H SERIES PUMPS
Installation and Operating Instructions

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CONTENTS

1. General information

This manual contains the installation, operating and maintenance of H series centrifugal multistage pumps with technical features.

Read the manual carefully before installation and using the pump. Keep this user's manual for as long as the pump is in use.

For detailed information, please contact us.

1.1 Safety symbols used in this manual

Danger of electric shock. Safety sign according to ISO 3864.

General warning sign according to ISO 3864.

2. Product introduction

H series pumps are multistage stainless-steel pumps with closed impeller and for high pressure applications. Pumps can reach pressure up to 25 Bar thanks to multistage pump construction. When the pumps work as serial it possible to reach higher pressure up to 50 Bar.

The main applications of the high pressure pumps;

- CNC lathes,
- CNC machining centers,
- Especially deep hole boring operations,
- Erosion machines,
- Washing processes,
- Cooling systems.

High pressure pumps have stainless steel (AISI 304) impellers and diffusers which have a good chemical resistance against to various chemical liquids. There are O-rings between diffusers and impellers to reach high pressure and prevent back flow to have high efficiency. O-rings are made of Viton for high chemical resistance.

Mechanical Seal

Mechanical seals are consist of four parts. These parts are; stable part, rotary part, bellows and spring. Mechanical seal materials must be choose according to liquid specifications and pump application type. These materials are shown the table below.

Components	Type 1	Type 2
Stable Part	SiC	TC
Rotary Part	C	TC
Bellows	Viton	
Spring	Stainless steel	

SiC : Silicon Carbide
TC : Tungsten Carbide
C : Resin-Impregnated Carbon
V : Viton (FKM)

2.1 Identification

The nameplate is positioned on the motor and indicates the type model - immersion depth, pump performance data, motor specifications, serial number and production date.

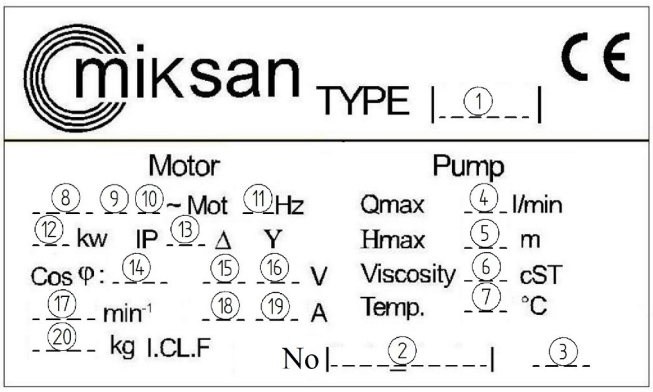


Figure 1. Sample Nameplate

No	*Description*		*No*	*Description*
1	Pump Model		**11**	Frequency (Hz)
2	Serial Number		**12**	Rated Motor Power
3	Production Date		**13**	IP Protection Class
4	Max. Flow Rate		**14**	Motor Cos*φ* Value
5	Max. Delivery Head		**15**	Rated Voltage (V) (Δ)
6	Fluid Viscosity Range		**16**	Rated Voltage (V) (Y)
7	Max. Operating Temp.		**17**	Rotational Speed
8	Motor Frame		**18**	Rated Current (A) (Δ)
9	Motor Pole Number		**19**	Rated Current (A) (Y)
10	Motor Phase		**20**	Pump Weight

Table 1. Description of the values in the nameplate

2.2 Pumping medium requirements

Pump Type	**H Series Pumps**
Medium	Coolants, grinding oils, cutting oils
Kinematic viscosity	1…30 mm^2/s
Medium temperature	0 … 80 °C
Allowed chip size	2 mm

Pump performances are based on fluid with 1 mm^2/s kinematic viscosity and 997 kg/m^3 density and tolerance according to ISO 9906:2012 Grade 3B.

If H series pumps will be used on grinding applications or filtration systems for pumping highly contaminated liquids, TC mechanical seals must be chosen due to the good mechanical resistance against to metal chips or abrasives. All the O-rings will be removed for these applications. Because abrasive metal dusts can damage to O-rings which will result the failure of the pump.

3. Safety

It is only the general safety instructions included under this main heading 'Safety' that have to be followed but also the safety instructions provided under the specific headings.
Miksan Motor does not accept any liability for damage and injury caused by not applying the directions and instructions in this manual.

Non-compliance with the safety instructions

Non-compliance with safety instructions may pose a risk to the safety of personnel, the environment and the product itself, and also will lead to forfeiture of all rights to claims for damages.
Non-compliance may result in for example, hazards given below

- Failure of important pump/plant functions,
- Failure of recommended maintenance and repair process,
- Exposure of people by electrical, mechanical and chemical hazards,
- Threatening the environment due to leakage of hazardous substances,

◊ *Operating Personnel*

All personnel participated in the installation, operation, maintenance and inspection of the product must be adequately qualified. Responsibilities, capability and supervision of the personnel must be clearly defined by the plant operator. Moreover, the operator is responsible for ensuring that the contents of the operating instructions are fully understood by the personnel.

◊ *Unauthorised modifications and procurement of spare parts*

The product has been designed and manufactured with the greatest possible care and any modification may be made to the pump only after consultation with the manufacturer. Using spare parts and accessories authorised by the manufacturer is required to meet safety regulations. Use of non-original parts can invalidate any liability of the manufacturer for consequential damage and may lead to a safety risk.

