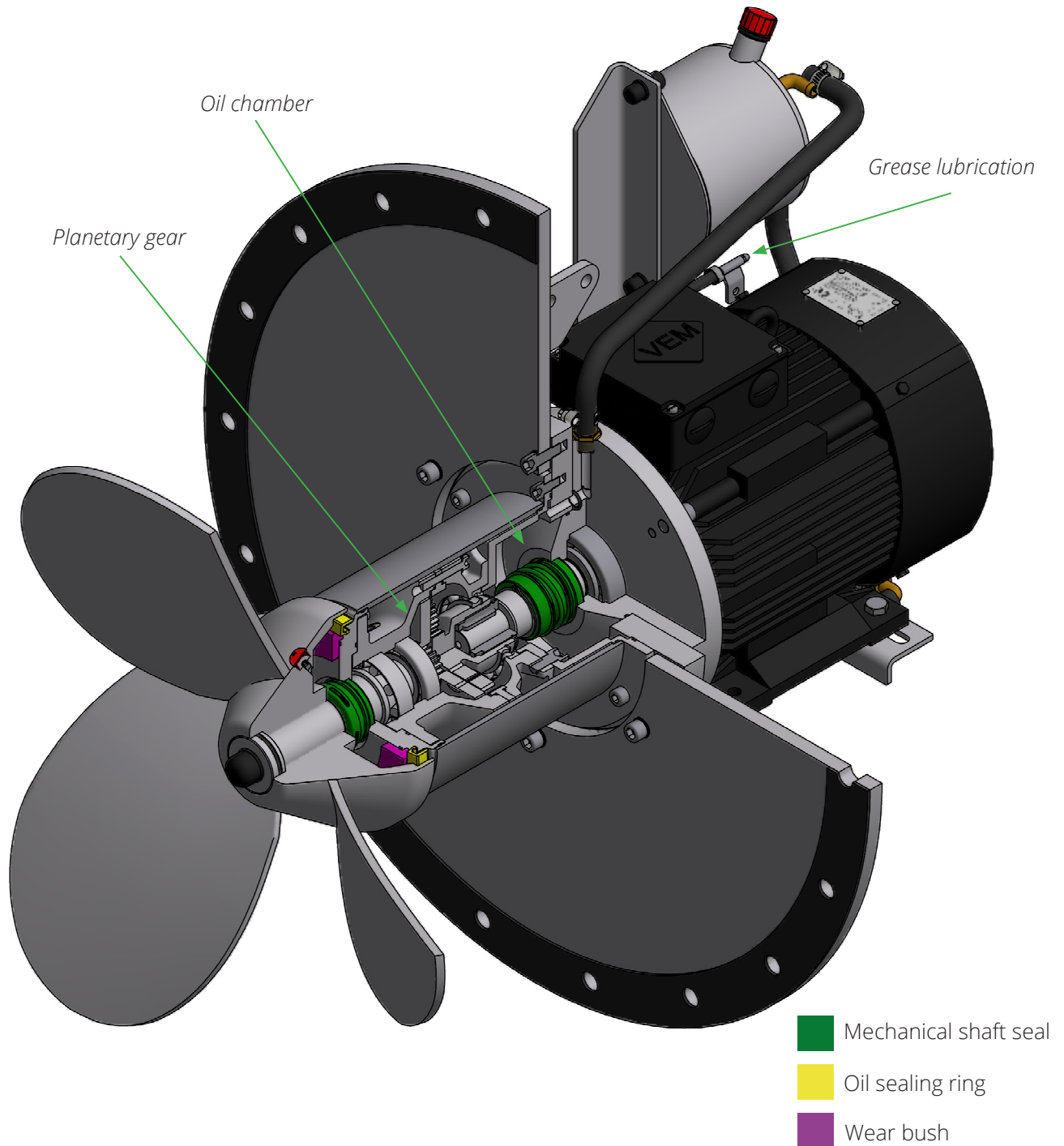
Thermistor

Moisture detection system (optional)

DESIGN

The Landia POPTR-I is mounted through a hole in the tank wall, meaning that servicing can be performed from the outside of the tank. Oil change and lubrication of grease chamber in the propeller can be performed once the mixer has stopped.

The unique sealing system that consists of two mechanical seals as well as one lubricated in grease in the propeller provides optimal protection against ingress of liquids.



ELECTRICAL DATA POPTR-I

Motor type	3-phase AC motor
Nominal voltage	400 V
Minimum voltage allowed	360 V
Nominal frequency	50 Hz
Applicable for VFD operation	Yes
Ingress protection rating	IP 55
Insulation class	F
Start function	Soft starter required

Model	Item number	Nominal power	Motor	Full load current (400 V)	Connection method	Start current (DOL)	cos phi	Efficiency
		[kW]	[rpm]	[A]	Y/Δ	[A]		[%]
POPTR-I 5.5 kW-300 rpm	1114505	5.5	1,440	11.0	Δ	68	0.87	84.6
POPTR-I 7.5 kW-300 rpm	1114507	7.5	1,455	15.0	Δ	90	0.83	86.2
POPTR-I 11.0 kW-300 rpm	1114511	11.0	1,455	21.5	Δ	146	0.84	87.9
POPTR-I 15.0 kW-300 rpm	1114515	15.0	1,465	29.0	Δ	212	0.84	88.7
POPTR-I 18.5 kW-300 rpm	1114518	18.5	1,460	35.0	Δ	238	0.85	89.3
POPTR-I 22.0 kW-300 rpm	1114522	22.0	1,465	43.0	Δ	280	0.82	90.1
POPTR-I 7.5 kW-300 rpm IE2	1134507	7.5	1,470	14.5	Δ	123	0.82	89.9
POPTR-I 11.0 kW-300 rpm IE2	1134511	11.0	1,470	22.5	Δ	176	0.78	90.3
POPTR-I 18.5 kW-300 rpm IE2	1134518	18.5	1,470	37.5	Δ	240	0.78	91.2

For voltages others than 400 V/50 Hz please refer to the attached Appendix.

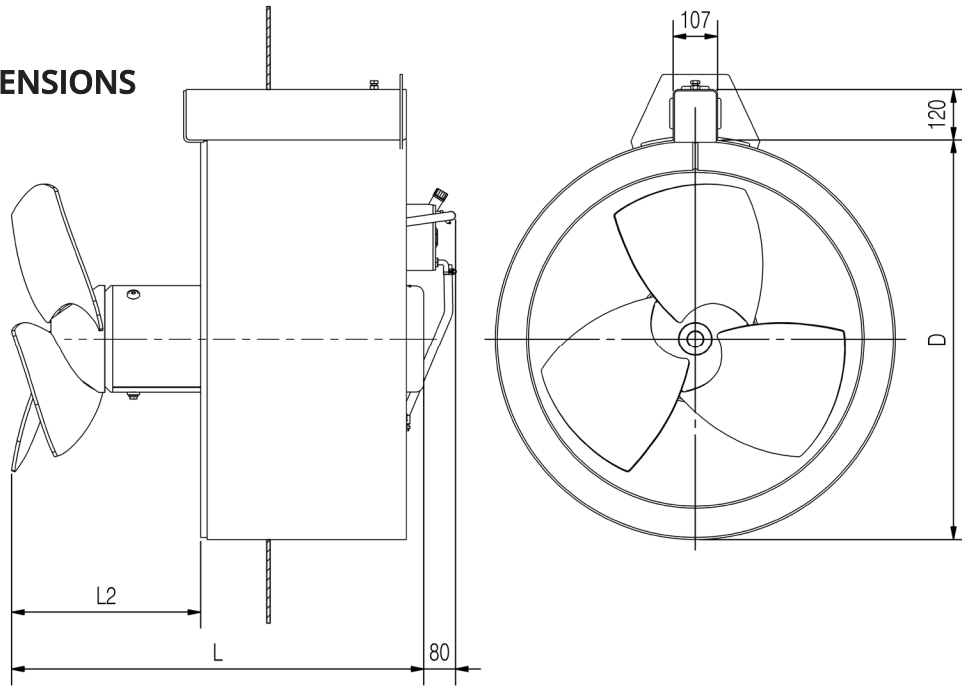
ELECTRICAL DATA POPTR-I EX

Motor type	3-phase AC motor Ex II 3 G k T3
Nominal voltage	400 V
Minimum voltage allowed	360 V
Nominal frequency	50 Hz
Applicable for VFD operation	No
Ingress protection rating	IP 55
Insulation class	F
Start function	Soft starter required

Model	Item number	Nominal power	Motor	Full load current (400 V)	Connection method	Start current (DOL)	cos phi	Efficiency
		[kW]	[rpm]	[A]	Y/Δ	[A]		[%]
POPTR-I 5.5 kW-300 rpm Ex	1114605	5.5	1,440	11.0	Δ	68	0.87	84.6
POPTR-I 7.5 kW-300 rpm Ex	1114607	7.5	1,455	15.0	Δ	90	0.83	86.2
POPTR-I 11.0 kW-300 rpm Ex	1114611	11.0	1,455	21.5	Δ	146	0.84	87.9
POPTR-I 15.0 kW-300 rpm Ex	1114615	15.0	1,465	29.0	Δ	212	0.84	88.7
POPTR-I 18.5 kW-300 rpm Ex	1114618	18.5	1,460	35.0	Δ	238	0.85	89.3

For voltages others than 400 V/50 Hz please refer to the attached Appendix.

OVERALL DIMENSIONS



Model	Item number	Propeller diameter [mm]	L [mm]	L2 [mm]	D [mm]	Axial pressure – operation [N]	Axial pressure – start [N]	Weight [kg]
POPTR-I 5.5 kW-300 rpm	1114505	ø620	870	400	ø860	1,400	4,000	210
POPTR-I 7.5 kW-300 rpm	1114507	ø660	900	425	ø860	1,700	5,000	225
POPTR-I 11.0 kW-300 rpm	1114511	ø770	990	460	ø963	3,000	5,000	318
POPTR-I 15.0 kW-300 rpm	1114515	ø770	1005	445	ø963	4,000	6,900	325
POPTR-I 18.5 kW-300 rpm	1114518	ø770	1005	445	ø963	5,000	8,400	335
POPTR-I 22.0 kW-300 rpm	1114522	ø770	1070	445	ø963	5,500	8,900	410
POPTR-I 5.5 kW-300 rpm Ex	1114605	ø620	870	400	ø860	1,400	4,000	210
POPTR-I 7.5 kW-300 rpm Ex	1114607	ø660	900	425	ø860	1,700	5,000	225
POPTR-I 11.0 kW-300 rpm Ex	1114611	ø770	990	460	ø963	3,000	5,000	318
POPTR-I 15.0 kW-300 rpm Ex	1114615	ø770	1005	445	ø963	4,000	6,900	325
POPTR-I 18.5 kW-300 rpm Ex	1114618	ø770	1005	445	ø963	5,000	8,400	335
POPTR-I 7.5 kW-300 rpm IE2	1134507	ø660	950	425	ø860	1,700	5,000	243
POPTR-I 11.0 kW-300 rpm IE2	1134511	ø770	1045	460	ø963	3,000	5,000	331
POPTR-I 18.5 kW-300 rpm IE2	1134518	ø770	1025	445	ø963	5,000	8,400	410

The shroud casing and angle of the POPTR-I is adjusted in accordance with the tank’s condition and dimensions.

Be aware that the tank must be able to withstand the force from the mixer (both axial and vertical). Landia’s built-in casing for the mixer does not replace the material that is removed from the tank wall. The tank supplier must design the necessary reinforcements around the hole for the mixer.

We reserve the right to make technical changes.

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Applications

The mixer can be used for flow creation, mixing and homogenisation of liquid with high or low dry matter content. The mixer must be dry installed when operating in e.g. sewage treatment plants or in agricultural and industrial areas. The mixer can be exposed to 1.0 bar of overpressure. If you intend to use the mixer for other applications, you should first consult Landia A/S.

Warning

Please note the following:

- The mixer should only be connected by a certified electrician.
- Prior to start-up, check that the mixer is installed correctly on the tank according to the service instructions.
- Before starting up the mixer for the first time, the propeller shaft should be rotated manually. This also applies if the mixer has not been in operation for a prolonged period.
- The mixer must be dry installed but can be placed outdoors without covering, as the motor is explosion-proof. To facilitate cooling, the motor must not be wrapped with plastic sheet or similar.
- Before the mixer is serviced/repared, it is imperative that the electrical connection of the mixer is switched off or locked out.
- The propeller must be fully submerged and there must be at least 1.1 m from the surface of the liquid to the centre of the mixer.
- Prior to operation, the oil level in the sight glass must be checked.

Servicing/repair

To maintain a high level of operating safety and a long service life without unnecessary and expensive repairs, it is important from the beginning to carry out regular preventive servicing. Service procedures should be carried out at the intervals prescribed in the manual. Always follow the instructions carefully and only use the parts prescribed by Landia A/S in the spare parts list.

It is essential that routine maintenance is carried out as prescribed in this service instruction.

If you prefer not to do the servicing yourself, please give us a call and we can arrange a service agreement.

Please note

If during servicing/repairs spare parts are used that are not identical to those recommended, the guarantee from Landia A/S will be voided. Spare parts can be ordered from Landia A/S.

Major repairs should be carried out at the specialist workshop below.

Head Office:
LANDIA A/S
Industrivej 2
DK-6940 Lem St.
Tel.: +45 97 341244
info@landia.dk
www.landia.dk

UK subsidiary:
Landia (UK) Ltd.
Waymills Industrial Estate,
Whitchurch,
Shropshire SY13 1TT
Tel: + 44 01948 661 200
info@landia.co.uk
www.landia.co.uk

Installation on the tank shroud

When assembling the mixer on the shroud, the bolts should be cross-tensioned. Bolt M16 class A480 should be tensioned with 137 Nm. If the washer is not tight, the tightening moment should be increased by 10 Nm at a time up to max. 200 Nm until the washer is tight.

In view of vibrations and friction, all stainless steel bolts should be secured/lubricated with a threadlocker, e.g. Loctite type 243.

After assembling the mixer, you should check that the washer, fig. 1 pos. A, is tight.

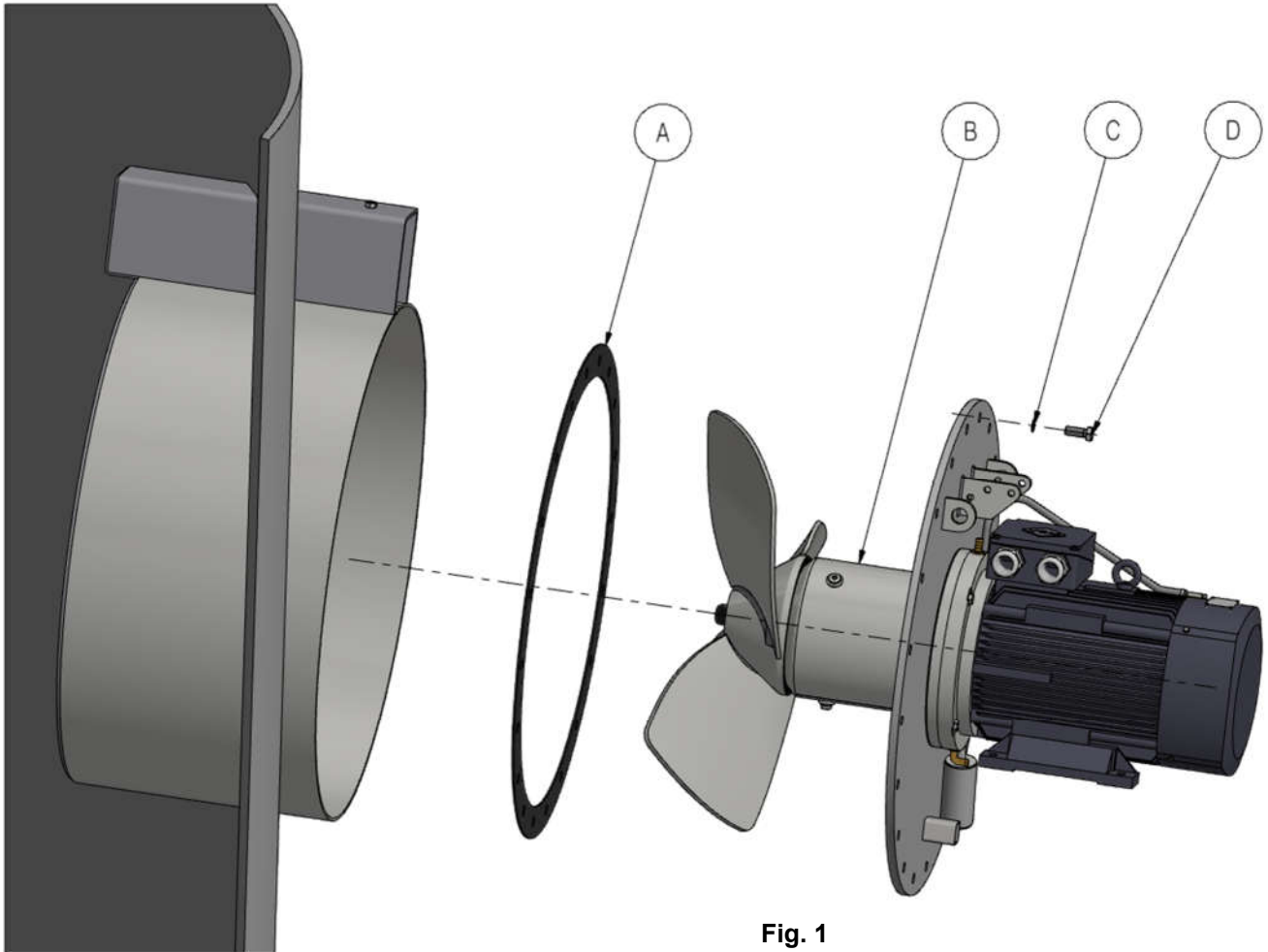
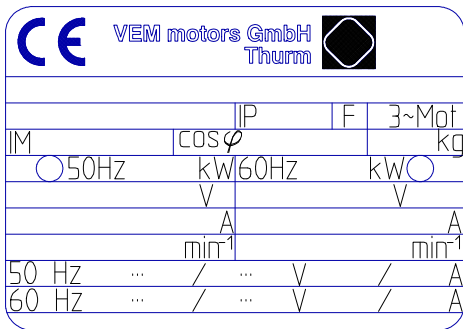


Fig. 1

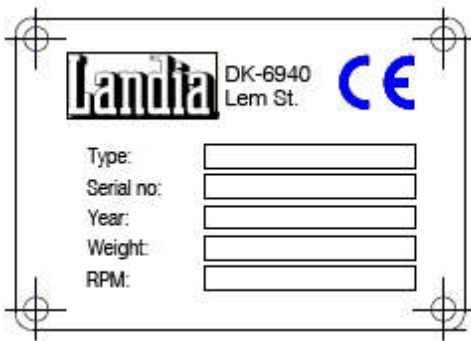
- A. Washer
- B. Mixer POPTR-I
- C. Stainless steel washer $\varnothing 32/\varnothing 16.2 \times 4$
- D. Acid-proof bolt M16x40

A special rail system for handling the mixer has been developed.
See separate service instruction.

