

Hygienisation system

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

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Content last updated on 17. January 2022

LANDIA BIOCHOP®

HYGIENISATION TANK

A well-proven complete solution with a solid and compact design as well as high treatment capacity

EU-regulations allow for the use of by-products from the food- and waste industry in biogas plants. However, it is a requirement that the by-products* must be heat-treated at 70°C for one hour. The Landia BioChop® ensures that these EU-requirements are complied with so the by-products can be used for biogas production and the remains are spread as fertilizer on the fields.

The Landia BioChop® hygienisation tank has a simple design with reliable components of high quality. The hygienisation tank achieves a unique synergy through the combination of well-tested products that ensure shredding of particles, efficient mixing, effective heat transfer and transfer pumping after completed batch.

The Landia BioChop® hygienisation tank is delivered complete with user-friendly PLC for regulation, monitoring and registration of the hygienisation process.

*particles must not exceed 12 mm prior to the hygienisation process.



MATERIALS AND OPTIONS

Tank	AISI 304 AISI 316 (option)
Insulation jacket	Alu-zinc AISI 316 (option)
Wash nozzle	Option

PIPE CONNECTIONS

Inlet pipe	DN 100, PN 10
Outlet pipe	DN 100, PN 10
Ventilation pipe	DN 100, PN 10
Discharge pipe	DN 100, PN 10

GATE VALVES

Pneumatic, supply pressure max.	10 bars
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PLC

Landia delivers the tank with a complete PLC solution that can be fully integrated with existing local control system. The interface on the tank is a 7" touch screen, but the system can also be operated remotely via TeamView.

Information regarding temperature, level of filling and other measures can be read directly or shared to existing local control system via e.g. ProfiNET.

Furthermore, the PLC logs all the required information for each batch to comply with the EU requirements.



PUMP

The Landia chopper pump is installed on the bottom of the tank ensuring bottom-to-top circulation of the biomass and preventing dead zones in the tank. The chopper pump's knife system reduces the particle size for the benefit of the heating process and following handling. Furthermore, the pump can be used for emptying of the tank, which can typically be done in a few minutes depending on the installation's requirements of flow and pressure.

All pump components in contact with the liquid is available in cast iron, hardened or acidproof stainless steel.

Further information about the pump can be found in the pump data sheet.



MIXER

An angled mixer is installed in the side of the tank and ensures proper homogenising and movement in the tank for the benefit of the heat transfer from the heating jacket to the liquid. Mixer size and propeller are customised for the specific project. All materials in contact with the media is stainless steel and can be upgraded to acid proof steel if required.

Further information regarding the pump can be found in the pump data sheet.



INSTALLATION

The tank must be located frost free on an even and stable base.

All pipe connections must be made with pipe compensator.

The installation is described in more detail in the specific installation guide provided with the tank.

CONNECTION HOT WATER HEATING JACKET

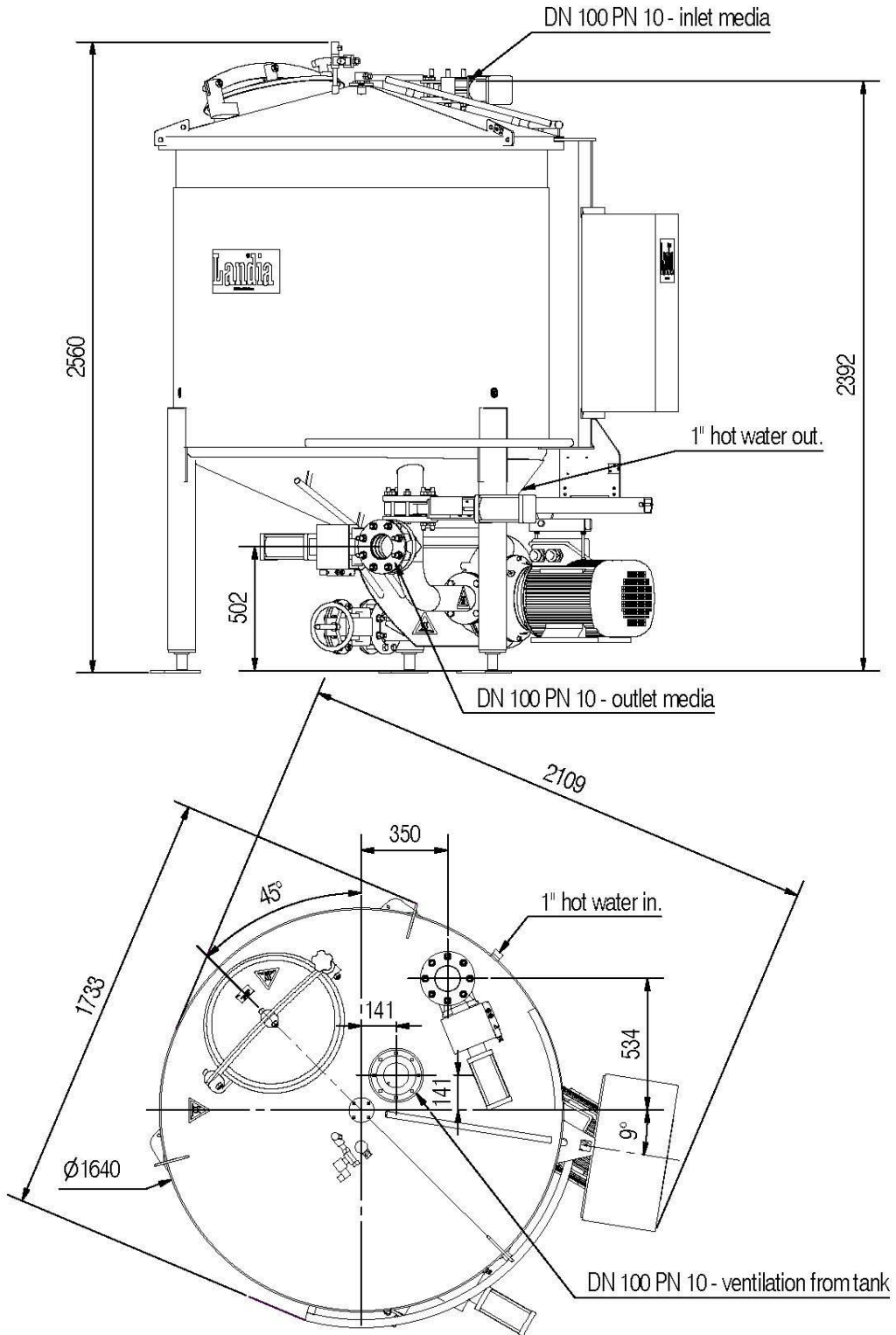
Type	Item no.	Tank size	Indicative net batch volume	Process time (excl. filling and emptying)	Pressure in process tank	Maximum pressure on the heating jacket	Weight empty incl. pump and mixer	Weight full incl. pump and mixer
BioChop		[m ³]	[m ³]	[Timer]	[Bar]	[Bar]	[kg]	[kg]
2.5 m ³ hygienisation tank	2911002	2.5	1.8	3 – 3.5	0	3.3	900	3,400
5.0 m ³ hygienisation tank	2911005	5	4.5	3.5 - 4	0	3.3	1,270	6,270
8.0 m ³ hygienisation tank	2911008	8	7.5	3.5 – 4.5	0	3.3	1,900	9,900
25 m ³ hygienisation tank	2911025	25	23.5	5 - 6	0	3.3	2,430	27,430

Type	Item no.	Connection of water to/from heating jacket	Flow heating jacket	Drop of pressure over heating jacket	Energy demand during process time (per batch) at starting temperature 10°C (in water)	Flow temperature of heat-up water	Peak power need
BioChop		[Pipe thread]	[L/h]	[Bar]	[kWh]	[°C]	[kW]
2.5 m ³ hygienisation tank	2911002	1.0"	2,500	0 – 0.8	175	85-95	250
5.0 m ³ hygienisation tank	2911005	1.5"	5,000	0 – 0.8	350	85-95	450
8.0 m ³ hygienisation tank	2911008	1.5"	8,000	0 – 0.8	558	85-95	800
25 m ³ hygienisation tank	2911025	2.5"	25,000	0 – 0.8	1,850	85-95	2,350

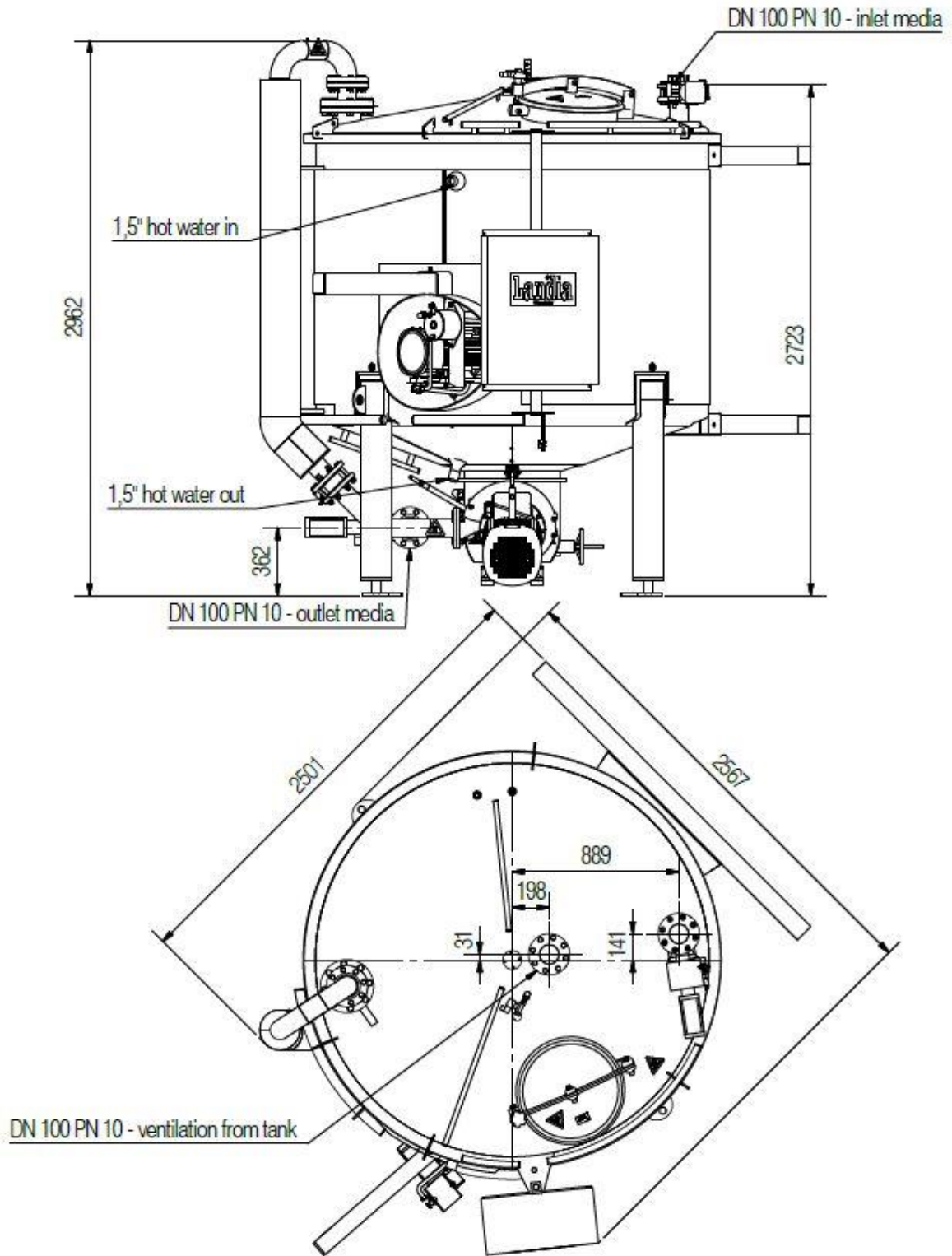
*If the maximum heat demand is not available, it will result in a prolonged heating time. Most of the heating period will take place with a lower energy intake due to a lower temperature difference between the heating source and the liquid.

The return temperature of the heating water must expectedly be 5-10°C higher than the liquid temperature.

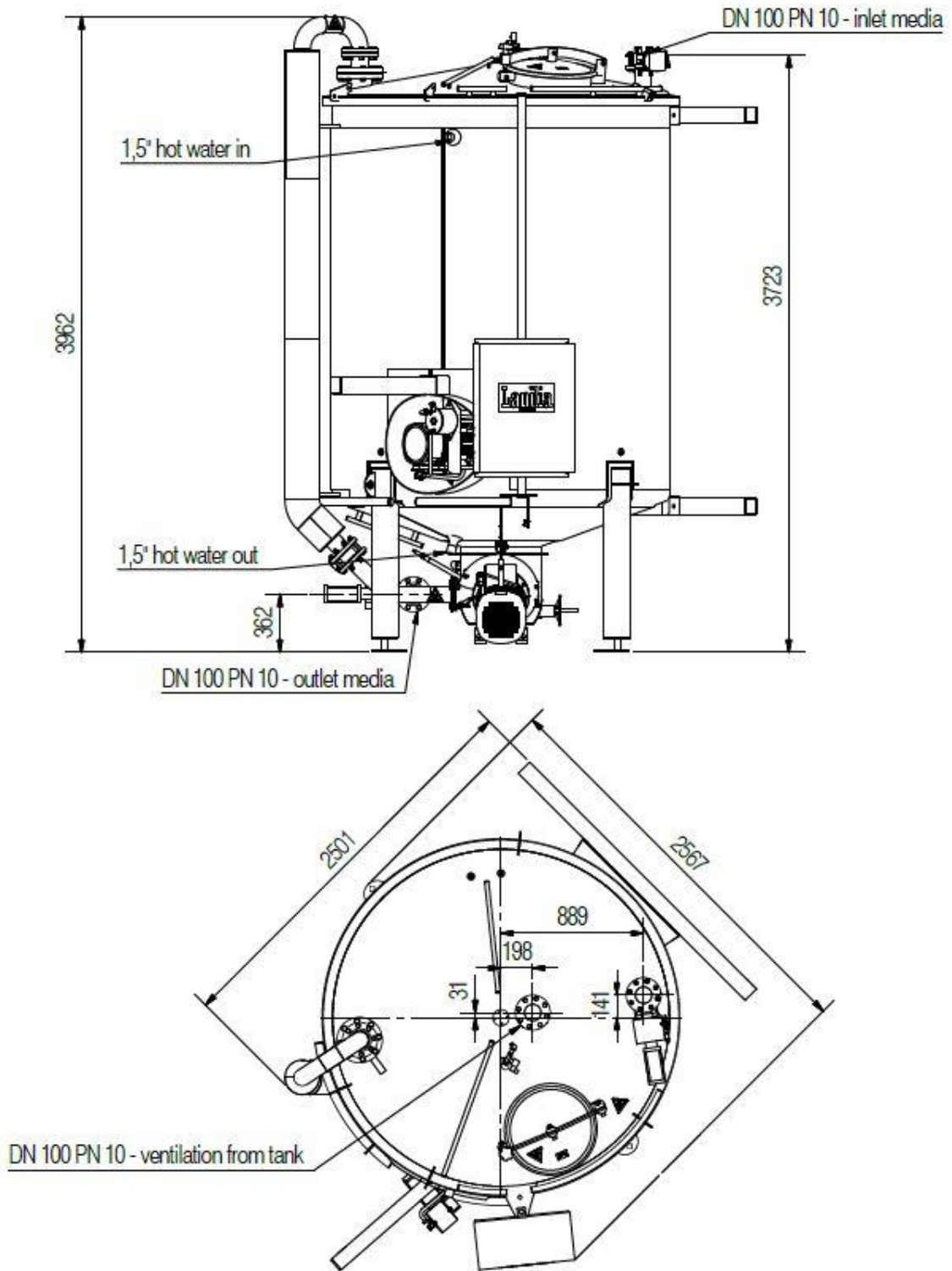
GENERAL ARRANGEMENT DRAWING, 2.5 m³ TANK



