IOM manual

tapflo®

CTX High Performance Centrifugal Pumps

Original instruction
2021 | 1

STOP

Read this instruction manual carefully, before you install and operate the pump.

CE

CTX I	CTX H
CTX I 40-165	CTX H 40-165
CTX I 50-145	CTX H 50-145
CTX I 50-200	CTX H 50-200
CTX I 65-175	CTX H 65-175
CTX I 65-230	CTX H 65-230
CTX I 65-240	CTX H 65-240
CTX I 80-205	CTX H 80-205
CTX I 80-212	CTX H 80-212
CTX I 80-260	CTX H 80-260
CTX I 100-230	CTX H 100-230

All about your flow

www.tapflo.com

CONTENTS

CONTENTS

EC DECLARATION OF CONFORMITY 01/EC/CTX/2020

Series:
CTX...

Serial numbers:
From 2001 - ...

Manufactured by:
Tapflo AB
Filaregatan 4
442 34 Kungälv, Sweden

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of declaration: **SINGLE STAGE CENTRIFUGAL PUMPS**

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

- Directive 2006/42/EC of European Parliament and of the Council of 17 May 2006 on machinery, amending Directive 95/16/EC;
- Directive 2014/35/UE of the European Parliament and of the Council of 14 February 2014 on harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

Mr Michał Śmigiel is authorized to compile the technical file.
Tapflo Sp. z o.o.
ul. Czatkowska 4b
83-110 Tczew

Signed for and on behalf of Tapflo AB:

Håkan Ekstrand
Managing director
Tapflo AB, 02.02.2020

0. GENERAL

0.1. Introduction

The CTX pumps are open impeller single stage centrifugal pumps. They are manufactured in high finish and mechanical strong material stainless steel AISI 304/316L. The pump range meets the demands from a variety of today's industries.
The industrial series CTX I is designed with sand blasted pump casing. A variety of connection types, mechanical seal options and other executions are available to satisfy most type of industrial duties.
The hygienic series CTX H is supplied with electro polished internals. This series is specially dedicated for hygienic duties in food, beverage and pharmaceutical industries, where clean- and drain-ability are important factors.

With proper attention to maintenance, CTX pumps will give efficient and trouble free operation. This instruction manual will familiarise operators with detailed information about installing, operating and maintaining the pump.

0.2. Warning symbols

The following warning symbols are present in this instruction manual. This is what they say:

This symbol stands next to all safety instructions in this instruction manual where danger to life and limb may occur. Observe these instructions and proceed with utmost caution in these situations. Inform also other users of all safety instructions. In addition to the instructions in this instruction manual, the general safety and accident prevention regulations must be observed.

This signal stands at points in this instruction manual of particular importance for compliance with regulations and directives, for correct work flow and for the prevention of damage to and destruction of the pump.

This symbol signals possible danger caused by the presence of electric fields or live wires.

0.3. Qualification and training of personnel

The personnel in charge of installation, operation and maintenance of the pumps we produce must be qualified to carry out the operations described in this manual. Tapflo shall not be held responsible for the training level of personnel and for the fact that they are not fully aware of the contents of this manual.

1. INSTALLATION

1. INSTALLATION

1.1. Operation principle

In order to operate the pump, the casing has to be filled with liquid before start-up. The liquid enters the pump casing axially to the shaft. The rotating impeller generates a centrifugal force accelerating the liquid through the pump casing and into the discharge piping.

1.2. Receiving inspection

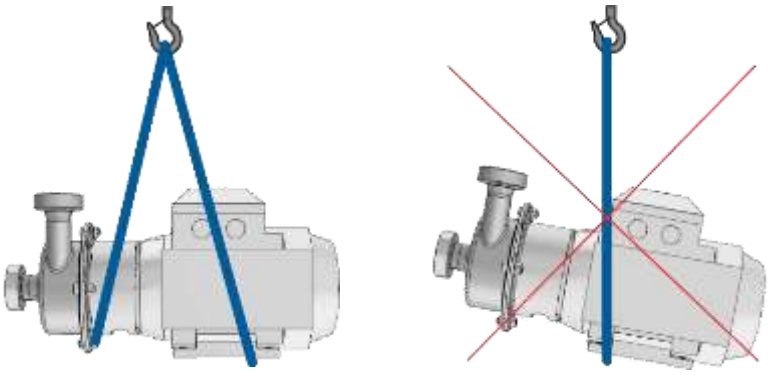
Although precaution is taken by us when packing and shipping, we urge you to carefully check the shipment on receipt. Make sure that all parts and accessories listed on the packing list are accounted for. Immediately report any damage or shortage to the transport company and to us.

1.3. Lifting and transportation

Before handling the pump check the weight of the pump (see chapter 6. Data). Refer to Your local standards on how to handle the pump. If the weight is excessive to transport by hand it must be lifted using slings and a suitable lifting device e.g. a crane or forklift.

Always use at least two slings and make sure they are secured in such a way to prevent the pump from slipping and that the pump unit is hanging straight.

Never lift the pump with only one sling. Incorrect lifting can cause serious injury and/or damage to the pump.



Never lift the pump under pressure.

Be careful that nobody passes under the pump when lifted.

Never try to lift the pump by the connections or hoses attached to the pump.

1. INSTALLATION

1.4. Storage

If the equipment is to be stored prior to installation, place it in a clean location. Do not remove the protective covers from the suction and discharge which have been fastened to keep pump internals free of debris. Clean the pump thoroughly before installation.
When in storage, turn the shaft by hand at least once per month. The pump-motor unit should always be stored indoor in dry, vibration and dust free conditions.

1.5. Foundation

The pump-motor unit must stand on and be fixed to a sufficiently rigid structure that can support the entire perimeter on which the unit stands. The foundation on a firm bottom is the most satisfactory. Once the pump is in position, adjust level with metal shims between the feet and the surface on which it stands. Check that the feet of the pump motor unit stand well on each of them. The surface on which the foundation stands must be flat and horizontal. If the unit is fitted on a steel structure, make sure that it is supported so that the feet do not warp. In any case, it is advisable to fit some anti-vibration rubber pieces between the pump and the brickwork. The motor needs an additional stand as its level is higher than that of the pump casing. As an option the pump can be ordered with feet for the motor. For close-coupled type, pump motor alignment is not required.

1.6. Environment

- There should be enough space in the vicinity of the pump in order to operate, maintain and repair it.
- The area in which the pump is operated, must be sufficiently ventilated. Excessive temperature, humidity or dirt may affect the pump operation.
- Behind the cooling fan of the motor there must be sufficient room for the hot air to escape the motor.

1.7. Suction and discharge piping

A pump is generally part of a piping system that can include a number of components such as valves, fittings, filters, expansion joints, instruments, etc. The way the piping is arranged and the positioning of the components has a great influence on the operation and the lifetime of the pump. The pump cannot be used as a support for the components connected to it.

The flow of liquid from the pump must be as even as possible. It is advisable to avoid any tight bends or drastic reductions of diameters that may cause flow resistance in the installation. In case of diameter reduction, it is advisable to use appropriate conical reductions (possibly eccentric on suction side and concentric on discharge side) at changes of diameter and at a minimum distance from pump connections of five diameters of the pipeline.

1.7.1. Connection of discharge pipe

A check-valve and a shut-off/regulation valve are normally fitted on the discharge side.
The check-valve protects the pump from any backflow. The shut-off/regulation valve cuts off the pump from the line and adjusts the output. Never adjust flow rate using the valve on the suction pipe.

1. INSTALLATION

1.7.2. Connection of suction pipe

The suction piping is very important for the correct operation of the pump assembly. It must be as short and as direct as possible. If a longer suction line is unavoidable, the diameter should be large enough, i.e. at least as the inlet connection on the pump, to ensure less flow resistance. In any case, suction must be carried out properly avoiding any air locks.

The CTX pumps are single-stage centrifugal pumps, thus not self-priming. It will therefore always be necessary to install a bottom valve in all cases when the static height of the liquid is lower than the suction height of the pump. It is also crucial that the whole suction line is filled with liquid prior to starting the pump. The suction piping must be air tight. Critical points in these terms are also the seals between flanges and the seals of the valve stems. Even some small air let into the suction line cause serious operating problems that can make the pump stop. It is recommended to use check-valve in the suction line to avoid siphoning when the pump stops.

1.8. Health and safety

The pump must be installed according to local and national safety rules.

The pumps are constructed for particular applications. Do not use the pump on applications different from that for which it was sold without consulting us to ascertain its suitability.

1.8.1. Protection

In the interest of health and safety it is essential to wear protective clothing and safety goggles when operating, and/or working in the vicinity of Tapflo pumps.

1. INSTALLATION

1.8.2. Electrical safety

Do not carry out any maintenance or/and operation on the pump while it is running or before it has been disconnected from the power supply. Avoid any danger caused by electric power (for details see current regulations in force). Check that electrical specifications on the data plate are equivalent to the power supply to which it will be connected.

1.8.3. Chemical hazard

Whenever the pump is to be used for pumping a different liquid, it is essential to clean the pump beforehand in order to avoid any possible reaction between the two products.

1.8.4. Dry running

Do not start nor carry out running tests before filling the pump with liquid. Always avoid dry operation of the pump. Start the pump when it is completely filled and with the valve on the discharge side almost completely closed.

1.8.5. Noise level

CTX pumps, including the motor, in normal operating conditions produce a sound level below 80 dB(A). The major sources of noise are: liquid turbulence in the installation, cavitation or any other abnormal operation that is independent from the pump construction nor the pump manufacturer. The user must provide suitable protective means if the sources of noise could produce a harmful noise level for operators and for the environment (in compliance with current local regulations).

1.8.6. Temperature hazards

Raised temperature can cause damage on the pump and/or piping and may also be hazardous for personnel in the vicinity of the pump/piping. The hot or cold parts of the machine must be protected to avoid accidental contacts.

1.8.7. Rotating parts

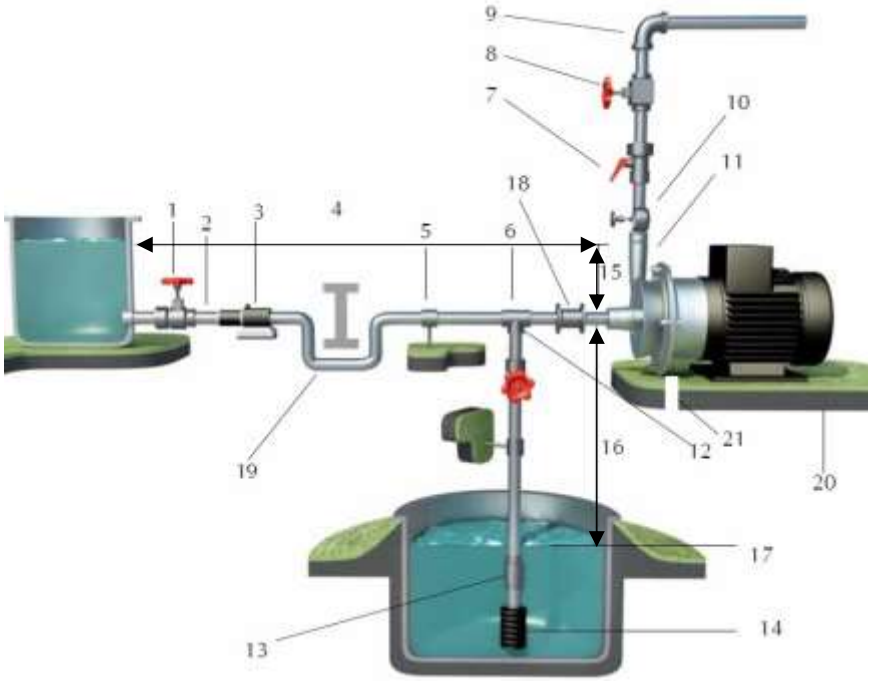
Do not tamper with the protection of the rotating parts, do not touch or approach rotating parts in movement.

1.8.8. Cleaning and disinfection

Cleaning and disinfection of the pump system is of greatest importance when the pump is used in a food process installation. Use of a pump system that is NOT cleaned or disinfected can cause contamination of the product.

1. INSTALLATION

1.9. Example of installation



1) YES: Gate valve (may also be near pump in case of long piping)
2) With positive head: tilt of piping towards pump
3) YES: line strainer if particles are present
4) NO: air pockets – the circuit must be short and straight
5) YES: pipe fastening
6) Suction line as short and direct as possible
7) YES: attachment for gauge or safety pressure switch
8) YES: adjusting gate valve on outlet
9) Bends placed after valves and instruments not closer to the pump inlet than five times the piping diameter
10) YES: attachment for gauge or safety pressure switch
11) NO: elbow joints (and other parts) on the pump (discharge and suction lines)
12) With negative suction lift: tilt of piping towards suction tank
13) YES: check valve (with negative suction lift)
14) YES: strainer if particles are present
15) Suction head varies according to flow in order to prevent windage
16) Suction head
17) Immersion depth
18) YES: expansion joint (indispensable with long pipes or hot liquids) and/or anti-vibration facility during discharge and suction; anchored near to pump
19) YES: overcoming obstacles at lower depths
20) Fix the pump by the fixing holes provided: the supports must be level
21) YES: drainage channel around base

1.10. Instruments

In order to ensure a proper control of the performance and the conditions of the installed pump, we recommend using the following instruments:
- a pressure-vacuum gauge on the suction piping;
- a pressure gauge on the discharge piping.

1. INSTALLATION

The pressure intakes must be made of straight pieces of piping at a distance of minimum five diameters from the pump inlets. The pressure gauge on discharge must always be fitted between the pump and the shut-off / regulation valve. The output can be read on the pressure gauge, transformed into meters and then compared with the typical curves.

1.10.1. Electric power

The electric power absorbed by the motor can be measured by means of a wattmeter or an amp gauge.

1.10.2. Optional instruments

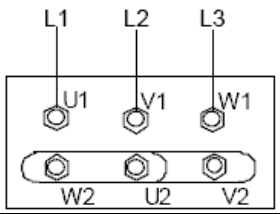
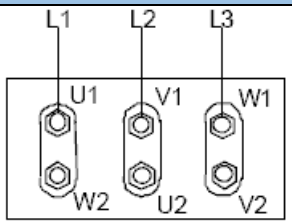
The optional instruments can indicate if pump is working in an abnormal way. The abnormal conditions can be caused by: accidentally closed valves, lack of pumped liquid, overloads, etc.

1.10.3. Thermometer

If the temperature of the pumped liquid is a critical parameter, provide the installation with a thermometer (preferably on the suction side).

1.11. Motor connection

An expert electrician must always carry out the electrical connection. Compare the power supply with the data plate specifications and then choose a suitable connection. The type of connection is stated on the motor data plate and can be Y (star) or D (Delta), according to the power supply of the motor (see figure below).

