

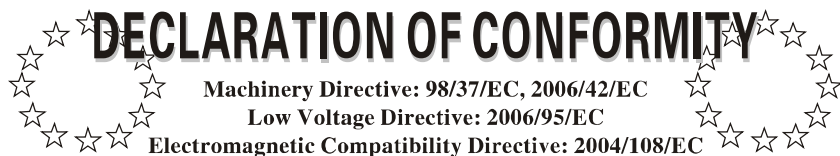
CDL, CDFL

Light Vertical Multistage Centrifugal Pump

Operation Manual



Hangzhou Nanfang Special Pump Industry Co., Ltd.
Add: Renhe Town, Yuhang District, Hangzhou, Zhejiang
Tel: +86-571-86397810; +86-571-86397838
Fax: +86-571-86397809
P.C: 311107
E-mail: info@nanfang-pump.com
[Http://www.nanfang-pump.com](http://www.nanfang-pump.com)



Name of manufacturer or supplier

Hangzhou Nanfang Special Pump Industry Co., Ltd.

Full postal address including country of origin

No.26,Hongjiashe,Renhe Town, Yuhang District, Hangzhou, Zhejiang, China.

Description of product

CDL/CDLF is a kind of vertical non-self priming multistage centrifugal pump, It can be used to convey various medium from tap water to industrial liquid at different temperature and with different flow rate and pressure.

Name, type or model, batch or serial number

Name: Light Vertical Multistage Centrifugal Pump

Model: CDL Series ,CDLF Series

Standards used, including number, title, issue date and other relative documents

EN ISO 12100-1:2003、 EN ISO 12100-2:2003、 EN 809:1998+AC:2002、
EN ISO 14121-1:2007、 EN 60204-1:2006、 EN 61000-6-2-2005、 EN 61000-6-4-2007.

Place of issue Hangzhou City, China.

Name of authorised representative Shen Jinhao

Position of authorised representative General manager

Declaration

I declare that as the authorised representative, the above information in relation to the supply / manufacture of this product, is in conformity with the provisions of the above Directives. For the most specific risks of this machine, safety and compliance with the essential requirements of the Directive has been based on elements of the above standards.

Contents

I. Applications and conditions-----	1
II. Definition of model -----	2
III. Structure -----	3
IV. Installation and connection -----	10
V. Start-up, operation and maintenance -----	31
VI. Assemble and disassemble-----	33
VII. Fault finding and solution chart -----	36
VIII. Important notice -----	38

Read this manual carefully before install, start the pump

I. Applications and conditions

Pumps of CDL and CDLF model are non-self-priming vertical multistage centrifugal pumps. The features are high efficient, low noise, a little corrosive liquid resistance, compact structure, good appearance, small volume, light weight, easy to service, good seal performance, etc.

1.Applications

• Pumped liquids: Low viscosity, neutral, non-explosive liquids, not containing solid particles or fibres. The liquid must not attack the pump materials chemically.

- Boiler water supply and condensing system;
- Water treatment, filtration system;
- Food and beverage industries;
- Pressure boosting in high-rise buildings;
- Farmland irrigation, nursery irrigation and golf court irrigation;
- Industry cleaning system;
- Liquid conveying, circulation and boosting;
- Hot and cool water;

2.Operation conditions

• Medium temperature: Normal temperature type $-15^{\circ}\text{C} \sim +70^{\circ}\text{C}$;

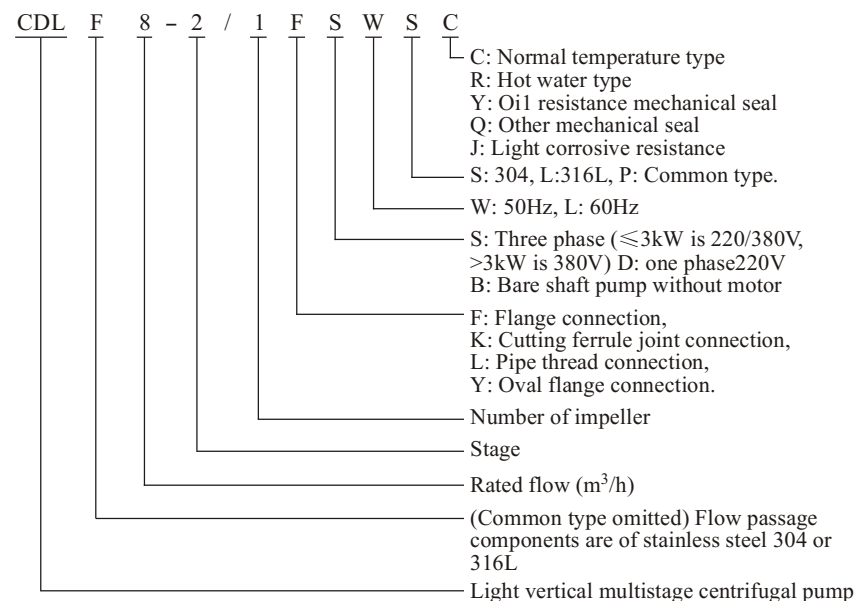
Hot water type $-15^{\circ}\text{C} \sim +120^{\circ}\text{C}$;

- Flow: $0.4 \sim 180\text{m}^3/\text{h}$
- Medium pH range: pH 5-9;
- Maximum ambient temperature: $+40^{\circ}\text{C}$;
- Maximum altitude: 1000 m;
- Minimum inlet pressure: Refer to CDL catalogue;

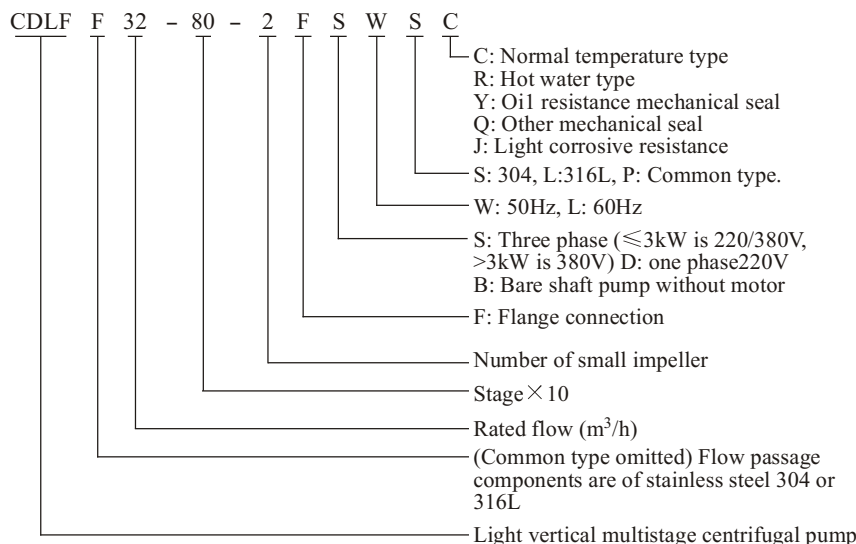
Caution: When pumping liquids with a density and/or viscosity higher than that of water, use motors with correspondingly higher outputs, if required.

