

IOM manual

tapflo®

CTI & CTH Centrifugal Pumps

edition 2018 rev 2

Original instruction



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



CTI

With 2900 rpm motor:

CTI AA-03
CTI AA-05
CTI BB-07
CTI CC-15
CTI CC-22
CTI CE-15
CTI CE-22
CTI DD-40
CTI DF-40
CTI DG-40
CTI DF-60
CTI DG-60
CTI EF-55
CTI EG-55
CTI EF-75
CTI EG-75
CTI EG-110B

CTH

With 2900 rpm motor:

CTH AA-03
CTH AA-05
CTH BB-07
CTH CC-15
CTH CC-22
CTH CE-15
CTH CE-22
CTH DD-40
CTH DF-40
CTH DG-40
CTH DF-60
CTH DG-60
CTH EF-55
CTH EG-55
CTH EF-75
CTH EG-75
CTH EG-110B

CTI

With 1450 rpm motor:

CTI AA-024
CTI BB-054
CTI CC-114
CTI CE-114
CTI DD-224
CTI DF-224
CTI DG-224

CTH

With 1450 rpm motor:

CTH AA-024
CTH BB-054
CTH CC-114
CTH CE-114
CTH DD-224
CTH DF-224
CTH DG-224



» All about your flow

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EC DECLARATION OF CONFORMITY 01/EC/CT/2016

Series:

CTI / CTH ...

Serial numbers:

2016 - ... (from 1604 - ...)

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 VERTICAL CENTRIFUGAL PUMPS**

The object of the declaration described above is in conformity with the relevant Union harmonization 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. Czatowska 4b
83-110 Tczew

Signed for and on behalf of Tapflo AB:



Håkan Ekstrand

Managing director

Tapflo AB, 16.04.2016

0. GENERAL

0. GENERAL

0.1. Introduction

The CT pumps are open or semi open single stage centrifugal pumps. They are manufactured in high finish and mechanical strong material stainless steel AISI 316L. The pump range meets the demands from a variety of today's industries.

The industrial series CTI is designed with glass 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 CTH is supplied with electro polished pump casing and 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, CT 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



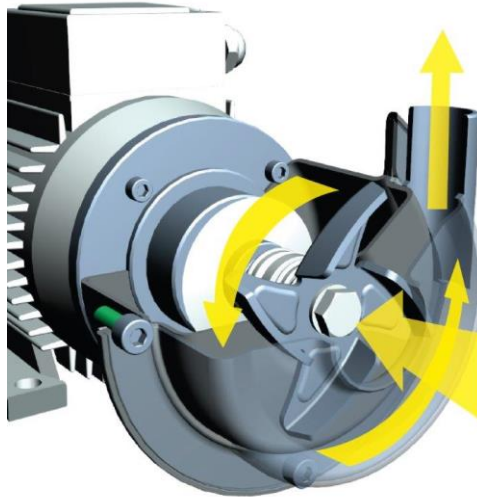
The personnel in charge of installation, operation and maintenance of the pumps we produce must be qualified to carry out the operations described in this manual. Tapflo shall not be held responsible for the training level of personnel and for the fact that they are not fully aware of the contents of 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. 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 twice per week. The pump-motor unit should always be stored indoor in dry, vibration and dust free conditions.

1.4. 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. INSTALLATION

1.5. 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.

1.6. 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.

1.6.1. 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.

1.6.2. 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 CT 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. INSTALLATION

1.7. 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.

1.7.1. 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.

1.7.2. 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.

1.7.3. 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.

1.7.4. 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.

1.7.5. Noise level



CT 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).

1.7.6. 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. INSTALLATION

1.7.7. Rotating parts



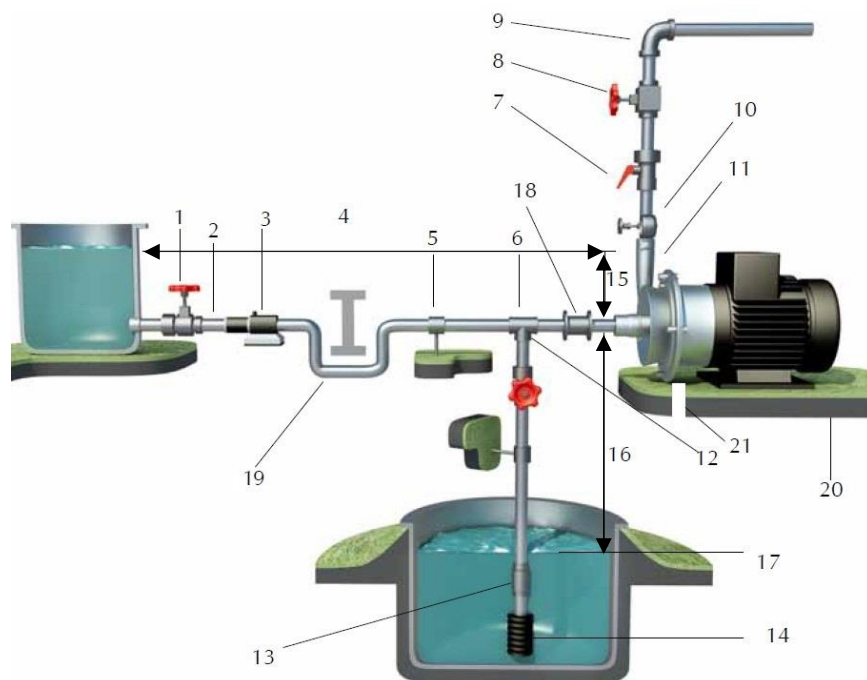
Do not tamper with the protection of the rotating parts, do not touch or approach rotating parts in movement.

1.7.8. 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.

1.8. 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. INSTALLATION

1.9. 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.

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.

1.9.1. Electric power

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

1.9.2. 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.

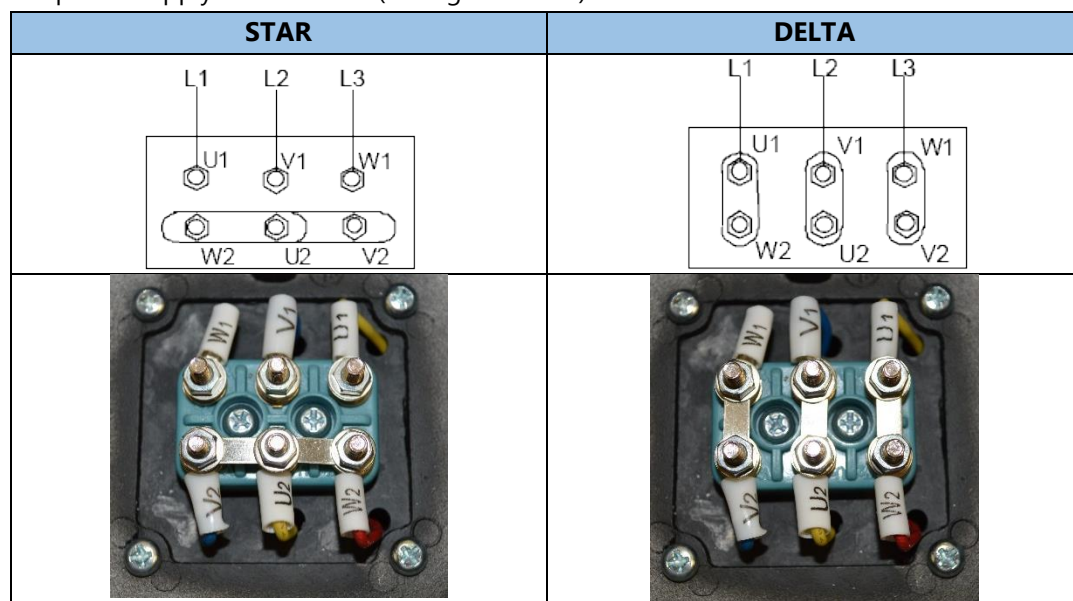
1.9.3. Thermometer

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

1.10. 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).



1. INSTALLATION

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.

1.11. Motor standard

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

- International Mounting Arrangement – **B34**
- Number of poles / Rotation speed [rpm] – **2**
- **Non ATEX**
- Protection grade – **IP55**
- Voltage – **3 phase**

| Motor power | RPM | Voltage | Frequency |
|----------------|------|-------------|-----------|
| 0,37 kW | 2900 | Δ230 / Y400 | 50 Hz |
| | 3500 | Δ265 / Y460 | 60 Hz |
| 0,55 kW | 2900 | Δ230 / Y400 | 50 Hz |
| | 3500 | Δ265 / Y460 | 60 Hz |
| 0,75 kW | 2900 | Δ230 / Y400 | 50 Hz |
| | 3500 | Y460 | 60 Hz |
| 1,5 kW | 2900 | Δ230 / Y400 | 50 Hz |
| | 3500 | Δ265 / Y460 | 60 Hz |
| 2,2 kW | 2900 | Δ230 / Y400 | 50 Hz |
| | 3500 | Δ265 / Y460 | 60 Hz |
| 4,0 kW | 2900 | Δ400 / Y690 | 50 Hz |
| | 3500 | Δ460 | 60 Hz |
| 5,5 kW | 2900 | Δ400 / Y690 | 50 Hz |
| | 3500 | Δ460 | 60 Hz |
| 6,0 kW | 2900 | Δ400 / Y690 | 50 Hz |
| 7,5 kW | 2900 | Δ400 / Y690 | 50 Hz |
| 11 kW | 2900 | Δ400 / Y690 | 50 Hz |

2. OPERATION

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, emptying therefore 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 completely 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 1.10 "Motor connection") and repeat the procedure described above.



- Any auxiliary connections must all be connected.
- If the pump is equipped with an oil reservoir, make sure to fill it before start-up.

2.1.1. Starting the pump



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 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

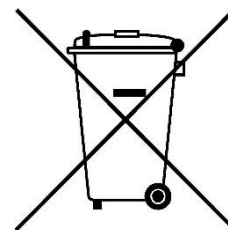
Even with proper application and observance of all points listed in this operating manual, there is still an estimable and unexpected residual risk when using the pumps. It may leak, fail due to wear, application-related causes or system-related circumstances.

2.5. Disposal after expiration of the expected lifetime

The metallic components like aluminium, stainless steel and carbon 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 case of a leakage of an unknown fluid, respiratory protection should be worn and contact with the fluid avoided. During firefighting, no special hazards are to be expected from the pump itself. In addition, the currently handled fluid and the corresponding safety data sheet must be taken into account.

In the event of personal injury, the appropriate emergency number or 112 must be chosen.

3. MAINTENANCE

3. MAINTENANCE



Maintenance work on electrical installations must be performed by qualified personnel and only when the power supply has been shutoff. 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.

3.2. Location of faults

| | Overheating of motor | Insufficient flow rate or pressure in pump | No pressure on the discharge side | 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 4 "Spare parts".

3.3.1. Disassembly procedure



Fig. 3.3.1

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



Fig. 3.3.2

Take off the pump casing [13].



Fig. 3.3.3

Remove the O-ring [18].

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



Fig. 3.3.4

Remove the impeller mounting screw [191] and the washer [192], use a spanner key in the opening of the pump back cover [11] to hold the shaft [16] during assembly and disassembly of the impeller. Remove the impeller.

3. MAINTENANCE



Fig 3.3.5

Carefully remove the back casing [12]. The static part [15B] of the mechanical seal will remain in the back casing.



