

User Manual

CPC Centrifugal Pumps



Pomac Pumps

tapflo®

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Pump serial number		
capacity		m ³ /h
pressure		bar
NPSHR		m
Drive, make		
type		
speed		min ⁻¹
voltage △ / ▲	/	V
frequency		Hz
current		A
power		kW
isolation class		
protection class	IP	
area classification		
Coupling, make		
type		
size		

User manual Pomac CPC pumps

This manual has been compiled with the utmost care.
However, POMAC assumes no liability for possible deficiencies of the information in this manual. It is the responsibility of the buyer/user of this pump to ensure this information is complete and up-to-date.

All technical information mentioned in this user manual remains property of Pomac bv and may only be used for the installation, operation and maintenance of this pump. The information may not be copied, duplicated or passed on to third parties without our written permission.

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EC Declaration of Incorporation

according to annex II 1B of the Machinery Directive
(2006/42/EC – May 17th 2006)

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We, Pomac B.V., certify and declare under our sole responsibility that the pumps mentioned below, to which this document relates:

- **Model:** Centrifugal Pump
- **Type:** CPC
- **Execution:** KAM, KAV, KAC, IG, IGH
- **Materials:** 1.4404 (AISI 316L) or 1.4435 or 2.4602 (Hastelloy C22)

are in conformity with the following harmonised standards:

- **NEN-EN 809** 1998+A1:2009
- **NEN-EN-IEC 60204-1** 2006

A technical construction file according to annex VII part B is being kept on file.
This technical construction file was composed by the below mentioned authorised person.

The pump must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive (2006/42/EC), where appropriate.

Issued at Tolbert, 7th of January 2016

Authorised / Approved by;

A handwritten signature in black ink, consisting of a stylized 'H' and 'P' followed by a long horizontal stroke.

H. Poelstra, Managing Director

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1. Introduction

1.1. General information

This manual provides important information regarding the correct way of installing, operating and servicing this pump.

This manual also provides information necessary to prevent the installer/operator from injury or discomfort during installation and operation of this pump and to ensure the correct use and reliable performance of this pump.

This manual represents the most recent information regarding the pump types mentioned in this manual at the time of going to print. However, POMAC reserves the right to modify the construction of the pump types mentioned, as well as the contents of this manual, without prior or afterward notification.

Read this manual thoroughly before installing, operating or servicing this pump. Ensure that operators and maintenance staff are familiar with the symbols used. Follow the instructions in this manual step by step.

1.2. Warranty

Warranty is strictly limited to the conditions specified by POMAC and will only be granted according to these conditions.

Warranty will only come into force provided that:

- the pump has been installed and put into operation strictly in accordance with the instructions given in this manual.
- maintenance and repairs have been carried out according to the instructions given in this manual.
- exclusively original POMAC parts or parts provided by POMAC have been used for replacing parts.
- the pump has not been used for applications other than those shown in the specifications according to which the pump was sold.
- no changes have been made to the construction of the pump itself by the buyer.
- the damage is not the result of work carried out by persons not qualified or appointed.
- the damage has not been caused through major force.

1.3. Transport and receipt

1. Check to see if the pump has not been subject to damage during transportation. If this is the case, report it directly to the carrier and to POMAC;
2. If the pump is delivered on a pallet, leave it on the pallet for as long as possible. This facilitates internal transport.
3. If a suitable hoisting device is available, use this if the pump is fitted with lifting eyes.
4. With the exception of the motors fitted with a stainless steel shroud, the motors (pumps) from construction size 112 or 132 can be fitted with a screw-in lifting eye.

Motor size	100-112	132	160	180	200
Lifting eye thread size	M8	M10	M10	M12	M16

1.4. Pump identification

Pomac		Pomac Pumps P.O. Box 327 9356 ZG Tolbert The Netherlands	
Type:			
Serial nr:		Year:	
Capacity:		m ³ /h	Pressure:
Drive:			
Power:		kW	Speed:
			rpm
Tel: +31(0)594-512877 www.pomacpumps.com			

- On the type plate of the pump the serial number and the type code are indicated. The type code describes the arrangement of the pump.
- Always refer to the serial number and the type code in any correspondence and when ordering parts.

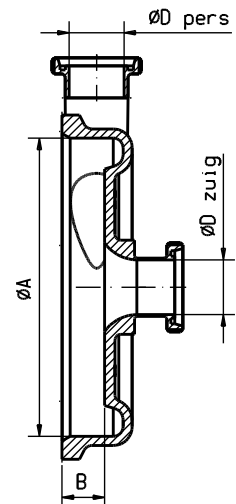


These pump data are also stated on the first page of this manual.

If the pump type plate is missing, please provide us with the following details so that we can establish the correct pump size:

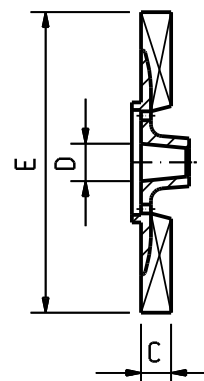
Pump cover

Diameter A	
Depth B	
Diameter suction	
Diameter discharge	
Connection:	Please state



Impeller

Diameter D	
Diameter E	
Blade width C	
Impeller type	



Motor

There is a motor type plate on the motor itself.

1.5. Type code

The type code consists of the following items:

x	x	x	-	x	-	x	-	x	-	x	-	x	-	x
1	2	3		4		5		6		7		8		9

Example: CPC 16044 – KAM – 2 – 0750 – S1 – AF - XS

1. Type

CPC

2. Pump size

160 / 210 / 260 / 310 / 380

3. Connection sizes

22 / 33 / 44 / 55/ 66 / 88 / 108 / 1210

4. Construction

KAM / KAC / KAV / IG / IGH

5. Electric motor poles

2 / 4 / 6

6. Power

0.55	=	0055
7.5	=	0750
18.5	=	1850
37	=	3700

7. Mechanical seal

According to EHEGD:

B11 = mechanical seal, balanced, internal, according to EHEDG

Q12 = double mechanical seal with Quench, 1 side balanced, according to EHEDG

Non-EHEGD:

S1 = mechanical seal, unbalanced, internal

S2 = mechanical seal, unbalanced, external

B1 = mechanical seal, balanced, internal

Q1 = double mechanical seal with Quench, unbalanced

F1 = double mechanical seal, Back to Back, with Flush, unbalanced

8. Connections

A = DIN 11851

B = SMS 1145

C = Tri Clamp

D = DIN 11864-1

E = Flanges EN 1092-1

G = special connection

F = inch

H = metric

9. Options

V = heating jacket

I = drain

T = turbine

X = ATEX

S = extra surface roughness treatment internal parts

W = internal parts hardened

1.6. Ordering spare parts

An order form for ordering spare part is included in the documents accompanying this pump. You should state the following details on this form:

- your address data
- the **serial number and the type number** (these are stated on the type plate of the pump and on the first page of this manual).
- the **item numbers** and **quantities** of the desired parts.



See chapter 8 for the sectional drawings of the pump, with the corresponding parts lists with item numbers.

1.7. Manufacturer

CPC pumps are manufactured by

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9356 BX Tolbert
The Netherlands
Tel +31(0) 594 5128 77
Fax +31(0) 594 5170 02
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www.pomacpumps.com

2. Safety

2.1. General information

This manual provides information necessary to prevent the installer/operator from injury or discomfort during installation and operation of this pump and to ensure the correct use and reliable performance of this pump.

- Read this manual thoroughly before installing, operating or servicing this pump.
- Ensure that operators and maintenance staff are familiar with the contents of this manual and with the instructions given.
- Ensure that operators and maintenance staff are familiar with the symbols used.
- Follow the instructions in this manual step by step.
- Store this manual in a place that is known and accessible to any user.

2.2. Instructions

This manual contains instructions with regard to the safety of the user, the continued good functioning of the pump and hints to facilitate certain actions or procedures. These instructions are indicated with the following symbols:



Warning! May cause injury to the user! Act strictly in accordance with the instructions given!



Caution! May cause severe damage to the pump or bad functioning! Closely follow the instructions given!



Note: Hint or instruction that can facilitate certain actions.

Issues which require extra attention are printed in **bold**.

2.3. Staff

All personnel, in charge of the installation, operation or maintenance and overhaul of the pump, should have received the necessary training.

2.4. Precautions



When performing maintenance work to the pump ensure that the drive of the pump is shut down and cannot be switched on unintentionally!



All work on and with the pump must always be in accordance with all the prevailing standards regarding occupational health and safety as well as machine safety!



Always wear protective gloves and safety goggles if the pump conveys harmful liquids that may cause injuries!



See to it that the pump is depressurized, when it has to be disassembled for overhaul!



Allow the pump to cool down first when it is used for conveying hot liquids!

2.5. Changed application

- Contact POMAC in case the pump is going to be used for other applications or in different circumstances than those specified during the initial pump selection.

3. Description CPC centrifugal pump

3.1. Pump description

Stainless steel sanitary centrifugal pump that is used for pumping liquids up to 500 cP. For this process a liquid flow (with a pre-pressure or an underpressure) is constantly present on the suction side.

3.2. Certification

Pump type CPC is certified in accordance with the EHEDG directives.
Pump type CPC is ATEX certified.

3.3. Application area

The application area goes from a capacity of 300 m³/h to a manometric head of 9 bars, at 3000 rpm (360 m³/h – 13 bar at 3600 rpm).

3.4. Pump impeller design

The pumps are provided with an open impeller.

3.5. Type description

Depending on the area of application the following types are available:

CPC

- Stainless steel sanitary centrifugal pump designed with tangential outlet and suitable for system pressures up to 16 bars.

CPC-H

- Stainless steel sanitary centrifugal pump designed with tangential outlet and suitable for system pressures up to 50 bars.

3.6. Connections

All pump types are available with the following connections:

- Couplings according to DIN 11851, DIN 11864-1, SMS, etc.
- Tube connections according to NEN 1472 en DIN 1850
- Flanges according to EN 1092-1, DIN 11864-2
- Tri-clamp according to ISO 2852, DIN 32676 en DIN 11864-3
- Connections according to client specification.

3.7. Materials

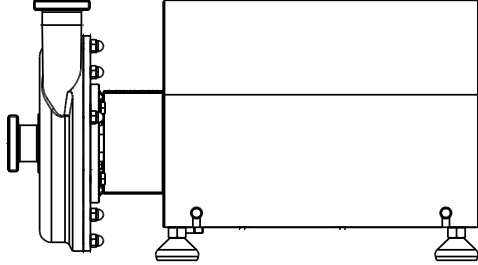
- All parts that come into contact with the liquid are designed in stainless steel Materials nr. 1.4404.
- At request also available in Materials nr. 1.4435 or Materials nr. 2.4602 (Hastelloy C22).

3.8. Construction variants

All pumps are available in the following, fully exchangeable designs:

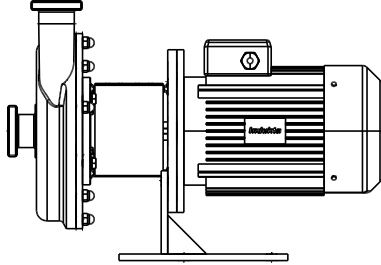
KAM

Pump and motor close coupled and placed on adjustable stainless steel feet. The motor is provided with a stainless steel shroud.



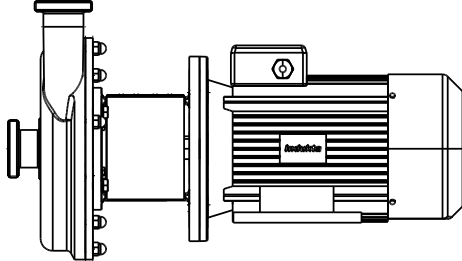
KAC

Pump and motor close coupled and placed on a steel support.



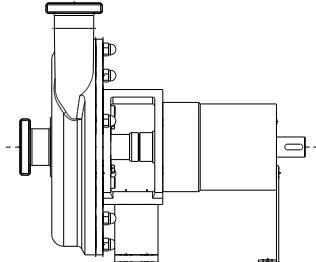
KAV

Pump and motor close coupled and placed on the motor feet.



IG

Pump fitted to a bearing bracket.



