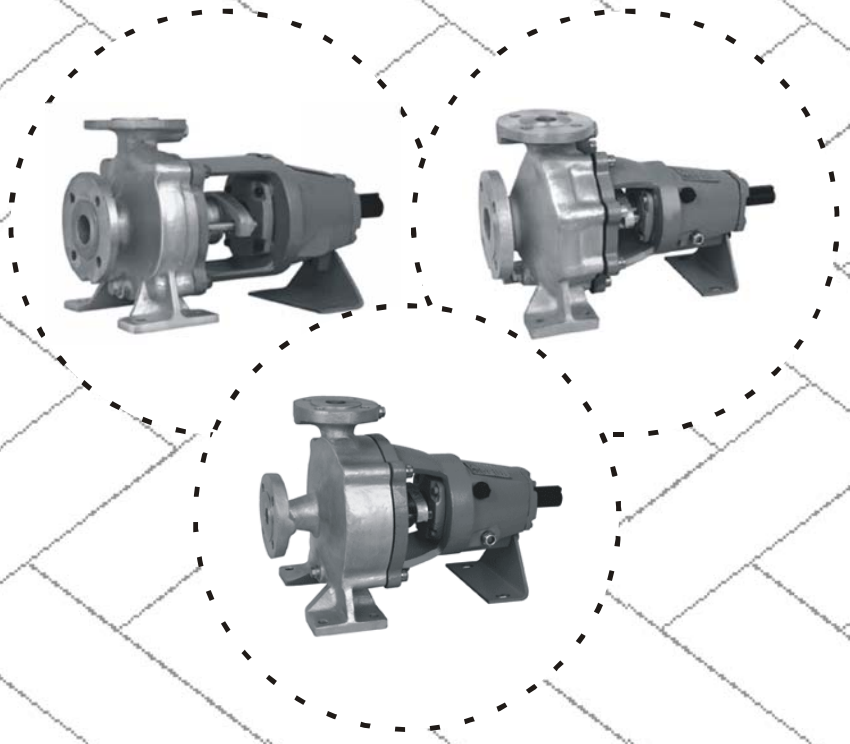
USER MANUAL
'CPC' Series
Chemical Process pump



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Introduction

Preface

This manual provides the information for proper functioning and maintenance of the pump and contains instructions to prevent possible accidents and damages and to ensure the safe and smooth functioning of the pump.

Before commissioning of the pump, read the manual carefully and strictly follow the instructions.

General information and safety instruction

The product supplied by WTE has been designed with safety in mind.

- Pump installation area must be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access point
- The pump nameplate is fitted to each unit must not be removed. Loss of it could make identification impossible which in turn could cause difficulty in obtaining spare parts. If accidental loss occurs, contact WTE immediately.
- Access to the equipment should be restricted to the personnel responsible for installation, operation and maintenance and they must be trained adequately qualified and supplied with appropriate tools for their respective tasks.
- All personnel that are responsible for installation-operation-maintenance of the pump must study the product instruction manual before any work is done and that they will comply with all local and industry based safety instructions and regulations.
- Safety glasses or goggles should be worn where working with pressurized systems and hazardous substances. Other personal protection equipments must be worn where local rules apply.
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- Do not wear loose clothing or jewelry which could catch on the controls or become trapped in the equipments.
- Read the instruction manual prior to installation and confirm that the manual is relevant copy by comparing pump type on the nameplate and with that on the manual.
- Note the ‘limits of product application and permissible use’ specified in the manual. Operation of the equipment beyond those limits will increase the risk from hazardous and may lead to premature hazardous pump failure.
- Clear and easy access to all controls, gauges, and dials etc. must be maintained at all the times.
- Hazardous or flammable material must not be stored in pump rooms unless safe area or racking and suitable containers have been provided.
- Improper installation, operation or maintenance of this WTE product could result in injury or death.

Warranty

WTE warrants the pump supplied by us is free from defective material and faulty workmanship. This warranty holds good for a period of 12 months from the date of commissioning of the pump or 18 months from the date of dispatch from our factory, whichever is earlier. Our liability in respect of any complaint is limited to replacing part/parts free of charge. Ex-works or repairs of the defective part/parts only to the extent that such replacement/repairs are attributable to our arise solely from faulty workmanship or defective material.

This warranty holds good only for the products manufactures by us.

Service and support

This manual is intended for technicians and maintenance staff and for those who are in charge of ordering spare parts.

This manual contains the spare and replacement parts recommended by WEL-TECH EQUIPMENTS.

The pump number is stated on the nameplate. Please refer to this number and the other data mentioned on the nameplate when corresponding or ordering parts.

Inspection of delivered items

- Check the consignment immediately on arrival for damage and conformity with the advice note.
- In case of damage and/or missing parts, have a report drawn up by the carrier at once.