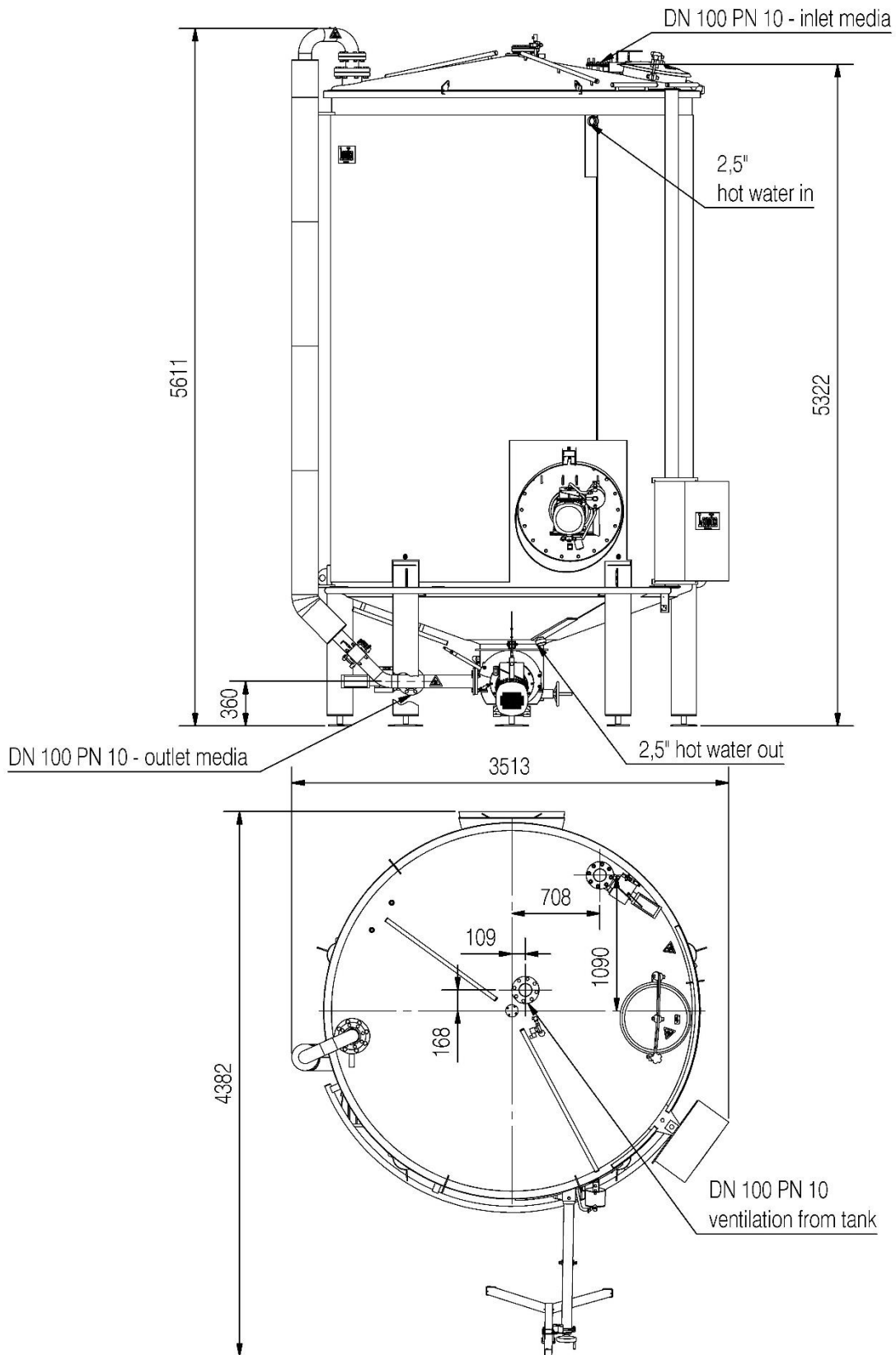
GENERAL ARRANGEMENT DRAWING, 5.0 m³ TANK



GENERAL ARRANGEMENT DRAWING, 8.0 m³ TANK



GENERAL ARRANGEMENT DRAWING, 25.0 m³ TANK



We reserve the right to make technical alterations.



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Introduction

MPTK-I is a dry installed pump.

By means of different equipment a great number of different pumping requirements can be met. The pumping takes place by means of an electric motor; a pump casing with an impeller is installed on the motor. The oil filled oil chamber between motor and impeller provides cooling and lubrication of the mechanical seals. The sealing system consists of two mechanical seals. The exterior seal separates the medium from the oil chamber, the interior seal separates the oil from the motor casing.

Application

This dry installed pump is to be applied for pumping of liquids with a high or a low dry matter content, like e.g. thick manure and highly polluted wastewater. The pump is only to be applied dry installed in connection with application at e.g. effluent treatment plants, in industry and in agriculture. If the pump is to be applied for other purposes, contact Landia A/S for advice.

Important

Please note the following points:

- Only a certified electrician is allowed to connect the unit.
- Prior to installation and start-up ensure that the equipment, such as hoses, pipes and pipe branches, is installed correctly and fixed to the pump.
- Prior to the first start of the pump, the pump shaft must be rotated manually. This also applies if the pump has not been in operation for a longer period.
- The pump must be dry installed but can be placed outside without protection as the motor is splash proof. The motor is not to be wrapped in plastic film etc.
- Prior to service/repair of the pump it is always to be ensured that the electrical connection of the pump is switched off or locked.
- Prior to disassembling the pump, the sluice valve on the pressure and on the suction side must be completely closed.

Service/repair

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

If you do not want to execute the service yourself, we can offer you a service agreement - please call for further information.

Please note

If spare parts not identical to the recommended are applied at service/repair, the guarantee from Landia A/S will be annulled. Spare parts can be ordered at Landia A/S or your local distributor.

For major repairs at a special workshop please contact:

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

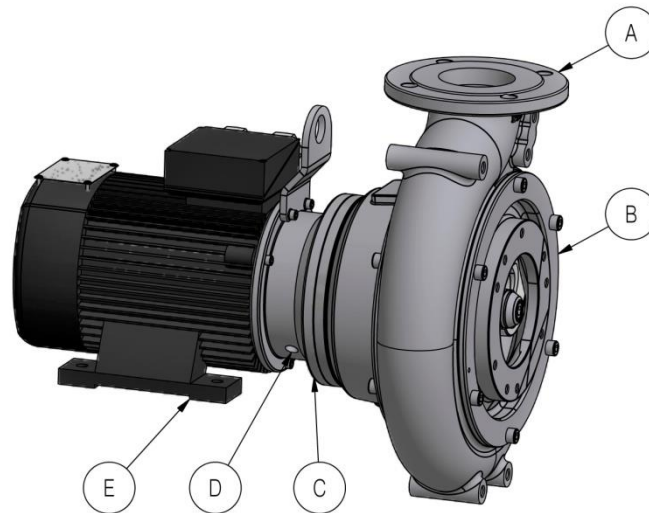
Landia A/S is represented by local distributors worldwide, please call for further information.

Installation

At installation, it must be ensured that the pump can be removed from the pipe system in case of breakdown, service etc. Therefore, block valves must be installed on the pressure and on the inlet side of the pump, unless the pipe system can be emptied in another way. Besides, it must be ensured at fixing to the concrete foundation that the pump can be lifted in service situations. By means of a motor support foot, the console of the pump is relieved, pos. E. At pump installations in piping systems compensators must be applied since vibrations and temperature fluctuations will influence the piping system.

At installation the drainage hole, pos. C, in the receiver and the condensate hole, pos. D, in the motor must turn downwards.

- A. Pressure side
- B. Suction side
- C. Draining hole
- D. Condensate hole
- E. Motor base



Rating plate

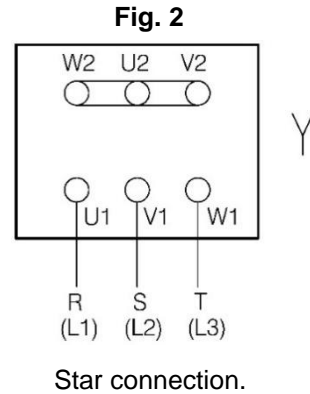
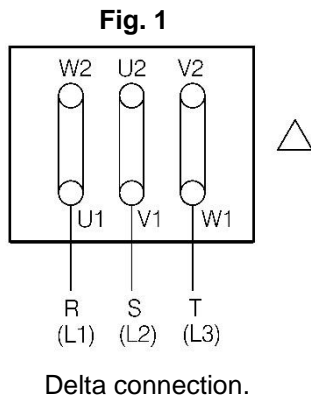
		VEM motors GmbH Thurm			
IM	IP	IF	3-Mot	kg	
50Hz	60Hz				
kW		kW			
V		V			
A		A			
min ⁻¹		min ⁻¹			
50 Hz	...	/	...	V	/
60 Hz	...	/	...	V	/

IP: Cage class
 F: Insulation class F
 3~mot.nr.: 3 phased motor
 IM: Building form
 cos φ: Power factor
 Kg: Weight of motor without pump
 kW: Max. shaft power
 V: Mains voltage
 A: Nominal power consumption
 min: Motor revolutions per minute
 kW,V,A and min⁻¹ for 50 Hz and 60 Hz respectively.
 The final two lines state the allowed voltage intervals with power consumption at 50 Hz and 60 Hz resp.

Power connection

Every pump 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 ensured that the other electrical parts correspond to the motor data. For each pump there is an electrical diagram. A protective motor switch must be applied at connection of the pump to the mains.

Only a certified electrician is allowed to connect the unit.



Capacity

The capacity of the pump will always depend on the consistency of the medium.

To obtain the highest capacity possible with as low motor power as possible it is important that the diameters of the pump pipes are large enough and that sharp bends are avoided as far as possible. Large pipe dimensions are especially important in connection with long pumping distances. When installing in a pipe system where vibrations and temperature fluctuations affect the pipe system, compensators must be used.

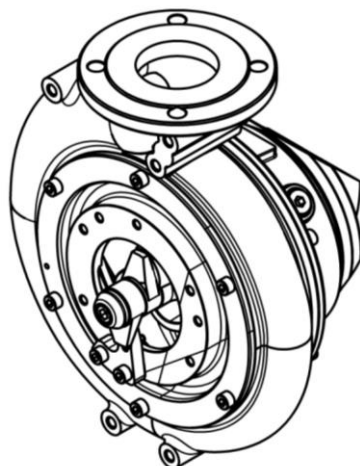
The pumps are equipped with open impellers especially suited for liquids with large particles, like e.g. raw wastewater, manure and industry applications.

For difficult mediums with e.g. a high dry matter content or large impurities which make up a risk for blocking, the pumps can be supplied with a knife system. The knife system which is placed in the inlet port consists of one (or three) fixed and two rotating knives. The knives comminute large impurities in the medium in order to ease the pumping. They are ideal for comminuting e.g. straw, shreds, paper, fish etc.

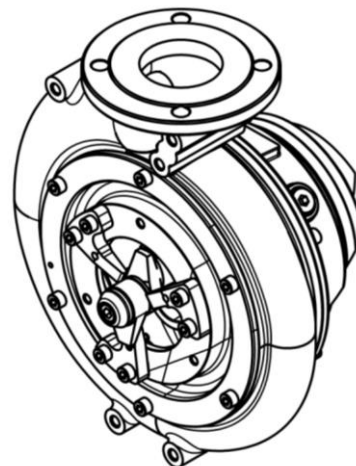
To minimize downtime on the pump due to metal objects in the medium, it may be recommended that a magnet be fitted to the feed system to the tank to which the pump is connected.

The pump capacity will be reduced if the edge of the guide traces on the front and back plates is worn round or if there are deep traces on the surface. You can minimize the wear on the front and rear plate by changing the impeller before the edges on the back of the impeller become too round. If the edges of the impeller become too round, it can be easier to settle stones in the clamp between the impeller and the back plate, which will turn the impeller round and the wear will increase. If you have any doubts or questions, please contact Landia for advice.

Pump casing w. knife system



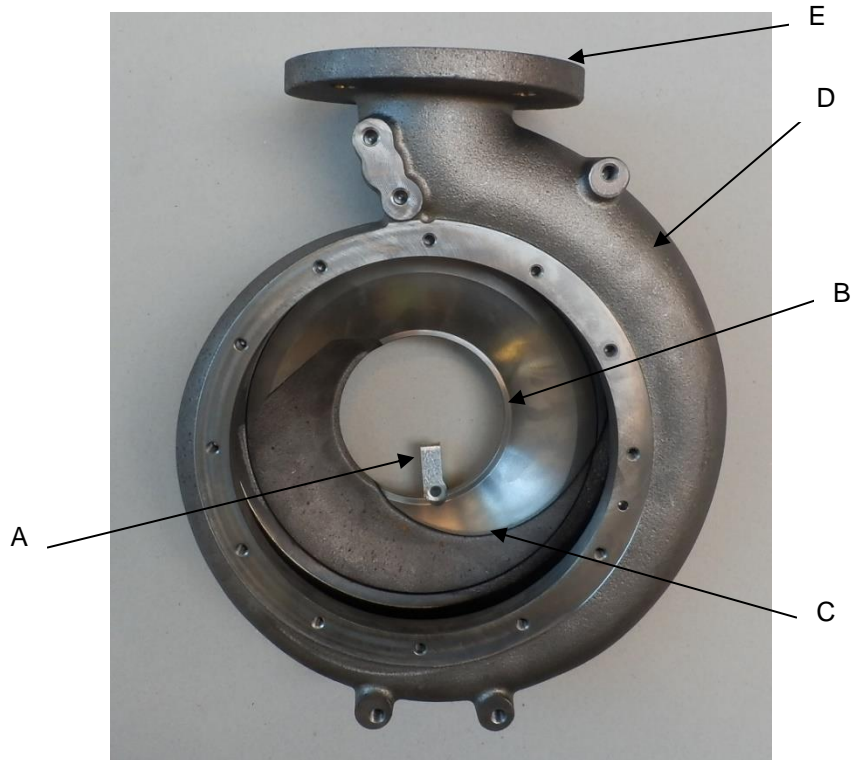
Pump casing w. extended knife system



Fitting the front plate

- A. Knife with tightening pin
- B. Front plate
- C. Guide trace
- D. Pump casing
- E. Outlet

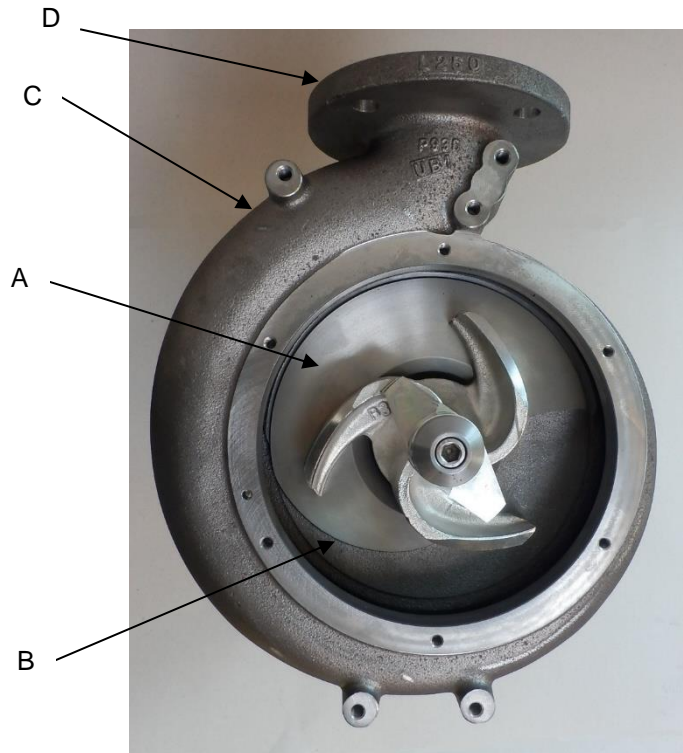
The front plate of the pump casing is designed with a guide trace. The guide trace has to be placed like shown on the above photo, regardless of how the outlet of the pump is turned.



Fitting the back plate

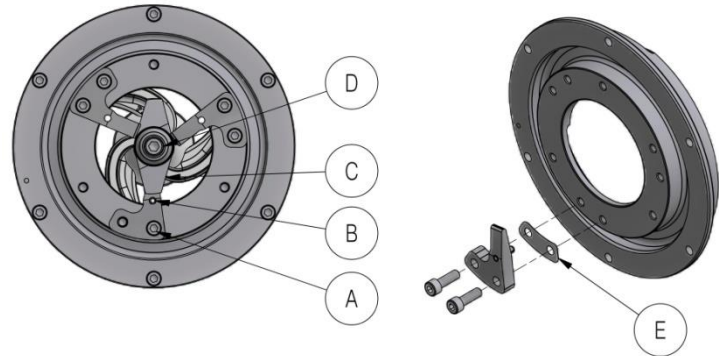
- A. Back plate
- B. Guide trace
- C. Pump casing
- D. Outlet

The back plate of the pump casing is designed with a guide trace. The guide trace has to be placed like shown on the above photo, regardless of how the outlet of the pump is turned.



Installation of knives

- A. Fixed knife
- B. Tightening pin
- C. Rotating knife
- D. Bolt
- E. Shim



If the tightening pin in the fixed knife is missing, the pin/knife must be replaced.

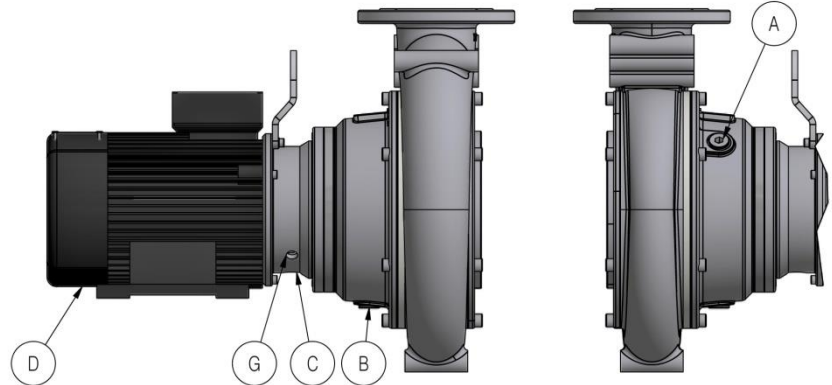
When the fixed and rotating knives are replaced, make sure that the shaft can rotate without the rotating knives touching the fixed knife/knives. If this is not the case, the fixed knife/knives must be adjusted with shims.

Inspection

Periodic inspections can ensure that the pump has a long life for modest costs. For every 6 months, possibly more often, depending on the operating conditions, the pump's impeller, oil supply, motor housing and any blade system should be checked. The oil must be changed at least once a year, or as described on the front of this manual for the recommended service interval for this particular unit.