IGF

Pump fitted to a bearing bracket and connected to an hydraulic motor

3.9. Shaft seals

3.9.1. Materials

Within the hygienic standards of EHEDG the pumps are available with different mechanical seal arrangements.

The mechanical seals are available in the following materials:

- Carbon on silicon carbide
- Carbon on CrMo-steel
- Carbon on Ceramic
- Hard metal on hard metal
- Silicon carbide on silicon carbide
- Tungsten carbide on tungsten carbide
- Carbon on hard metal

The mechanical seals are available with EPDM, FKM (Viton), Teflex FEP/Viton and FFKM (Kalrez) "O"-rings.

All materials meet FDA - CFR 21 or equivalent European standards.



Pomac pumps are supplied as standard with an internal balanced mechanical seal, carbon on silicon carbide with EPDM O-rings: type EHP, configuration B11).

3.9.2. Type indication code

Code	Description	type
S1	internal single mechanical seal – unbalanced	NP
S2	external single mechanical seal - unbalanced	NP
B1	internal single mechanical seal - balanced	NP
B11	internal single mechanical seal - balanced, according to EHEDG	EHP
Q1	double mechanical seal with Quench - unbalanced	NP
Q12	double mechanical seal with Quench - 1 side balanced, according to EHEDG	EHP
F1	double mechanical seal with Flush - back to back - unbalanced	NP

3.9.3. Explanation double action mechanical seals

Quench

- This is applied where a constant pressure-free flush is required because of the product.

Flush

- This is applied when a considerable underpressure prevails on the suction side, or when a constant flushing is required in order to prevent fouling of the shaft seal. The pressure of the flushing fluid must always be higher than the discharge pressure of the pump.

3.10. Drive

- The designs **KAM and KAV** are fitted with B3/B5 foot/flange motors acc. to IEC, provided with a balanced stainless steel extension shaft.
- The design **KAC** is fitted with a B5 flange motor acc. to IEC provided with a balanced stainless steel extension shaft. Only available up to build size IEC 132.
- The electric motors are available in all possible efficiency classes, voltages, insulation categories, protection categories and in low-noise and in ATEX design.
- The designs **IG and IGH** are available with air-driven, hydro, combustion and electric motors.

4. Installation

4.1. General

- The foundation must be smooth and level.
- For the KAM design set the adjustable legs using the leg adjustment bolts (21), **in such a way that the pump is stable on all 4 legs!** Secure the leg adjustment bolts with the lock nuts (22).
- Verify that the system pressure does not exceed the permitted operating pressure.
- Verify that the pipes do not show any leakage.
- The pipes must be installed and connected stress-free.
- If backflow of the liquid flow is undesired, or there is a chance of undesired liquid mixing, apply a non-return valve.

4.2. Assembling Type IG

Type IG can be assembled with all drives. Proceed as follows:

1. Fit one coupling half to the pump shaft and one half to the drive shaft.
2. Place the pump on the foundation and fix it.
3. Place the drive on the foundation. Keep a gap of 3 mm between both coupling halves.
4. Level the drive to the correct height in relation to the pump using the copper shims under the motor legs. Fix the motor.
5. Align the coupling according to the following instructions.

4.3. Connecting the electric motor



An electric motor may only be connected by a qualified electrician!

5. Putting into operation

5.1. Precautions

5.1.1. General

- Check that the shaft can turn freely. To do this, rotate the pump shaft a few times manually.
- Check that the fuses have been fitted.
- Types IG and IGH are designed as standard with grease lubricated ball bearings that are provided with grease for their entire life (2RS1).
- If type IG(H) is designed with oil lubricated bearings, the bearing housing should be filled with oil first.

5.1.2. Quench

If provided with **quench** (shaft seals **Q1** and **Q12**):

1. Connect the quench lines to the quench space. Capacity approx. **3 l/min. The SUPPLY line must be connected to the LOWER port!**
2. Open the inlet and outlet of these lines.
3. Set the required pressure. **The maximum pressure is 0.2 bar.**

5.1.3. Flush

If provided with **flush** (shaft sealing **F1**):

1. Connect the flush lines to the flush space. The flushing must have a capacity of approx. **3 ltr/min. The SUPPLY line must be connected to the LOWER port!**
2. Open the inlet and outlet of these lines.
3. Set the required pressure. **This must be 2 bars higher than the maximum occurring system pressure!**

5.2. Checking the rotation direction

1. Fill the pump with the medium to be pumped.
2. Check that the quench or flush system is set to the correct pressure.
3. Switch the pump on briefly.



Take care with any unprotected rotating parts!

4. Check that the rotation direction of the motor corresponds with the rotation direction of the pump (which is indicated by an arrow on the lantern piece). If the rotation direction is not correct, swap the connection wires L1 and L2.



This must be done by a qualified electrician!

5. Fit the guard.

5.3. Putting into operation

1. Check that the quench or flush system is set to the correct pressure.
2. Fully open the shut-off-valve in the suction pipe.
3. Close the delivery valve.
4. Switch the pump on and allow it to come up to pressure.
5. Subsequently open the delivery valve.
6. Set the pump to its required operating point.

5.4. In operation

5.4.1. Noise

The noise data stated in this manual refer to normal usage, with an electric motor. Under these conditions the noise level, measured at a distance of 1 meter and at a height of 1,6 meter, is below 85 dB(A). If after the passage of time the pump produces excessive noise, this can be an indication that there is a fault in the pump or elsewhere in the system (e.g. worn out bearings, cavitation).

5.4.2. Daily maintenance



Regularly check the pressure of quench or flush supply if the shaft seal is equipped with it.

- Check that the high flush pressure does not provoke any undesired leakage to the liquid to be pumped.
- The valve in the suction pipe must always be completely open
- Regularly check that the inlet pressure is not too low to avoid the occurrence of cavitation in the pump
- Regularly check the delivery pressure
- Regularly check the shaft seals for leakage.



The pump may never run without liquid

5.4.3. Cleaning procedure and agents

The pumps are suitable for being CIP cleaned.
Use the cleaning agents recommended for the products.

5.4.4. Periodic maintenance

The pumps basically are maintenance free. Only the following items require periodic attention:



Periodically check that the quench or flush system is still set at the correct pressure and capacity!

- The electric motor bearings are greased for their entire life and do not require any maintenance or subsequent lubrication. This also applies to the designs IG and IGH, if designed with grease lubricated bearings.
- Regularly check the oil level for designs IG and IGH, **designed with oil bath lubricated bearings**. This oil must also be changed annually or after every 5000 operating hours.



Check that the spent oil is disposed of in the correct manner (environment)!

- A mechanical seal may not show any visible leakage. If this is the case, replace the shaft seal.
- If a mechanical seal does not show any visible leakage disassembly is not recommended!

5.5. Malfunction

If there is a malfunction in the pump, try to find the cause using the troubleshooting list at the back of this manual or consult your installer!



Always switch off the current first if you intend to investigate the malfunction yourself. Remove the fuse or lock the operating switch with a pad lock!



The pump can still be hot or under pressure. Allow the pump to cool down first and if possible release the pressure from the pump. Always wear the correct personal protection devices (goggles, gloves, etc.)!

6. Overhaul and repair

6.1. Removing the pump



First ensure the electric current has been switched off. Remove the fuses or switch the operating switch to OFF and lock it with a pad lock!



If the pumped liquid is HOT, first allow the pump to cool down!

1. Disconnect the electrical connections to the electric motor.
2. For designs Q1, Q12 and F1 disconnect the flushing lines.
3. Loosen the connections of the pipes and remove the pump from the piping.

6.2. Dismantling and assembling the pump



The item numbers shown (...) refer to the illustrations and the parts lists in chapter 7

6.2.1. Dismantling the pump

1. Loosen the pump cover nuts (9) and remove the pump cover (3). Inspect the pump cover O-ring (8) for damage.
2. Remove the pump shaft nut (1) and remove the impeller (4) and the O-ring (2).
3. Remove the sunk key (504).
4. If necessary dismantle the shaft seal.
5. If necessary dismantle the stub shaft.

6.2.2. Assembling the pump

1. If it has been dismantled: fit the extension shaft (12). This has to be adjusted before the pump can be further assembled, see next paragraph.
2. If it has been dismantled: fit the shaft seal.
3. For an interior seal check that the spring of the seal is positioned firmly against the collar of the shaft sleeve!
4. Place the O-ring (32) on the shaft.
5. Push the impeller onto the shaft.
6. Place the O-ring (2) and fit the pump shaft nut (1).



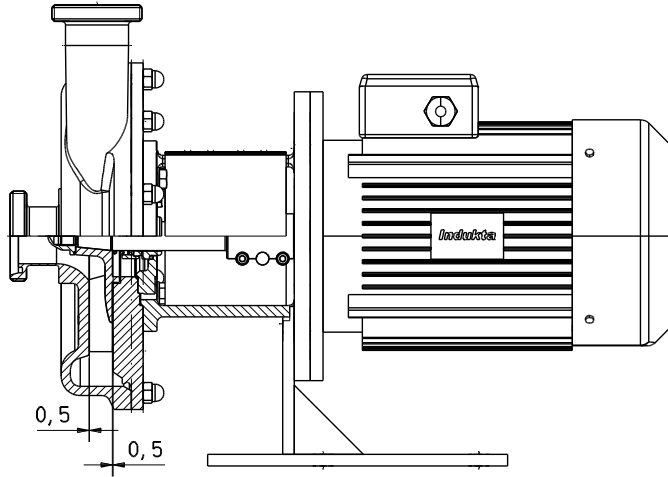
Use a feeler gauge to check that the gap between the impeller and the rear plate is correct. If this is not the case, readjust the extension shaft! See next paragraph.

7. Place the pump cover O-ring (8). Fit the pump cover (3) and tighten the pump cover nuts (9).

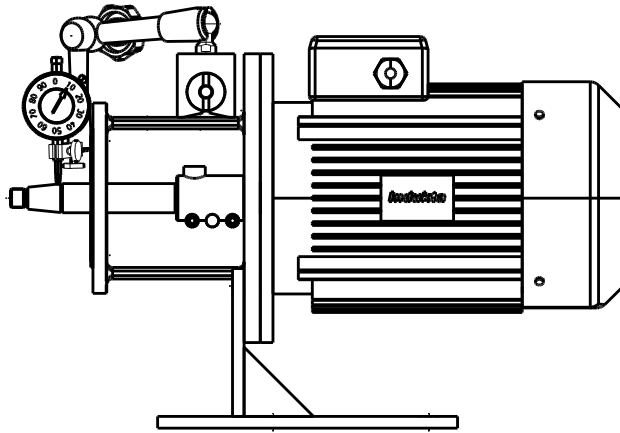
6.2.3. Adjusting the extension shaft

For versions KAM, KAC and KAV **before the final assembly** the extension shaft first must be adjusted on the motor shaft to set the proper gap between the impeller and the back plate later.

1. If dismantled, fit the lantern piece (15) and the back plate (6).
2. If provided with shaft sealing F1, fit shaft sleeve (23) on the extension shaft. Fit the impeller (2) and the pump shaft nut (3) to the extension shaft and fit the extension shaft to the motor shaft.
3. Place a feeler gauge of thickness **0,5 mm** between the impeller and the back plate. Gently tighten the bolts of the extension shaft. Do not tighten the Allen screw for disassembly of the extension shaft too much.



4. Dismantle the impeller and the back plate and assemble the pump according to the relevant instructions.
5. Check the extension shaft for oscillation. This must not be more than 0.05 mm.



6.3. Dismantling and fitting the shaft seal

6.3.1. Instructions

The fitting/dismantling instructions can differ between manufacturers. You will find below the fitting/dismantling instructions for the most commonly applied mechanical seals in Pomac pumps.



In other cases, always follow the instructions that are provided by the supplier of the seal in question!