II. Definition of model

1.CDL, CDLF 1,2,3,4,8,16,20



1.CDL, CDLF 32,42,65,85,120,150



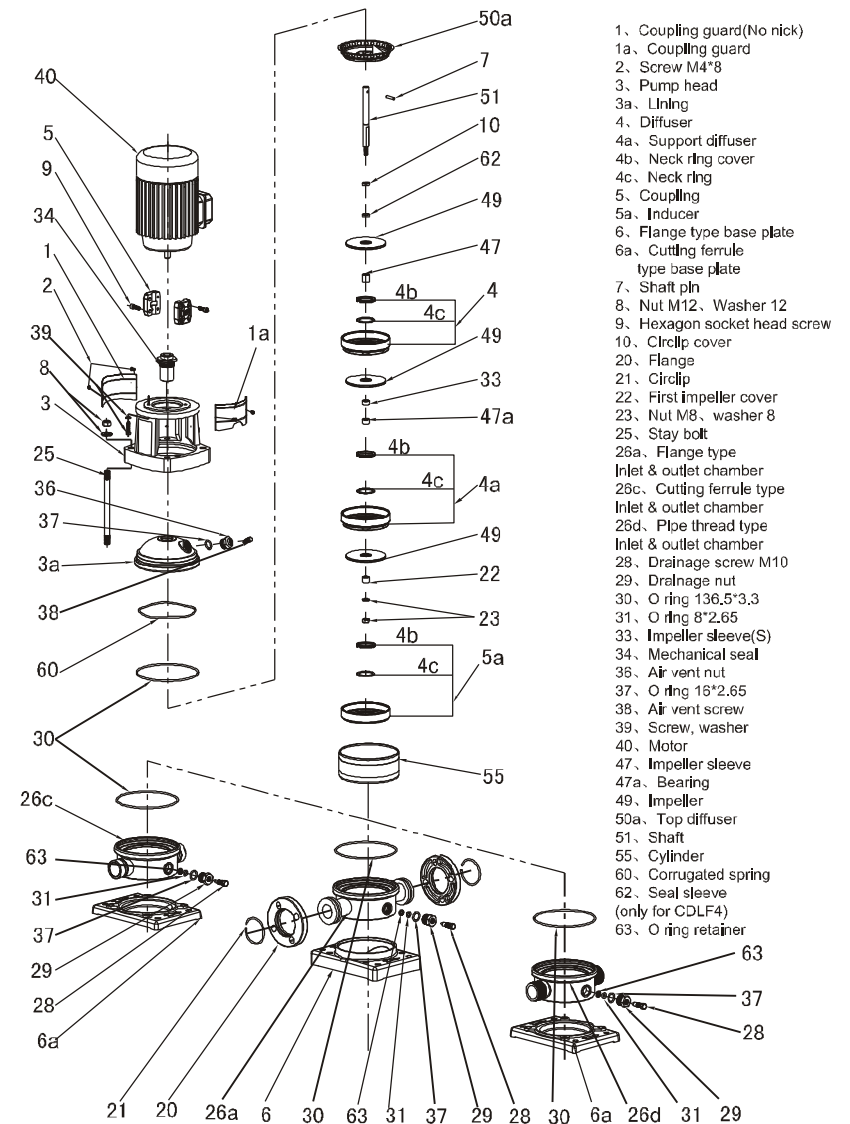
III. Structure

• The pump is mainly composed of motor, pump head, diffuser, impeller, cylinder, inlet & outlet chamber, pump shaft, mechanical seal and so on. Refer to Fig.1.

• Key parts of the pump, diffuser, impeller, cylinder, shaft, are all made of stainless steel. For CDL series, material of pump head and inlet & outlet chamber is made of cast iron. While for CDLF series, they are made of stainless steel.

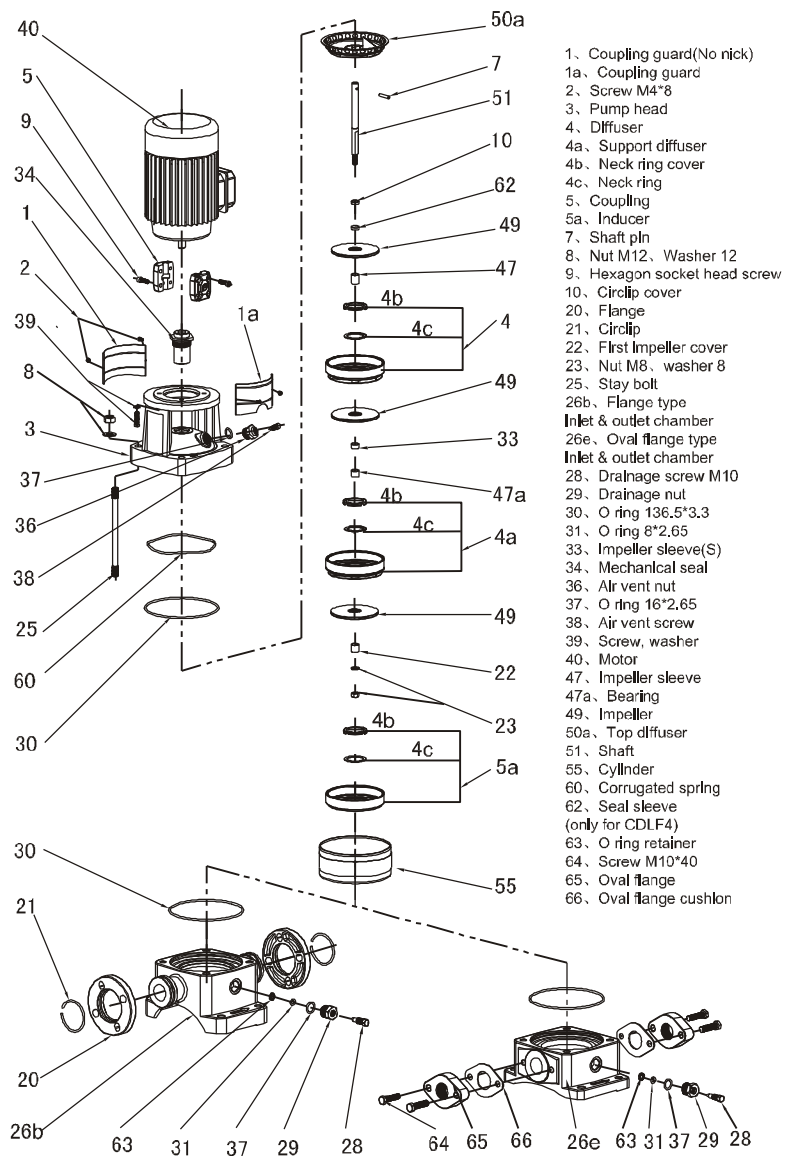
• Mechanical seal is a single face seal. Seal part is cemented carbides/ carbon. Support part of support diffuser is made of tungsten carbide.

• Normally, pipes are connected by round flanges. Different types of connections are also available on demand of customer. See fig.2.