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

◊ *During Operation*

⚠ If hot/cold machine components involve hazards, they must be prevented against accidental contact.

⚠ Guards for the moving parts (e.g. coupling, fan) must not be removed while the pump is running. Also make sure that guards are never in contact with the moving parts by using proper protection parts

⚠ Any leakage of hazardous (e.g. explosive, toxic, hot) fluids must be drained away to prevent any risk to surroundings.

⚠ Always close the terminal box to prevent hazards caused by electricity.

◊ *During Installation, Maintenance and Inspect*

Only authorised and qualified personnel may install, maintain and inspect the product and repair electrical components. Observe the local safety regulations.

⚠ Always disconnect the energy supply to the product before installation, maintenance and repairs and secure disconnection.

⚠ Surfaces of a pump can be hot, after continuous operation. Handle the pump with dangerous liquids with the ultimate care. Decontamination of the pump is recommended to prevent hazardous fluids.

On completion of work all safety and protective facilities must be re-installed and made operative again.

Make sure that no one can be near rotating components when starting a pump. Before restarting the machine, observe the instructions listed under 'Start up'.

4. Transport and storage

- Transport the pump in the position as indicated on the pallet or packaging.
- When moving the entire pump assembly by a crane, all ropes must be mounted around the pump

⚠ The lifting capacity of the crane and rope must exceed the weight of the pump. Only qualified personnel are allowed to lift the pump. Do NOT use the terminal box to lift the pump.

- Make sure the pump is stable. Protect pump from damage during transportation. The warranty becomes invalid if damages occur during transportation.

⚠ Do not remove the lever or protection from the pump before the pump is placed and mounted correctly.

- If present, observe the instructions on the packaging.
- All pumps should be stored in a clean dry place. Avoid humidity, dirt and any foreign materials from the pump and do NOT remove the protective plastic pipe ends during storage.

5. Installing the product

5.1 Before installation

- Check the nameplate and performance curve to ensure that the pump meets requirements of your application (Delivery head, flow rate, viscosity etc.).

⚠ Make sure that the product operates within its working range. Only then the product performance is guaranteed.

Check the condition of the pump for any damage that may have occurred during shipping.
Keep the pump vertical and prevent from falling down.
The electrical supply should be verified so the voltage, phase and frequency match that of the pump motor.

5.2 Mechanical installation

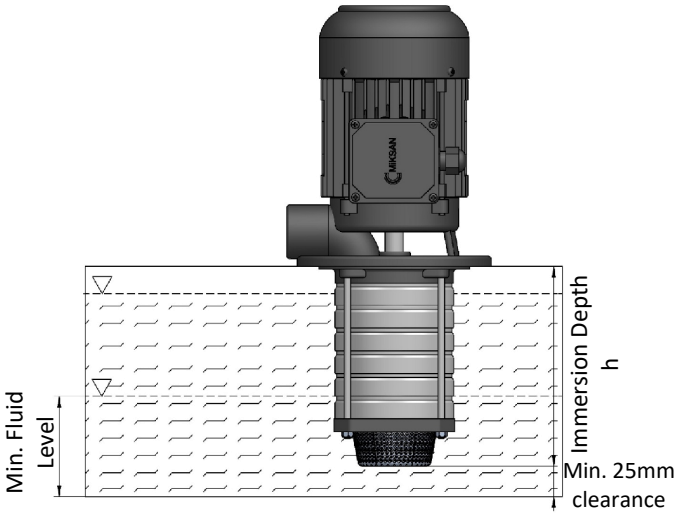
Place and install the pump on a flat surface on the top of the coolant tank with the pump body being immersed in the coolant. Immersion depth of the pump should be at least 25 mm shorter than the depth of the tank and minimum fluid level should exceed lower stage of the pump.

The piping must be fully installed and bore diameter have to be chosen according to the discharge of the pump. Flow rate can be adjusted by installing a valve on the piping and on the delivery connection of the pump. Be sure that piping is capable of delivering the hydraulic pressure.

Check the pump stayed out of use for a long time by turning the shaft via hand before installation. Make sure that the suction of the pump is not clogged.

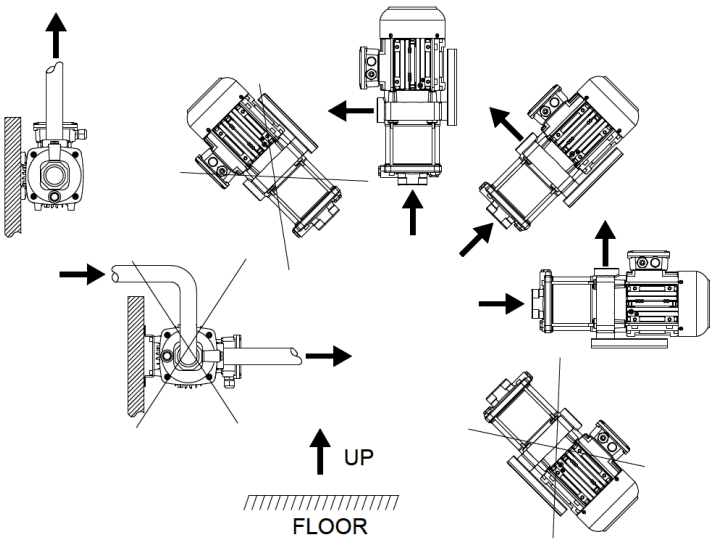
Do not block the air flow through the motor. Make sure that sufficient air can pass the cooling fan.