STAR	DELTA
	
	

Follow the connection standard used in the plant. In no case connect the electrical motor directly to supply network but use a suitable electric switchboard equipped with a knife switch and suitable safety devices (e.g. motor breaker switches) in the power circuit. Safety devices against overloads must also protect the motors. Make sure that the motor has suitable grounding and that it has been connected properly.

1. INSTALLATION

1.12. Motor standard

As a standard Tapflo CTX pump are equipped with motors of the following parameters:

- International Mounting Arrangement – **B35**
- Number of poles / Rotation speed [rpm] – **2**
- **Non ATEX**
- Protection grade – **IP55**
- Voltage – **3 phase**
- **PTC protection**

Motor power	IEC size	RPM	Voltage	Frequency
1.5 kW	90S	2920	Δ230 / Y400	50 Hz
		3500	Δ280 / Y480	60 Hz
2.2 kW	90L	2920	Δ230 / Y400	50 Hz
		3500	Δ280 / Y480	60 Hz
3.0 kW	100L	2910	Δ230 / Y400	50 Hz
		3500	Δ280 / Y480	60 Hz
4.0 kW	112M	2910	Δ400 / Y690	50 Hz
		3500	Δ480 / Y830	60 Hz
5.5 kW	132S	2930	Δ400 / Y690	50 Hz
		3500	Δ480 / Y830	60 Hz
7.5 kW	132S	2930	Δ400 / Y690	50 Hz
		3520	Δ480 / Y830	60 Hz
11 kW	160M	2950	Δ400 / Y690	50 Hz
		3540	Δ480 / Y830	60 Hz
15 kW	160M	2950	Δ400 / Y690	50 Hz
		3550	Δ480 / Y830	60 Hz
18.5 kW	160L	2960	Δ400 / Y690	50 Hz
		3550	Δ480 / Y830	60 Hz
22 kW	180M	2960	Δ400 / Y690	50 Hz
		3550	Δ480 / Y830	60 Hz
30 kW	200L	2970	Δ400 / Y690	50 Hz
		3550	Δ480 / Y830	60 Hz
37 kW	200L	2970	Δ400 / Y690	50 Hz
		3560	Δ480 / Y830	60 Hz
45 kW	225M	2970	Δ400 / Y690	50 Hz
		3580	Δ480 / Y830	60 Hz

2. OPERATION

2.1. Start-up

- Check manually that the motor is free to turn, moving the motor cooling fan.
- Make sure that the piping is not clogged and is free from residues or foreign objects. Make sure that the liquid flows regularly into the pump.

- The pump and piping connected to it, at least the suction pipe, must be full of liquid. Any air or gas must be carefully released. In case of suction with negative head, fill the suction piping and check how the bottom valve works. It must guarantee that the liquid must not flow back, therefore emptying the suction pipe with consequent disconnection of the pump.
- The suction shut-off valve (if any) must be completely open.
- The shut-off / regulation valve on the discharge side must be 75% closed.

- The motor must turn in the same direction as the arrow shown on the pump. The direction of rotation is always clockwise looking at the pump from the motor side; check by starting briefly, then looking at the direction of rotation of the motor fan through the fan lid. If it is wrong, the motor must be stopped immediately. Change the connection to the terminals of the electric motor (chapter *1.11 "Motor connection"*) and repeat the procedure described above.

- Any auxiliary connections must all be connected.

2.1.1. Starting the pump

The CTX pump must be started with almost closed discharge valve. Start the electric motor and open the discharge shut-off / regulation valve gradually until the desired output has been reached. The pump must not run more than two or three minutes with closed discharge. Longer operation in these conditions can seriously damage the pump.

If the pressure shown on the pressure gauge on the discharge piping does not increase, turn off the pump immediately and release pressure carefully. Repeat the connection procedure.

If there are changes of flow rate, head, density, temperature or viscosity of the liquid, stop the pump and get in touch with our technical service.

2.1.2. Restarting after power shut-off

In case of accidental stopping, make sure that the non-return valve has prevented backflow and check that the motor cooling fan has stopped. Start the pump again following the instructions of chapter 2.1.1 "Starting the pump".

If the pump intakes from a lower level than it is positioned, it can un-prime during the standstill and therefore you must check again before starting that the pump and the suction piping are full of liquid.

2. OPERATION

2.2. Stopping the pump

It is advisable to close the discharge shut-off / regulation valve gradually and stop the motor immediately after. The reverse sequence is not recommendable, especially with larger pumps or longer delivery piping. That is to avoid any problems due to water hammering. If a suction shutoff valve has been installed, it is advisable to close it completely after pump is fully stopped.

2.3. Cleaning and disinfection

Cleaning and disinfection of the pump system is of greatest importance when the pump is used in a food processing installation. Use of a pump system that is NOT cleaned or disinfected can cause contamination of the product. The cleaning cycles as well as chemicals to use for the cleaning vary depending on the pumped product and the process. The user is responsible to establish a suitable cleaning and / or disinfection program according to local and public health and safety regulations.

2.3.1. Cleaning procedure

The pump may be cleaned in two different ways:

CIP (Cleaning In Place)

without dismantling the pump, using steam, water or cleaning chemicals. Follow these safety instructions during the CIP procedure:

- Make sure that all cleaning line connections are properly tightened to avoid splashing of hot water or cleaning chemicals.
- When using an automatic process, a safety device should be installed to avoid unintentional automatic start-up of the pump.
- Before any disassembly of the pump, fittings or pipes, make sure that the cleaning cycle is finished.

Manual cleaning

by simply dismantling the pump casing, impeller and mechanical seal. Always follow these safety instructions:

- Switch off the electric power to the motor and disconnect the motor starting system if installed.
- The cleaning personnel shall wear suitable protective clothing, footwear and goggles.
- Use a suitable non-toxic and non-flammable cleaning solution.
- Always keep the area around the pump clean and dry.
- Never clean the pump by hand with pump running.

2. OPERATION

2.4. Residual risks

Even with proper application and observance of all points listed in this operating manual, there is still an estimable and unexpected residual risk when using the pumps. It may leak, fail due to wear, application-related causes or system-related circumstances.

2.5. Disposal after expiration of the expected lifetime

The metallic components like stainless steel can be recycled. Plastic parts are not recyclable and must be disposed of as residual waste. The pump must be disposed of properly, according to local regulations. It should be noted that potentially dangerous fluid residues may remain in the pump and can create a hazard to the operator or the environment, therefore the pump has to thoroughly cleaned before disposal.

2.6. Waste of electrical and electronic equipment (WEEE) directive

Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labelled in accordance with European Directive 2002/96/EC. Contact your local waste recovery agency for a designated collection facility in your area.

2.7. Actions in emergency

In the event of a leak during fluid transfer, the air supply have to be closed and the pressure released. During spillage of an aggressive liquid, local and national safety rules must be followed.

3. MAINTENANCE

3. MAINTENANCE

Maintenance work on electrical installations must be performed by qualified personnel and only when the power supply has been shut off. Follow the local and national safety regulations.

3.1. Inspections

- Periodically check suction and discharge pressures.
- Inspect the motor according to the instructions from the motor manufacturer.
- In general, a mechanical seal does not require maintenance, but the pump should never run when empty (dry). If a leakage occurs, replace the mechanical seal.
- Establish a preventive maintenance schedule based on the pump's service history.

3.2. Location of faults

Overheating of motor	Insufficient flow rate or pressure in pump	No pressure on the discharge	Irregular discharge flow / pressure	Noise and vibrations	The pump gets clogged	Overheating of the pump	Abnormal wear	Leak in mechanical seal	Possible reason	Solution
	X		X						Wrong direction of rotation	Invert the direction of rotation
	X	X	X	X					Insufficient suction head (NPSH)	Increase available NPSH: ➢ Raise the suction reservoir ➢ Lower the pump ➢ Increase the pressure in the suction tank ➢ Reduce the vapour pressure ➢ Increase the diameter of the suction pipe ➢ Make suction pipe short and direct
		X							Pump is clogged	Clean the pump
	X		X	X			X		Cavitation	Increase suction pressure
	X		X	X			X		The pump sucks air	Make sure all connections are tight
		X	X	X					Suction pipe is blocked	Check pipes / valves and filters on the suction line
	X			X					Discharge pressure too high	Reduce the head by increasing pipe diameter and/or reduce number of valves and bends
X				X		X			Flow rate too high	Reduce the flow: ➢ Partially close the discharge valve ➢ Reduce the impeller diameter (contact us) ➢ Reduce the rotation speed
	X			X	X	X	X		Liquid temperature too high	Cool the liquid
								X	Broken or worn mechanical seal	Replace the seal
								X	Wrong material of O-rings for the liquid	Mount O-rings in other material (contact us)
X				X	X	X			The impeller scratches	Reduce the temperature and / or suction pressure. Adjust clearance between housing and impeller
				X			X		Loads on the pipes	Connect the pipes independent of the pump
				X	X	X	X		Foreign objects in the liquid	Use a filter on the suction side
								X	Spring tension too low on mechanical seal	Adjust as mentioned in this manual
		X							Shut-off valve closed on suction side	Check and open the valve
	X								Discharge pressure too low	Increase the pressure – install an impeller with a bigger diameter (contact us)
					X	X			Pump is not filled with liquid	Fill pump with liquid
X	X			X					Liquid parameters different than calculated	Check pumped liquid parameters

3. MAINTENANCE

3.3. Disassembly of the pump

The disassembly should be performed only by qualified personnel.

Each operation to be fulfilled with the machine must always be carried out once all the electrical contacts have been disconnected. The pump-motor unit must be placed in a position where it cannot be started unintentionally.

Before servicing in any way the parts that come in contact with the pumped liquid, make sure that the pump has been fully emptied and washed. When draining the liquid, make sure that there is no danger for people or the environment.

The numbers put in brackets, refer to the part numbers in the spare part drawings and spare part lists in chapter *5. "Spare parts"*.

3.4. Disassembly procedure – single mechanical seal

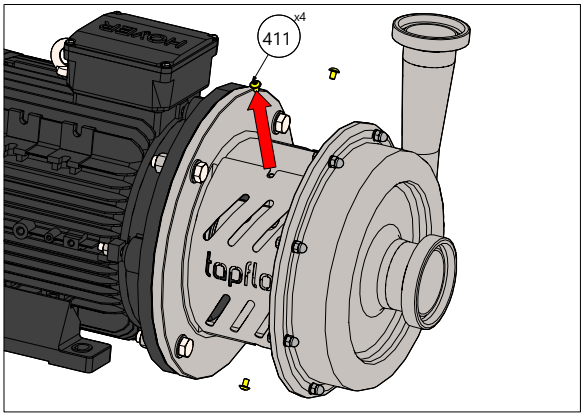


Fig. 3.3.1
Unscrew the shaft guard screws [411] fastening the shaft guards [41] to the lantern [11].

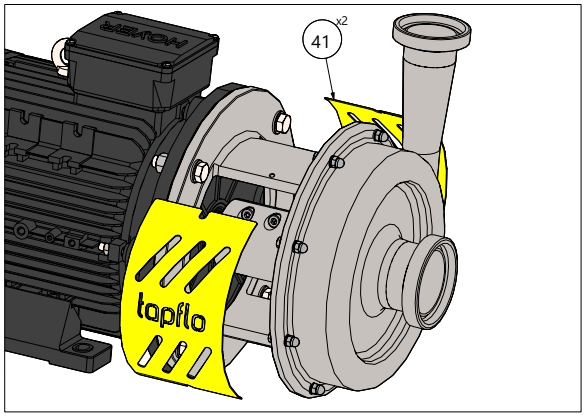


Fig. 3.3.2
Take off the shaft guards [41].

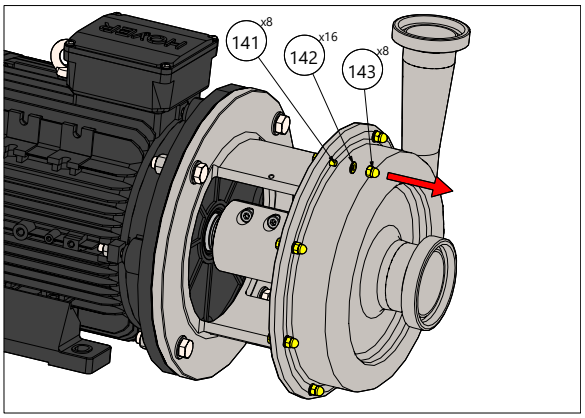


Fig. 3.3.3
Unscrew the casing mounting screws [141] and remove them with the nuts [143] and washers [142].

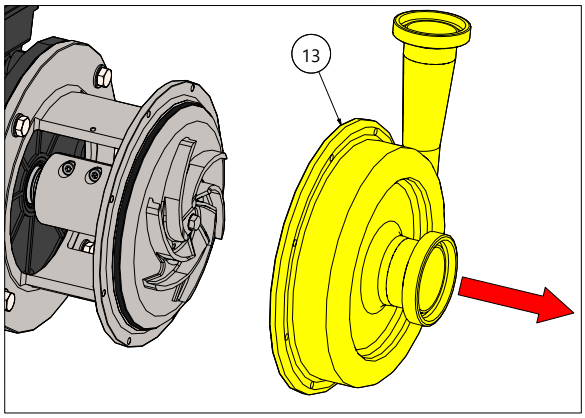


Fig. 3.3.4
Take off the pump casing [13].

3. MAINTENANCE

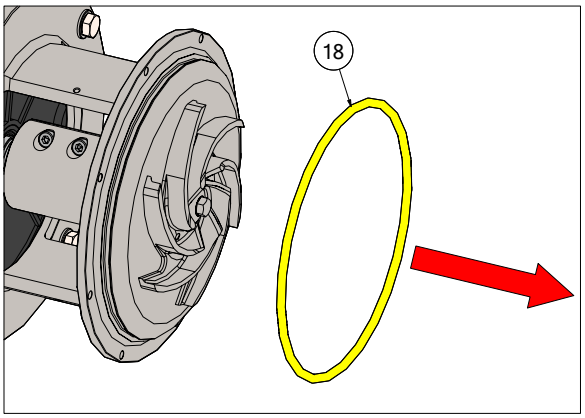


Fig 3.3.5

Remove the casing O-ring [18].

NOTE! After every disassembly the O-ring [18] should be replaced by a new one.

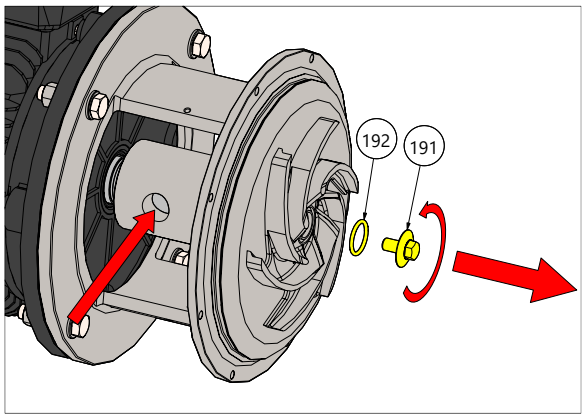


Fig 3.3.6

Use a bar to fix the shaft in place and unscrew the impeller nut [191] and remove the O-ring [192].