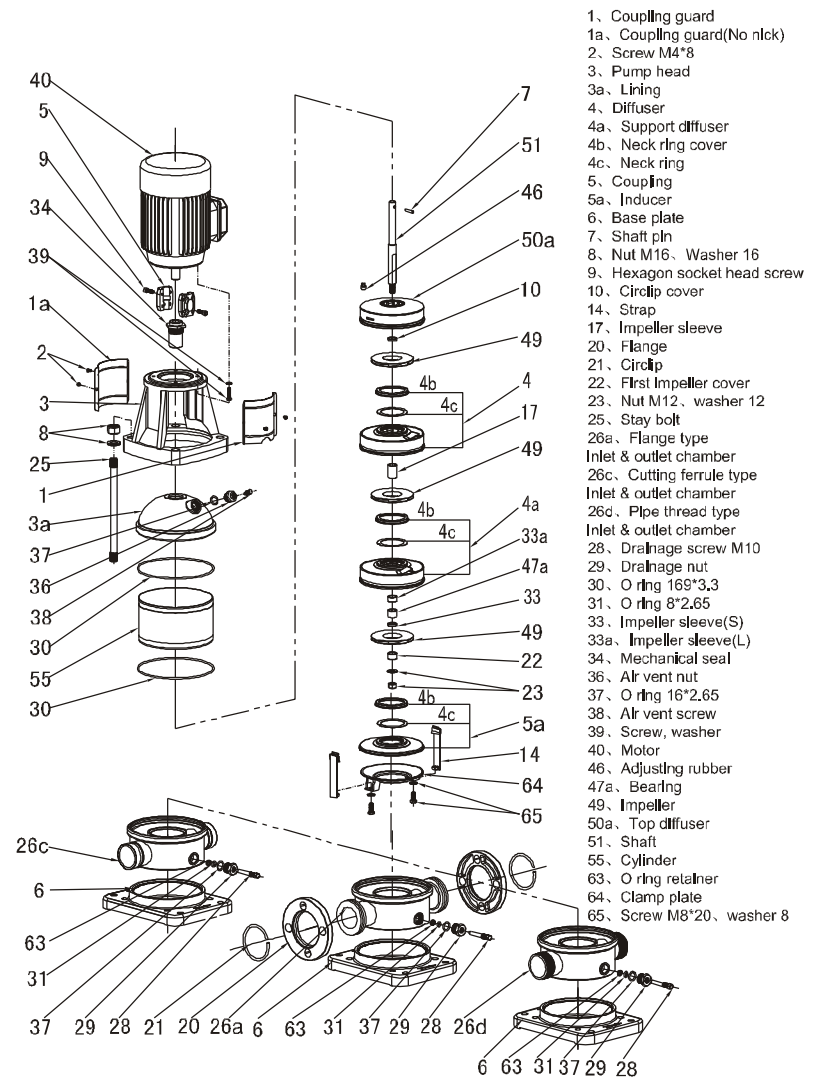
CDLF1, 2, 3, 4-080701

Figure 1 A



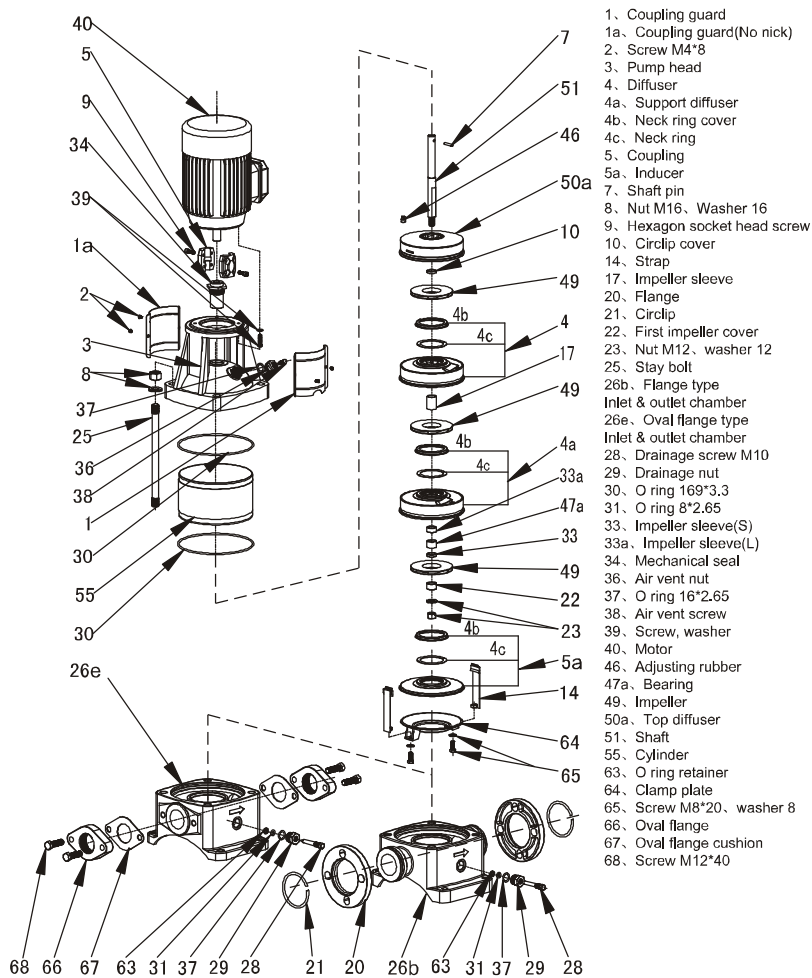
CDL1, 2, 3, 4-080701

Figure 1 B



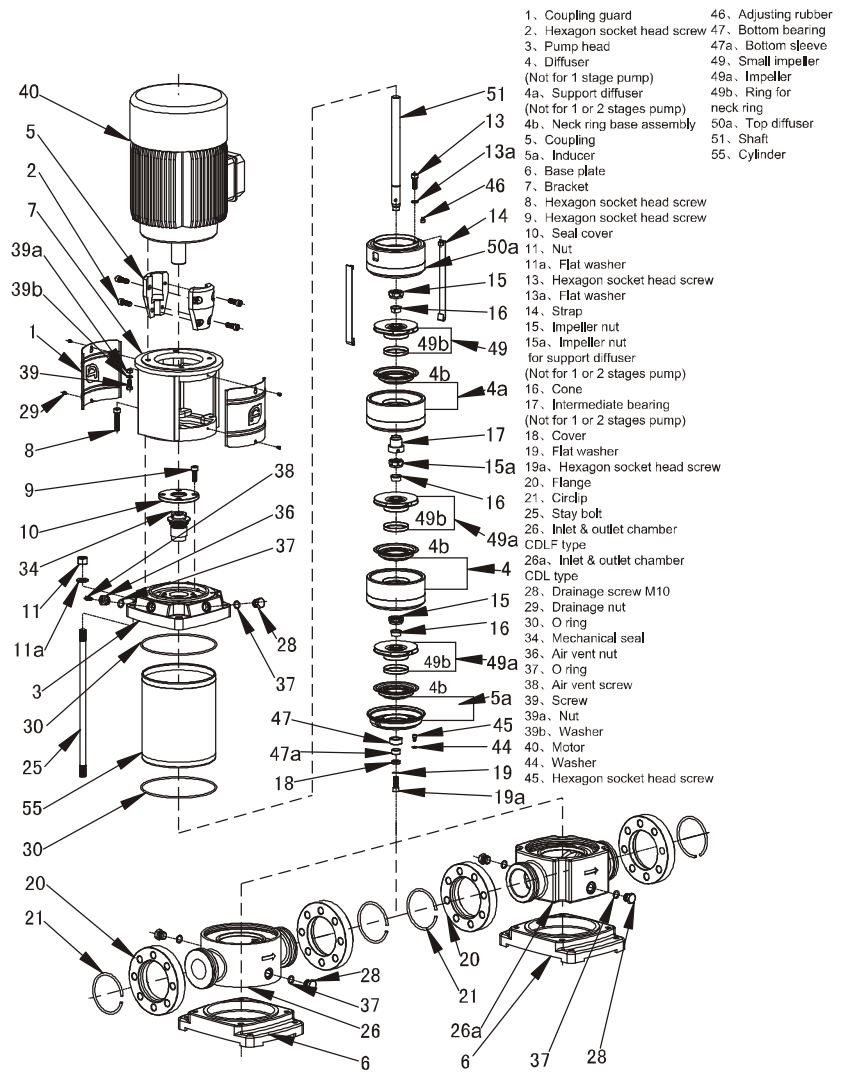
CDLF8, 12, 16, 20-080701

Figure 1 C



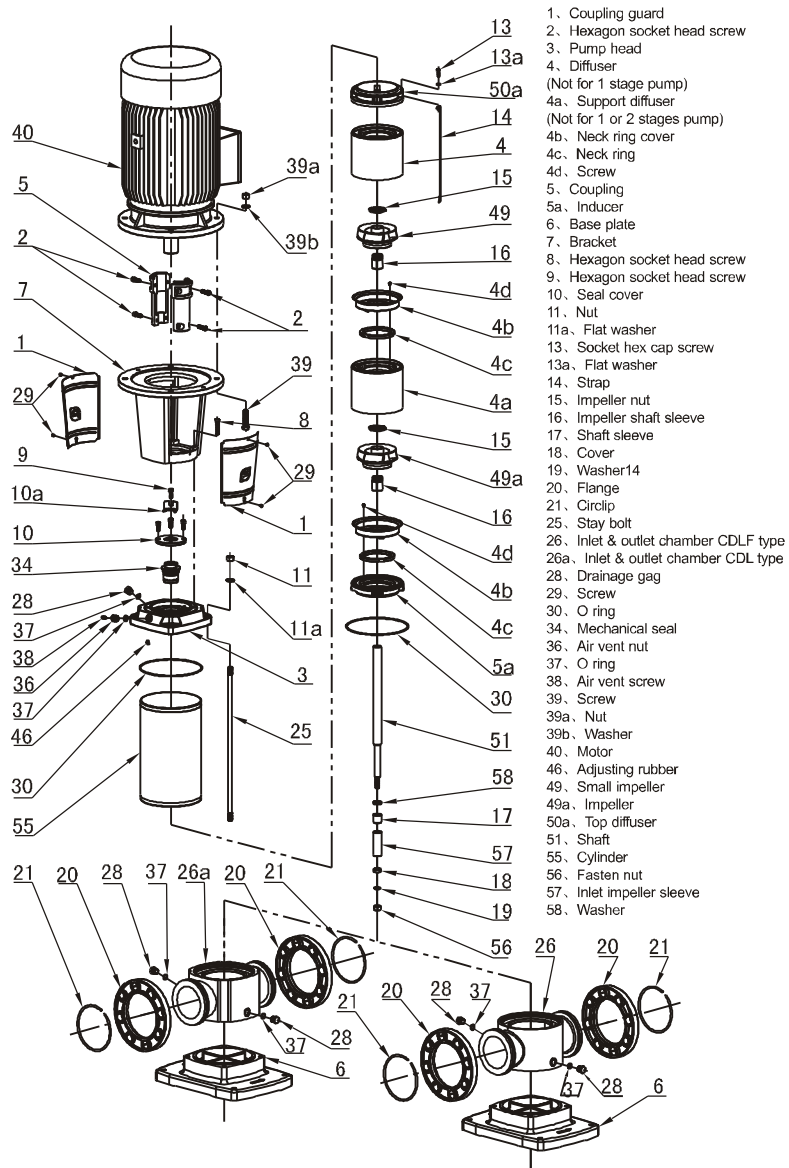
CDL8, 12, 16, 20-080701

Figure 1 D



CDL(F)32, 42, 65, 85-080701

Figure 1 E



1. Coupling guard
2. Hexagon socket head screw
3. Pump head
4. Diffuser
- 4a. Support diffuser (Not for 1 stage pump)
- 4b. Neck ring cover (Not for 1 or 2 stages pump)
- 4c. Neck ring
- 4d. Screw
5. Coupling
- 5a. Inducer
6. Base plate
7. Bracket
8. Hexagon socket head screw
9. Hexagon socket head screw
10. Seal cover
11. Nut
- 11a. Flat washer
13. Socket hex cap screw
- 13a. Flat washer
14. Strap
15. Impeller nut
16. Impeller shaft sleeve
17. Shaft sleeve
18. Cover
19. Washer
20. Flange
21. Circlip
25. Stay bolt