6.4. Internal mechanical seal S1, B1

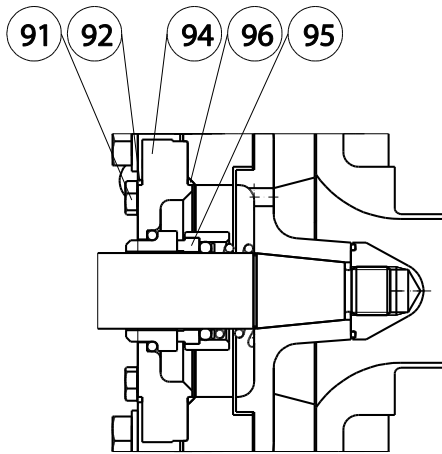


Figure 1 Mechanical seal S1.

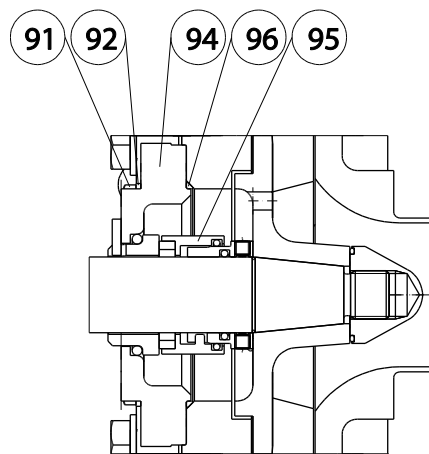


Figure 2 Mechanical seal B1.

6.4.1. Dismounting

1. Dismantle the pump cover and the impeller.
2. Remove the rotating ring of the mechanical seal (95) from the extension shaft
3. Dismantle the back plate (7).
4. Push the static ring of the mechanical seal (95) out of the seal seat (93).

6.4.2. Mounting

1. If it has been disassembled: Place the O-ring (96) and refit the seal seat (93) to the back plate (7) with bolts (91) and washers (92).
2. Apply some food grade grease to the seal seat (93) and press the static ring of the mechanical seal (95) into the seal seat. **Ensure the slot in the static seal ring corresponds with the lock pin.**
3. Fit the back plate (7) to the lantern piece (11) with bolts (6) and washers (5).
4. Apply some food grade grease to the extension shaft and push the rotating parts of the mechanical seal (95) onto the shaft.
5. For shaft seal B1: line up the rear side of the mechanical seal with the shaft collar and fix the lock screws.
6. Fit the impeller and the pump cover.

6.5. External mechanical seal S2

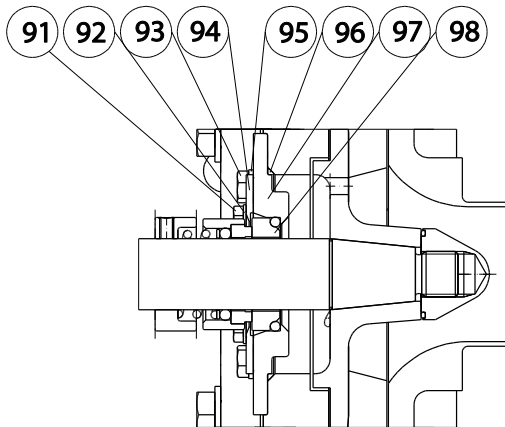


Figure 3 Mechanical seal S2.

6.5.1. Dismounting

1. Dismantle the pump cover, the impeller and the back plate (7).
2. Push the static ring of the mechanical seal (98) out of the seal seat (97).
3. Remove the rotating ring of the mechanical seal (98) from the shaft.

6.5.2. Mounting

1. If it has been disassembled: Fit the set ring of the mechanical seal and adjust it according to figure 3 and the values from the table below.

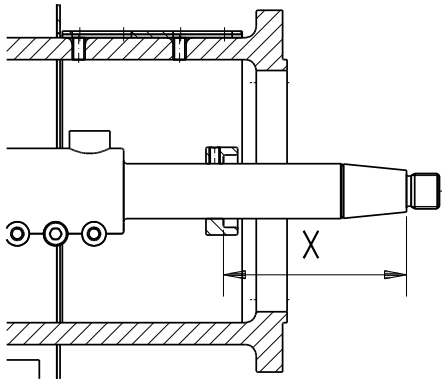


Figure 4 Adjusting the set ring.

D [mm]	X ± 0.5 [mm]
25	83,5
30	83,5
35	88



In case of different seal constructions follow the fitting instructions supplied by the manufacturer!

2. Apply some food grade grease to the shaft and push the rotating part of the mechanical seal (98) onto the shaft, the seal face facing the impeller.
3. If it has been disassembled: Mount the O-ring (96) and refit the seal seat (97) to the back plate (7).
4. Apply some food grade grease to the seal seat (97) and press the static ring of the mechanical seal (98) into the seal seat.
5. Fit the back plate (7) to the lantern piece (11) with bolts (6) and washers (5).
6. Fit the impeller and the pump cover.

6.6. Mechanical seal with quench Q1, Q12

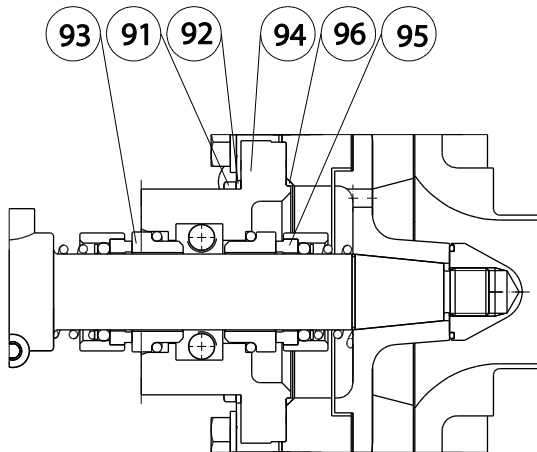


Figure 5 Mechanical seal Q1.

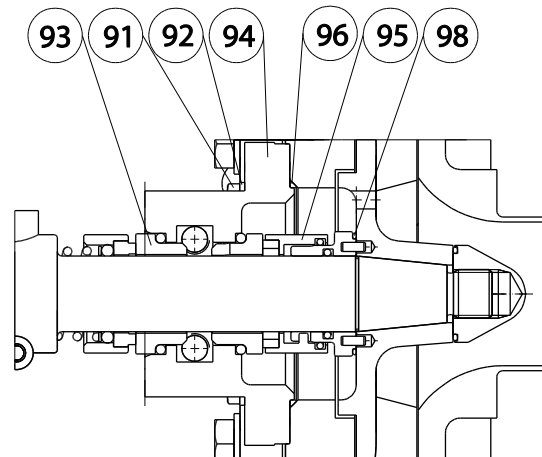


Figure 6 Mechanical seal Q12.

6.6.1. Dismounting

1. Dismount the impeller and the pump cover.
2. Push the rotating parts of the mechanical seal (95) off the shaft. In case of a balanced seal (Q12) loosen the lock screws of the rotating part of the seal.
3. Disassemble the back plate (7) and the seal housing (94) and remove both static rings of the mechanical seals (93 and 95) from the seal seats of the seal housing.
4. Remove the rotating part of the other mechanical seal (93) from the shaft.

6.6.2. Mounting

1. Fit the rotating part of the mechanical seal **with the left-wound spring** (93) onto the shaft, the seal face facing the impeller.
2. If it has been disassembled: Mount the O-ring (96) and refit the seal housing (94) to the back plate (7).
3. Apply some food grade grease to the seal seats and push both static rings of the mechanical seals (93 and 95) in the seal seats of the seal housing (94). The static ring belonging to the exterior seal (93) is fitted at motor side.
4. Fit the back plate (7) with the seal housing.

Q1:

5. Fit the rotating part of the other mechanical seal (95) onto the shaft.
6. Mount the O-ring (32) on the shaft.
7. Fit the impeller.

Q12:

8. Fit the rotating part of the other mechanical seal (95) onto the shaft.
9. Mount the O-ring (98) on the seal.
10. Mount the O-ring (32) on the shaft.
11. Fit the impeller. **Ensure the slot in the static seal ring corresponds with the lock pin.**

6.7. Mechanical seal with flush F1

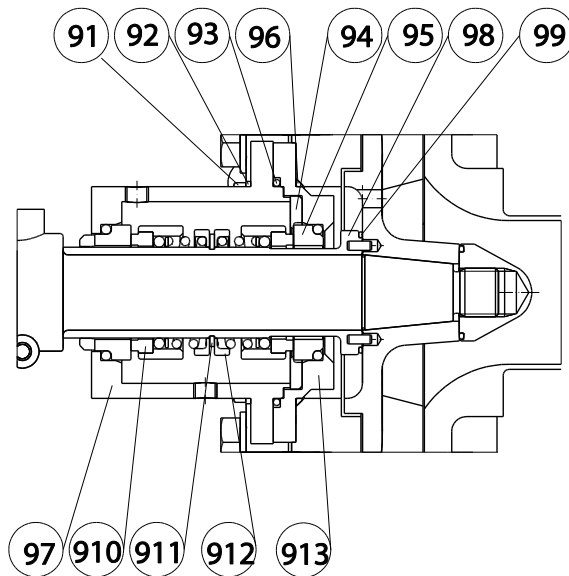


Figure 7 mechanical seal F1.

6.7.1. Dismounting

1. Dismantle the pump cover and the impeller.
2. Remove the flush supply lines.
3. Remove the back plate (7) from the lantern piece (11) and pull the entire flush-configuration (97+913) including the shaft sleeve (98) from the shaft.
4. Remove the entire flush-configuration (97+913) from the back plate and remove the O-ring (93).
5. Separate the flush compartment (97) from the seal seat (913).
6. Remove the O-ring (93) and the fixing ring (253).
7. Push the static rings of both mechanical seals (95/910) out of their respective seats.
8. Remove the O-ring (99) from the shaft sleeve.
9. Remove the rotating ring of mechanical seal (910) and the support ring (912) from the shaft sleeve.
10. Remove the snap ring (911).
11. Remove the support ring (912) and the rotating ring of mechanical seal (95) from the shaft sleeve.

6.7.2. Mounting

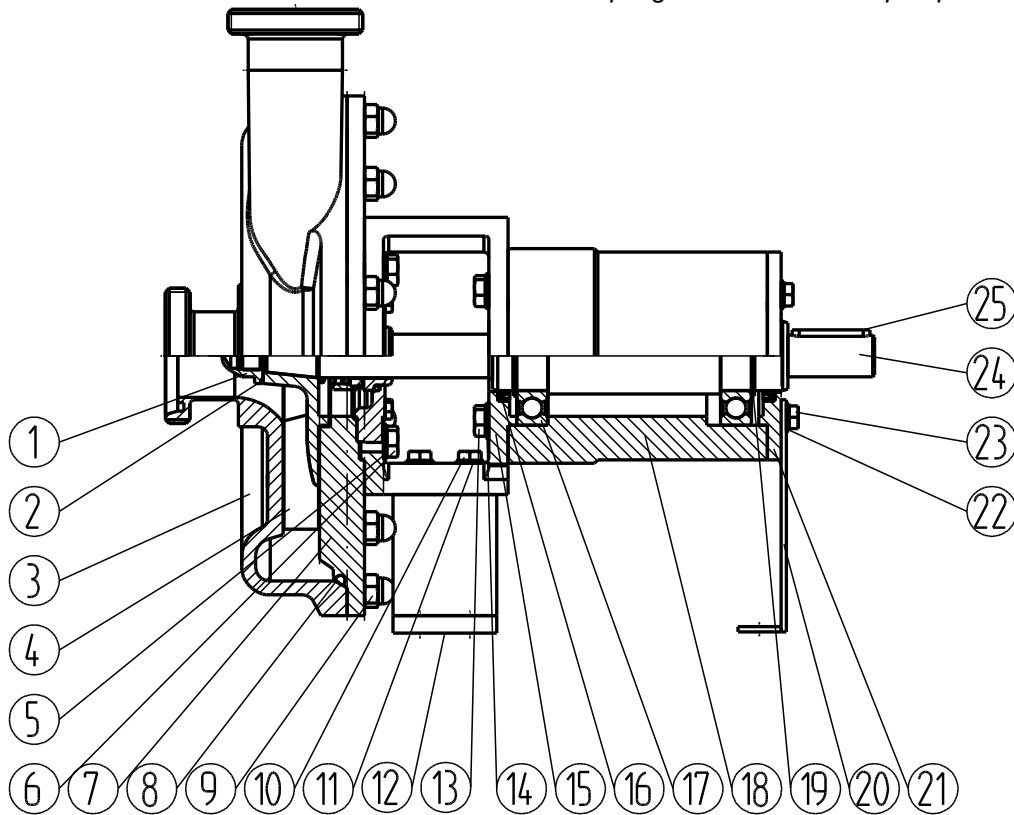
1. Apply some food grade grease into the seat of the flush compartment (97) and push the static ring of the mechanical seal (910) in the seat. **Ensure the slot in the static ring coincides with the lock pin.**
2. Apply some food grade grease into the seat of the seal seat (913) and push the static ring of the mechanical seal (95) in the seat.
3. Insert the shaft sleeve (98) from outside in through the seal seat (913).
4. Place the fixing ring (94) over the static seal ring (95) in the seal seat (913).
5. Apply some food grade grease to the shaft sleeve (98) and fit the rotating ring of the mechanical seal (95) onto the shaft sleeve, the seal face facing the static seal ring.
6. Fit a support ring (912) onto the shaft sleeve.
7. Fit the snap ring (911) onto the shaft sleeve.
8. Fit the other support ring (912) onto the shaft sleeve.
9. Fit the rotating ring of the other mechanical seal (910) onto the shaft sleeve, the seal face facing outward and the spring bearing to the support ring. This set-up is called a **Back to Back** assembly.
10. Fit the O-ring (93). Fit the seal seat (913) to the flush compartment (97) by means of the Allen screws.
11. Fit the O-ring (96) and fit the assembly to the back plate (7).