Fig 3.3.6

If necessary, push out the static part [15B] of the mechanical seal.

NOTE! Apply some alcohol or water before pushing out of the mechanical seal.



Fig 3.3.7

Remove the deflector [17].

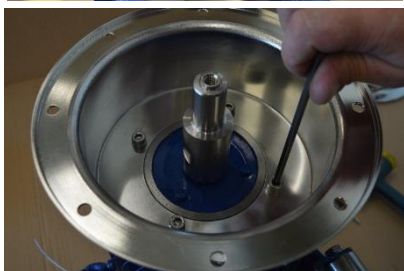


Fig 3.3.8

Remove the screws [121] and washers [122] fastening the back cover [11] to the motor [10].



Fig 3.3.9

Loosen the lock screws [161] and remove the shaft extension [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. MAINTENANCE

3.4. Assembly of the pump

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

Before inserting the static part [15B] of the mechanical seal, fit the back casing [12] onto the back cover [11] and check the seal fitting dimension according to the table below. This ensures that correct pressure is applied on the mechanical seal by the impeller.

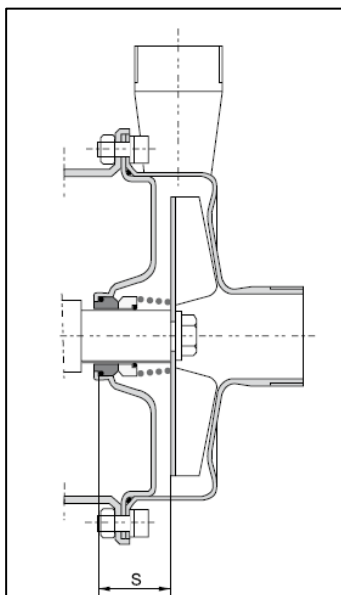
NOTE! This is a very important procedure when you have taken off the shaft extension.



Fig. 3.4.2

Using a calliper, adjust the "S" dimension.

It is achievable by loosening the lock screws [161] and moving the shaft extension [16] up or down.



| Pump type | S [mm] |
|-----------|--------|
| CT A | 33 |
| CT B | 33 |
| CT C | 35.5 |
| CT D | 35.5 |
| CT E | 35.5 |

3. MAINTENANCE

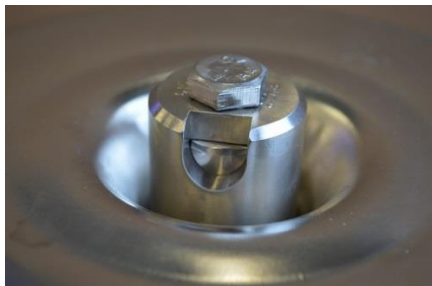


Fig. 3.4.3 – alternative way of assembly

„S“ dimension can also be set by special Tapflo tool [T]. Put the tool [T] onto the shaft extension [16] and fix it with the screw [191], then lean the tool [T] against internal rim of the back casing [12]. Using an allen key fix the shaft [16] by tightening screws [161].
NOTE1! Pay attention to the application of the tool [T]. There are 3 types of tools matching the following pump sizes:

- CT A, CT B
- CT C, CT D, CT E
- CT C, CT D, CT E with reinforced shaft

NOTE2! The inspection hole allows you to check whether the face of the shaft [16] touches the tool.

NOTE3! After tightening screw [161] remember to take off the mounting tool [T].

NOTE4! The set of special tools can be purchased under Tapflo code **5-355-16MTS**

Fig. 3.4.4

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

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

Fig. 3.4.5

While unpacking pay attention to the application (industrial / hygienic) of the mechanical seal [15].

Fig. 3.4.6

Lubricate the static part [15B] of mechanical seal to provide more accurate assembly as well as prevent the O-ring from blocking before reaching the surface of the internal rim.

3. MAINTENANCE



Fig. 3.4.7

Simultaneously with both hands push the static part [15B] of mechanical seal until the end.



Fig. 3.4.8

Ensure that the static part of mechanical seal is evenly spaced around the circumference.

NOTE! Check if O-ring does not springs back. It may springs back when O-ring does not reach the surface of the internal rim.



Fig. 3.4.9

Once again degrease surface of the recess and the sliding face of the static part of mechanical seal.



Fig. 3.4.10

Clean and degrease the shaft extension [16].



Fig. 3.4.11

Fit the back casing [12] onto the back cover [11].

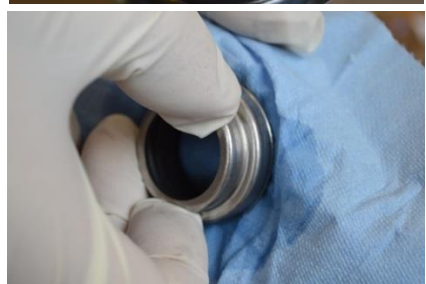


Fig. 3.4.12

Precisely clean and degrease the sealing face of the dynamic part of the mechanical seal [15A].

3. MAINTENANCE



Fig. 3.4.13

Put a few drops of alcohol on the dynamic part O-ring before mounting on shaft extension [16].



Fig. 3.4.14

Evenly pressing, place the dynamic part of the mechanical seal [15A] onto the shaft extension [16].



Fig. 3.4.15

Assembly the spring of the mechanical seal.



Fig. 3.4.16

Evenly with both hands press the impeller [9...] onto the shaft extension [16].

When mounting the impeller [9...] on the shaft extension [16] make sure that it is locked in the proper position before tightening the mounting screw [191] with its washer [192].

NOTE! Take care not to damage the head surface of the shaft extension.



Fig. 3.4.17

When assembling the washer [192] remember to face the flat surface towards the impeller [9...]. Fit the mounting screw [191] into the shaft extension [16].



Fig. 3.4.18

For tightening the mounting screw [191], use a spanner key in the opening of the pump back cover [11] to hold the shaft [16].

3. MAINTENANCE



Fig. 3.4.19

When assembling the casing, make sure that the O-ring sealing surfaces on the casing [13] and the back casing [12] are clean.

3.4.1. 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.

3.5. Disassembly – 4FZ option

Please follow below instructions in order to perform the disassembly of the lubricated and flushed seal option in our CT pumps.



Fig. 3.5.1

Loosen the screw holding the oil reservoir [62] and remove it.



Fig. 3.5.2

Unscrew the straight union from the back casing [126].



Fig. 3.5.3

Loosen the screw on the straight union [1366].

3. MAINTENANCE



Fig. 3.5.4

Release the metal pipe [1363].



Fig. 3.5.5

Loosen the screw on the elbow union [1367].



Fig. 3.5.6

Remove the metal pipe [1363].



Fig. 3.5.7

Unscrew and remove the elbow union [1367].



Fig. 3.5.8

Unscrew the connection adaptor [1364].

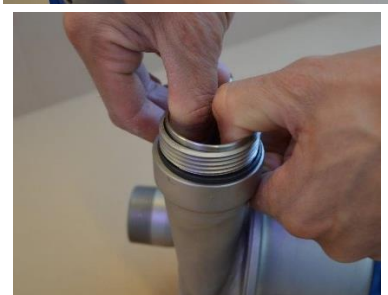


Fig. 3.5.9

Take out the strainer [1361] and the O-ring [1365].

3. MAINTENANCE



Fig. 3.5.10

Unscrew the straight union [1366].



Fig. 3.5.11

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



Fig. 3.5.12

Take off the pump casing [136].



Fig. 3.5.13

Remove the O-ring [18].

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



Fig. 3.5.14

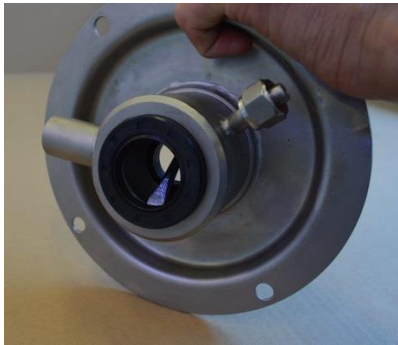
Remove the impeller mounting screw [191] and the washer [192], use a spanner key in the opening of the pump back cover [1146] to hold the shaft [16Z] during assembly and disassembly of the impeller. Remove the impeller.



Fig 3.5.15

Carefully remove the back casing [126]. The static part [15B] of the mechanical seal will remain in the back casing.

3. MAINTENANCE



Lubricated seal (4Z) only!

Fig. 3.5.16

If necessary remove the lip seal [159].

3.6. Assembly – 4FZ option

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. 3.6.1

Check if the strainer [1361] is not clogged and clean if necessary.



Fig. 3.6.2

Before inserting the lip seal [159] into the back casing [126] wet it with alcohol. Use a pressing device to insert the lip seal.

3.6.1. 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. OPTIONS

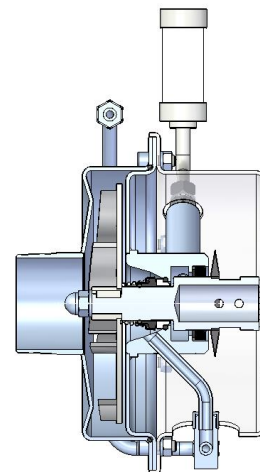
4.1. Lubricated seal – 4Z

A great option when there is a potential risk of dry running, or where the product tends to solidify or crystallize. An oil reservoir is connected to the mechanical seal chamber.



The pump is delivered without lube medium in oil reservoir!

- Before the first start fill up the oil reservoir with a proper medium (i.e. SAE 20 oil). In case if the pumped medium cannot be contaminated by oil, you should use a lubricating medium compatible with the pumped medium;
- Medium in the oil reservoir should be also compatible with materials that the pump is made of (when using oil as buffering liquid you should not use EPDM O-rings in mechanical seal);
- As a standard, an NBR lip seal is used (other materials are available upon request);
- Oil reservoir should be filled up to $\frac{3}{4}$ of cup height;
- You should change liquid after 2000 hours of operation or once a year.
- For food applications it is recommended to use FDA approved liquid.

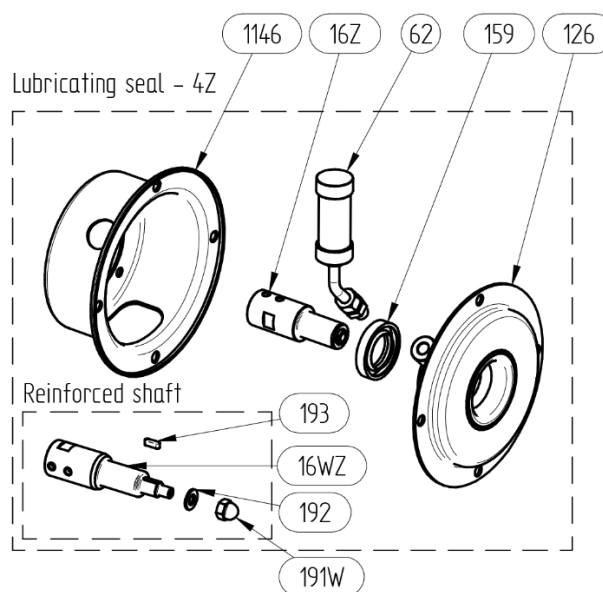


Important!

- If mechanical seal damage will occur, fluid level in the chamber will increase and then it will spill out of the oil reservoir. You must stop the pump immediately to replace mechanical seal!
- If liquid level in oil reservoir will start decreasing in short period of time, probably the lip seal is damaged. You should stop the pump and replace damaged lip seal.

