IOM manual

CTV Vertical Centrifugal Pumps

Original Instruction
2020 | 1

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

PP & PVDF	**Stainless steel**
CTV25-9	CTV20-9
CTV25-10	CTV25-9.8
CTV25-11	CTV40-12.5
CTV25-11.5	CTV40-13.5
CTV32-8.5	
CTV32-10	
CTV32-12.5	



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EC DECLARATION OF CONFORMITY 01/EC/CTV/2016

Series:

CTV...

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.

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83-110 Tczew

Signed for and on behalf of Tapflo AB:

Håkan Ekstrand
Managing director
Tapflo AB, 16.04.2016

0. GENERAL

0.1. Introduction

CTV is a vertical, seal less centrifugal pump made from PP, PVDF or stainless steel AISI 316L. With proper attention to maintenance, CTV pumps will give efficient and trouble free operation. This instruction manual will familiarise operators with detailed information about installing, operating and maintaining the pump.

The CTV series are single-stage pumps with the pump casing directly submerged in the liquid. It is driven by an asynchronous electric motor. The inlet is located axially to the drive shaft, facing downwards and has a female BSP (plastic pumps) or male BSPT (metal pumps) threaded connection. The discharge pipe is vertical, coming up through the base plate and has a male BSP / BSPT threaded connection (other connection types available upon request).

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 complete dampener or its subassemblies.



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.
In case any instructions in this manual are unclear or any information is lacking, please contact Tapflo before handling the pump.

1. INSTALLATION

1. INSTALLATION

1.1. Operation principle

In order to operate the pump, the liquid level has to be above the impeller before start-up (for details see chapter 1.9 *Example of installation*). The rotating impeller generates a centrifugal force accelerating the liquid through the pump casing and into the discharge piping. It works by means of a "liquid seal" meaning the liquid level can drop below the impeller line once the pump is operating. When the liquid inside a sump reaches the pump inlet or end of a suction pipe, the liquid column is broken and the level must be increase above the impeller once again in order to restart the pump.

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. Store the pump on the motor fan cover in an upright position. Clean the pump thoroughly before installation. When in storage, turn the shaft by hand at least twice per week

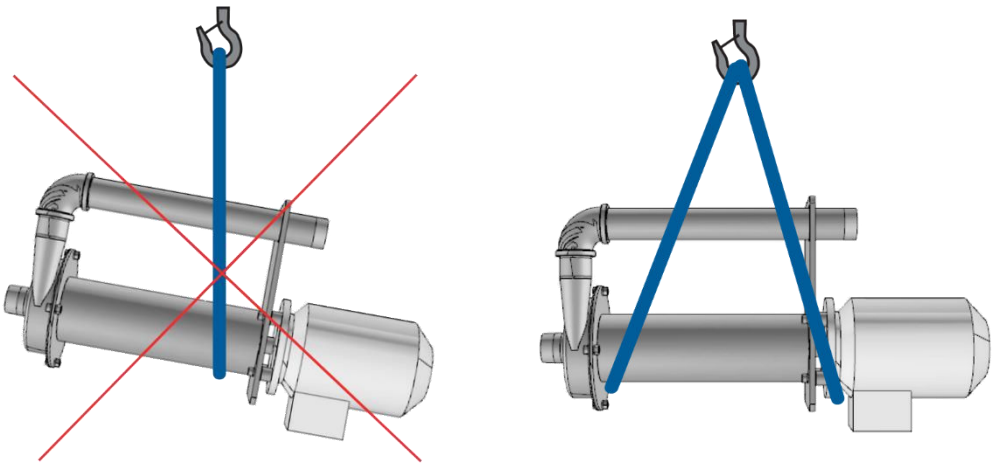
1.4. Lifting and transportation



Before handling the pump check the weight of the pump (see 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.

1. INSTALLATION

Be careful that nobody passes under the pump when lifted.
Never try to lift the pump by the manifolds or hoses attached to the pump.

1.5. Installation



- The CTV pump must be installed vertically and can be used in sumps, tanks and similar containers
- For a safe "outside tank" installation (e.g. overflow orifice) always consult us for arrangement of necessary modifications.
- Install the pump on a rigid support and fasten the pump by the baseplate.

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 concentric on discharge side) at changes of diameter and at a minimum distance from pump connections of five diameters.

1.7.1. Connection of discharge pipe



If the discharge height is more than 2 meters, a check valve should be installed in the discharge line (see installation example, chapter 1.7 *Example of installation*.
The check-valve protects the pump from any backflow.
No stress or tension is allowed on the discharge pipe (it is recommended to use a flexible hose between the pump outlet and fixed piping).

1.7.2. Connection of suction pipe

Use of an extension pipe is possible for the CTV pump to allow emptying of a tank from a lower level. During operation, the liquid level can drop below the impeller (pump casing). However, at start-up the level must always be over the impeller (pump casing). See installation example, chapter 1.9 *Example of installation*

1. INSTALLATION

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.

1.8.2. 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. Noise level



CTV 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).

1.8.5. 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

1.8.6. Rotating parts



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

1.8.7. Modifications and spare parts

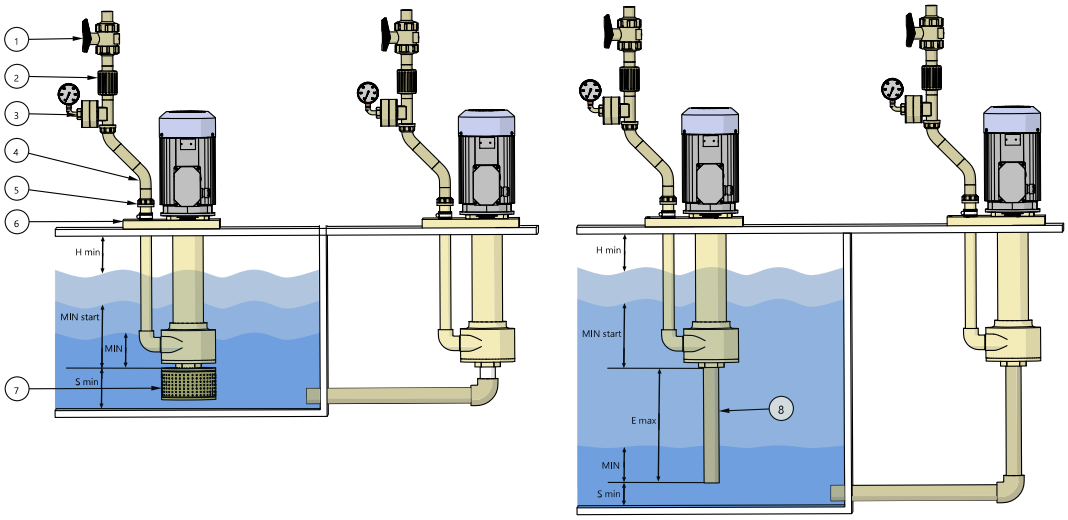


Any changes concerning the service of the pump as originally purchased, can be executed only after written approval from Tapflo.
It is recommended to use only genuine Tapflo spare parts and approved accessories. The use of unoriginal spare parts or non-approved accessories will void warranty and remove any responsibility on our behalf for any damage caused to people or things.