If large amounts of oil / liquid leak out of the drain hole in the intermediate chamber, the mechanical shaft seals of the pump should be checked. When replacing the knife system, tighten the bolts with a torque wrench according to the diagram below.

- A. Top oil plug
- B. Lower oil plug
- C. Drainage hole
- D. Condensate hole
- E. Filter
- F. Pressure equalization
- G. Inspection hole



Oil control

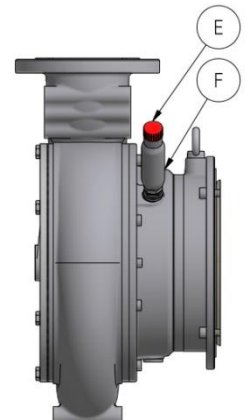
The oil is checked by uninstalling the upper oil plug pos. A. For pumps with pressure equalization, pos. F is uninstalled.

The oil has to be clean and the level must reach the level of the upper plug pos. A when the pump is in a horizontal position, standing on its feet. If the oil is dirty, it must be changed and the two mechanical seals must be checked and changed, if necessary. Oil type see part list.

The oil is drained off at oil plug pos. B and is filled at oil plug pos. A. For pumps with pressure equalization, oil is filled at pos. F.

If the pump is equipped with an oil collector, a plug is placed in drainage hole C. The oil in the collector is drained by removing the plug in drainage hole C. If the oil collector is full, the oil comes out of inspection hole G.

For pumps equipped with pressure equalization, the filter pos. F must be cleaned or replaced in connection with maintenance to avoid plugging.



Disassembling/assembling

A major repair should take place at a special workshop.

Below please find some general conditions regarding disassembling/ assembling of the pump. The drawing attached to the spare parts list shows the construction of the unit. Not all parts can/should be dismantled, e.g. do not press the rotor off the shaft. When disassembling the unit, handle the mechanical seals with care as they are not shock resistant.

Prior to re-assembly, 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 tightening torque according to the diagram below:

Bolt sizes	Quality 10.9 - 12.9 Steel	Quality A4 kl. 80 St. steel
M5	-	4,5 Nm
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

After mounting the bearing flange, the axial clearance must be checked as indicated in the table below.

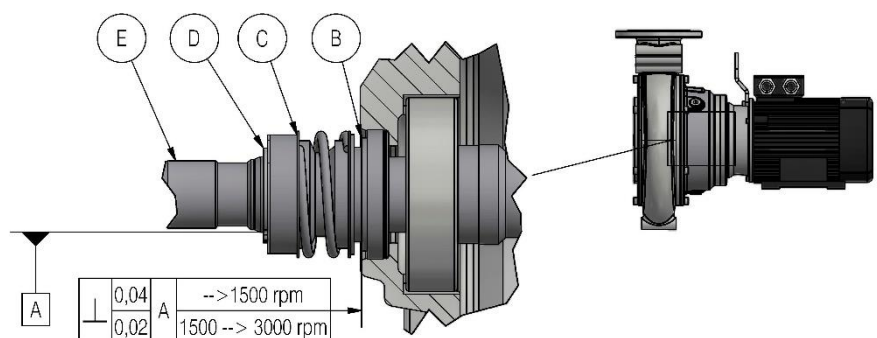
Pump size 1500 rpm	Acceptable clearance	Pump size 3000 rpm	Acceptable clearance
50	0.25 ± 0.05 mm	50	0.50 ± 0.05 mm
65	0.50 ± 0.05 mm	65	0.80 ± 0.05 mm
80	0.50 ± 0.05 mm	80	1.30 ± 0.05 mm
105	0.80 ± 0.05 mm		
150 and 105 22/30 kW	1.30 ± 0.05 mm		

Installation of mechanical seals

When installing the mechanical shaft seals, it is important to note that these are precision products and that they should be treated as such. The slide faces must be protected during the installation.

- B. Stationary sealing part
- C. Rotary 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 the 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 bellows as well as on the shaft. Do not apply silicone, PTFE lubricants or oil as they will prevent the rubber bellows from sticking to the shaft. Installation arbor should be used.

Locking ring, pos. D, is placed on the shaft and the seal is pressed until the locking ring is mounted in the locking ring groove. Check the seal by turning the motor shaft.

Oil is filled in the oil chamber. During the filling, the pump must be in a horizontal position. Oil quantity: see spare parts list, otherwise the oil must reach the level of the upper oil plug.

Repair of the surface coating is necessary before the pump is put back into operation. See instruction for maintenance of surface coating.

We reserve the right to technical alterations. Translated from Danish.

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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.

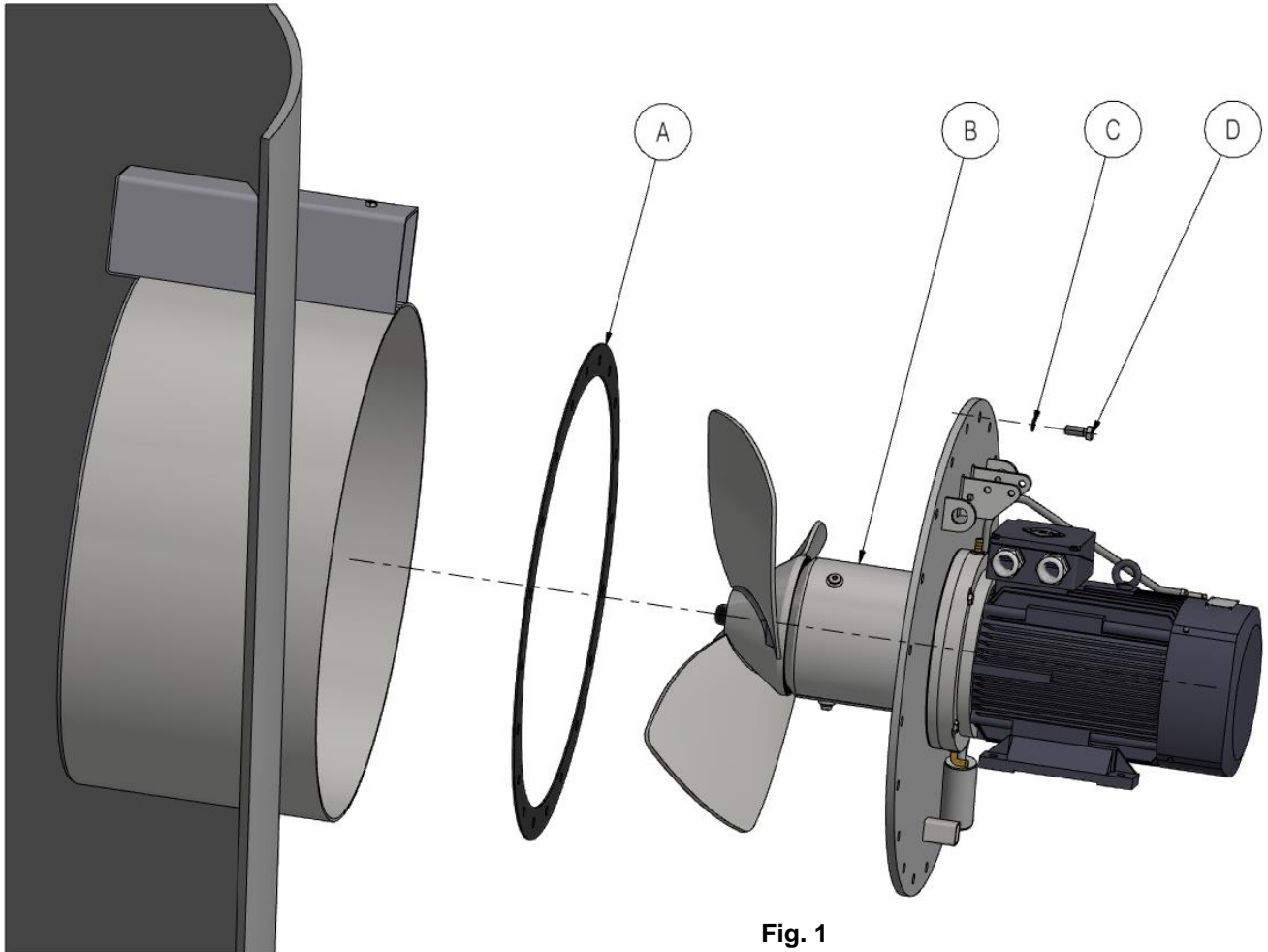
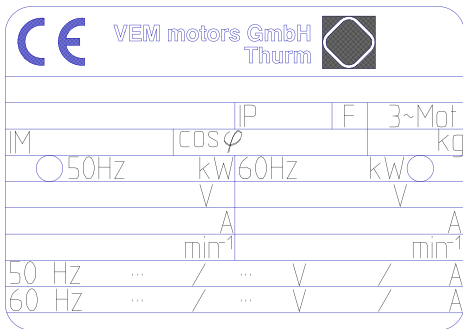


Fig. 1

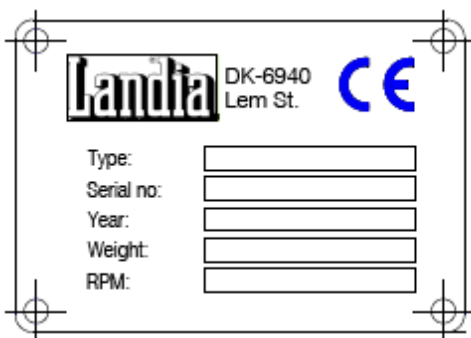
- A. Washer
- B. Mixer POPTR-I
- C. Stainless steel washer $\varnothing 32/\varnothing 16.2 \times 4$
- D. Acid-proof bolt M16x40

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.

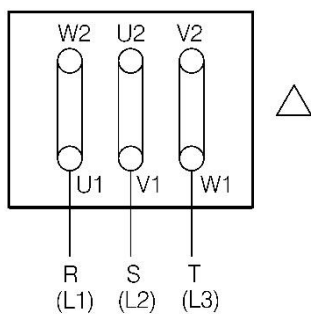
The rating plate states the motor's electrical data as well as the year of manufacture and the serial no. When contacting Landia regarding maintenance of a specific unit, please always state the serial no.

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.

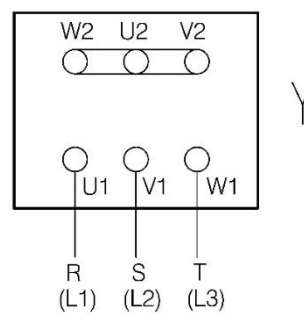
Only a certified electrician is allowed to connect the unit.

Fig. 2



Delta connection.

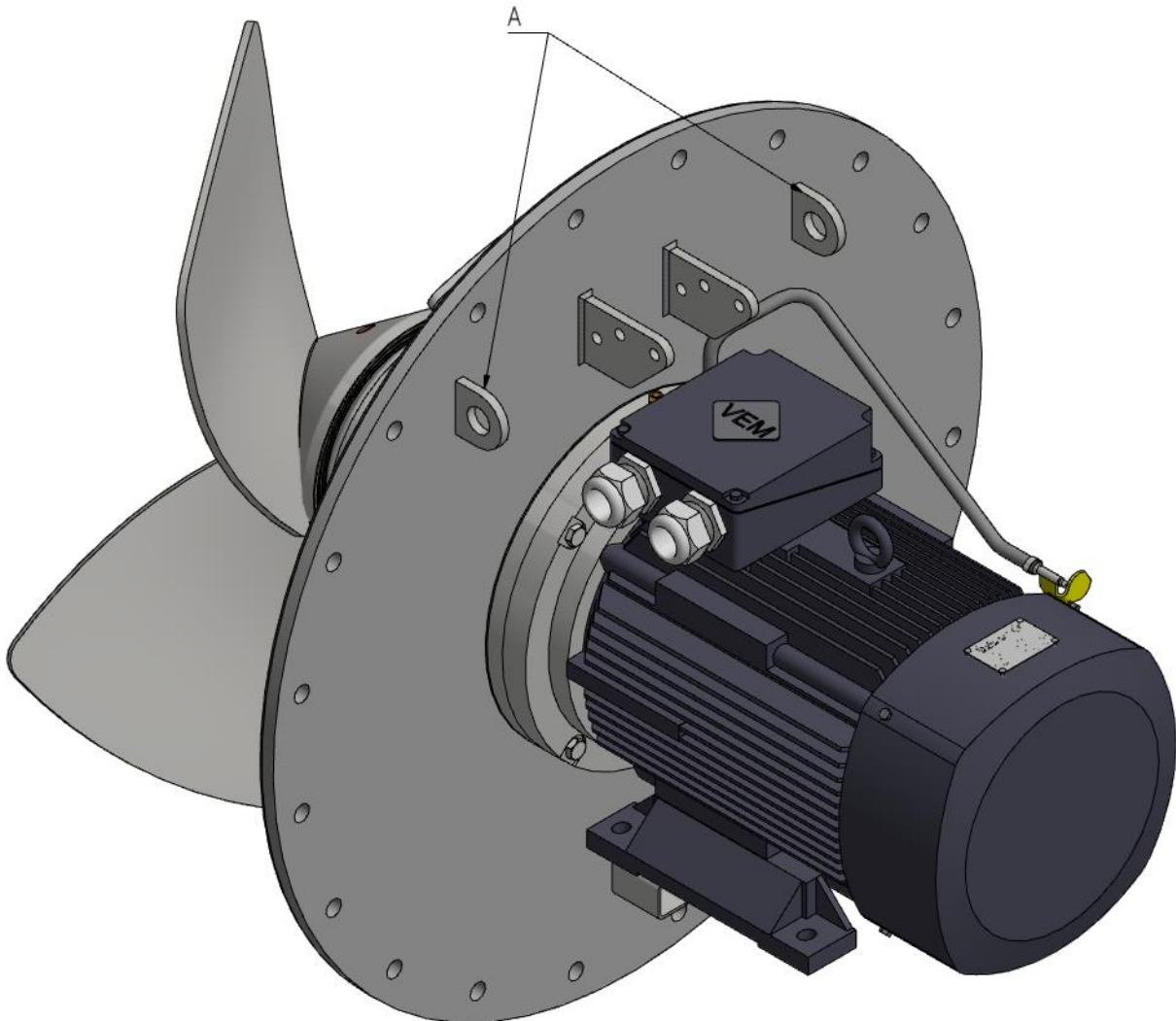
Fig. 3



Star connection.

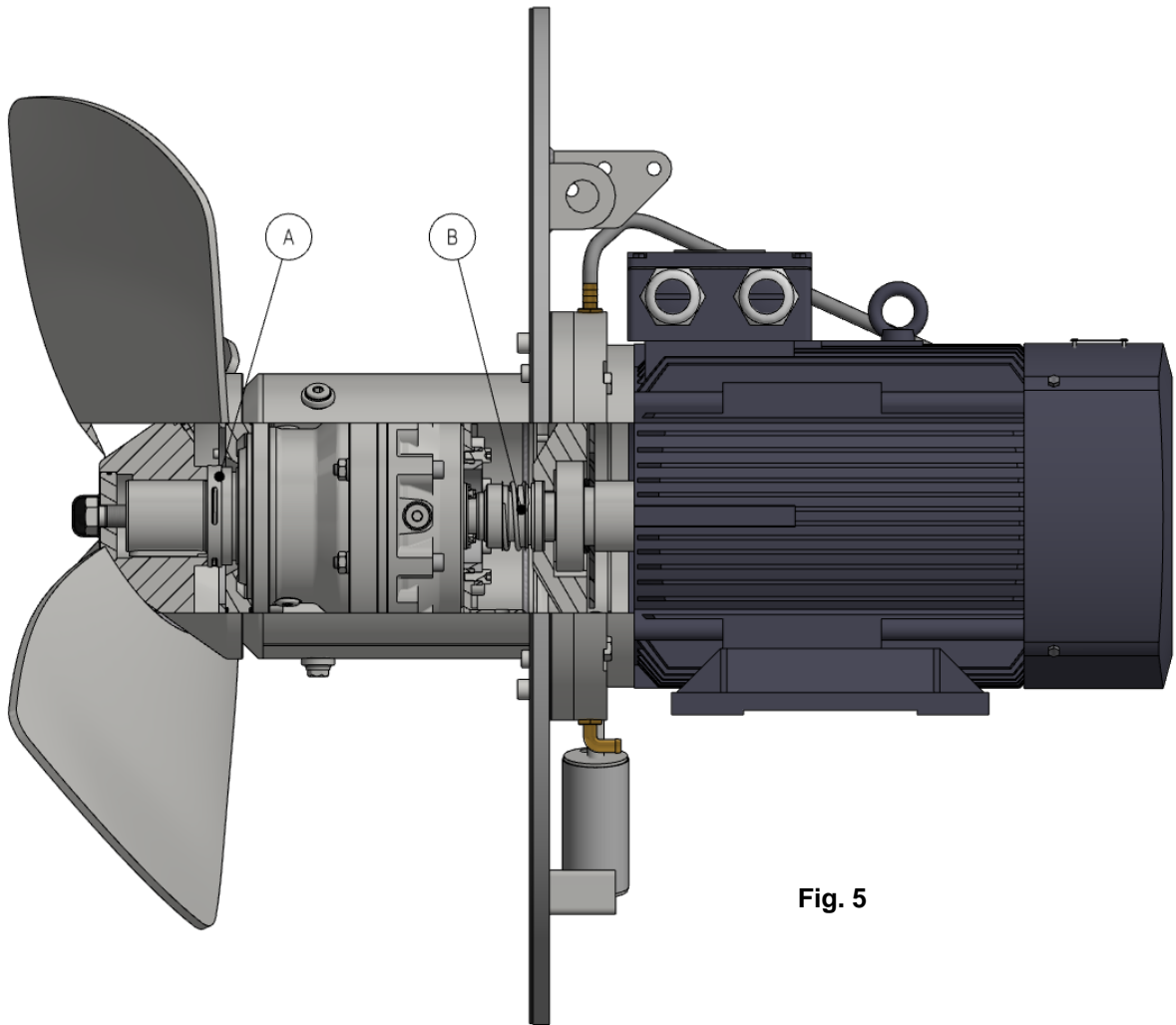
Lifting point

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

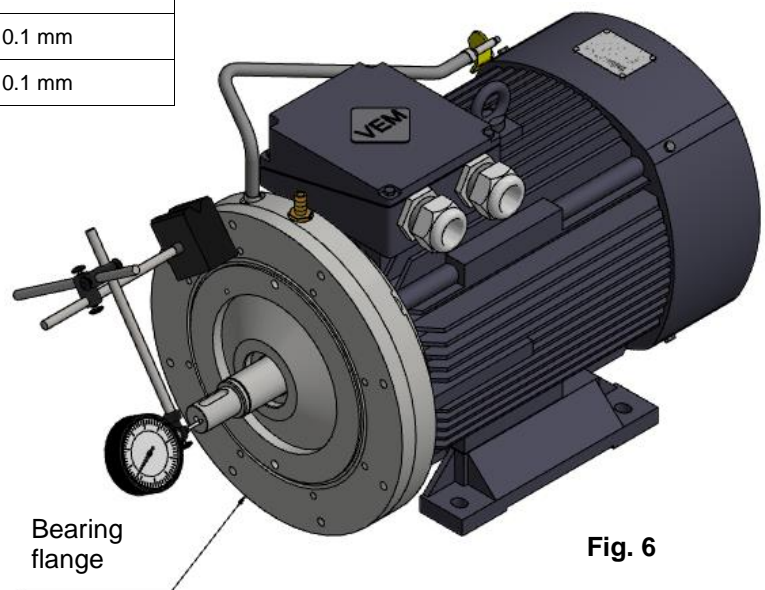


Fig. 6

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.