NOTE! Apply grease on the thread before re-assembly.

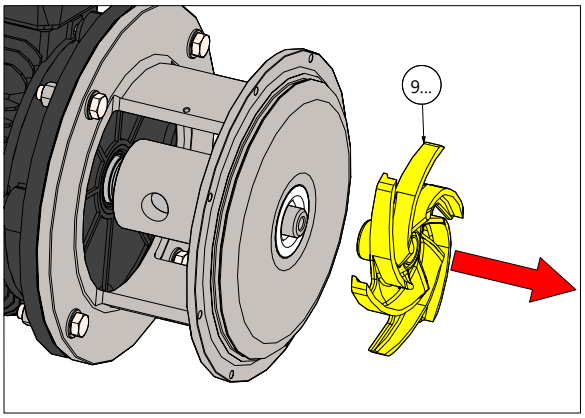


Fig 3.3.7

Unscrew the impeller [9...].

NOTE! Apply grease on the thread before re-assembly.

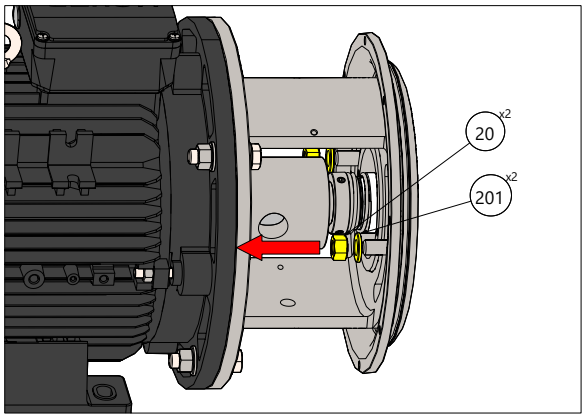


Fig 3.3.8

Remove the nuts [20] and washers [201] fastening the back casing [12] to the lantern [11].

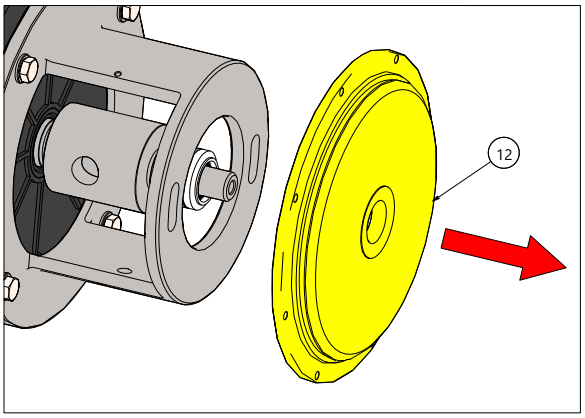


Fig 3.3.9

Carefully remove the back casing [12]. The static part of the mechanical seal will remain in the back casing.

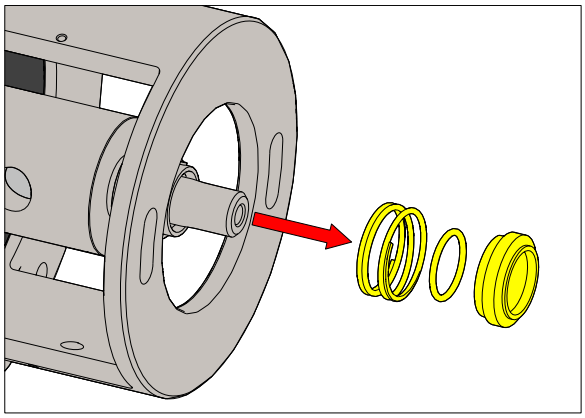


Fig 3.3.10

Remove the rotary parts of mechanical seal.

3. MAINTENANCE

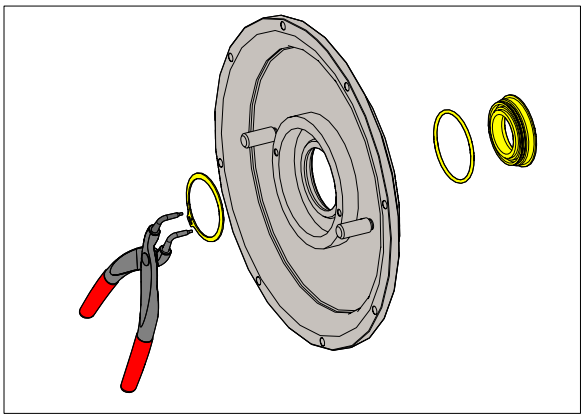


Fig 3.3.11

Remove the circlip by means of pliers and push out the static part of the mechanical seal.

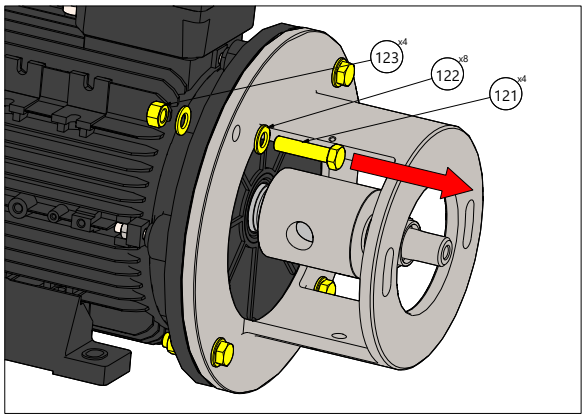


Fig 3.3.12

Remove the bolts [121], washers [122] and nuts [123] fastening the lantern [11] to the electric motor.

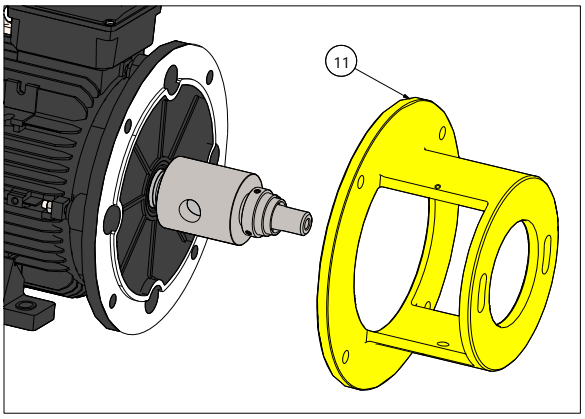


Fig 3.3.13

Remove the lantern [11].

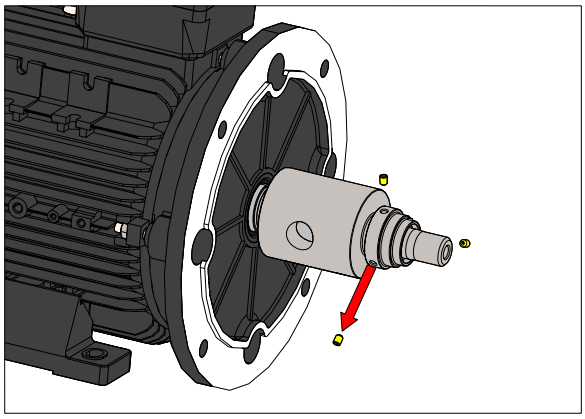


Fig 3.3.14

Remove the mechanical seal grub screws.

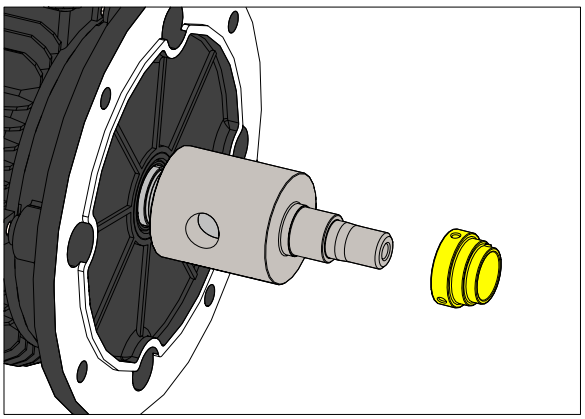


Fig 3.3.15

Remove the remaining part of mechanical seal.

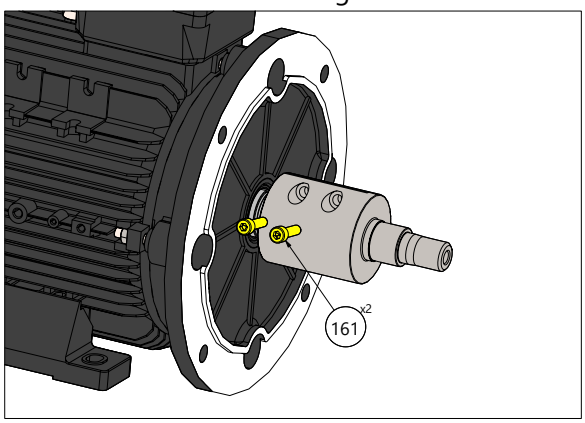


Fig 3.3.16

Remove the shaft screws [161].

3. MAINTENANCE

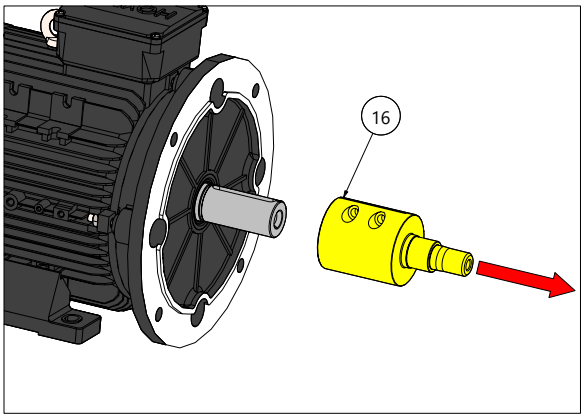


Fig 3.3.17
Remove the shaft [16].

The pump is now completely disassembled. Check all components, especially the mechanical seal, for wear or damage and replace if necessary. The casing O-ring should be replaced after every pump disassembly!

3.5. Assembly of the pump – single mechanical seal

The assembly procedure is done in the reverse order to the disassembly.
Nevertheless there are a few things that you have to remember in order to assemble the pump correctly.

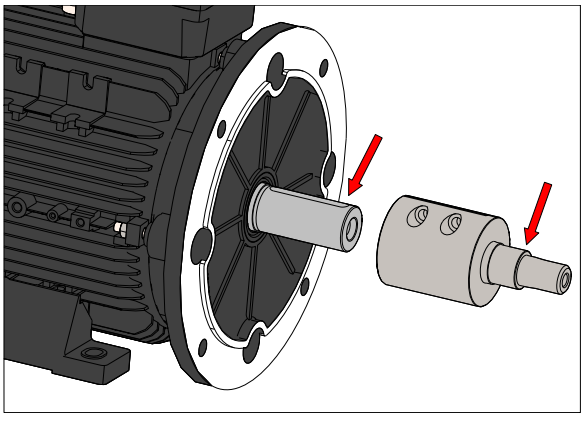


Fig. 3.4.1
Degrease the motor shaft and pump shaft before assembly.

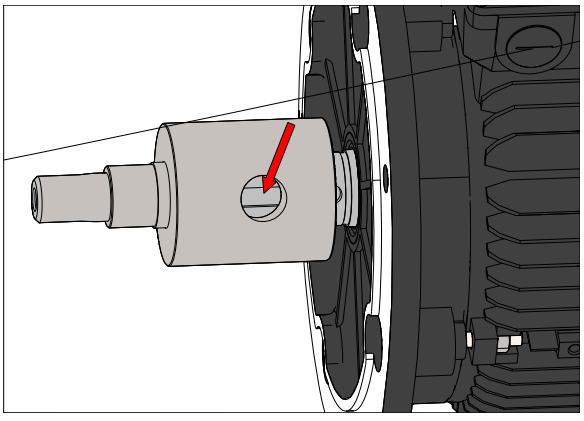


Fig. 3.4.2
Align key groove with shaft hole.

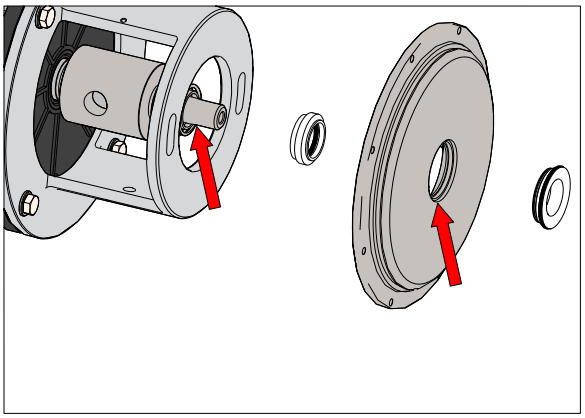


Fig. 3.4.3

Precisely clean and degrease with alcohol the internal rim of the back casing [12] as well as the shaft [16] surface. Check if the rim surface is smooth. If not it may cause mechanical seal leakage.

NOTE! For cleaning use dust-free material e.g. blue towel TORK 1230081.

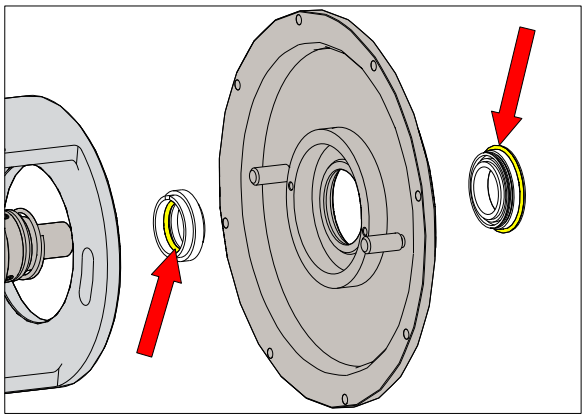


Fig. 3.4.4

Before assembly lubricate the mechanical seal O-rings to provide more accurate assembly as well as prevent the O-ring from curling.

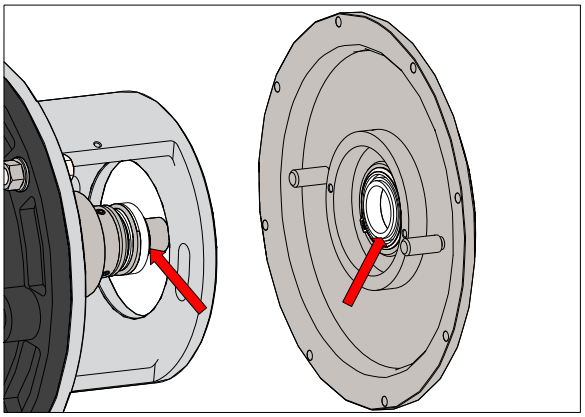


Fig. 3.4.5

Before final assembly, once again degrease the sliding faces of the mechanical seal.