4. OPTIONS

Additional / different parts:



Available for pump sizes: C, D and E

| Art. no | Q-ty | Description |
|-------------|------|---|
| 5-xxx-1146 | 1 | Pump back cover for lubricated seal |
| 5-xxx-126 | 1 | Pump back casing with welded seal chamber |
| 5-xxx-159 | 1 | Lip seal |
| 5-xxx-16Z | 1 | Shaft for pump with lubricated seal |
| 5-xxx-16WZ* | 1 | Shaft – reinforced version |
| 5-xxx-62 | 1 | Oil reservoir |
| 5-xxx-191W* | 1 | Domed nut for reinforced shaft |
| 5-xxx-192* | 1 | Washer for reinforced shaft |
| 5-xxx-193* | 1 | Key for reinforced shaft |

* Option

4. OPTIONS

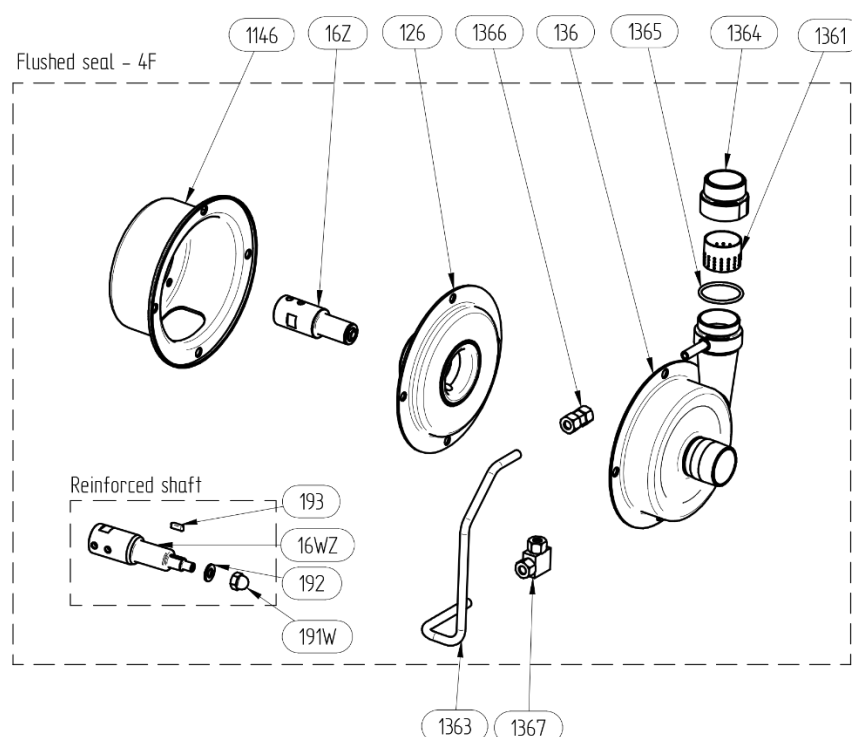
4.2. Flushed seal – 4F (API Plan 11)

When abrasive or sticky particles are present, it's recommended to use a flushed seal system. A small amount of the pumped product is recirculated from the discharge side to the seal chamber to flush solids cumulated in it. It helps to save mechanical seal (15) and back casing (12) from being worn. In addition a self-cleaning filter is used at the discharge.

Flushed seal pipe work is fully demountable. To disassemble self-cleaning filter for removal of collected "big" particles or routine inspections, remove upper flange and then disassemble the filter. To provide easy disassembly the flushing steel pipe line is fixed with gas fittings.



Additional / different parts:



Available for pump sizes: C, D and E

| Art. no | Q-ty | Description |
|------------|------|---|
| 5-xxx-1146 | 1 | Pump back cover for flushed seal |
| 5-xxx-126 | 1 | Pump back casing with welded seal chamber |
| 5-xxx-136 | 1 | Pump cover for flushed seal |
| 5-xxx-1361 | 1 | Strainer |
| 5-xxx-1363 | 1 | Metal pipe |
| 5-xxx-1364 | 1 | Connection adaptor |
| 5-xxx-1365 | 1 | Adaptor O-ring |
| 5-xxx-1366 | 1 | Straight union |
| 5-xxx-1367 | 1 | Elbow union |
| 5-xxx-16Z | 1 | Shaft |

4. OPTIONS

4.3. Heating / cooling jacket – 4J

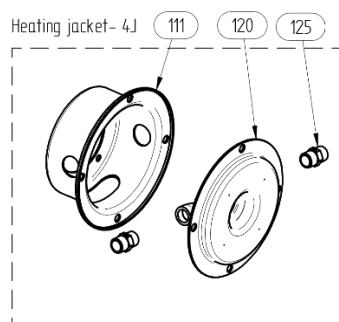
Great protection for the mechanical seal in cases where there is a risk of solidification of the product. The heating jacket is also used when the pumped product has to maintain a specific temperature, high or low. A heating or cooling medium is continuously circulated in the jacket.

Heating / cooling is operated by a jacket welded into the pump back casing (12). The jacket has two G ½" connections. To connect the jacket use flexible hoses to prevent any undue stress and strain on the heating jacket connectors.

For heating / cooling process use medium that is fully compatible with materials the pump is made of. Maximum temperature for heating medium is 60°C, maximum pressure is 2 bar. It's crucial to avoid sudden temperature changes that could cause excessive strain. The pump can also be equipped with optional connections on the heating jacket (e.g. flanges).



Additional / different parts:



Available for pump sizes: C, D and E

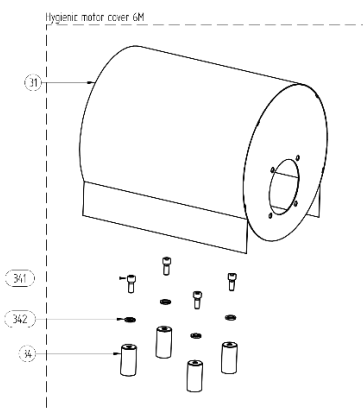
| Art. no | Q-ty | Description |
|-----------|------|--------------------------------------|
| 5-xxx-111 | 1 | Pump back cover for heating jacket |
| 5-xxx-120 | 1 | Pump back casing with heating jacket |
| 5-xxx-125 | 2 | Joint for pump with heating jacket |

4.4. Hygienic shroud – M

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 is equipped with feet.



Additional / different parts:



Available for all pump sizes

| Art. no | Q-ty | Description |
|-----------|------|--------------------------|
| 5-xxx-31 | 1 | Hygienic pump shroud |
| 5-xxx-34 | 4 | Shroud foot |
| 5-xxx-341 | 4 | Shroud foot screw |
| 5-xxx-342 | 4 | Shroud foot screw washer |

4. OPTIONS

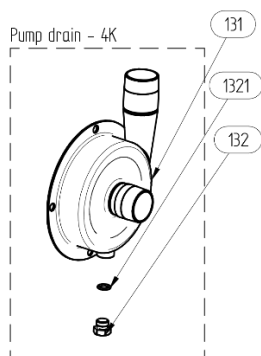
4.5. Pump drain – 4K

To allow easy draining, the pump casing can be designed with a drain and drain plug. To empty the pump just remove the plug and the casing will drain automatically.

As a standard, the drain has a G 3/8" threaded connection. Optional connections like Tri-clamp or hygienic thread can be fitted instead.



Additional / different parts:



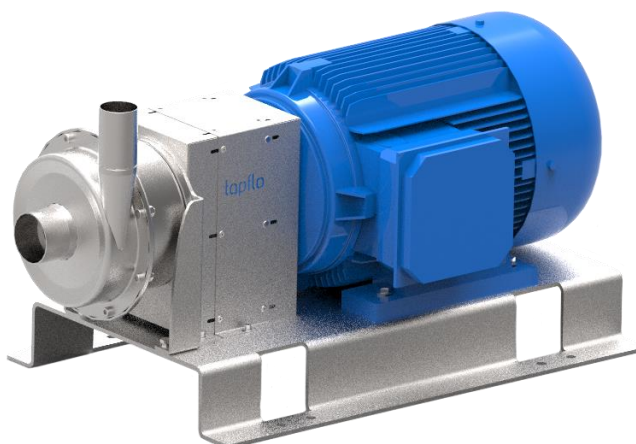
Available for all pump sizes

| Art. no | Q-ty | Description |
|--------------|------|--|
| 5-xxx-131 | 1 | Pump casing with drain |
| 5-xxx-131(x) | 1 | Pump casing with drain; x – nonstandard drain plug and size |
| 5-xxx-132 | 1 | Drain plug |
| 5-xxx-1321 | 1 | Drain plug O-ring |

4.6. Long coupled execution – B

Long coupled execution is a perfect solution when pumping hot products like oil at temperatures up to 180°C.

Complete pump unit is mounted on baseplate, with coupling, bearing and guard. Usage of additional bearing also provides more stable work for the pump unit.



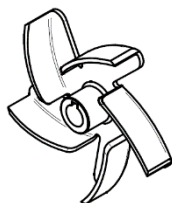
Available for all pump sizes

For spare parts drawing and list please refer to chapter 5.5. *Spare parts – long coupled execution*

4. OPTIONS

4.7. Semi-open impeller – 4H; Reinforced impeller – 4W

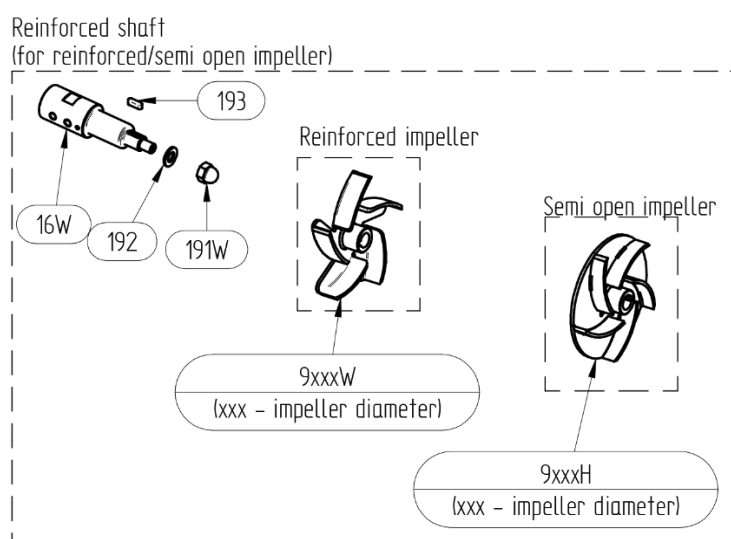
Tapflo CT pumps can be fitted with a semi-open impeller in comparison to its standard open impeller. This option ensures more stable operation, lower noise, lower vibrations and more robust construction. It is recommended to use the semi-open impeller when hard solids can be present in the pumped liquid. This impeller is always in reinforced execution.



The reinforced impeller is a great option when pumping high viscous liquids or ones containing solid particles. This design is much more robust and can withstand more tensions transferred from the liquid.

NOTE! The D, F and G size impellers are reinforced as standard.