Check the direction of rotation of the pump and designated direction on the label on the top of the pump before start up.



TYPE	HC - HD	HCA - HDA	HCB -HCD - HDB - HDD	HEB / HED HFB / HFD
DISCHARGE	G 1''			G 2''

Installation positions of HC & HD Series multistage horizontal pumps are given below



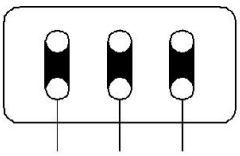
5.3 Electrical connections

Centrifugal pumps consist of air-cooled squirrel cage electric motor and pump parts. Pump is connected to the motor perpendicularly via bolts, coupling etc. to operate inside the liquid.

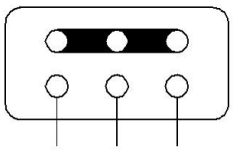
⚠ A faulty motor or wiring can cause electrical shock that could be fatal, whether direct contact or conducted through standing water. For this reason, proper grounding of the motor frame to the power supply's grounding terminal is required for safe installation and operation.

⚠ Only trained staff should make the electrical connections of the pump unit. Otherwise, electrical shocks can cause fatal injuries.

- Before running the pump unit, be sure about the electrical connections and connection type. Appropriate voltage level and connection type are shown below.
- Ground terminal of the motor is inside the terminal box. This terminal must be connected to the terminals of the Networks ground terminals.
- Bolts of the connection cables must be tightened. Loose connections cause overheat and faults of the motor.
- Before run the pump, all the mechanical and electrical connections of the pump has been made. Check all of the bolts are fastened tightly.
- Use appropriate fuse and thermal switches etc. to protect the motor damages of the faults
- Always check the voltage level of the pump unit before maintenance and before opening the terminal box.



Delta connection (Δ)
3 x 230 V up to 5.5 kW 3 x 400 V from 7.5 kW and higher



Star connection (Y)
3 x 400 V
Standard connection motors up to 5.5kW

Wiring diagram can also be found interior of the terminal box cover. All other mechanical or electrical designs are described in the nameplate of the pump.

6. Operation

6.1 Start-up

Install the pump according to 'Installation' heading in the manual.

Switch off the mains and connect the terminals according to 'Electrical connections' heading in the manual. Then close the terminal box.

Check installation and electrical connections steps one more time before starting up the pump.

Briefly start the motor to check the direction of rotation according to the arrow on the top of the motor (By looking through the fan cover that has to turn clockwise for H series pumps). For three-phases motor, interchange two of the power leads if the direction is incorrect.

Make sure that the temperature of the medium is inside of the designated limits of the pump.

⚠ Do **NOT** run H series pumps **dry**.

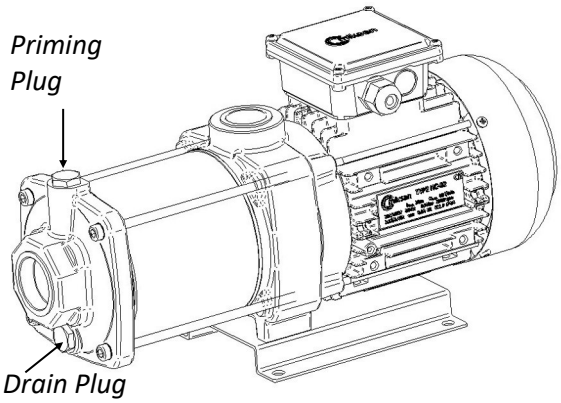
⚠ Check the allowed particle size in the medium and prevent the pump from bigger particles.

⚠ Do not start HC-HD series horizontal pumps until it has been primed.

Priming (Only for HC and HD series pumps):

1. Close the valve on the discharge side of the pump.
2. Open the valve in the suction pipe completely before starting the pump.
3. Remove the priming plug shown in Figure below.
4. Fill the pump housing and the suction pipe completely with liquid until a steady stream of liquid runs out of the priming hole.
5. Fit and tighten the priming plug.
6. Slowly open the discharge isolating valve while the pump is running. This ensures venting and pressure build-up during start-up.

⚠ If the pump is not building up pressure, it may be necessary to repeat steps 1 to 6.



6.2 Shut down

- Switch off all the mains.
- Open the terminal box and disconnect all the terminals.
- Evacuate the pump.

⚠ All service work must be carried out by qualified service personnel.

7. Servicing and Maintenance

⚠ Observe the general safety precautions for installation, maintenance and repair.

Do NOT keep the pump immersed in water if it is not in use for a long period. The pump must be stored in dry and clean place. Check the pump shaft by rotating manually before re-installed.

Spare parts are available from the supplier.