Lifting

If a pump or a complete pump unit has to be lifted, the slings should be fixed as shown in ***figure 1.***

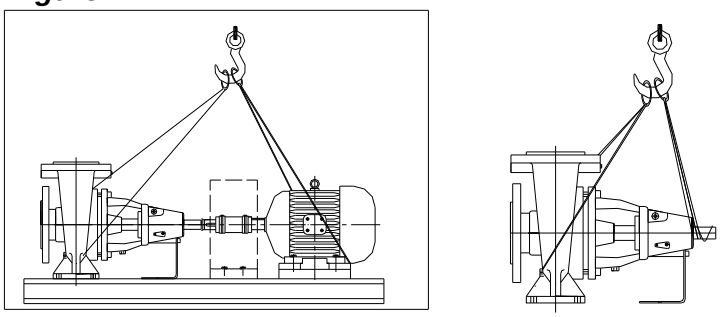


Figure 1 *Lifting instruction pump set CPC*

Note: Proper care should be taken to protect pump and prime mover and/or paint at contact area of sling or rope at the time of lifting.

Storage

In case the pump is not immediately being used, the pump shaft has to be rotated manually twice a week.

General

Pump description

"CPC" is a range of horizontal centrifugal chemical process pump which meet ISO-2858 respectively DIN 24256 designed in accordance with ISO 5199 (Technical specification for centrifugal pump-class-ii)

1) THE BOOKLET COVERS INSTRUCTION FOR FOLLOWING MODELS OF "CPC "SERIES PUMP

SHAFT GROUP	CPC SERIES PUMP MODEL IN S.S CONSTRUCTION
0	25-125
0+	25-160,32-200s.
1	32-125,32-160,32-200,40-125,40-200,40-250,50-125,50-160,50-200, 65-125
2	32-250,40-250,50-250,,65-160,65-200,80-160,80-200,100-200,100-160,125-250,

1. WEL-TECH "CPC" Series are of back pull out design which enables to removes the rotating unit of pump for inspection and repairs without disturbing the pipe connection and motor by using spacer type coupling.
2. "CPC" Series pump covers the range by four shaft group thereby reducing inventory and achieving interchangeability of parts.
3. When the pump is received, sometime before the actual use of pump, it should be inspected and located in dry place .the coupling should be rotated one in a month to prevent pitting of bearing surface.

Application

In general, the CPC pumps can be used for thin, clean, or slightly polluted liquids. The liquids should not affect the pump materials. The maximum allowed system pressure and temperature and the maximum speed depend on the pump type and the pump construction.

Please do not use the pump for purposes other than for which it is delivered.

Installation

Safety

- Read this manual carefully before installing and commissioning pump. Non observance of these instructions may cause serious damage to the pump and that will not be covered by our guarantee terms. Follow the instructions step by step.
- Make sure the motor cannot be started when work is done to the pump-motor combination and running parts are insufficiently shielded.
- When installing the pump unit, take appropriate protection and warning measures to prevent contact with hot pump parts.
- If danger arises in case of static electricity. The entire pump unit should be earth properly.
- If there is a danger that the pumped liquid might be harmful to men or the environment, the user should take appropriate measures for safe drainage. Also possible leakage fluid from the shaft seal should be safely discharged.

Flushing

Before putting the pump in to operation, drain off any preservative agent and flush the pump thoroughly with hot water.

Environment

- The foundation must be hard, level and flat
- The area in which the pump unit is to be placed should be adequately ventilated. A too high ambient temperature and air humidity, as well as a dusty environment may have a negative effect on the functioning of the pump.
- Around the pump unit there should be enough space to operate and if necessaries repair the pump.
- Behind the cooling air inlet of the motor there should be a free area of at least ¼ of the electric motor diameter, to ensure enobstructed air supply.

Mounting

Installation of the set

Pump and motor shafts of complete sets are adjusted perfectly in line in the works. In case of permanents arrangements place the base plate on the foundation with the aid of shims and tighten the nuts on the foundation bolts carefully.

The check the alignment of pump and motor shafts and realign, if necessary according to the instruction in **Figure 1.**

Assembly

If the pump and the electric motor still have to assembled, proceed as follows:

1. Mount the two coupling halves on the pumps and motor shaft respectively
2. Place the pump on the foundation slab. Secure the pump with bolts.
3. Place the electric motor on the foundation slab. Between the two coupling halves there should be a gap of 3 mm.
4. Place some copper shims under the feet of the electric motor. Secure the electric motor with bolts.
5. Align the coupling according to the following instruction.

Alignments of the coupling

1. Place a ruler (A) on the coupling. The ruler should touch both coupling halves across the whole width. See figure 3.
2. Do the same check against both sides of the coupling near the axis.
3. For all security the alignment is also checked with a pair of outside calipers (B) at 2 diametrically opposite points of the side surfaces of the coupling halves. See fig.3

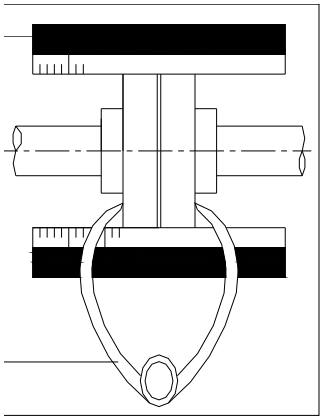


Figure 3 *Aligning of the coupling for SM*

Tolerances for aligning coupling

The maximum allowable tolerances in the alignment of the coupling halves are shown in the table below. See ***figure 4.***