Additional / different parts:



Available for all pump sizes

| Art. no | Q-ty | Description |
|-------------|------|------------------------|
| 5-xxx-9xxxH | 1 | Semi-open impeller |
| 5-xxx-16W | 1 | Reinforced shaft |
| 5-xxx-191W | 1 | Domed nut for impeller |
| 5-xxx-192 | 1 | Washer |
| 5-xxx-193 | 1 | Mounting key |

| Art. no | Q-ty | Description |
|-------------|------|------------------------|
| 5-xxx-16W | 1 | Reinforced shaft |
| 5-xxx-9xxxW | 1 | Reinforced impeller |
| 5-xxx-191W | 1 | Domed nut for impeller |
| 5-xxx-192 | 1 | Washer |
| 5-xxx-193 | 1 | Mounting key |

4. OPTIONS

4.8. Reinforced pump casing – 4B

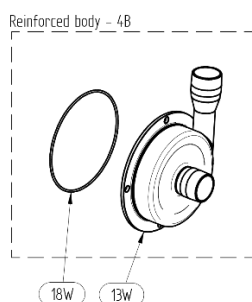
This option is perfect for CT pumps when the pumped liquid has high penetration properties like paraffin.

4B stands for reinforced front cover which has special groove for O-ring.

4O is for increased number of mounting holes in pump casing, back cover and back casing.



Additional / different parts:



Available for all pump sizes

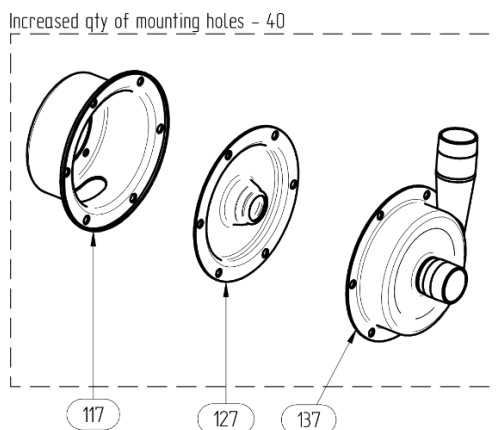
| Art. no | Q-ty | Description |
|-----------|------|--------------------------------------|
| 5-xxx-13W | 1 | Reinforced pump casing |
| 5-xxx-18W | 1 | Housing O-ring for reinforced casing |

4.9. Increased number of mounting holes – 4O

This options is perfect for CT pumps when the pumped liquid has high penetration properties like paraffin.

4O is for increased number of mounting holes in pump casing, back cover and back casing.

Additional / different parts:



Available for all pump sizes

| Art. no | Q-ty | Description |
|-----------|------|---|
| 5-xxx-117 | 1 | Pump back cover with increased no of holes |
| 5-xxx-127 | 1 | Pump back casing with increased no of holes |
| 5-xxx-137 | 1 | Pump casing with increased no of holes |

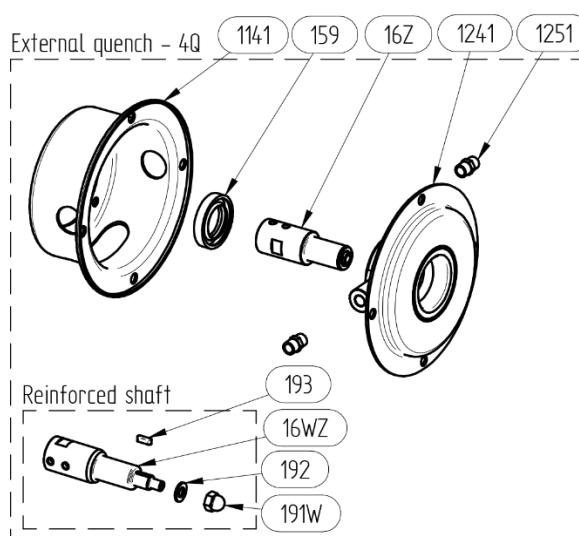
4. OPTIONS

4.10. External quench – 4Q

This option is similar to the lubricated seal option and is recommended when there is a potential risk of dry running, or where the product tends to solidify or crystallize when in contact with air. There is however an added value to this option, as circulating quench liquid removes heat from the mechanical seal. It is recommended to use a thermos-siphon circulation method in the quench circuit.

NOTE! Max pressure in the quench circuit is 0,5 bar.

Additional / different parts:



Available for pump sizes C, D and E

| Art. no | Q-ty | Description |
|------------|------|--------------------------------------|
| 5-xxx-1141 | 1 | Pump back cover for external quench |
| 5-xxx-1241 | 1 | Pump back casing for external quench |
| 5-xxx-1251 | 2 | Connection joint |
| 5-xxx-159 | 1 | Lip seal |
| 5-xxx-16Z | 1 | Pump shaft for external quench |

4.11. Mechanical seal options

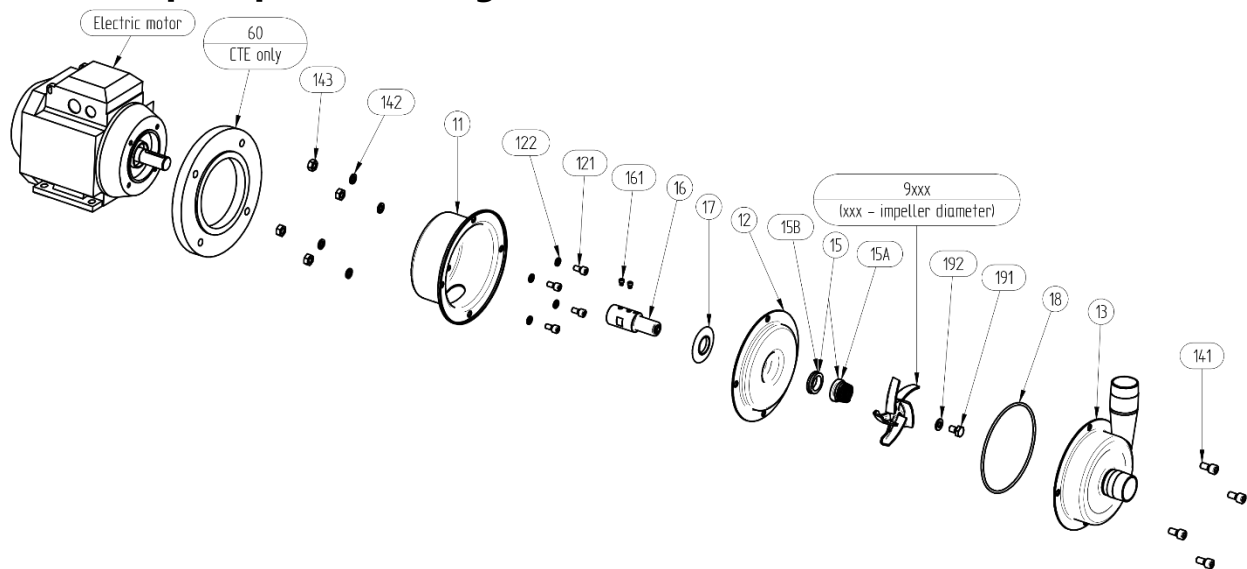
Apart from different materials that can be used for static and dynamic seal faces as well as elastomers (see 6.1 "Pump code") we offer a range of different special execution mechanical seals:

- 2P – in this option the O-ring of the static part of the mechanical seal is replaced by an OP-ring (square O-ring). This increases friction between the O-ring and the back casing thus lowering chances of static part rotation when seal faces stick together.
- 2K – this option refers only to SiC/SiC mechanical seals. Standard seals have seal faces of the same hardness therefore there is potential risk of them sticking together due to adhesion phenomena. 2K offers seal faces of different hardness (J/D) thus eliminating this risk. Additionally seal is equipped with OP-ring.

5. SPARE PARTS

5. SPARE PARTS

5.1. Spare parts drawing



5.2. Spare parts list

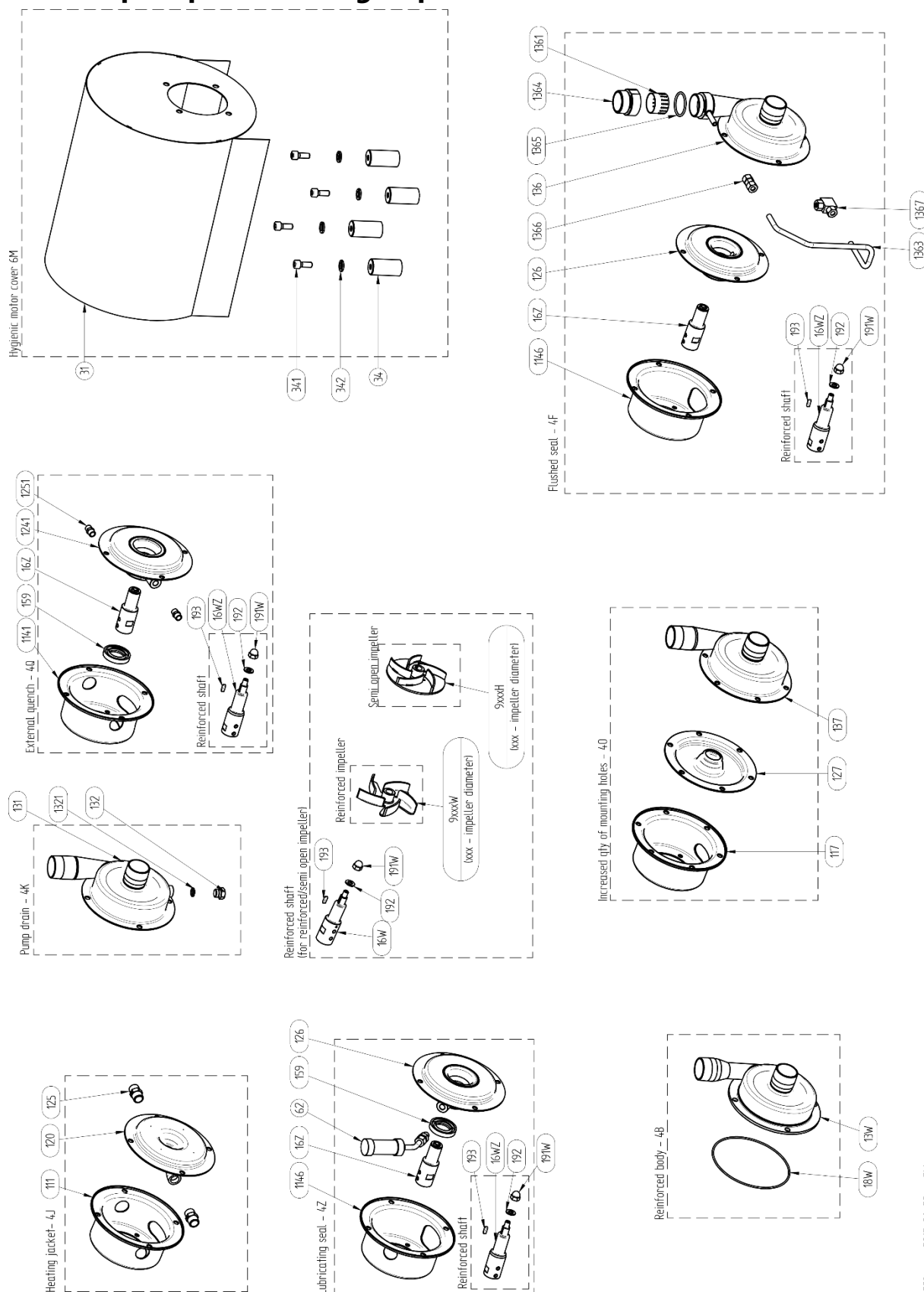
| Pos. | Description | Size | | | | | Material | |
|------|----------------------------------|------|------|------|------|------|------------------------------------|---|
| | | CT A | CT B | CT C | CT D | CT E | CT I | CT H |
| 11 | Back cover [H/N]* | 1 | 1 | 1 | 1 | 1 | AISI 316L Glass blasted | AISI 316L Ra<0.8 |
| 12 | Back casing [H/N] | 1 | 1 | 1 | 1 | 1 | AISI 316L Glass blasted | AISI 316L Ra<0.8 |
| 121 | Back cover mounting screws | 4 | 4 | 4 | 4 | 4 | A4-70 | A4-70 |
| 122 | Back cover mounting washers | 4 | 4 | 4 | 4 | 4 | A4-80 | A4-80 |
| 13 | Pump casing [H/N] | 1 | 1 | 1 | 1 | 1 | AISI 316L Glass blasted | AISI 316L Ra<0.8 |
| 141 | Casing mounting screws | 4 | 4 | 4 | 8 | 8 | A4-70 | A4-70 |
| 142 | Casing mounting washers | 4 | 4 | 4 | 8 | 8 | A4-80 | A4-80 |
| 143 | Casing mounting nuts | 4 | 4 | 4 | 8 | 8 | A4-70 | A4-70 |
| 15 | Mechanical seal (complete) [H/N] | 1 | 1 | 1 | 1 | 1 | See 6.1 | See 6.1 |
| 16 | Shaft extension | 1 | 1 | 1 | 1 | 1 | AISI 316L | AISI 316L |
| 161 | Lock screw | 1 | 1 | 2 | 2 | 2 | A2-70 | A2-70 |
| 17 | Deflector | 1 | 1 | 1 | 1 | 1 | NBR | NBR |
| 18 | Casing O-ring [H/N] | 1 | 1 | 1 | 1 | 1 | EPDM (std), FKM, FEP/Silicone, NBR | EPDM FDA (std), FKM FDA, FEP/Silicone FDA |
| 191 | Impeller mounting screw | 1 | 1 | 1 | 1 | 1 | A4-70 | A4-70 |
| 192 | Impeller mounting washer | 1 | 1 | 1 | 1 | 1 | A4-70 | A4-70 |
| 60 | Motor adaptive flange | - | - | - | - | 1 | Aluminium | Aluminium |
| 9xxx | Impeller (xxx – diameter) | 1 | 1 | 1 | 1 | 1 | AISI 316L Ra<0,8 | AISI 316L Ra<0.8 |