Rating plate



IP: Protection level
 F: Isolation class F
 3~Mot.: 3-phase motor
 IM: Construction form
 Cosφ: Power factor
 kg: Motor's weight without mixer
 kW: Nominal shaft power
 V: Connection voltage
 A: Nominal current
 Min⁻¹: Motor's revolutions per minute
 kW, V, A and min⁻¹ for 50Hz and 60 Hz, respectively
 The two bottom lines indicate acceptable intervals with related current at 50 Hz and 60 Hz.



The Landia rating plate is located on the air guide plate on the motor.

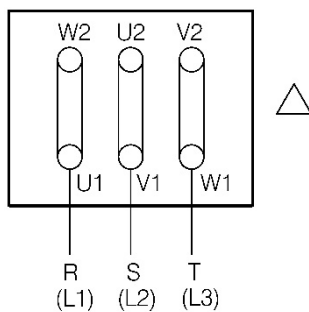
The rating plate states the motor's electrical data as well as the year of manufacture and the serial no. When contacting Landia regarding maintenance of a specific unit, please always state the serial no.

Power connection of motor

The mixer is equipped with a rating plate with the motor's technical data. The motor is connected according to Fig. 2 or 3. It must be verified that the other electrical parts correspond to the motor data, and the motor must be connected to a protective motor switch and a soft starter. For each mixer there is an electrical diagram. Check that the motor is running in the right direction. When looking into the ventilator at the end of the motor, this should run anticlockwise. If this is not the case, the phase sequence must be switched.

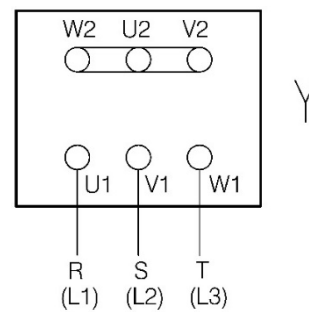
Only a certified electrician is allowed to connect the unit.

Fig. 2



Delta connection.

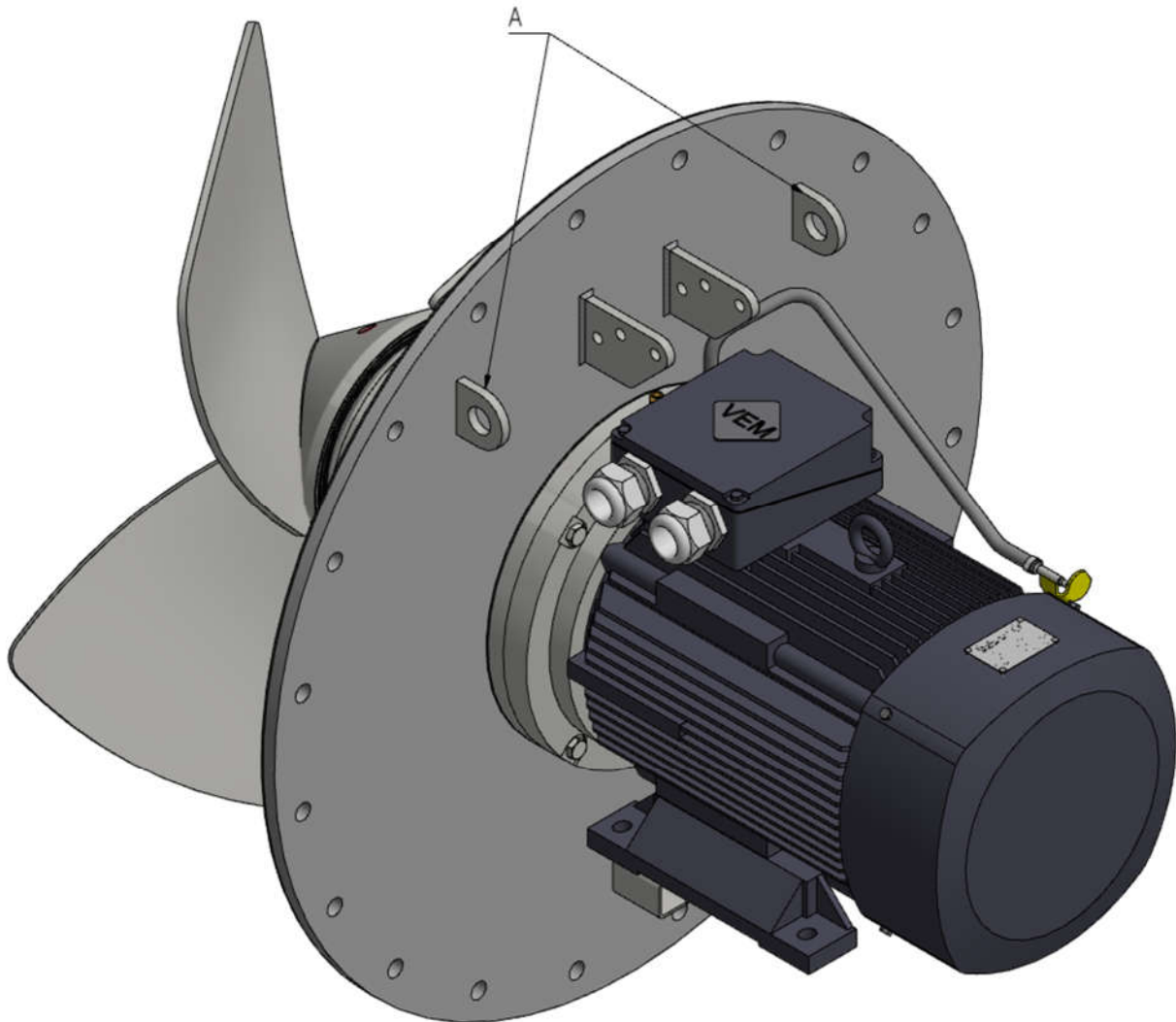
Fig. 3



Star connection.

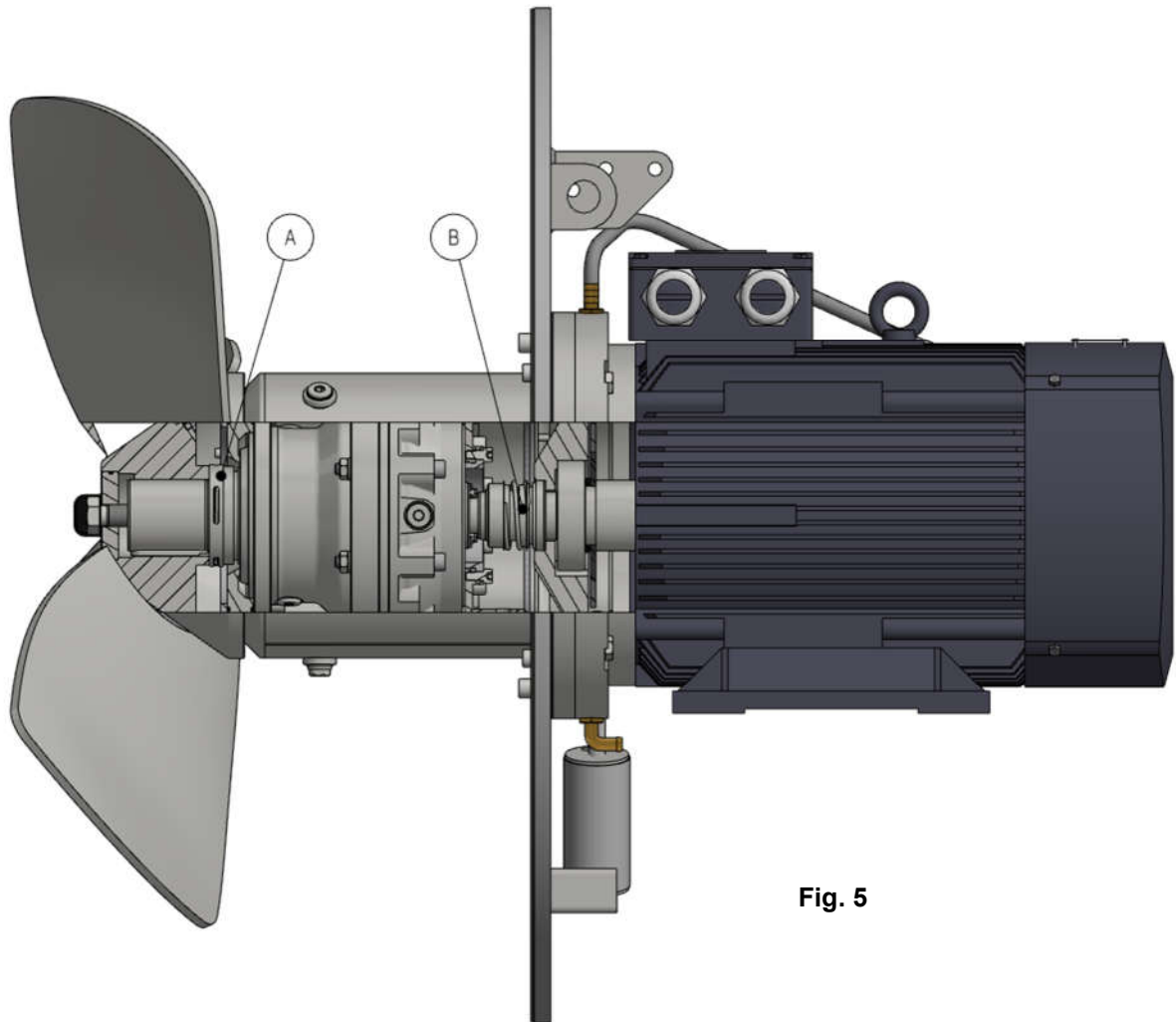
Lifting point

The lifting point of the unit equates to the centre of gravity.

A. Lifting point**Fig. 4**

Fault detection

Fault detection			
Fault type	Cause	Problem	Solution
Motor stops.	Protective motor switch activated.	Connection voltage too low.	Resolve issue and reset protective motor switch.
Motor stops.	Protective motor switch activated.	Propeller blocked.	Unblock propeller and reset protective motor switch.
Oil level in reservoir too low.	Oil has disappeared slowly over a prolonged period.	No problem. Normal oil consumption at mechanical shaft seals.	Refill oil until it shows in the middle of the sight glass, fig. 11 or until max level, fig. 12
Oil level in reservoir too low. Oil has disappeared over a short period or suddenly.	Leak at the inner mechanical shaft seal.	The waste oil collector is full or overflowing.	<p>If the oil is not dirty, clean/change the inner mechanical shaft seal.</p> <p>If the oil is dirty, clean/change both the outer and inner mechanical shaft seals. See fig. 5</p> <p>Refill oil until it shows in the middle of the sight glass, fig. 11 or until max level, fig. 12</p> <p>Quantity of oil: see spare parts list (paragraph on oil change).</p>
Oil level in reservoir too high when mounted at mixer level, fig. 11	Leak at the outer mechanical shaft seal.	Oil in reservoir dirty.	<p>Stop motor and demount the mixer for service.</p> <p>Temporary remedy until the tank can be emptied.</p> <p>Raise the oil container to above the level in the tank to increase the pressure in the mixer in relation to the tank.</p> <p>Plan to empty the tank and disassemble the mixer for servicing as prescribed in this service instruction.</p> <p>Keep a close watch on the oil consumption and lubricate the mixer with ca. 1 dl of grease every other day until the mixer has been serviced.</p> <p>If necessary, contact Landia.</p>

**Fig. 5**

- A. Outer mechanical shaft seal
- B. Inner mechanical shaft seal

The outer mechanical shaft seal can be changed after the tank has been emptied and the mixer removed from the tank. See parts list for disassembling the mixer.

The inner mechanical shaft seal can be changed by disassembling the mixer motor. See parts list for disassembling the mixer.

Regular maintenance

The mixer must be regularly serviced. Service procedures can be carried out by the operating personnel and should be performed at the intervals prescribed in the chart below:

See Fig. 11 and 12.

Daily service procedures	
<p>Check that the mixer is not emitting abnormal noise and vibrations.</p>	<p>If the mixer is noisy or vibrating, there may be something deposited on the propeller inside the tank. Stop the mixer for a few minutes. If necessary, run in reverse for up to 5 minutes.</p> <p>If the mixer is noisy or vibrating, it may be due to the level of liquid in the tank being too low. Stop the mixer and increase the level of liquid in the tank to min. 1.1 m above the centre of the mixer. Restart the mixer.</p> <p>Abnormal noise that starts quietly and increases over time may be due to defective ball bearings. Resolve the problem by disassembling the motor and replacing the input ball bearing (see fig 10 pos. C) in the gear and any ball bearings in the motor.</p>
<p>Check the oil level in the oil container.</p> <p>The oil should be in the middle of the sight glass, fig. 11 or between the oil container min. and max markings, fig. 12.</p>	<p>If the oil level is below, top up the oil and empty the waste oil collector.</p> <p>The quantity of oil in the collector may vary from a few drops to a full collector. The quantity of oil in the collector should be roughly the same as the quantity that needs to be added to the oil container.</p> <p>If the oil is above maximum level.</p> <p>Check that the oil is clean by unscrewing the dip stick and inspecting the oil. If the oil is clean, everything is OK. The oil should have a dark colour. Is the oil contaminated with liquid from the processing tank? Stop motor and change oil in mixer.</p> <p>Temporary remedy until the tank can be emptied:</p> <p>Raise the oil container to above the level in the tank to increase the pressure in the mixer in relation to the tank.</p> <p>Plan to empty the tank and disassemble the mixer for servicing as prescribed in this service instruction.</p> <p>Keep a close watch on the oil consumption and lubricate the mixer with ca. 1 dl of grease every other day until the mixer has been serviced.</p> <p>If necessary, contact Landia.</p>
<p>Waste oil collector quickly becomes full.</p>	<p>The temperature of the liquid in the tank is above 30°C.</p> <p>Drain the oil from the mixer and refill with oil as per the Landia oil chart.</p>

Service procedures every 3 days	
Lubricate the mixer with grease.	Lubricate the mixer with ca. 1 dl grease.
Monthly service procedures	
Check that there are no deposits on the electric motor preventing the motor from cooling.	If necessary, remove any deposits from the electric motor's cooling fins and ventilation case.
The vent plug on the oil container must not be clogged.	If the vent plug is clogged, clean it with compressed air.
4,300 hours of operation/min. once a year	
Change the oil in the mixer. See the procedure under "Oil change" in the service instruction.	
12,900 hours of operation/min. once every 3 years	
Remove the mixer from the processing tank and service it as per the service instruction.	

Servicing/repair of mixer





In the following, we have set out some general conditions regarding servicing/repair of Landia mixer type POPTR-I.

Under no circumstances may the mixer be suspended at the lifting points when servicing of the mixer is to be carried out. The mixer must be placed on a solid surface and be stable. It must be ensured that the person carrying out the servicing cannot be injured or have the mixer fall on them in connection with the mixer being removed and the centre of gravity of the mixer moving.

The drawing attached to the parts list illustrates the construction of the unit. Not all parts can/should be removed, e.g. the rotor should not be pressed off the shaft.

Also, when disassembling the unit, handle the mechanical shaft seals with care, as they are not shock-resistant.

Prior to reinstallation, all sealing surfaces must be cleaned and all O-rings inspected and, if necessary, replaced. A threadlocker (e.g. Loctite) must be applied to all bolt joints. All bolts must be tightened with a torque wrench as specified in the table below.

Bolt sizes	Quality 10.9 12.9 Steel  	Quality A4 at 80 Acidproof  
M6	14 Nm	10 Nm
M8	34 Nm	24 Nm
M10	67 Nm	48 Nm
M12	115 Nm	82 Nm
M16	160 Nm	137 Nm
M20	200 Nm	180 Nm
M30	620 Nm	620 Nm

Note

The oil chamber and gear must be turned as far **anticlockwise** as possible, seen from the end of the propeller, in order to balance the clearance in the bolt holes before final tightening of the bolts

After installing the bearing flange, check that the axial clearance is in accordance with the table below.

Motor size	Acceptable clearance
5.5 kW	0.50 + 0.1 mm
7.5 kW	0.80 + 0.1 mm
15.0 kW – 18,5 kW	1.30 + 0.1 mm

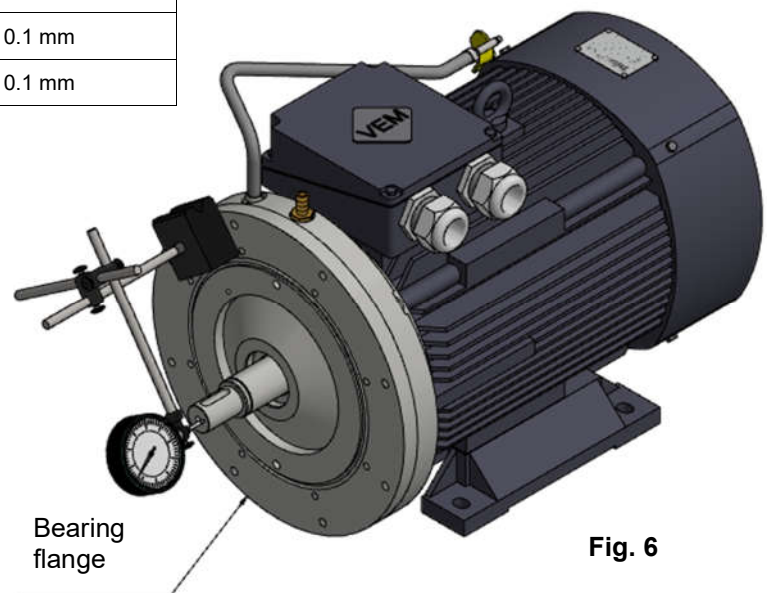


Fig. 6

Installation of mechanical shaft seals

When installing the mechanical shaft seals, please be aware that these are precision products and should be handled as such. The slide faces must be protected during installation.