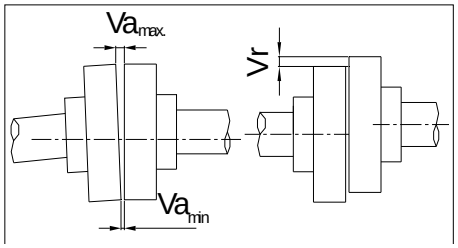


Figure 4

Aligning tolerances:

Outer diameter Coupling (mm)	Va min. (mm)		Va max. (mm)		Va max-Va min. (mm)	Vr max (mm)
81-95	2	5*	4	6*	0.15	0.15
96-110	2	5*	4	6*	0.18	0.18
111-130	2	5*	4	6*	0.21	0.21
131-140	2	5*	4	6*	0.24	0.24
141-160	2	6*	6	7*	0.27	0.27
161-180	2	6*	6	7*	0.30	0.30
181-200	2	6*	6	7*	0.34	0.34
201-225	2	6*	6	7*	0.38	0.38

*= for spacer coupling.

Piping

- The piping to the suction and delivery connections must fit exactly and must not be subject to stress during operation.
- The passage of the suction pipe must be amply dimensioned. This pipe should be as short as possible and run towards the ump in such a way that no air pockets can arise. If this is not possible, a venting facility should be provided at the highest point of the pipe.
- If the inside diameter of the suction pipe is larger than the suction connection of the pump, an eccentric reducer should be applied to prevent air pockets and whirls.
- If there is a risk that this pressure might be exceeded, for instance because of an excessive inlet pressure, appropriate measures should be taken by mounting a safety valve in the piping.
- Sudden changes in the rate of flow can lead to high pressure impulses in the pump and the piping (water shock). Therefore, don't use quick acting closing devices, valves etc.

Mounting accessories

- Mount any parts that may have been supplied separately.
- If the liquid does not flow towards the pump, mount a foot valve at the bottom of the suction pipe. If necessary, combine this foot valve with a suction strainer to prevent impurities from being drawn in.
- When mounting, place temporarily (for the first 24 operating hours) fine gauze between suction flange and suction pipe so as to prevent internal parts from being damaged by foreign matter. If the risk of damage continues to exist, mount a permanent filter.
- In case of a pump with a cooled stuffing box , connect the cooling chamber to the cooling system.

- In case of a pump with a double mechanical seal , connect the flushing chamber to the flushing system. The pressure of the flushing system must be 1.5 bars higher than the pressure at the impeller hub.

Commissioning

Precaution before commissioning

Pump

- Construction with stuffing box: whether the gland nuts have not been over tightened. If necessary, loosen the gland nuts and retighten them by hand.
- Check whether the shaft turns freely. Do this by turning the shaft end at the coupling a few times by hands.

Motor

If driven by an electric motor:

- Check whether the fuses have been mounted.

Engine

If driven by a combustion engine:

- Check whether the room in which the engine is placed is well ventilated.
- Check whether the exhaust of the engine is not obstructed.
- Before starting the engine check the oil level
- Never turn the engine in a closed room.

Preparation of lubrication

The bearing of pump provided with grease-lubricated is filled with grease at the time of delivery.

Pump provided with grease-lubricated bearings are supplied without oil. See Technical data for the specifications of the oil to be used.

- Fill the oil sump through the oil filling orifice up to the bottom of the constant level oiler.
- After that, fill the constant level oiler entirely.

Preparing the unit for commissioning

Proceed as follows both when the unit is put in to operation for the first time and after the pump has been overhauled:

1. Fully open the stop valve in the suction pipe. Close the delivery stop valve.
2. Fill the pump and the suction pipe with the liquid to be pumped.
3. Turn the pump shaft a few times by hand and add more liquid, if necessary.

Checking the sense of rotation

- The sense of rotation of the pump is indicated by an arrow. Check whether the sense of rotation of the motor corresponds with that of the pump.
- Let the motor run for only a short time and check the sense of rotation.
- If the sense of rotation is not correct, change connecting wire of motor so as to match with the rotation of pump.
- Mount the coupling guard.

Starting the pump

- Open the stop valve in the supply piping for flushing or cooling liquid, if the pump is supplied with a flushing or cooling system. When flushing a double mechanical seal , the appropriate pressure at the impeller hub.
- Start the pump.
- As soon as the pump is under pressure, slowly open the delivery stop valve until the working pressure is attained.

Adjustments of shaft sealing

Stuffing box packing

After the pump is started, the stuffing box will show a certain amount of leakage. Because of the expansion of the packing fibers, this leakage will gradually decrease. Make sure that the packing never runs dry. To prevent this, loosen the gland nuts to the extent that the stuffing box leaks drop wise. As soon as the pump has reached the proper temperature (and leakage is still too much) the gland can be adjusted permanently.

- Tighten both gland nuts, one after the other, a quarter turn.
- Wait 15 minutes after each adjustment before making the next adjustment.
- Continue in this way until an acceptable drop wise leakage has been attained.(20-30 drops/minutes)

Mechanical seal

- A mechanical seal may never show visible leakage.
- The flushing liquid of a double mechanical seal always must have the appropriate pressure set .This pressure must be 1.5 bar higher than the pressure at the impeller hub.