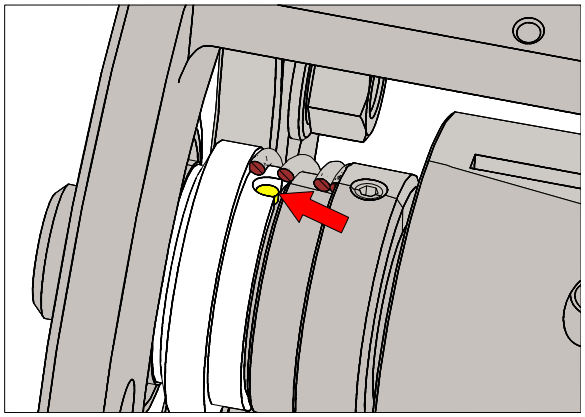


Fig. 3.4.6

Adjust retainer pin with rotary seal part grove.

3. MAINTENANCE

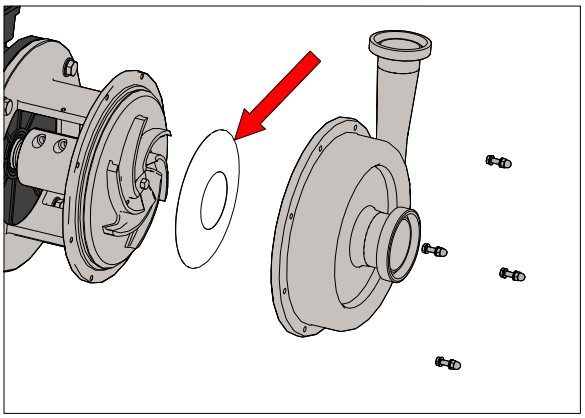


Fig. 3.4.7

Install back casing, impeller, insert spacer ring tool [13-MT]. Install casing, screw every second casing mounting screws nuts and washers.

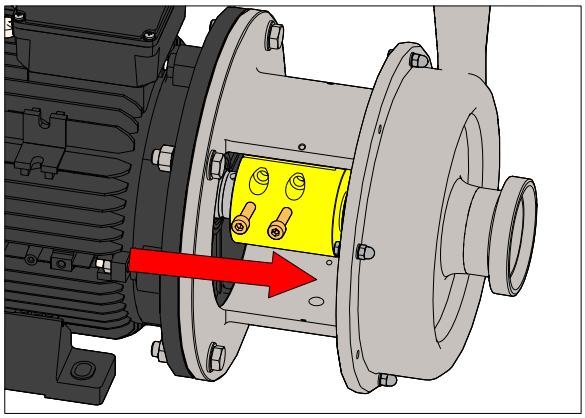


Fig. 3.4.8

Proper gap between the impeller and the back casing has to be set. Push the impeller to the housing through the shaft, then tighten the shaft screws.

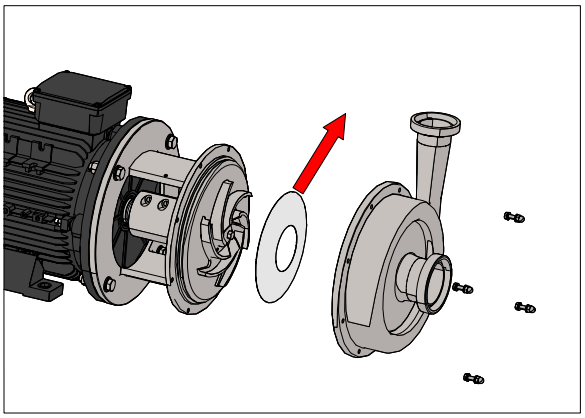


Fig. 3.4.9

Remove casing and spacer ring tool [13-MT]. Install casing O-Ring, lubricate it and install back casing with all screws.

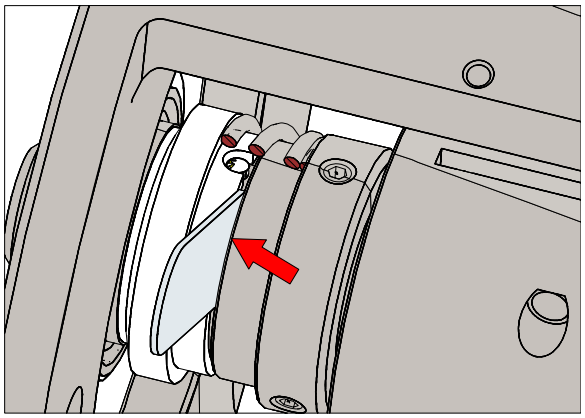
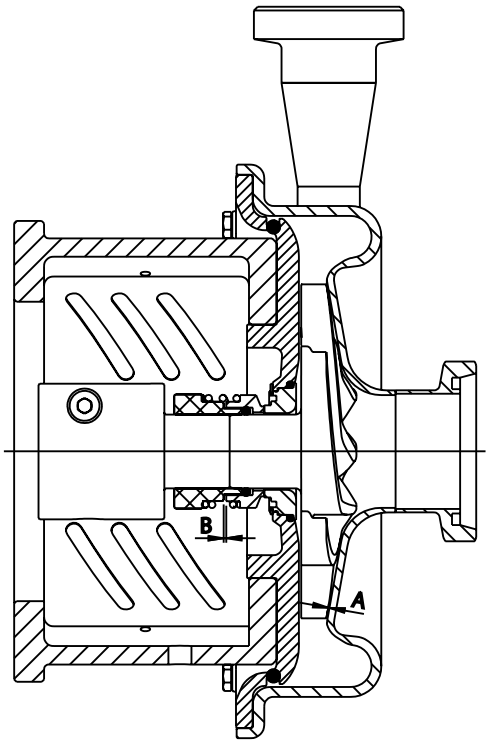


Fig. 3.4.10

By using a feeler gauge [15-MT] set the appropriate gap (**B**) between retainer and rotary seal part – *see below*.

3. MAINTENANCE



After installation of the impeller, proper gap "A" between the impeller and the back casing has to be set. Loosen the shaft screws [161] and using a spacer ring tool (**A**) and a feeler (gap) gauge set the appropriate gap (**B**).

Pump type	A [mm]	B [mm]	Spacer ring tool	Feeler gauge
CTX 40-165	0.5	1.2	14-145-13-MT	14-175-15-MT
CTX 50-145				
CTX 50-200			14-175-13-MT	
CTX 65-175				
CTX 65-240	1.0	3	14-240-13-MT	14-231-15-MT
CTX 65-230				
CTX 80-205			14-212-13-MT	
CTX 80-212				
CTX 80-260			14-231-13-MT	
CTX 100-230				

3. MAINTENANCE

3.6. Disassembly of the pump – double mechanical seal

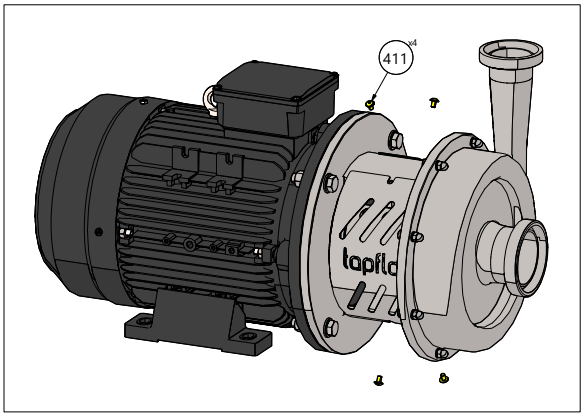


Fig. 3.5.1

Unscrew the shaft guard screws [411] fastening the shaft guards [41] to the lantern [11].

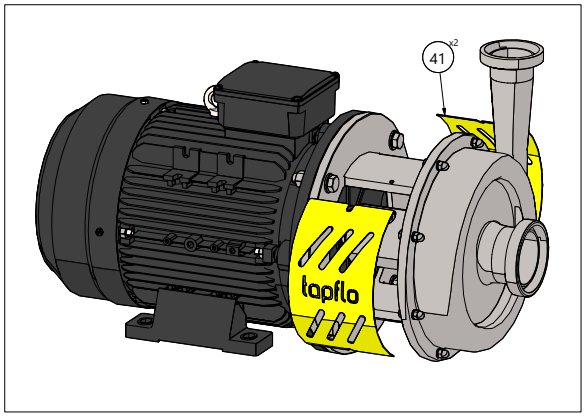


Fig. 3.5.2

Take off the shaft guards [41].

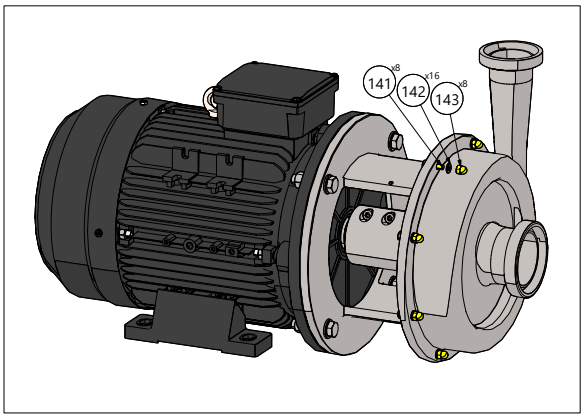


Fig. 3.5.3

Unscrew the casing mounting screws [141] and remove them with the nuts [143] and washers [142].

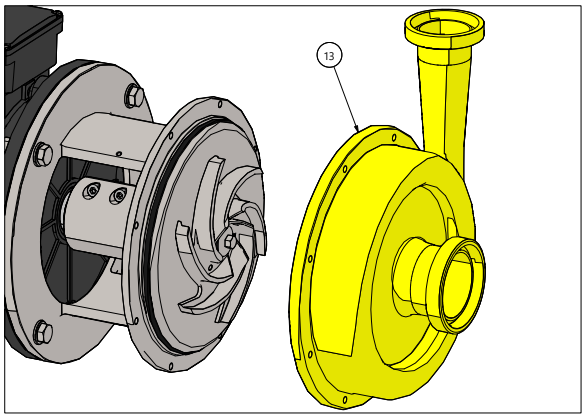


Fig. 3.5.4

Take off the pump casing [13].

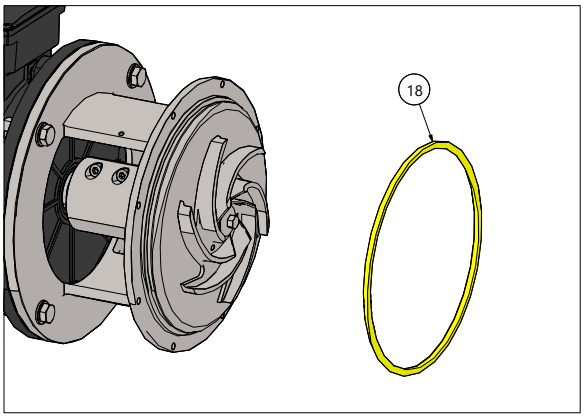


Fig 3.5.5

Remove the casing O-ring [18].

NOTE! After every disassembly the O-ring [18] should be replaced by a new one.

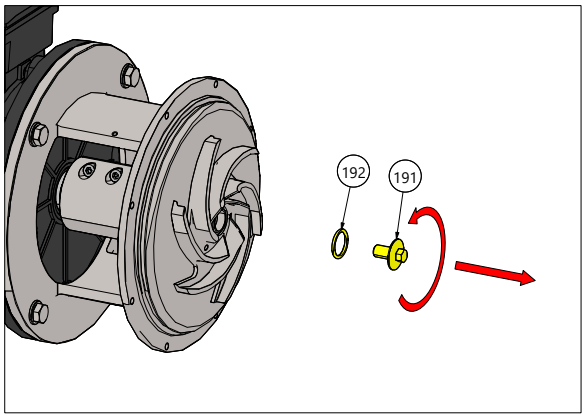


Fig 3.5.6

Use a bar to fix the shaft in place and unscrew the impeller nut [191] and remove the O-ring [192].

NOTE! Apply grease on the thread before re-assembly.

3. MAINTENANCE

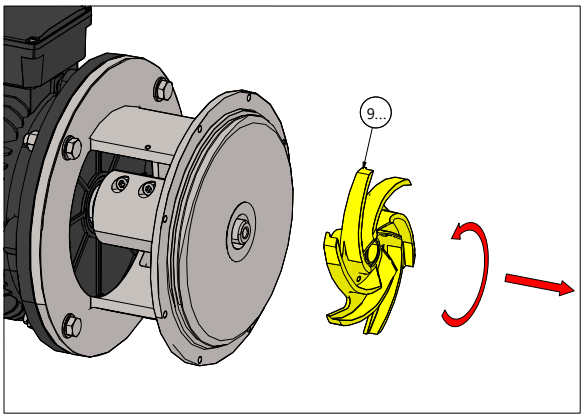


Fig 3.5.7

Unscrew the impeller [9...].

NOTE! Apply grease on the thread before re-assembly.

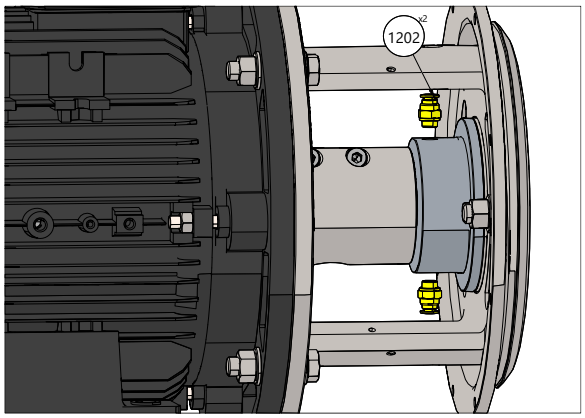


Fig 3.5.8

Remove the push-in fittings [1202].

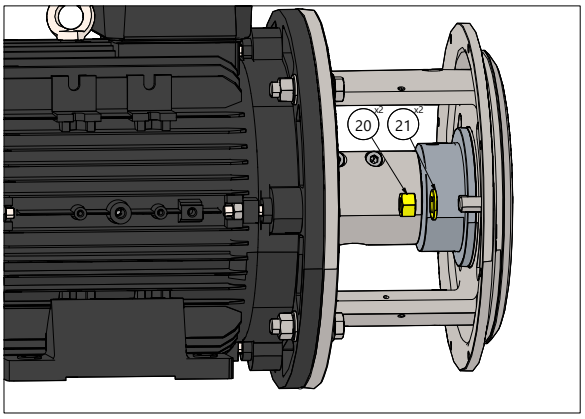


Fig 3.5.9

Remove the nuts [20] and washers [201] fastening the back casing [12] to the lantern [11].