* Parts indicated as [H/N] have different execution for CT I and CT H pumps. When ordering spare parts please indicate if the part is for Industrial or Hygienic series e.g. 5-340**N**-11 or 5-340**H**-11.

5. SPARE PARTS

5.3. Spare parts drawing - options



[150229] 2015-06-29 PLJ

5. SPARE PARTS

5.4. Spare parts list - options

| Lubricated seal – 4Z | | |
|----------------------|------|---|
| Art. no | Q-ty | Description |
| 5-xxx-1146 | 1 | Pump back cover for lubricated seal |
| 5-xxx-126 | 1 | Pump back casing with welded seal chamber |
| 5-xxx-159 | 1 | Lip seal |
| 5-xxx-16Z | 1 | Shaft for pump with lubricated seal |
| 5-xxx-16WZ* | 1 | Shaft – reinforced version |
| 5-xxx-62 | 1 | Oil reservoir |
| 5-xxx-191W* | 1 | Domed nut for reinforced shaft |
| 5-xxx-192* | 1 | Washer for reinforced shaft |
| 5-xxx-193* | 1 | Key for reinforced shaft |

* Option

| Flushed seal – 4F | | |
|-------------------|------|---|
| Art. no | Q-ty | Description |
| 5-xxx-1146 | 1 | Pump back cover for flushed seal |
| 5-xxx-126 | 1 | Pump back casing with welded seal chamber |
| 5-xxx-136 | 1 | Pump cover for flushed seal |
| 5-xxx-1361 | 1 | Strainer |
| 5-xxx-1363 | 1 | Metal pipe |
| 5-xxx-1364 | 1 | Connection adaptor |
| 5-xxx-1365 | 1 | Adaptor O-ring |
| 5-xxx-1366 | 1 | Straight union |
| 5-xxx-1367 | 1 | Elbow union |
| 5-xxx-16Z | 1 | Shaft |

| Heating jacket – 4J | | |
|---------------------|------|--------------------------------------|
| Art. no | Q-ty | Description |
| 5-xxx-111 | 1 | Pump back cover for heating jacket |
| 5-xxx-120 | 1 | Pump back casing with heating jacket |
| 5-xxx-125 | 2 | Joint for pump with heating jacket |

| External quench – 4Q | | |
|----------------------|------|--------------------------------------|
| Art. no | Q-ty | Description |
| 5-xxx-1141 | 1 | Pump back cover for external quench |
| 5-xxx-1241 | 1 | Pump back casing for external quench |
| 5-xxx-1251 | 2 | Connection joint |
| 5-xxx-159 | 1 | Lip seal |
| 5-xxx-16Z | 1 | Pump shaft for external quench |

| Hygienic shroud - M | | |
|---------------------|------|--------------------------|
| Art. no | Q-ty | Description |
| 5-xxx-31 | 1 | Hygienic pump shroud |
| 5-xxx-34 | 4 | Shroud foot |
| 5-xxx-341 | 4 | Shroud foot screw |
| 5-xxx-342 | 4 | Shroud foot screw washer |

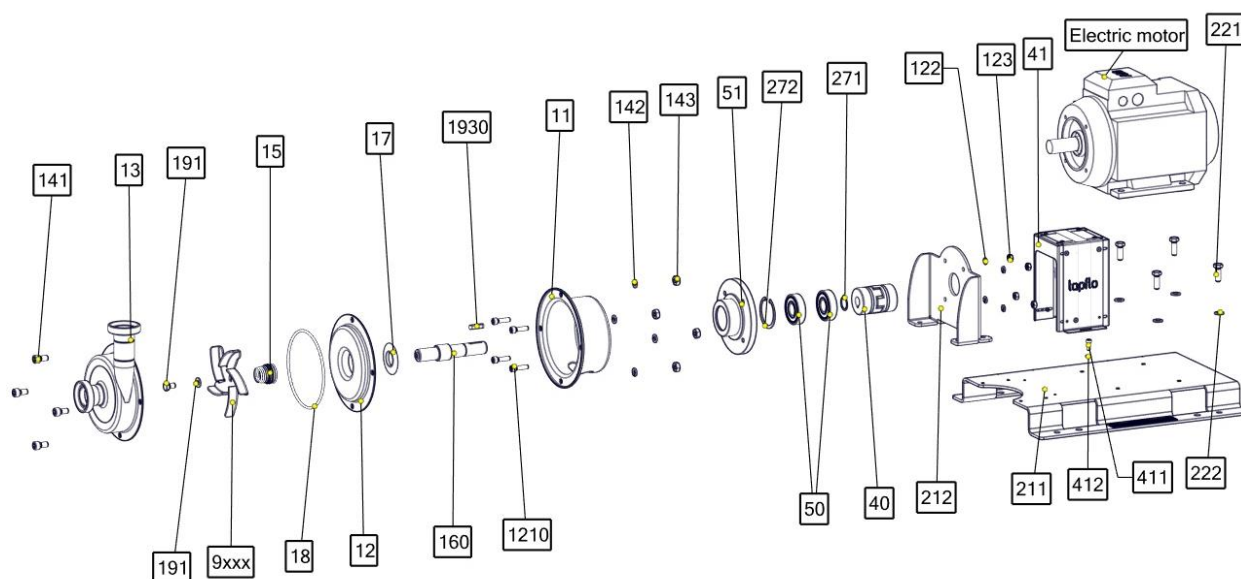
| Pump drain – 4K | | |
|-----------------|------|--|
| Art. no | Q-ty | Description |
| 5-xxx-131 | 1 | Pump casing with drain |
| 5-xxx-131(x) | 1 | Pump casing with drain; x – nonstandard drain plug and size |
| 5-xxx-132 | 1 | Drain plug |
| 5-xxx-1321 | 1 | Drain plug O-ring |

| Semi-open impeller – 4H Reinforced impeller – 4W | | |
|---|------|------------------------|
| Art. no | Q-ty | Description |
| 5-xxx-9xxxH | 1 | Half open impeller |
| 5-xxx-9xxxW | 1 | Reinforced impeller |
| 5-xxx-16W | 1 | Reinforced shaft |
| 5-xxx-191W | 1 | Domed nut for impeller |
| 5-xxx-192 | 1 | Washer |
| 5-xxx-193 | 1 | Mounting key |

| Reinforced pump casing – 4B Increased number of mounting holes – 4O | | |
|--|------|--------------------------------------|
| Art. no | Q-ty | Description |
| 5-xxx-117 | 1 | Back cover - increased no of holes |
| 5-xxx-127 | 1 | Back casing - increased no of holes |
| 5-xxx-137 | 1 | Casing - increased no of holes |
| 5-xxx-13W | 1 | Reinforced pump casing |
| 5-xxx-18W | 1 | Housing O-ring for reinforced casing |

5. SPARE PARTS

5.5. Spare parts – long coupled execution



5.6. Spare parts list – long coupled execution

| Pos. | Description | Q-ty | Material |
|------|-------------------------------|--------|---|
| 11 | Back cover | 1 | AISI 316L |
| 12 | Back casing | 1 | AISI 316L |
| 1210 | Back cover mounting screws | 4 | A4-70 |
| 122 | Back cover mounting washer | 4 | A4-70 |
| 123 | Back cover mounting nut | 4 | A4-70 |
| 13 | Pump casing | 1 | AISI 316L |
| 141 | Casing mounting screws | 4 / 8* | A4-70 |
| 142 | Casing mounting washers | 4 / 8* | A4-80 |
| 143 | Casing mounting nuts | 4 / 8* | A4-70 |
| 15 | Mechanical seal (complete) | 1 | See 6.1 |
| 160 | Shaft for long coupled pump | 1 | AISI 316L |
| 17 | Deflector | 1 | NBR |
| 18 | Casing O-ring | 1 | EPDM FDA (std), FKM FDA, FEP/Silicone FDA |
| 191 | Impeller mounting screw | 1 | A4-70 |
| 192 | Impeller mounting washer | 1 | A4-70 |
| 1930 | Key for shaft | 1 | A4 |
| 211 | Base plate for pump assembly | 1 | AISI 304L |
| 212 | Pump bracket | 1 | AISI 304L |
| 221 | Motor mounting screw | 4 | A4-70 |
| 222 | Motor mounting nut | 4 | A4-70 |
| 271 | Bearing circlip towards motor | 1 | Cr3 coated steel |
| 272 | Bearing circlip towards pump | 1 | Cr3 coated steel |
| 40 | Coupling | 1 | AISI 316Ti |
| 41 | Bearing cover | 1 | AISI 316L |
| 411 | Bearing cover mounting screw | 4 | A4-70 |
| 412 | Bearing cover mounting washer | 4 | A4-70 |
| 50 | Bearing | 2 | AISI 52100 |
| 51 | Cover for bearing | 1 | AISI 316L |
| 9xxx | Impeller (xxx – diameter) | 1 | AISI 316L Ra<0.8 |

* 4 for CT A, B and C size; 8 for CT D and E size

5. SPARE PARTS

5.7. Recommended spare parts

Normally the CT 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 have to be replaced. We recommend having the following parts in stock:

| Pos. | Description | Q-ty |
|------|-----------------|------|
| 15 | Mechanical seal | 1 |
| 18 | Casing O-ring | 1 |