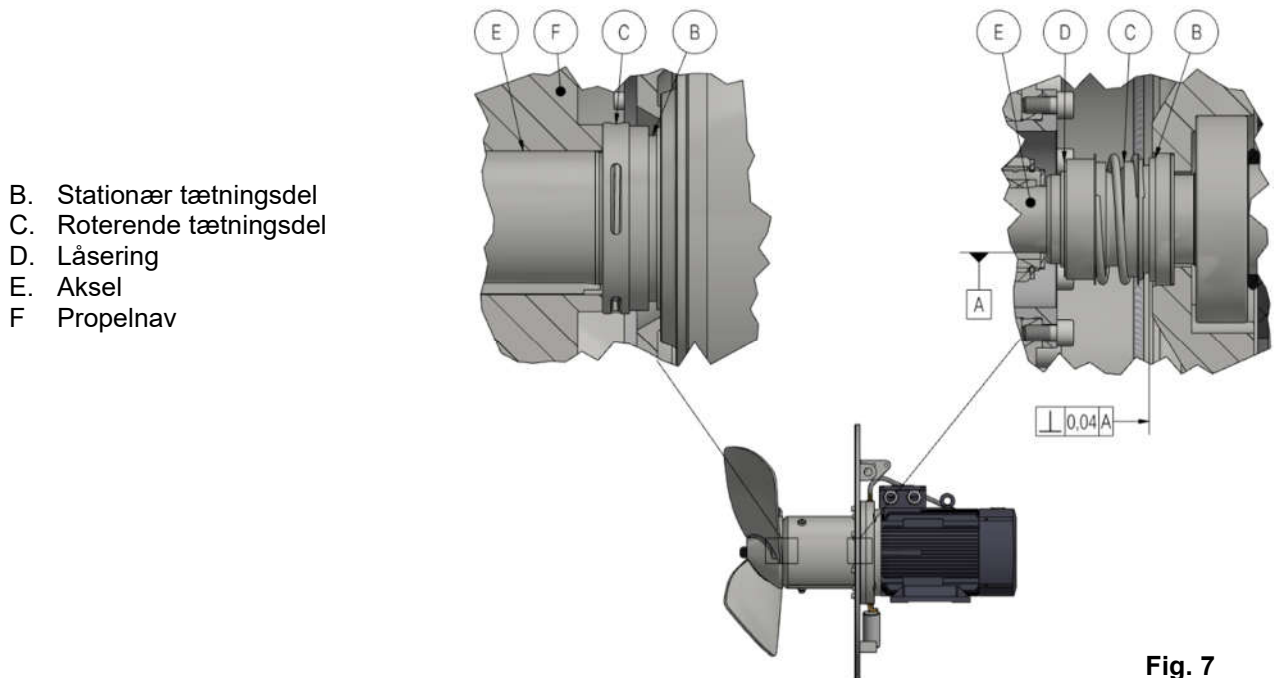


Fig. 7

Push the stationary sealing ring, pos. B, into place. Be careful not to damage the slide face during installation. When the stationary part is mounted and straightened with a dial gauge, cf. Fig. 7/8, wipe it off with degreaser.

The rotating sealing ring, pos. C, is put over the shaft. To facilitate installation, put soapy water on the interior side of the rubber bellows and on the shaft. Do not use silicone, PTFE lubricants or oil, as they will stop the rubber bellows from sticking to the shaft. An installation arbor should be used

The propeller hub, pos. F, keeps the outer mechanical shaft seal in place. This happens when the propeller hub is tightened against the output shaft collar. At the inner mechanical shaft seal, the locking ring, pos. D, must be put on the shaft and the seal pressed together until the locking ring snaps into the locking ring groove. Check the sealing by turning the motor shaft.

After servicing, check the mixer for leaks by applying 1 bar of overpressure in the case around the gear. Apply soapy water to all joints on the part of the mixer that is located inside the tank. Leaks (air bubbles) must not occur.

Oil quantity: See parts list.

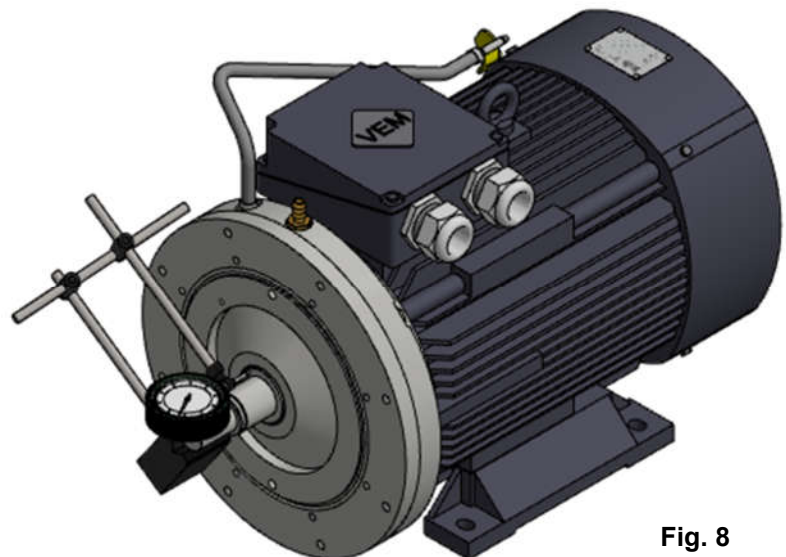


Fig. 8

Inspection

The inspection should include oil change, lubrication and inspection of slide faces, as prescribed here.

- I. Grease chamber
- J. Spacer (not shown)
- K. Wear bush
- L. Oil sealing ring
- M. Mechanical shaft seal

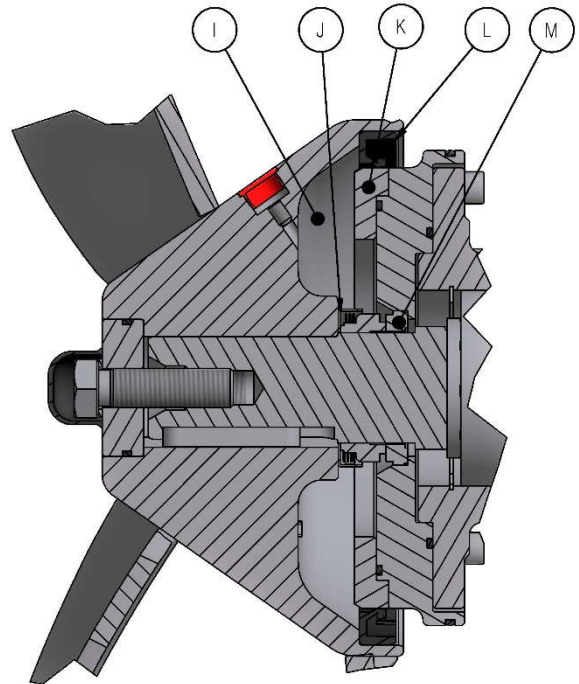


Fig. 9

Outer wear bush – general

There are two different kinds of outer wear bushing. One is made of stainless steel and the other, designed for extremely wearing liquids, is stainless steel and coated with a ceramic material. The ceramic-coated type can be recognised from its dark colour on the wearing surface.

With stainless steel wear bush

If the wear bush, fig. 9 pos. K, has deep wear traces, the propeller must be removed.

A spacer, pos. J, can be installed between the mechanical shaft seal and the propeller in order to move the wear area for the exterior wear bush. If it is not possible to move the wear area, either because it has been moved previously or because the wear area is too wide, a new wear bush must be installed. The oil sealing ring, pos. L, (incl. spring) must be checked for wear and changed if necessary.

With ceramic-coated wear bush

In this case, remove the propeller and check whether the surface is mat/porous. If it is, the wear bush is worn and must be changed. It is very important to check the oil sealing ring, pos. L, for wear with this system.

Mechanical shaft seal

Remove the propeller and carry out a visual inspection of the outer mechanical shaft seal. Remove any rags and, if the oil is dirty, remove the seal and check it for wear.

Lubrication

Before the propeller is reinstalled, fill up the grease chamber with grease, Fig. 9, pos. I. When the propeller has been installed, grease is filled through the grease nipple, Fig. 11, pos. A, and, Fig. 12, pos. E, until the grease is pressed out at the oil sealing rings, Fig. 9, pos. L.

Grease type: See parts list.

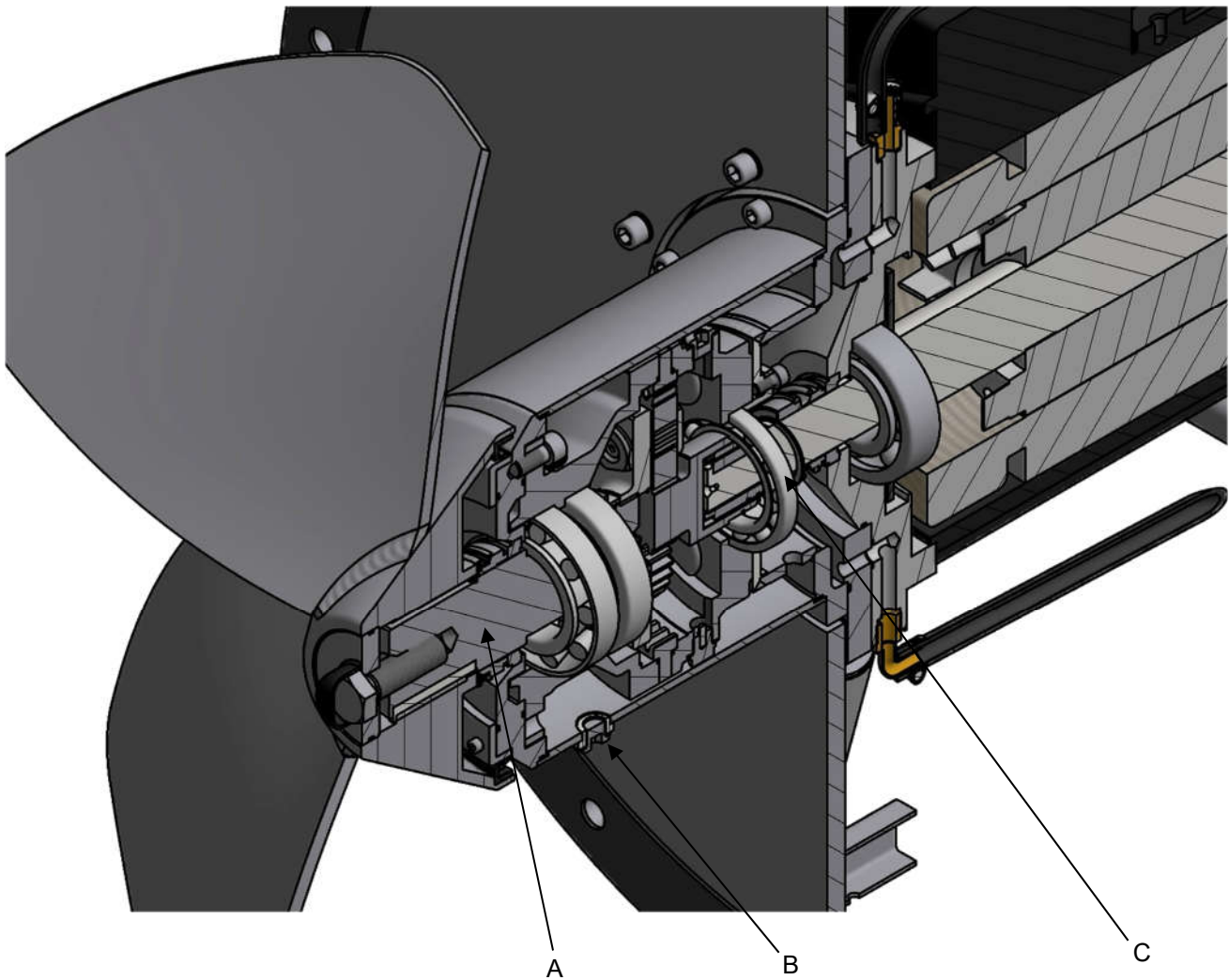
Gear

The ball bearing used in POPTR-I 5.5-7.5 kW, Fig. 10, pos. C, must always be replaced during servicing. Remove any metal slivers from the magnetic drain plug.

If there has been liquid in the gear, remove the gear. Change all ball bearings and carefully inspect the gearwheels. If it is judged that the gearwheels cannot last a full operating period of 12,900 hours/3 years, replace the gearwheels. Alternatively, a new gear can be installed.

There must not be any slack in the output shaft of the gear. If there is, the roller bearings in the gear must be tightened or the gear replaced.

Fig. 10



POPTR-I 5.5-7.5 kW, Gear EM 1010

- A. Output shaft of the gear
- B. Magnetic drain plug
- C. Ball bearing (always replace during service)

POPTR-I 11.0-18.5 kW, Gear EM 1020

- A. Output shaft of the gear
- B. Magnetic drain plug
- C. Fixing washer for sun wheel (maintenance free)

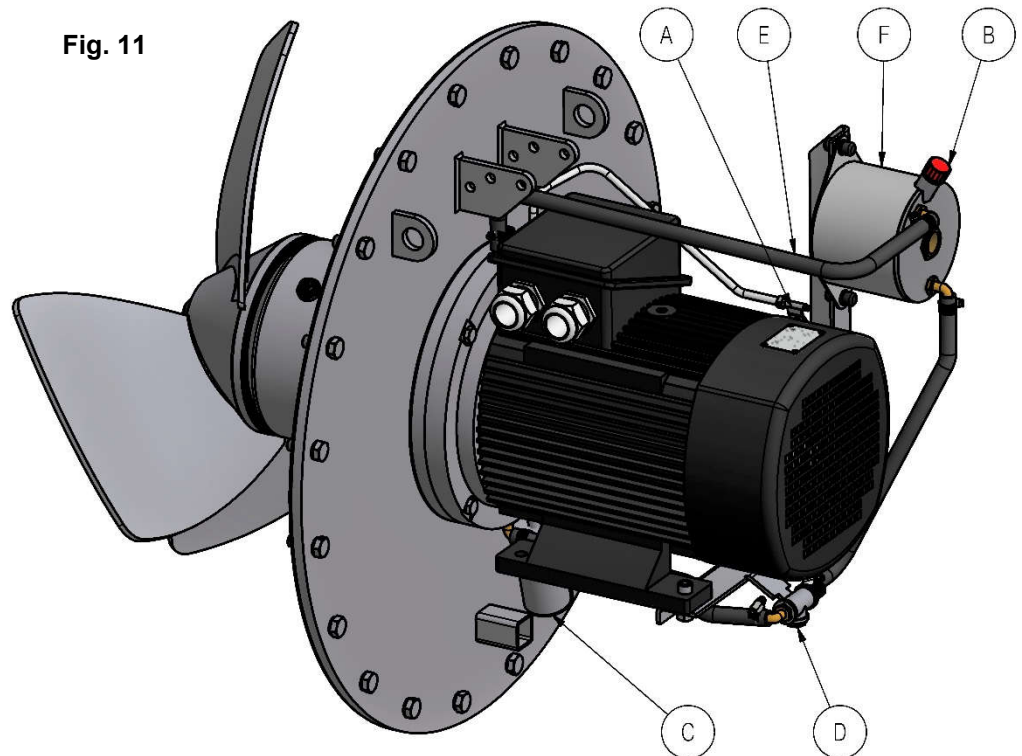
Oil change in POPTR-I with oil reservoir

The oil is drained by removing the ventilation cap, pos. B, and the draining plug, pos. D, as shown in Fig. 11.

Refill the oil through the tube on which the ventilation cap, pos. B, is installed. Oil type/quantity: see spare parts list.

When refilling the oil, it is advisable to use a vacuum pump to suck in the oil. This is done by removing the top hose on the oil reservoir, pos. E, and blanking off the hose connection. After this, you can pump out the air in the mixer via the removed hose, pos. E, and refilling oil into the oil reservoir, pos. F/B. A vacuum pump can be bought from Landia A/S – alternatively, you can use e.g. a pump for waste oil.

Fig. 11



- A. Grease nipple
- B. Ventilation cap
- C. Collector for waste oil from the mechanical shaft seal
- D. Draining plug
- E. Hose
- F. Oil reservoir

Oil change in POPTR-I with oil tank above liquid level

Oil draining

Dismantle the oil hose with quick coupling from the oil pump by loosening the clamp, pos. F, and removing the hose. Install the quick coupling on the oil hose on the mixer, pos. D. Put the other end of the hose into a bucket of min. 20 L, which will make the oil run from the mixer into the bucket – the oil will run out slowly and it may take a while to empty the system.

Oil filling

Install the oil pump in a suitable oil can with pure oil – see spare part list for type and quantity. Make sure that the vent plug, pos. A, is not blocked. Mount the hose end that runs into the bucket on the oil pump with a hose clamp, pos. F, after which the oil can be pumped onto the mixer. Fill the oil close to the top marking, pos. B. Stop a little below the top mark, as the pressure in the system will cause the oil to rise a little after you stop pumping.