26. Inlet & outlet chamber CDLF type
- 26a. Inlet & outlet chamber CDL type
28. Drainage gag
29. Screw
30. O ring
34. Mechanical seal
36. Air vent nut
37. O ring
38. Air vent screw
39. Screw
- 39a. Nut
- 39b. Washer
40. Motor
46. Adjusting rubber
49. Small impeller
- 49a. Impeller
- 50a. Top diffuser
51. Shaft
55. Cylinder
56. Fasten nut
57. Inlet impeller sleeve
58. Washer

CDL(F)120, 150-081101

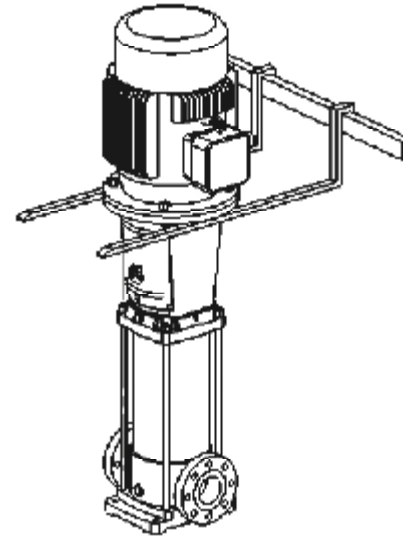
Figure 1 F

IV. Installation and connection

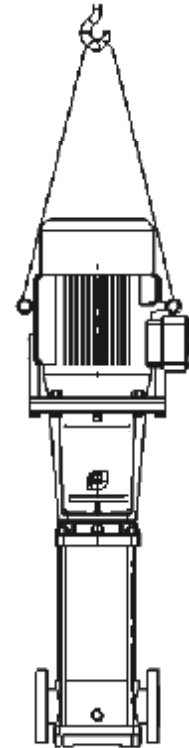
1. Handling

When lifting the entire pump with motor, follow these instructions:

- Pump with motor sizes 0.37-7.5kW:
Lift the pump in the motor flange by means of straps or the like.
- Pump with motor sizes 11-75kW:
Lift the pump by means of the motor eyebolts.



0.37-7.5kW



11-75kW

2. Pump installation

Pump size and dimension is as follows.