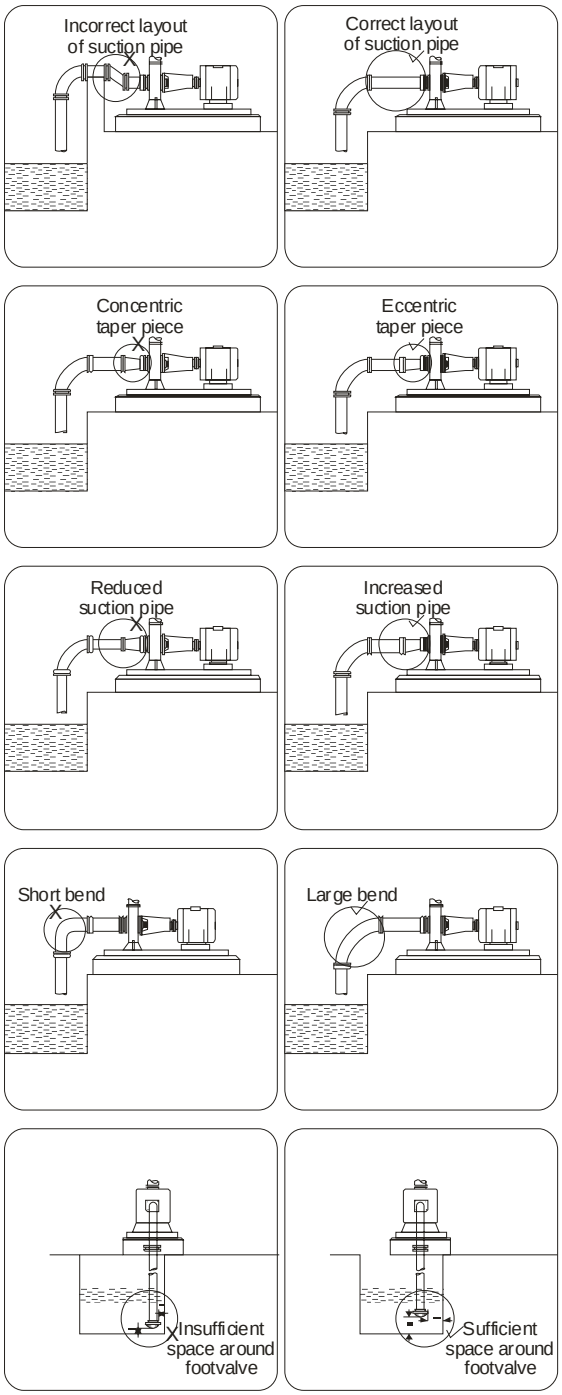
Control

If a pump is in operation pay attention to be following:

- The pump should never run dry.
- Never use a stop valve in the suction pipe to control pump capacity. The stop valve should always be fully opened during operation.

- Check whether the absolute inlet pressure is sufficient, so that no vapour can be formed.
- Check whether the pressure difference between suction and delivery pressure corresponds with specifications for the duty point of the pump.

Installation guidelines for pump piping



Maintenance

Daily maintenance

Regularly check the outlet pressure.

Shaft sealing

Gland packing

- Do not tighten the gland nuts any more after the running-in period and adjustment.
- If in time the gland packing starts to leak excessively, new gasket rings have to be mounted instead of further tightening the gland nuts.

Mechanical seal

A mechanical seal generally requires no maintenance; however, it should never be allowed to run dry. If there are no problems, it is not advisable to dismantle the seal, as the facing surfaces are running in one another. Dismantling always means replacement of the mechanical seal.

Check the pressure of the flushing liquid regularly. This pressure must be 1.5 bars higher than the pressure at the impeller hub.

Lubrication of the bearings

Grease-lubricated bearings/oil lubricated bearings

Bearing brackets with two grease-packed deep-groove ball-bearings require no maintenance. a double-row angular contact ball bearing and a cylindrical bearing (L2) requires re-greasing after every 1000 hours of operation. The bearings are filled with grease during assembly. In case the pump is overhauled, the bearing house and the bearings have to be cleaned and provided with new grease

Oil-bath lubricated bearings

During operation the constant lever oiler should never be empty, so take care to top up timely. The oil should be changed once a year. If the oil temperature is higher than 80’c, the oil should be changed more often.

Environmental influences

- Regularly clean the filter in the suction pipe or the suction strainer at the bottom of the suction pipe, as the inlet pressure may become too low if the filter or the suction strainer is fouled.
- If there is a risk that the pumped liquid expands during solidification or freezing, the pump has to be drained and, if necessary, flushed after it has been put out of service.
- If the pump is out of service for a long time, it has to be preserved.

Faults

To determine the source of the malfunctioning of the pump, proceed as follows:

- Switch off the current supply to the pump unit. Block the working switch with a lock or remove the fuse. In case of a combustion engine: switch off the engine and close the fuel supply to the engine.
- Close the stop valve.
- Determine the nature if the fault.
- Try to determine the cause of the fault. (See Cause of failures) and take the appropriate measures, OR
  Contact your installer.