- A. Ventilation cap
- B. Oil reservoir
- C. Grease nipple
- D. Quick coupling
- E. Collector for waste oil from the mechanical shaft seal
- F. Hose clamp

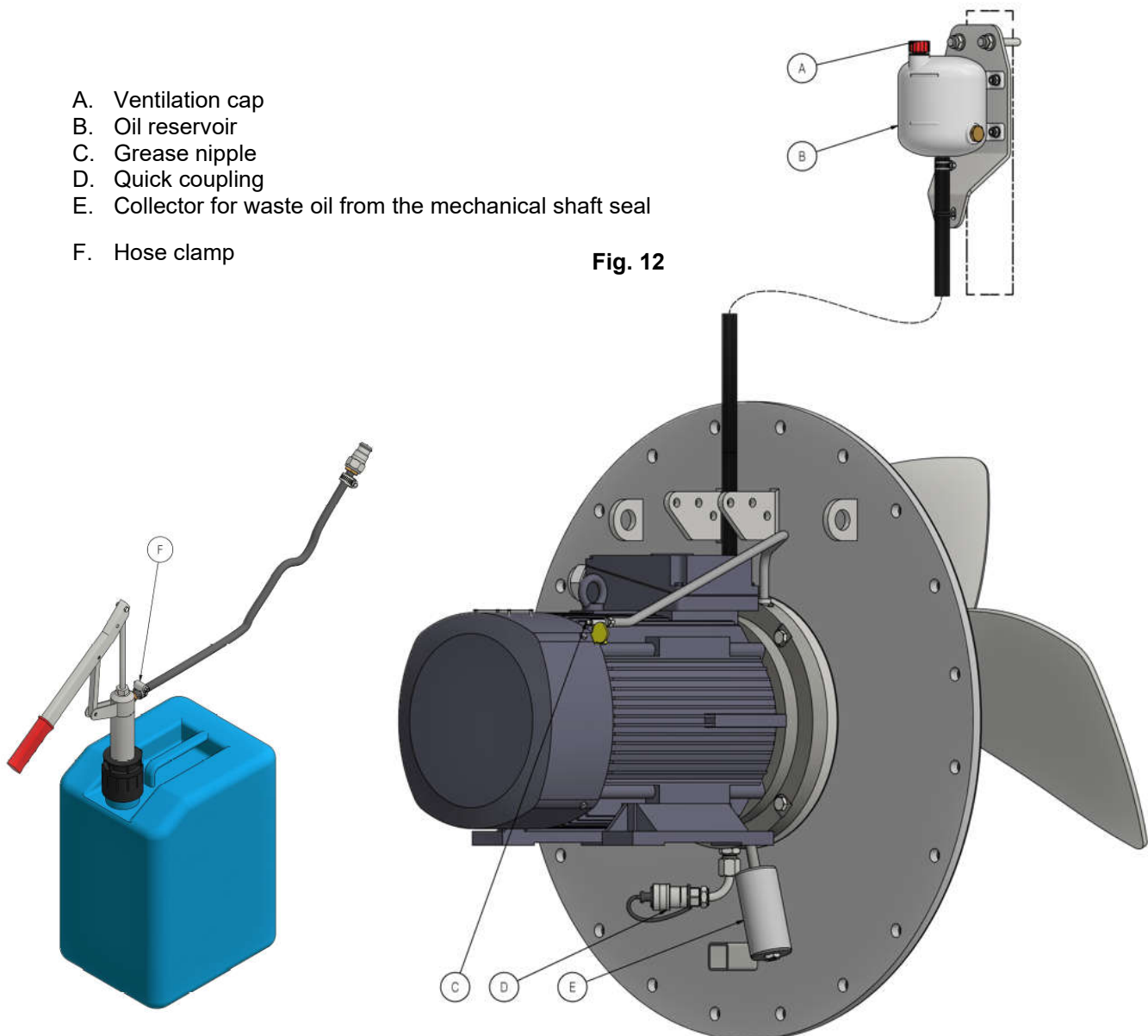


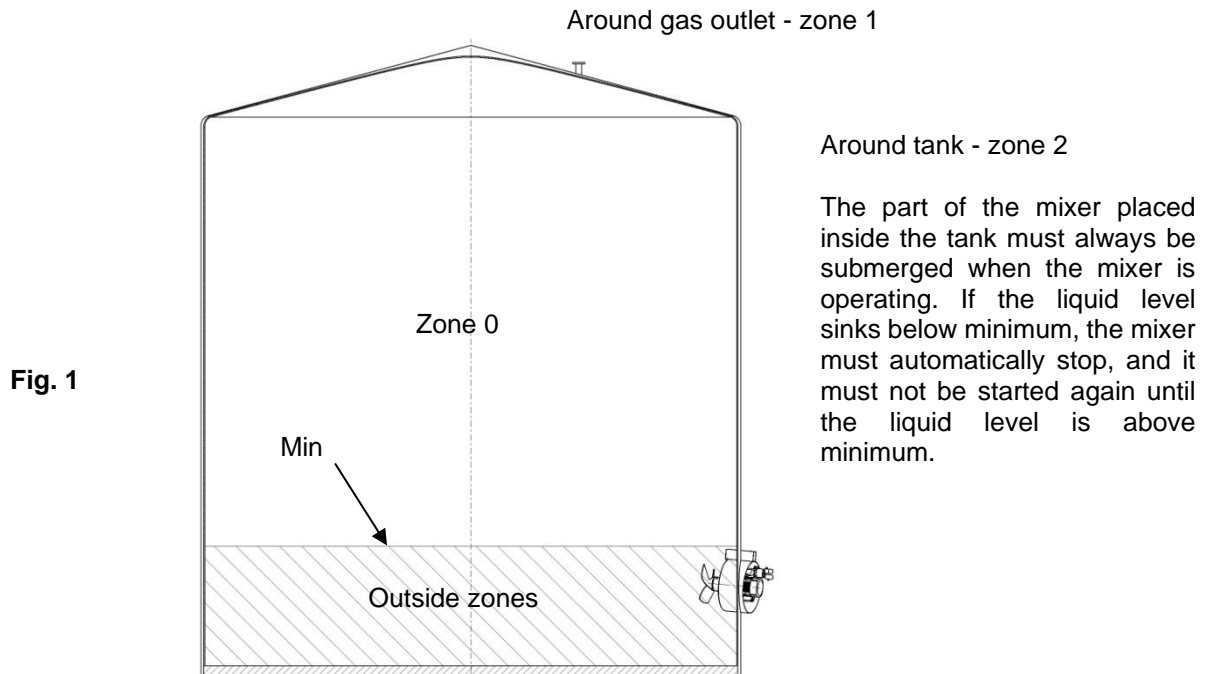
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Introduction

POPTR-I is a flange-installed mixer. The mixer is to be used for mixing of liquids with high or low dry matter content. The mixer is ATEX marked to zone 2. See fig. 1.

The mechanical part of the mixer with the propeller is placed inside the tank, and the electrical motor pulling the propeller by means of the gear is placed outside the tank.



The mixer is installed with a dry-installed explosion-proof motor with temperature class T3. The motor pulls the propeller shaft by means of a gear. Between propeller and gear as well as between motor and gear is a mechanical shaft seal which keeps the oil in the oil chamber. The oil lubricates the gear and the mechanical shaft seal closest to the motor. The mechanical shaft seal closest to the propeller must be lubricated manually. On the mixer is an oil container with a level sensor. The level sensor monitors low and high levels of oil, respectively. The propeller is installed on the output shaft of the gear.

Application

The mixer is to be used for flow creation, mixing and homogenization of liquids with high or low dry matter content. The mixer can be exposed to 1.0 bar excessive pressure and within the temperature area -20 °C to +40 °C. If another application is requested, please consult Landia beforehand.

Installation

The flange is installed in the tank in the requested angle according to the directions of Landia. If the mixer is installed in a plant where gas has been or is being extracted, make sure that the plant is aired out and completely free from gas. When this has been secured, the mixer can be installed on the prepared flange with washer and bolts.

The motor must be dry-installed but can be placed outdoors, as it is splash proof.

Warning

Please note the following:

- The mixer should only be connected by a certified electrician.
- Prior to start-up, check that the mixer is installed correctly on the tank according to the service instructions.
- Before starting up the mixer for the first time, the propeller shaft should be rotated manually. This also applies if the mixer has not been in operation for a prolonged period.
- The mixer must be dry installed but can be placed outdoors without covering, as the motor is explosion-proof. To facilitate cooling, the motor must not be wrapped with plastic sheet or similar.
- Before the mixer is serviced/repared, it is imperative that the electrical connection of the mixer is switched off or locked out.
- The propeller must be fully submerged and there must be at least 1.1 m from the surface of the liquid to the centre of the mixer.
- Prior to operation, the oil level in the sight glass must be checked.

Servicing/repair

To maintain a high level of operating safety and a long service life without unnecessary and expensive repairs, it is important from the beginning to carry out regular preventive servicing. Service procedures should be carried out at the intervals prescribed in the manual. Always follow the instructions carefully and only use the parts prescribed by Landia A/S in the spare parts list.

It is essential that routine maintenance is carried out as prescribed in this service instruction.

If you prefer not to do the servicing yourself, please give us a call and we can arrange a service agreement.

As the mixer must adhere to the regulations of 2014/34/EU, service is to be executed by educated personnel only. If the service involves disassembling of the mixer from the tank, the tank must be thoroughly aired out and free from gas.

Please note

If during servicing/repairs spare parts are used that are not identical to those recommended, the guarantee from Landia A/S will be voided. Spare parts can be ordered from Landia A/S.

Major repairs should be carried out at the specialist workshop below.

Head Office:
LANDIA A/S
Industrivej 2
DK-6940 Lem St.
Tel.: +45 97 341244
info@landia.dk
www.landia.dk

UK subsidiary:
Landia (UK) Ltd.
Waymills Industrial Estate,
Whitchurch,
Shropshire SY13 1TT
Tel: + 44 01948 661 200
info@landia.co.uk
www.landia.co.uk

Landia A/S is represented by local distributors worldwide, please call for further information.

Installation on tank flange

When installing the mixer on the tank flange, the bolts are to be cross-tensioned. Bolt M16 class A4-80 is to be tensioned with 137 Nm. If the washer is not tight, the tightening moment must be increased with 10 Nm. at a time until 200 Nm. max till the washer is tight.

Due to vibrations and frictions, all stainless steel bolts have to be ensured/ lectured with a lock remedy, e.g. Loctite type 243.

After having installed the mixer, ensure that the washer fig. 2 pos. A is tight.

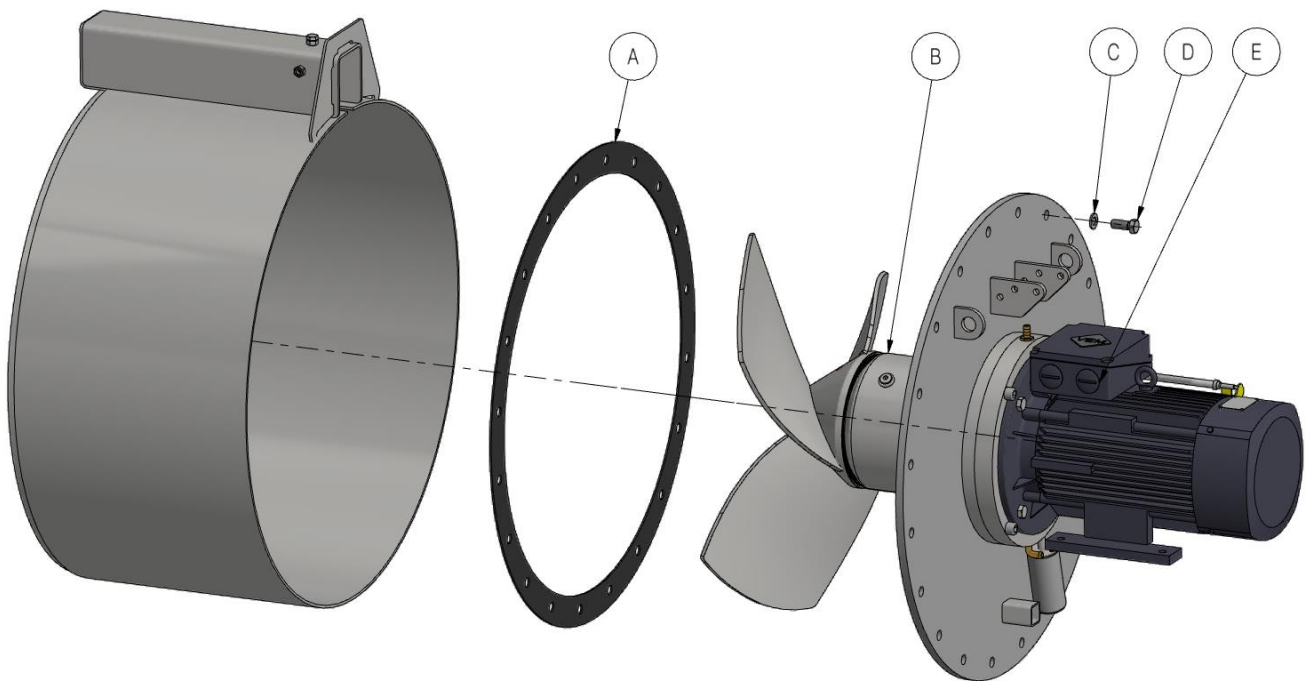
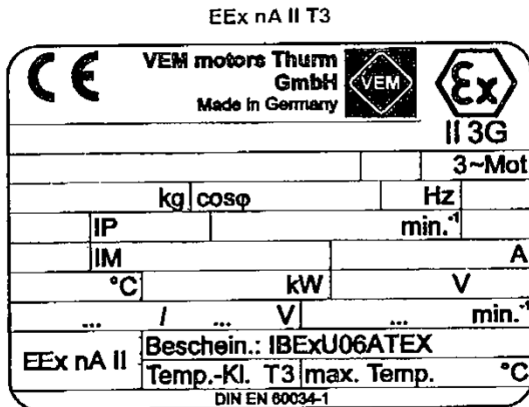


Fig. 2

- A. Washer
- B. Mixer POPTR-I
- C. St. steel washer $\varnothing 32/\varnothing 16,5 \times 4$
- D. Acid proof bolt M16x40
- E. Clamp for potential balancing of entire unit

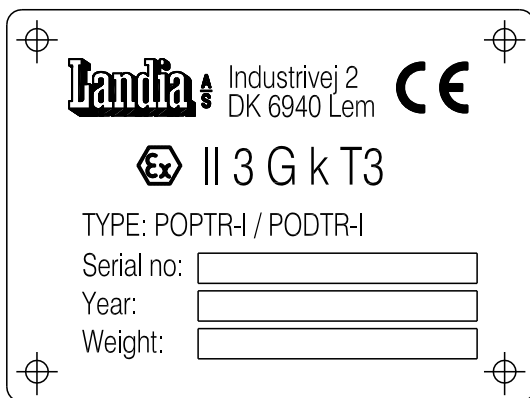
A particular rail system for handling of the mixer has been developed. See separate service instruction

Rating plate



- IP: Cage class
- 3~Mot.: 3 phase motor
- IM: Construction form
- cos φ: Power factor
- kg: Motor's weight without pump
- kW: Nominal shaft power
- V: Connection's voltage
- A: Nominal power consumption
- °C: Temperature
- min⁻¹: Motor revolutions per minute
- kW, V, A and min⁻¹ for resp. 50Hz and 60Hz

Ex-marking of unit



- II: Group 2
- 3: Category 3 – zone 2
- G: Permitted in potentially explosive areas with gas or steam
- k: Protected by liquid immersion
- T3: Temperature class up to 200 °C

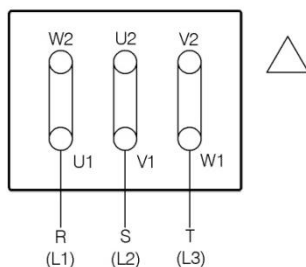
The rating plate indicates the motor's electrical data as well as the year of construction and the serial no. When contacting Landia regarding maintenance of a specific unit, please always state the serial no.

Power connection of motor

Every mixer is equipped with a rating plate with technical motor data. The motor is connected according to fig. 3 or fig. 4. It must be verified that the other electrical parts correspond to the motor data and a protective motor switch and a soft-starter must be applied at connection of the mixer. The electrical installation of the mixer must comply with the requirements of the ATEX directive.

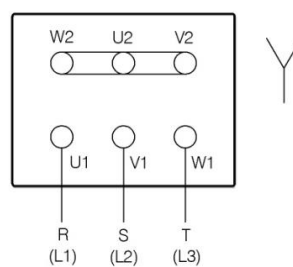
Only a certified electrician is allowed to connect the unit.

Fig. 3



Delta connection

Fig. 4



Star connection

Starting the mixer by means of level sensor

The part of the mixer placed inside the tank, fig. 1, is to be protected by liquid immersion "k". If the liquid level in the tank sinks below minimum, the mixer must automatically stop and must not be started again until the liquid level is above minimum. That is, the tank must be equipped with a level sensor sending a stop signal to the mixer if the liquid level sinks below minimum. It is the end user's responsibility that the electrical fittings adhere to the regulations of ATEX Directive.

Landia cannot be held responsible for flaws and deficiencies regarding the installation.

Lifting point

The lifting point of the unit equals the centre of gravity.