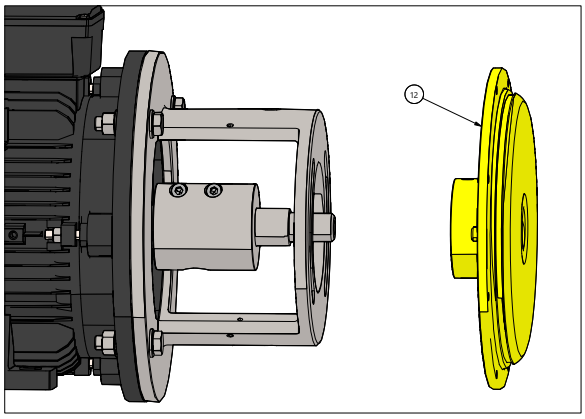


Fig 3.5.10

Remove the back casing with all parts of mechanical seal.

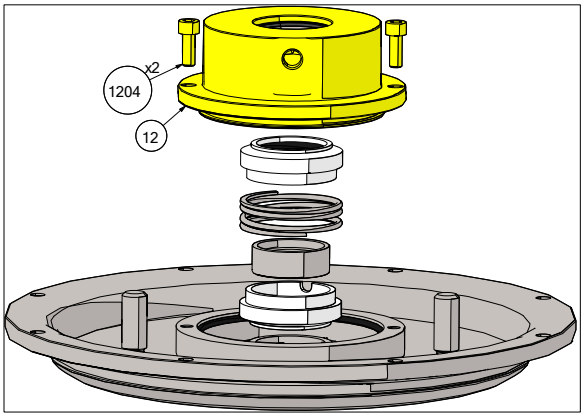


Fig 3.3.11

Remove the double mechanical seal chamber [120] and holding bolts [1204].

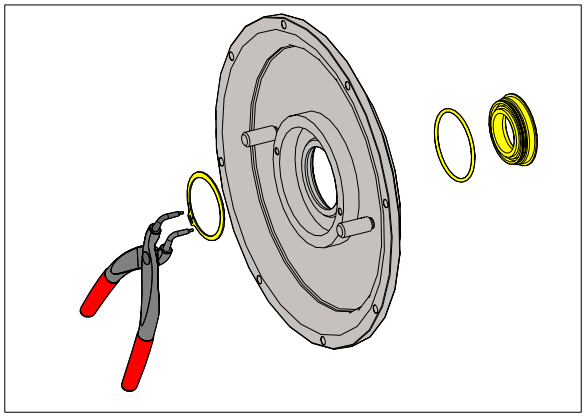


Fig 3.3.12

Remove the circlip by means of pliers and push out the static part of the mechanical seal.

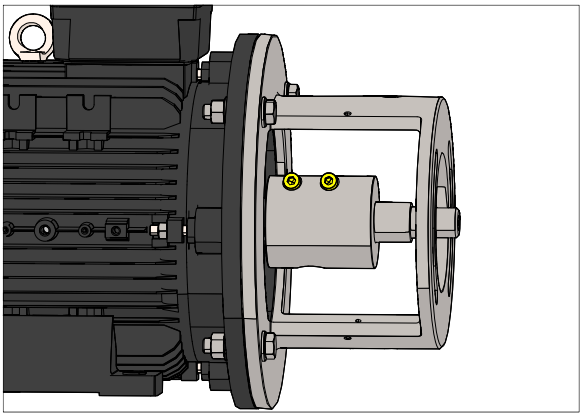


Fig 3.5.13

Loose the shaft screws [161].

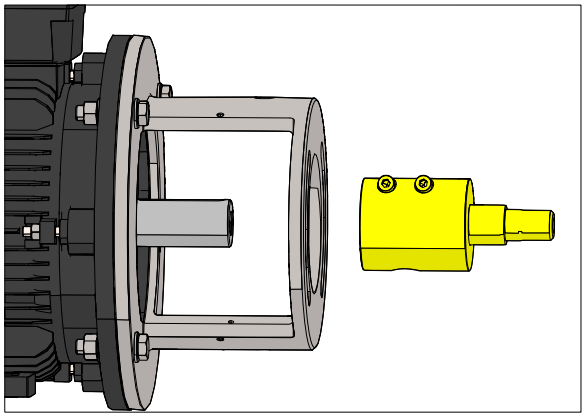


Fig 3.5.14

Remove the shaft [16].

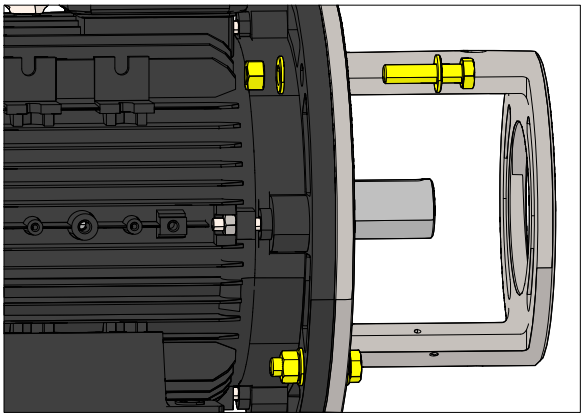


Fig 3.5.15

Remove the bolts [121], washers [122] and nuts [123] fastening the lantern [11] to the electric motor.

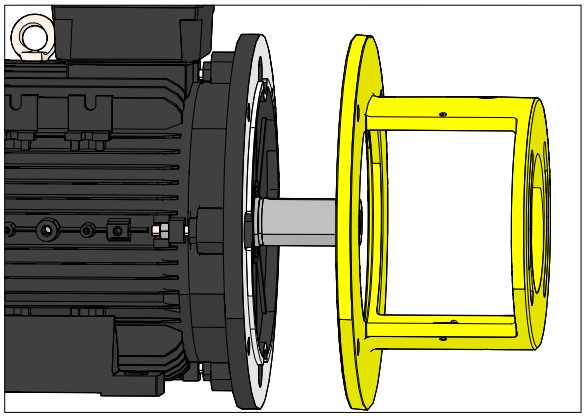


Fig 3.5.16

Remove the lantern [11].

The pump is now completely disassembled. Check all components, especially the mechanical seal, for wear or damage and replace if necessary. The casing O-ring should be replaced after every pump disassembly!

3. MAINTENANCE

3.7. Assembly of the pump – double mechanical seal

The assembly procedure is done in the reverse order to the disassembly.
Nevertheless there are a few things that you have to remember in order to assemble the pump correctly.

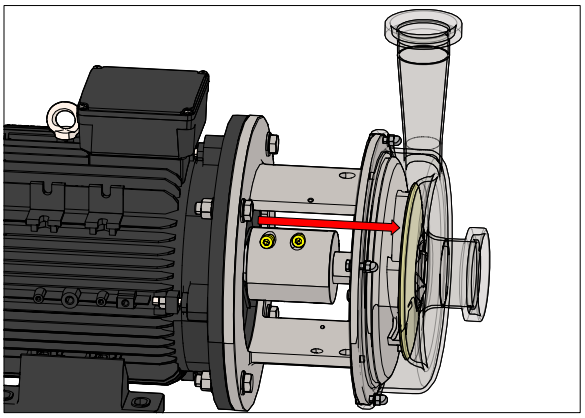


Fig. 3.6.1a

Assemble complete pump, without O-Rings, Impeller nut and any part of mechanical seal, except distance ring's sleeve. Insert spacer ring tool [13-MT] between Impeller and pump casing (see 3.4.7).
For this step every second screw of casing is enough.
Proper gap between the impeller and the back casing has to be set. Push the impeller to the housing through the shaft, then tighten the shaft screws.

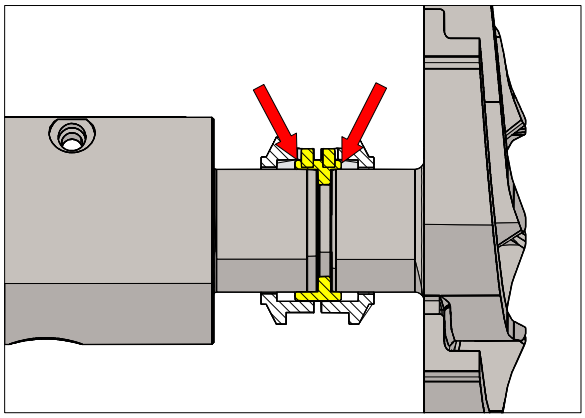


Fig. 3.6.1a

Distance ring's sleeve [1203] has direction on pump sizes:
CTX 80-205
CTX 80-212
CTX 65-230
CTX 65-240
CTX 65-240
CTX 100-230

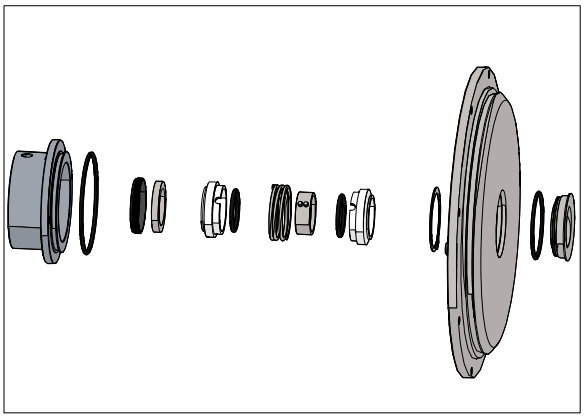


Fig. 3.6.2

Take off Pump casing [13], Back casing [12], impeller [9...] and distance ring's sleeve [1203].
Remove spacer ring tool [13-MT].
Equip pump with all required parts and assemble again.
Picture shows proper sequence of double mechanical seal parts.

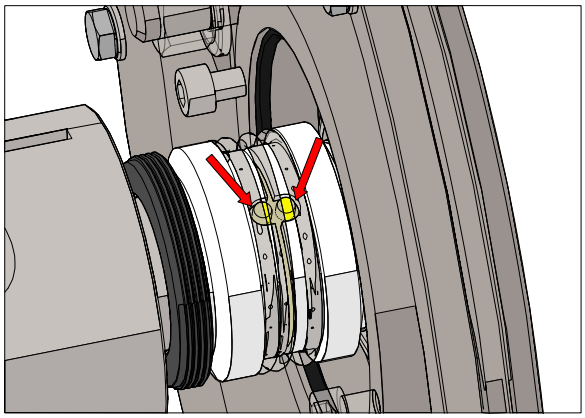


Fig. 3.6.3

Take extra care for adjustment of distance ring's sleeve pins with rotary seal parts grove.

After assembly, the spacer ring should be able to move slightly forward and backward, but not rotate.

3. MAINTENANCE

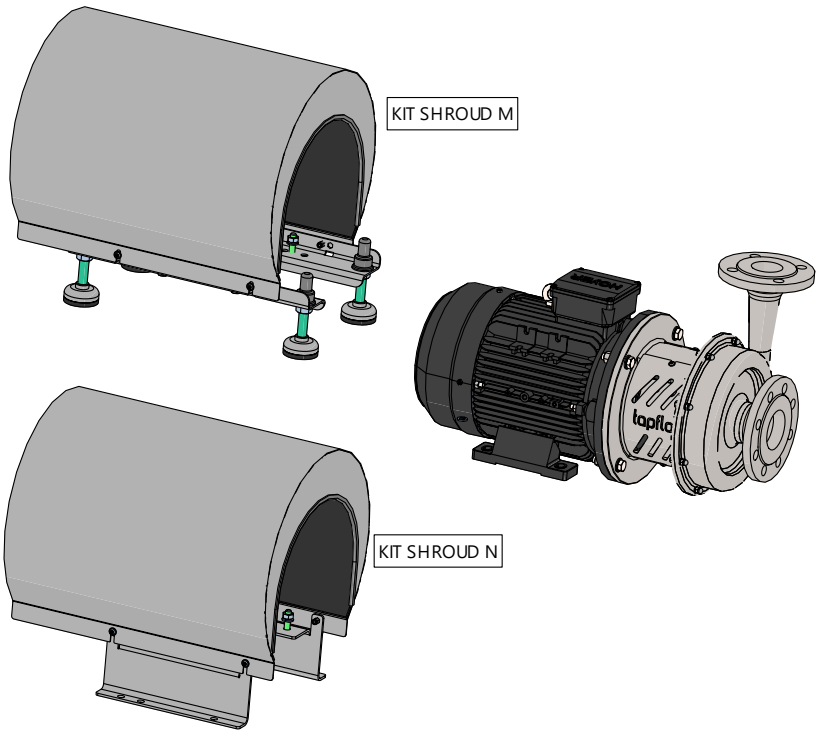
3.7.1. Test run

We recommend you to conduct a test run of the pump before installing it in the system, so no liquid gets wasted if the pump leaks or perhaps does not start accordingly to wrong assembly of the pump.
After a few weeks of operation retighten the screws with appropriate torque.

4. OPTIONS

4.1. Motor shroud – M/N

An optional motor shroud is available. It is made of stainless steel and provides easy cleaning and splash protection for the electrical motor. As a standard, the pump with the shroud is equipped with feet (M) or bracket (N). Material execution of the shroud is AISI 304 stainless steel.