1. INSTALLATION

1.9. Example of installation

Flooded installation | **Installation with suction extension**



- **All installations:**
  1) Valve for flow control
  2) Non-return valve (check valve) on discharge as close to the pump as possible
  3) Connection point for pressure gauge or pressure switch
  4) Divert discharge with 45° bend to enable more space when lifting the pump
  5) Quick connection between pump and piping system for easy disconnection
  6) Arrange for drainage of liquid form the base plate.

- **Flooded installation**
  7) Foot strainer 3-5 mm mesh if solids are present or in open tank / sump installation

- **Installations with suction extension**
  8) Vertical suction extension is allowed. Size of pipe shall correspond with pump connection size. Do not use complex piping on suction side. In particular applications, use of bottom valve (ball type) may be used. In case of any questions please consult us.

- **Important levels and dimensions**

	PP & PVDF	Stainless steel	Comment
H_{min} (mm / inch)	50 / 2.0	80 / 3.1	Distance between base and liquid level
MIN start (mm / inch)	170 / 6.7	170 / 6.7	Minimum level during start-up
MIN (mm / inch)	80 / 3.1	80 / 3.1	Minimum level during operation
S_{min} (mm / inch)	50 / 2.0	50 / 2.0	Min distance to bottom of tank / sump
E_{max} @ 25°C (mm / inch)	1000 / 39	1000 / 39	Max length of suction extension
E_{max} @ 40°C (mm / inch)	500 / 19	500 / 19	Max length of suction extension
E_{max} @ 60°C (mm / inch)	-	-	Impeller must always be submerged

1. INSTALLATION

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 gauge on the discharge piping.

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.

1.10.2. Optional instruments

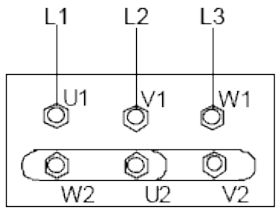
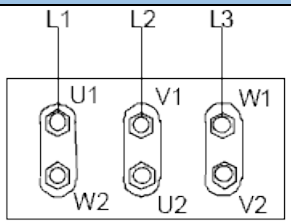
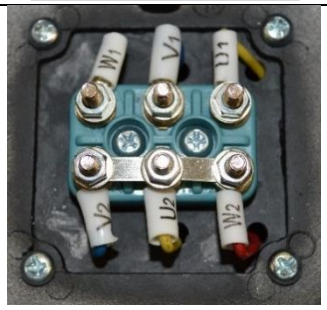
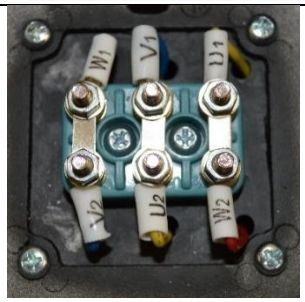
The optional instruments can indicate if pump is working in an abnormal way. The abnormal conditions can be caused by: accidentally closed valves, lack of pumped liquid, overloads, etc.

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 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 CTV pump are equipped with motors of the following parameters:

- International Mounting Arrangement – **V1**
- Number of poles / Rotation speed [rpm] – **2**
- **Non ATEX**
- Protection grade – **IP55**
- Voltage – **3 phase**

Motor power	RPM	Voltage	Frequency
0,55 kW	2800	Δ230 / Y400	50 Hz
	3400	Δ265 / Y460	60 Hz
0,75 kW	2900	Δ230 / Y400	50 Hz
	3500	Δ265 / Y460	60 Hz
1,1 kW	2900	Δ230 / Y400	50 Hz
	3500	Δ265 / 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

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.
- 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 1.9 *Motor connection*) and repeat the procedure described above.

  NOTE! Perform this check when pump is dry in order to avoid pump damage in case of wrong terminal connection.
- Any auxiliary connections must all be connected.

2.1.1. Starting the pump

Whenever starting the pump, make sure the pump casing is filled with liquid. See MIN start level in chapter 1.7 *Example of installation*.

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.

During pump operation, make sure that the liquid level is within the permissible limits, see levels H_{min} and MIN in chapter 1.7 *Example of installation*.

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*.

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 recommended, 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.

2. OPERATION

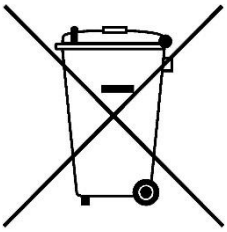
2.3. Residual risks

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.

2.4. 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.

2.5. 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.

2.6. 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 shutoff. Follow the local and national safety regulations.

Wait five minutes for capacitor discharge before opening any equipment.

3.1. Inspections

In general CTV range pumps do not require any maintenance. However depending on the application, it may be necessary to periodically clean the internals of the pump to optimize the performance. In addition, it is advised to:

- Periodically check discharge pressure.
- Inspect the motor according to the instructions from the motor manufacturer.

3.2. Location of faults

Failure to deliver the liquid	Insufficient capacity	Insufficient head	Irregular flow	Electric current too high	Pump vibrates	Possible reason	Solution
X			X			Liquid level too low	See MIN start level – chapter 1.7 *Example of installation*
X		X				Motor speed too low	Check the motor and motor connection
X	X	X			X	Impeller is clogged	Clean the pump
X	X	X			X	Impeller is damaged	Replace the impeller
		X				Impeller diameter to small	Consult us for change
X	X					Wrong direction of rotation	See chapter 1.9 *Motor connection* for change of direction
X						NPSHa too low	Consult us for more details
X	X					Discharge piping clogged	Clean the pump thoroughly
X	X		X			Suction or strainer clogged	Check and clean
	X					Pressure loses higher than expected	Change piping system
X		X				Air in the casing or discharge	Check system for air pockets
				X		Specific gravity higher than expected	Increase the head with flow control valve
	X			X		Viscosity higher than expected	Consult us for more details
				X		Pressure loses lower than expected	Increase the head with flow control valve
				X	X	Motor bearings worn	Change bearings, check vapour seal
X	X					Pump volute not submersed enough	Check liquid level in the tank
	X	X		X		Motor failure	Check motor
					X	Pump insufficiently fastened	Check the pump mounting bolts

3. MAINTENANCE

3.3. Disassembly and assembly of the pump



The disassembly should only be performed by qualified personnel.



Each operation carried out on 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 – PP & PVDF pumps



Fig. 3.3.1.1
After removal of the suction extension or/and strainer (if applicable), place the pump horizontally on a table or a bench.