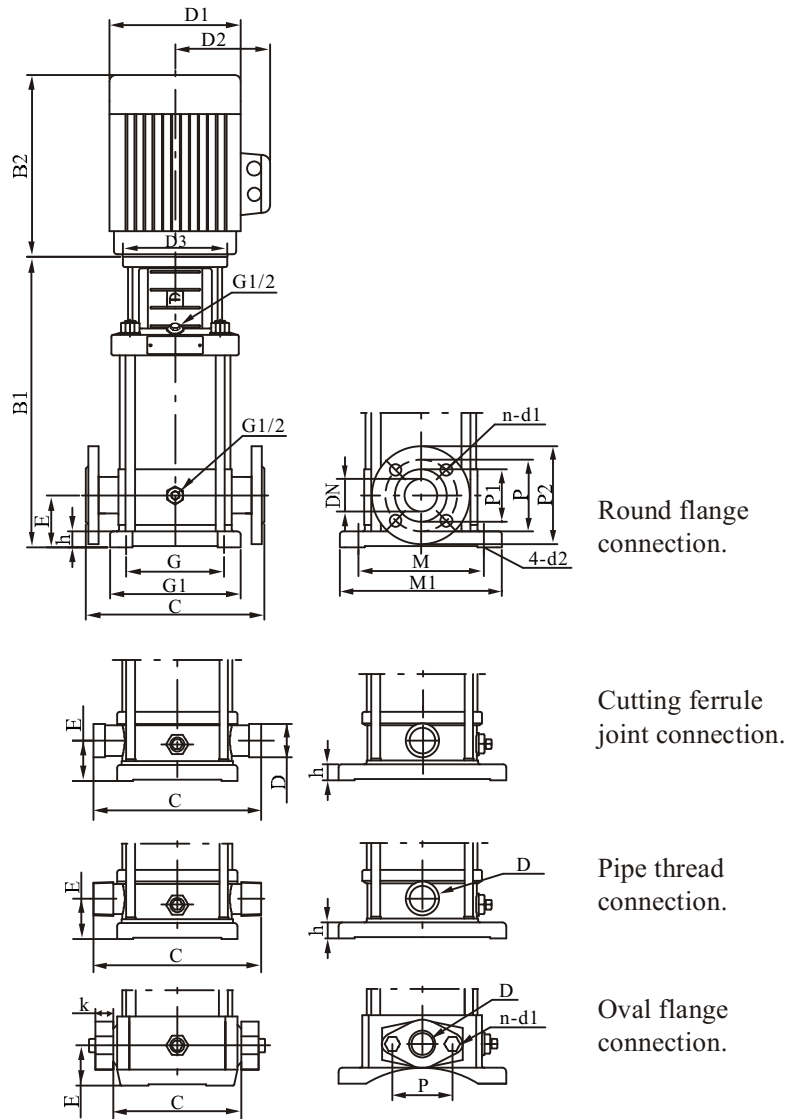


Figure 2 Installation sketch

Table 1 Pump dimensions 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)1-2	258	210	468	148	117	20
CDL(F)1-3	276	210	486	148	117	20
CDL(F)1-4	294	210	504	148	117	20
CDL(F)1-5	312	210	522	148	117	20
CDL(F)1-6	330	210	540	148	117	20
CDL(F)1-7	348	210	558	148	117	20
CDL(F)1-8	366	210	576	148	117	22
CDL(F)1-9	384	210	594	148	117	22
CDL(F)1-10	402	210	612	148	117	22
CDL(F)1-11	420	210	630	148	117	22
CDL(F)1-12	448	245	693	170	142	25
CDL(F)1-13	466	245	711	170	142	25
CDL(F)1-15	502	245	747	170	142	25
CDL(F)1-17	538	245	783	170	142	28
CDL(F)1-19	574	245	819	170	142	28
CDL(F)1-21	610	245	855	170	142	30
CDL(F)1-23	646	245	891	170	142	33
CDL(F)1-25	692	290	982	190	155	40
CDL(F)1-27	728	290	1018	190	155	40
CDL(F)1-30	782	290	1072	190	155	40
CDL(F)1-33	836	290	1126	190	155	45
CDL(F)1-36	890	290	1180	190	155	45
CDL(F)2-2	258	210	468	148	117	20
CDL(F)2-3	276	210	486	148	117	20
CDL(F)2-4	294	210	504	148	117	20
CDL(F)2-5	312	210	522	148	117	20
CDL(F)2-6	340	245	585	170	142	25
CDL(F)2-7	358	245	603	170	142	25
CDL(F)2-9	394	245	639	170	142	30
CDL(F)2-11	430	245	675	170	142	30
CDL(F)2-13	476	290	766	190	155	35
CDL(F)2-15	512	290	802	190	155	35
CDL(F)2-18	566	290	856	190	155	40
CDL(F)2-22	638	290	928	190	155	45
CDL(F)2-26	720	315	1035	197	165	50

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)3-2	258	210	468	148	117	20
CDL(F)3-3	276	210	486	148	117	20
CDL(F)3-4	294	210	504	148	117	20
CDL(F)3-5	312	210	522	148	117	20
CDL(F)3-6	330	210	540	148	117	22
CDL(F)3-7	348	210	558	148	117	22
CDL(F)3-8	376	245	621	170	142	22
CDL(F)3-9	394	245	639	170	142	22
CDL(F)3-10	412	245	657	170	142	22
CDL(F)3-11	430	245	675	170	142	25
CDL(F)3-12	448	245	693	170	142	25
CDL(F)3-13	466	245	711	170	142	25
CDL(F)3-15	502	245	747	170	142	25
CDL(F)3-17	548	290	838	190	155	30
CDL(F)3-19	584	290	874	190	155	35
CDL(F)3-21	620	290	910	190	155	35
CDL(F)3-23	656	290	946	190	155	40
CDL(F)3-25	692	290	982	190	155	40
CDL(F)3-27	728	290	1018	190	155	40
CDL(F)3-29	764	290	1054	190	155	40
CDL(F)3-31	810	315	1125	197	165	45
CDL(F)3-33	846	315	1161	197	165	50
CDL(F)3-36	900	315	1215	197	165	50
CDL(F)4-2	276	210	486	148	117	20
CDL(F)4-3	303	210	513	148	117	20
CDL(F)4-4	340	245	585	170	142	20
CDL(F)4-5	367	245	612	170	142	25
CDL(F)4-6	394	245	639	170	142	25
CDL(F)4-7	431	290	721	190	155	30
CDL(F)4-8	458	290	748	190	155	30
CDL(F)4-10	512	290	802	190	155	30
CDL(F)4-12	566	290	856	190	155	35
CDL(F)4-14	630	315	945	197	165	35
CDL(F)4-16	684	315	999	197	165	40
CDL(F)4-19	765	335	1100	230	188	45
CDL(F)4-22	846	335	1181	230	188	50

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)8-2/1	347	245	592	170	142	22
CDL(F)8-2	347	245	592	170	142	22
CDL(F)8-3	377	245	622	170	142	32
CDL(F)8-4	417	290	707	190	155	32
CDL(F)8-5	447	290	737	190	155	42
CDL(F)8-6	477	290	767	190	155	42
CDL(F)8-8	547	315	862	197	165	47
CDL(F)8-10	607	335	942	230	188	57
CDL(F)8-12	667	335	1002	230	188	57
CDL(F)8-14	747	430	1177	260	208	82
CDL(F)8-16	807	430	1237	260	208	82
CDL(F)8-18	867	430	1297	260	208	92
CDL(F)8-20	927	430	1357	260	208	92
CDL(F)12-2	367	290	657	190	155	36
CDL(F)12-3	397	290	687	190	155	39
CDL(F)12-4	437	315	752	197	165	46
CDL(F)12-5	467	315	782	197	165	47
CDL(F)12-6	497	335	832	230	188	57
CDL(F)12-7	547	430	977	260	208	75
CDL(F)12-8	577	430	1007	260	208	75
CDL(F)12-9	607	430	1037	260	208	77
CDL(F)12-10	637	430	1067	260	208	77
CDL(F)12-12	697	430	1127	260	208	79
CDL(F)12-14	845	490	1335	330	255	150
CDL(F)12-16	905	490	1395	330	255	150
CDL(F)12-18	965	490	1455	330	255	152

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)16-2	397	290	687	190	155	42
CDL(F)16-3	452	315	767	197	165	52
CDL(F)16-4	497	335	832	230	188	57
CDL(F)16-5	562	430	992	260	208	72
CDL(F)16-6	607	430	1037	260	208	77
CDL(F)16-7	652	430	1082	260	208	82
CDL(F)16-8	697	430	1127	260	208	82
CDL(F)16-10	875	490	1365	330	255	142
CDL(F)16-12	965	490	1455	330	255	147
CDL(F)16-14	1055	490	1545	330	255	162
CDL(F)16-16	1145	490	1635	330	255	167
CDL(F)20-1	387	245	632	170	142	32
CDL(F)20-2	397	290	687	190	155	43
CDL(F)20-3	452	335	787	230	188	57
CDL(F)20-4	517	430	947	260	208	72
CDL(F)20-5	562	430	992	260	208	74
CDL(F)20-6	607	430	1037	260	208	82
CDL(F)20-7	652	430	1082	260	208	84
CDL(F)20-8	785	490	1275	330	255	140
CDL(F)20-10	875	490	1365	330	255	145
CDL(F)20-12	965	490	1455	330	255	160
CDL(F)20-14	1055	490	1545	330	255	165
CDL(F)20-17	1190	550	1740	330	255	190

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)32-10-1/CDL(F)32-10	505	290	795	190	155	68/71
CDL(F)32-20-2/CDL(F)32-20	575	315/335	890/910	197/230	165/180	78/84
CDL(F)32-30-2/CDL(F)32-30	645	430	1075	260	208	93
CDL(F)32-40-2/CDL(F)32-40	715	430	1145	260	208	102
CDL(F)32-50-2/CDL(F)32-50	890	490	1380	330	255	172
CDL(F)32-60-2/CDL(F)32-60	960	490	1450	330	255	176
CDL(F)32-70-2/CDL(F)32-70	1030	490	1520	330	255	188
CDL(F)32-80-2/CDL(F)32-80	1100	490	1590	330	255	192
CDL(F)32-90-2/CDL(F)32-90	1170	550	1720	330	255	218
CDL(F)32-100-2/CDL(F)32-100	1240	550	1790	330	255	222
CDL(F)32-110-2/CDL(F)32-110	1310	590	1900	360	285	259
CDL(F)32-120-2/CDL(F)32-120	1380	590	1970	360	285	263
CDL(F)32-130-2/CDL(F)32-130	1450	660	2110	400	310	327
CDL(F)32-140-2/CDL(F)32-140	1520	660	2180	400	310	331
CDL(F)42-10-1 CDL(F)42-10	561	315/335	876/896	197/230	165/188	86/92
CDL(F)42-20-2 CDL(F)42-20	641	430	1071	260	208	102/107
CDL(F)42-30-2 CDL(F)42-30	826	490	1316	330	255	175
CDL(F)42-40-2 CDL(F)42-40	906	490	1396	330	255	187
CDL(F)42-50-2 CDL(F)42-50	986	550	1536	330	255	208
CDL(F)42-60-2 CDL(F)42-60	1066	590	1656	360	285	251
CDL(F)42-70-2 CDL(F)42-70	1146	660	1806	400	310	315
CDL(F)42-80-2 CDL(F)42-80	1226	660	1886	400	310	319
CDL(F)42-90-2 CDL(F)42-90	1306	660	1966	400	310	323/343
CDL(F)42-100-2 CDL(F)42-100	1386	660	2046	400	310	347
CDL(F)42-110-2 CDL(F)42-110	1466	700	2166	450	345	413
CDL(F)42-120-2 CDL(F)42-120	1546	700	2246	450	345	417
CDL(F)42-130-2	1626	700	2326	450	345	421