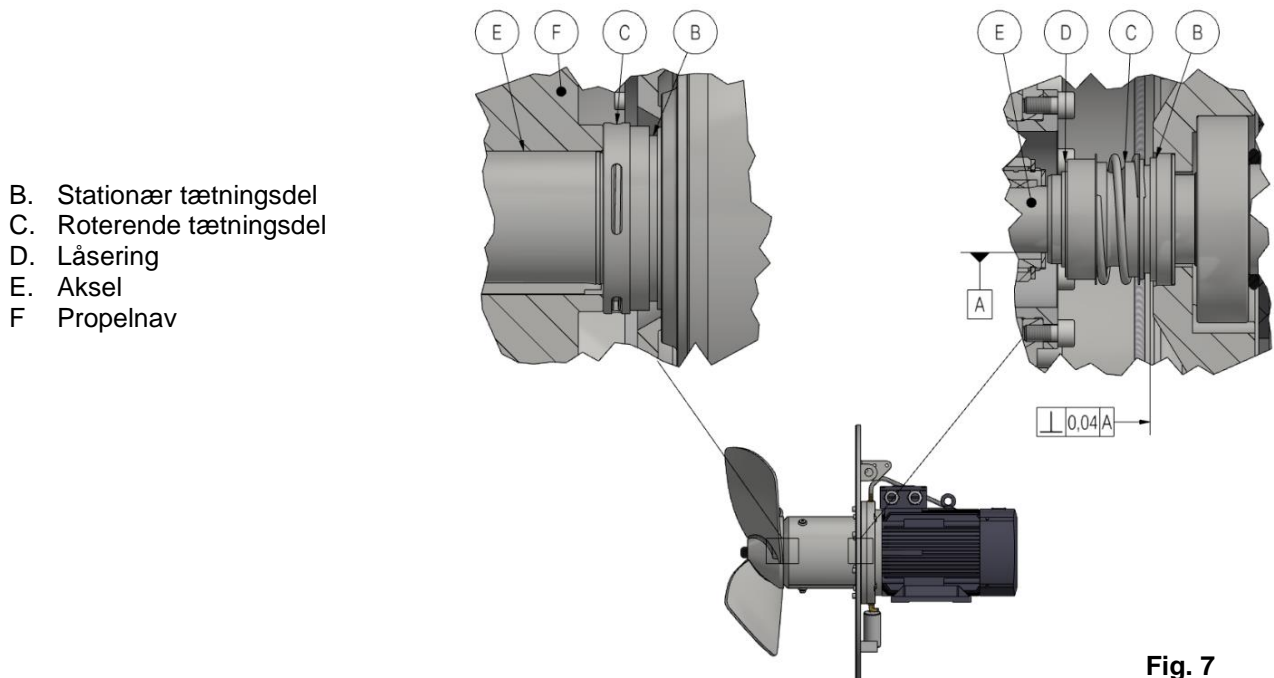


Fig. 7

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.

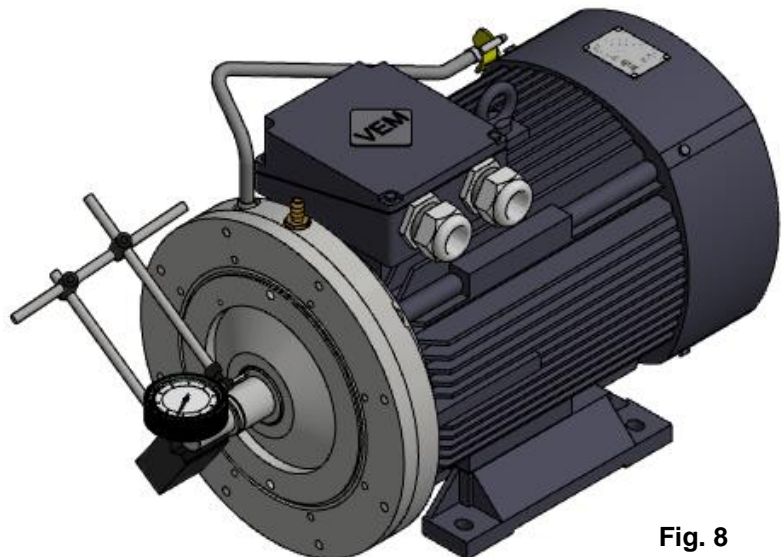


Fig. 8

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

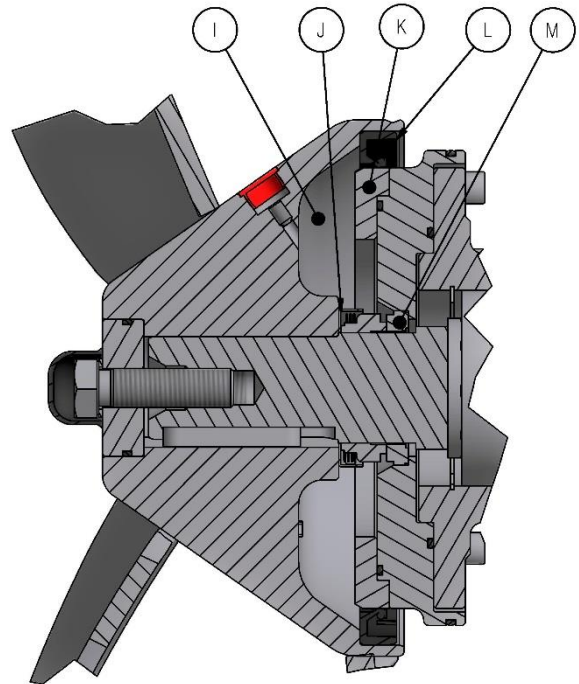


Fig. 9

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.

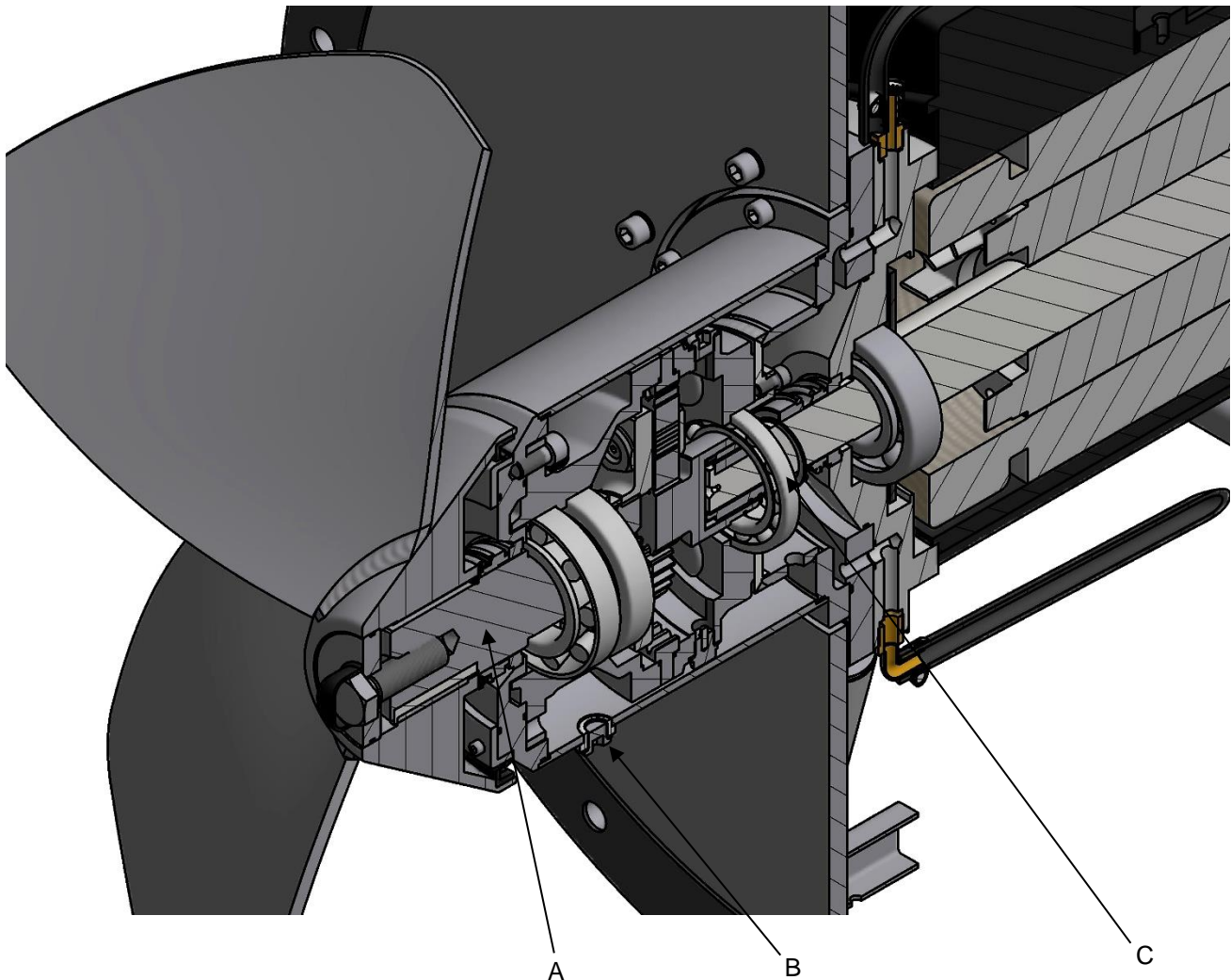
Gear

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)

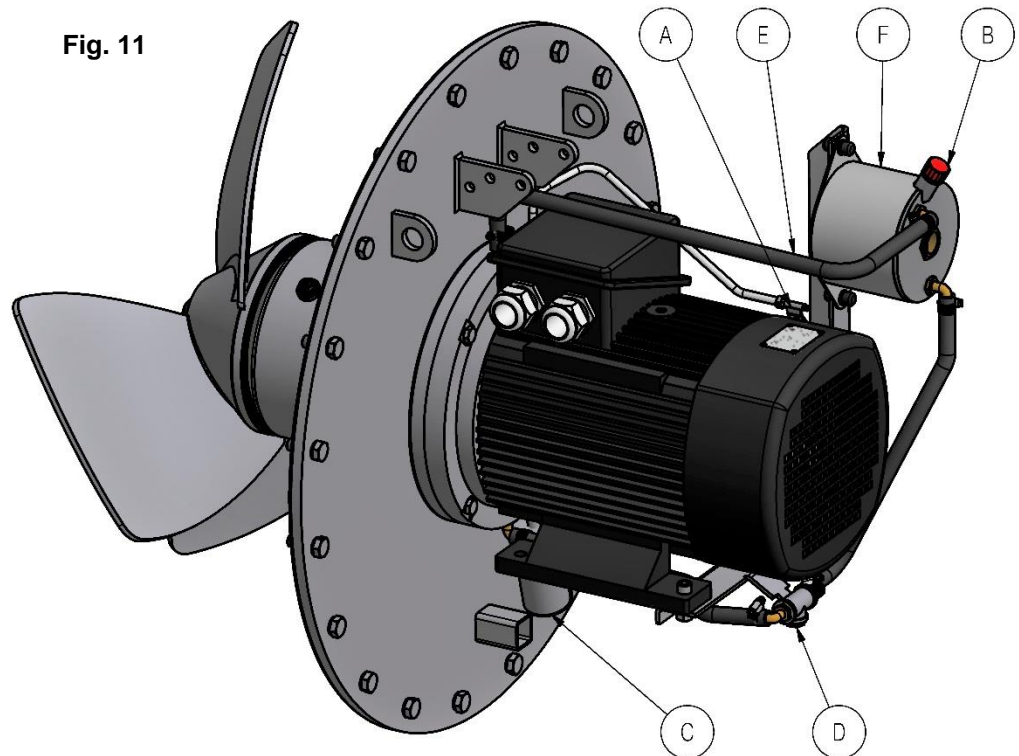
Oil change in POPTR-I with oil reservoir

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 Mixer with oil reservoir placed above liquid level

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

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

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

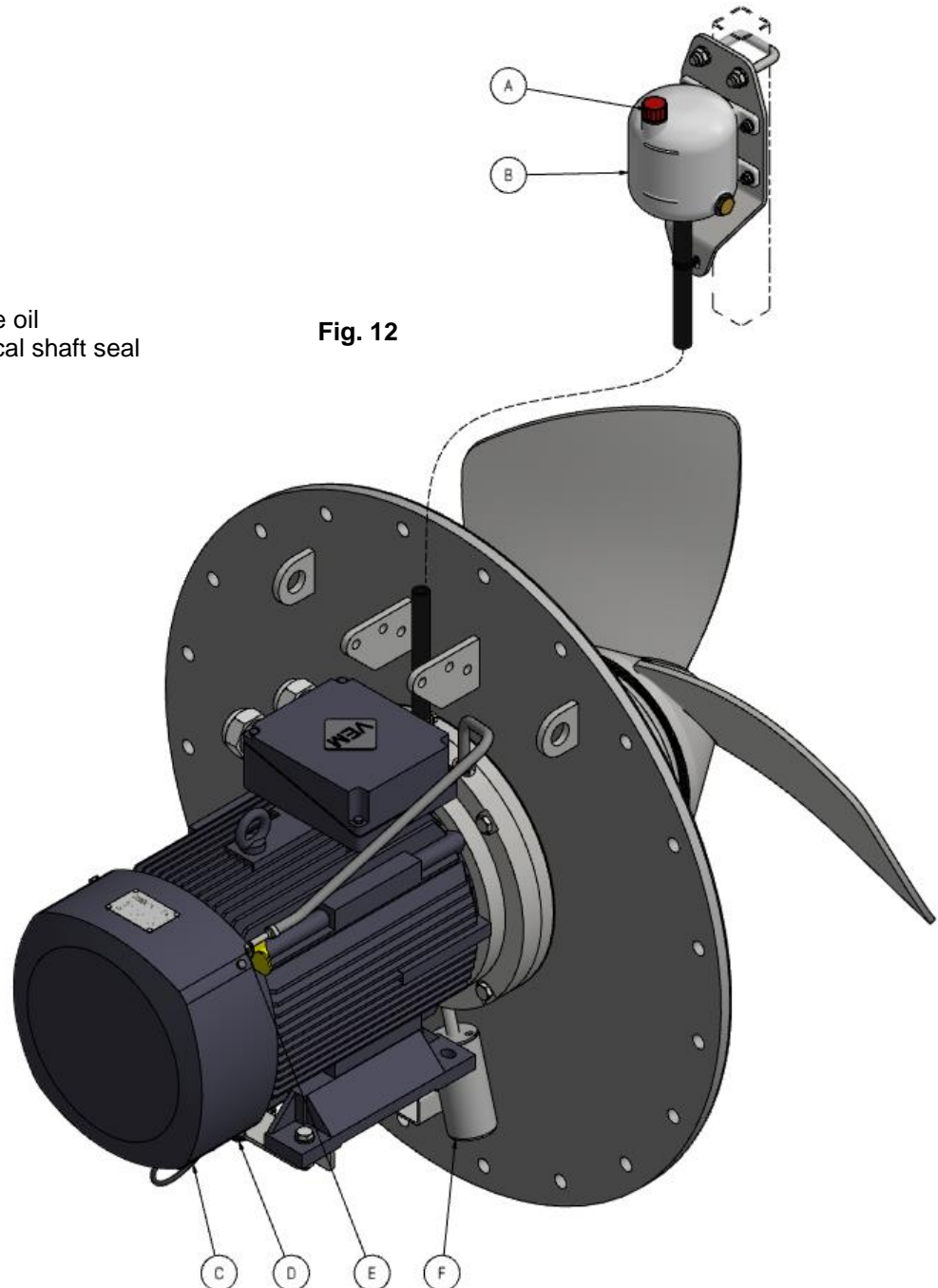


Fig. 12

All rights to technical changes reserved. Translated from Danish.