Fig. 3.3.1.2
In a counter-clockwise direction unscrew the pump cover [1312] using an adjustable spanner.



Fig. 3.3.1.3
Remove the pump cover [1312] with the cover O-ring [18]. If necessary screw a plastic nipple into the pump cover and then pull it out.

3. MAINTENANCE

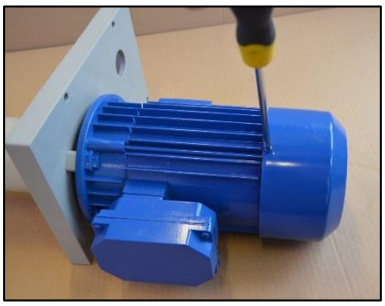


Fig. 3.3.1.4
Remove the motor fan cover from the electric motor and then remove the motor fan.





Fig 3.3.1.5
Secure the free end of the motor shaft using universal pliers or similar.

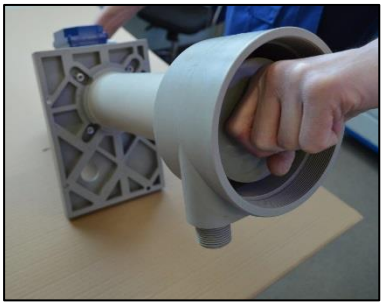


Fig 3.3.1.6
Unscrew the impeller.

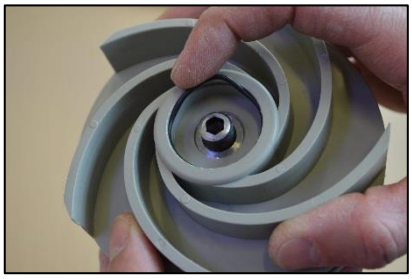


Fig 3.3.1.7
Remove the impeller O-ring [193] from the impeller.

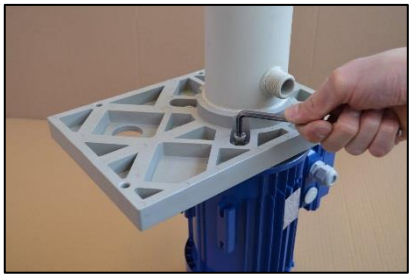


Fig 3.3.1.8
Unscrew the motor mounting screws [121] and washers [122] and carefully pull the pump casing unit [11] from the motor/shaft assembly.

3. MAINTENANCE



Fig 3.3.1.9
Pull the shaft sleeve [162] from the motor shaft and then remove the lip seal [161].



Fig 3.3.1.10
Carefully push out the shaft bushing [15] from its seat by means of a screwdriver. Remove the O-ring [151] from the shaft bushing.



Fig 3.3.1.11
Loosen the hose clip [20] and remove the stabilizer from the discharge pipe [12].

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

3.3.2. Assembly of the pump – PP & PVDF pumps

The assemble the pump in a proper manner, please follow the below steps:

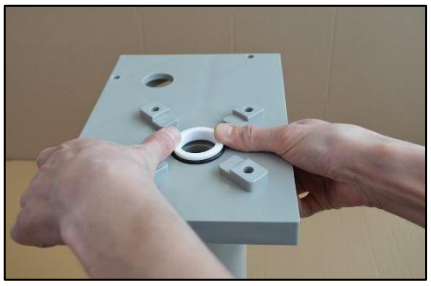


Fig. 3.3.2.1
Insert the shaft bushing [15] with its O-ring [151] into the pump casing unit [11].
Note! Use some alcohol on the O-ring to ease bushing insertion.



Fig. 3.3.2.2
Put the lip seal [161] on the shaft sleeve [162].

3. MAINTENANCE

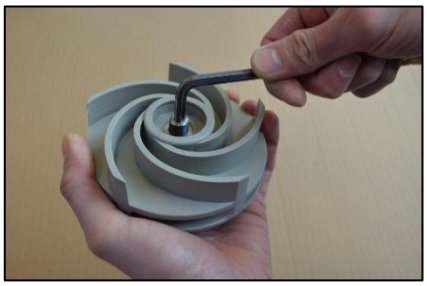


Fig. 3.3.2.3
Screw the impeller screw [194] into the impeller [9...].
NOTE! Make sure to perform this procedure with care. Too much force applied while screwing in can damage the impeller.

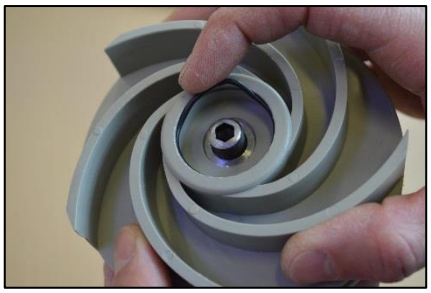


Fig. 3.3.2.4
Insert the O-ring [193] into the impeller [9...].

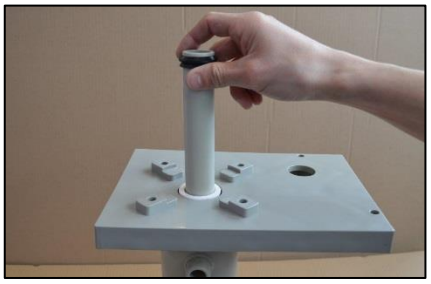


Fig. 3.3.2.5
Insert the shaft sleeve [162] into the pump casing unit [11].

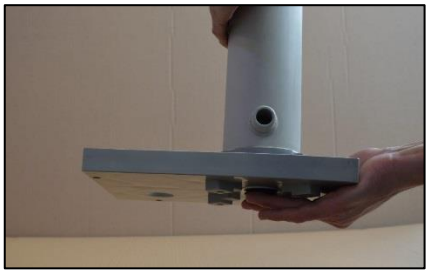


Fig. 3.3.2.6
While holding the shaft sleeve [162] rotate the pump casing unit [11].

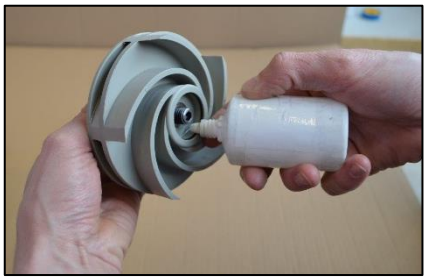


Fig. 3.3.2.7
Apply some alcohol / grease onto the impeller O-ring [193] and insert the impeller [9...] onto the shaft sleeve [162].
NOTE! While holding the shaft sleeve, rotate the impeller to check if the O-ring has not fallen out of groove (if it is hard to rotate, check the impeller O-ring).



3. MAINTENANCE



Fig. 3.3.2.8
Insert the pump casing unit [11] on the motor shaft.