Cause of failure

In general, failures in a pump unit are attributable to the following causes.

- Failure in the pump
- Failure or faults in the piping system.
- Failure due to wrong installation or commissioning
- Failure due to a wrong pump selection.

A number of the most frequently occurring failures as well as their possible causes are set forth in the table below.

Trouble shooting

In case of abnormal operation or when trouble occurs the pump must be taken out of service immediately. Inform all responsible personal, Prior to restarting the pump the cause of the problem must be determined and the problem to be solved.

Fault finding chart

Most frequently occurring failure	Possible causes
Pump doesn't delivers any liquid	1 2 3 4 5 6 7 8 9 10 11 12 14 17 19 20 21 29
The volume flow of the pump is insufficient	1 2 3 4 5 6 7 8 9 10 11 12 14 15 17 19 20 21 28 29
The discharge head of the pump is insufficient	2 4 5 13 14 17 19 28 29
Pump stalls after it has been put in to operation	1 2 3 4 5 6 7 8 9 10 11
The power consumption of the pump is higher than normal	12 15 16 17 18 22 23 24 25 26 27 32 34 38 39
The power consumption of the pump is lower than normal	13 14 15 16 17 18 20 2128 29
The stuffing box is leaking excessively	6 7 13 25 26 30 31 32 33 43
Shaft packing or mechanical seal have to be replace to often	6 7 23 25 26 30 32 33 34 35 36 41
Pump vibrates or makes noise	1 9 10 11 15 18 19 20 22 23 24 25 26 27 29 37 38 39 40
Bearings wear too soon or get hot	23 24 25 26 27 37 38 39 40 42
Pump runs with difficulty, gets hot or stuck	23 24 25 26 27 34 37 38 39 40 42

Possible causes:

1. Pump or suction pipe not sufficiently filled or de-aerated
2. Gas or air coming from the liquid
3. Air lock in the suction pipe
4. Suction pipe leaks air
5. The pump sucks in air through the stuffing box
6. The sealing or flush-water pipe to the stuffing box is not connected or blocked.
7. The lantern ring in the stuffing box has been mounted wrongly.
8. The manometric suction head is too high.
9. Suction pipe or suction strainer is blocked.
10. Insufficient immersion of foot valve or suction pipe during operation of the pump.
11. NPSH available too low.
12. Speed too high.
13. Speed to low.
14. Wrong sense of rotation.
15. Pump doesn't work at right duty point.
16. Liquid density differs from the calculated liquid density.
17. Liquid viscosity differs from the calculated liquid viscosity.
18. Pump works when the liquid flow is too low.
19. Wrong pump selection.
20. Obstruction in impeller or pump casing.

21. Obstruction in the piping.
22. Wrong installation of the pump unit.
23. Pump and motor not well aligned.
24. Rotating part running out of true.
25. Imbalance in rotating parts(for instance impeller, coupling)
26. Pump shaft is running out of true.
27. Bearing faulty or worn out.
28. Seals rings faulty or worn out.
29. Damaged impeller.
30. Pump shaft or shaft sleeve at shaft packing or running surfaces of the mech. seal are worn out.
31. Worn or dried up shaft packing.
32. Not well Packed stuffing box or bad mounting of the mech. seal.
33. Packing type of the mech. seal not suitable for the operation liquid or operation circumstances.
34. Gland of seal cover has been tightened too much or crookedly.
35. No water cooling of stuffing box at high temperatures.
36. The sealing or flushing liquid to the stuffing box or the mech. seal is polluted.
37. Axial retaining of impeller or pump shaft is defective.
38. The bearing has been mounted wrongly.
39. Too much or too little bearing lubrication.
40. Wrong or polluted lubricant.
41. Impurities in the liquid get into stuffing box.
42. Too high axial force because worn dorsal blades or excessive inlet pressure.
43. Excessive pressure in packing space due to much play in the smothering bush, blocked by pass pipe or worn dorsal blades.

IF SYMPTOMS PERSIST THE PUMP MUST BE TAKEN OUT OF SERVICE IMMEDIATELY and Contact us or our appointed agents.

Technical data

Lubrication

Oil

Recommended oils according to ISO VG 68 classification for ambient temperature above 15de.c:

BP	-HLP 68
Chevron	-EP industrial Oil 68
Esso	-Teresso 68
Shell	-Tellus 68
Mobile	-mobile D.T.E.Oil Heavy Medium

Oil contents

Bearing bracket	Contents (mini.quantity)
0	300ml
0+	300ml
1	400 ml.
2	500 ml.
3	600 ml.