12. Slide the entire subassembly onto the shaft and fit the back plate (7) to the lantern piece (11). **Ensure the shaft sleeve does not slip out of the seal seat!**
13. Fit the O-ring (99) onto the shaft
14. Fit the impeller.

6.8. Dismantling and assembling bearings



First dismantle the pump unit to the extent that the following parts can be reached and can be dismantled. Remove the electric motor and the coupling. Disassemble the pump.



6.8.1. Dismantling bearing of IG construction

1. Remove the intermediate piece (15) and the bearing cover (21).
2. Remove the outer circlip (19) from the bearing (17) at drive side and push the shaft with the other bearing out of the bearing bracket.
3. Remove the other outer circlip (19) and remove the bearing from the shaft.
4. Remove the bearing from the bearing bracket.

6.8.2. Assembling bearing of IG construction



First check both oil catchers (16) in the intermediate piece (15) and the bearing cover (21). Replace them if they are damaged!



Lubricate the inner and outer ring of the bearing, shaft and bearing seats in order to prevent seizing up.

1. Fit the bearing (17) to the shaft at pump side and fix it with circlip (19)
2. Insert the shaft (29) at pump side into the bearing bracket (18).
3. Fit the intermediate piece (15) with bolts (13) and washers (14).
4. Fit the bearing (17) onto the shaft at motor side and press it into the bearing bracket (18).
5. Fix the bearing with circlip (19).
6. Fit the bearing cover (21).

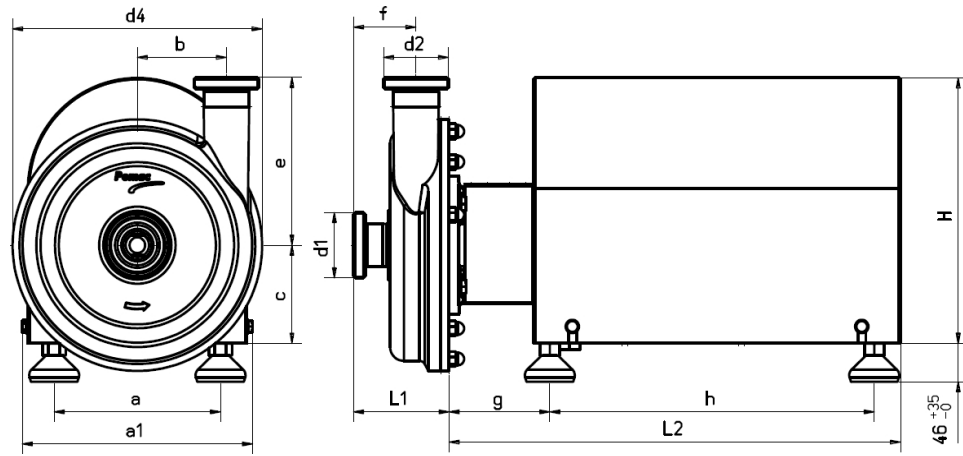
6.9. Application IEC standard motors with extension shaft



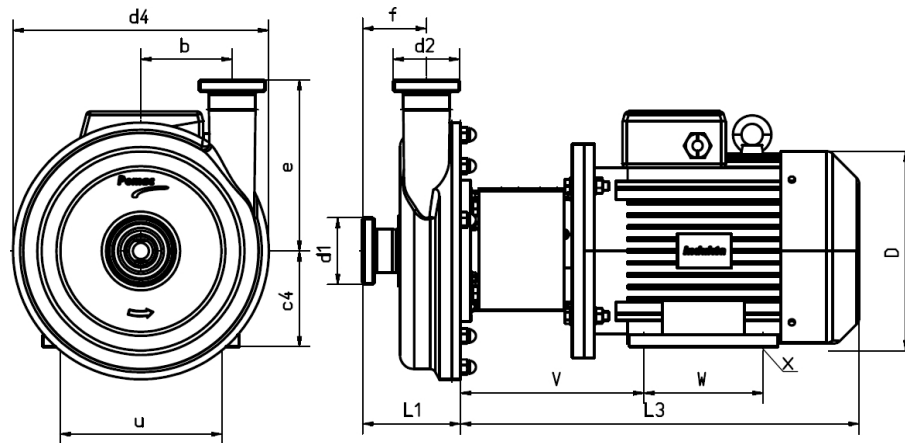
When replacing a standard IEC standard electric motor the new motor must always be designed with an axially fixed shaft at flange side!

7. Dimensions

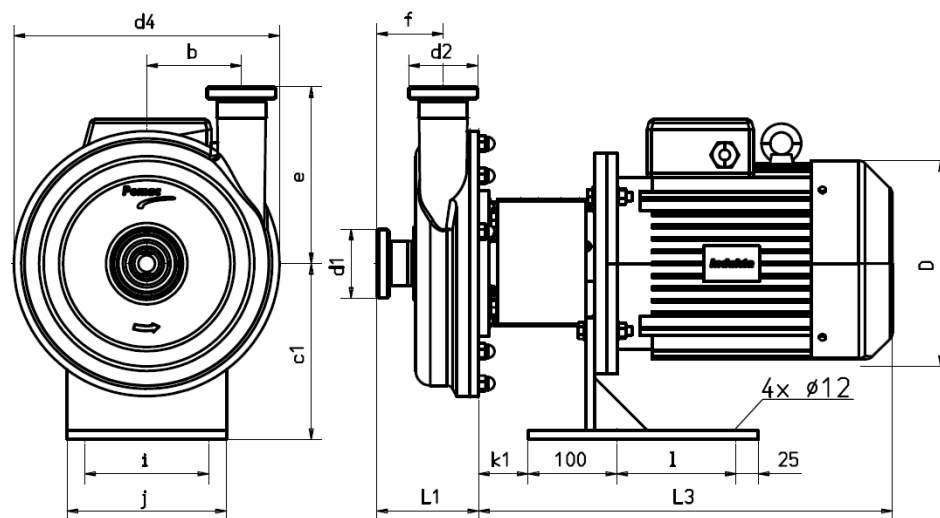
7.1. Dimensions drawings



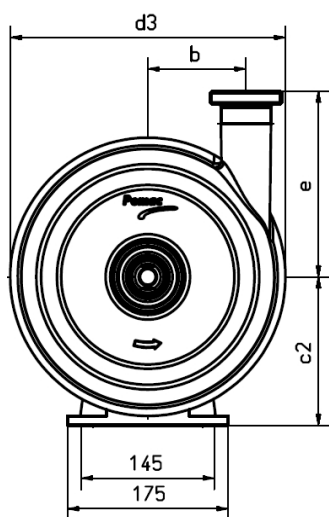
CPC-KAM



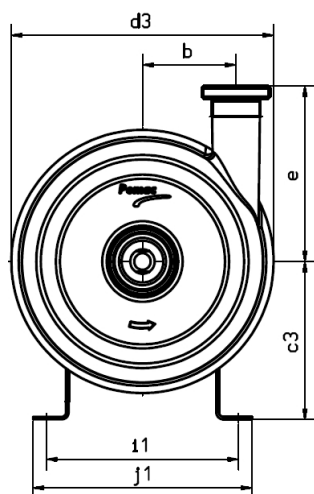
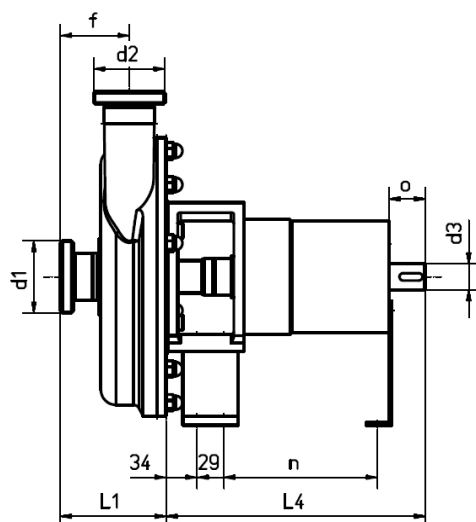
CPC-KAV



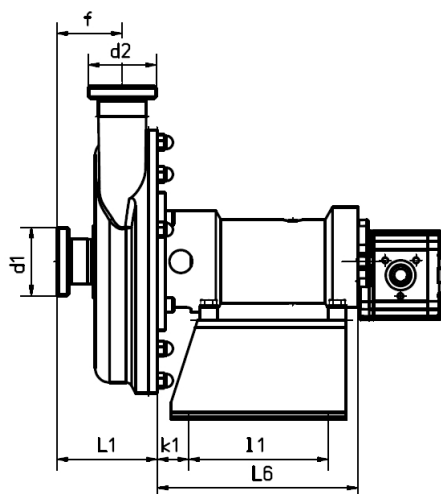
CPC-KAC



CPC-IG



CPC-IGH



7.2. Dimensions electric motors KA series

size	power (KW)				Build-in dimensions electric motors																														
IEC	3000	1500	1000	750	a	a1	c	c1	c4	D	g	h	H	i	j	k1	l	u	V	W	x	L2	L3												
80-A	0,75	0,55	0,37	0,18	160	228	85	180	80	150	110	316	246	120	150	43	110	125	0	100	10	458	0												
80-B	1,1	0,75	0,55	0,25																			0												
90S	1,5	1,1	0,75	0,37	160	228	95	180	90	176	110	316	246	120	150	43	110	140	0	100	10	458	0												
90L-2	2,2			0,55																0															
90L-4,6,8		1,5	1,1																	0															
100L-2,4A	3	2,2																		0															
100L-4B		3			200	278	105	194	100	202	121	390	316	140	180	53	135	160	0	140	12	543	0												
100L-6,8A			1,5	0,75																			0												
100L-8B				1,1																			0												
112M-2,6,8	4		2,2	1,5																			0												
112M-4		4			200	278	117	194	112	233	121	390	316	140	180	53	135	190	0	140	12	543	0												
132S-2A,6,8	5,5		3	2,2	250	328	137	219	132	266	121	452	356	160	230	73	165	216	0	140	12	605	0												
132S-2B,4	7,5	5,5																		0															
132M-4,6A,8		7,5	4	3																178			0												
132M-6B			5,5																																
160M	11	11	7,5	4	320	390	183		160	316	198	447	443					254	308	210	15	772	0												
				5,5													254			0															
160L		15	11	7,5																														0	
180M	22	18,5			320	390	203		180	350	198	447	520					279	321	241	15	902	0												
180L		22	15	11																									279						
200L	30	30	18,5		370	445	223		200	406	206	520	570					318	343	305	19	975	0												
	37		22																																
200L-8				15																															0
225M-2	45				416	490	248		225	485	213	521	615					356	351	311	19	1050	0												
225S-4		37																																0	
225M-4,6		45	30																															0	
225S-8				18,5																														0	
225M-8				22																														0	
																																			0
250M-2	55				450	585	255		250	520	326	510	695					406	0	349	24	1198	0												
250M-4		55																																0	
250M-6			37																															0	
250M-8				30																														0	
280S-2	75				510	680	285		280	596	352	580	775					457	408	368	24	1318	0												
280S-4,6		75	45																															0	
280S-8				37																														0	
280M-2	90																																	0	
280M-4,6		90	55																															0	
280M-8				45																															0
																																			0