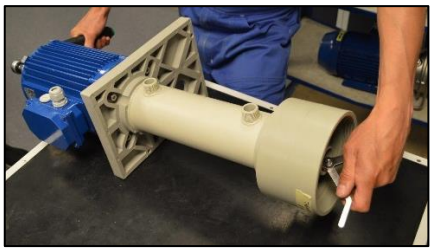


Fig. 3.3.2.9
Using the special assembly tool [8-32-9XXX-MT] screw in the impeller [9...] onto the motor shaft.
Note!
Block the motor fan in order to perform this procedure. Use a torque wrench to screw the impeller with the appropriate torque (see table in section 6.2.).

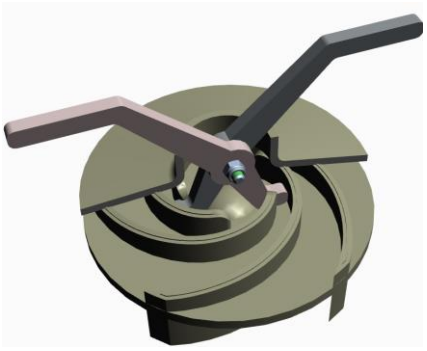


Fig. 3.3.2.10
Proper utilization of the 8-32-9XXX-MT assembly tool.

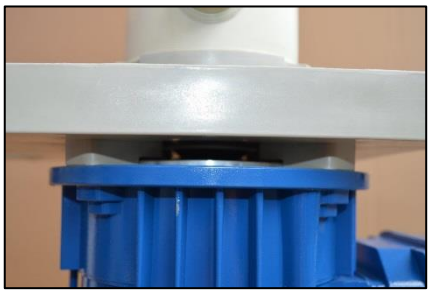


Fig. 3.3.2.11
Make sure that the lip seal is touching the ceramic bushing.

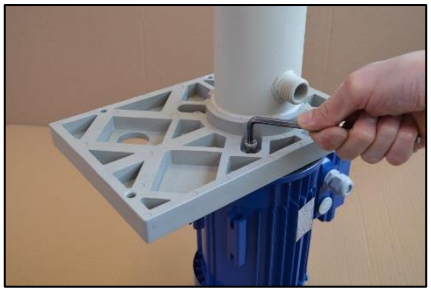


Fig. 3.3.2.12
Screw the pump casing unit [11] to the motor using motor mounting screws [121] and washers [122, 123].
Note!
Make sure the shaft rotates concentrically in the casing unit.

3. MAINTENANCE



Fig. 3.3.2.13
Screw the plug [22] onto the pump casing unit [11].
Note!
Use PTFE tape on the thread.





Fig. 3.3.2.14
Screw the elbow [17] into the pump casing unit [11].
Note!
Use PTFE tape on the thread.





Fig. 3.3.2.15
Screw the discharge pipe [12] into the elbow [17].
Note!
Use PTFE tape on the thread.



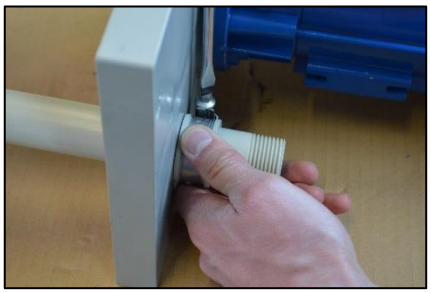


Fig. 3.3.2.16
Insert the stabilizer [202] on the discharge pipe [12] and fasten it with the hose clip [20].

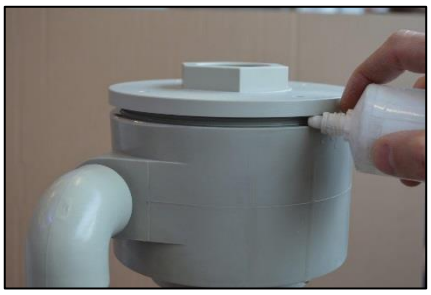


Fig. 3.3.2.17
Put the casing O-ring [18] into the pump cover [1312].



Fig. 3.3.2.18
Screw the pump cover [1312] into the pump casing unit [11].

Note!
Use some alcohol / grease to ease the assembly of the pump cover.



3.3.3. 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.

3.3.4. Disassembly procedure – stainless steel pumps



Fig. 3.3.4.1
After removal of the suction extension or/and strainer (if applicable), place the pump horizontally on a bench.



Fig. 3.3.4.2
Unscrew the casing mounting screws [141] with washers [142].



Fig. 3.3.4.3
Carefully lift off the pump cover [13] together with the elbow [17] and discharge pipe [12].



Fig. 3.3.4.4
Remove the casing O-ring [18].
NOTE! Always replace the casing O-ring after pump maintenance.



Fig. 3.3.4.5
Secure the impeller, unscrew the impeller nut [191] and washer [192], lift off the impeller [9...].
NOTE! If the impeller is hard to unscrew, take of the motor fan cover and secure the motor shaft (see Fig. 3.3.4.10).



Fig. 3.3.4.6
Unscrew the shaft bushing [15] from the pump casing unit [11].



Fig 3.3.4.7
Unscrew the motor mounting screws [121] and washers [122] and carefully pull the pump casing unit [11] from the motor/shaft assembly.



Fig 3.3.4.8
Remove the lip seal [161] from the motor shaft.



Fig 3.3.4.9
Remove the motor fan cover from the electric motor and then remove the motor fan.



Fig 3.3.4.10
Secure the free end of the motor shaft by means of universal pliers or similar. Unscrew the shaft sleeve [162] from the motor shaft.

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

3.3.5. 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.

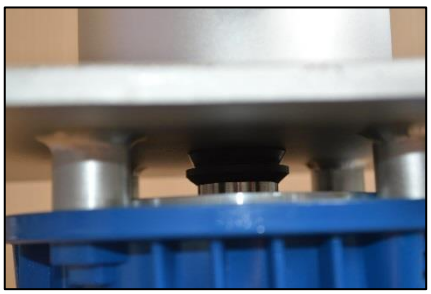


Fig. 3.3.5.1
After inserting the lips seal [161] onto the shaft sleeve [162] put on the pump casing [11] to check if it is correctly aligned with it.



Fig. 3.3.5.2
When inserting the impeller [9...] onto the shaft sleeve [162] make sure that it is locked in the proper position (cut shaped opening).

3. MAINTENANCE



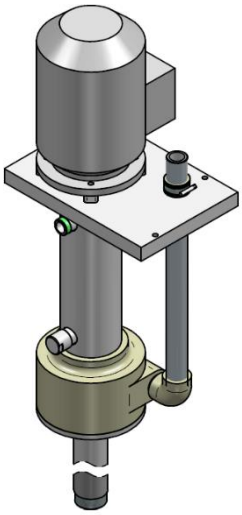
Fig. 3.3.5.3
Use PTFE tape to tighten the connections between the pump cover [13], elbow [17] and discharge pipe [12].