- A. Lifting point

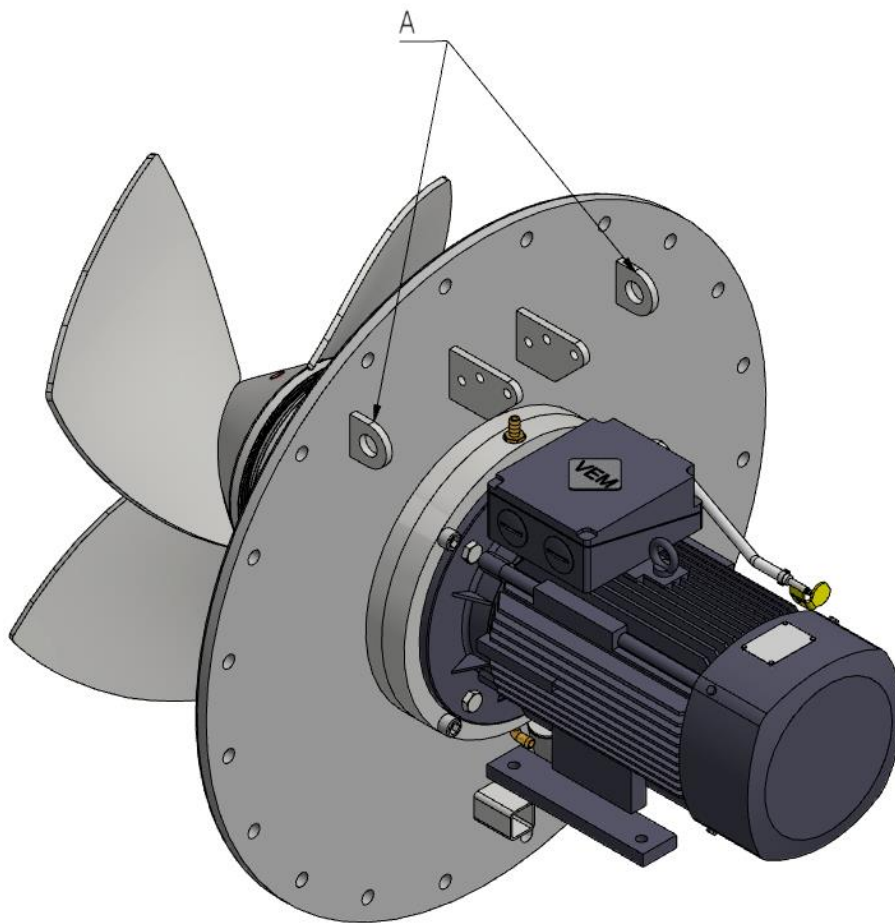
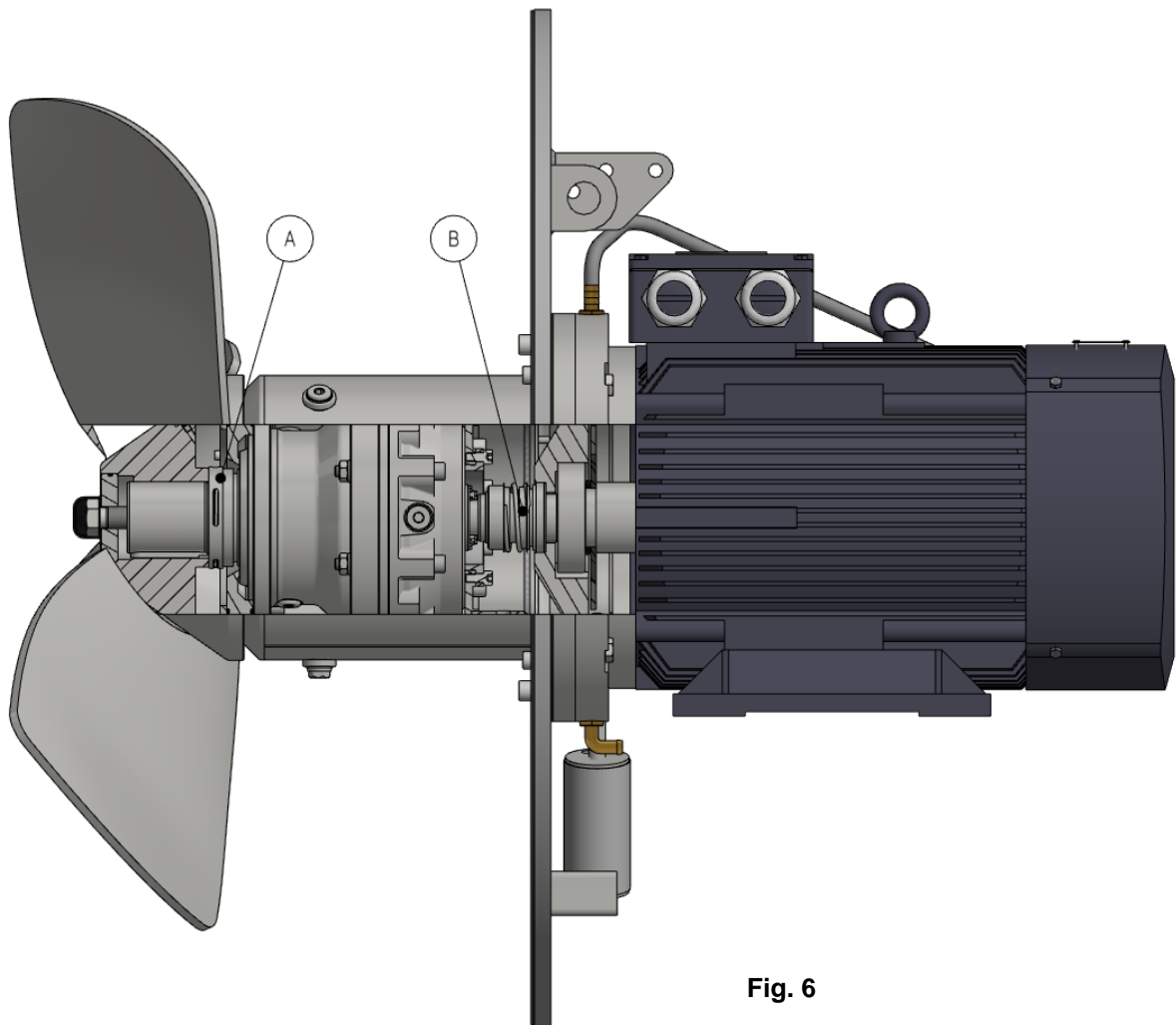


Fig. 5

Fault detection

Fault detection			
Fault type	Cause	Problem	Solution
Motor stops.	Protective motor switch activated.	Connection voltage too low.	Resolve issue and reset protective motor switch.
Motor stops.	Protective motor switch activated.	Propeller blocked.	Unblock propeller and reset protective motor switch.
Oil level in reservoir too low.	Oil has disappeared slowly over a prolonged period.	No problem. Normal oil consumption at mechanical shaft seals.	Fig. 11: Fill with oil until the correct level appears on the dipstick, pos. D Fig. 12: Fill with oil until the top float gives a signal.
Oil level in reservoir too low. Oil has disappeared over a short period or suddenly.	Leak at the inner mechanical shaft seal.	The waste oil collector is full or overflowing.	If the oil is not dirty, clean/change the inner mechanical shaft seal. If the oil is dirty, clean/change both the outer and inner mechanical shaft seals. See fig. 6 Fig. 11: Fill with oil until the correct level appears on the dipstick, pos. D Fig. 12: Fill with oil until the top float gives a signal. Quantity of oil: see spare parts list (paragraph on oil change).
Oil level in reservoir too high in oil container mounted by mixer, fig. 11	Leak at the outer mechanical shaft seal.	Oil in reservoir dirty.	Stop motor and demount the mixer for service. Temporary remedy until the tank can be emptied. Raise the oil container to above the level in the tank to increase the pressure in the mixer in relation to the tank. Plan to empty the tank and disassemble the mixer for servicing as prescribed in this service instruction. Keep a close watch on the oil consumption and lubricate the mixer with ca. 1 dl of grease every other day until the mixer has been serviced. If necessary, contact Landia.

**Fig. 6**

- A. Outer mechanical shaft seal
- B. Inner mechanical shaft seal

The outer mechanical shaft seal can be changed by emptying the tank and disassemble the mixer from the tank. Prior to disassembling, the tank must be thoroughly aired out and free from gas. See parts list drawing for disassembling the mixer. The inner mechanical shaft seal can be changed by disassembling the motor. See parts list drawing for disassembling the mixer.

Regular maintenance

The mixer must be regularly serviced. Service procedures can be carried out by the operating personnel and should be performed at the intervals prescribed in the chart below:

See Fig. 11 and 12.

Daily service procedures	
<p>Check that the mixer is not emitting abnormal noise and vibrations.</p>	<p>If the mixer is noisy or vibrating, there may be something deposited on the propeller inside the tank. Stop the mixer for a few minutes. If necessary, run in reverse for up to 5 minutes.</p> <p>If the mixer is noisy or vibrating, it may be due to the level of liquid in the tank being too low. Stop the mixer and increase the level of liquid in the tank to min. 1.1 m above the centre of the mixer. Restart the mixer.</p> <p>Abnormal noise that starts quietly and increases over time may be due to defective ball bearings. Resolve the problem by disassembling the motor and replacing the input ball bearing in the gear, fig 10 pos. C and any ball bearings in the motor.</p>
<p>Check the oil level in the oil container.</p>	<p>If the oil level is too low, it will be seen on the dipstick, fig. 11 pos. D or by signal from the lower float at fig. 12.</p> <p>The quantity of oil in the collector may vary from a few drops to a full collector. The quantity of oil in the collector should be roughly the same as the quantity that needs to be added to the oil container.</p> <p>If the oil level is too high, the upper float in fig. 11 give signal. High oil level does not occur with oil container located as in fig. 12.</p> <p>Check that the oil is clean by unscrewing the dip stick and inspecting the oil. If the oil is clean, everything is OK. The oil should have a dark colour. Is the oil contaminated with liquid from the processing tank? Stop motor and change oil in mixer.</p> <p>Temporary remedy until the tank can be emptied:</p> <p>Raise the oil container to above the level in the tank to increase the pressure in the mixer in relation to the tank. Plan to empty the tank and disassemble the mixer for servicing as prescribed in this service instruction.</p> <p>Keep a close watch on the oil consumption and lubricate the mixer with ca. 1 dl of grease every other day until the mixer has been serviced.</p> <p>If necessary, contact Landia.</p>
<p>Waste oil collector quickly becomes full.</p>	<p>The temperature of the liquid in the tank is above +30°C.</p>

	Drain the oil from the mixer and refill with oil as per the Landia oil chart.
Service procedures every 3 days	
Lubricate the mixer with grease.	Lubricate the mixer with ca. 1 dl grease.
Monthly service procedures	
Check that there are no deposits on the electric motor preventing the motor from cooling.	If necessary, remove any deposits from the electric motor's cooling fins and ventilation case.
The vent plug on the oil container must not be clogged.	If the vent plug is clogged, clean it with compressed air.
4,300 hours of operation/min. once a year	
Change the oil in the mixer. See the procedure under "Oil change" in the service instruction.	
12,900 hours of operation/min. once every 3 years	
Remove the mixer from the processing tank and service it as per the service instruction.	

Servicing/repair of mixer

In the following is listed some overall conditions regarding assembling/disassembling of the mixer.

Under no circumstances may the mixer be suspended at the lifting points when servicing of the mixer is to be carried out. The mixer must be placed on a solid surface and be stable. It must be ensured that the person carrying out the servicing cannot be injured or have the mixer fall on them in connection with the mixer being removed and the centre of gravity of the mixer moving.

The drawing attached to the parts list illustrates the construction of the unit.

When disassembling the unit, handle the mechanical shaft seals with care, as they are not shock resistant.

Prior to reinstallation, all sealing surfaces must be cleaned; all O-rings must be checked and changed if necessary. Adhesive substance (e.g. Loctite) must be applied on all bolt joints. All bolts must be tightened with a torque wrench as specified in the table below.

Bolt sizes	Quality 10.9 12.9 Steel  	Quality A4 at 80 Acidproof  
M6	14 Nm	10 Nm
M8	34 Nm	24 Nm
M10	67 Nm	48 Nm
M12	115 Nm	82 Nm
M16	160 Nm	137 Nm
M20	200 Nm	180 Nm
M30	620 Nm	620 Nm

Please note

Oil chamber and gear must be turned anti-clockwise as much as possible, seen from the end of the propeller, in order to balance the clearance in the bolt holes before the final tightening of the bolts.

Installation of mechanical shaft seals

When installing the mechanical shaft seals, please be aware that these are precision products and should be handled as such. The slide faces must be protected during installation.

- B. Stationary sealing ring
- C. Rotating sealing ring
- D. Locking ring
- E. Shaft
- F. Propeller hub

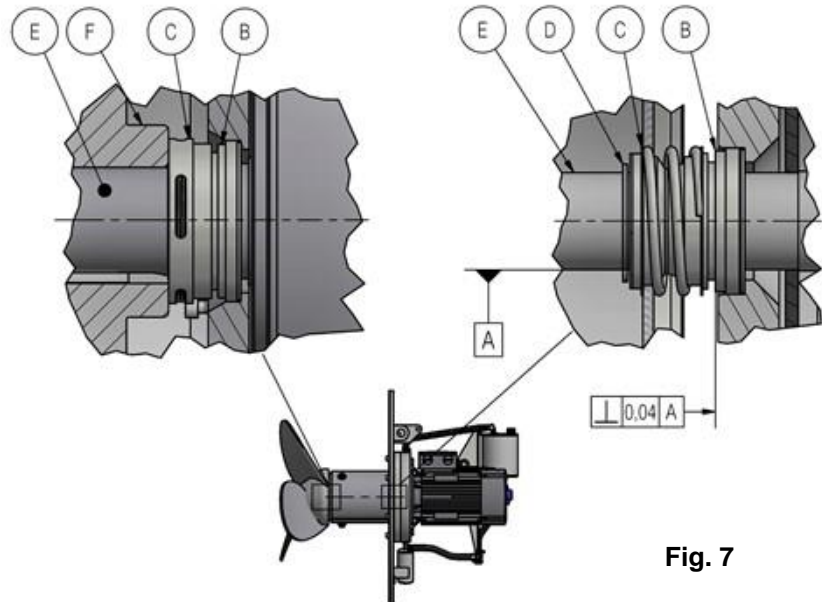


Fig. 7

Push the stationary sealing ring, pos. B, into place. Be careful not to damage the slide face during installation. When the stationary part is mounted and straightened with a dial gauge, cf. Fig. 7/8, wipe it off with degreaser.

The rotating sealing ring, pos. C, is put over the shaft. To facilitate installation, put soapy water on the interior side of the rubber bellows and on the shaft. Do not use silicone, PTFE lubricants or oil, as they will stop the rubber bellows from sticking to the shaft. An installation arbor should be used.

The propeller hub, pos. F, keeps the outer mechanical shaft seal in place. This happens when the propeller hub is tightened against the output shaft collar. At the inner mechanical shaft seal, the locking ring, pos. D, must be put on the shaft and the seal pressed together until the locking ring snaps into the locking ring groove. Check the sealing by turning the motor shaft.

After servicing, check the mixer for leaks by applying 1 bar of overpressure in the case around the gear. Apply soapy water to all joints on the part of the mixer that is located inside the tank. Leaks (air bubbles) must not occur.

Oil quantity: See parts list.

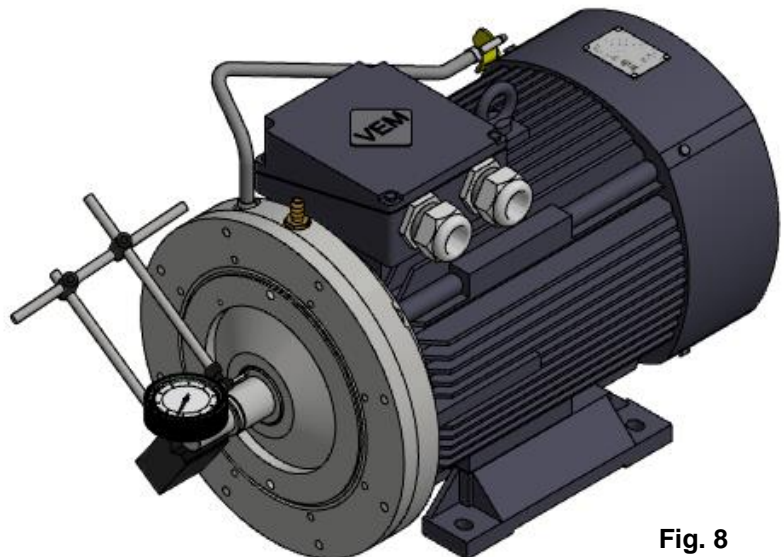


Fig. 8

Inspection

The inspection should include oil change, lubrication and inspection of slide faces, as prescribed here.

- I. Grease chamber
- J. Spacer (not shown)
- K. Wear bush
- L. Oil sealing ring
- M. Mechanical shaft seal

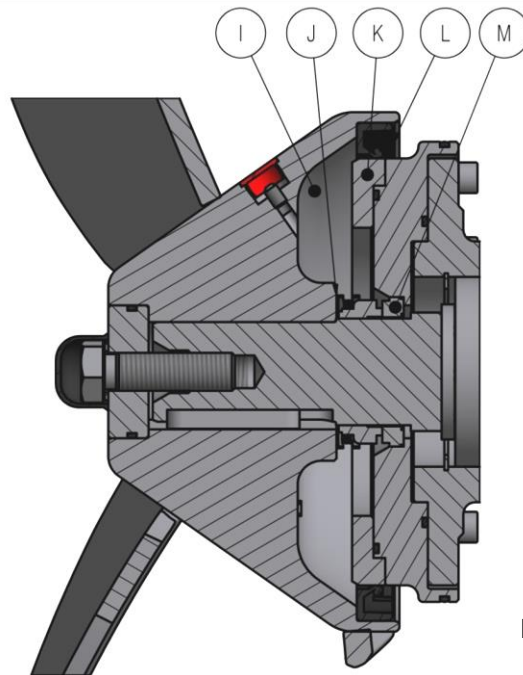


Fig. 9

Outer wear bush – general

There are two different kinds of outer wear bushing. One is made of stainless steel and the other, designed for extremely wearing liquids, is stainless steel and coated with a ceramic material. The ceramic-coated type can be recognised from its dark colour on the wearing surface.

With stainless steel wear bush

If the wear bush, fig. 9 pos. K, has deep wear traces, the propeller must be removed.

A spacer, pos. J, can be installed between the mechanical shaft seal and the propeller in order to move the wear area for the exterior wear bush. If it is not possible to move the wear area, either because it has been moved previously or because the wear area is too wide, a new wear bush must be installed. The oil sealing ring, pos. L, (incl. spring) must be checked for wear and changed if necessary.

With ceramic-coated wear bush

In this case, remove the propeller and check whether the surface is mat/porous. If it is, the wear bush is worn and must be changed. It is very important to check the oil sealing ring, pos. L, for wear with this system.

Mechanical shaft seal

Remove the propeller and carry out a visual inspection of the outer mechanical shaft seal. Remove any rags and, if the oil is dirty, remove the seal and check it for wear.

Lubrication

Before the propeller is reinstalled, fill up the grease chamber with grease, Fig. 9, pos. I. When the propeller has been installed, grease is filled through the grease nipple, Fig. 11, pos. B, and Fig. 12, pos. F, until the grease is pressed out at the oil sealing rings, Fig. 9, pos. L.

Grease type: See parts list.