7.3. Pump dimensions

Dimensions CPC	Dimensions pump casing CPC									
size	d1	d2	d2 alt.	d4	NW1	NW2	b	e	f	L1
16033	1,5"	1,5"		200	40	40	68	148	67	98
16044	2"	2"	1,5"	200	50	50	68	148	69	100
21044	2"	2"		250	50	50	82	168	75	115
21055	2,5"	2,5"	2"	250	65	65	82	170	80	120
21066	3"	3"	2", 2,5"	250	80	80	82	170	80	120
26044	2"	2"		300	50	50	107	198	75	115
26055	2,5"	2,5"	2"	300	65	65	107	200	80	120
26066	3"	3"	2", 2,5"	300	80	80	107	200	80	120
26088	4"	4"	3"	300	100	80	100	200	106	161
31044	2"	2"		350	50	50	133	222	75	115
31055	2,5"	2,5"	2"	350	65	65	133	225	80	120
31066	3"	3"	2", 2,5"	350	80	80	133	225	80	120
31088	4"	4"	3"	350	100	100	120	225	106	161
310108	5"	4"	3"	350	125	100	120	225	98	153
310128	6"	4"	3"	350	150	100	120	225	95	157

7.4. Dimensions IGH

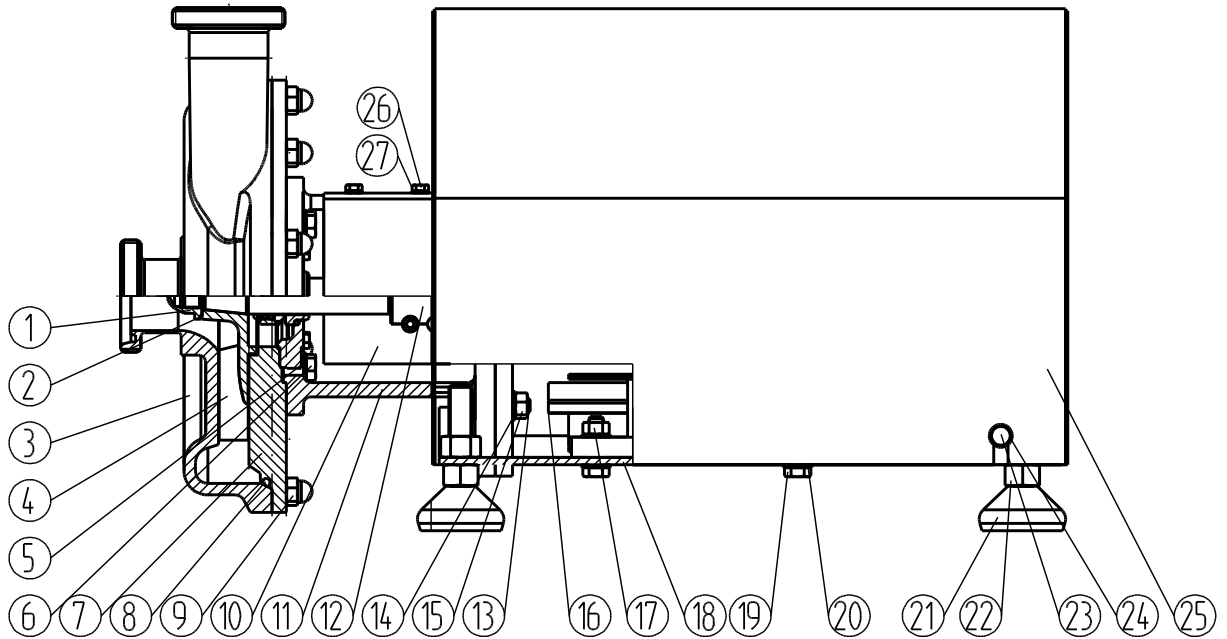
Bearing bracket for hydromotors					
c3	i1	j1	k1	l1	L6
180	220	250	36	160	230
179	190	225	22	188	257

7.5. Dimensions IG series

size	power (KW)				Bearing bracket IG																
IEC	3000	1500	1000	750	c2	d3	o	n	L5	m7	m8	m9	m10	m11	m12	m13	m14				
80-A	0,75	0,55	0,37	0,18	100	24	30	168	295	135	0	266	50		19j6	40	130				
80-B	1,1	0,75	0,55	0,25								278									
90S	1,5	1,1	0,75	0,37	100	24	30	168	295	135	0	330	56		24j6	50	153				
90L-2	2,2			0,55								330									
90L-4,6,8		1,5	1,1									355									
100L-2,4A	3	2,2			100	24	30	168	295	145	0	420	63		28j6	60	172				
100L-4B		3										440									
100L-6,8A			1,5	0,75								376									
100L-8B				1,1																	
112M-2,6,8	4		2,2	1,5	112	24	30	168	295	145	0	384	70		28j6	70	174				
112M-4		4										411									
132S-2A,6,8	5,5		3	2,2	132	24	30	168	295	145	20	463	89		38k6	80	182				
132S-2B,4	7,5	5,5										501					220				
132M-4,6A,8		7,5	4	3																	
132M-6B			5,5																		
160M	11	11	7,5	4	160	38	50	258	399	145	55	612	108		42k6	110	256				
				5,5								656					300				
160L		15	11	7,5																	
180M	22	18,5			180	38	50	258	399	145	55	705	121		48k6	110	320				
180L		22	15	11																	
200L	30	30	18,5		200	38	50	258	399	145	65	850	133		55m6	110	380				
	37		22									825									
200L-8				15																	
225M-2	45				225	38	50	258	399	145	65	930	149	345	55m6	110	380				
225S-4		37									95	960			60m6	140					
225M-4,6		45	30								960					355					
225S-8				18,5							865										
225M-8				22							890					380					
250M-2	55				145					145	95	1010	168		60m6	140	446				
250M-4		55										1040									
250M-6			37									1040									
250M-8				30								965									
280S-2	75				145					145	95	1135	190		65m6	140	520				
280S-4,6		75	45									1135			75m6						
280S-8				37								1040									
280M-2	90											1135			65m6						
280M-4,6		90	55									1135			75m6						
280M-8				45								1040									

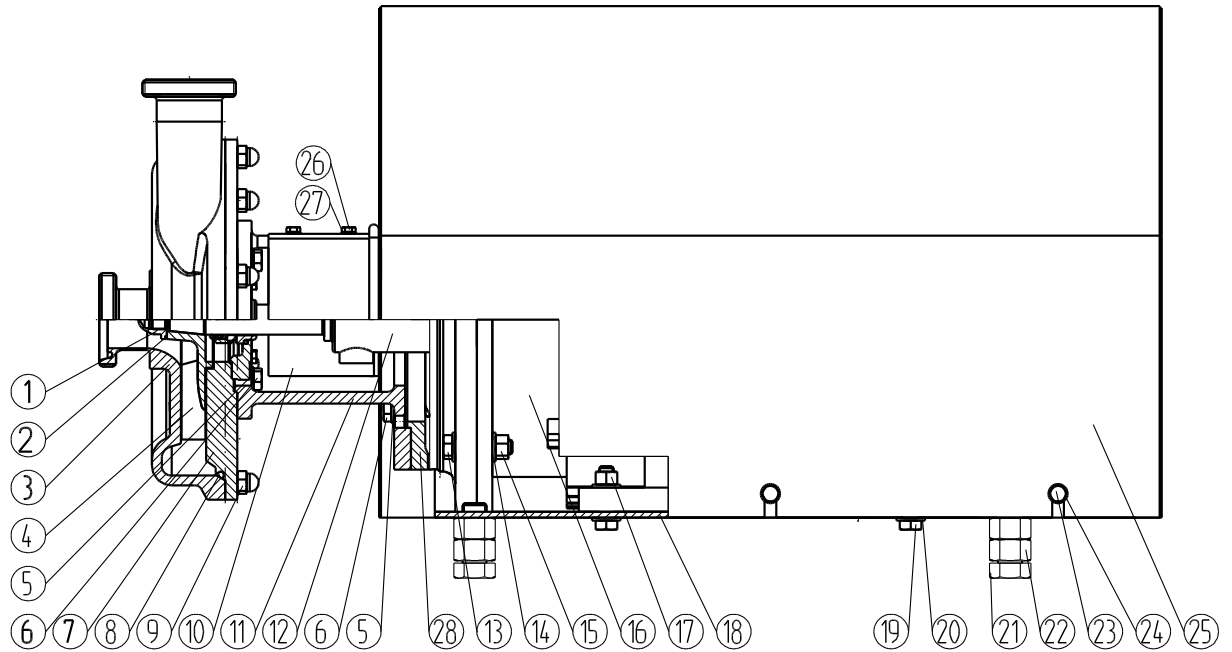
8. Sectional drawings and parts lists

8.1. CPC-KAM (IEC 80-112)



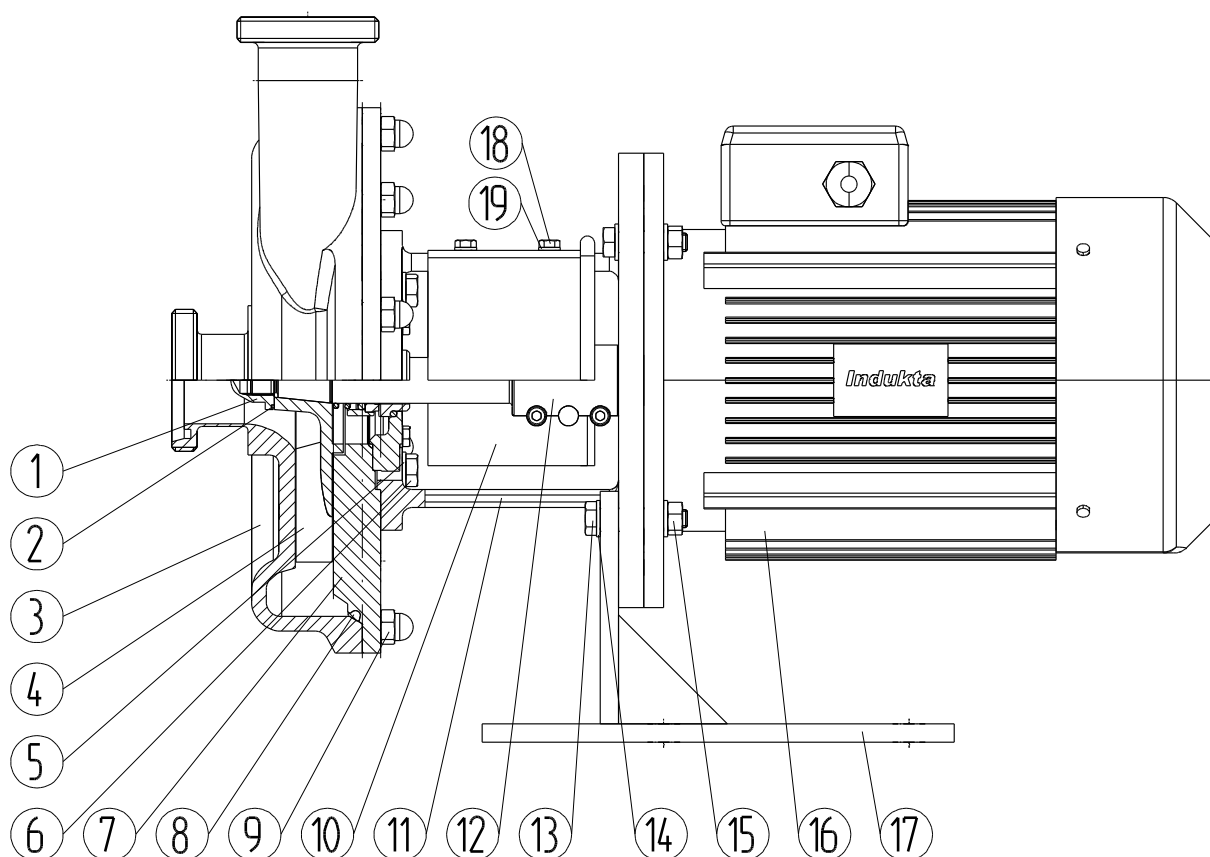
Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Protection cover
11	Intermediate piece
12	Stub shaft
13	Hexagon bolt
14	Washer
15	Hexagon nut
16	Motor
17	Hexagon bolt
18	Profiled strip
19	Hexagon bolt
20	Washer
21	Pump foot
22	Hexagon nut
23	Hexagon bolt
24	Washer
25	Motor shroud
26	Hexagon bolt
27	Washer