3.3.6. 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.

4. OPTIONS

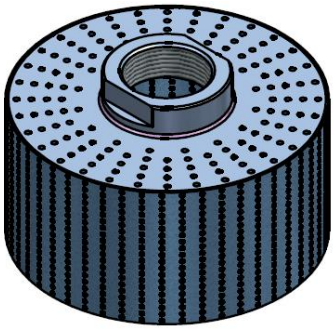
4.1. Suction extension and strainer – 4E05, 4E10, 4S



The pump can be delivered with a suction extension pipe. It is a great solution when there is a need to empty a tank or sump from a lower level than the immersion depth of the pump.
A 500 mm and 1000 mm extension pipe is available as a standard.
It is recommended to fasten long suction pipes to the wall of the tank. The supports need to be flexible and should not cause any vibration to the piping.

A suction strainer is also a possible option where the liquid is dirty or contains solids.

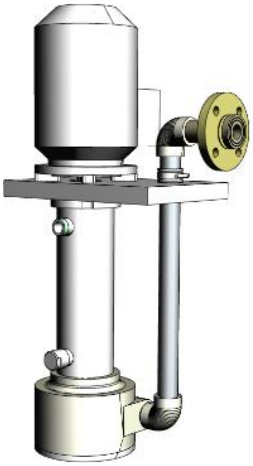




Additional parts:

Art. no	Q-ty	Description
7-xx-145	1	Suction extension pipe for SS pump – 500 mm
7-xx-1410	1	Suction extension pipe for SS pump – 1000 mm
8-xx-145	1	Suction extension pipe for plastic pump – 500 mm
8-xx-1410	1	Suction extension pipe for plastic pump – 1000 mm
8-xx-21	1	Strainer for plastic pump
7-xx-20	1	Strainer for SS pump

4.2. Optional discharge connection – 5A, 5D



If required, the CTV pump can be delivered with optional connections on the discharge side. Flanges following ANSI and DIN standard are available. Loose or welded flange.
For more information see chapter 6.1 *Pump code*.

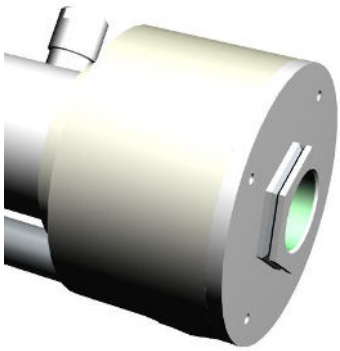
4. OPTIONS

4.3. Left-hand thread on pump cover – 8L

For plastic CTV pump there is an option of a left-hand thread on the pump cover. The thread can be differed from standard one with a cut on the socket.

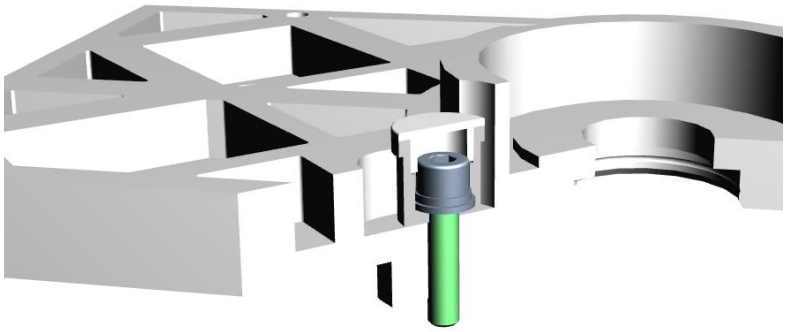
This way unscrewing of pump cover is avoided. This option is recommended especially when viscous liquids are pumped.

The pump cover code is: ***8-xx-1312L***.



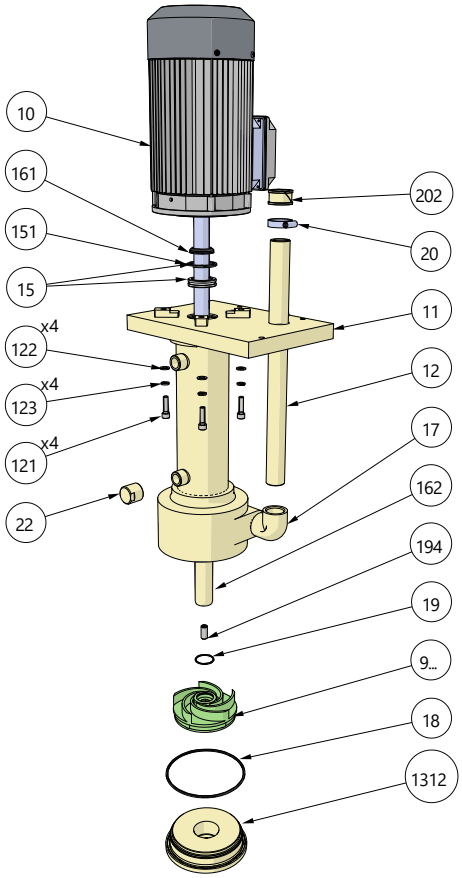
4.4. Motor mounting screw protection plugs – 8P

In situations when there is a risk of liquid evaporation and damaging the motor mounting screws, an option with protection plugs is available. In this case screws are sealed and no vapours will reach them.