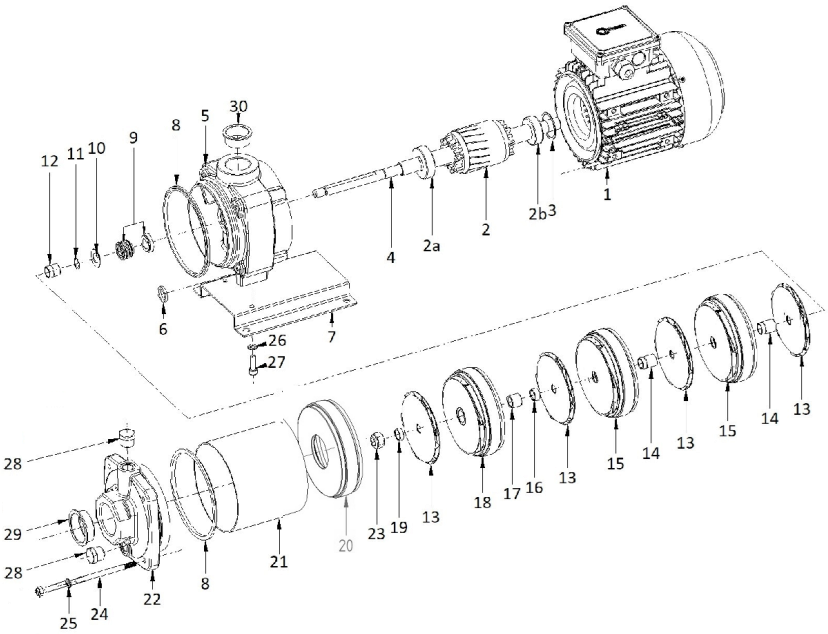
Please contact us for the documents of replacing the mechanical seal.

8. Troubleshooting

Fault	Possible cause	Remedy
Motor does not start (no motor noise)	Supply failure	Check the power supply
		Check the fuses, terminals and supply leads
Motor does not start (makes noise)	Supply leads failure	See above
	Motor bearing faulty	Replace bearing
Pump does not work (Motor is running)	Low fluid level	Fill up fluid
	Pipe of the machine tool is blocked	Clean the system
	Pump is bound	Turn off power and check the pump shaft by rotating manually
Insufficient pressure and/or flow rate	Pump rotates in wrong direction	Change over two power leads
	Pipe of the pump is blocked	Disassemble and clean the clogged area
	Low rotational speed	Check the voltage and power supply
Too much vibration and noise	Bearing faulty	Replace the defective bearing
	TC/Ceramic rings worn/broken	Replace the rings
	Pump and motor shaft coupling is loose	Tighten the coupling screws
Power consumption is too high	Too much mechanical friction	Contact to your supplier
	Pump rotates in wrong direction	Change over two power leads
Leakage	Leakage on the sleeve (HCD-HDD-HED)	Contact to your supplier
	Leakage on the pump body (mech. seal)	