8.2. CPC-KAM (IEC 132-250)



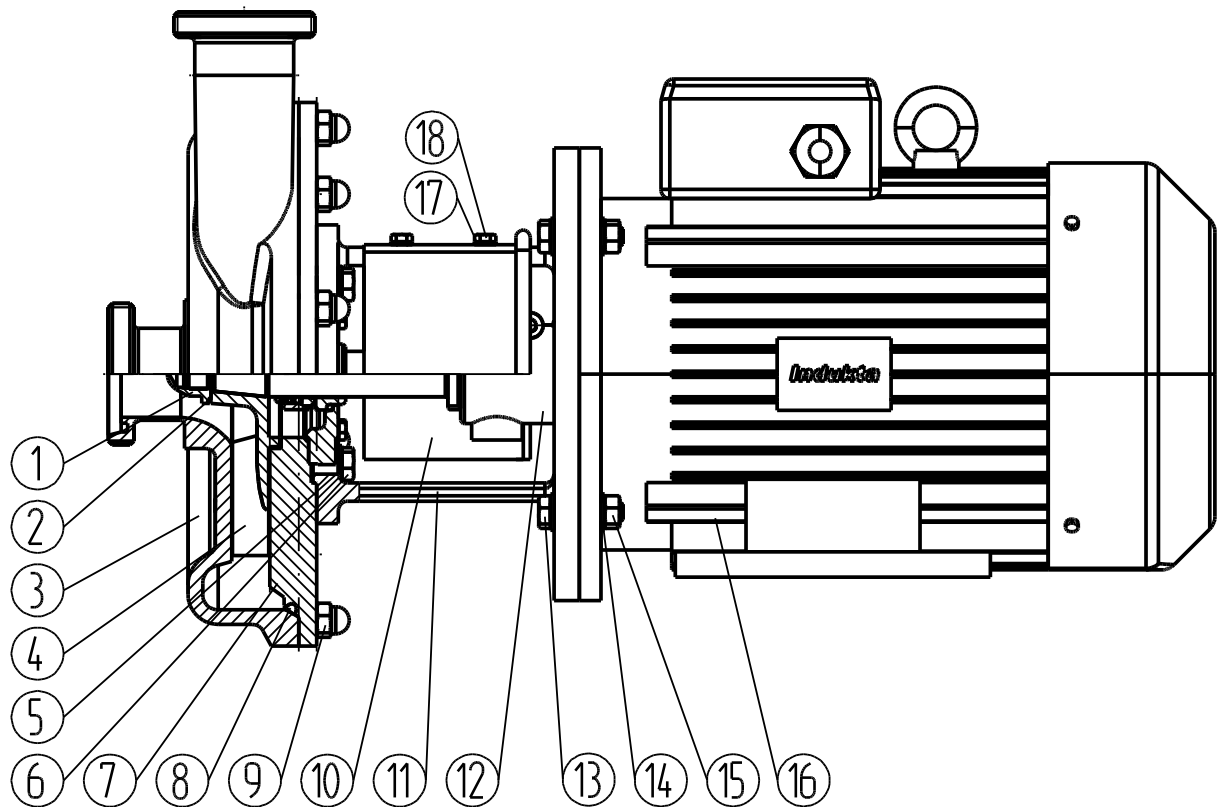
Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Protection cover
11	Intermediate piece
12	Stub shaft
13	Hexagon bolt
14	Washer
15	Hexagon nut
16	Motor
17	Hexagon nut
18	mProfiled strip
19	Hexagon bolt
20	Washer
21	Hexagon bolt
22	Hexagon nut
23	Hexagon bolt
24	Washer
25	Motor shroud
26	Hexagon bolt
27	Washer
28	Flange

8.3. CPC-KAC



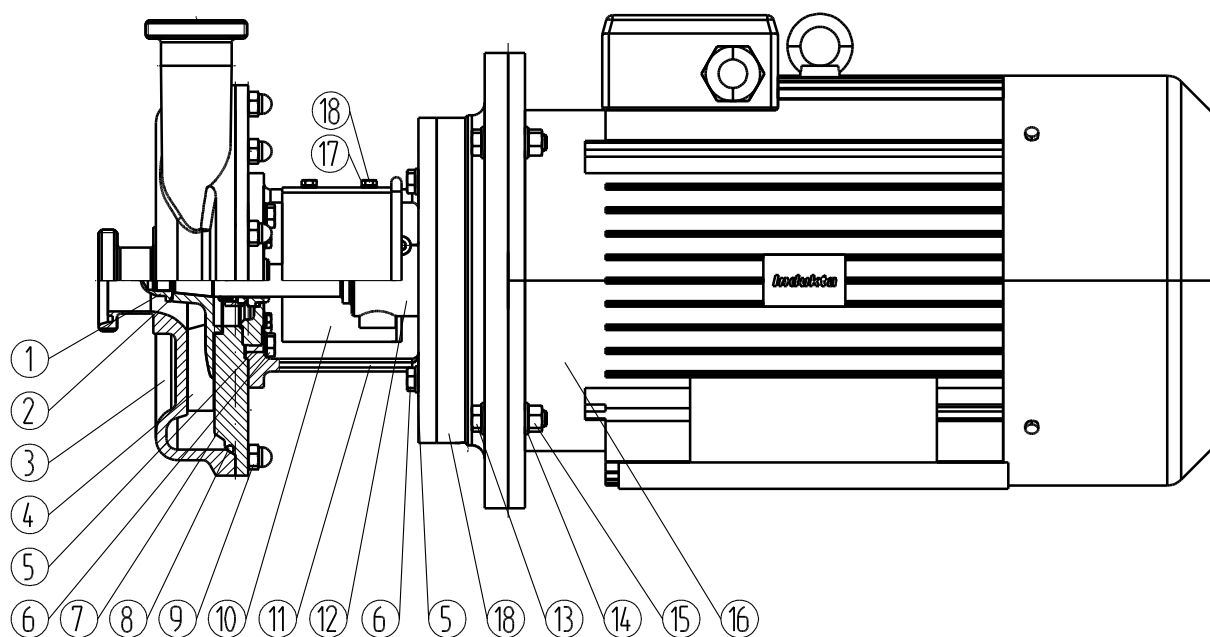
Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Protection cover
11	Intermediate piece
12	Stub shaft
13	Hexagon bolt
14	Washer
15	Hexagon nut
16	Motor
17	Pedestal
18	Hexagon bolt
19	Washer

8.4. CPC-KAV (IEC 80 -112)



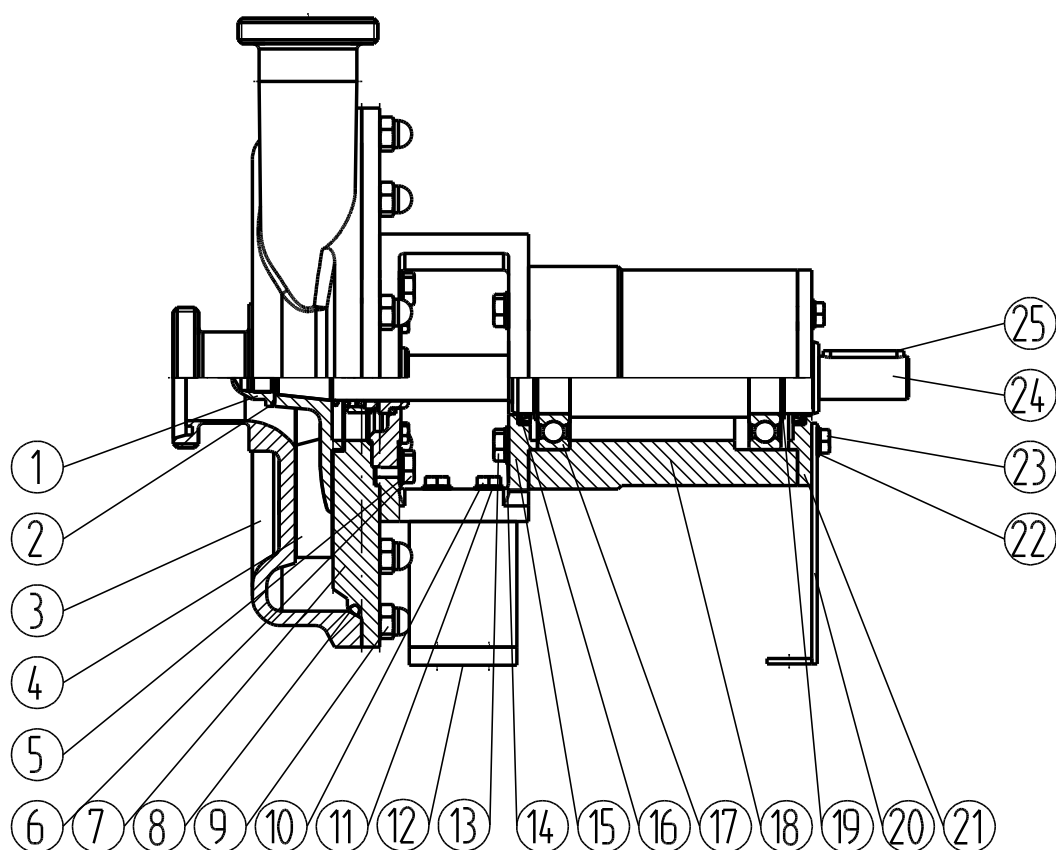
Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Protection cover
11	Intermediate piece
12	Stub shaft
13	Hexagon bolt
14	Washer
15	Hexagon nut
16	Motor
17	Washer
18	Hexagon bolt

8.5. CPC-KAV (IEC 132-250)



Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Protection cover
11	Intermediate piece
12	Stub shaft
13	Hexagon bolt
14	Washer
15	Hexagon nut
16	Motor
17	Washer
18	Hexagon bolt