5.8. 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. DATA

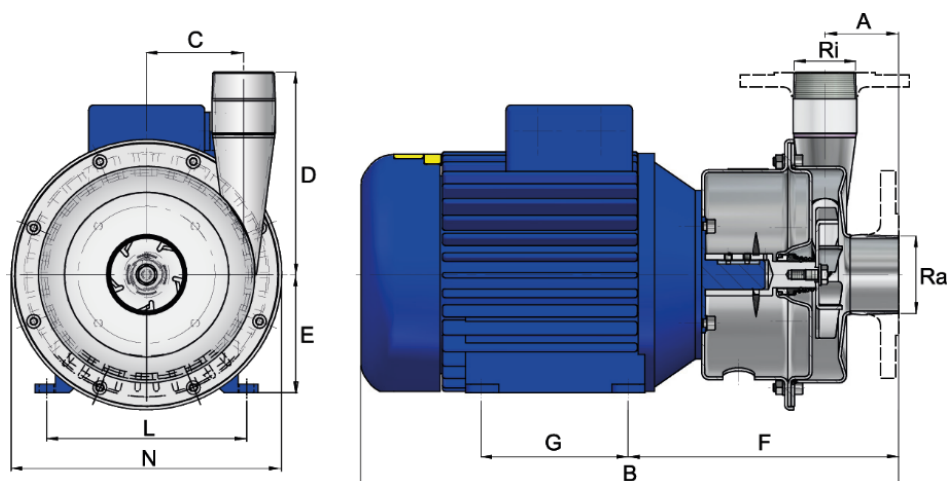
6.1. Pump code

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. Tapflo centrifugal pump | II. Pump execution | III. Casing size | IV. Impeller size | V. Pump options | VI. Motor power | VII. Motor option |
|---|--------------------|------------------|-------------------|--|-----------------|-------------------|
| CT | I | C | C- | 1CGV3F- | 02 | M |
| I. CT = Tapflo centrifugal pump II. Pump execution: I = Industrial H = Hygienic III. Casing size (motor flange diameter / IEC size): A = 105 mm / 71 B = 120 mm / 80 C = 140 mm / 90 D = 160 mm / 100 or 112 E = 200 mm / 132 IV. Impeller size A = 90 mm B = 98 mm C = 125 mm D = 130 mm (reinforced in standard) E = 135 mm F = 155 mm (reinforced in standard) G = 180 mm (reinforced in standard) | | | | V. Pump options 3R = Thread RJT (CTH only) 3P = ISO 1127 clamp (CTH only) 3DA = DIN11866-1A thread (CTH only) 3X = Thread DIN 11851 (on CTI) 4. Special executions 4J = Pump with heating jacket 4F = Flushed seal 4Z = Lubricated seal 4H = Semi open heavy duty impeller (C-G sizes) 4K = Drain plug (3/8" BSP thread as standard) 4PX = Welds polishing (CTH only) 4W = Reinforced inimpeller (D and F sizes only) 4Q = External quench 4B = Reinforced front cover; special O-ring 4O = Increased number of mounting holes VI. Motor power / IEC motor size 2900 rpm motors (2-pole): 03 = 0.37 kW / 71 05 = 0.55 kW / 71 07 = 0.75 kW / 80 15 = 1.5 kW / 90 22 = 2.2 kW / 90 40 = 4.0 kW / 112 55 = 5.5 kW / 132 60 = 6.0 kW / 112 75 = 7.5 kW / 132 110 = 11.0 kW / 160 (long coupled pump only) 1450 rpm motors (4-pole): 024 = 0.25 kW / 71 054 = 0.55 kW / 80 114 = 1.1 kW / 90 224 = 2.2 kW / 100 VII. Motor options M = Hygienic motor shroud (CTS H) B = Long coupled pump P = Single phase motor X2d = Eex d IIB T4 motor X2e = Eex e IIB T3 motor X3e = Ex II 3G T135C motor - tropic T = Motor with PTC thermistor V...F... = Motor for special voltage, frequency * = standard execution | | |
| V. Pump options: 1. Mechanical seal: Blank* = ceramic/graphite/EPDM (FDA on CTH) 1CGV = ceramic/graphite/FKM (FDA on CTH) 1CGF = ceramic/graphite/FEP (FDA) 1CGN = ceramic/graphite/NBR (CTI only) 1SSE = SiC/SiC/EPDM (FDA on CTH) 1SSV = SiC/SiC/FKM (FDA on CTH) 1SSF = SiC/SiC/FEP (FDA) 1SSN = SiC/SiC/NBR (CTI only) 1SGE = SiC/graphite/EPDM (FDA on CTH) 1SGV = SiC/graphite/FKM (FDA on CTH) 1SGF = SiC/graphite/FEP (FDA) 1SGN = SiC/graphite/NBR (CTI only) 2. Mechanical seal type: P = Standard mechanical seal with OP-ring K = Different hardness of static and dynamic seal elements – J/D with OP-ring (SiC/SiC only) 3. Connection options Blank* = Thread BSP on CTI Thread DIN 11851 on CTH 3A = ANSI flange (CTI only) 3B = BSPT thread (on CTH) 3C = Clamp ISO 2852 (CTH only) 3F = Flange DIN2633 PN 10/16 3T = Clamp DIN 32676 (CTH only) 3S = Thread SMS 1145 (CTH only) | | | | | | |

6. DATA

6.2. Dimensions - CTI



Dimensions in mm (where other is not indicated)

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

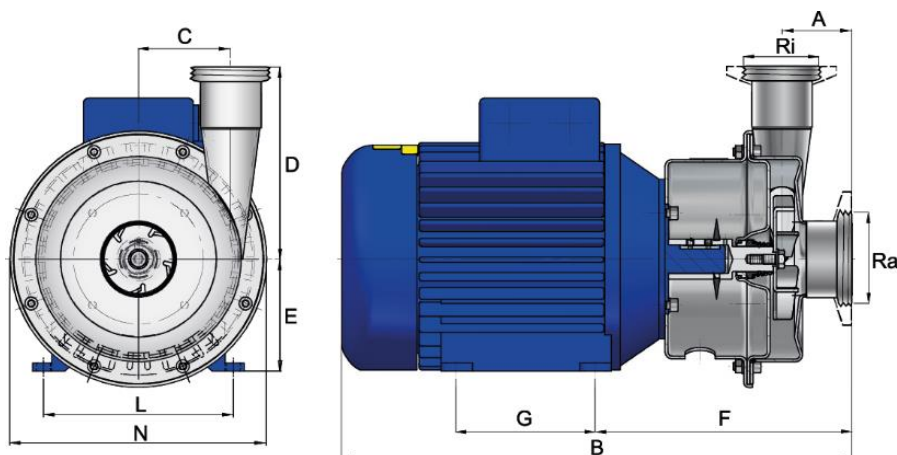
| MODEL | Motor power | IEC size | Weight [kg] | A | B* | C | D | E | F | G* | L* | N |
|------------|-------------|----------|-------------|----|-----|----|-----|-----|-----|-----|-----|-----|
| CTI AA-03 | 0.37 | 71 | 7.15 | 60 | 358 | 36 | 100 | 71 | 193 | 90 | 112 | 145 |
| CTI AA-05 | 0.55 | 71 | 8.00 | 60 | 358 | 36 | 100 | 71 | 193 | 90 | 112 | 145 |
| CTI BB-07 | 0.75 | 80 | 11.40 | 63 | 395 | 50 | 110 | 80 | 205 | 100 | 125 | 170 |
| CTI CC-15 | 1.5 | 90 | 22.25 | 64 | 404 | 68 | 160 | 90 | 226 | 100 | 140 | 205 |
| CTI CC-22 | 2.2 | 90 | 23.95 | 64 | 404 | 68 | 160 | 90 | 226 | 100 | 140 | 205 |
| CTI CE-22 | 2.2 | 90 | 24.05 | 64 | 404 | 68 | 160 | 90 | 226 | 100 | 140 | 205 |
| CTI DD-40 | 4.0 | 112 | 37.10 | 70 | 521 | 92 | 192 | 112 | 257 | 140 | 190 | 256 |
| CTI DF-40 | 4.0 | 112 | 37.15 | 70 | 521 | 92 | 192 | 112 | 257 | 140 | 190 | 256 |
| CTI EF-55 | 5.5 | 132 | 53.00 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTI EG-55 | 5.5 | 132 | 53.10 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTI EF-75 | 7.5 | 132 | 64.50 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTI EG-75 | 7.5 | 132 | 64.85 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTI AA-024 | 0.25 | 71 | 7.00 | 60 | 358 | 36 | 100 | 71 | 193 | 90 | 112 | 145 |
| CTI BB-054 | 0.55 | 80 | 10.30 | 63 | 395 | 50 | 110 | 80 | 205 | 100 | 125 | 170 |
| CTI CC-114 | 1.1 | 90 | 15.90 | 64 | 451 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTI CE-114 | 1.1 | 90 | 16.00 | 64 | 451 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTI DD-224 | 2.2 | 100 | 43.85 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |
| CTI DF-224 | 2.2 | 100 | 43.95 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |
| CTI DG-224 | 2.2 | 100 | 44.05 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |

*The dimension may vary depending on motor brand

| Connection dimensions | | | | | | |
|-----------------------|-------------------------|------|-----------------------|-------|-----------------|------|
| Model | BSPT male thread (std.) | | DIN 2633 PN 16 flange | | ANSI 150 flange | |
| | Ra | Ri | Ra | Ri | Ra | Ri |
| CTI A | 1" | ¾" | DN 25 | DN 20 | 1" | ¾" |
| CTI B | 1 ½" | 1" | DN 40 | DN 25 | 1 ½" | 1" |
| CTI C | 1 ½" | 1 ½" | DN 40 | DN 40 | 1 ½" | 1 ½" |
| CTI D | 2 ½" | 2" | DN 65 | DN 50 | 2 ½" | 2" |
| CTI E | 2 ½" | 2" | DN 65 | DN 50 | 2 ½" | 2" |

6. DATA

6.3. Dimensions - CTH



Dimensions in mm (where other is not indicated)