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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:

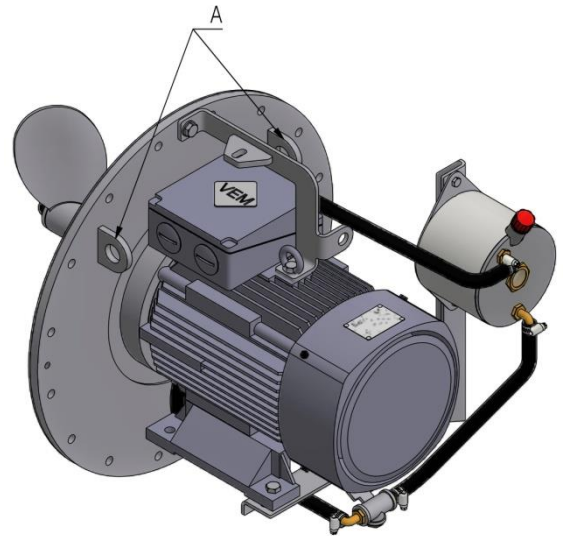
Head Office:
LANDIA A/S
Industrivej 2
DK-6940 Lem St.
Tel.: +45 97 341244
info@landia.dk
www.landia.dk

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

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

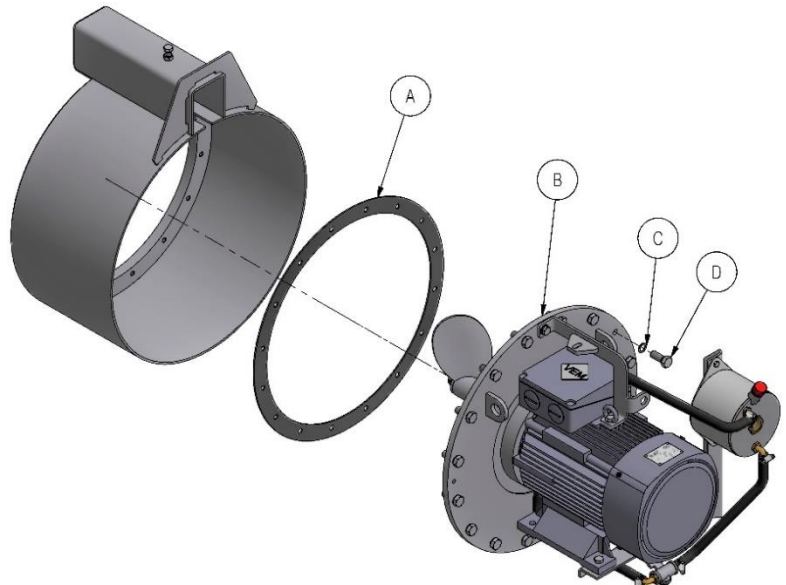
When assembling the mixer on the tank flange, the bolts are to be cross-tensioned. Bolt M12 class A4-80 is to be tensioned with 82 Nm. If the washer is not tight, the tightening torque must be increased with 10 Nm at a time until 130 Nm max till the washer is tight.

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.

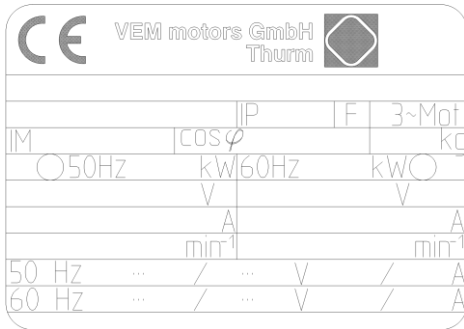
NB: Remember to install the electric cable prior to installation of the mixer

- 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.

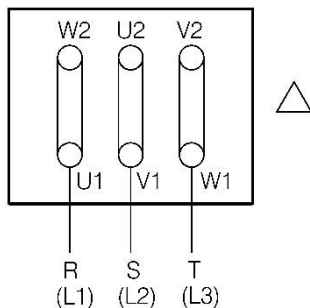
Power connection of motor

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.

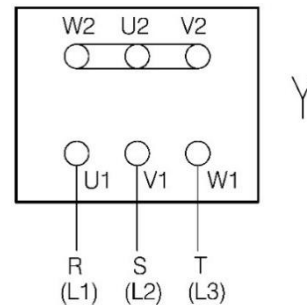
Only a certified electrician is allowed to connect the unit.

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.

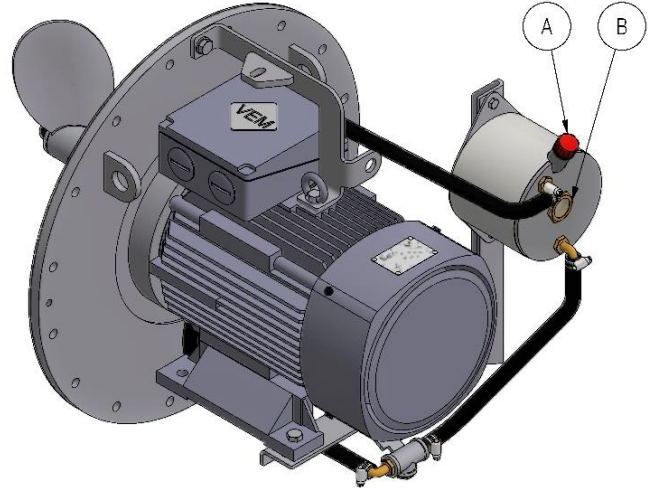
Inspection

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

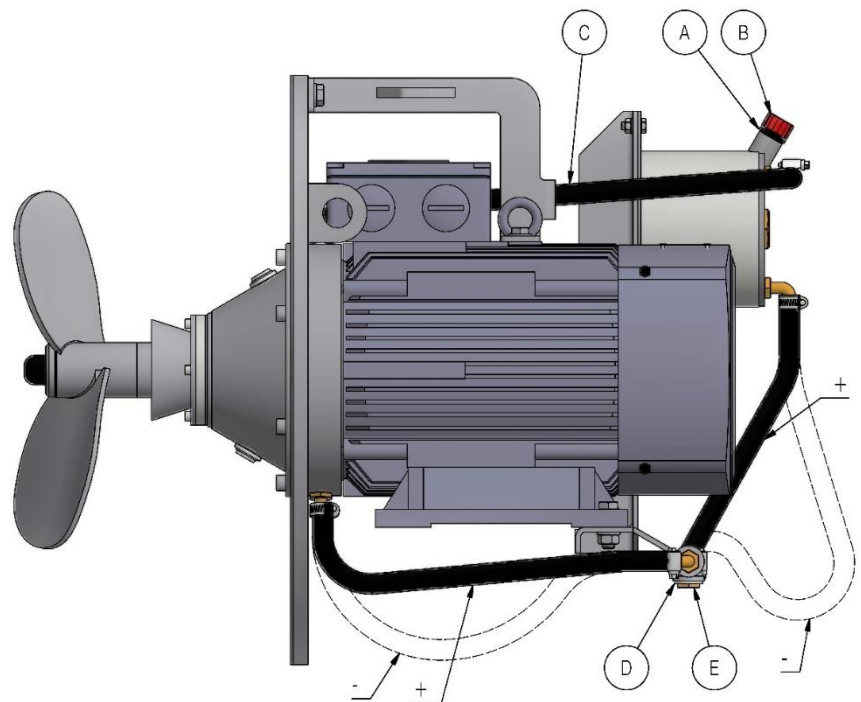
The oil is drained by removing the ventilation cap pos. B and the draining plug pos. E. Refill the oil through the tube on which the ventilation cap pos. B is installed. See oil type and oil quantity in the spare parts list. When changing oil, the mixer must be placed horizontally.

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 of 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

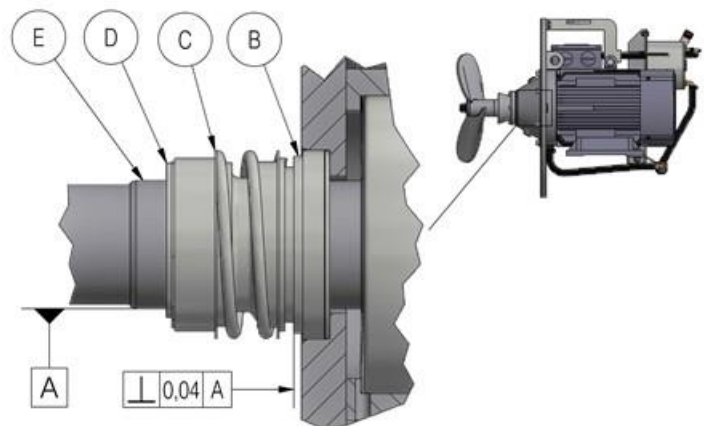
After installation of the bearing flange, the axial space must be controlled; it should be as stated in the table below.

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.

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Description of the unit

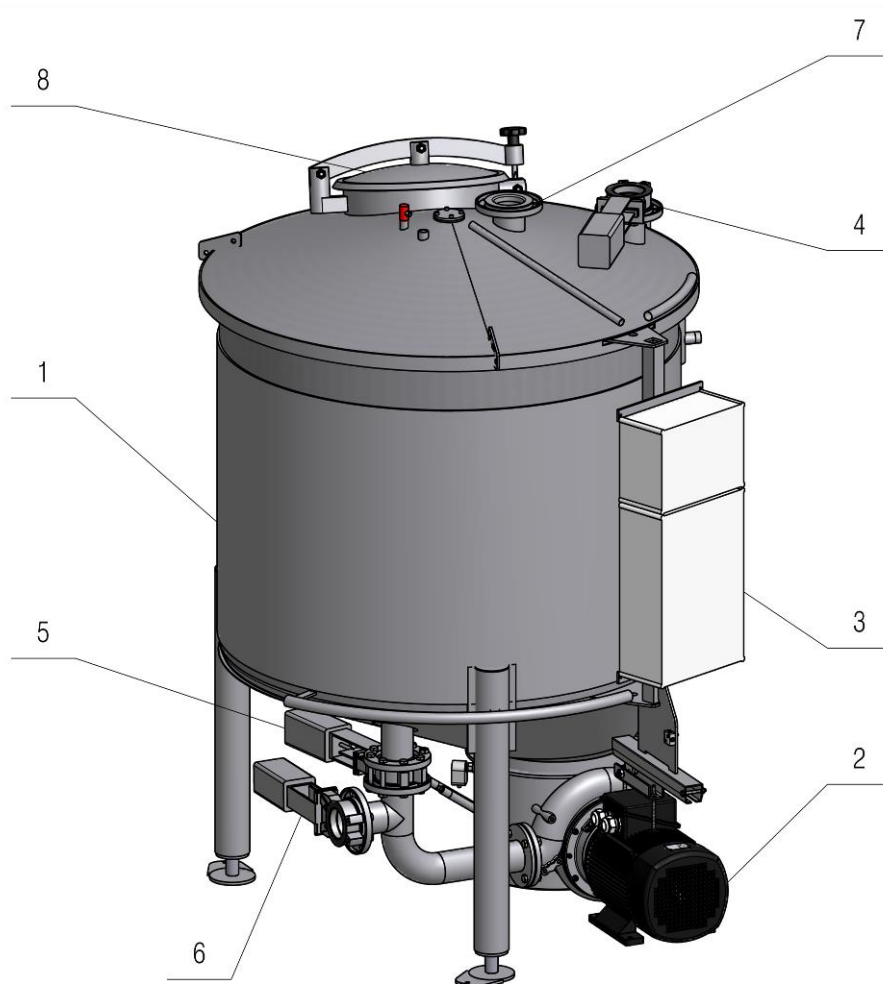
The Landia BioChop hygienisation unit is an automated system for monitored hygienisation of category 3 by-products at 70°C for one hour.

Since the useful tank volume is dependent on the liquid type and composition, the stated nominal batch volume of 5.0 or 8.0 m³ cannot be fully guaranteed. Please note that Landia may determine specific demands regarding both filling and emptying levels.

The main components of the system are:

1. 2.5 m³ hygienisation unit equipped with heating jacket for heating through hot water circulation. The tank is insulated.
2. BioChop pump for mixing, chopping and evacuation of hygienisation unit
3. PLC-control for controlling, regulating and monitoring the hygienisation process
4. Inlet valve
5. Mixing nozzle
6. Outlet valve
7. Vent
8. Manhole cover

Fig. 1



The Process

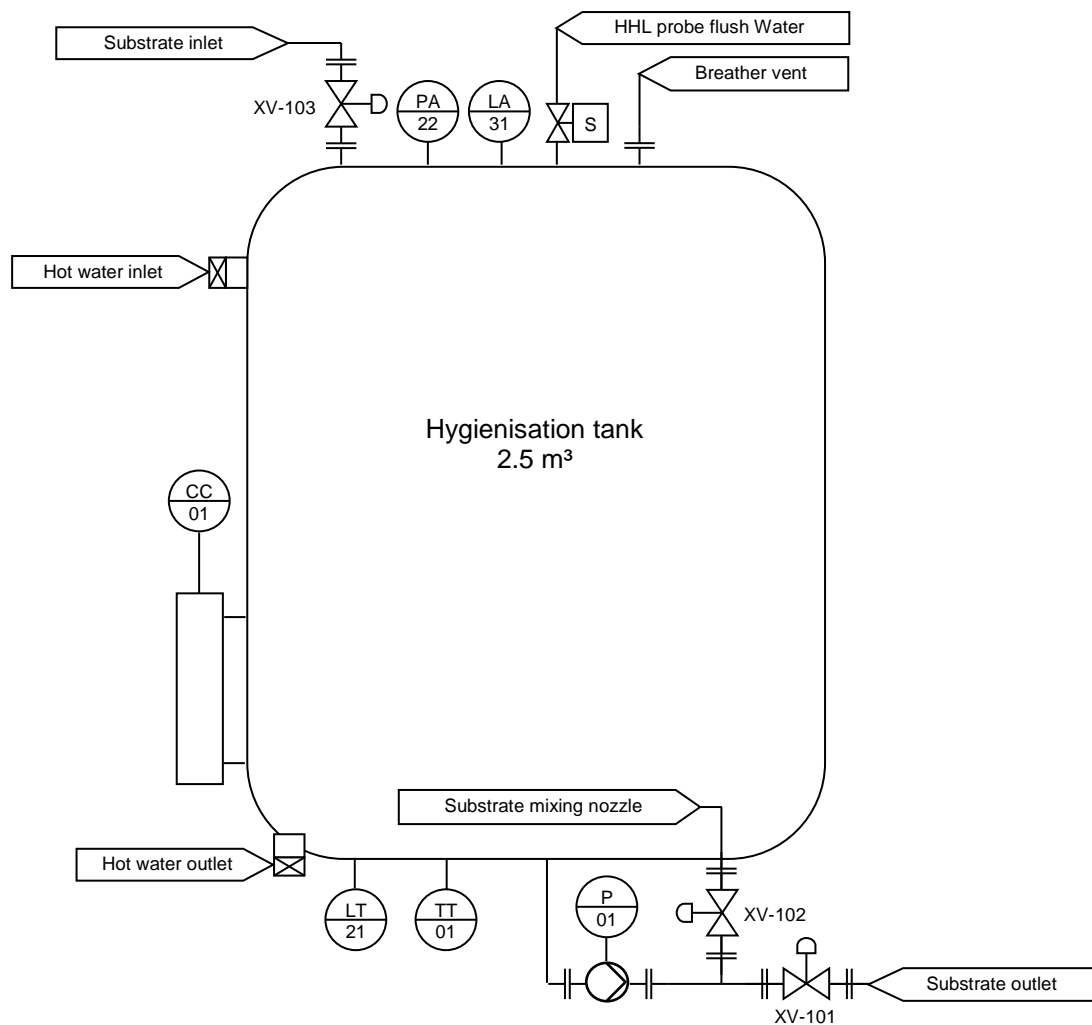
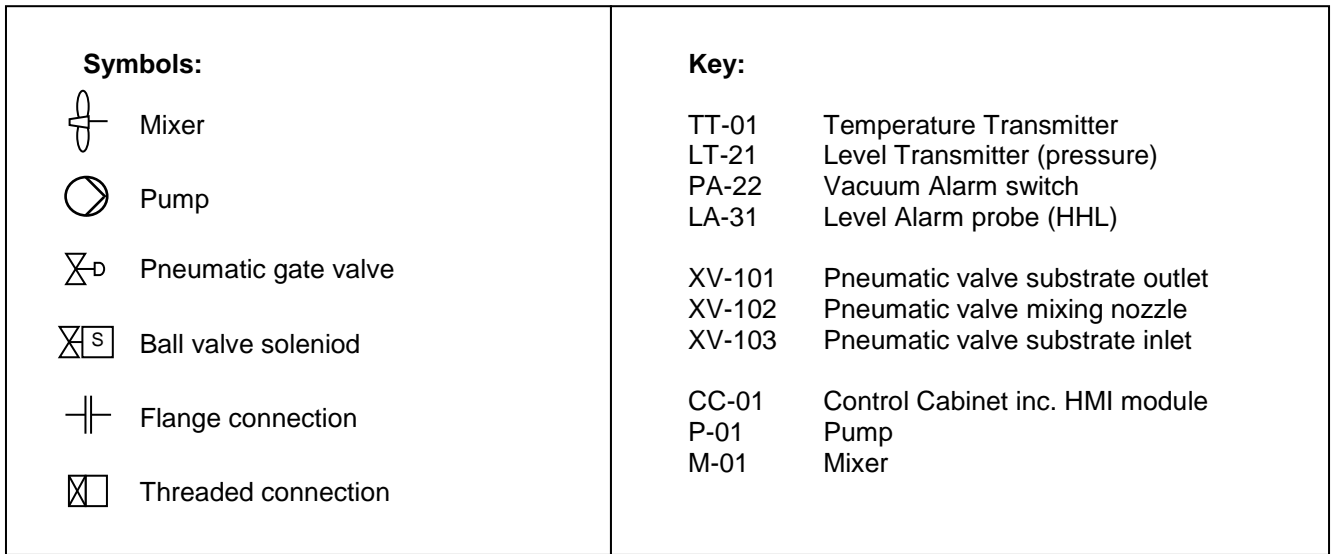
The maximum dry matter content of liquid for hygienisation is 10%, though this depends on the composition of the liquid. Contact Landia with questions.