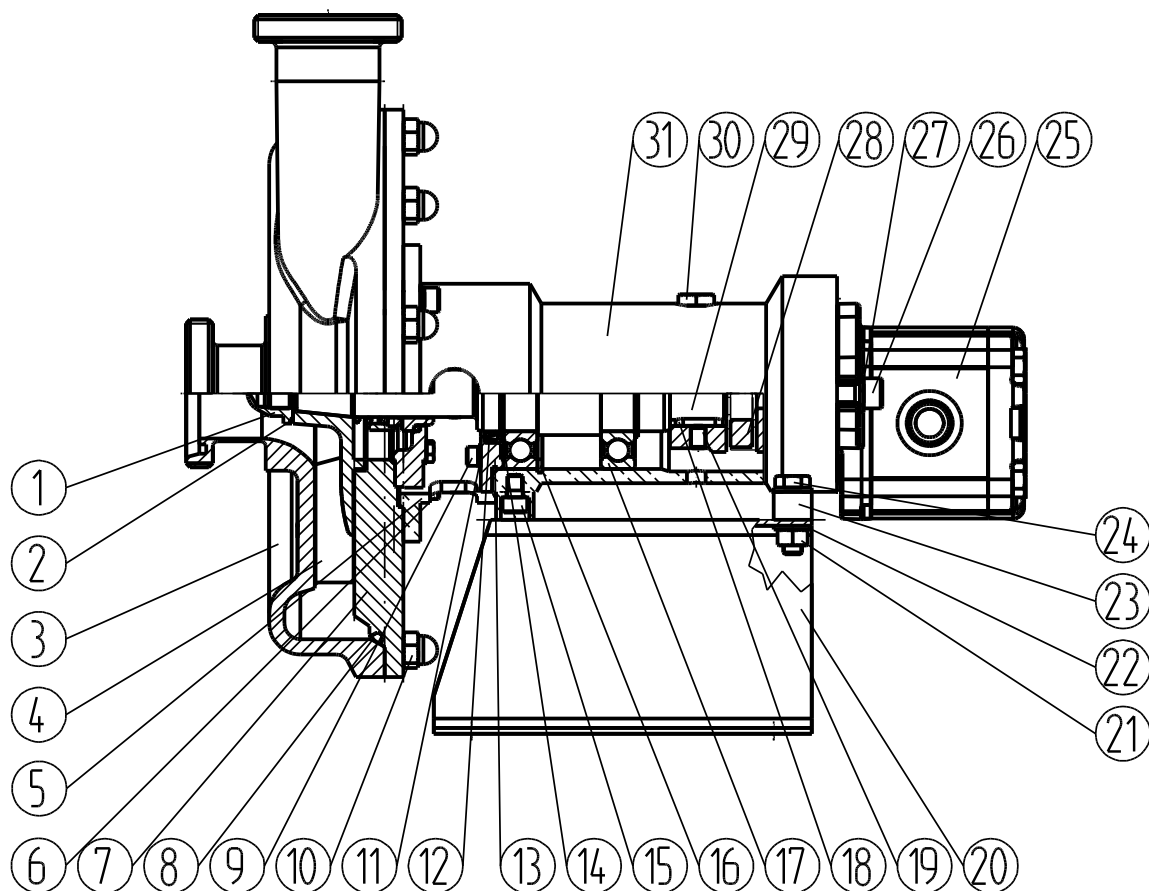
8.6. CPC- IG



Item nr	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Washer
6	Hexagon bolt
7	Back plate
8	O-ring
9	Cap nut
10	Hexagon bolt
11	Washer
12	Pedestal
13	Hexagon bolt
14	Washer
15	Bearing cover
16	Oil retainer
17	Ball bearing
18	Bearing bracket
19	Circlip
20	Pedestal
21	Bearing cover
22	Washer
23	Hexagon bolt
24	Shaft
25	Key

8.7. CPC-IGH

IGH is an IG construction, driven by a flanged-on hydromotor.



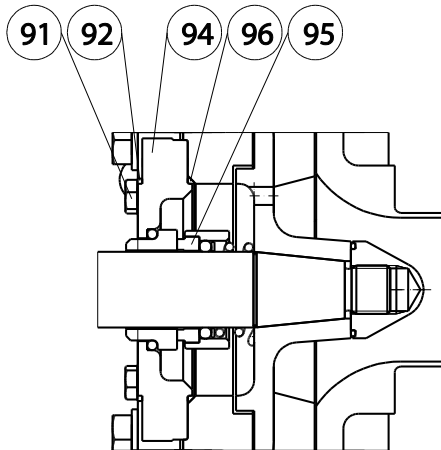
Item Nr.	Description
1	Impeller nut
2	O-ring
3	Pump casing
4	Impeller
5	Spring ring
6	Allen screw
7	Back plate
8	O-ring
9	Allen screw
10	Cap nut
11	Washer
12	Oil retainer
13	Bearing cover
14	Retaining ring
15	Allen screw
16	Retaining ring
17	Ball bearing
18	Key

19	Set screw
20	Pedestal
21	Hexagon nut
22	Washer
23	Strip
24	Hexagon bolt
25	Hydromotor
26	Allen screw
27	Spring ring
28	Coupling
29	Shaft
30	Plug
31	Bearing bracket

8.8. Shaft sealings

8.8.1. Version S1

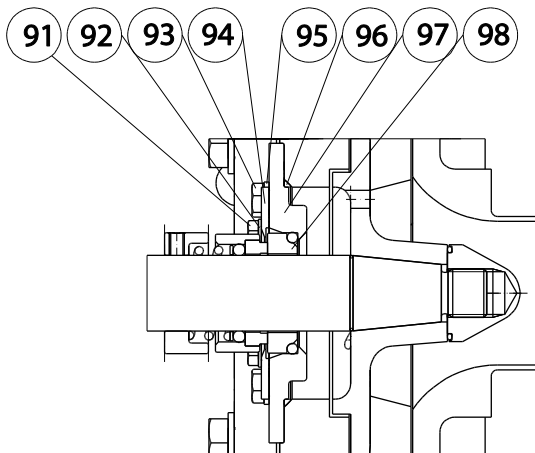
Internal mechanical seal, unbalanced.



Item Nr.	Description
91	Hexagon bolt
92	Washer
94	Seal seat
95	Mechanical seal
96	O-ring

8.8.2. Version S2

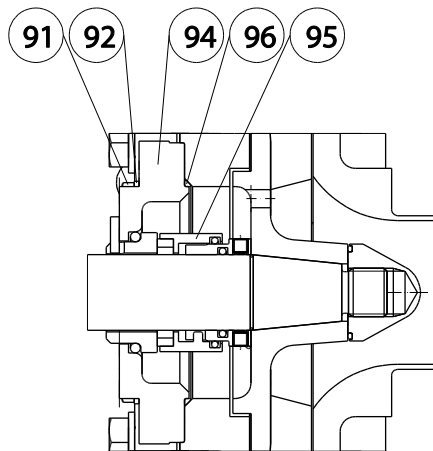
External mechanical seal, unbalanced.



Item Nr.	Description
91	Hexagon bolt
92	Washer
93	Hexagon bolt
94	Support ring
95	Washer
96	O-ring
97	Seal seat
98	Mechanical seal

8.8.3. Version B1

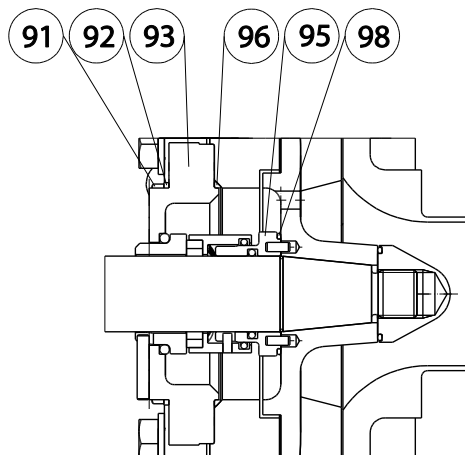
Internal mechanical seal, balanced.



Item Nr.	Description
91	Hexagon bolt
92	Washer
94	Seal seat
95	Mechanical seal
96	O-ring

8.8.4. Version B11

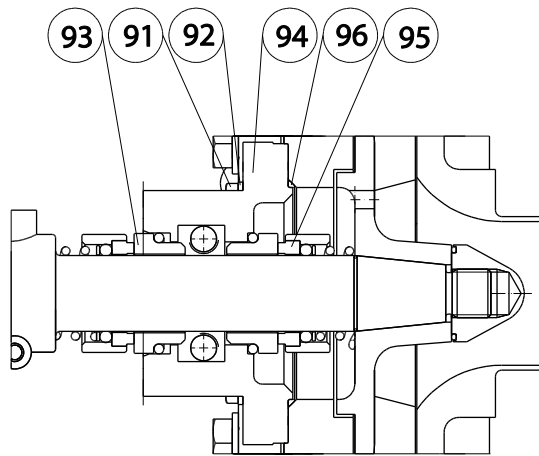
Internal mechanical seal, balanced, according to EHEDG.



Item Nr.	Description
91	Hexagon bolt
92	Washer
93	Seal seat
95	Mechanical seal
96	O-ring
98	O-ring

8.8.5. Version Q1

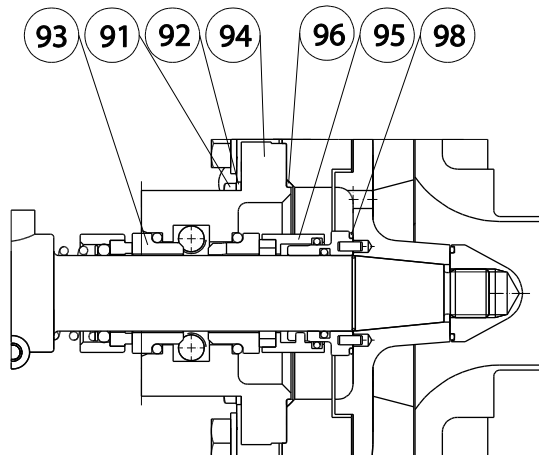
Internal unbalanced mechanical seal with unbalanced quench seal.



Item Nr.	Description
91	Hexagon bolt
92	Washer
93	Mechanical seal with left hand wound spring
94	Seal seat
95	Mechanical seal with right hand wound spring
96	O-ring

8.8.6. Version Q12

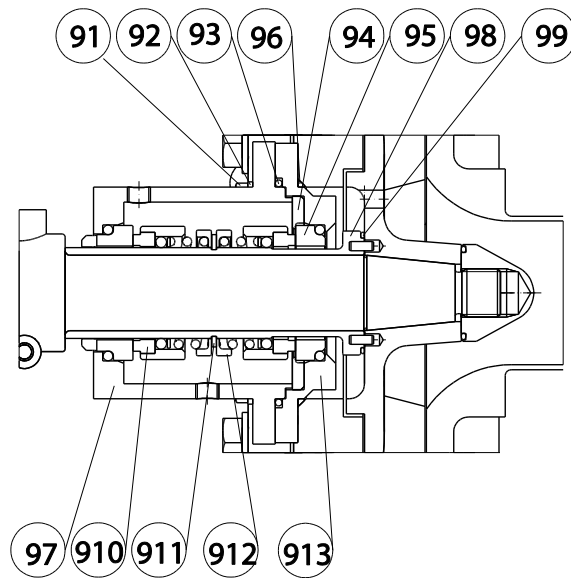
Internal balanced mechanical seal, according to EHEDG, with unbalanced quench seal.



Item Nr.	Description
91	Hexagon bolt
92	Washer
93	Mechanical seal with left hand wound spring
94	Seal seat
95	Mechanical seal
96	O-ring
98	O-ring

8.8.7. Version F1

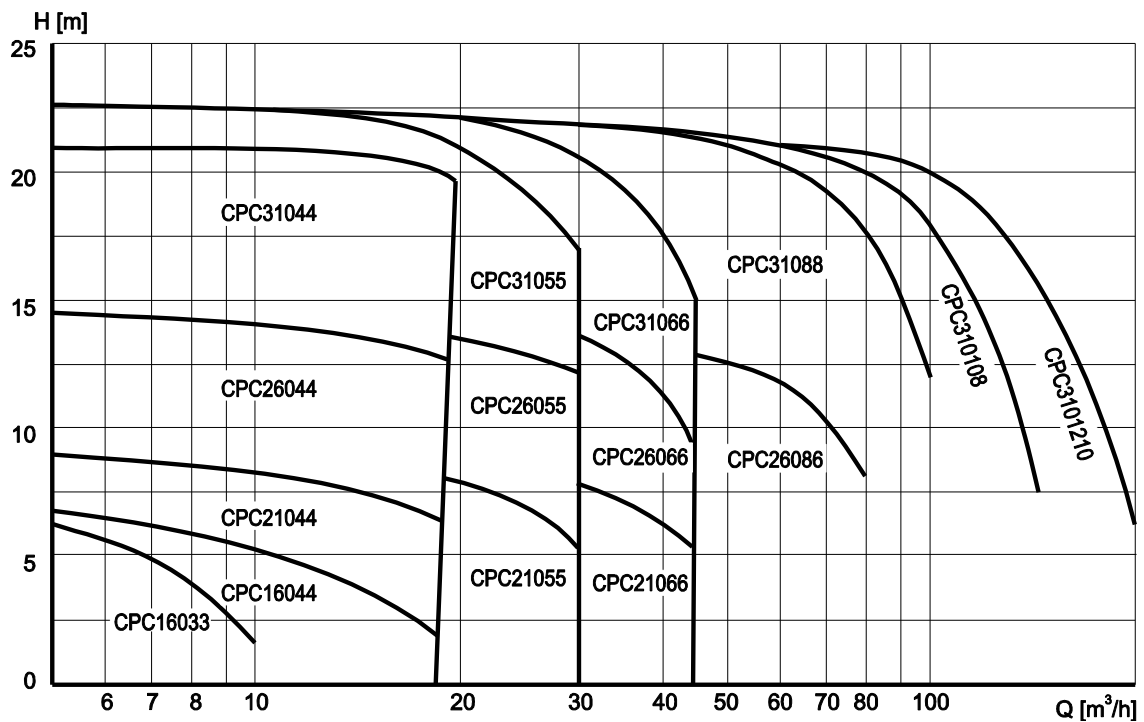
Double mechanical seal, back-to-back, unbalanced.