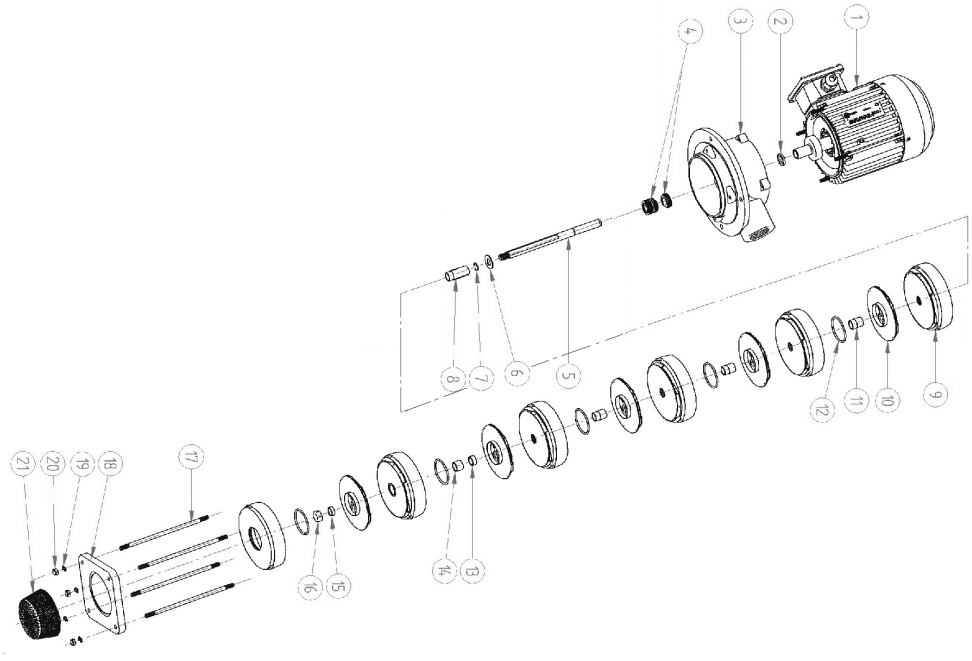
9. Spare Parts

9.1 Spare part list of HC / HD series pump



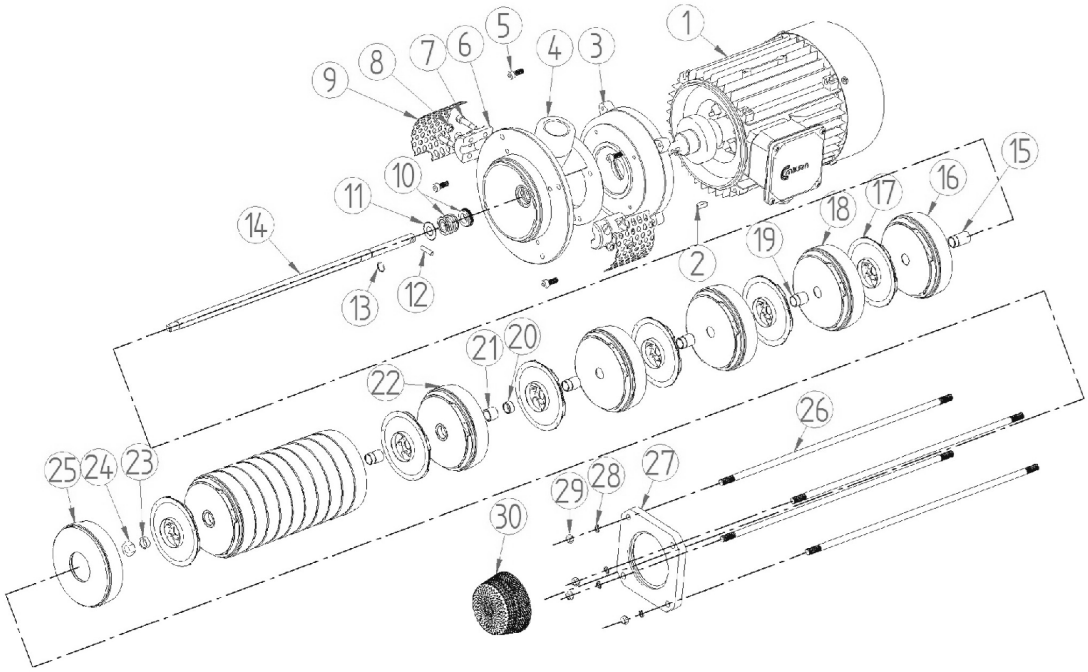
Item	Description	Qty	Item	Description	Qty
1	71 motor frame	1	15	Diffuser (w. O-ring)	2-5
2	Motor shaft w. rotor	1	16	Spacer sleeve #3	1
2a	Front bearing (6203)	1	17	TC bearing	1
2b	Rear bearing (6202)	1	18	Diffuser w. bearing	1
3	Wave spring	1	19	Spacer sleeve #4	1
4	Pump shaft	1	20	Stage w/o diffuser	1
5	Pump body	1	21	Outer case	1
6	Splash ring	1	22	Pump inlet	1
7	Base plate	1	23	M10 Lock nut	1
8	O-ring	2	24	M6 Hex socket bolt	4
9	Mechanical seal	1	25	M6 Lock washer	4
10	Washer	1	26	M6 Lock washer	2
11	Circlip	1	27	M6 Hex socket screw	2
12	Spacer sleeve #1	1	28	3/8'' Blind plug	2
13	Impeller	1-7	29	1¼'' Pipe end plug	1
14	Spacer sleeve #2		30	1'' Pipe end plug	1

9.2 Spare part list of HCA / HDA series pump



Item No	Description	Qty
1	Motor	1
2	Diverting disc	1
3	Pump Body (Discharge)	1
4	Mechanical Seal	1
5	Pump Shaft	1
6	Washer	1
7	Circlip	1
8	Sleeve (Long)	1
9	Diffuser	
10	Impeller	
11	Spacer Sleeve	
12	O-ring	
13	Ring	
14	SIC Bearing Ring	
15	Sleeve (Short)	1
16	M10 Self-locking Nut	1
17	M6 Tie Bolt	4
18	Pump Intake	1
19	M6 Split Lock Washer	4
20	M6 Self-Locking Nut	4
21	Strainer	1