Available for all pump sizes

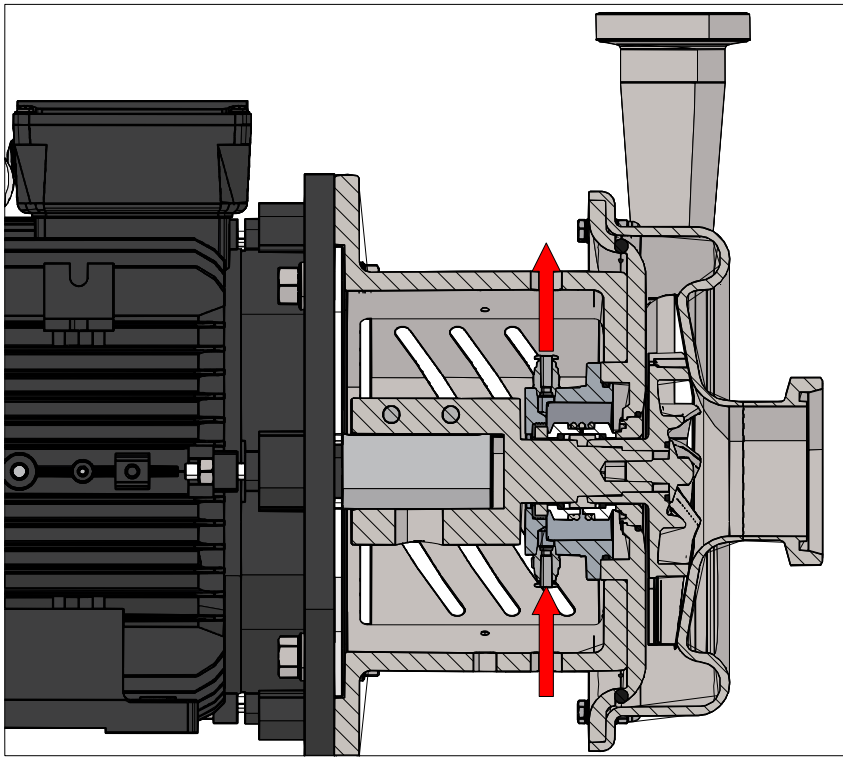
Code	Motor IEC size	Motor powers	Pump size
KIT SHROUD 90 *X*	90S / 90L	1.5 kW, 2.2 kW	40-165, 50-145
KIT SHROUD 100 *X*	100L	3.0 kW	40-165, 50-145, 65-175
KIT SHROUD 112 *X*	112M	4.0 kW	65-175
KIT SHROUD 132 *X*	132S	5.5 kW, 7.5 kW	50-200, 65-175, 65-230
KIT SHROUD 160 *X*	160M / 160L	11kW, 15 kW, 18.5 kW	50-200, 65-xxx, 80-xxx, 100-230
KIT SHROUD 180 *X*	180M	22 kW	65-240, 80-xxx, 100-230
KIT SHROUD 200 *X*	200L	30 kW, 37 kW	80-260, 100-230
KIT SHROUD 225 *X*	225M	45 kW	80-260, 100-230

4. OPTIONS

4.2. Double mechanical seal – 2D

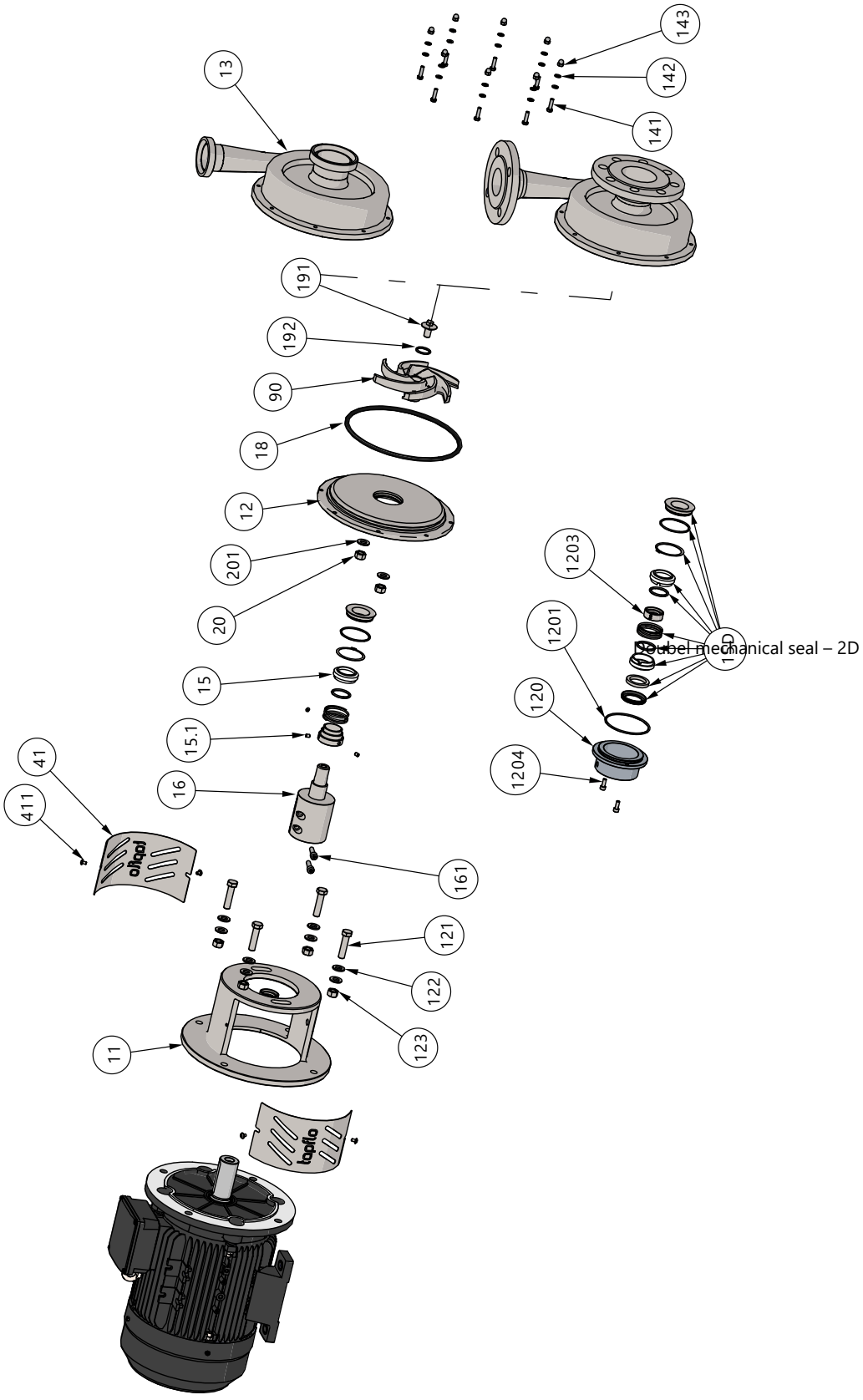
This option is utilized in cases of liquids with high abrasive solids content, aggressive or polymerizing liquids. It allows easy leakage control. Utilizes pressurized quench liquid. Available with SiC/Carbon seal faces at atmospheric side and SiC/SiC and SiC/Carbon on liquid side.

Flushed seal connection thread is 1/8" G. As a standard pump is equipped with push in fitting connectors for 6mm hoses. The required flow quantity amounts to 15–30 l/h normally at atmospheric pressure (maximum permissible pressure 5 bar). The hose connection should always be positioned vertically with the fluid inlet below and the outlet above.



5. SPARE PARTS

5.1. Spare parts drawing



5. SPARE PARTS

5.2. Spare parts list

Pos.	Description	Q-ty	Material	
			CTX I	CTX H
11	Lantern	1	AISI 304	
12	Back casing *[H/N]****	1	AISI 316L Ra<3.2	AISI 316L Ra<0.8
121	Lantern assembly bolt	4	A4-70	
122	Lantern assembly washer	8	A4-70	
123	Lantern assembly nut	4	A4-70	
13	Pump casing *[H/N]*	1	AISI 316L Ra<3.2	AISI 316L Ra<0.8
141	Casing mounting screws	8/6*	A4-80	
142	Casing mounting washers	16/12*	A4	
143	Casing mounting nuts	8/6*	A4-70	
15	Mechanical seal (complete)	1	See 6.1	See 6.1
16	Shaft extension	1	AISI 304L	
161	Shaft screw	2/1*	A4-80	
18	Casing O-ring	1	EPDM (std), FKM, Silicone, NBR	
191	Impeller mounting bolt *[N/H]*	1	AISI 316L Ra<3.2	AISI 316L Ra<0.8
192	Impeller bolt O-ring	1	EPDM (std), FKM, Silicone, NBR	
21	Back casing nut	4/2**	A4-70	
201	Back casing washer	4/2**	A4-70	
41	Shaft guard	2	AISI 304L	
411	Shaft guard screw	4	A2-70	
9xxx	Impeller (xxx – diameter in mm)	1	AISI 316L Ra<3.2	AISI 316L Ra<0.8

Double mechanical seal parts				
Pos.	Description	Q-ty	Material	
			CTX I	CTX H
15D	Double mechanical seal	1	See 6.1	
120	Double mechanical seal chamber	1	AISI 304	
1201	Double mechanical seal chamber O-Ring	1	EPDM, FKM	
1202	Push in fitting	2	-	
1203	Distance ring's sleeve	1	AISI 304L	
1204	Double mechanical seal chamber holding bolt	2	A4-80	

* CTX 100-230, 80-260, 80-212, 80-205, 65-240, 65-230, 65-175, 50-200 **/** 50-145, 40-165

** CTX 100-230, 80-260, 80-212, 80-205, 65-240, 65-230 **/** 65-175, 50-200, 50-145, 40-165

*** Parts indicated as *[H/N]* have different execution for CTX I and CTX H pumps. When ordering spare parts please indicate if the part is for Industrial or Hygienic series e.g. 14-145**N**-11 or 14-145**H**-11.

5. SPARE PARTS

5.3. Recommended spare parts

Normally the CTX pump is maintenance free. However, depending on the nature of the liquid and temperature etc. some parts of the pump are subject to wear and need to be replaced. We recommend having the following parts in stock:

Pos.	Description	Q-ty
15	Mechanical seal	1
18	Casing O-ring	1
192	Impeller nut O-ring	1

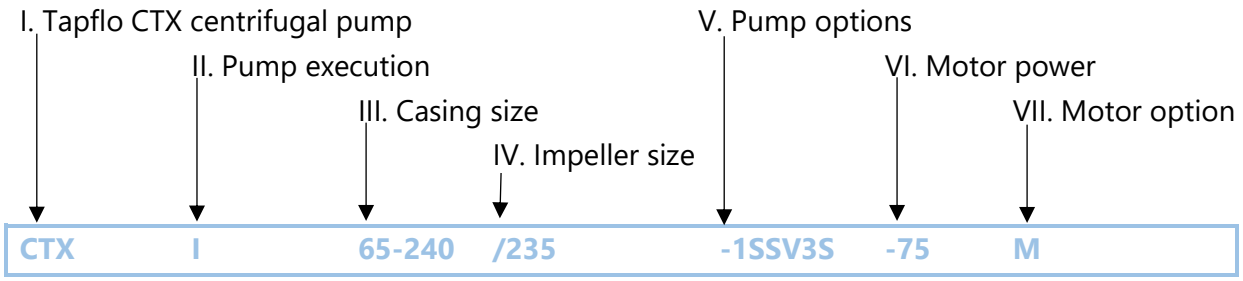
5.4. How to order parts

When ordering spare parts for Tapflo pumps. please let us know what is the ***model number*** and ***serial number*** from the pump's name plate. Then just indicate the part numbers from the spare parts list and quantity of each item.

6. DATA

6.1. Pump code

The model number on the pump and on the front page of this instruction manual tells the pump size and materials of the pump.



I. CTX = Tapflo CTX centrifugal pump

II. Pump execution:

I = Industrial

H = Hygienic

III. Pump size (inlet DN – max impeller diameter [mm]):

40-165
50-145
50-200
65-175
65-230
65-240
80-205
80-212
80-260
100-230

IV. Actual impeller diameter [mm] used in pump
Trimming by 5 mm allowed

	Max.	Min.
100-230	230	170
80-260	260	195
80-212	212	160
80-205	205	155
65-240	240	190
65-230	230	170
65-175	175	130
50-200	200	160
50-145	145	115
40-165	165	120

V. Pump options:

1. Mechanical seal (FDA as standard):

Blank*	= SiC/carbon/EPDM
SSS	= SiC/SiC/Silicone
SSE	= SiC/SiC/EPDM
SSV	= SiC/SiC/FKM
SSN	= SiC/SiC/NBR
SGV	= SiC/graphite/FKM
SGS	= SiC/graphite/Silicone
SGN	= SiC/graphite/NBR

2. Type of mechanical seal

Blank*	= Single mechanical seal
D	= Double mechanical seal – back-to-back

3. Connection options

Blank*	= EN 1092-1 flange on CTX I Thread DIN 11851 on CTX H
A	= ANSI flange (CTX I only)
B	= BSPT female thread (CTX I only)
C	= SMS 3017 clamp (CTX H only)
T	= Clamp DIN 32676 (CTX H only)
S	= Thread SMS 1145 (CTX H only)
R	= Thread RJT (CTX H only)
P	= ISO 1127 clamp (CTX H only)
W	= No connection – plain weld end
Z	= Camlock male connection (CTX I only)

4. Special executions

P05	= Extra polishing to Ra<0.5 (CTX H only)

VI. Motor power / IEC motor size

2900 rpm motors (2-pole):

15	= 1.5 kW / 90S
22	= 2.2 kW / 90L
30	= 3.0 kW / 100L
40	= 4.0 kW / 112M
55	= 5.5 kW / 132S
75	= 7.5 kW / 132S
110	= 11 kW / 160M
150	= 15 kW / 160M
185	= 18.5 kW / 160L
220	= 22 kW / 180M
300	= 30 kW / 200L
370	= 37 kW / 200L
450	= 45 kW / 225M

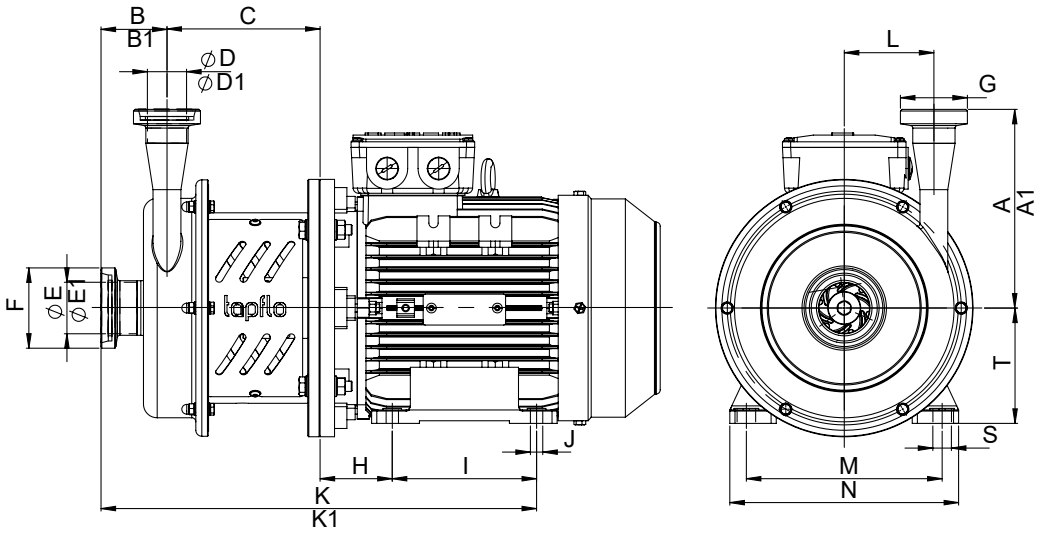
VII. Motor options

M	= Motor shroud with hygienic feet
N	= Motor shroud with mounting bracket
V...F...	= Motor for special voltage, frequency
C	= External cooling for motor
UL	= UL/CSA certified motor
IP..	= IP class for motor
D	= Built on frequency inverter

* = standard execution

6. DATA

6.2. Dimensions



Dimensions in mm (where other is not indicated)

General dimensions only, ask us for detailed drawings. Changes reserved without notice.