5. SPARE PARTS

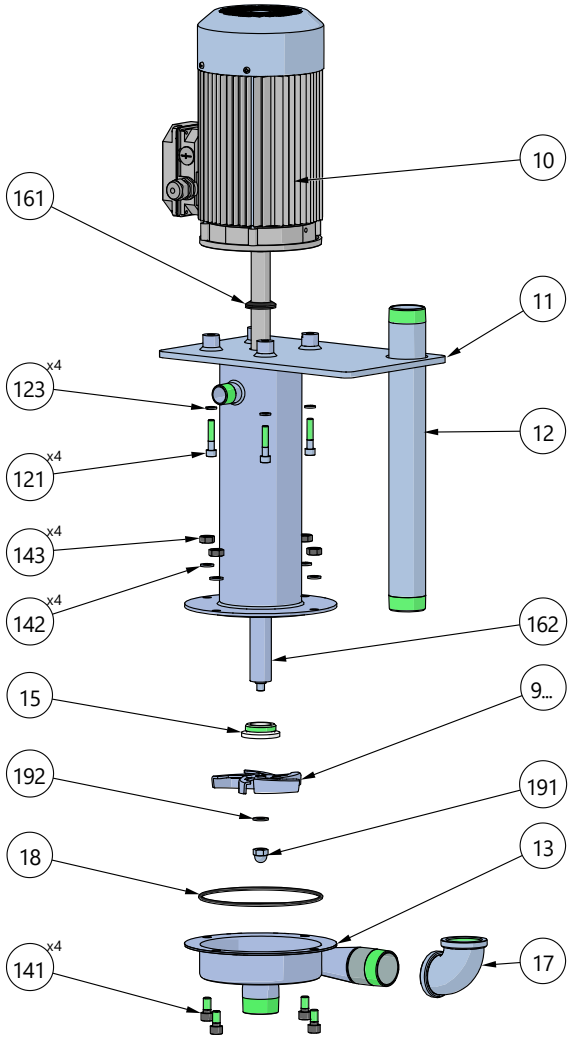
5.1. Spare parts – PP & PVDF pump



Pos.	Description	Q-ty	Material
10	Motor	1	
11	Pump casing unit	1	PP, PVDF
12	Discharge pipe	1	PP, PVDF
121	Motor mounting screw	4	A4-70
122	Motor mounting washer	4	A4-70
123	Motor mounting spring washer	4	A4-80
1312	Pump cover	1	PP, PVDF
15	Shaft bushing with O-ring	1	Ceramic/NBR
151	Shaft bushing O-ring	1	NBR
161	Lip seal	1	NBR, FKM
162	Shaft sleeve	1	PP, PVDF
17	Elbow	1	PP, PVDF
18	Casing O-ring	1	EPDM, FKM, FEP
193	Impeller O-ring	1	EPDM, FKM, FEP
194	Impeller screw	1	St45 H
20	Hose clip	1	A4
202	Hose clip band	1	PP
22	Plug	1	PP, PVDF
9...	Impeller	1	PP, PVDF

5. SPARE PARTS

5.2. Spare parts – stainless steel pump



Pos.	Description	Q-ty	Material
10	Motor	1	
11	Pump casing unit	1	AISI 316L
12	Discharge pipe	1	AISI 316L
121	Motor mounting screw	4	A4-70
123	Motor mounting spring washer	4	A4-80
13	Pump cover	1	AISI 316L
141	Casing mounting screw	4	A4-70
142	Casing mounting washer	4	A4-80
143	Casing mounting nut	4	A4-70
15	Shaft bushing	1	PTFE
161	Lip seal	1	NBR, FKM
162	Shaft sleeve	1	AISI 316L
17	Elbow	1	AISI 316L
18	Casing O-ring	1	EPDM, FKM, FEP
191	Impeller mounting screw	1	A4
192	Impeller mounting washer	1	A4-70
9...	Impeller	1	AISI 316L

5. SPARE PARTS

5.3. Recommended spare parts

Normally the CTV 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 replaced. We recommend having the following parts in stock:

PP & PVDF pumps

Pos.	Description	Q-ty
161	Lip seal	1
193	Impeller O-ring	1
18	Casing O-ring	1
15	Shaft bushing	1
151	Shaft bushing O-ring	1

Stainless steel pumps

Pos.	Description	Q-ty
161	Lip seal	1
15	Shaft bushing	1
18	Casing O-ring	1

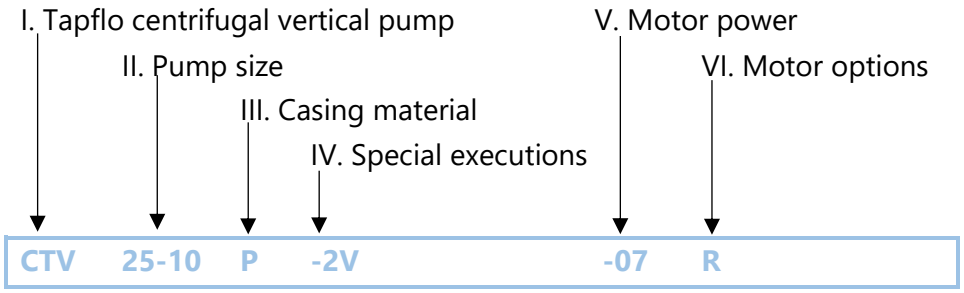
5.4. How to order parts

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. CTV = Tapflo centrifugal vertical pump

II. Pump size (outlet mm – impeller cm):

PP & PVDF	**Stainless steel**
25-9	20-9
25-10	25-9.8
25-11	40-12.5
25-11.5	40-13.5
32-8.5	
32-10	
32-12.5	

III. Pump housing material:

P = PP
K = PVDF
S = AISI 316L stainless steel
PK = PP housing with PVDF impeller

IV. Special executions

2. Casing O-ring:
- Blank* = EPDM (for PP and SS pump); FKM (for PVDF)
- V = FKM
- F = FEP/Silicone

3. Lip seal:
- Blank* = NBR (for PP and SS pump); FKM (for PVDF)
- V = FKM

4. Suction extension pipe:
- E05 = Suction extension pipe – 500 mm
- E10 = Suction extension pipe – 1000 mm
- ES05 = Suction extension pipe – 500 mm + strainer
- ES10 = Suction extension pipe – 500 mm + strainer
- S = Pump with strainer

5. Optional discharge connection:

1st letter, connection standard:
- Blank* = BSP (plastic pumps) / BSPT (metal pumps) thread
- A = ANSI flange
- D = DIN flange

2nd letter, material of flange stub:
- Blank* = Loose flange, stub in same material as pump
- X = One piece welded flange, same material as pump

3rd letter, material of flange ring:
- Blank* = PP on PP & PVDF pump, SS on Stainless steel pump
- L = PP
- S = AISI 316L stainless steel

6. Optional base plate
- H = Hendor style
- B = Babco style
- D = Bigger opening for easily drying liquids
- F = Baseplate for frame mounting

7. Special surface finishing (Stainless steel pump only)
- P = Polished version

8. Other options
- H = Half open impeller
- L = Left-hand thread on pump casing
- P = Motor mounting screw protection plugs
- F = FDA compliant wet side elastomers
- D = Second orifice for drain at bottom of column

V. Motor power (2-pole motor, 2900 rpm, IP55)
- 05 = 0.55 kW (CTV 25-9, 20-9)
- 07 = 0.75 kW (CTV 25-10, 25-9.8)
- 11 = 1.1 kW (CTV 25-11, 32-8.5, 25-9.8)
- 15 = 1.5 kW (CTV 25-11.5, 32-10, 40-12.5)
- 22 = 2.2 kW (CTV 32-12.5, 40-13.5)