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)65-10-1	561	335	896	230	188	105
CDL(F)65-10	561	430	991	260	208	110
CDL(F)65-20-2	644	430	1074	260	208	120
CDL(F)65-20-1	754	490	1244	330	255	155
CDL(F)65-20	754	490	1244	330	255	155
CDL(F)65-30-2	836	490	1326	330	255	195
CDL(F)65-30-1	836	490	1326	330	255	195
CDL(F)65-30	836	550	1386	330	255	205
CDL(F)65-40-2	919	550	1469	330	255	208
CDL(F)65-40-1	919	590	1509	360	285	260
CDL(F)65-40	919	590	1509	360	285	260
CDL(F)65-50-2	1001	660	1661	400	310	345
CDL(F)65-50-1	1001	660	1661	400	310	345
CDL(F)65-50	1001	660	1661	400	310	345
CDL(F)65-60-2	1084	660	1744	400	310	350
CDL(F)65-60-1	1084	660	1744	400	310	370
CDL(F)65-60	1084	660	1744	400	310	370
CDL(F)65-70-2	1166	660	1826	400	310	375
CDL(F)65-70-1	1166	660	1826	400	310	375
CDL(F)65-70	1166	700	1866	460	340	435
CDL(F)65-80-2	1248	700	1948	460	340	440
CDL(F)65-80-1	1248	700	1948	460	340	440
CDL(F)85-10-1	571	430	1001	260	208	120
CDL(F)85-10	571	430	1001	260	208	122
CDL(F)85-20-2	773	490	1263	330	255	165
CDL(F)85-20	773	490	1263	330	255	198
CDL(F)85-30-2	865	550	1415	330	255	212
CDL(F)85-30	865	590	1455	360	285	265
CDL(F)85-40-2	957	660	1617	400	310	348
CDL(F)85-40	957	660	1617	400	310	348
CDL(F)85-50-2	1049	660	1709	400	310	375
CDL(F)85-50	1049	660	1709	400	310	375
CDL(F)85-60-2	1141	700	1841	460	340	438
CDL(F)85-60	1141	700	1841	460	340	438

Continued 50Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)120-10	840	490	1330	330	255	230
CDL(F)120-20-2	1000	490	1490	330	255	245
CDL(F)120-20-1	1000	550	1550	330	255	250
CDL(F)120-20	1000	590	1590	360	285	285
CDL(F)120-30-2	1160	660	1820	400	310	360
CDL(F)120-30-1	1160	660	1820	400	310	360
CDL(F)120-30	1160	660	1820	400	310	360
CDL(F)120-40-2	1320	660	1980	400	310	400
CDL(F)120-40-1	1320	660	1980	400	310	400
CDL(F)120-40	1320	700	2020	460	340	460
CDL(F)120-50-2	1480	700	2180	460	340	470
CDL(F)120-50-1	1480	700	2180	460	340	470
CDL(F)120-50	1510	770	2280	540	370	575
CDL(F)120-60-2	1670	770	2440	540	370	585
CDL(F)120-60-1	1670	770	2440	540	370	585
CDL(F)120-60	1670	845	2515	580	410	705
CDL(F)120-70-2	1830	845	2675	580	410	715
CDL(F)120-70-1	1830	845	2675	580	410	715
CDL(F)120-70	1830	845	2675	580	410	715
CDL(F)150-10-1	840	490	1330	330	255	230
CDL(F)150-10	840	490	1330	330	255	235
CDL(F)150-20-2	1000	550	1550	330	255	250
CDL(F)150-20-1	1000	590	1590	360	285	295
CDL(F)150-20	1000	660	1660	400	310	350
CDL(F)150-30-2	1160	660	1820	400	310	360
CDL(F)150-30-1	1160	660	1820	400	310	360
CDL(F)150-30	1160	660	1820	400	310	385
CDL(F)150-40-2	1320	700	2020	460	340	460
CDL(F)150-40-1	1320	700	2020	460	340	460
CDL(F)150-40	1350	770	2120	540	370	560
CDL(F)150-50-2	1510	770	2280	540	370	570
CDL(F)150-50-1	1510	845	2355	580	410	690
CDL(F)150-50	1510	845	2355	580	410	690
CDL(F)150-60-2	1670	845	2515	580	410	700
CDL(F)150-60-1	1670	845	2515	580	410	700
CDL(F)150-60	1670	845	2515	580	410	700

Table 1 Pump dimensions 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)1-2	258	210	468	148	117	20
CDL(F)1-3	276	210	486	148	117	20
CDL(F)1-4	294	210	504	148	117	20
CDL(F)1-5	312	210	522	148	117	22
CDL(F)1-6	330	210	540	148	117	22
CDL(F)1-7	358	245	603	170	142	25
CDL(F)1-8	376	245	621	170	142	25
CDL(F)1-9	394	245	639	170	142	25
CDL(F)1-10	412	245	657	170	142	28
CDL(F)1-11	430	245	675	170	142	28
CDL(F)1-12	448	245	693	170	142	28
CDL(F)1-13	466	245	711	170	142	28
CDL(F)1-15	512	290	802	190	155	30
CDL(F)1-17	548	290	838	190	155	30
CDL(F)1-19	584	290	874	190	155	35
CDL(F)1-21	620	290	910	190	155	35
CDL(F)1-23	656	290	946	190	155	40
CDL(F)1-25	702	315	1017	197	165	45
CDL(F)2-2	258	210	468	148	117	20
CDL(F)2-3	286	245	531	170	142	20
CDL(F)2-4	304	245	549	170	142	25
CDL(F)2-5	322	245	567	170	142	25
CDL(F)2-6	340	245	585	170	142	25
CDL(F)2-7	368	290	658	190	155	30
CDL(F)2-9	404	290	694	190	155	35
CDL(F)2-11	440	290	730	190	155	35
CDL(F)2-13	486	315	801	197	165	40
CDL(F)2-15	522	315	837	197	165	40
CDL(F)2-18	576	335	911	230	188	45

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)3-2	258	210	468	148	117	20
CDL(F)3-3	276	210	486	148	117	20
CDL(F)3-4	294	210	504	148	117	20
CDL(F)3-5	322	245	567	170	142	22
CDL(F)3-6	340	245	585	170	142	25
CDL(F)3-7	358	245	603	170	142	25
CDL(F)3-8	376	245	621	170	142	25
CDL(F)3-9	404	290	694	190	155	30
CDL(F)3-10	422	290	712	190	155	30
CDL(F)3-11	440	290	730	190	155	30
CDL(F)3-12	458	290	748	190	155	35
CDL(F)3-13	476	290	766	190	155	35
CDL(F)3-15	512	290	802	190	155	35
CDL(F)3-17	548	290	838	190	155	35
CDL(F)3-19	594	315	909	197	165	40
CDL(F)3-21	630	315	945	197	165	40
CDL(F)3-23	666	315	981	197	165	40
CDL(F)3-25	702	335	1037	230	188	50
CDL(F)4-2	286	245	531	170	142	20
CDL(F)4-3	313	245	558	170	142	20
CDL(F)4-4	350	290	640	190	155	25
CDL(F)4-5	376	290	667	190	155	30
CDL(F)4-6	404	290	694	190	155	35
CDL(F)4-7	441	315	756	197	165	40
CDL(F)4-8	468	315	783	197	165	40
CDL(F)4-10	522	335	857	230	188	45
CDL(F)4-12	576	335	911	230	188	45
CDL(F)4-14	650	430	1080	260	208	70
CDL(F)4-16	704	430	1134	260	208	70