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

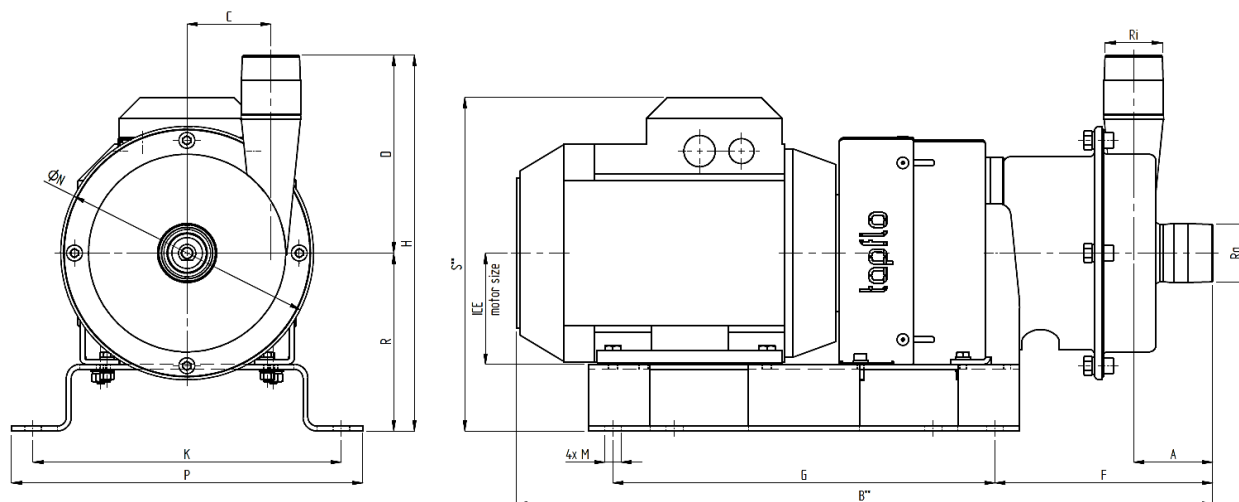
| MODEL | Motor power | IEC size | Weight [kg] | A | B* | C | D | E | F | G* | L* | N |
|------------|-------------|----------|-------------|----|-----|----|-----|-----|-----|-----|-----|-----|
| CTH AA-03 | 0.37 | 71 | 7.35 | 60 | 358 | 36 | 100 | 71 | 193 | 90 | 112 | 145 |
| CTH AA-05 | 0.55 | 71 | 8.00 | 60 | 358 | 36 | 100 | 71 | 193 | 90 | 112 | 145 |
| CTH BB-07 | 0.75 | 80 | 11.40 | 63 | 395 | 50 | 110 | 80 | 205 | 100 | 125 | 170 |
| CTH CC-15 | 1.5 | 90 | 22.35 | 64 | 429 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTH CC-22 | 2.2 | 90 | 24.10 | 64 | 429 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTH CE-22 | 2.2 | 90 | 24.15 | 64 | 429 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTH DD-40 | 4.0 | 112 | 37.05 | 70 | 479 | 92 | 192 | 100 | 251 | 140 | 160 | 256 |
| CTH DF-40 | 4.0 | 112 | 37.10 | 70 | 479 | 92 | 192 | 100 | 251 | 140 | 160 | 256 |
| CTH EF-55 | 5.5 | 132 | 53.30 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTH EG-55 | 5.5 | 132 | 53.40 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTH EF-75 | 7.5 | 132 | 64.80 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTH EG-75 | 7.5 | 132 | 65.15 | 70 | 571 | 92 | 192 | 132 | 293 | 140 | 216 | 256 |
| CTH AA-024 | 0.25 | 71 | 7.25 | 60 | 358 | 36 | 100 | 71 | 197 | 90 | 112 | 145 |
| CTH BB-054 | 0.55 | 80 | 15.80 | 63 | 395 | 50 | 110 | 80 | 205 | 100 | 125 | 170 |
| CTH CC-114 | 1.1 | 90 | 15.85 | 64 | 451 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTH CE-114 | 1.1 | 90 | 15.90 | 64 | 451 | 68 | 160 | 90 | 226 | 125 | 140 | 205 |
| CTH DD-224 | 2.2 | 100 | 32.20 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |
| CTH DF-224 | 2.2 | 100 | 32.30 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |
| CTH DG-224 | 2.2 | 100 | 32.40 | 70 | 478 | 92 | 192 | 100 | 250 | 140 | 160 | 256 |

*The dimension may vary depending on motor brand

| Connection dimensions | | | | | | | | | | |
|-----------------------|-------------------------|-------|-----------------|-------|----------------|----|-----------------|----|------------|------|
| Model | DIN 11851 thread (std.) | | DIN 32676 clamp | | ISO 2852 clamp | | SMS 1145 thread | | RJT thread | |
| | Ra | Ri | Ra | Ri | Ra | Ri | Ra | Ri | Ra | Ri |
| CTH A | DN 25 | DN 25 | DN 25 | DN 20 | 38 | 25 | 38 | 25 | 1 ½" | 1" |
| CTH B | DN 40 | DN 32 | DN 40 | DN 25 | 38 | 25 | 51 | 38 | 1 ½" | 1 ½" |
| CTH C | DN 40 | DN 40 | DN 40 | DN 40 | 38 | 38 | 51 | 38 | 2" | 2" |
| CTH D | DN 65 | DN 50 | DN 65 | DN 50 | 70 | 51 | 63 | 51 | 3" | 2" |
| CTH E | DN 65 | DN 50 | DN 65 | DN 50 | 70 | 51 | 63 | 51 | 3" | 2" |

6. DATA

6.4. Dimensions – CTI long coupled pump



Dimensions in mm (where other is not indicated)

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

| MODEL | Motor power | IEC size | Weight [kg] | A | B* | C | D | F | G | H | K | N | P | R | S* |
|-------------|-------------|----------|-------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CTI AA-03B | 0.37 | 71 | | 60 | 485 | 36 | 100 | 155 | 310 | 225 | 250 | 143 | 285 | 125 | 223 |
| CTI AA-05B | 0.55 | 71 | | | | | | | | | | | | | |
| CTI AA-024B | 0.25 | 71 | | | | | | | | | | | | | |
| CTI BB-07B | 0.75 | 80 | | 63 | 498 | 50 | 110 | 160 | 310 | 244 | 250 | 170 | 285 | 134 | 247 |
| CTI BB-054B | 0.55 | 80 | | | | | | | | | | | | | |
| CTI CC-15B | 1.5 | 90S | | 64 | 540 | 68 | 160 | 177 | 310 | 304 | 250 | 205 | 285 | 144 | 270 |
| CTI CE-15B | 1.5 | 90S | | | | | | | | | | | | | |
| CTI CC-22B | 2.2 | 90L | | 64 | 565 | 68 | 160 | 177 | 310 | 304 | 250 | 205 | 285 | 144 | 270 |
| CTI CE-22B | 2.2 | 90L | | | | | | | | | | | | | |
| CTI DD-40B | 4.0 | 112M | | 70 | 666 | 92 | 192 | 200 | 370 | 359 | 350 | 256 | 400 | 167 | 303 |
| CTI DF-40B | 4.0 | 112M | | | | | | | | | | | | | |
| CTI DF-60B | 6.0 | 112M | | | | | | | | | | | | | |
| CTI DG-60B | 6.0 | 112M | | | | | | | | | | | | | |
| CTI DD-224B | 2.2 | 100L | | 72 | 630 | 92 | 192 | 200 | 370 | 347 | 350 | 256 | 400 | 155 | 291 |
| CTI DF-224B | 2.2 | 100L | | | | | | | | | | | | | |
| CTI DG-224B | 2.2 | 100L | | | | | | | | | | | | | |
| CTI EF-55B | 5.5 | 132S | | 70 | 746 | 92 | 192 | 200 | 370 | 379 | 350 | 256 | 400 | 187 | 355 |
| CTI EG-55B | 5.5 | 132S | | | | | | | | | | | | | |
| CTI EF-75B | 7.5 | 132S | | | | | | | | | | | | | |
| CTI EG-75B | 7.5 | 132S | | | | | | | | | | | | | |
| CTI EG-110B | 11.0 | 160M | | 70 | 881 | 92 | 192 | 260 | 490 | 448 | 416 | 256 | 466 | 256 | 522 |

* The dimension may vary depending on motor brand



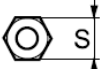


M=13 mm for all pump sizes

6. DATA

6.5. Materials, data and limits

| | CTH ... | CTI ... |
|------------------------|--|--|
| Casing | Stainless steel AISI 316L electro polished Ra<0.8 | Stainless steel AISI 316L glass blasted |
| Impeller | Stainless steel AISI 316L electro polished Ra<0.8, open (std) or semi-open | Stainless steel AISI 316L electro polished Ra<0.8, open (std) or semi-open |
| Mechanical seal | Single ceramic/graphite (std), SiC/SiC or SiC/graphite, optional with lube or flushing | Single ceramic/graphite (std), SiC/SiC or SiC/graphite, optional with lube or flushing |
| O-rings | EPDM FDA approved (std), FEP/Silicone FDA approved, FKM FDA approved | EPDM (std), FKM, FEP/Silicone or NBR |
| Motor | IP55; IEC frame B34; Available with ATEX cat 2 or 3; Eex e or Eex d | |
| Pressure rating | 10 bar (PN10) | |
| Temperature | Max 90°C; 180°C for long coupled pump | |
| Viscosity | Max ~200 cSt | |
| Particles | Max diameter is 6 mm (std open impeller); bigger if soft particles | |

6.6. Mounting torques and dimensions of screws/nuts

| Screw / nut type | Description | Pump model | | | | |
|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | CT A ... | CT B ... | CT C ... | CT D ... | CT E ... |
|  | Pos. 121. allen screw Mounting torque [Nm] Too size "S" [mm] Thread | 15 5 M6 | 15 5 M6 | 15 6 M8 | 15 6 M8 | 15 8 M10 |
|  | Pos. 141. allen screw Mounting torque [Nm] Too size "S" [mm] Thread | 15 5 M6 | 15 5 M8 | 15 8 M10 | 15 6 M8 | 15 6 M8 |
|  | Pos. 143. hexagonal nut Mounting torque [Nm] Too size "S" [mm] Thread | 15 5 M6 | 15 13 M8 | 15 17 M10 | 15 13 M8 | 15 13 M8 |
|  | Pos. 161. allen screw Mounting torque [Nm] Too size "S" [mm] Thread | 17 3 M6 | 17 3 M6 | 17 4 M8 | 17 4 M8 | 17 4 M8 |
|  | Pos. 191. hexagonal screw Mounting torque [Nm] Too size "S" [mm] Thread | 17 17 M10 | 17 17 M10 | 17 17 M10 | 17 17 M10 | 17 17 M10 |