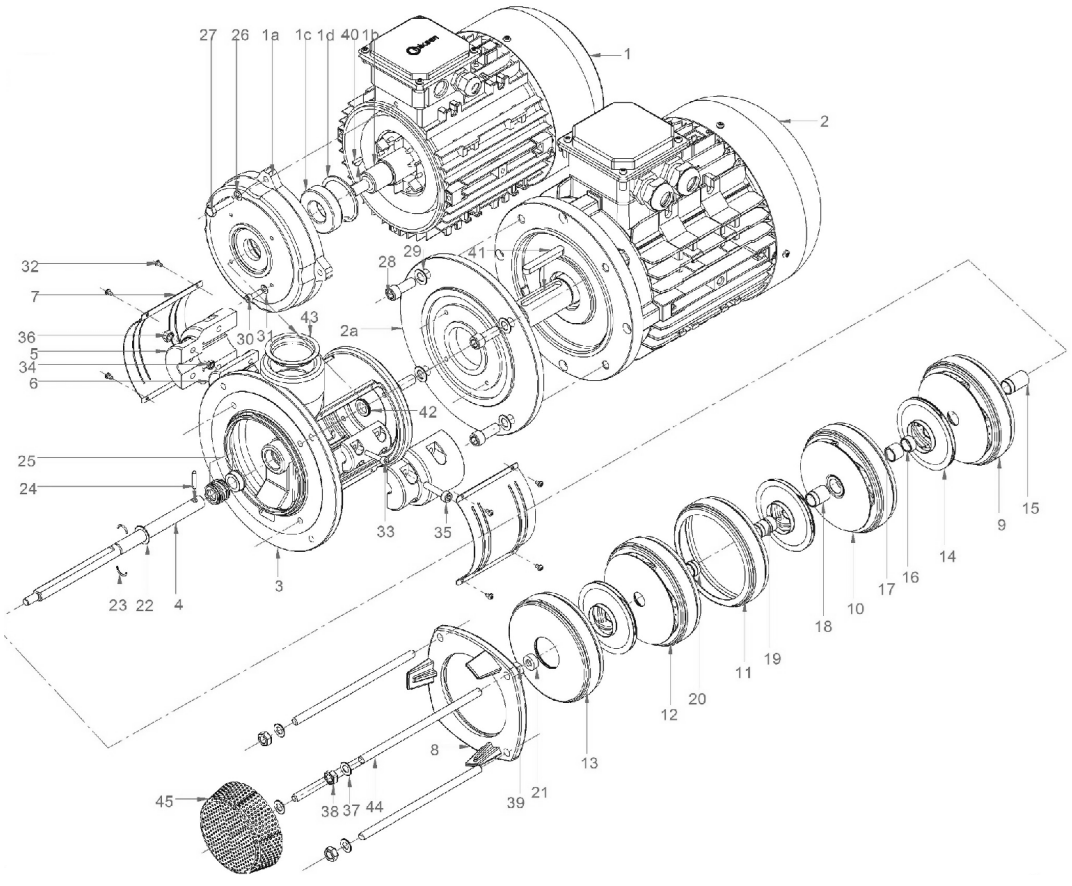
9.3 Spare part list of HCB / HDB series pump



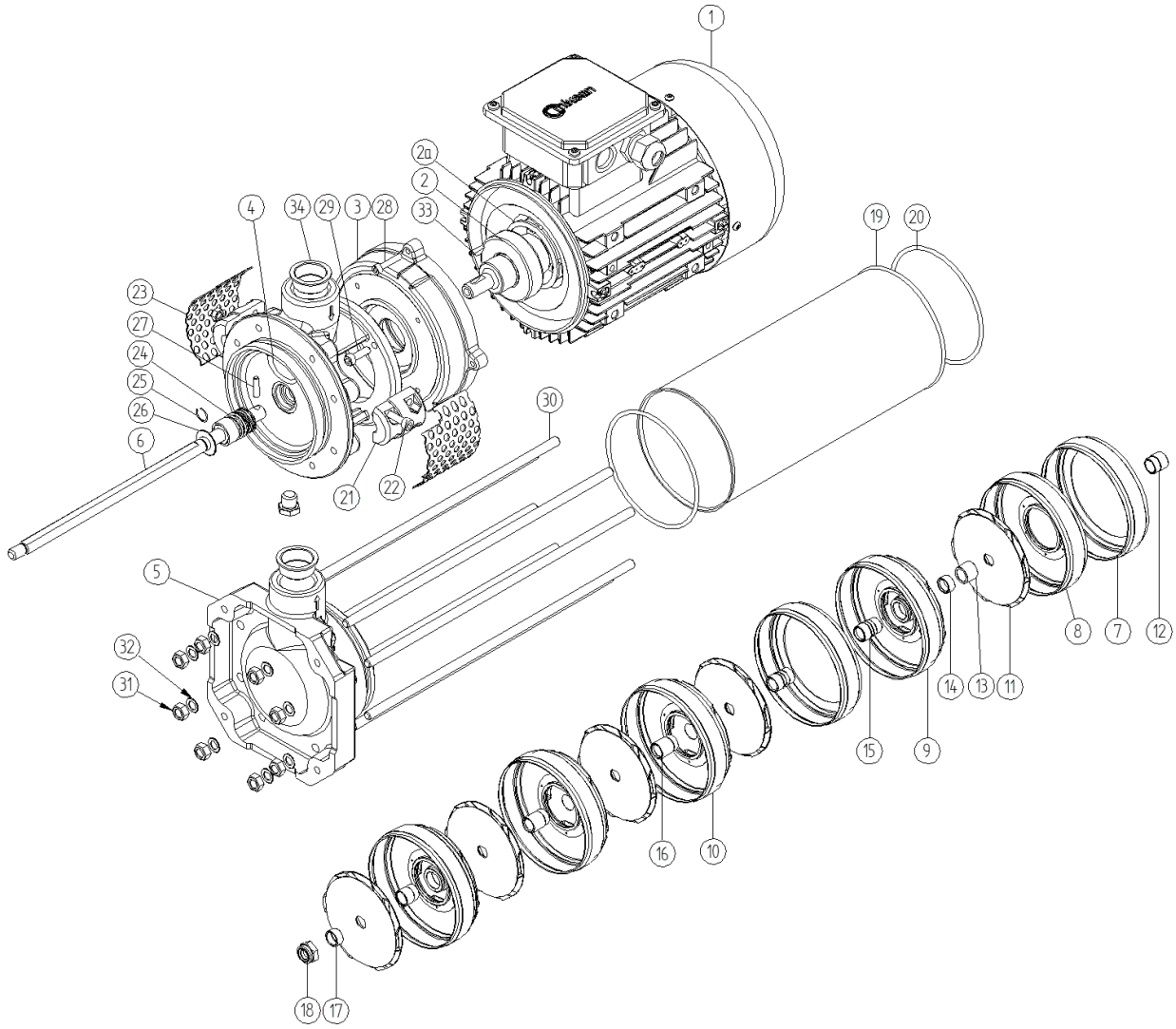
Item No	Description	Qty
1	Motor	1
2	Woodruff Key	1
3	Front Cover	1
4	Motor Stool (Discharge)	1
5	M6x20 Socket Head Screw	4
6	Coupling Shell	2
7	M6x25 Socket Head Screw	4
8	M6 Nut	4
9	Coupling Guard	1
10	Mechanical Seal	1
11	Washer	1
12	Shaft Pin	1
13	Circlip	1
14	Pump Shaft	1
15	Sleeve (Long)	1
16	Diffuser w/o o-ring	1
17	Impeller	
18	Diffuser w/ o-ring	
19	Sleeve	
20	Sleeve (Short)	
21	SIC Bearing Ring	
22	Diffuser with bearing (O-ring mounted)	
23	Clamping Sleeve	1
24	M10 Nut	1
25	Empty Stage (Chamber)	1
26	M8 Tie Bolt	4
27	Pump Cover	1
28	M8 Split Lock Washer	4
29	M8 Nut	4
30	Strainer	1