VI. Motor options
- M = Motor shroud
- R = Protection roof for the motor back cover
- W = Tropic motor IP56

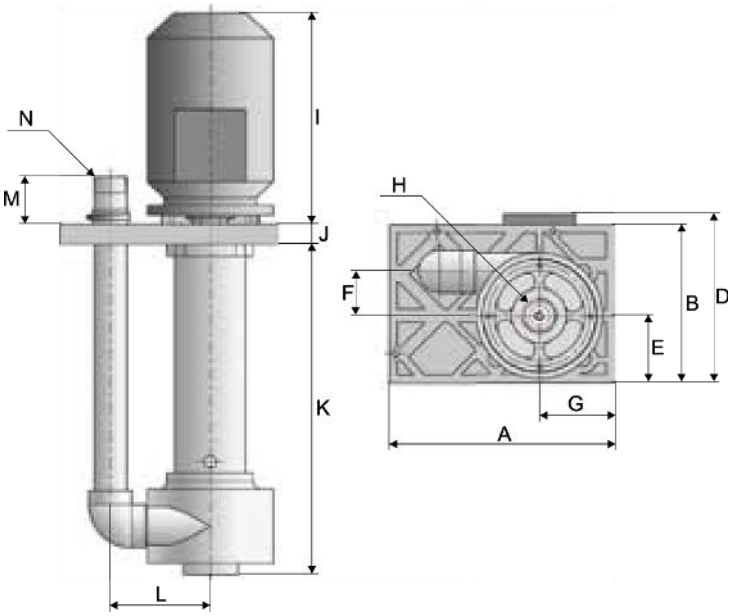
* = standard execution

6. DATA

6.2. Dimensions and data – PP & PVDF pumps

Dimensions in mm (inch)

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



DIMENSION		CTV 25	CTV 32
A		285	
		11.22	
B		200	
		7.87	
D*	0,55 kW	196	
		7.72	
	0.75 kW ÷ 2.2 kW	220	
		8.66	
E		85	
		3.35	
F		56	
		2.2	
G		95	
		3.74	
H (BSP)		1 ½"	
		1 ½	
I*	0,55 kW	213	
		8.39	
	0.75 kW ÷ 2.2 kW	319	
		12.56	
J		25	
		0.98	
K		413	
		16.26	
L		123	126
		4.84	4.96
M		60	
		2.36	
N (BSP)		1"	1 ¼"
		1	1 ¼

* Dimension may vary depending on motor brand

Pump model CTV	25-9	25-10	25-11	25-11.5	32-8.5	32-10	32-12.5
Max capacity [m³/h]	12	14	15.5	18	13	17	19
Max head [m]	11	14	17	18	9	14	20
Motor power [kW]	0.55	0.75	1.1	1.5	1.1	1.5	2.2
Outlet dimension [BSP]	1"	1"	1"	1"	1 ¼"	1 ¼"	1 ¼"
Impeller torque [Nm]	20	20	20	20	20	20	20
Weight [kg]*	11.7/14	12.7/15.3	13.4/16.4	16.1/18.3	13.7/16.8	16/18.1	17.6/19.9
Motor data	3-phase, 2-pole (2900 rpm), 380-420 VAC, 50 Hz, IP55						
Max solids size [mm]	6 mm						
Max temperature	Pump in PP: **70°C**; Pump in PVDF: **100°C**						

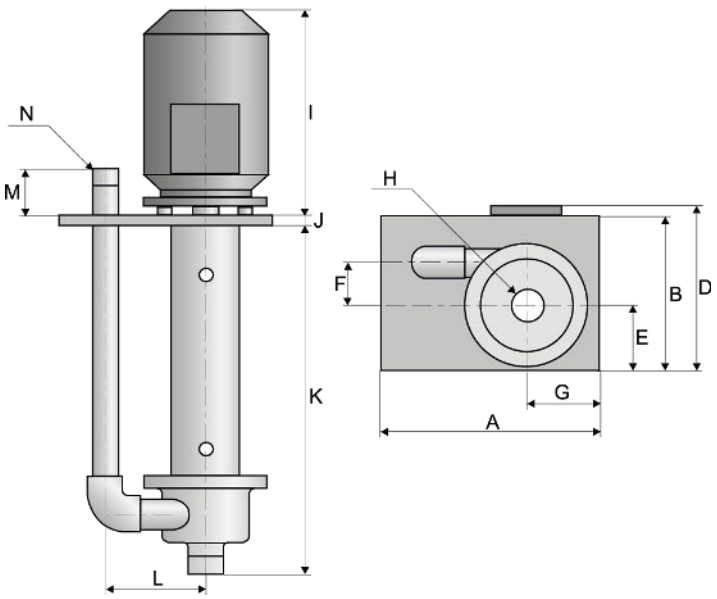
* PP/PVDF

6. DATA

6.3. Dimensions and data – Stainless steel pumps

Dimensions in mm (inch)

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



DIMENSION		CTV 20	CTV 25	CTV 40
A		267		327
		10.51		12.87
B		207		
		8.15		
D*	0,55 kW	214		
		8.43		
	0.75 kW ÷ 2.2 kW	236		
		9.29		
E		103		
		4.06		
F		36	50	68
		1.38	1.97	2.68
G		94		
		3.70		
H (BSPT)		1″	1 ½″	
		1	1 ½	
I*	0,55 kW	275.5		
		10.85		
	0.75 kW ÷ 2.2 kW	299		
		11.77		
J		8		
		0.31		
K		420.5	414	425
		16.56	16.30	16.73
L		113.5	127	193
		4.47	5.00	7.60
M		60	66	65
		2.36	2.60	2.56
N (BSPT)		¾″	1″	1 ½″
		¾	1	1 ½

* Dimension may vary depending on motor brand

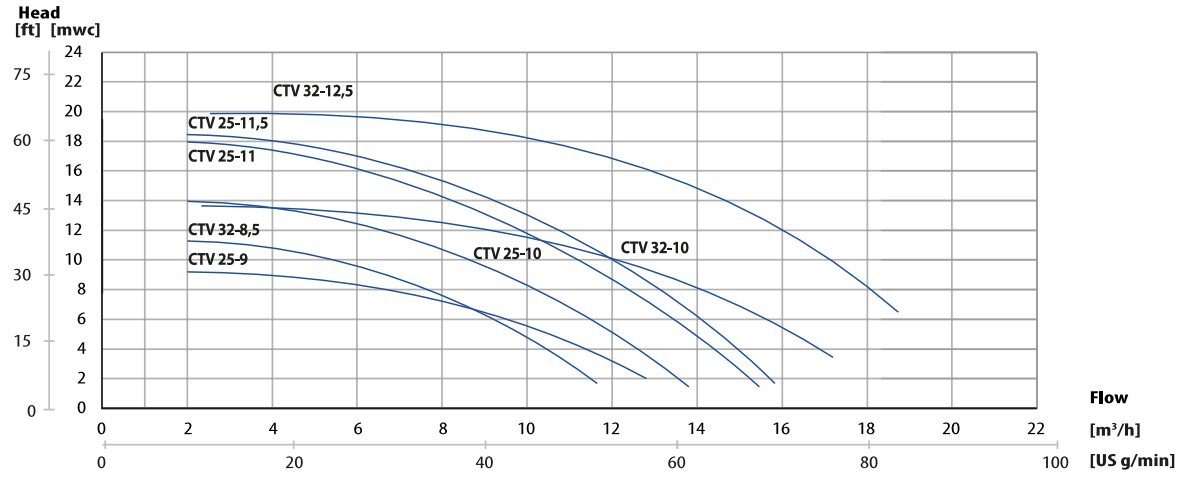
Pump model CTV	20-9	25-9.8	25-9.8	40-12.5	40-12.5	40-13.5
Max capacity [m³/h]	12	11	17	19	34	20
Max head [m]	10	11	11	22	22	31
Motor power [kW]	0.55	0.75	1.1	1.5	2.2	2.2
Outlet dimension [BSPT]	¾″	1″	1″	1 ½″	1 ½″	1 ½″
Weight [kg]	16.3	18	19.2	25.2	26.7	27.2
Motor data	3-phase, 2-pole (2900 rpm), 380-420 VAC, 50 Hz, IP55					
Max solid size [mm]	6 mm					
Max temperature	100°C					