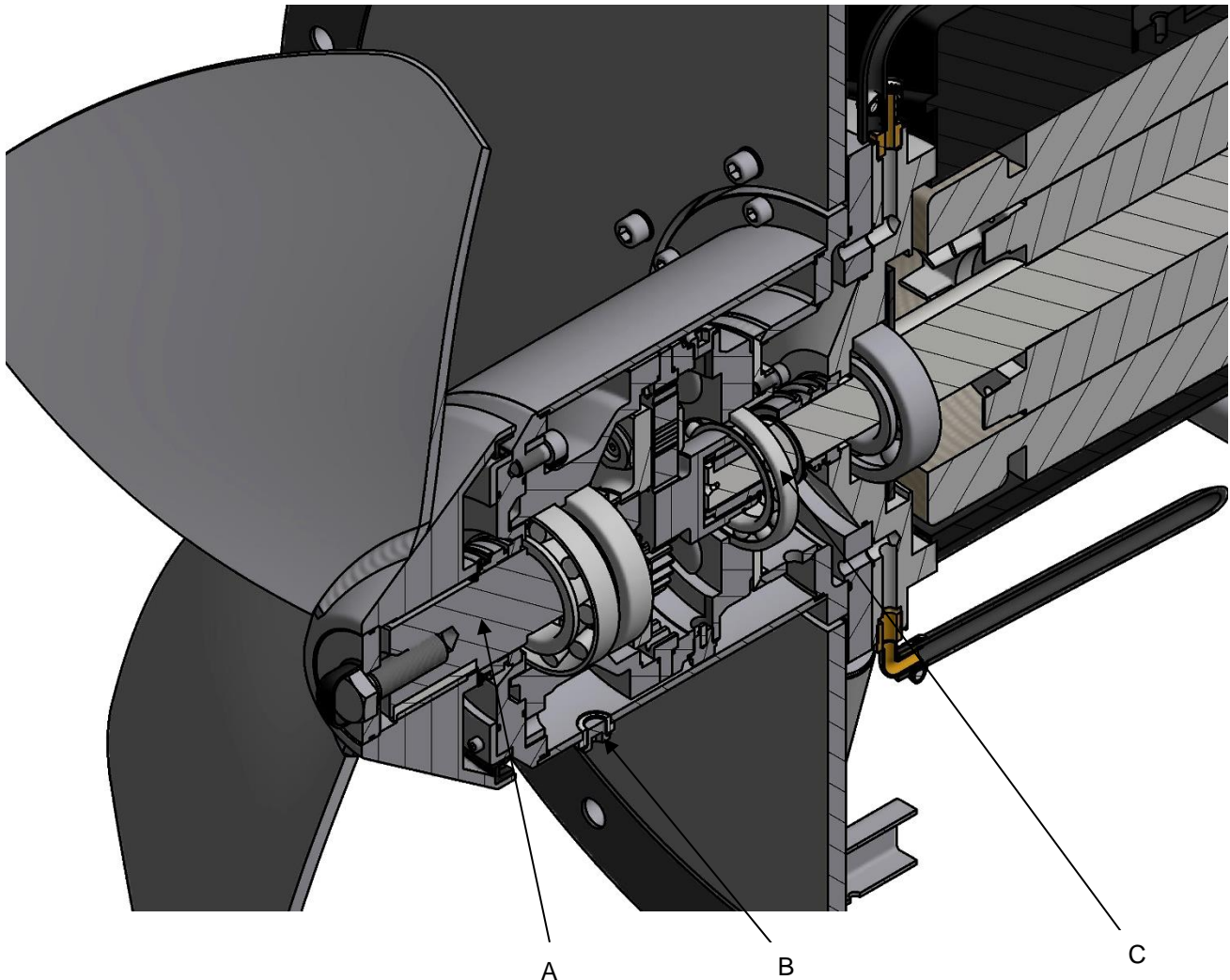
Gear

The ball bearing used in POPTR-I 5,5-7,5 kW, Fig. 10, pos. C, must always be replaced during servicing. Remove any metal slivers from the magnetic drain plug.

If there has been liquid in the gear, remove the gear. Change all ball bearings and carefully inspect the gearwheels. If it is judged that the gearwheels cannot last a full operating period of 12,900 hours/3 years, replace the gearwheels. Alternatively, a new gear can be installed.

There must not be any slack in the output shaft of the gear. If there is, the roller bearings in the gear must be tightened or the gear replaced.

Fig. 10



OPTR-I 5.5-7.5 kW, Gear EM 1010

- A. Output shaft of the gear
- B. Magnetic drain plug
- C. Ball bearing (always replace during service)

POPTR-I 11.0-18.5 kW, Gear EM 1020

- A. Output shaft of the gear
- B. Magnetic drain plug
- C. Fixing washer for sun wheel (maintenance free)

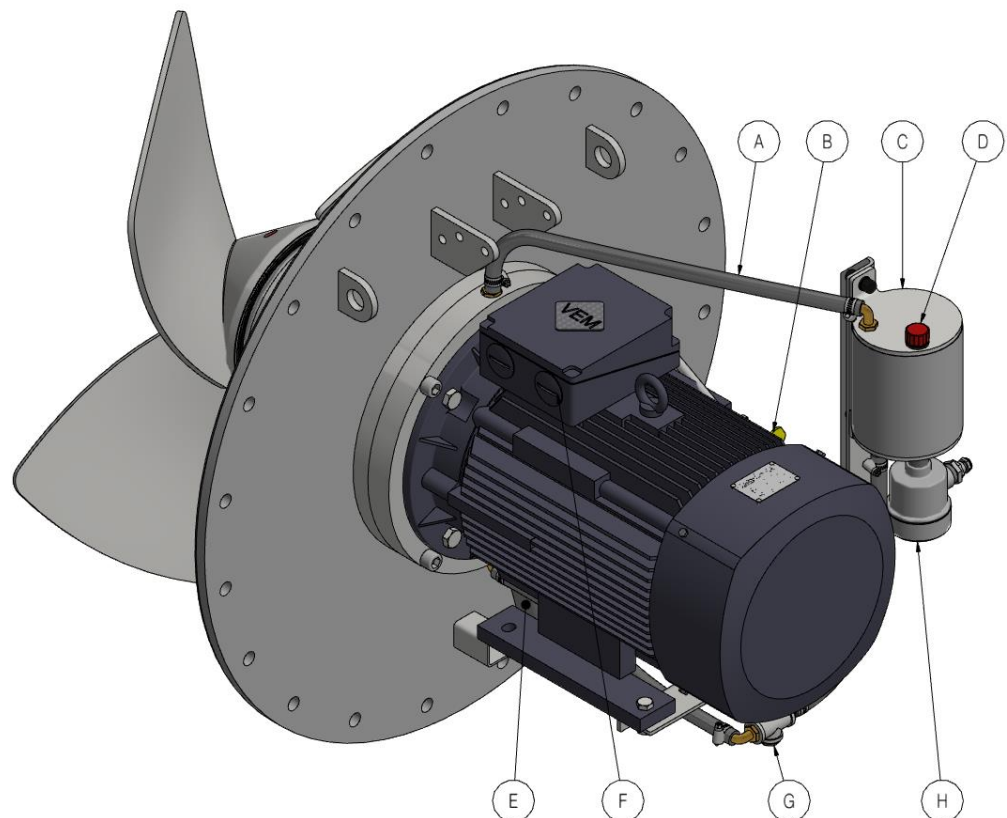
Oil change in POPTR-I with oil reservoir

The oil is drained by removing the ventilation cap, pos. D, and the draining plug, pos. G, as shown in Fig. 11.

Refill the oil through the tube on which the ventilation cap, pos. D, is installed. Oil type/quantity: see spare parts list.

When refilling the oil, it is advisable to use a vacuum pump to suck in the oil. This is done by removing the top hose on the oil reservoir, pos. A, and blanking off the hose connection. After this, you can pump out the air in the mixer via the removed hose, pos. A, and refilling oil into the oil reservoir, pos. C/D. A vacuum pump can be bought from Landia A/S – alternatively, you can use e.g. a pump for waste oil.

Fig. 11



- A. Hose
- B. Grease nipple
- C. Oil reservoir
- D. Ventilation cap
- E. Collector for waste oil from the mechanical shaft seal
- F. Clamp for potential balancing of entire unit
- G. Draining plug
- H. Level sensor

Oil change in POPTR-I Mixer with oil reservoir placed above liquid level

The oil is drained by removing the ventilation cap, pos. A, and the draining plug, pos. E, as shown in Fig. 12.

Refill the oil through the quick coupling under the mixer, Pos. D. Use a hand pump for the oil filling.
See spare parts list for oil type/quantity.

- A. Ventilation cap
- B. Oil reservoir
- C. Level sensor
- D. Quick coupling
- E. Draining plug
- F. Grease nipple
- G. Clamp for potential balancing of entire unit
- H. Collector for waste oil from the mechanical shaft seal

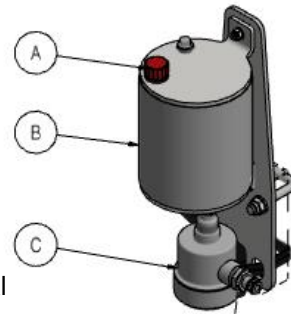
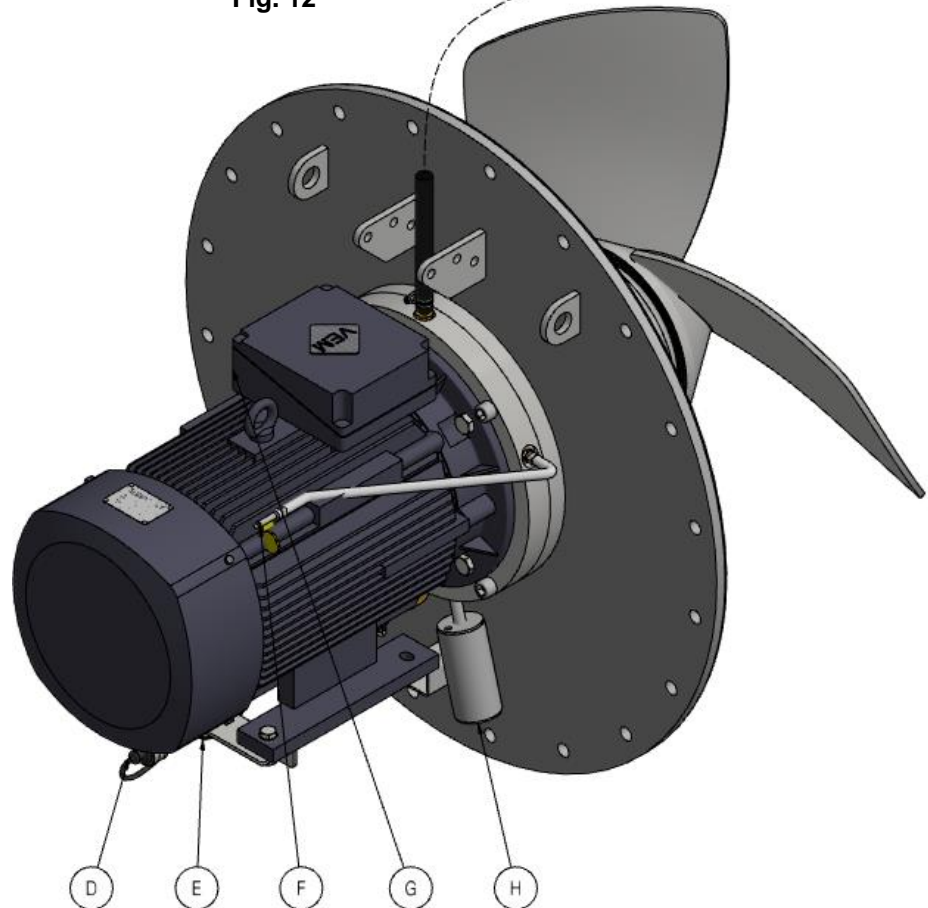
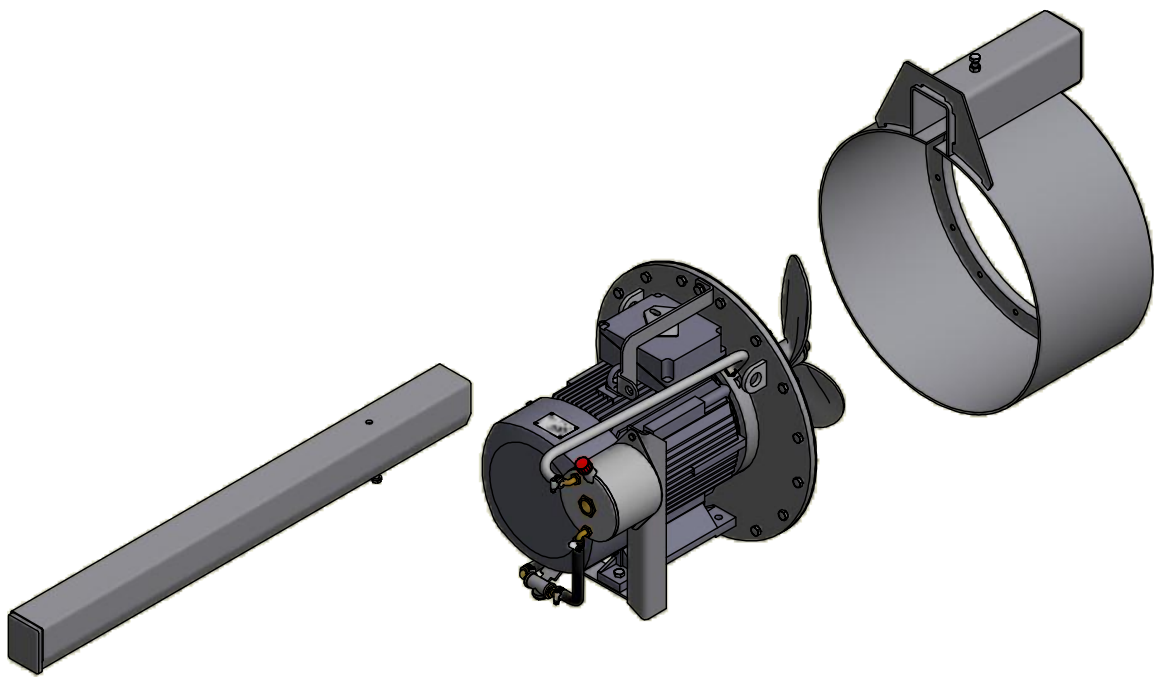


Fig. 12



All rights to technical changes reserved. Translated from Danish.

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Styret dokument

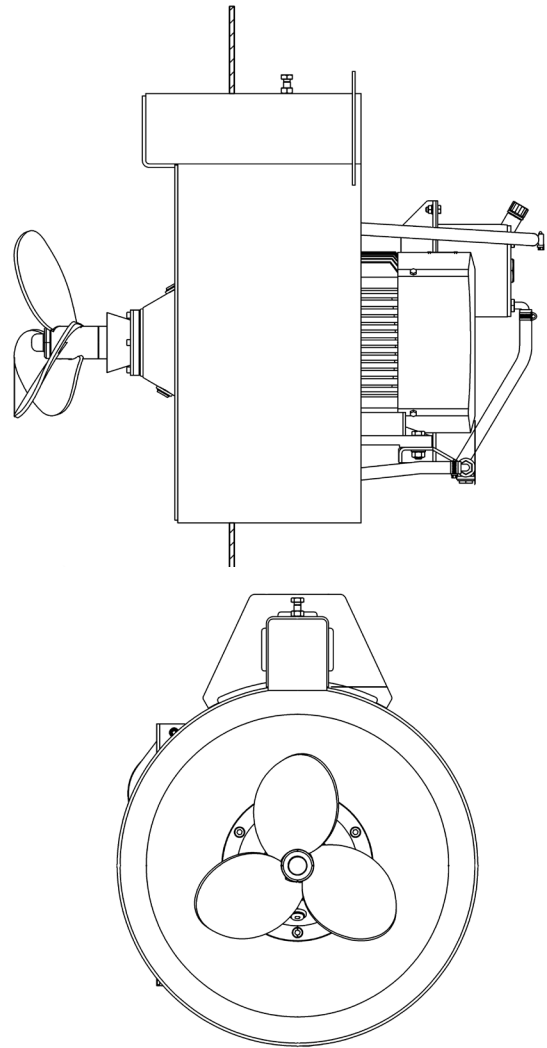
Landia

PODTR-I
Principetegning / Principal drawing
Prinzipskizze / Dessin de principe

Scale: 1 : 15	Sign.: CML KSK	Date: 13-09-2011
Dwg.no.:		3740852
Revision date: 31-07-2017		

PODTR-I

The PODTR-I is a flexible and efficient mixer that is mounted through the side of the tank wall. The three-blade propeller and the relatively low propeller speed makes it well-suited for mixing liquids with a high viscosity, such as dewatered or digested sludge. The optimal cooling function of the motor makes it an ideal choice for liquids with high temperatures.



APPLICATION EXAMPLES

- ▶ Sludge tanks
- ▶ Mixing system for digestion tanks
- ▶ Hot liquids

PROPELLER RPM

750 rpm

MATERIAL OF CONSTRUCTION

Motor housing	Cast iron EN-GJL-250
Oil chamber	W1.4404/AISI316
Propeller and protection collar	Stainless steel W1.4301/AISI304
Shaft	W1.4404/AISI316
Bolts	A4
Sealing system	Mechanical shaft seals: silicon carbide/silicon carbide
Oil type	15W-40 Vario HDX (with moisture detection)

SERVICE AND MAINTENANCE

Recommended service interval/oil change	Maximum 2,500 operating hours/minimum once a year
Motor	Lifetime lubricated bearings
Oil chamber	Periodic oil change

SURFACE TREATMENT

Machinery enamel: RAL 9005 (Jet Black)	Jet Black
2-component coating: RAL 7005 (Mouse Grey) (optional)	Mouse Grey

MONITORING FUNCTIONS

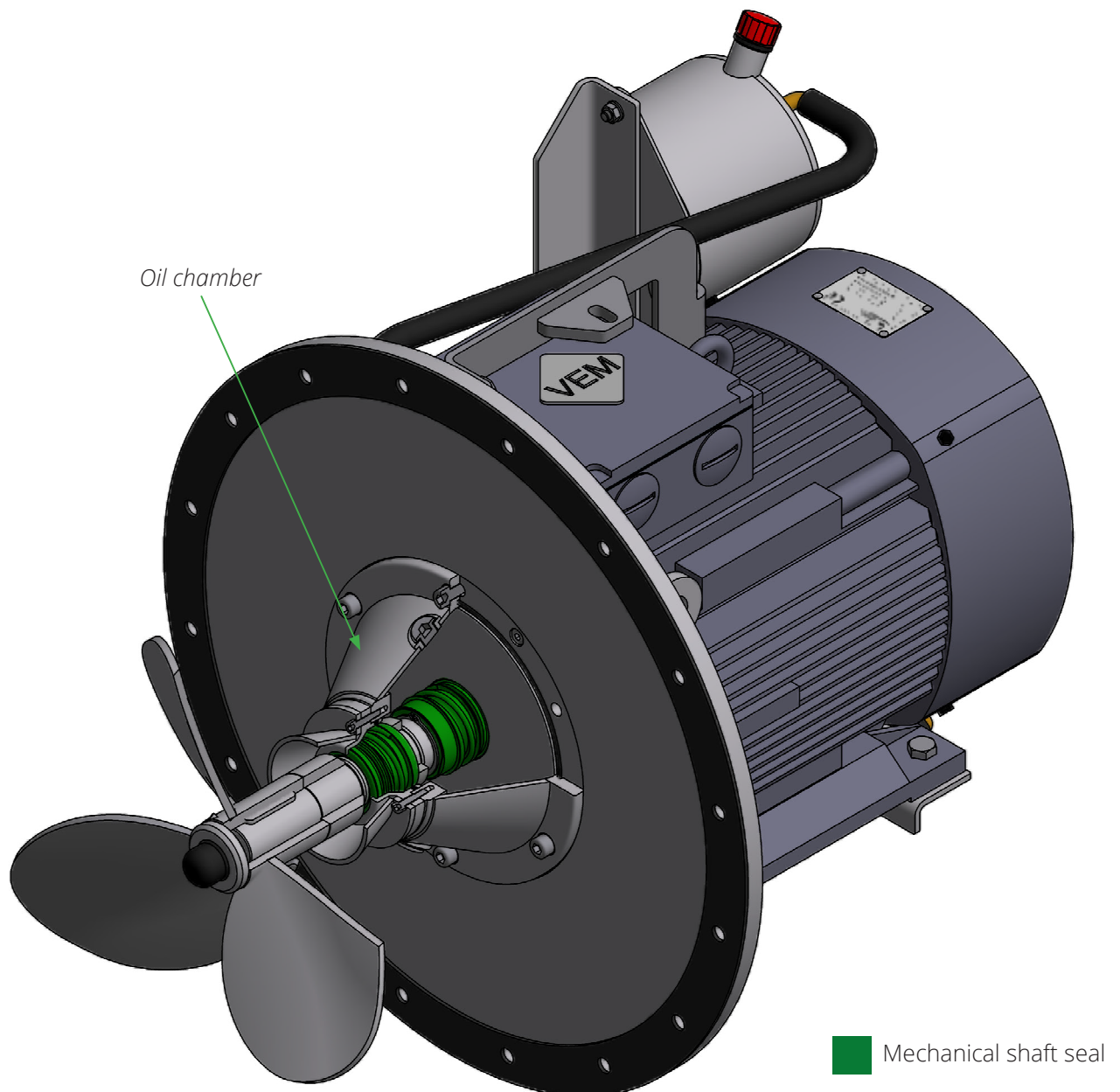
Thermistor

Moisture detection system (optional)

DESIGN

The Landia PODTR-I is mounted through a hole in the tank wall, meaning that all servicing can be performed from the outside of the tank. Oil changes can be carried out once the mixer has stopped.