9.4 Spare part list of HEB/ HFB series pump

Item No	Description	Qty
1	Motor	1
1a	Motor Cover	1
1b	Motor Shaft	1
1c	Front Bearing	1
1d	Bearing Circlip	1
2	Motor 132 Frame	1
2a	Motor Flange	1
3	Motor Stool (Pump Discharge)	1
4	Pump Shaft	1
5	Coupling Shell (For Motor Item No:2)	2
6	Coupling Shell (For Motor Item No:1)	2
7	Coupling Guard	2
8	Pump Cover	1
9	Diffuser w/o o-ring	
10	Diffuser with ceramic bearing	
11	Empty Stage (Chamber)	
12	Diffuser	
13	Stage (Chamber) w/ o-ring	
14	HEB Impeller	
15	Sleeve (Long)	
16	Sleeve (Short)	
17	Wolfram Carbide Bearing	
18	Sleeve	
19	Sleeve (For empty chamber)	
20	Short Sleeve (For empty Chamber)	
21	Clamping Sleeve	
22	Washer	1
23	Circlip	1
24	Shaft Pin	1
25	Mechanical Seal	1
26	Split Lock Washer	4
27	Bolt	4
28	Socket Head Screw (Allen)	4
29	Split Lock Washer	4
30	Socket Head Screw (Allen)	4
31	Split Lock Washer	4
32	Pan Head Machine Screw	8
33	Socket Head Screw (Allen)	4
34	Nut	4
35	Socket Head Screw (Allen)	4
36	Nut	4
37	Split Lock Washer	4
38	Nut	4
39	Self Locking Nut	1
40	Woodruff Key	1
41	Key (Parallel)	1
42	Oil Seal	1
43	2" Pipe End Plug	1
44	Tie Bolt	4
45	Strainer	1