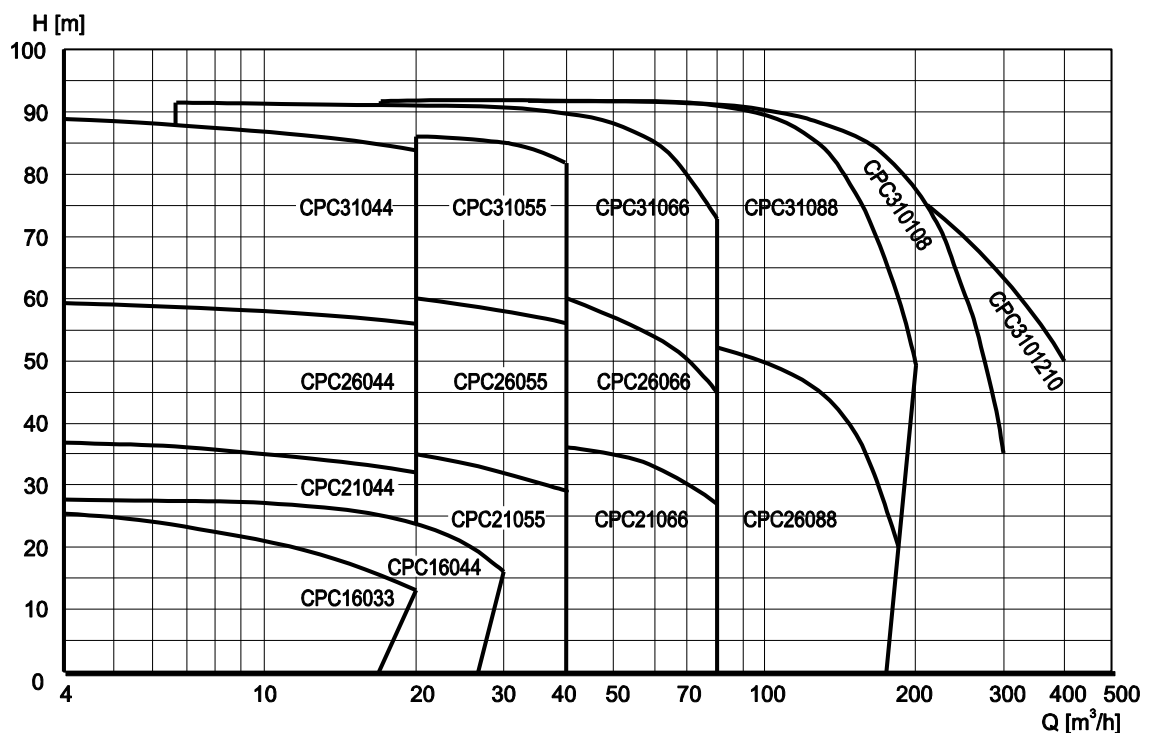
Item Nr.	Description
91	Hexagon bolt
92	Washer
93	O-ring
94	Fixing ring
95	Mechanical seal with left hand wound spring
96	O-ring
97	Flush compartment
98	O-ring
99	Shaft sleeve
910	Mechanical seal with right hand wound spring
911	Retaining ring
912	Support ring
913	Seal seat

9. Performance curves

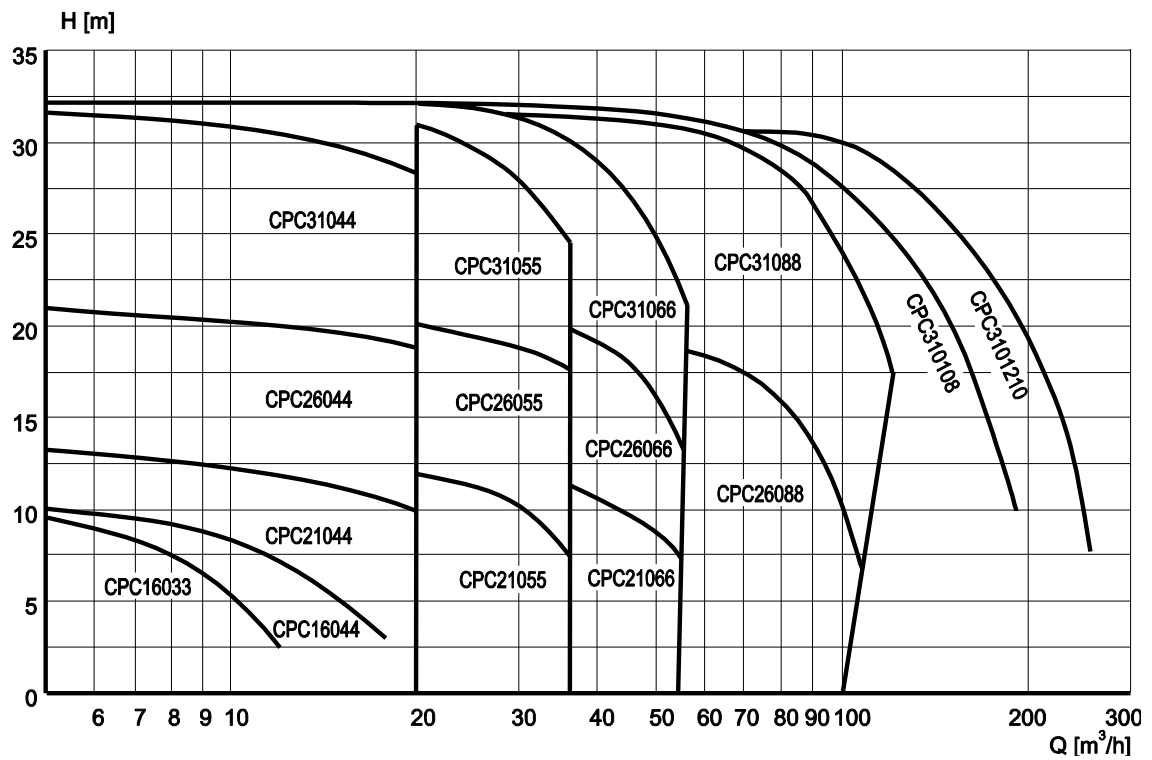
9.1. CPC 1500 min⁻¹



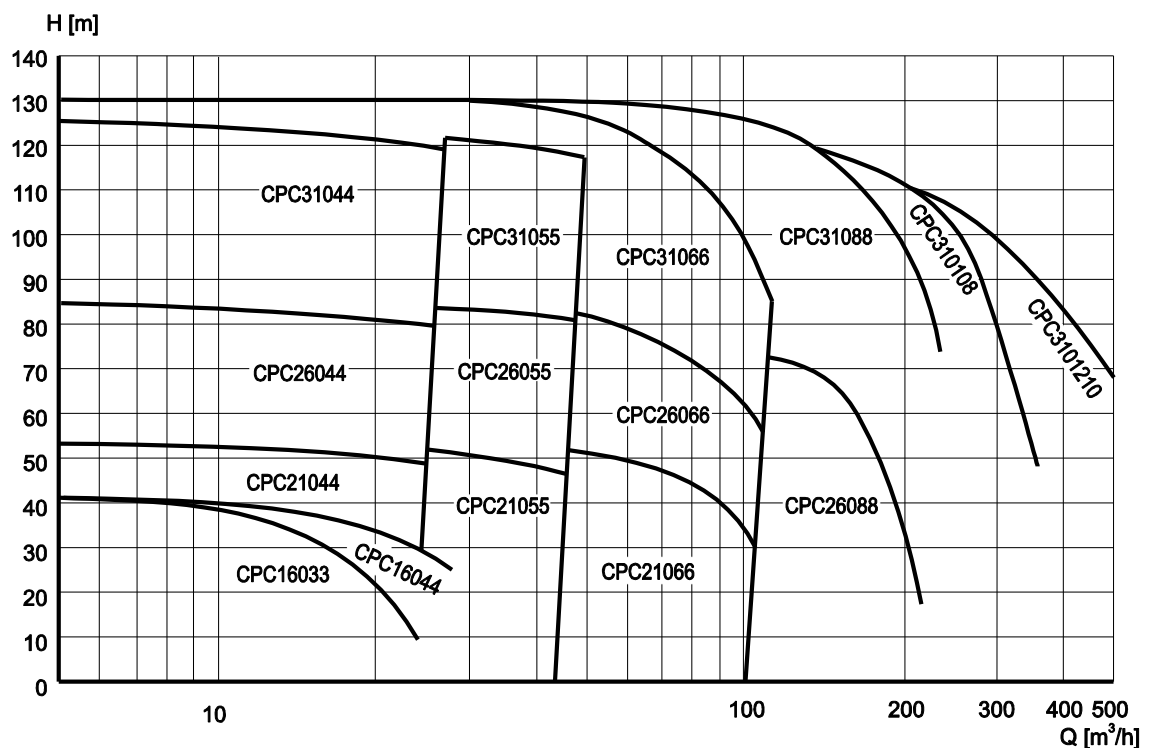
9.2. CPC 3000 min⁻¹



9.3. CPC 1800 min⁻¹



9.4. CPC 3600 min⁻¹



10. Trouble shooting

A malfunction in a pump system may have various causes. The malfunction is not always necessarily in the pump itself, but can also be caused by a malfunction in the piping system, or in another appendage in the system. If the operating conditions differ too greatly from the specifications by which the pump was purchased this can also cause malfunctioning.

Therefore always check first:

- Has the pump been installed correctly?
- Are the operating conditions still according to the initial specifications?
- Are the other appendages in the pipe system functioning correctly?
-

In general terms, the following malfunctions in a pump can be distinguished:

1. pump gives no or little liquid
2. pump does not reach duty point
3. pump gives irregular liquid flow
4. pump leaks
5. pump vibrates excessively
6. pump makes too much noise
7. motor overheats
8. pump cuts out thermally
9. pump has seized

The table on the next page gives a possible cause and solution for the malfunctions mentioned above:

Malfunction										Cause	Action
1	2	3	4	5	6	7	8	9			
	4				4	4				electrical connection defective	Have qualified electrician check the electric connections
	4									wrong rotation direction	Have qualified electrician reverse the sense of rotation of the electric motor
4										pump is not completely filled with liquid (only for CP)	Top up the pump entirely with liquid
4	4	4			4					insufficient pre-pressure	Increase the pre-pressure or place the pump on a lower position
	4						4			pump operating at the wrong speed	Check the motor speed
								4		contaminations or objects in the pump	Clean the pump, if necessary disassemble
4	4	4								air in the piping	Inspect the piping
	4									valve in suction pipe is not completely open	Entirely open the valve in the suction pipe
	4									pump selected with too small delivery head	Install another pump
4	4	4						4		suction pipe or filter blocked	Clean the suction pipe or the filter
			4							shaft seal defective	Disassemble the pump and replace the shaft seal
			4							O-ring seal defective	Disassemble the pump and replace the O-ring seal
							4			liquid temperature is too high	Decrease the liquid temperature
4							4	4		impeller is jammed	Disassemble the pump and replace the impeller
				4	4		4	4		impeller is damaged	Disassemble the pump and replace the impeller
				4	4	4	4	4		motor shaft is bent	Replace the motor
				4	4	4	4	4		extension shaft is loose	Disassemble the pump, inspect the extension shaft, reassemble it and readjust.
				4	4	4	4	4		bearings are damaged or worn	Replace the motor. For IG(F): replace the bearings
							4	4		motor is overloaded	Check the viscosity of the liquid. Switch off the motor and check if the pump does not drag. If so, disassemble the pump and repair it

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