Grease

Recommended greases according to NLGI-2 classification

BP	-Enerrease LS 2
Shell	-Alvania R 2
Mobil	-Mobilux EB 2
Chevron	-Polyurea EP grease-2
Esso	-Beacon 2
SKF	-Alfalub LGMT 3

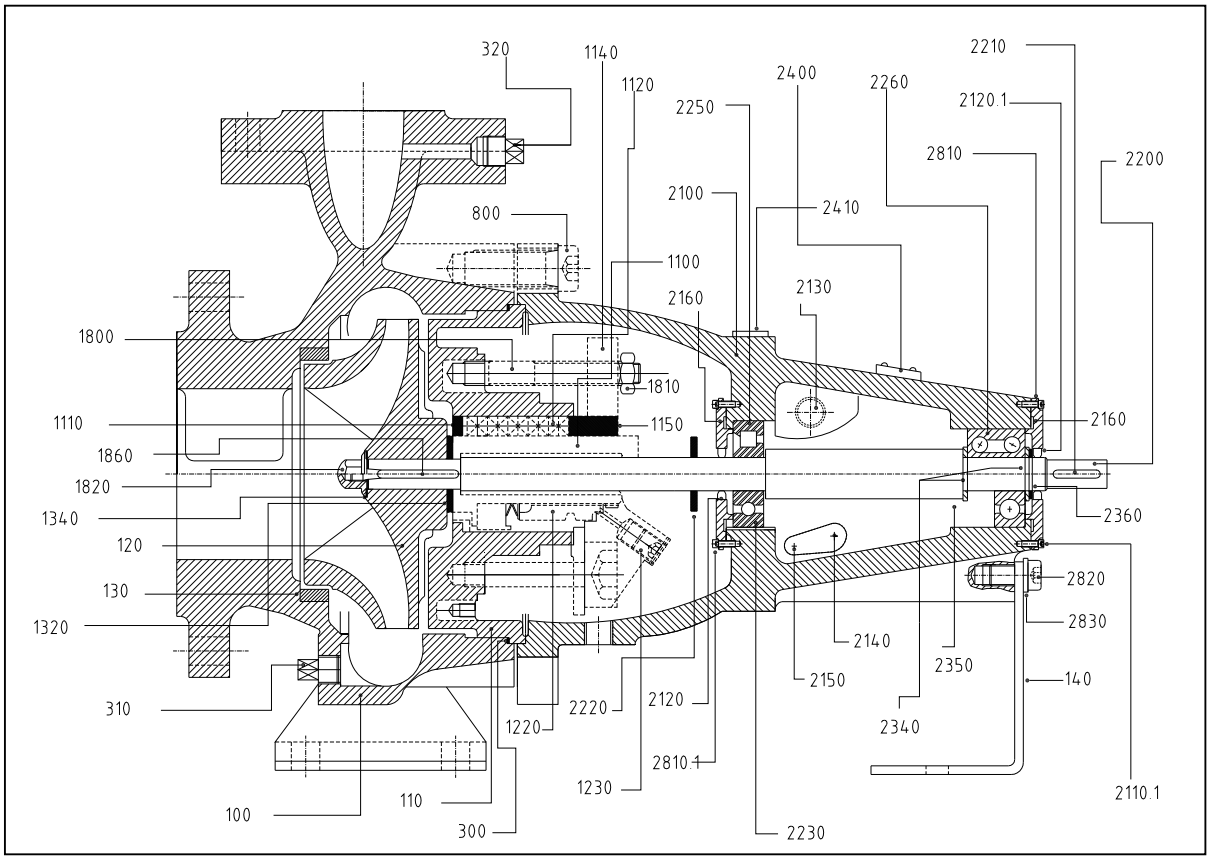
Interchangeability chart of parts for "CPC" series

Parts having same number in the same column and made of same material are interchangeable.

Series 'CPC' Part no:	Casing wear ring 130	Gasket-main 300	St.box cover 110	Bearing housing 2100	Shaft 2200	Sleeve 1100	Gland+G.P.ring 1140, 1150,1800	Bearing Cover (INB) 2110	Bearing Cover (OB) 2110.1	Support foot 140	Impeller dome nut 1820
25-125	----	0	0	0	0	0	0	0	0/+1	0	0
25-160	-----	01	01	01	01	0	0	0	0/+1	2	0
32-200s	------	02	02	02	01	0	0	0	0/+1	1	0
32-125	1	1	1	1	1	1	1	1	1®	1	1
32-160	2	2	2	2	1	1	1	1	1®	2	1
32-200	3	3	4	3	1	1	1	1	1®	3	1
32-250	3	4	6	6	2	2	2	2	2®	4	2
40-125	1	1	1	1	1	1	1	1	1®	1	1
40-160	4	2	2	2	1	1	1	1	1®	2	1
40-200	5	3	4	3	1	1	1	1	1®	3	1
40-250	6	4	6	6	2	2	2	2	2®	4	2
40-315	6	5	8	8	2	2	2	3	3®	5	2
50-125	7	1	1	1	1	1	1	1	1®	1	1
50-160	3	2	2	2	1	1	1	1	1®	3	1
50-200	7	3	4	4	1	1	1	1	1®	3	1
50-250	6	4	6	6	2	2	2	2	2®	4	2
50-315	8	5	8	8	2	2		3	3®	6	2
65-125	8	1	1	1	1	1	1	1	1®	1	1
65-160	8	2	3	3	2	2	2	2	2®	3	2
65-200	9	3	5	4	2	2	2	2	2®	4	2
65-250	10	4	6	5	2	2	2	2	2®	5	2
65-315	8	5	9	9	3	3	2	3	3®	6	3
80-160	11	2	3	3	2	2	2	2	2®	4	2
80-200	12	3	5	5	2	2	2	2	2®	4	2
80-250	11	4	6	6	2	2	2	2	2®	5	2
80-315	11	5	9	9	3	3	3	3	3®	7	3
80-400	13	6	10	10	3	3	3	3	3®	8	3
100-160	14	3	5	5	2	2	2	2	2®	5	2
100-200	14	3	5	5	2	2	2	2	2®	5	2
100-250	15	4	7	7	3	3	2	3	3®	6	3
100-315	11	5	9	9	3	3	3	3	3®	7	3
100-400	12	6	10	10	3	3	3	3	3®	8	3
125-250	16	4	7	7	3	3	3	3	3®	7	3
125-315	16	5	9	9	3	3	3	3	3®	8	3
125-400	16	6	10	10	3	3	3	3	3®	9	3
200-200		4									3