The substrate is added to the hygienisation unit through the inlet valve to the pre-set tank level. This level is determined on the basis of the substrate's expansion capacities in relation to the heating process. Now the inlet valve closes and then the BioChop pump and mixer start and remain in operation during the entire heating process. This is to ensure adequate mixing, reduce the potential the potential formation of sediments and the inside of the tank wall and to increase the heat transfer from the heating jacket to the substrate. Some types of substrate may be more prone to cause sediments than others. Incrustations may form faster than usual when heating substrates containing slurry.

When the substrate temperature reaches 70° C, the inlet valve and the outlet valve are locked for one hour and the mixer is stopped. The substrate temperature, the hygienisation time and the locked position of the valves are registered by the PLC-control's data collector to document that the hygienisation requirements have been adhered to.

After one hour of hygienisation at 70°C, the substrate level in the tank is pumped, via the outlet valve, to a minimum level, which has been pre-set in the PLC-control by Landia A/S. The minimum level of the tank is pre-set in order to ensure that the pump does not cavitate when the substrate is pumped out. Should the pump begin to make noise or vibrate while the substrate is being pumped out, it is important to stop the pump, examine the problem and if necessary contact Landia A/S to have the problem examined. The required minimum level in the tank is closely related to the pump's pressure when emptying the tank. When the tank has been emptied to the minimum level it is automatically ready for a new batch.

P- and I-diagram



Warning

Please note the following points:

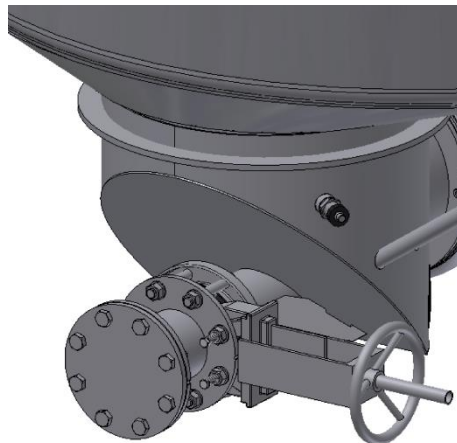
- Only a certified electrician is allowed to connect the unit.
- The hygienisation unit has parts that are voltage conducting and movable. According to machine directives, they are securely sealed in but still, cautiousness is imperative.
- Prior to service/repair, it is **imperative** that the electrical connection to the unit is switched off or locked out by the disconnect switch, and the power switch is to be secured from re-switching.

Fig. 3. Disconnect switch and emergency stop button (red)



- By maintenance/repair of units located in areas with explosion danger or toxic fumes, we refer to national security regulations, among other things regarding the toxic hydrogen sulphide.
- The hygienisation unit must be placed on a level and sustainable base. When the tank is full, the total weight is approximately 3.5 ton.
- In order to avoid unintended emptying of the tank, the bottom valve must be closed and the outlet equipped with a blind plate.

Fig. 4. Outlet valve with blind plate



Warranty and responsibility

In order to obtain a flawless operation and working of the hygienisation unit, it is prerequisite that the information in this operation manual is adhered to. For potential warranty claims to be upheld, it is also a condition that the below instructions have been followed.

In case Landia does not supply the PLC control, Landia assumes no responsibility for correct legal execution of the hygienisation process.

Regarding potential transport damages on the facility, this must be reported to Landia A/S immediately after receiving the goods.

Landia A/S renounces all responsibility of faults and imperfections of the hygienisation process that can be ascribed to substrate and/or equipment that has not been delivered or installed by Landia A/S.

Landia A/S also renounces all responsibility if descriptions relating to the process in quotations, order confirmations and this operation and maintenance manual have not been adhered to.

Installing the unit

The hygienisation unit can only be lifted in its four lift brackets, as indicated below, and only when empty. See fig. 6.

For the sake of the hygienisation unit's output and operational reliability, the hygienisation unit must be placed frost free and under a roof. It is the customer's responsibility that the hygienisation unit is placed frost free.

The unit must be placed at a level and sustainable base. Once the hygienisation unit is in place it must be fixed to the base by means of the delivered fixing brackets.

1. Lift brackets
2. Fixing brackets

Fig. 6

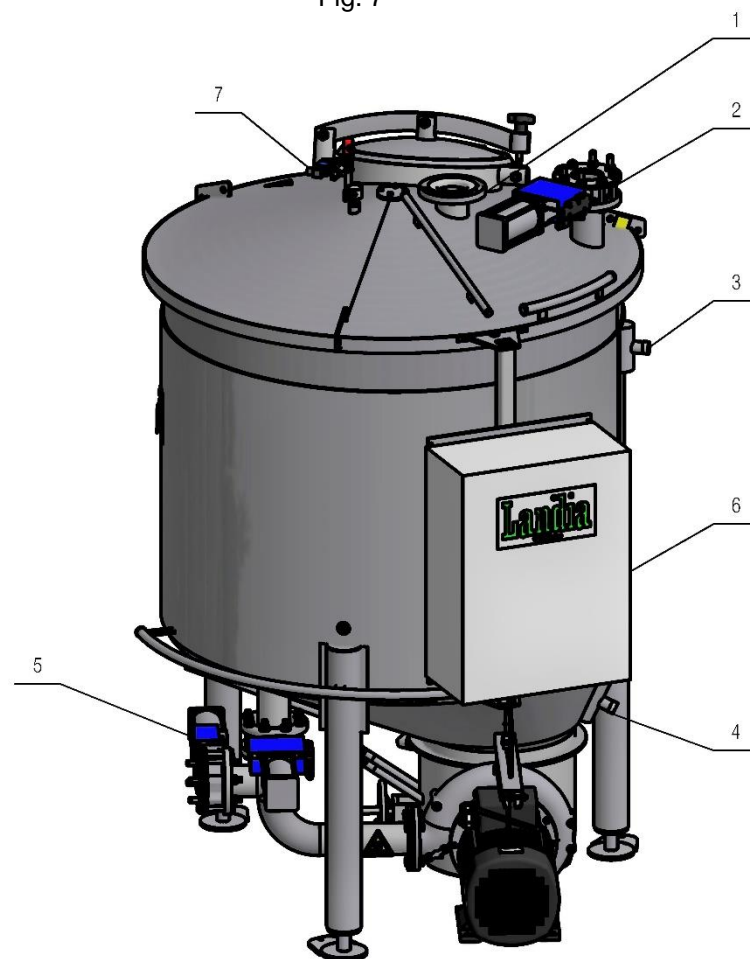


Various connections to the unit

Pipes connected to the tank must be non-flexible with an expansion joint towards the tank. It must be ensured that the vent pipe is not clogged by condensate.

1. DN 100 for ventilation
2. DN 100 for filling of medium
3. Hot water connection for heat jacket
4. Return flow from heating jacket
5. DN 100 for evacuation of unit
6. Power connection
7. ½" Connection of wash water for HHL sensor

Fig. 7



Power connection

Every unit has an electrical diagram that must be followed. The BioChop pump is equipped with a rating plate with technical motor data as shown below. It must be verified that the other electrical parts correspond to the motor data.

CE		VEM motors GmbH Thurm			
IM	IP	IF	3~Mot	kg	
50Hz	cos φ	60Hz	kW	V	
A		min ⁻¹		A	
50 Hz	V	/ A	
60 Hz	V	/ A	

IP:	Cage class
F:	Insulation class F
3~mot.nr.:	Serial no.
IM:	Type
Cos φ:	Power factor
Kg:	Weight of motor without pump
kW:	Max shaft power
V:	Connection voltage
A:	Nominal power consumption
min ⁻¹ :	Motor revolutions per minute
kW,V,A and min ⁻¹ for 50Hz and 60Hz, respectively	

The two bottom lines state tolerable voltage intervals at a power consumption at 50Hz and 60Hz, respectively.

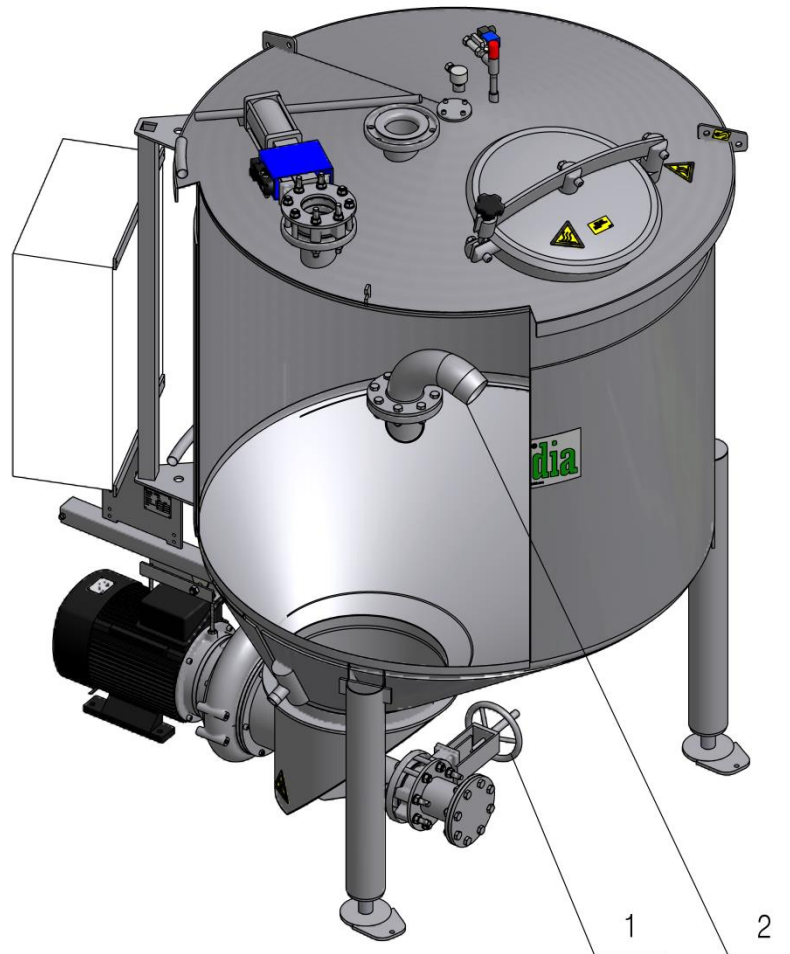
The rating plate states the motor's electrical data as well as the year of manufacture and the serial no. (3~Mot.nr.). With regard to maintenance of a specific unit please state serial no. when contacting Landia.

Mixing inside the unit

The unit is equipped with a mixing nozzle placed at the bottom of the tank. The direction of the mixing nozzle is a presetting from Landia A/S but it may be necessary to fine-adjust the nozzle depending of the medium.

1. Valve for manual evacuation of unit
2. Mixing nozzle

Fig. 8



Service and maintenance

To ensure the current regulations regarding hygienisation are followed, it is imperative that the complete hygienisation unit always is maintained in good condition.

Landia prescribes service checks twice a year. Depending on the number of operation hours and the composition of the material treated, it may be necessary to conduct service more often than twice a year.

The hygienisation unit must be inspected regularly. These inspections can be performed by the operating staff and must be conducted at the following intervals:

Daily inspection:

- Inspect for leaks at or around the tank
- Inspect for unusual noises or vibrations
- This can occur if the pump cavitates, which is a result of the pump's operational conditions

NB: If unusual noises or vibrations occur, stop the pump immediately and locate the cause

- Inspect that the vent pipe from the tank is not clogged
- If it is clogged, there is a risk that the tank implodes
- Read off the temperature on the HMI interface built on the front of the control cabinet
- If the temperature suddenly deviates from the norm, it may be necessary to calibrate
- Inspect that sediments do not develop on the inside of the tank
- Sediments can affect the heating time

Weekly inspections

- Inspect that the control cabinet is waterproof so that water cannot get into the electrical components
- Landia cannot guarantee that the operation can be maintained if the electrical components are exposed to water
- Inspect that valves completely open and close and that they are tight
- The system cannot fulfil the authorities' requirements on hygienisation of by-products if leaks through one or more valve occur.
- Inspect that the mixing nozzle in the tank is not clogged
- The mixing nozzle is an important part of the system's operation for correct mixing. See the paragraph on mixing functions.

Monthly inspections

- Inspect that the BioChop pump is not contaminated by sediments or the like that can prevent the cooling of the electrical motor. Inspect the fan jacket on the back of the electrical motor and clean it if necessary

Half-yearly inspection

- To be conducted by Landia or a company approved by Landia

IMPORTANT

In relation to the half-yearly inspection:

- The hygienisation tank must be emptied before the inspection can be started
- If it has not been emptied, additional costs for the waiting time must be expected
- The residue is emptied through the bottom valve. After that, the bottom valve must be secured with a blind flange.

Now the pump can be dismantled for inspection of the knife system, impeller, propeller etc.

For service and maintenance of the pump, please see the enclosed service instruction.

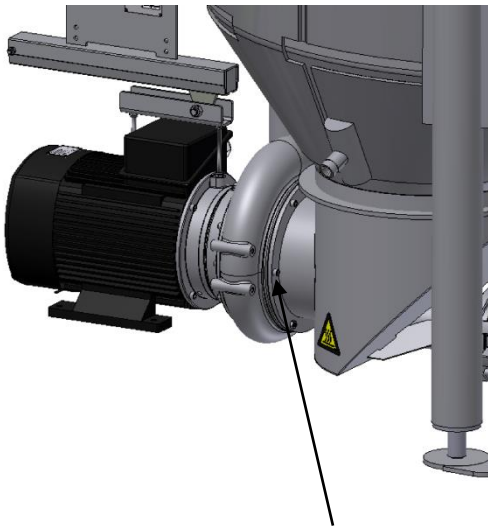
Warning

Before opening the inspection hatch on top of the tank it must be secured that the pump does not operate or may begin operating spontaneously, thus preventing possible scalds due to spatters from the heated product.

Regarding service and maintenance of the BioChop pump, we refer to the separate service manual for the pump.

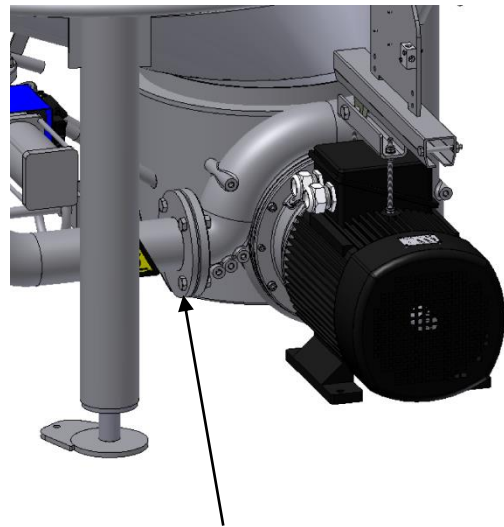
Dismantling the pump from the tank

Fig. 9



Unscrew the six screws from the flange towards the tank.

Fig. 10



Unscrew the four screws from the outlet flange.

Having removed the screws, the BioChop pump will be hanging in the rail for maintenance. Now it is possible to drag the pump back and service it. We refer to the service manual for the pump.