MODEL	Power [kW]	IEC size	A	A1	B	B1	C	øD	øD1	øE	øE1	H*	I*	J*	K*	K1*	L	M*	N*	S*	T*
40-165-15	1.5	90S	178	198	58.5	70.5	135	32	37.2	38	39.3	56	125	10	375	387	91	140	177	14	90
40-165-22	2.2	90L																			
40-165-30	3.0	100L					147					63	140	12	409	421		160	205	18	100
40-165-40	4.0	112M										70			416	428		190	222		112
40-165-55	5.5	132S					171					89			459	471		216	256		132
40-165-75	7.5	132S																			132
50-145-15	1.5	90S	193	205	64	82	137	38	39.3	50	54.5	56	125	10	382	400	87	140	177	14	90
50-145-22	2.2	90L																			90
50-145-30	3.0	100L					149					63	140	12	416	434		160	205	18	100
50-145-40	4.0	112M										70			423	441		190	222		112
50-145-55	5.5	132S					173					89			466	484		216	256		132
50-145-75	7.5	132S																			132
50-200-30	3.0	100L	201	213	65.5	83.5	150	38	39.3	50	54.5	63	140	12	419	437	105	160	205	18	100
50-200-40	4.0	112M										70			426	444		190	222		112
50-200-55	5.5	132S					172					89			467	485		216	256		132
50-200-75	7.5	132S																			132
50-200-110	11	160M					201					108	210	14.5	585	603		254	314	14.5	160
50-200-150	15	160M																			160
50-200-185	18.5	160L											254		629	647					160
65-175-30	3.0	100L	231	249.5	75.5	88.5	149	50	54.5	66	70.3	63	140	12	428	441	100	160	205	18	100
65-175-40	4.0	112M										70			435	448		190	222		112
65-175-55	5.5	132S					171					89			476	489		216	256		132
65-175-75	7.5	132S																			132
65-175-110	11	160M					200					108	210	14.5	594	607		254	314	14.5	160
65-175-150	15	160M																			160
65-175-185	18.5	160L											254		638	651					160
65-240-55	5.5	132S	238	250	88	101	162	38	39.3	66	70.3	89	140	12	479	492	132	216	256	18	132
65-240-75	7.5	132S																			132
65-240-110	11	160M					190					108	210	14.5	596	609		254	314	14.5	160
65-240-150	15	160M																			160
65-240-185	18.5	160L											254		640	653					160
65-240-220	22	180M										121	241					279	349		180
65-240-300	30	200L										133	305	18.5	716	729		318	388	18.5	200
65-240-370	37	200L																			200

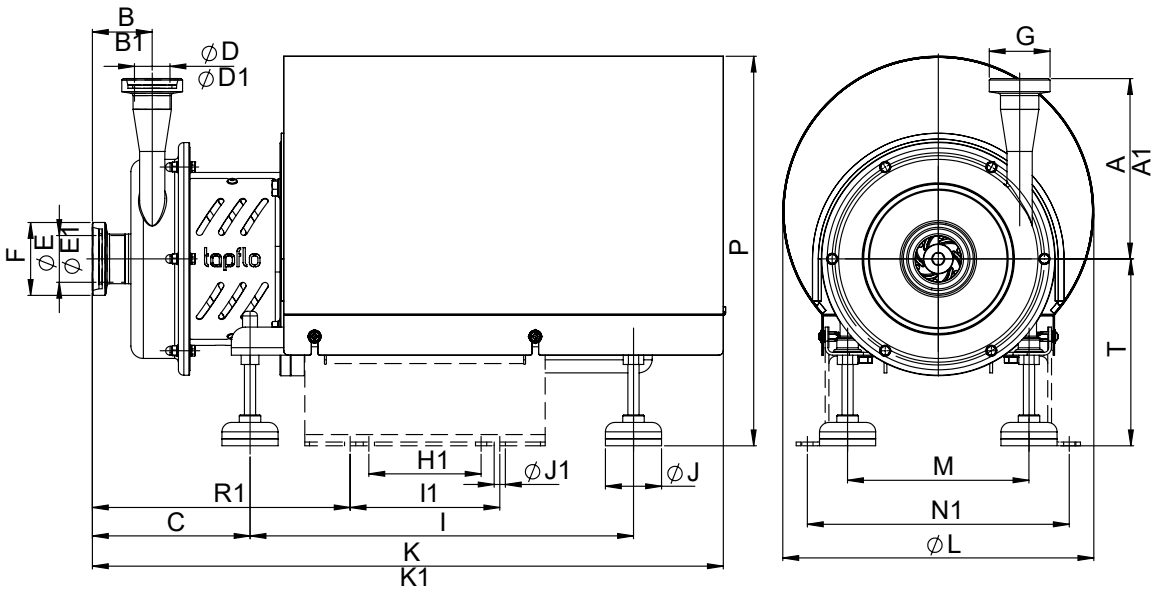
6. DATA

65-240-450	45	225M										149			738	751		356	431		225
80-205-55	5.5	132S					170					89	140	12	495	501		216	256	18	132
80-205-75	7.5	132S																			132
80-205-110	11	160M										108	210	14.5	612	618		254	314	14.5	160
80-205-150	15	160M																			160
80-205-185	18.5	160L	240	258	96	101		50	54.5	81	82.5		254		656	662	130				160
80-205-220	22	180M					198					121	241					279	349		180
80-205-300	30	200L										133	305	18.5	732	738		318	388	18.5	200
80-205-370	37	200L																			200
80-205-450	45	225M										149			754.5	759.5		356	431		225
65-230-55	5.5	132S					170					89	140	12	486	491		216	256	18	132
65-230-75	7.5	132S																			132
65-230-110	11	160M										108	210	14.5	603	609		254	314	14.5	160
65-230-150	15	160M																			160
65-230-185	18.5	160L	240	258	87	92		50	54.5	66	70.3		254		647	652	130				160
65-230-220	22	180M					198					121	241					279	349		180
65-230-300	30	200L										133	305	18.5	723	728		318	388	18.5	200
65-230-370	37	200L																			200
65-230-450	45	225M										149			754.5	750		356	431		225
80-212-55	5.5	132S					170					89	140	12	498	504		216	256	18	132
80-212-75	7.5	132S																			132
80-212-110	11	160M										108	210	14.5	615	621		254	314	14.5	160
80-212-150	15	160M																			160
80-212-185	18.5	160L	272	285	99	104		66	70.3	81	82.5		254		659	665	130				160
80-212-220	22	180M					198					121	241					279	349		180
80-212-300	30	200L										133	305	18.5	735	741		318	388	18.5	200
80-212-370	37	200L																			200
80-212-450	45	225M										149			757.5	762.5		356	431		225
100-230-55	5.5	132S					168.5					89	140	12	508.5	519		216	256	18	132
100-230-75	7.5	132S																			132
100-230-110	11	160M										108	210	14.5	625.5	636		254	314	14.5	160
100-230-150	15	160M														636					160
100-230-185	18.5	160L	292	297	94	99		81	82.5	100	107.1		254		669.5	680	124				160
100-230-220	22	180M					196.5					121	241			680		279	349		180
100-230-300	30	200L										133	305	18.5	745.5	756		318	388	18.5	200
100-230-370	37	200L														756					200
100-230-450	45	225M										149	311		767,5	778		356	431		225
80-260-55	5.5	132S					169.5					89	140	12	493	497.5		216	256	18	132
80-260-75	7.5	132S																			132
80-260-110	11	160M										108	210	15	610	614.5		254	314	14.5	160
80-260-150	15	160M																			160
80-260-185	18.5	160L	272	284	94	99		66	70.3	81	82.5		254		654	658.8	130				160
80-260-220	22	180M					197.5					121	241					279	349		180
80-260-300	30	200L										133	305	19	730	734.5		318	388	18.5	200
80-260-370	37	200L																			200
80-260-450	45	225M										149	311		751.5	756.5		356	431		225

*Dimension may vary depending on motor brand

Dimensions A, B, D, E for sanitary version; A1, B1, D1, E1 for industrial version.

6. DATA



Dimensions in mm (where other is not indicated)

General dimensions only, ask us for detailed drawings. Changes reserved without notice.

MODEL	Power [kW]	IEC size	A	A1	B	B1	C	øD	øD1	øE	øE1	H1	I	I1	øJ	øJ1	K	K1	øL	M	N1	P	R1	T
40-165-15	1.5	90S	178	198	58.5	70.5	166	32	37.2	38	39.3	75	337	125	60	12	583	592.6	283	186/ 146**	230	370	261.5	190
40-165-22	2.2	90L																						
40-165-30	3.0	100L					161.5					120	410	160		12	667.5	679.5	332.5	194	280	417	280.5	200
40-165-40	4.0	112M										-		140		12/18*							290.5	
40-165-55	5.5	132S					185.5						420	178		12	722.5	734.5	402.5	226	320	465	330.5	225
40-165-75	7.5	132S																						
50-145-15	1.5	90S	193	205	64	82	173	38	39.3	50	54.5	75	337	125	60	12	587.5	605.5	283	186/ 146**	230	370	274.5	190
50-145-22	2.2	90L																						
50-145-30	3.0	100L					168.5					120	410	160		12	674.5	692.5	332.5	194	280	417	293.5	200
50-145-40	4.0	112M										-		140		12/18*								
50-145-55	5.5	132S					185.5						420	178		12	722.5	734.5	402.5	226	320	465	330.5	225
50-145-75	7.5	132S																						
50-200-30	3.0	100L	201	213	65.5	83.5	171.5	38	39.3	50	54.5	120	410	160	60	12	677.5	695.5	332.5	194	280	417	296.5	200
50-200-40	4.0	112M												140		12/18*								
50-200-55	5.5	132S					193.5					-	420	178		12	730.5	748.5	402.5	226	320	465	344.5	225
50-200-75	7.5	132S																						
50-200-110	11	160M					219.5						600	290		18	916.5	934.5	517.5	280	406	589	392.5	260
50-200-150	15	160M																						
50-200-185	18.5	160L																						
65-175-30	3.0	100L	231	249.5	75.5	88.5	180.5	50	54.5	66	70.3	120	410	160	60	12	686.5	699.5	332.5	194	280	417	300.5	200
65-175-40	4.0	112M												140		12/18*								
65-175-55	5.5	132S					202.5					-	420	178		12	739.5	752.5	402.5	226	320	465	348.5	225
65-175-75	7.5	132S																						
65-175-110	11	160M					228.5						600	290		18	925.5	938.5	517.5	280	406	589	396.5	260
65-175-150	15	160M																						
65-175-185	18.5	160L																						
65-240-55	5.5	132S	238	250	88	101	206	38	39.3	66	70.3	-	420	178	60	12	743	756	402.5	226	320	465	352	225
65-240-75	7.5	132S																						
65-240-110	11	160M					231						600	290		18	928	941	517.5	280	406	589	399	260
65-240-150	15	160M																						
65-240-185	18.5	160L																						
65-240-220	22	180M					234						645	315			968	981	552.5	316	442	621	412	280
65-240-300	30	200L					228					229	760	305			1068	1081	617.5	342	512	674	424	300
65-240-370	37	200L																						
65-240-450	45	225M					244					261		311			1131	1144	678	374	554	724	440	325

6. DATA

80-205-55	5.5	132S	240	258	96	101	222.5	50	54.5	81	82.5	-	420	178	60	12	759.5	764.5	402.5	226	320	465	360.5	225
80-205-75	7.5	132S																						
80-205-110	11	160M					247.5						600	290		18	944.5	949.5	517.5	280	406	589	407.5	260
80-205-150	15	160M																						
80-205-185	18.5	160L																						
80-205-220	22	180M					250.5						645	315			984.5	989.5	552.5	316	442	621	420.5	280
80-205-300	30	200L					244.5					229	760	305			1085	1090	617.5	342	512	674	432.5	300
80-205-370	37	200L																						
80-205-450	45	225S					265.5					261		311			1147	1152	678	374	554	724	448.5	325
65-230-55	5.5	132S	240	258	87	92	213	50	54.5	66	70.3	-	420	178	60	12	748	755	402.5	226	320	465	351	225
65-230-75	7.5	132S																						
65-230-110	11	160M					238						600	290		18	935	940	517.5	280	406	589	398	260
65-230-150	15	160M																						
65-230-185	18.5	160L																						
65-230-220	22	180M					241						645	315			975	978	552.5	316	442	621	411	280
65-230-300	30	200L					235					229	760	305			1075	1080	617.5	342	512	674	423	300
65-230-370	37	200L																						
65-230-450	35	225S					251					261		311			1138	1143	678	374	554	724	439	325
80-212-55	5.5	132S	272	285	99	104	225.5	66	70.3	81	82.5	-	420	178	60	12	762.5	767.5	402.5	226	320	465	363.5	225
80-212-75	7.5	132S																						
80-212-110	11	160M					250.5						600	290		18	947.5	952.5	517.5	280	406	589	410.5	260
80-212-150	15	160M																						
80-212-185	18.5	160L																						
80-212-220	22	180M					253.5						645	315			987.5	992.5	552.5	316	442	621	423.5	280
80-212-300	30	200L					247.5					229	760	305			1088	1093	617.5	342	512	674	435.5	300
80-212-370	37	200L																						
80-212-450	45	225S					263.5					261		311			1150	1155	678	374	554	724	451.5	325
80-260-55	5.5	132S	272	284	94	99	219.5	66	70.3	81	82.5	-	420	178	60	12	759	764	402.5	226	320	465	357.5	225
80-260-75	7.5	132S																						
80-260-110	11	160M					244.5					130	600	290		18	944	949	517.5	280	406	589	404.5	260
80-260-150	15	160M																						
80-260-185	18.5	160L																						
80-260-220	22	180M					247.5					167	645	315			984	989	552.5	316	442	621	417.5	280
80-260-300	30	200L					241.5					229	760	305			1084	1089	617.5	342	512	674	429.5	300
80-260-370	37	200L																						
80-260-450	45	225S					257.5					261		311			1144	1149	678	374	554	724	445.5	325
100-230-55	5.5	132S	292	297	94	99	235.5	81	82.5	100	107.1	-	420	178	60	12	775	785.5	402.2	226	320	465	379	225
100-230-75	7.5	132S																						
100-230-110	11	160M					260.5					130	600	290		18	960	970.5	517.5	280	406	589	426	260
100-230-150	15	160M																						
100-230-185	18.5	160L																						
100-230-220	22	180M					263.5					167	645	315			1000	1011	552.5	316	442	621	439	280
100-230-300	30	200L					257.5					229	760	305			1100	1111	617.5	342	512	674	451	300
100-230-370	37	200L																						
100-230-450	45	225S					273.5					261		311			1160	1171	678	374	554	724	467	325

*Kidney shaped hole – width/length

** Front feet wider than rear feet

Dimensions A, B, D, E, I, J, K, M for sanitary version; A1, B1, D1, E1, H1, I1, J1, K1, N1, R1 for industrial version.