Pump Parts

Cross sectional drawing 'CPC' series

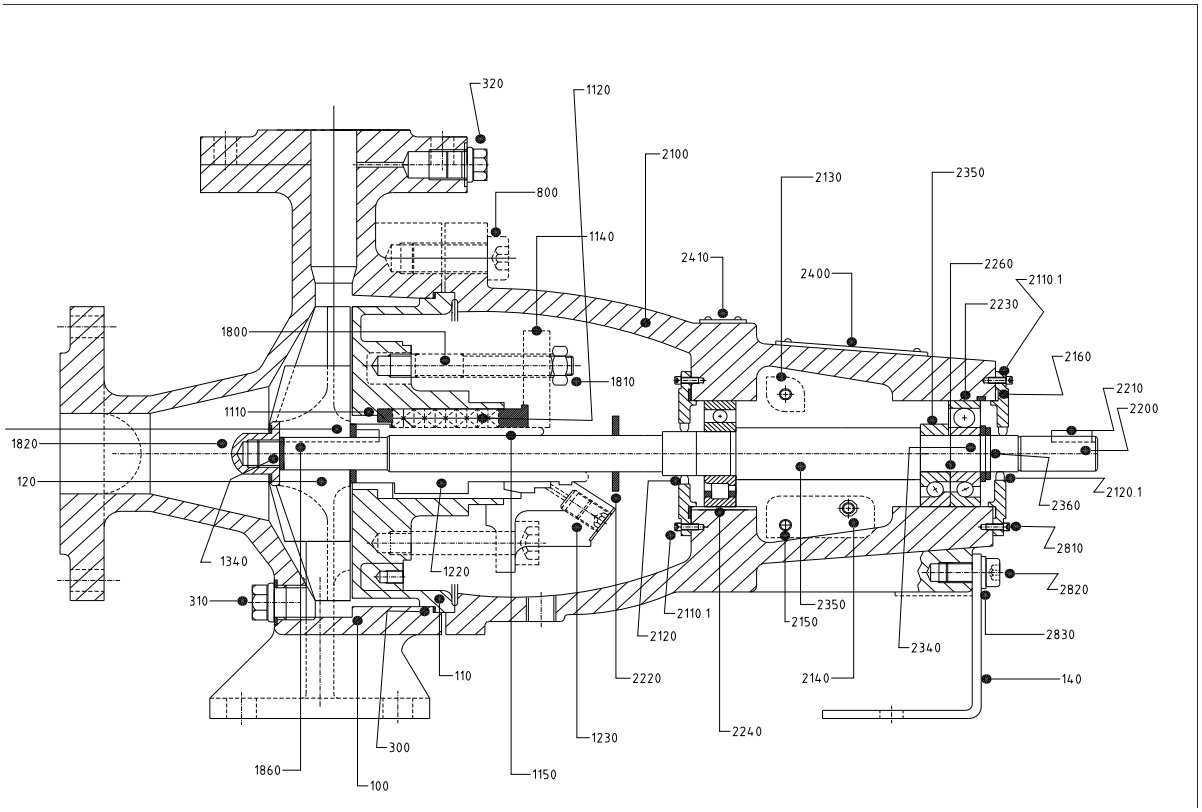


'CPC' pump part list

PART LIST (MODEL-"CPC")				
SR NO	PART NO	PART NAME	MATERIAL	QTY.
1	100	PUMP CASING	S.S-316	1
2	110	STUFFING BOX COVER	S.S-316	1
3	120	IMPELLER	S.S-316	1
4	130	WEAR RING		1
5	140	BRACKET SUPPORT (LEG)	MS	1
6	300	GASKET (MAIN)	ASB/PTFE	1
7	310	PLUG	S.S-316	1
8	320	PLUG	S.S-316	1
9	800	ALL.BOLT FOR PUMP CASING	S.S-316	4or 8or 2
10	1100	SHAFT SLEEVE	S.S-316	1
11	1110	BOTTOM RING	S.S-316	1
12	1120	GLAND PACKING RING	PTFE+ASB	5
13	1140	GLAND PUSHER	S.S-316	1