The unique sealing system consists of two mechanical seals, giving optimal protection against the ingress of liquids.



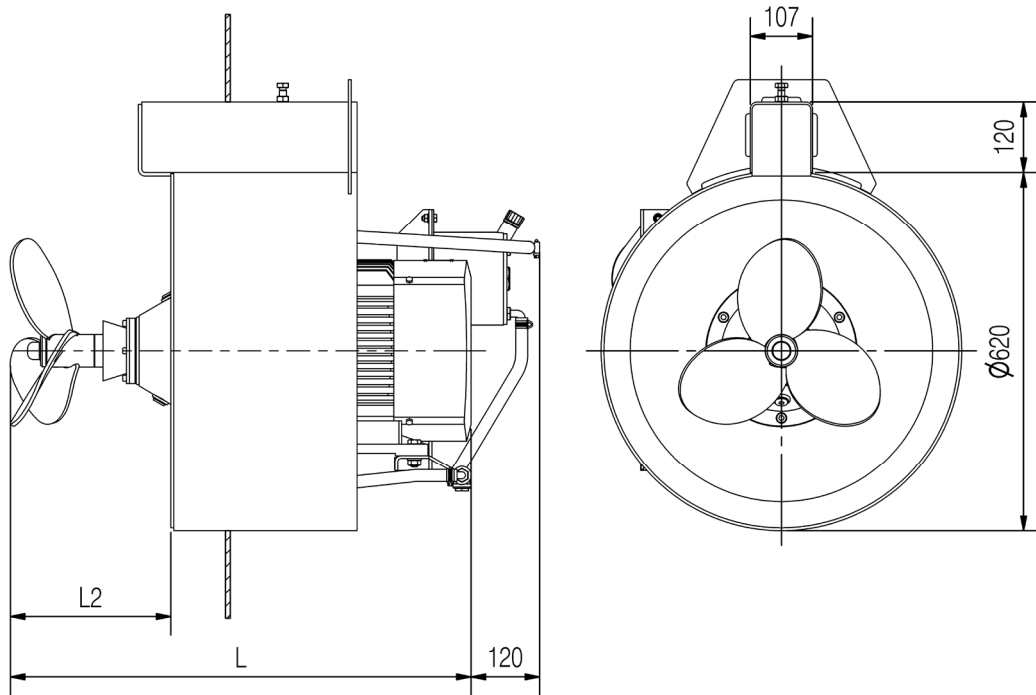
ELECTRICAL DATA

Motor type	3-phase AC motor
Nominal voltage	400 V
Minimum voltage allowed	360 V
Nominal frequency	50 Hz
Applicable for VFD operation	Yes
Ingress protection rating	IP 55
Insulation class	F

Model	Item number	Nominal power	Motor	Full load current (400 V)	Connection method	Start current (DOL)	cos phi	Efficiency
		[kW]	[rpm]	[A]	Y/Δ	[A]		[%]
PODTR-I 4.0 kW-750 rpm	1218504	4.0	710	9.3	Δ	37	0.78	79.6
PODTR-I 5.5 kW-750 rpm	1218505	5.5	710	12.5	Δ	56	0.78	81.4
PODTR-I 7.5 kW-750 rpm	1218507	7.5	725	18.0	Δ	81	0.71	84.7
PODTR-I 11.0 kW-750 rpm	1218511	11.0	720	24.0	Δ	108	0.78	84.8

For voltages others than 400 V/50 Hz please refer to the attached Appendix.

OVERALL DIMENSIONS



Model	Item number	Propeller diameter [mm]	L [mm]	L2 [mm]	Weight [kg]
PODTR-I 4.0 kW-750 rpm	1218504	ø355	735	260	141
PODTR-I 5.5 kW-750 rpm	1218505	ø355	735	260	157
PODTR-I 7.5 kW-750 rpm	1218507	ø385	795	280	195
PODTR-I 11.0 kW-750 rpm	1218511	ø385	795	280	218

The shroud casing and angle of the PODTR-I is adjusted in accordance with the tank’s condition and dimensions.

Be aware that the tank must be able to withstand the force from the mixer (both axial and vertical). Landia’s built-in casing for the mixer does not replace the material that is removed from the tank wall. The tank supplier must design the necessary reinforcements around the hole for the mixer.

We reserve the right to make technical changes.

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Introduction

PODTR-I is a dry-installed mixer. All surfaces in contact with the liquid are in stainless steel material. The unit is installed on a flange on a tank side/tank bottom in the liquid section so that the required mixing is achieved. The mixing is done by means of an electric motor; a propeller is installed on the motor shaft.

The oil filled oil chamber between motor and propeller cool and lubricate the mechanical seals. The sealing system consists of two mechanical seals; the outer separates the liquid from the oil chamber and the inner separates the oil from the motor casing.

The following pages describe connection and maintenance of mixers type PODTR-I.

Application

The mixer is to be used for flow creation, mixing and homogenization of liquids with high or low dry matter content such as wastewater, sludge, paper pulp and chemical liquids and slurry.

The mixer can be installed in rectangular and circular tanks.

If another application is requested, please consult Landia beforehand.

Warning

Please note the following:

- Prior to start-up, check the oil level in the sight glass on the oil container.
- Only a certified electrician is allowed to connect the unit.
- Prior to installation and commissioning, ensure that the equipment is installed correctly and fixed to the mixer and that the equipment in the tank securely fixed.
- Prior to the first start-up of the mixer, rotate the propeller shaft manually. This also applies if the mixer has not been in operation for a while.
- Prior to disassembling of the mixer for service/repair, it is always to be ensured that the electrical connection of the mixer is switched off or locked. Prior to service/repair the mixer should be cleaned effectively.
- For service/repair of mixers installed in tanks with potential explosive areas or toxic steam, we refer to the national safety regulations, among others regarding the toxic hydrogen sulphide.

Service/repair

To maintain a high operation safety and a long service life without unnecessary and expensive repair, it is important from the beginning to execute regular and preventative service. Maintenance should be executed according to the intervals stated in the manual. Always follow the instructions carefully and only apply the parts described by Landia in the spare parts list.

If you do not want to service yourself, Landia will be pleased to arrange a service agreement – please call for more information.

Please note

If the spare parts are not identical to the ones recommended for service/repair, the guarantee from Landia will be voided. Spare parts can be ordered at Landia or your local distributor.

For major repairs at a special workshop please contact:

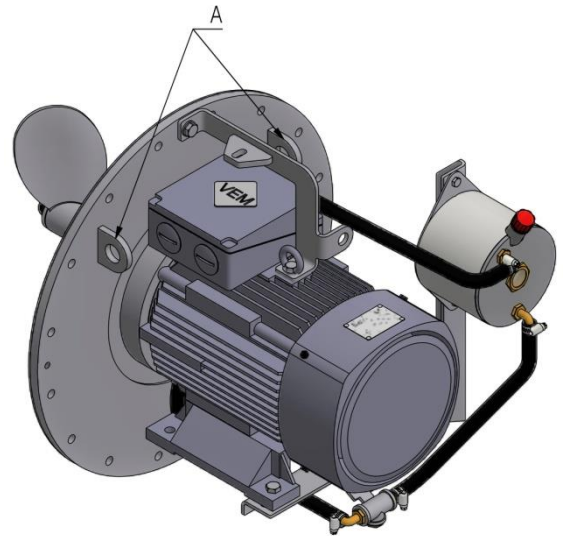
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Lifting points

The lifting points, pos. A, on the mixer is equal to the center of gravity.

Weight chart PODTR-I	
kW size	Weight
4.0 kW	145 kg
5.5 kW	160 kg
7.5 kW	200 kg
11.0 kW	220 kg



Installation on tank flange

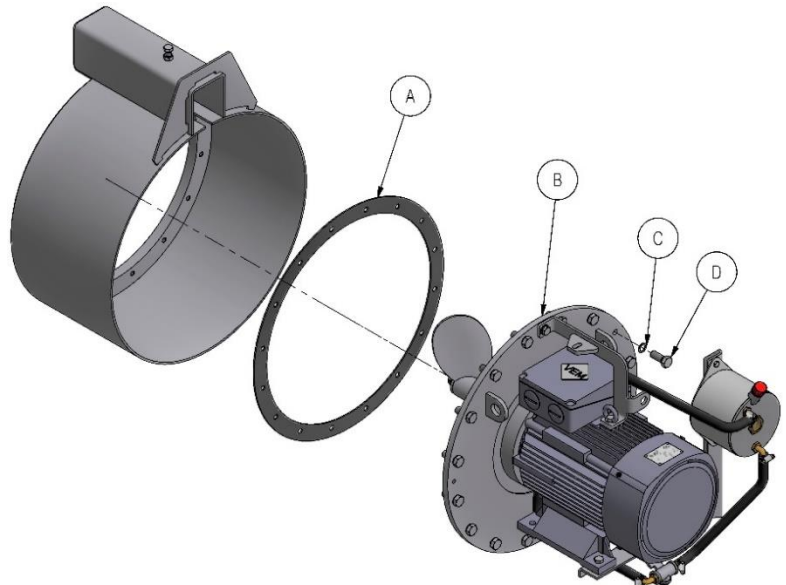
When assembling the mixer on the tank flange, the bolts are to be cross-tensioned. Bolt M12 class A4-80 is to be tensioned with 82 Nm. If the washer is not tight, the tightening torque must be increased with 10 Nm at a time until 130 Nm max till the washer is tight.

Due to vibrations and frictions, all stainless steel bolts have to be ensured/ lectured with a lock remedy, e.g. Loctite type 243 (red).

After having installed the mixer, ensure that the washer pos. A is tight.

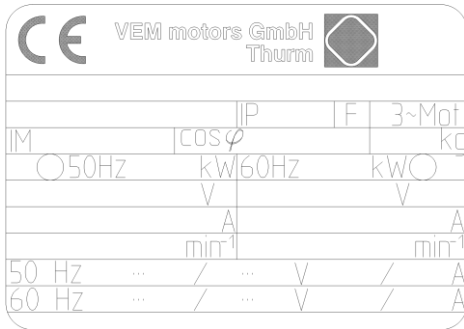
NB: Remember to install the electric cable prior to installation of the mixer

- A. Washer
- B. Mixer PODTR-I
- C. Acid proof washer for M12 bolt
- D. Acid proof bolt M12x35



A special rail system for handling of the mixer has been developed. See separate service instruction no. AN22A.C01.

Rating plate



IP: Cage class
 F: Insulation class F
 3~Mot.nr.: 3 phased motor
 IM: Building form
 cos φ: Power factor
 Kg: Motor weight
 kW: Max shaft power
 V: Mains voltage
 A: Nominal power consumption
 min⁻¹: Motor revolutions per minute
 kW,V,A and min⁻¹ for 50Hz and 60Hz respectively
 The final two lines state the allowed voltage intervals with power consumption at 50Hz and 60Hz respectively.

The rating plate indicates the electrical data of the motor and year of construction and production number (3~Mot.nr.). For all requests regarding maintenance of a specific unit, the production number must be given.

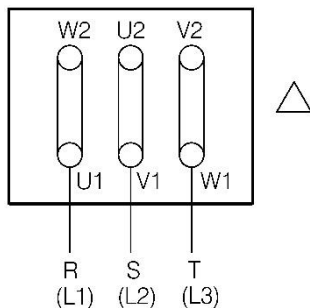
Power connection of motor

Every mixer is equipped with the above-mentioned rating plate with technical motor data. The motor is connected according to Fig. 1 or 2. It must be verified that the other electrical parts correspond to the motor data. For each unit is an electrical diagram.

A protective motor switch must be applied for the mixer type PODTR-I.

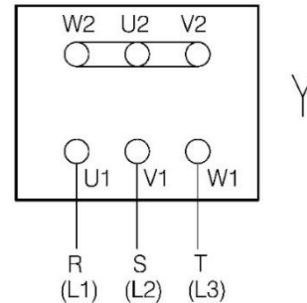
Only a certified electrician is allowed to connect the unit.

Fig. 1



Delta connection.

Fig. 2



Star connection.

Capacity

The capacity of the mixer will always depend on the consistency of the liquid, but in particular on the tank design.

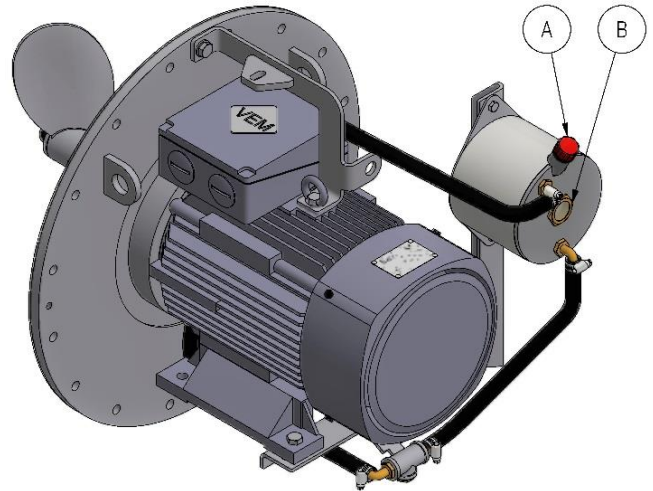
Inspection

Regular inspection will ensure the mixer a long service life at low costs. The oil must be changed every 4 months/2500 hours of operation but minimum once a year. For difficult operating conditions, the oil must be changed more often than every 4 months.

Oil control

The oil level is inspected through the sight glass, pos B, and the oil level must be in the middle of the sight glass and can also be checked via the dipstick, pos. A. Check seals for oil loss.

The oil refilling is done through the pipe as a venting cap, pos. A, is mounted in. The ventilation hood must be checked on the same occasion to ensure that it is not clogged. The vent cap can be cleaned with compressed air.



- A. Ventilation cap / oil dipstick
- B. Sight glass

Oil change

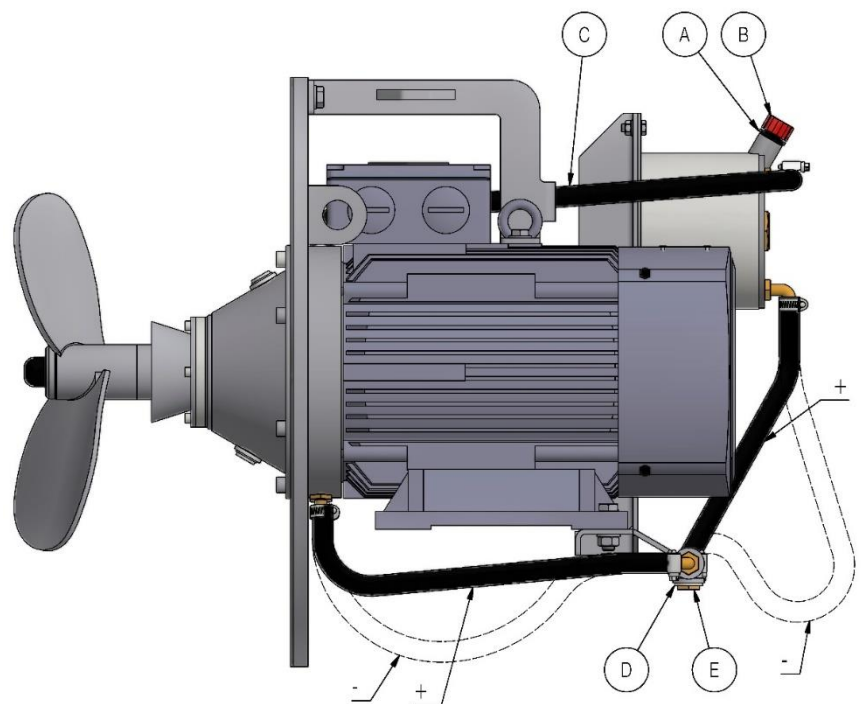
The oil is drained by removing the ventilation cap pos. B and the draining plug pos. E. Refill the oil through the tube on which the ventilation cap pos. B is installed. See oil type and oil quantity in the spare parts list. When changing oil, the mixer must be placed horizontally.

When refilling the oil, it is suitable to use a vacuum pump to suck in the oil. This is done by removing the top hose on the oil container pos. C and board up the hose connection. After this air can be pumped out of the mixer via the removed hose pos. C and oil can be refilled in the oil container via pos. A.

All oil hoses are to be installed tightly.

Vacuum pump can be bought at Landia – alternatively a pump for waste oil can be used.

Please contact a special workshop is drying of the motor windings is necessary.



- A. Filling
- B. Ventilation cap
- C. Oil hose
- D. Drainage
- E. Draining plug

Assembling/disassembling

A major repair should be done at a special workshop.

The following are some general conditions regarding the assembly/disassembly of the mixer type PODTR-I. The drawing attached to the parts list illustrates the construction of the unit. Not all parts can/should be dismantled, e.g. the rotor should not be pressed off the shaft.