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)8-2/1	347	245	592	170	142	27
CDL(F)8-2	357	290	647	190	155	32
CDL(F)8-3	387	290	677	190	155	37
CDL(F)8-4	427	315	742	197	165	42
CDL(F)8-5	457	315	772	197	165	47
CDL(F)8-6	487	335	822	230	188	52
CDL(F)8-8	567	430	997	260	208	77
CDL(F)8-10	627	430	1057	260	208	87
CDL(F)8-12	687	430	1117	260	208	87
CDL(F)8-14	835	490	1325	330	255	132
CDL(F)12-1	357	245	602	170	142	30
CDL(F)12-2	367	290	657	190	155	38
CDL(F)12-3	407	335	742	230	188	55
CDL(F)12-4	457	430	887	260	208	72
CDL(F)12-5	487	430	917	260	208	72
CDL(F)12-6	517	430	947	260	208	75
CDL(F)12-7	547	430	977	260	208	75
CDL(F)12-8	665	490	1155	330	255	145
CDL(F)12-10	725	490	1215	330	255	147
CDL(F)12-12	785	490	1275	330	255	160
CDL(F)12-14	845	490	1335	330	255	162

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)16-2/1	397	290	687	190	155	42
CDL(F)16-2	407	335	742	230	188	52
CDL(F)16-3	472	430	902	260	208	72
CDL(F)16-4	517	430	947	260	208	82
CDL(F)16-5	650	490	1140	330	255	142
CDL(F)16-6	695	490	1185	330	255	147
CDL(F)16-7	740	490	1230	330	255	162
CDL(F)16-8	785	490	1275	330	255	162
CDL(F)16-10	875	550	1425	330	255	192
CDL(F)20-1	397	290	687	190	155	42
CDL(F)20-2	407	335	742	230	188	52
CDL(F)20-3	472	430	902	260	208	72
CDL(F)20-4	517	430	947	260	208	82
CDL(F)20-5	650	490	1140	330	255	142
CDL(F)20-6	695	490	1185	330	255	147
CDL(F)20-7	740	490	1230	330	255	162
CDL(F)20-8	785	490	1275	330	255	162
CDL(F)20-10	875	550	1425	330	255	192

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)32-10-1	505	315	820	197	165	85
CDL(F)32-10	505	335	840	230	188	95
CDL(F)32-20-2	575	430	1005	260	208	105
CDL(F)32-20	575	430	1005	260	208	115
CDL(F)32-30-2	645	490	1135	330	255	120
CDL(F)32-30	750	490	1240	330	255	175
CDL(F)32-40-2	820	490	1310	330	255	180
CDL(F)32-40	820	490	1310	330	255	210
CDL(F)32-50-2	890	490	1380	330	255	220
CDL(F)32-50	890	550	1440	330	255	240
CDL(F)32-60-2	960	550	1510	330	255	250
CDL(F)32-60	960	550	1510	330	255	250
CDL(F)32-70-2	1030	590	1620	360	285	285
CDL(F)32-70	1030	590	1620	360	285	285
CDL(F)32-80-2	1100	590	1690	400	310	290
CDL(F)32-80	1100	660	1760	400	310	330
CDL(F)32-90-2	1170	660	1830	400	310	340
CDL(F)32-90	1170	660	1830	400	310	340
CDL(F)32-100-2	1240	660	1900	400	310	350
CDL(F)42-10-1	561	430	992	260	208	108
CDL(F)42-10	561	430	992	260	208	113
CDL(F)42-20-2	748	490	1238	330	255	154
CDL(F)42-20	748	490	1238	330	255	187
CDL(F)42-30-2	828	550	1378	330	255	201
CDL(F)42-30	828	550	1378	330	255	201
CDL(F)42-40-2	908	590	1498	360	285	258
CDL(F)42-40	908	660	1568	400	310	336
CDL(F)42-50-2	988	660	1648	400	310	341
CDL(F)42-50	988	660	1648	400	310	341
CDL(F)42-60-2	1068	660	1728	400	310	365
CDL(F)42-60	1068	660	1728	400	310	365
CDL(F)42-70-2	1148	700	1848	460	340	435
CDL(F)42-70	1148	700	1848	460	340	435

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)65-10-1	561	430	991	260	208	115
CDL(F)65-10	671	490	1161	330	255	152
CDL(F)65-20-2	754	490	1244	330	255	190
CDL(F)65-20	754	590	1344	360	285	252
CDL(F)65-30-2	836	590	1426	360	285	257
CDL(F)65-30	836	660	1496	400	310	335
CDL(F)65-40-2	919	660	1579	400	310	360
CDL(F)65-40	919	700	1619	460	340	425
CDL(F)65-50-2	1001	700	1701	460	340	430
CDL(F)85-10-1	571	490	1061	330	255	184
CDL(F)85-10	571	490	1061	330	255	184
CDL(F)85-20-2	773	550	1323	330	255	264
CDL(F)85-20-1	773	590	1363	360	285	264
CDL(F)85-20	773	660	1433	400	310	329
CDL(F)85-30-2	865	660	1525	400	310	363
CDL(F)85-30-1	865	660	1525	400	310	363
CDL(F)85-30	865	700	1565	460	340	363
CDL(F)85-40-2	957	700	1657	460	340	430

Continued 60Hz

Model	Size (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
CDL(F)120-10-1	840	490	1330	330	255	235
CDL(F)120-10	840	550	1390	330	255	250
CDL(F)120-20-2	1000	660	1660	400	310	350
CDL(F)120-20-1	1000	660	1660	400	310	350
CDL(F)120-20	1000	660	1660	400	310	380
CDL(F)120-30-2	1160	700	1860	460	340	445
CDL(F)120-30-1	1160	700	1860	460	340	445
CDL(F)120-30	1190	770	1960	510	370	545
CDL(F)120-40-2	1350	845	2195	580	410	675
CDL(F)120-40-1	1350	845	2195	580	410	675
CDL(F)120-40	1350	845	2195	580	410	675
CDL(F)120-50-2	1510	845	2355	580	410	690
CDL(F)150-10-1	840	490	1330	330	255	235
CDL(F)150-10	840	590	1430	360	285	280
CDL(F)150-20-2	1000	660	1660	400	310	360
CDL(F)150-20-1	1000	660	1660	400	310	380
CDL(F)150-20	1000	700	1700	460	340	435
CDL(F)150-30-2	1190	770	1960	510	370	545
CDL(F)150-30-1	1190	845	2035	580	410	665
CDL(F)150-30	1190	845	2035	580	410	665
CDL(F)150-40-2	1350	845	2195	580	410	680

Table 2 Installation size

Size	Model	CDL, CDLF													
		1	2	3	4	8	12	16	20	32	42	65	85	120	150
Round flange connecting	DN	25		32	40	50		65	80	100	125				
	P1	60			80				107	120	150	175			
	P	85		100	110	125		145	160	180	220				
	P2	115		140	145	160		185	200	220	270				
	n-d1	4- φ 14		4- φ 18				8- φ 18			8- φ 28				
	C	250			280	300		320	365	380	380				
	E	75		80	90		105	140		180					
	h	32		25	35		30	45		40					
	Nominal pressure	PN25						PN25-40	PN16-25	PN16	PN25-40				
Cutting Ferrule Joint connecting	D	42			60										
	C	210			260										
	E	50		80	90										
	h	20		25	35										
Pipe thread connection.	D	ZG 1 $\frac{1}{4}$			ZG 2										
	C	210			260										
	E	50		80	90										
	h	20		25	35										
Oval flange connection	D	G1	G1 $\frac{1}{4}$	G1 $\frac{1}{2}$											
	C	162		200											
	E	50		80											
	h	20		25											
	P	75		100											
	n-d1	2-M 10 × 40			2-M 12 × 45										
k	22														
Footer size	G	100			130		170	190	199	275					
	G1	150			199		225	245	255	340					
	M	180			215		240	266	280	380					
	M1	210			247		298	330	348	472					
	d2	13			14										18

The pump should be sited in a well ventilated and frost-free position. The distance between pump-motor and other objects should be at least 150mm , in order to cool the motor by fan with enough air

- To reduce the head loss of inlet as least as possible, the inlet pipe shall be as short as possible.