6. DATA

Connection dimensions						
Model	BSPT male thread		EN1092-1 flange (std.)		ANSI 150 flange	
	F	G	F	G	F	G
40-165	1.5″	1.25″	DN40	DN32	1.5″	1.25″
50-145	2″	1.5″	DN50	DN40	2″	1.5″
50-200	2″	1.5″	DN50	DN40	2″	1.5″
65-175	2.5″	2″	DN65	DN50	2.5″	2″
65-230	2.5″	2″	DN65	DN50	2.5″	2″
65-240	2.5″	1.5″	DN65	DN40	2.5″	1.5″
80-205	3″	2″	DN80	DN50	3″	2″
80-212	3″	2.5″	DN80	DN65	3″	2.5″
80-260	3″	2.5″	DN80	DN65	3″	2.5″
100-230	4″	3″	DN100	DN80	4″	3″

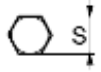
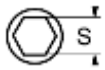
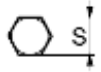
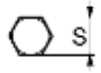
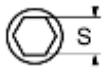
Connection dimensions										
Model	DIN 11851 thread (std.)		DIN 32676 clamp		SMS3017 clamp		SMS 1145 thread		RJT thread	
	F	G	F	G	F	G	F	G	F	G
40-165	DN40	DN32	DN40	DN32	38	33.7	38	32	1.5″	1.25″
50-145	DN50	DN40	DN50	DN40	51	38	51	38	2″	1.5″
50-200	DN50	DN40	DN50	DN40	51	38	51	38	2″	1.5″
65-175	DN65	DN50	DN65	DN50	63.5	51	63.5	51	2.5″	2″
65-230	DN65	DN50	DN65	DN50	63.5	51	63.5	51	2.5″	2″
65-240	DN65	DN40	DN65	DN40	63.5	38	63.5	38	2.5″	1.5″
80-205	DN80	DN50	DN80	DN50	76.1	51	76	51	3″	2″
80-212	DN80	DN65	DN80	DN65	76.1	63.5	76	63.5	3″	2.5″
80-260	DN80	DN65	DN80	DN65	76.1	63.5	76	63.5	3″	2.5″
100-230	DN100	DN80	DN100	DN80	101.6	76.1	108	76	4″	3″

6.3. Materials, data and limits

	CTX H …	CTX I …
Casing	Stainless steel AISI 316L electro polished Ra<0.8	Stainless steel AISI 316L sand blasted Ra<3.2
Open impeller	Stainless steel AISI 316L electro polished Ra<0.8	Stainless steel AISI 316L electro polished Ra<3.2
Mechanical seal	Single, SiC/carbon (std) or SiC/SiC, FDA approved	Single, SiC/carbon (std) or SiC/SiC, FDA approved
O-rings	EPDM, FKM, NBR (all FDA approved)	EPDM, FKM, NBR (all FDA approved)
Motor	IP55; IEC frame B35; PTC thermistor; IE3; 3-phase	
Pressure rating @ 20°C	PN10 – CTX 40-165, CTX 50-145, CTX 50-200, CTX 65-175 PN16 – CTX 65-230, CTX 65-240, CTX 80-205, CTX 80-212, CTX 80-260, CTX 100-230	
Liquid temp.	(-10)÷120 °C (140°C for short periods during SiP)	
Ambient temp.	(-20)÷40 °C	
Viscosity	Max ~150 cSt	

6. DATA

6.4. Mounting torques and dimensions of screws/nuts

Screw / nut type	Description	CTX 40-165 CTX 50-145	CTX 50-200	CTX 65-175	CTX 65-230; CTX 65-240; CTX 80-205; CTX 80-212; CTX 80-260; CTX 100-230
	**Pos. 141. DIN 933 bolt**				
	Mounting torque [Nm]	8	8	8	20
	Tool size "S" [mm]	10	10	10	13
	Thread	M6	M6	M6	M8
	**Pos. 161. DIN 912 screw**				
	Mounting torque [Nm]	25	25	25	25
	Tool size "S" [mm]	6	6	6	6
	Thread	M8	M8	M8	M8
	**Pos. 121. DIN 933 bolt**				
	Mounting torque [Nm]	35	60	60	140
	Tool size "S" [mm]	17	19	19	24
	Thread	M10	M12	M12	M16
-	**Pos. 191. bolt**				
	Mounting torque [Nm]	40	65	40	65
	Tool size "S" [mm]	12	12	12	12
	Thread	M12	M14	M12	M14
	**Pos.20. DIN 934 nut**				
	Mounting torque [Nm]	40	40	40	40
	Tool size "S" [mm]	19	19	19	19
	Thread	M12	M12	M12	M12
	**Pos. 15.1. DIN 916 set screw**				
	Mounting torque [Nm]	2.5	2.5	2.5	2.5
	Tool size "S" [mm]	3	3	3	3
	Thread	M6	M6	M6	M6

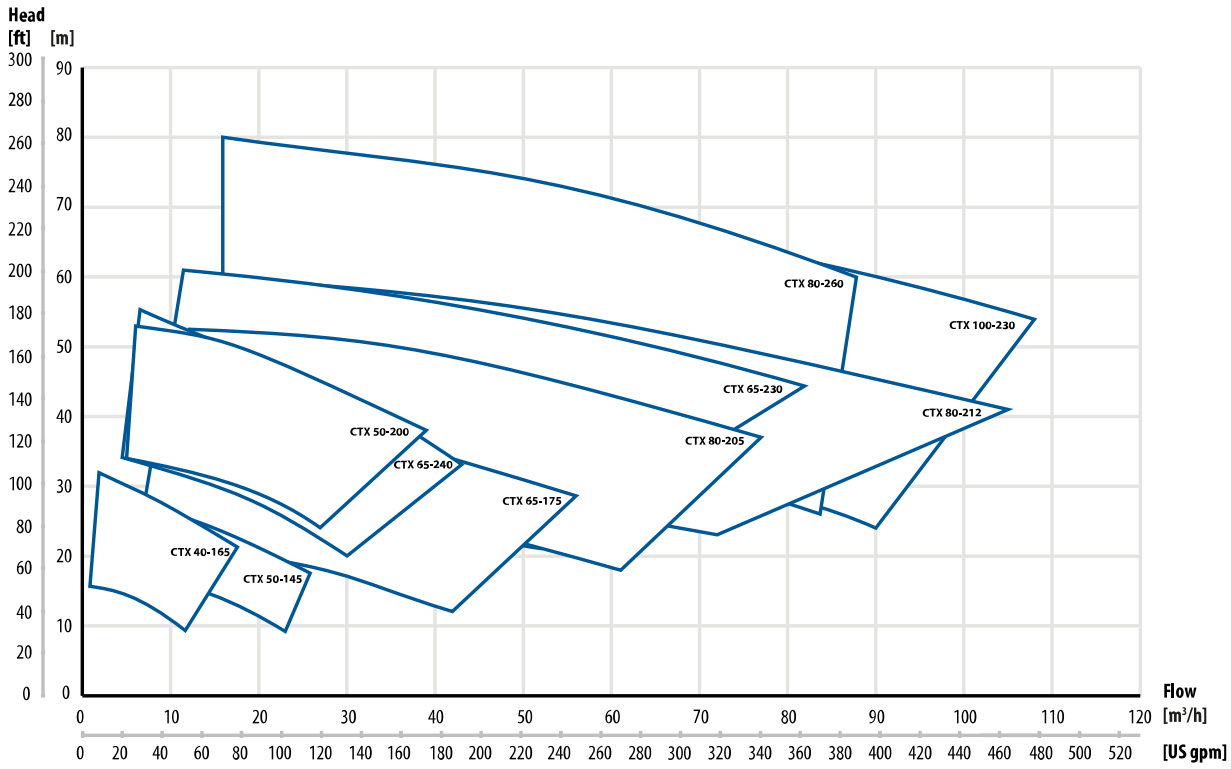
6. DATA

6.5. Performance curves

The performance curves are based on water at 20°C.

Contact us for detailed curves

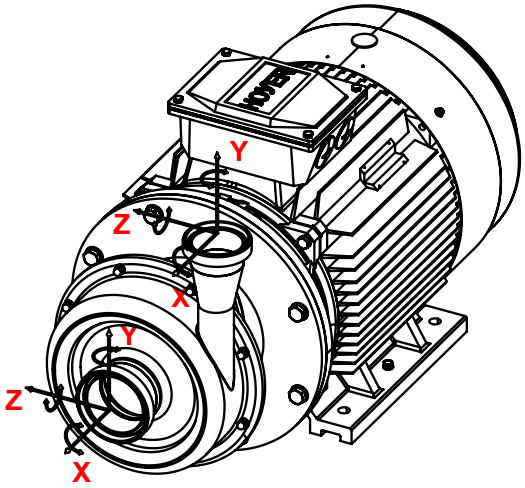
Speed 2900 rpm



6. DATA

6.6. Permitted loads on inlet and outlet

We recommend not to exceed the following loads and forces reacting on the inlet and outlet.



CTX I/H 40-165		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	65/55	26/4
Y	65/55	24/4
Z	65/55	24/3

CTX I/H 50-145		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	90/65	44/4
Y	90/65	17/4
Z	90/65	18/4

CTX I/H 50-200		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	90/65	45/5
Y	90/65	17/5
Z	90/65	17/5

CTX I/H 65-175		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	115/90	104/10
Y	115/90	39/10
Z	115/90	39/11

CTX I/H 65-230		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	115/65	103/5
Y	115/65	39/7
Z	115/65	39/5

CTX I/H 65-240		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	115/90	103/13
Y	115/90	39/11
Z	115/90	39/14

CTX I/H 80-205		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	135/90	157/16
Y	135/90	68/11
Z	135/90	68/15

CTX I/H 80-212		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	135/115	239/22
Y	135/115	182/16
Z	135/115	182/21

CTX I/H 80-260		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	135/115	159/32
Y	135/115	70/28
Z	135/115	69/34

CTX I/H 100-230		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	180/135	243/39
Y	180/135	83/45
Z	180/135	83/50

7. WARRANTY

7.1. Returning parts

When returning parts to Tapflo please follow this procedure:

- Consult Tapflo for shipping instructions.
- Cleanse or neutralize and rinse the part/pump. Make sure the part/pump is completely empty from liquid.
- Pack the return articles carefully to prevent any damage during transportation.

Goods will not be accepted unless the above procedure has been complied with.

7.2. Warranty

Tapflo warrants products under conditions as stated below for a period of not more than 12 months from installation and not more than 24 months from date of manufacturing.

1. The following terms and conditions apply to the sale of machinery, components and related services and products, of Tapflo (hereinafter "the products").

2. Tapflo (the manufacturer) warrants that:

   a. its products are free of defects in material, design and workmanship at the time of original purchase;
   b. its products will function in accordance with Tapflo operative manuals; Tapflo does not guarantee that the product will meet the precise needs of the Customer except for those purposes set out in any invitation to render documents or other documents specifically made available to Tapflo before entering into this agreement;
   c. high quality materials are used in the construction of the pumps and that machining and assembly are carried out to the highest standards.

   Except as expressly stated above, Tapflo makes no warranties, express or implied, concerning the products, including all warranties of fitness for a particular purpose.

3. This warranty shall not be applicable in circumstances other than defects in material, design and workmanship. In particular warranty shall not cover the following:

   a. Periodic checks, maintenance, repair and replacement of parts due to normal wear and tear (seals, O-rings, rubber items, bushings, etc..);
   b. Damage to the product resulting from:
      b.1. Tampering with, abuse or misuse, including but not limited to failure to use the product for its normal purposes as stated at the time of purchase or in accordance with Tapflo instructions for use and maintenance of the product, or the installation or improper ventilation or use of the product in a manner inconsistent with the technical or safety standard in force;
      b.2. Repairs performed by non-skilled personnel or use of non-original Tapflo parts;

b.3. Accidents or any cause beyond the control of Tapflo, including but not limited to lightning, water, fire, earthquake and public disturbances etc.;

4. The warrantee shall cover the replacement or repairing of any parts, which is documented faulty due to construction or assembling, with new or repaired parts free of charges delivered by Tapflo. Parts subjected to normal tear and wear shall not be covered by the warranty. Tapflo shall decide as to whether the defective or faulty part shall be replaced or repaired.

5. The warrantee of the products shall be valid for a period in accordance to the current law from the date of delivery, under the condition that notice of the alleged defect to the products or parts thereof be given to Tapflo in written within the mandatory term of 8 days from the discovery. Repair or replacement under the terms of this warranty shall not give a right to an extension to or a new commencement of the period of warranty.

6. Repair or replacement under the terms of this warranty shall not give a right to an extension to, or a new commencement of, the period of warranty. Repair or replacement under the terms of this warranty may be fulfilled with functionally equivalent reconditioned units. Tapflo qualified personnel shall be solely entitled to carry out repair or replacement of faulty parts after careful examination of the pump. Replaced faulty parts or components will become the property of Tapflo.

7. The products are built in accordance with standard CE normative and are tested (where applicable) by Tapflo. Approval and tests by other control authority are for the customer's account. The products shall not be considered defective in materials, design or workmanship if they need to be adapted, changed or adjusted to conform to national or local technical or safety standards in force in any country other than that for which the unit was originally designed and manufactured. This warranty shall not reimburse such adaptations, changes or adjustments, or attempt to do so. whether properly performed or not, nor any damage resulting from them, nor any adaptation change or adjustments to upgrade the products from their normal purpose as described in the products operative manual without the prior written consent of Tapflo.

8. Installation, including electric and other connections to utility mains according to Tapflo drawings, is for the cost and responsibility of the customer, unless otherwise agreed in writing.

9. Tapflo will not be liable on any claim, whether in contact, tort, or otherwise, for any indirect, special, incidental or consequential damages caused to the customer or to third parties, including loss of profits arising by any possible infringement of par. 3 above or by the customer or third parties being in the impossibility of using the products.

Steady the above, Tapflo liability to the customer or third parties from any claim, whether in contract, tort or otherwise, shall be limited to the total amount paid by the customer for the product that caused the damages.

7. WARRANTY

7.3. Warranty form

Company: _____

Telephone: _____ Fax: _____

Address: _____

Country: _____ Contact Name: _____

E-mail: _____

Delivery Date: _____ Date of pump installation: _____

Pump type: _____

Serial No (see name plate): _____

Description of the fault: _____

_____

_____

The installation:

Liquid: _____

Temperature [°C]: _____ Viscosity [cPs]: _____ Spec grav. [kg/m^3]: _____ pH-value: _____

Content of particles: _____ %, of max size [mm]: _____

Flow [l/min]: _____ Duty [h/day]: _____ No of starts per day: _____

Discharge head [mWC]: _____ Suction head / lift [m]: _____

Other: _____

_____

Place for sketch of installation:

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Sweden

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Tapflo products and services are available in 75 countries on 6 continents.

Tapflo is represented worldwide by own Tapflo Group Companies and carefully selected distributors assuring highest Tapflo service quality for our customers' convenience.

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