6. DATA

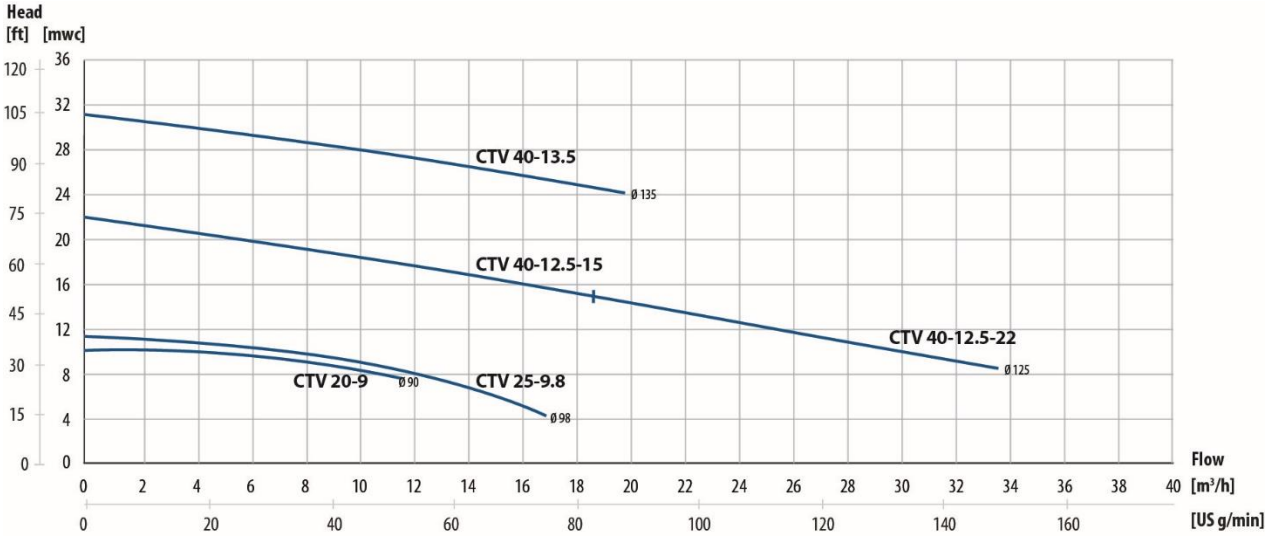
6.4. Performance curves

The performance curves are based on water at 20°C. Speed 2900 rpm.
Contact us for detailed curves

PP & PVDF pumps



Stainless steel pumps



6. DATA

6.5. Permitted loads on inlet and outlet

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

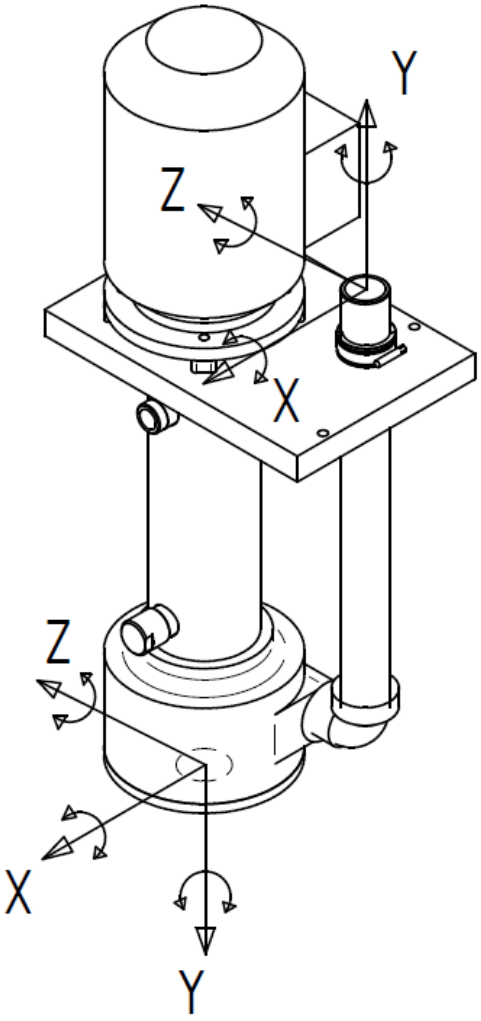
CTV 25 – PP & PVDF		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	23	4
Y	23	4
Z	23	4

CTP 32 – PP & PVDF		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	33	6
Y	33	6
Z	33	6

CTV 20 – SS		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	70	6
Y	100	6
Z	70	6

CTV 25 – SS		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	80	8
Y	120	8
Z	80	8

CTV 40 – SS		
Direction	**Load [N] (inlet/outlet)**	**Moment of force (inlet/outlet) [Nm]**
X	100	10
Y	150	10
Z	100	10



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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Tapflo products and services are available worldwide.

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

AUSTRALIA | AUSTRIA | AZERBAIJAN | BAHRAIN | BELGIUM | BOSNIA | BRAZIL | BULGARIA | CANADA | CHILE | CHINA | COLOMBIA | CROATIA | CZECH REPUBLIC | DENMARK | ECUADOR | EGYPT | ESTONIA | FINLAND | FRANCE | GEORGIA | GERMANY | GREECE | HONG-KONG | HUNGARY | ICELAND | INDIA | INDONESIA | IRELAND | ISRAEL | ITALY | JAPAN | JORDAN | KAZAKHSTAN | KUWAIT | LATVIA | LIBYA | LITHUANIA | MACEDONIA | MALAYSIA | MEXICO | MONTENEGRO | MOROCCO | NETHERLANDS | NEW ZEALAND | NORWAY | OMAN | PHILIPPINES | POLAND | PORTUGAL | QATAR | ROMANIA | 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

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