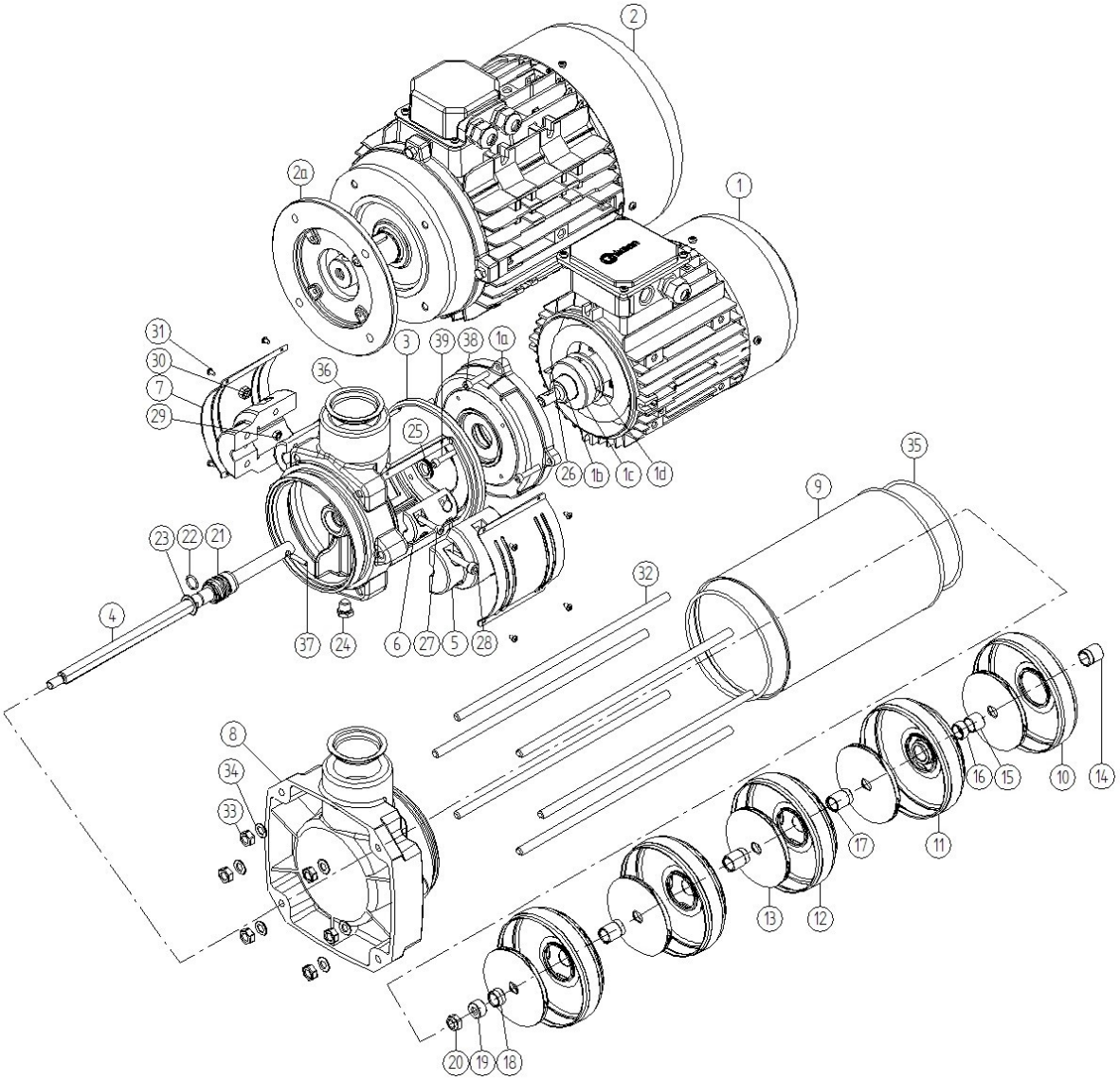


9.5 Spare part list of HCD / HDD series pump



Item	Description	Qty		Item	Description	Qty
1	Electric motor 80 to 112 Frame	1		**18**	M10 Lock nut	1
2	Front bearing	1		**19**	Outer sleeve	1
2a	Circlip	1		**20**	O-ring	2
3	Motor flange	1		**21**	Coupling	1 set
4	Pump body (inlet)	1		**22**	M6 Socket head screw	1
5	Pump outlet	1		**23**	Coupling guard cover	1
6	Pump shaft	1		**24**	Mechanical seal	1
7	Empty stage	1		**25**	Circlip	1
8	Stage	1		**26**	Washer	1
9	Diffuser w/ bearing			**27**	Pin	1
10	Diffuser			**28**	M6 Socket head screw	4
11	Impeller			**29**	M6 Socket head screw	4
12	Sleeve—seal	1		**30**	M8 Tie bolt	6
13	TC bearing			**31**	M8 Nut	6
14	Sleeve—bearing	1		**32**	M8 Split lock washer	6
15	Sleeve—empty stage			**33**	Woodruff key	1
16	Sleeve—stage			**34**	1¼ Pipe end plug	2
17	Sleeve—tighten	1		**35**	1/8'' Blind plug	1

9.6 Spare part list of HED/HFD series pump



Item	Description	Qty		Item	Description	Qty		Item	Description	Qty
1	Electric motor 80 to 112 Frame	1		**11**	Diffuser w/ ceramic bearing			**26**	Woodruff key	1
1a	Motor flange	1		**12**	Diffuser			**27**	M6 Socket head screw	4
1b	Motor shaft	1		**13**	Impeller			**28**	M8 Socket head screw	4
1c	Front bearing	1		**14**	Sleeve—seal			**29**	M6 Nut	4
1d	Circlip	1		**15**	Sleeve—bearing			**30**	M8 Nut	4
2	Electric motor 132 frame	1		**16**	TC bearing			**31**	Pan head screw	4
2a	Connection flange of 132 frame	1		**17**	Sleeve—stage			**32**	M10 Tie bolt	6
3	Pump body (inlet)	1		**18**	Sleeve—tighten	1		**33**	M10 Nut	6
4	Pump shaft	1		**19**	Sleeve—top	1		**34**	M10 Split lock washer	6
5	Coupling 16x38 (132 Frame)	1 set		**20**	M10 Lock nut	1		**35**	O-ring	2
6	Coupling 16x14 (80-112 Frame)	1 set		**21**	Mechanical seal	1		**36**	2'' Pipe end plug	2
7	Coupling guard cover	2		**22**	Washer	1		**37**	Pin	1
8	Pump outlet	1		**23**	Circlip	1		**38**	M6 Socket head screw	4
9	Outer sleeve	1		**24**	1/8'' Blind plug	1		**39**	M6 Socket head screw	4
10	Stage w/ O-ring	1		**25**	Seal 16x24x4mm	1				

10. Disposing of the product

This product, all the parts of it and the packaging materials must be disposed according to the local and national regulation for proper disposal.

Prior to its disposal, the pump must be completely drained and decontaminated if necessary.

11. EC Declaration of Conformity

We herewith declare that the design/construction of H Series Pumps

Complies with the following regulations/standards:

Low Voltage Directive 2014/35/EU

Directive 2014/30/EU Electromagnetic Compatibility Directive

2006/42/EC on Machinery