Translated from Danish

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Description of the System

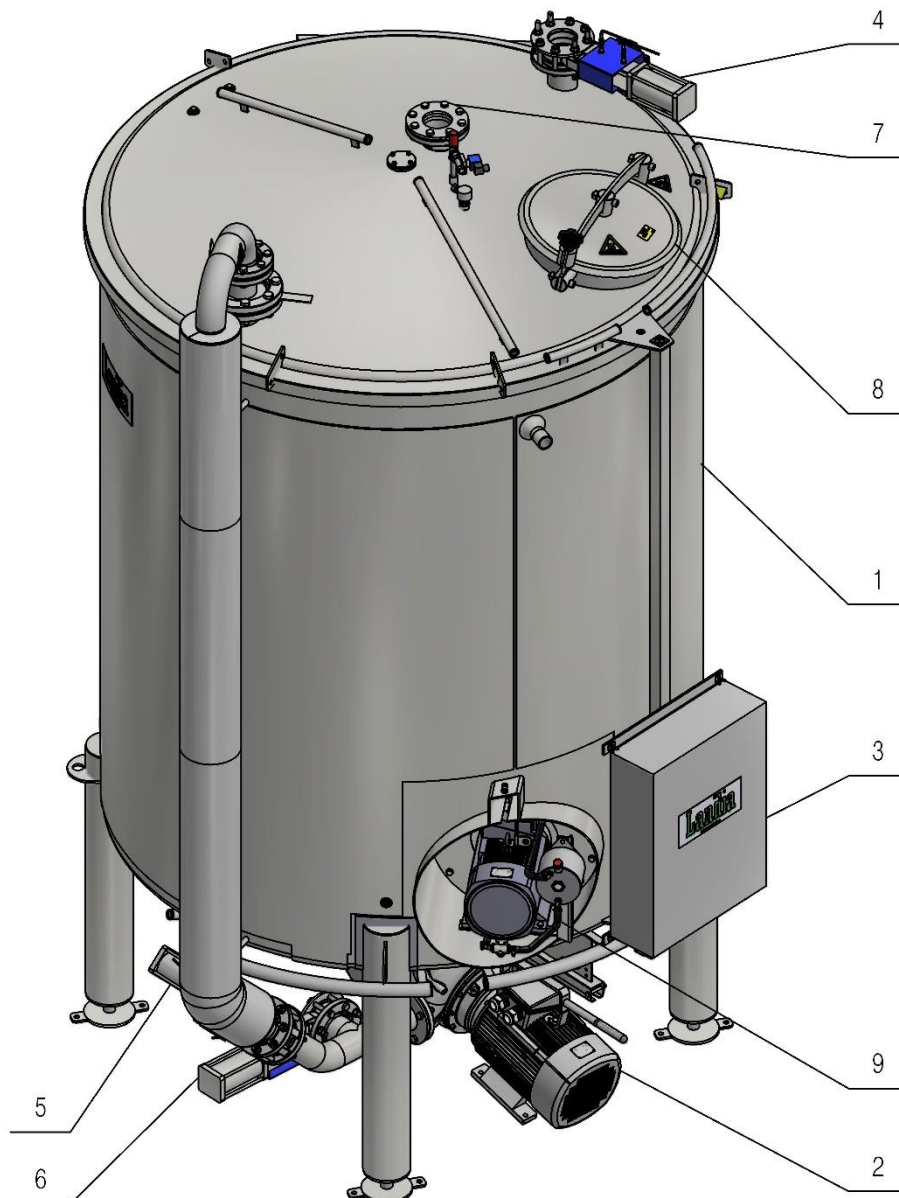
The Landia BioChop hygienisation unit is an automated system for monitored hygienisation of category 3 by-products at 70°C for one hour.

Since the useful tank volume is dependent on the liquid type and composition, the stated nominal batch volume of 5.0 or 8.0 m³ cannot be fully guaranteed. Please note that Landia may determine specific demands regarding both filling and emptying levels.

The main components of the system are:

1. Hygienisation tank equipped with heating jacket for heating by circulation of hot water. The tank is insulated.
2. BioChop-pump for mixing, chopping and emptying of the hygienisation tank
3. PLC-control for controlling, regulating and monitoring the hygienisation process
4. Inlet valve
5. Mixing valve
6. Outlet valve
7. Breather vent
8. Man hole cover
9. Mixer POPTR-I

Fig. 1



Process description

The dry-matter content of the liquid that is to be hygienised must not exceed 10% (dependent on the liquid composition). In case of questions relating to this, contact Landia.

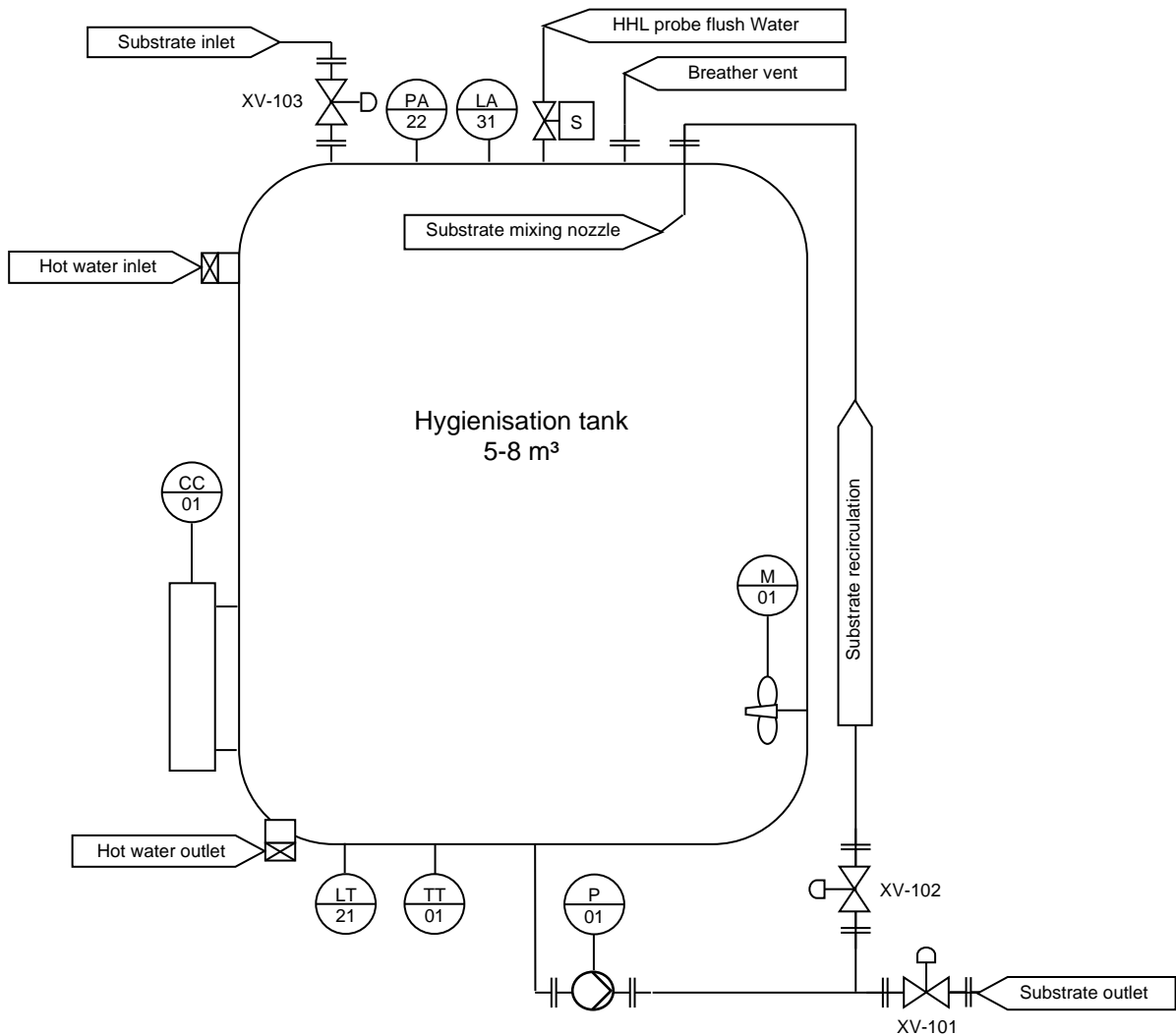
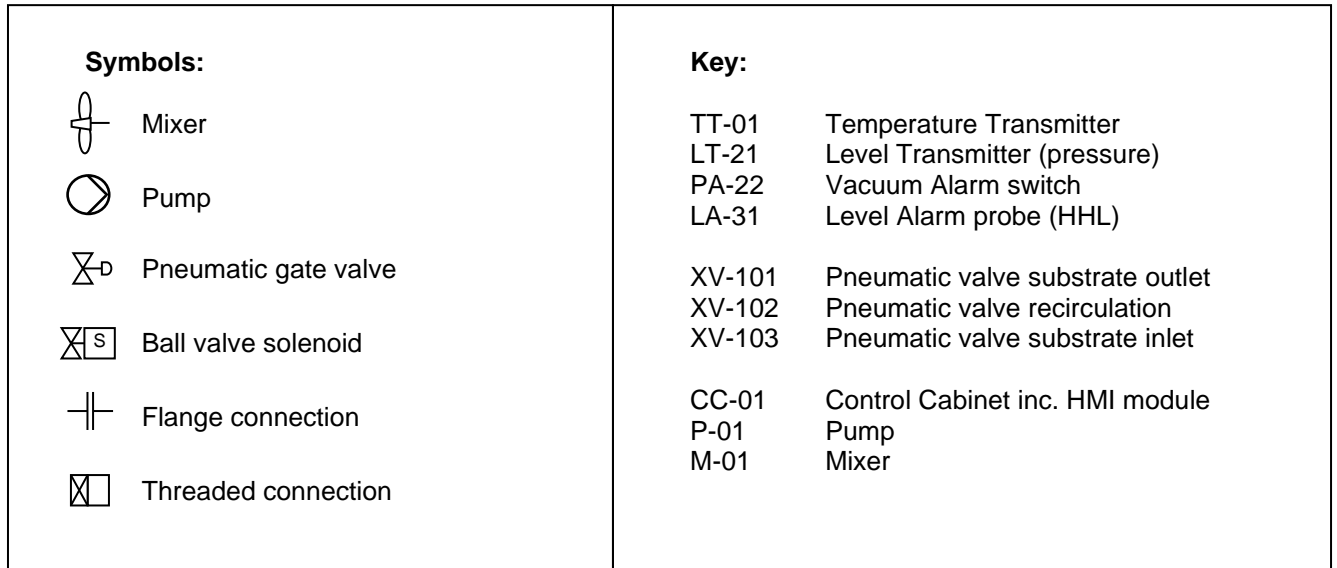
Liquid is added through the inlet valve until the pre-set level is reached. This level is set based on the expansion capacity in connection with the heating process. The inlet valve is closed and the BioChop pump and mixer start and remain in operation during the entire heating process. This is to ensure sufficient mixing, decrease potential incrustation on the inside of the tank wall and to increase the heat transfer from the heating jacket to the liquid. Some types of liquid are more prone to incrustation than others. Incrustations may form faster than usual when heating liquids containing slurry.

When the liquid temperature reaches 70°C, the inlet and outlet valves will lock for one hour and the mixer stops. The liquid temperature, the hygienisation time and the locked position of the valves is recorded by the data collector in the PLC control to document that the requirements for hygienisation have been abided by.

During the hour that the hygienisation is in progress, the BioChop pump runs in intervals.

After one hour of hygienisation at 70°C the liquid is pumped out through the outlet valve to a pre-set minimum level determined by Landia. The minimum level in the tank is set to ensure that the pump does cavitate during emptying. If the pump starts to make excessive noise or if vibrations occur during emptying, it is important to stop the pump and examine what causes the problem. Contact Landia for further examination of the problem. The requirement for the minimum level in the tank is closely related to the total head of the pump. The tank is automatically ready for a new batch when it has been emptied to the minimum level.

P- and I-diagram



Warning

Please note the following:

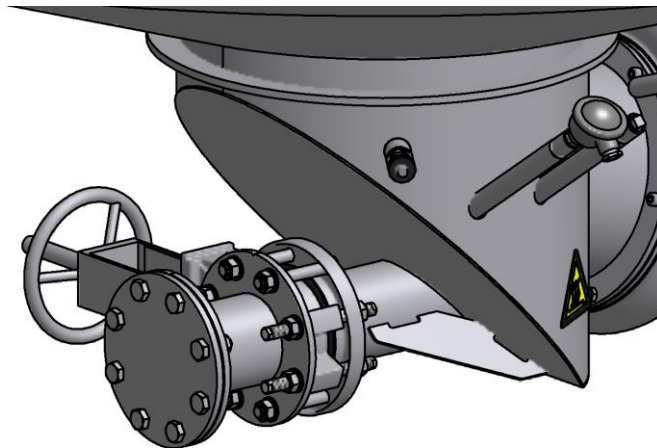
- Only a certified electrician is permitted to connect the power.
- There are live and moveable parts on the hygienisation system. These are securely encased, as per the Machinery Directive, but caution should be exercised.
- In connection with service and repair, the power connection **must** be disconnected at the safety switch and the switch must be securely locked out to prevent re-connection.

Fig. 3. Safety switch and emergency stop (red)



- For service/repair of hygienisation systems installed in areas with explosion dangerous/toxic fumes, refer to the national safety regulations, e.g. regarding toxic hydrogen sulphide.
- The hygienisation system must be placed on a level and stable surface.
Weight, full tank 5.0 m³ = 6,050 kg
Weight, full tank 8.0 m³ = 9,350 kg
- To avoid unintended emptying of the tank, the bottom valve must be closed and the discharge must be equipped with a blind flange.

Fig. 4. Discharge with blind flange



Warranty and Responsibility

To achieve correct function and operation of the hygienisation system, it is a prerequisite that the instructions in this operation instruction are complied with. For any warranty claims to be upheld, it is also a requirement that the instructions below have been adhered to.

In case Landia does not supply the PLC control, Landia assumes no responsibility for correct legal execution of the hygienisation process.

Inform Landia of any transport damages to the system immediately after receipt.

Landia disclaims all liability regarding errors and omissions in the hygienisation process that can be assigned to liquid and/or equipment not delivered or installed by Landia. Including descriptions in quotations, order confirmations and service instructions regarding the hygienisation process that have not been adhered to.

Receiving the System

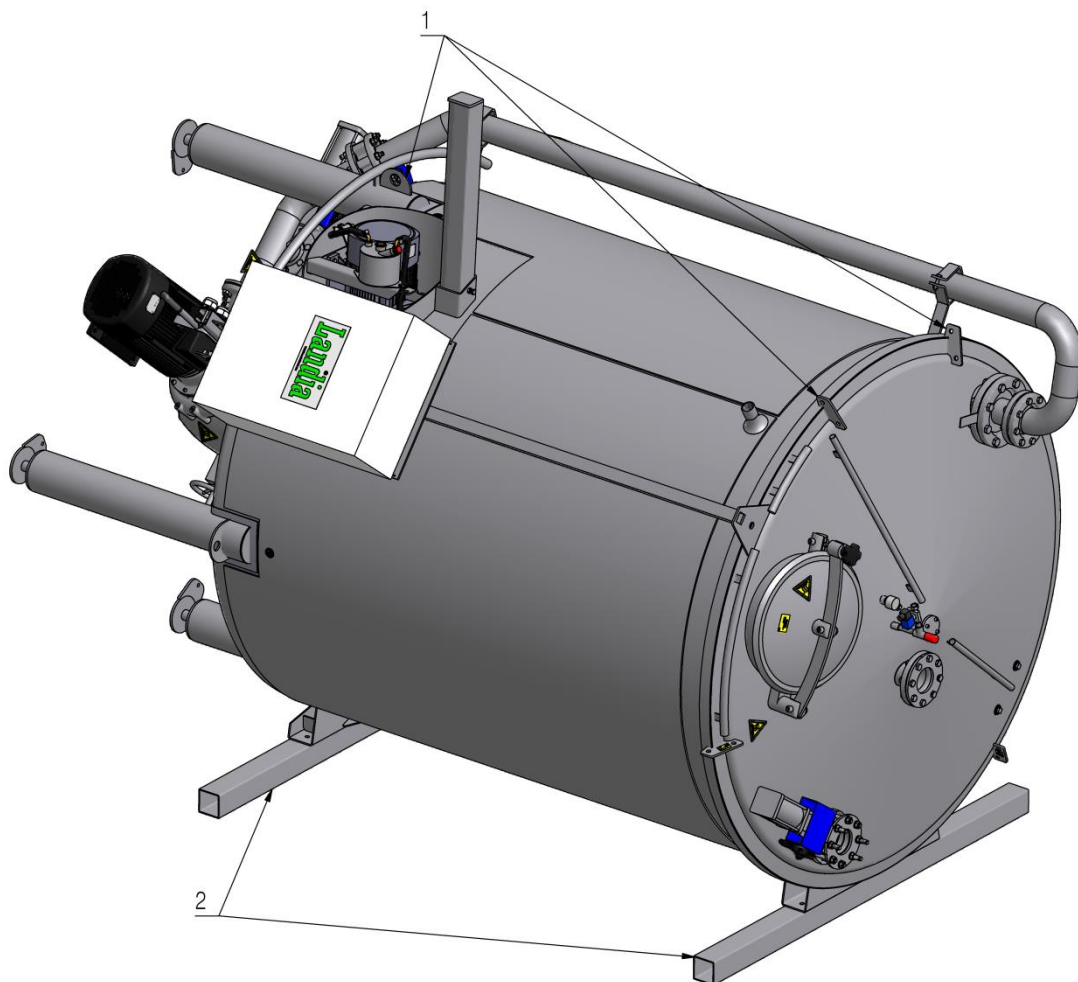
The system is received recumbent on two transport brackets, see fig. 6. Lift the system in a straight upward motion in the indicated lifting rings. The transport brackets can be removed when the system is suspended in the air. When raising the system, do not place strain on the legs until the system is fully suspended in the two lifting rings on top of the system. Carefully place the system on a stable surface. It is recommendable to use two lifting gear to raise the system.

It is the customer's responsibility to choose suitable lifting equipment and to ensure proper use of these.

Furthermore, it is the customer's responsibility to ensure safety in the handling of the system, both at reception and installation.

1. Lifting rings
2. Transport brackets

Fig. 6



Installing the System

The hygienisation tank must only be lifted in the four designated lifting brackets on the tank, see fig. 7, and only when it is empty.

For the sake of the hygienisation tank's output and reliability, it is the customer's responsibility to place the hygienisation tank frost-free and to ensure that the control cabinet and electrical components are not exposed to moisture/water.