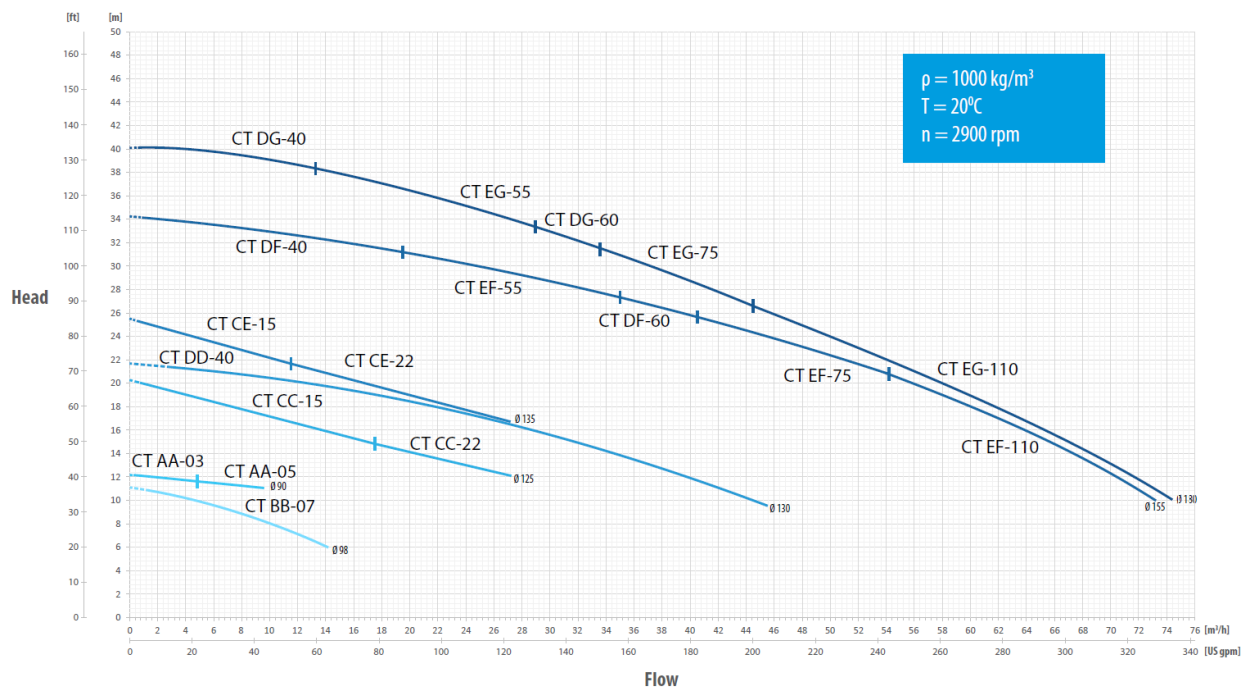
6. DATA

6.7. Performance curves

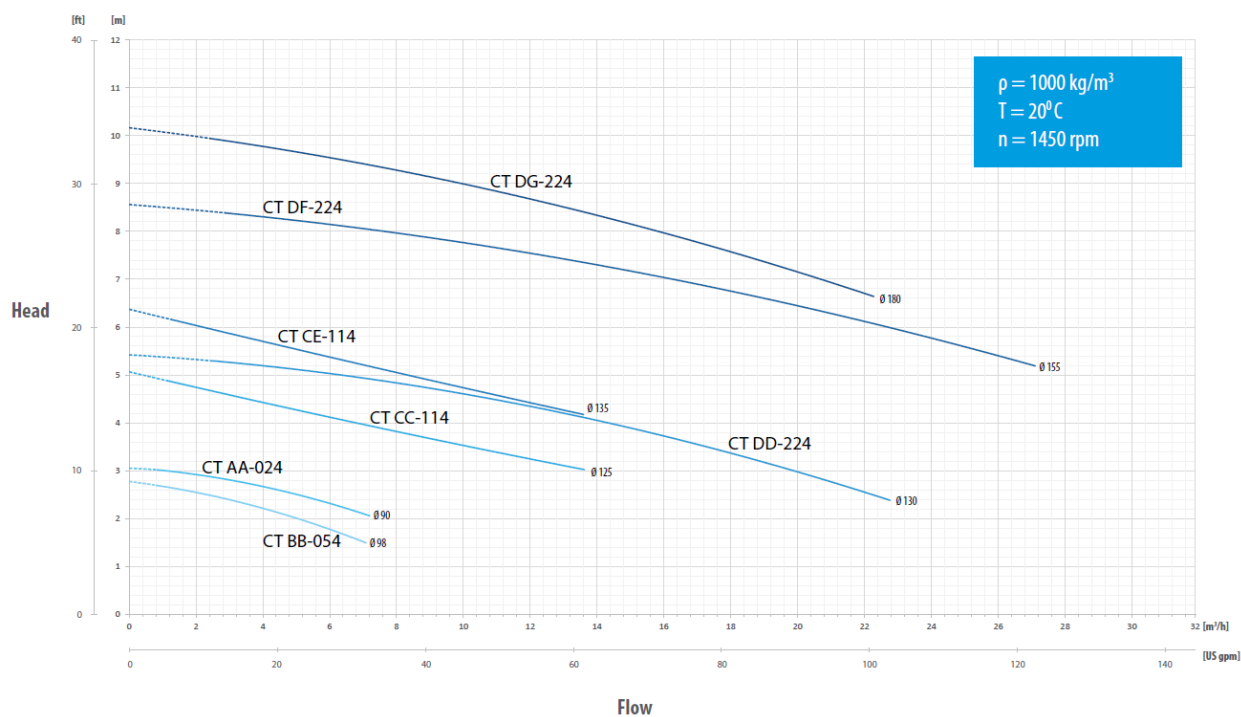
The performance curves are based on water at 20°C.

Contact us for detailed curves

Speed 2900 rpm



Speed 1450 rpm



6. DATA

6.8. Permitted loads on inlet and outlet

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

| CTI A | | |
|-----------|----------------------------|--|
| Direction | Load [N] (inlet/outlet) | Moment of force (inlet/outlet) [Nm] |
| X | 70 | 6 |
| Y | 100 | 6 |
| Z | 70 | 6 |

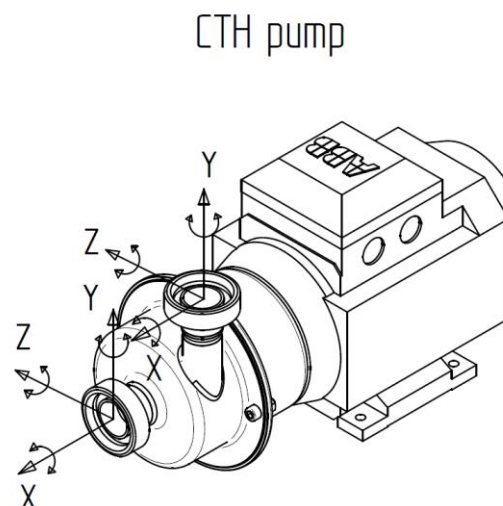
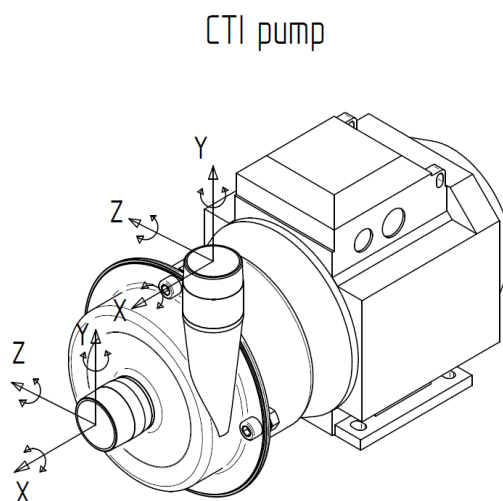
| CTI B | | |
|-----------|----------------------------|--|
| Direction | Load [N] (inlet/outlet) | Moment of force (inlet/outlet) [Nm] |
| X | 80 | 8 |
| Y | 120 | 8 |
| Z | 80 | 8 |

| CT C | | |
|-----------|----------------------------|--|
| Direction | Load [N] (inlet/outlet) | Moment of force (inlet/outlet) [Nm] |
| X | 100 | 10 |
| Y | 150 | 10 |
| Z | 100 | 10 |

outlet.

| CT D / E | | |
|-----------|----------------------------|--|
| Direction | Load [N] (inlet/outlet) | Moment of force (inlet/outlet) [Nm] |
| X | 100/120* | 12 |
| Y | 170 | 12 |
| Z | 120 | 12 |

*CTI / CTH



7. WARRANTY

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;

7. WARRANTY

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 contract, 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: |
| |

Sweden

Filaregatan 4 | S-442 34 Kungälv

Tel: +46 303 63390

Fax: +46 303 19916

E-mail addresses:

Commercial questions: sales@tapflo.com

Orders: order@tapflo.com

Tech support: support@tapflo.com

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.

AUSTRALIA | AUSTRIA | AZERBAIJAN | BAHRAIN | BELARUS | BELGIUM | BOSNIA & HERZEGOVINA | BRAZIL | BULGARIA | CANADA | CHILE | CHINA | COLOMBIA | CROATIA | CZECH REPUBLIC | DENMARK | ECUADOR | EGYPT | ESTONIA | FINLAND | FRANCE | GREECE | GEORGIA | GERMANY | HONG-KONG | HUNGARY | ICELAND | INDIA | INDONESIA | IRELAND | ISRAEL | ITALY | JAPAN | JORDAN | KAZAKHSTAN | KUWAIT | LATVIA | LIBYA | LITHUANIA | MACEDONIA | MALAYSIA | MEXICO | MONTENEGRO | MOROCCO | THE NETHERLANDS | NEW ZEALAND | NORWAY | POLAND | PORTUGAL | PHILIPPINES | QATAR | ROMANIA | RUSSIA | SAUDI ARABIA | SERBIA | SINGAPORE | SLOVAKIA | SLOVENIA | SOUTH AFRICA | SOUTH KOREA | SPAIN | SWEDEN | SWITZERLAND | TAIWAN | THAILAND | TURKEY | UKRAINE | UNITED ARAB EMIRATES | UNITED KINGDOM | USA | UZBEKISTAN | VIETNAM

Tapflo Group Companies

Austria

Tapflo Austria
Tel: +43 732 27292910
sales@tapflo.at

Azerbaijan

Tapflo Azerbaijan LLC
Tel: +994 502660799
sales@tapflo.az

Baltic States

Tapflo Latvia
Tel: +371 67472205
sales@tapflo.lv

Belarus

Tapflo Belarus
Tel: +375 17 3934609
sales@tapflo.by

Bulgaria

Tapflo EOOD
Tel: +359 (2) 974 18 54
office@tapflo.org

Canada

Tapflo Canada
Tel: +1 514 813 5754
canada@tapflo.com

Croatia

Tapflo GmbH
Tel: +385 91 4884 666
sales@tapflo.hr

Czech Republic

Tapflo s.r.o.
Tel: +420 513033924
tapflo@tapflo.cz

China

Tapflo (Wuxi)
Tel: +86 510 8241 7602
sales@tapflo.cn

Denmark

Tapflo Danmark
Tel: +45 36 454600
info@tapflo.dk

France

Tapflo France
Tel: +33 1 34 78 82 40
info@tapflo.fr

Georgia

Tapflo Georgia
Tel: +995 577 463010
sales@tapflo.ge

India

Tapflo Fluid Handling India Pvt Ltd
Tel: +91 20 65000215
ac@tapflo.in

Ireland

Tapflo Ireland Ltd
Tel: +353 1 2011911
info@tapflo.ie

Italy

Tapflo Italia
Tel: +39 0362307698
info@tapfloitalia.com

Japan

Tapflo Japan K.K.
Tel: +81-3-6240-3510
tapflojp@tapflo.co.jp

Kazakhstan

Tapflo Kazakstan
Tel: +7 727 3278347
sales@tapflo.kz

Poland

Tapflo Sp. z o.o.
Tel: +48 58 530 42 00
info@tapflo.pl

Romania

S.C. Tapflo Rom. S.r.l.
Tel: +40 21 3451255
sales@tapflo.ro

Russia

Tapflo Company
Tel: +7 495 232 18 28
sales@tapflo.com.ru

Serbia

Tapflo d.o.o.
Tel: +381 21 44 58 08
sales@tapflo.rs

Slovakia

Tapflo s.r.o.
Tel: +421 911 137 883
tapflo@tapflo.sk

Slovenia

Tapflo GmbH
Tel: +386 68 613 474
sales@tapflo.hr

Spain

Tapflo Iberica
Tel: +34 91 8093182
avives@tapfloiberica.es

South Africa

Tapflo (Pty) Ltd
Tel: +27 31 701 5255
sales@tapflo.co.za

Turkey

Tapflo Makina Ltd
Tel: +90 216 467 33 11
sales@tapflo.com.tr

Ukraine

TOB Tapflo
Tel: +380 44 222 68 44
sales@tapflo.com.ua

Uzbekistan

Tapflo Uzbekistan
Tel: +998 712370940
sales@tapflo.uz

United Kingdom

Tapflo (UK) Ltd
Tel: +44 2380 252325
sales@tapflo pumps.co.uk