When disassembling the unit, handle the mechanical shaft seals with care as they are not shock resistant. Prior to reinstallation the unit, all sealing surfaces must be cleaned; and all O-rings must be checked and changed if necessary. Adhesive substance (e.g. Loctite) must be applied on all bolt joints. All bolts must be tightened with a torque wrench as specified in the table below.

Bolt sizes	Quality A4-80 Acidproof
M6	10 Nm
M8	24 Nm
M10	48 Nm
M12	82 Nm
M16	137 Nm

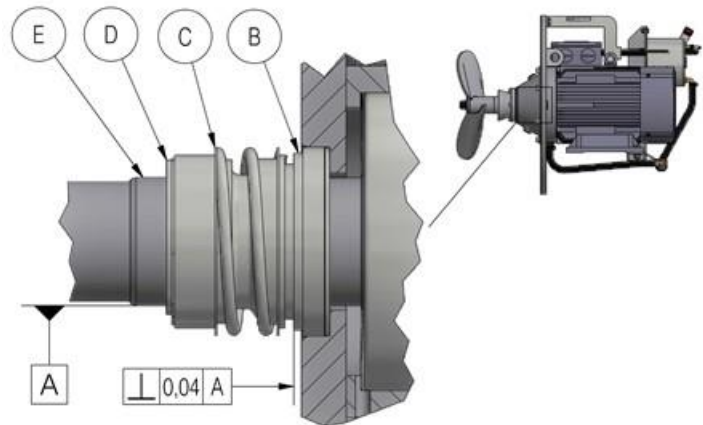
After installation of the bearing flange, the axial space must be controlled; it should be as stated in the table below.

Motor	Acceptable margin
4.0/5.5 kW 750 rpm.	1.0 ± 0.05 mm
7.5/11.0 kW 750 rpm.	1.1 ± 0.05 mm

Installation of mechanical shaft seals

When installing the mechanical shaft seals, please be aware that these are precision products and that they should be handled as such. The slide faces must be protected during the installation.

- B. Stationary sealing part
- C. Rotating sealing part
- D. Locking ring
- E. Shaft



Push the stationary sealing part (pos. B) into place. Be careful not to damage the slide face during installation.

The rotating sealing part (pos. C) is put over the shaft. To ease the installation put soap water on the interior side of the rubber bellow and on the shaft. Do not use silicone, PTFE lubricants or oil as it will prevent the rubber bellow from sticking to the shaft (pos. D). An installation arbour should be used. Put the locking ring on the shaft and press the seal together until the locking ring snaps into the locking ring groove.

Inspect the seal by turning the motor shaft.
Fill up with oil. See section oil change.

Oil Amount Table - Mixers

POP-I

Type	Motor series	Gear	Medium temp.	Medium temp.	Seal Control	Grease	Food Industry	
			0-30°	30-60°			Nevastane EP 100 (9380024)	Nevastane SFG 2 (9380025)
POP-I	80/90	EM 1010	Alpha SP 100 (9380008)	Alpha SP 220 (9380002)	Alphasyn GS 220 (9380005)	Bel Ray 50-2 (9380012)	0.9 l	0.3 kg
	100/112	EM 1010	0.9 l		0.5 kg	1.1 l	0.5 kg	
	132	EM 1010	1.1 l			1.8 l	1.0 kg	
	132/160	EM 1020	1.8 l		3.0 l	1.0 kg		
	180	EM 1045	3.0 l		4.0 l	1.0 kg		
POPR-I	100	EM 1010	4.0 l		0.5 kg	2.8 l	0.5 kg	
	132	EM 1010	2.8 l			3.0 l	1.0 kg	
	132/160	EM 1020	3.0 l		6.0 l	1.0 kg		
	180	EM 1045	6.0 l		6.0 l	1.0 kg		
POPTR-I POPTR-I Ex	-	EM 1010	5.3 l		0.5 kg	5.3 l	0.5 kg	
	-	EM 1020	9.3 l		1.0 kg	9.3 l	1.0 kg	

POPL-I

Type	Motor series	Gear	Alpha SP 220 (9380002)	Seal Control	Grease
				Alphasyn GS 220 (9380005)	Bel Ray 50-2 (9380012)
POPL-I	90	ED 2030	2.3 l		0.5 kg
	100/112	ED 2030	3.0 l		
	112/132	ED 2045	4.0 l		

POD-I

Type	Motor series	Rpm.	CRB Multi 15W-40 (9380001)	Hyspin HVI 15 (9380011)	Frequency Converter	Seal Control	Food Industry
					CRB Multi 15W-40 (9380001)	Hyspin HVI 46D (9380009)	Whitemore WOM 65 (9380015)
POD-I PODB-I	80/90	750/1000/1500	0.5 l		0.5 l		
	100/112		0.9 l		0.9 l		
	132/160		1.6 l		1.6 l		
PODR-I PODBR-I	100		0.5 l		0.5 l		
	132/160		1.2 l		1.2 l		
PODB-I	80/90	3000	0.5 l		0.5 l		
	100/112		0.9 l		0.9 l		
	132/160		1.6 l		1.6 l		
PODBR-I	100		0.5 l		0.5 l		
	132/160		1.2 l		1.2 l		
PODTR-I	-	750	3.5 l	-	3.5 l		

AXD-I / AXP-I

				Frequency Converter	Medium temp. 0-30°	Medium temp. 30-60°	Seal Control		Grease
Type	Motor series	Gear	CRB Multi 15W-40 (9380001)	Alpha SP 100 (9380008)	Alpha SP 220 (9380002)	Hyspin HVI 46D (9380009)	Alphasyn GS 220 (9380005)	Bel Ray 50-2 (9380012)	
AXD-I 300	100/112	-	0.9 l	-	-	0.9 l	-	-	
	132		1.7 l			1.7 l			
AXP-I 500 AXP-I 800	90	EM 1010	-	0.9 l	-	-	0.9 l	0.3 kg	
	100/112			1.1 l			1.1 l	0.5 kg	
	132			1.8 l			1.8 l		
	132/160	EM 1020		3.0 l			3.0 l	1.0 kg	

Konverteringsskema - Conversion table – Umrechnungstabelle - Tableau concernant**Olie - Oil - Öl**

CASTROL	Alpha SP 100	Alpha SP 220	Whitemore WOM 65	CRB Multi 15W-40	Hyspin HVI 15	Hyspin HVI 46D	Nevastane EP 100	Alphasyn GS 220
DIN-Norm / godkendelse	DIN 51502/DIN 51517 - CLP	DIN 51502/DIN 51517 - CLP	Ingen alternativer - No alternatives - Keine Alternativen - Pas d'alternative	Ingen alternativer - No alternatives - Keine Alternativen - Pas d'alternative	DIN 51502/ DIN 51524 - HVLP	DIN 51502-HVLP-D/ DIN 51524 - CLP	Ingen alternativer – No alternatives - Keine Alternativen - Pas d'alternative	DIN 51502/ DIN 51517 - CLP PG

Fedt - Grease - Fett - Graisse

BEL RAY	Bel Ray 50-2
CASTROL	Tribol GR 4747/220-2 HT
MOBIL	Mobilgrease FM 222
Q8	Rubens WB
SHELL	SHELL GADUS S3 V220C 2
TEXACO	Anderol 783-2
TOTAL	TOTAL NEVASTANE XMF 2

Smøremidler, som anvendes og anbefales af Landia A/S, er markeret med gråt i ovenstående skemaer. Konverteringsskemaerne angiver DIN-Norm / godkendelse på olietyper fra Castrol. DIN-Normen fra Castrol er vejledende og kan bruges til at finde en erstatningsolie hos Deres lokale olieleverandør. Hvis det ikke er muligt at finde en erstatningsolie, kan olien købes hos Landia A/S. Generelt bør blanding af forskellige fedttyper undgås enten ved udskiftning af al fedtet eller hyppig eftersmøring, så fedtet hurtigt udskiftes. Fedttyperne angivet ovenfor er blandbare.

Lubricants applied and recommended by Landia A/S are marked with grey in the above tables. The conversion schemes indicate the DIN Norms and the approved oil types from Castrol. The DIN Norm from Castrol is indicative and can be used to find a replacement oil from your local oil supplier. If it is not possible to find a replacement oil, the oil can be purchased from Landia A/S. Generally, mixing of different types of grease should be avoided either by replacing all the grease or frequent lubrication, so the grease is quickly replaced. The grease types mentioned above are mixable.

Das von Landia A/S empfohlene Schmiermittel, das verwendet werden muss ist in oben stehendem Schema mit grau markiert. Die Konvertierungsschemas zeigen die DIN-Normen und eine Übersicht der zugelassenen Öltypen von Castrol. Die DIN-Normen von Castrol sind indikativ und kann verwendet werden, um ein Ersatzöl von Ihrem lokalen Öllieferanten zu finden. Wenn es nicht möglich ist, ein Ersatzöl zu finden, kann das Öl von Landia A / S gekauft werden. Im Allgemeinen sollte Mischung von verschiedenen Schmiermitteln vermieden werden. Entweder das Fett wechseln oder häufig nachschmieren. Die oben genannte Fedttyper sind mischbar.

Les lubrifiants utilisés et recommandés par Landia A/S sont marqués d'un cri dans les tableaux ci-dessus. Les tableaux de conversion indiquent la norme DIN/approbation pour les types d'huile de Castrol. La norme DIN de Castrol est indicative et peut être utilisée pour trouver une huile de remplacement chez votre fournisseur d'huile local. S'il n'est pas possible de trouver une huile de remplacement, l'huile peut être acheté auprès de Landia. En général, il convient d'éviter de mélanger différents types de graisses en remplaçant toutes les graisses ou toutes les post-lubrifications fréquentes de manière à remplacer rapidement les graisses. Les types de graisse mentionnés ci-dessus sont miscibles.

Motordata for Landia motorer IE1
Side 1/1
3 x 400 Volt 50 Hz

Effekt kW	ms.	Poltal	RPM	Spænding trekant	Spænding stjerne	Strøm ved 3x400 V A	Strøm ved 3x690 A	Starts. direkte A	Cos phi %	Virk. grad fuld last %	Virk. grad 3/4 last %	Virk. grad 1/2 last %
1,5	80	2	2840	230	400	3,1	0	22	0,86	81,2	82,2	80,3
2,2	80	2	2850	230	400	4,6	0	34	0,85	82,1	83,4	81,9
3	90	2	2865	400	690	6,2	3,6	42	0,85	82,8	83,1	83,3
4	100	2	2900	400	690	8,4	4,9	59	0,81	84,9	85,5	84,4
5,5	100	2	2860	400	690	11	6,2	61	0,86	84,7	84,7	0
7,5	112	2	2890	400	690	15	8,6	99	0,85	86,1	86,1	84,1
11	132	2	2905	400	690	20,5	12	143	0,88	87,6	87,6	84,6
15	160	2	2940	400	690	27,5	16	195	0,89	88,7	88,7	85,8
18,5	160	2	2925	400	690	33	19,5	238	0,9	89,9	88,9	86,4
22	180	2	2935	400	690	39	22,5	265	0,9	90,5	90,5	86,7
30	180	2	2940	400	690	52,5	30,5	383	0,91	90,6	89,8	88,3
37		2	2940	400	690	65	37,50	455	0,9	91,5	90,5	89
45		2	2940	400	690	77,5	44,7	581	0,91	92	91,3	88,8
0,55	71	4	1400	230	400	1,6	0	7	0,69	71,9	70,7	64,1
0,75	71	4	1400	230	400	2,1	0	10	0,7	73,6	72,2	66,8
1,1	80	4	1410	230	400	2,6	0	14	0,79	76,7	76,8	73,6
1,5	80	4	1400	230	400	3,4	0	19	0,81	78,6	79,1	76,9
2,2	90	4	1410	230	400	5	0	30	0,8	80,2	80,7	79,5
3	100	4	1430	400	690	6,7	3,9	43	0,79	82,4	82,8	80,8
4	100	4	1435	400	690	8,8	5,1	61	0,78	84,1	85,1	83,6
5,5	112	4	1440	400	690	11	6,2	68	0,87	84,6	84,6	83,1
7,5	132	4	1455	400	690	15	8,8	90	0,83	86,2	85,2	83,8
11	131	4	1455	400	690	21,5	12,5	146	0,84	87,9	87,5	85,5
15	160	4	1465	400	690	29	17,00	212	0,84	88,7	88,3	85,8
18,5	160	4	1460	400	690	35	20,5	238	0,85	89,3	88,8	86,8
22	180	4	1465	400	690	43	25	280	0,82	90,1	90,1	88,6
30	180	4	1465	400	690	57	33	399	0,84	90,7	90,2	89,2
37		4	1470	400	690	68	39,2	476	0,86	91,2	90,2	89,2
45		4	1470	400	690	82,5	47,6	578	0,86	91,7	91,2	89,7
0,55	50	8	695	230	400	2	0	7	0,6	64,8	62,5	55,8
0,75	50	8	705	230	400	2,7	0	9	0,6	66,8	64,7	57,9
1,1	50	8	705	230	400	3,3	0	13	0,67	72,9	73,3	69,6
1,5	50	8	705	230	400	4,1	0	18	0,7	75,4	75,7	72,4
2,2	50	8	705	230	400	5,6	0	25	0,75	75,6	75,1	72,1
3	50	8	705	400	690	7,4	4,3	33	0,75	78	78	75
4	50	8	710	400	690	9,3	5	37	0,78	79,6	79,3	77,3
5,5	50	8	710	400	690	12,5	7,2	56	0,78	81,4	81	78
7,5	50	8	725	400	690	18	10,5	81	0,71	84,7	84,7	81,7
11	50	8	720	400	690	24	14	108	0,78	84,8	83,8	81,3

Motordata for Landia motorer IE2
Side 1/1
3 x 400 Volt 50 Hz

Effekt kW	ms.	Poltal	N rpm	Spænding trekant V	Spænding stjerne V	Strøm ved 3x400 V A	Strøm ved 3x690 A	Starts. direkte A	Cos phi ϕ	Virk. grad fuld last %	Virk. grad 3/4 last %	Virk. grad 1/2 last %
1,5	90	2	2910	230	400	2,9	0	34	0,87	81,3	85,5	82,9
2,2	90	2	2880	230	400	4,25	0	34	0,88	83,2	85,7	83,9
3	100	2	2930	400	690	6,55	3,8	56	0,76	84,6	86,2	83,5
4	100	2	2920	400	690	7,9	4,6	66	0,84	85,8	86,4	85,8
5,5	112	2	2900	400	690	10,3	5,9	80	0,88	87	88,7	88,8
7,5	132	2	2925	400	690	13,5	7,8	90	0,91	88,8	89,2	88,3
11	160	2	2950	400	690	19,5	11,3	150	0,9	90,3	90,3	89,1
15	160	2	2940	400	690	26	15,0	230	0,92	90,7	90,5	89,1
18,5	160	2	2935	400	690	32	18,5	230	0,91	91	91,4	91,4
22	180	2	2935	400	690	38,5	22,2	239	0,9	91,3	90,6	86,4
30	180	2	2945	400	690	52	30,0	359	0,91	92	91,3	90,5
37	180	2	2940	400	690	63	36,4	466	0,92	92,5	92,3	91,6
0,55	80	4	1430	230	400	1,25	0	8	0,8	79,4	79,6	78,7
0,75	80	4	1430	230	400	1,65	0	12	0,81	79,6	81,4	79,6
1,1	90	4	1435	230	400	2,4	0	16	0,8	81,4	82,3	80,4
1,5	100	4	1455	230	400	3,35	0	45	0,77	82,8	83,2	80,7
2,2	100	4	1455	230	400	4,8	0	45	0,77	84,3	85,2	81,7
3	112	4	1460	400	690	6,5	3,8	63	0,77	85,5	86,3	84,5
4	112	4	1460	400	690	7,6	4,4	63	0,86	87,6	88	86,9
5,5	132	4	1470	400	690	10,5	6,1	123	0,87	88,4	89,3	89
7,5	132	4	1470	400	690	14,5	8,4	123	0,82	89,9	90	88,5
11	160	4	1470	400	690	22,5	13,0	176	0,78	90,3	90,3	88,9
15	180	4	1475	400	690	28,5	16,5	307	0,83	91	90,4	89
18,5	180	4	1475	400	690	35,5	20,5	307	0,82	91,2	90,6	89,3
22	180	4	1475	400	690	42	24,2	307	0,83	91,6	91,4	89,9
0,55	80	6	950	230	400	1,5	0	6	0,69	76,5	76,1	72,6
0,75	90	6	955	230	400	1,95	0	10	0,71	75,9	78,3	75,1
1,1	100	6	955	230	400	2,75	0	15	0,71	78,1	82	79,3
1,5	112	6	955	400	690	3,55	0	50	0,75	81	80,5	79,6
2,2	112	6	955	400	690	5,2	0	50	0,74	82,8	82,5	80
3	112	6	955	400	690	7,1	4,1	50	0,73	83,3	83,1	80,5
4	132	6	965	400	690	8,5	4,9	43	0,79	85,5	85,5	83,8
5,5	160	6	970	400	690	12	6,9	91	0,76	87	86,4	85,8
7,5	160	6	970	400	690	15,5	8,9	91	0,79	87,5	87,6	85,9
11	180	6	975	400	690	21	12,1	177	0,84	89,2	87,9	86,3
15	180	6	975	400	690	28,5	16,5	177	0,84	89,7	88,8	86,7
18,5	180	6	980	400	690	35	20,2	231	0,85	90,4	88,8	86,5

Motordata for Landia motorer IE3

Side 1/1

3 x 400 Volt 50 Hz

Effekt	ms.	Poltal	N	Spænding trekant	Spænding stjerne	Strøm ved 3x400 V	Strøm ved 3x690	Starts. direkte	Cos phi	Virk. grad fuld last	Virk. grad 3/4 last	Virk. grad 1/2 last
kW			rpm	V	V	A	A	A	φ	%	%	%
1,5	100	4	1455	230	400	3,4	-	32,3	0,75	85,3	84	80,6
4	112	4	1465	400	690	7,9	4,6	74,3	0,82	88,6	88,9	87,4
7,5	132	4	1470	400	690	16	9,2	121,6	0,75	90,5	90,5	89,2
11	160	4	1465	400	690	21	12,1	147	0,82	91,4	91,4	91,5
18,5	180	4	1475	400	690	34,5	19,9	269,1	0,84	92,6	92,7	91,9
4	132	6	965	400	690	8,3	4,8	39,9	0,8	86,8	87	86
7,5	160	6	975	400	690	14,5	8,4	84,1	0,82	89,6	89,4	87,8