14	1150	GLAND PUSHER RING	SS-316	1
15	1220	MECHANICAL SEAL	CAR./TC,CAR./CERA,SIC./SIC	1
16	1230	SEAL COVER	S.S-316	1
17	1320	GASKET FOR SHAFT SLEEVE	ASB/PTFE	1
18	1340	GASKET FOR DOME NUT	ASB/PTFE	1
19	1800	STUD FOR GLAND	S.S-316	2 or 4
20	1810	NUT+WASHER FOR STUD	S.S-316	2
21	1820	IMPELLER DOME NUT	S.S-316	1
22	1860	IMPELLER KEY	S.S-316	1
23	2100	BEARING BRACKET	CI	1
24	2110	BEARING COVER (INB.)	CI	1
25	2110.1	BEARING COVER (OB.)	CI	2
26	2120	SEALING RING (OIL SEAL)	NEOPRENE	1
27	2120.1	SEALING RING (OIL SEAL)	NEOPRENE	2
28	2130	OIL FILLING PLUG	P.P	1
29	2140	OIL INDICATOR	STD.	1
30	2150	OIL DRAIN PLUG	MS	1
31	2160	GASKET (REAR) FOR BEARING COVER	ASB.	1
33	2160.1	GASKET (FRONT) FOR BEARING COVER	ASB.	1
34	2200	SHAFT	S.S-316	1
35	2210	COUPLING KEY	S.S-316	1
36	2220	DEFLACTOR	RUBBER/STEEL	1
37	2230	BALL BEARING (INB)	STD.	1
38	2240	BALL BEARING (OB.)	STD.	2
39	2340	ADJUSTMENT RING	MS	1
40	2350	SPACER SLEEVE	MS	1
41	2360	OUTER CIRCLIP	STD.	1
42	2400	NAME PLATE	SS	1
43	2410	ARROW PLATE	ALLU/SS.	1
44	2810	ALLEN SCREW	EN	4
45	2810.1	ALLEN SCREW	EN	4
46	2820	ALLEN BOLT SET FOR LEG	EN	1
47	2830	WASHER FOR ALLEN BOLT	MS	1

Cross sectional drawing 'CPC-A' series
Model:CPC-A-25-125,CPC-A-25-160,CPC-A-32-200



'CPC-A' pump part list

PART LIST (MODEL-"CPC-A")				
SR NO	**PART NO**	**PART NAME**	**MATERIAL**	**QTY.**
1	100	PUMP CASING	S.S-316	1
2	110	STUFFING BOX COVER	S.S-316	1
3	120	IMPELLER	S.S-316	1
4	130	WEAR RING OR WEAR PLATE	SS-316	1
5	140	BRACKET SUPPORT (LEG)	MS	1
6	300	GASKET (MAIN)	ASB/PTFE	1
7	310	PLUG	S.S-316	1
8	320	PLUG	S.S-316	1
9	800	ALL.BOLT FOR PUMP CASING	S.S-316	4or 8or 2
10	1100	SHAFT SLEEVE	S.S-316	1
11	1110	BOTTOM RING	S.S-316	1
12	1120	GLAND PACKING RING	PTFE+ASB	5
13	1140	GLAND PUSHER	S.S-316	1
14	1150	GLAND PUSHER RING	SS-316	1
15	1220	MECHANICAL SEAL	CAR./TC,CAR./CERA,SIC./SIC	1

16	1230	SEAL COVER	S.S-316	1
17	1320	GASKET FOR SHAFT SLEEVE	ASB/PTFE	1
18	1340	GASKET FOR DOME NUT	ASB/PTFE	1
19	1800	STUD FOR GLAND	S.S-316	2 or 4
20	1810	NUT+WASHER FOR STUD	S.S-316	2
21	1820	IMPELLER DOME NUT	S.S-316	1
22	1860	IMPELLER KEY	S.S-316	1
23	2100	BEARING BRACKET	CI	1
24	2110	BEARING COVER (INB.)	CI	1
25	2110.1	BEARING COVER (OB.)	CI	2
26	2120	SEALING RING (OIL SEAL)	NEOPRENE	1
27	2120.1	SEALING RING (OIL SEAL)	NEOPRENE	2
28	2130	OIL FILLING PLUG	P.P	1
29	2140	OIL INDICATOR	STD.	1
30	2150	OIL DRAIN PLUG	MS	1
31	2160	GASKET (REAR) FOR BEARING COVER	ASB.	1
33	2160.1	GASKET (FRONT) FOR BEARING COVER	ASB.	1
34	2200	SHAFT	S.S-316	1
35	2210	COUPLING KEY	S.S-316	1
36	2220	DEFLACTOR	RUBBER/STEEL	1
37	2230	BALL BEARING (INB)	STD.	1
38	2240	BALL BEARING (OB.)	STD.	2
39	2340	ADJUSTMENT RING	MS	1
40	2350	SPACER SLEEVE	MS	1
41	2360	OUTER CIRCLIP	STD.	1
42	2400	NAME PLATE	SS	1
43	2410	ARROW PLATE	ALLU/SS.	1
44	2810	ALLEN SCREW	EN	4
45	2810.1	ALLEN SCREW	EN	4
46	2820	ALLEN BOLT SET FOR LEG	EN	1
47	2830	WASHER FOR ALLEN BOLT	MS	1