The customer must also ensure that the tank is not installed in an environment where there may be an occurrence of corrosive gases that can cause breakdown of electrical components.

The motors are with ventilated frame and for the sake of their cooling capacity the tank cannot be installed in a room where the ambient temperature can exceed 40°C.

The base, on which the hygienisation tank is placed, must be level and stable. Once the hygienisation tank has been placed, fixate it to the base with the enclosed fixing brackets.

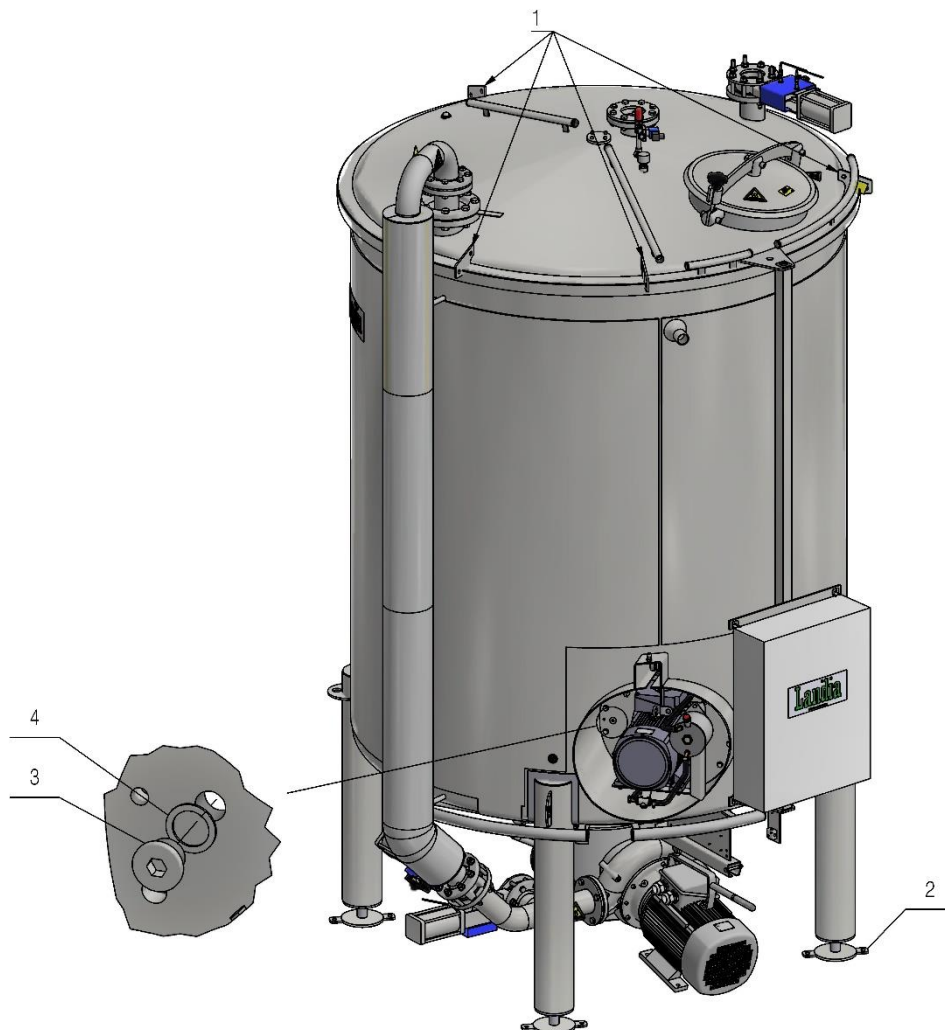
The mounting plate for the mixer on the side of the tank is equipped with an M20 threaded hole, which during transport acts as a drainage hole in the casing.

Before using the tank, install an M20 threaded plug and washer attached to the motor on the mixer in a bag together with an assembly instruction

The threaded plug must be tightened 180 Nm with a torque wrench.

1. Lifting brackets
2. Fixing bracket on each foot
3. Threaded plug
4. Washer

Fig. 7

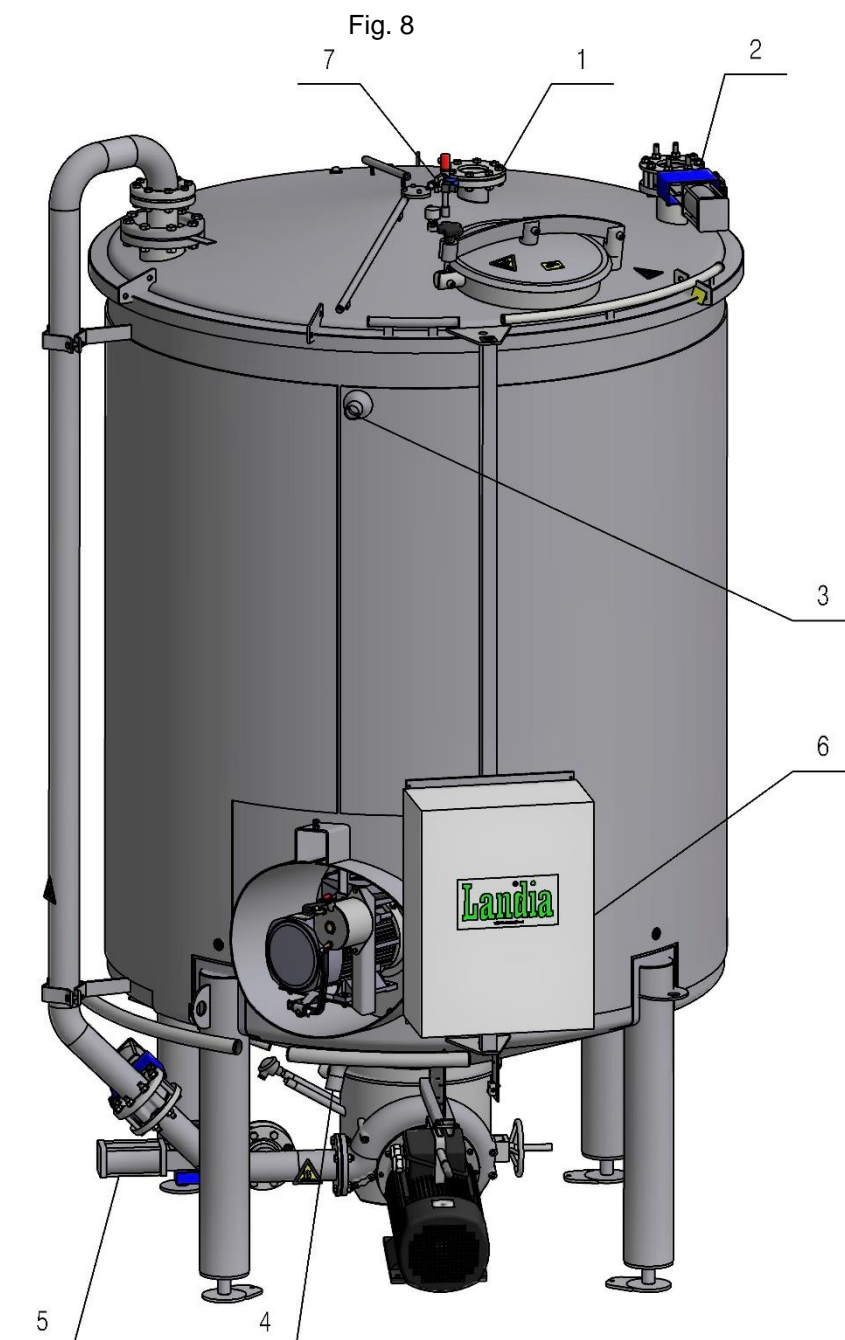


Various Connections to the System

Pipe connections that are attached to the tank must be made of non-flexible pipe with a rubber compensator towards the tank.

It must be ensured that condensate does not clog the breather pipe. It may be an advantage to run the breather pipe back to the reception tank.

1. DN 100, connection
2. DN 100, feeding liquid
3. 1½" connection of hot water to the heating jacket
4. 1½" return flow from the heating jacket
5. DN 100, emptying of the tank
6. Power connection
7. ½" Connection of wash water for HHL sensor



Connection

Every system has a power connection diagram that must be followed. A data plate, as shown below, is installed on the BioChop pump. It must be verified that the remaining electrical parts correspond to the motor data.

CE		VEM motors GmbH Thurm			
IP		F		3~Mot	
IM	cos φ	kW		kg	
50 Hz	V	60 Hz	V		
A		min ⁻¹		A	
50 Hz	...	/	...	V	/
60 Hz	...	/	...	V	/

IP:	Cage class
F:	Insulation class F
3~mot.nr.:	Serial no.
IM:	Type
cos φ:	Power factor
kg:	Weight of motor without pump
kW:	Max. Shaft power
V:	Connection voltage
A:	Nominal power consumption
min ⁻¹ :	Motor revolutions per minute
kW, V, A og min ⁻¹ for 50Hz og 60Hz respectively	
The two bottom lines state tolerable voltage intervals with associated power consumption for 50Hz and 60Hz respectively.	

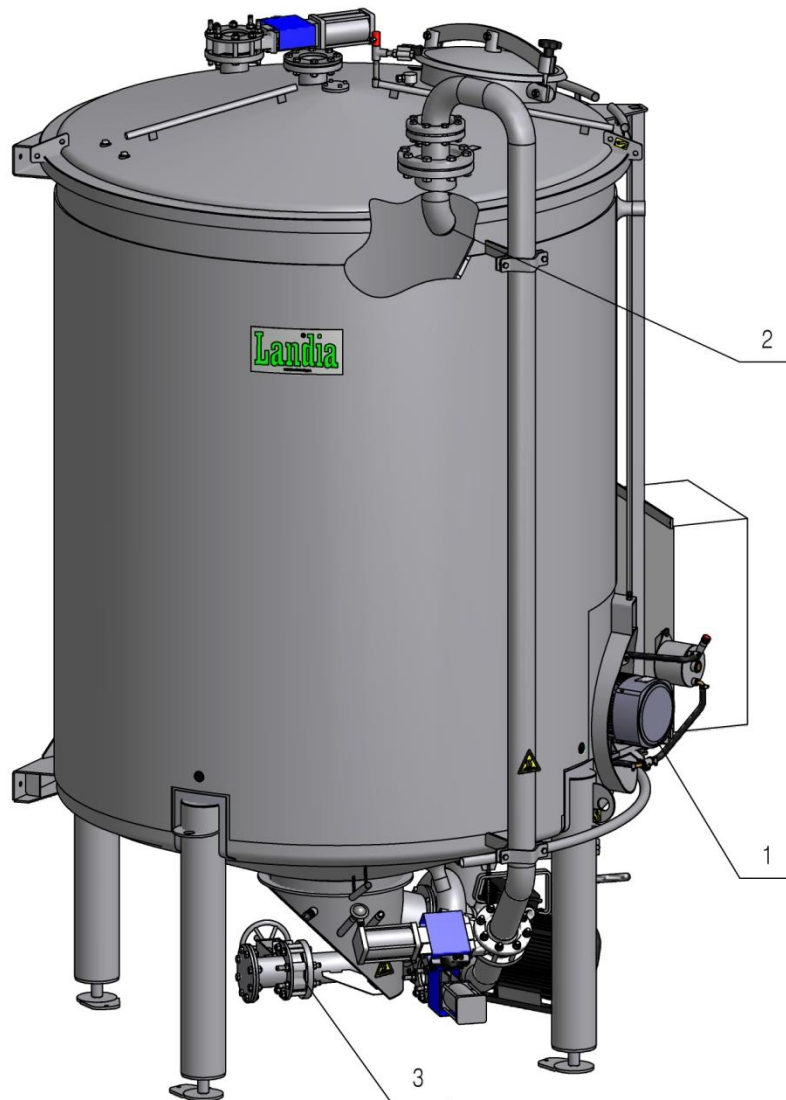
The data plate indicates the motor's electrical data as well as the year of manufacture and the serial no. (3~mot. no.). Please inform the serial no. when contacting Landia regarding maintenance of a specific unit.

Mixing Function in the Tank

The primary horizontal mixing and flow in the liquid takes place by means of the side-entry mixer installed in the tank. In addition to this, the system is equipped with a top mounted mixing nozzle, fed by the BioChop pump. The direction of the mixing nozzle is pre-set by Landia and constitutes the primary vertical mixing. These two mixing functions combined, ensure that the liquid is homogeneously mixed at all times. This entails better chopping and heating, thus resulting in decreased batch time.

1. Mixer POPTR-I
2. Mixing nozzle
3. Valve for manual emptying of the tank

Fig. 9



Service and Maintenance of the System

To ensure that the regulations applying to hygienisation are complied with, it is imperative that the complete hygienisation system is always in good service condition.

Landia prescribes service every six months. Dependent on operational hours and the composition of the processed liquid, certain conditions may entail the necessity of service more frequently.

The hygienisation system must be serviced regularly. These services can be conducted by the operating staff and must be conducted in the following intervals:

Daily Service:

- Inspect the tank for leaks.
- Check for abnormal noises or vibrations.
This may occur if the pump cavitates as a result of the pump's operational conditions.

NB: If abnormal noise or vibrations occur, stop the pump and mixer until the cause has been located.

- Inspect that the breather from the tank is not clogged.
If it is clogged, the tank may implode.
- Read off the temperature on the HMI-interface installed on the front of the control cabinet.
If the temperature suddenly deviates from the norm, there may be a need for calibration.
- Inspect the inside of the tank for incrustations.
Incrustations may affect the heating time.

Weekly Service:

- Check that the inside of the control panel cabinet is completely dry. Water must not get into the electrical components.
Landia does not guarantee that correct operation can be maintained if the electrical components are exposed to water.
- Inspect that valves open and close completely, and that they are not leaking.
The system cannot meet the regulatory requirements regarding hygienisation and by-products if leakages occur through one or more valves.
- Inspect that the mixing nozzle in the tank is not clogged.
The mixing nozzle is an important part of the system's operation for proper mixing. See the paragraph on mixing functions.

Monthly Service:

- Check that the BioChop pump/mixer is free of incrustations or other objects that can obstruct the cooling of the electrical motor. Inspect the fan cover at the back of the electrical motor and clean it if needed.

Six Month Service:

- To be conducted by Landia or a company approved by Landia.

IMPOTANT

In connection with the six month service:

- The service of the hygienisation tank cannot begin until the tank has been emptied.
If the tank is not empty, extra costs for lost time must be expected.
- Empty the residue through the bottom valve. Subsequently, the bottom valve must be secured with the blind flange.

Following the above procedures, the pump/mixer can be removed for service of the knife system, impeller, propeller etc.

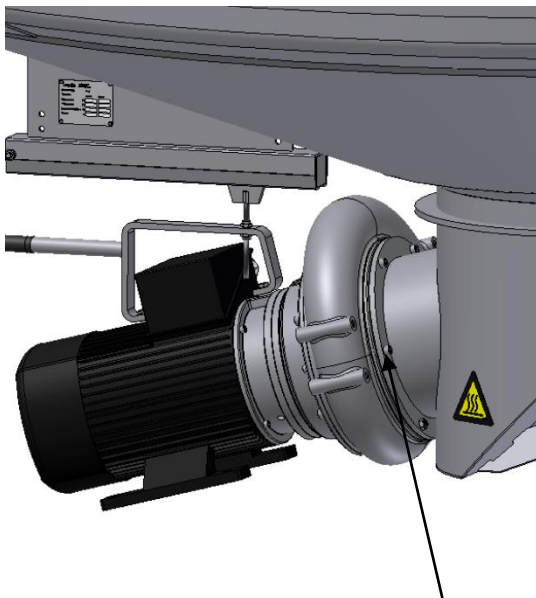
For service and maintenance of the pump and mixer, refer to the enclosed service instructions.

Warning

In connection with service that requires opening the inspection hatch, it is imperative to ensure that both the pump and mixer have been stopped and secured from reconnecting, due to the danger of scalding from splashes of hot liquid.

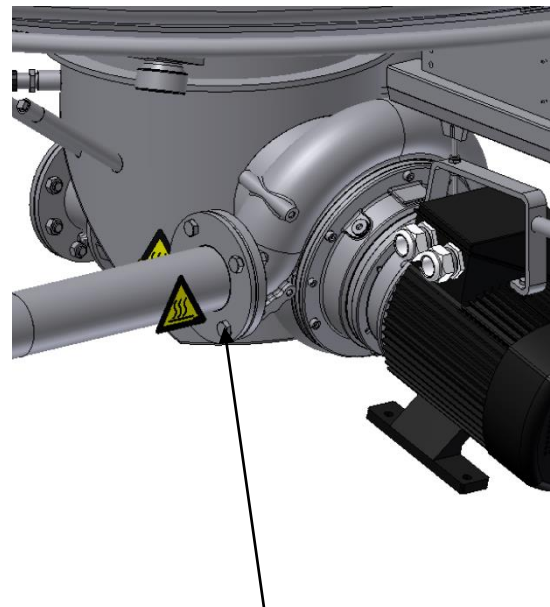
Removing the Pump from the Tank

Fig. 10



Remove the six screws in the flange between the pump and the tank

Fig. 11



Remove the four screws in the outlet flange

After removing the screws, the BioChop pump hangs in the service rail. Now, the pump can be pulled back, disassembled from the service rail and placed on a stable surface where service can be performed. Never service the pump when it is hanging in the service rail.

When service has been completed, the pump can be re-installed as per fig. 10 and 11.

Dismantling the Mixer

Refer to document "Crane System POPTR-I".