- Ensure the check valve is installed in pipe line system before the pump installation. If pump is used for boiler water supply, a check valve must be installed in the piping between pump and boiler.

- Pump shall be installed in cement base or other similar base with suitable height. It can also be installed in fixed grounds or fixed brackets on wall. Pay attention not to let the weight of pipe system on pump to prevent pump from damage.

Caution: When installation, motor is not allowed to be hung upside down.

- Arrow on the inlet and outlet chamber shows the direction of flow of liquid through the pump. Check whether the liquid can flow easily before starting pump.

- Before pump installation, the inlet pipe line shall be cleaned. If there is impurities in the pipe, it is necessary to install a strainer at 0.5-1m in front of the pump inlet (particularly recommended for pump with flow less than 8m³/h).

The air locks shall be avoided when installing the inlet pipe line. see Fig. 3

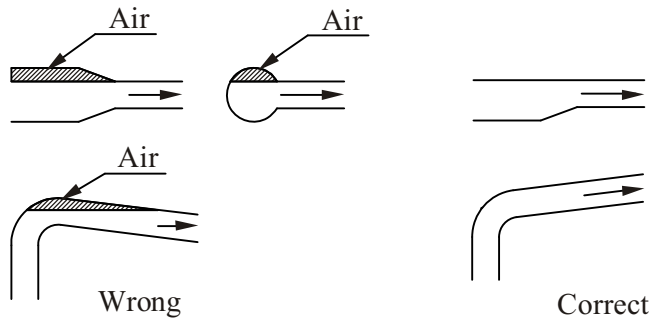


Figure 3

- If the outlet globe valve might be closed(or the flow is decreased to be zero), a bypass shall be installed in outlet pipeline to ensure adequate lubricating and cooling water to pass the pump.

2.Electrical connection

- The electrical connections should be carried out by an authorized electrician.

- To make sure the motor is suitable for the power supply, cables of the motor must be connected to power supply according to the Fig. on the terminal box and the motor nameplate.

- Motor shall be connected with a fast and effective motor starter, to ensure that the motor will not be damaged by lack of phase, unstable voltage or overload. The motor shall be earthed reliably.

Caution: Before take apart the terminal box cover or dismantle pump, make sure that the power supply is switched off.

Warning - Electrical connection and safety devices

- The pump units should be connected to the power supply by the appropriately rated power cables according to the motor ratings.
- The pump units should always be equipped with safety devices as required in the standards (EN 809 and/or EN 60204-1) as well as by the national rules of the country where the pump is used.
- Despite the rules of any country, the power supply to the pump unit must be equipped with at least following electrical safety devices with appropriate ratings:
 - Emergency switch
 - Circuit breaker (as a supply disconnecting (isolating) device as well as an overcurrent protective device)
 - Motor overload protection

Recommendation for Electrical Connection and Safety Devices

380V(50Hz/60Hz)						
No	Power input (kW)	Cable connection	Input current (A)	Cable spec (mm ²)	Circuit breaker (A)	Thermal protector (A)
1	0.37	Y	1	0.75	5	1.2
2	0.55	Y	1.4	0.75	5	1.7
3	0.75	Y	1.8	0.75	5	2.2
4	1.1	Y	2.6	1	5	3.1
6	1.5	Y	3.5	1	10	4.2
8	2.2	Y	4.9	1.5	10	5.9
11	3	Y	6.3	1.5	10	7.6
13	4	Δ	8.2	2.5	20	9.8
15	5.5	Δ	11	2.5	20	13.2
16	7.5	Δ	15	4	20	18.0
17	11kw	Δ	21	4	25	25.2
18	15kw	Δ	29	6	32	34.8
19	18.5kw	Δ	35	10	40	42.0
20	22kw	Δ	41	16	60	49.2
21	30kw	Δ	55	16	60	66.0
22	37kw	Δ	68	25	80	81.6
23	45kw	∧	82	35	100	98.4
25	55kw	∧	100	70	160	120.0
26	75kw	∧	134	70	160	160.8
27	90kw	∧	160	90	200	192.0

The acoustic noise emission is around 85 dB(A).

A、 Before open the terminal box, please shut off the power supply to prevent from power shock.



B、 Before open the coupling guards, please stop pump firstly to prevent from hurts.



C、 When installing the pump, please fix the foundation bolts vertically to prevent from pump falls to hurt people.

D、 Please fill grease to the pump when it req.

For motor power is less than 5.5kW, it is free of filling grease. For motor power is equal or bigger than 5.5kW, please fill grease every 5000 running hours.



V. Start-up, operation and maintenance

Caution: Read the label on the cylinder carefully before start-up.

1. Do not start the pump until it has been filled with water or liquid fully.

- Fill water in pump in inverse pouring system.

Close the pump outlet valve, release air vent screw on the pump head, and open the inlet valve slowly until stable water flows from the air vent screw. Then fasten the screw. Open the check valve completely in the inlet pipeline.

• In open system, fill water in pump when liquid surface is lower than pump.

Notice: A check valve shall be installed in the inlet pipe.

Close the pump outlet valve, release air vent screw and fill the liquid in pump through the air vent screw hole until the pump and inlet pipe line are filled with water fully. Fasten the air vent screw again.

Caution: Do not start the pump until it has been filled with liquid fully and air vented. Be careful the direction of the air vent screw hole. Make sure the flowing water will not hurt persons or pump or its parts. Especially, prevent from hurting for the hot water application.

2. Check the rotary direction

Switch on the power supply and view the rotary direction by viewing the motor fan. Arrow on the pump head indicates the correct direction of rotation. That is, from the motor end, pump shall run counter-clockwise.

3. Check before pump start-up

- Check whether the foundation bolt is fasten.
- Check whether pump is filled with water fully.
- Check whether the voltage of power supply is correct.
- Check whether it turns correctly.
- To make sure all pipe lines are connected tightly and can supply water normally.

• The valves in the inlet pipe line are completely opened and the outlet valve shall be opened slowly after the pump is started up.

- Check the operation pressure if pressure meter is installed.
- Check all the controls for normal operation. If the pump is controlled by pressure switch, check and adjust the starting pressure and stopping pressure. Check the full load current to make sure it not surpasses the max. Current.

4. Frequency of pump starts

Pump should not be started too frequently. It is suggested pump shall not be started more than 100 times per hour if the motor power is less or equal to 4kW. When motor power is big than 4kW, pump shall not be sta-

rted more than 20 times in one hour. If pump starts and stops too frequently, control device shall be checked and adjusted to make pump not start and stop too frequently. Also, it is necessary to check the installation.

5. Suggestion: When pump running, flow should be controlled at the range of 0.5-1.3 times of rated flow.

6. Pump which is installed according to this installation manual will work effectively and require a little maintenance.

• Mechanical seal will be adjusted automatically, the moving part and stationary part is lubricated and cooled by the transferring liquid. When replace the mechanical seal, the user needn't to disassemble the motor for power bigger than 7.5kW.

• The bearing in pump is lubricated by the transferring liquid.

7. Frost Protecting

Pump can be used in the system with anti-frozen measures to water. If the pump is installed in easily frozen place, suitable antifreeze shall be added to the transferring liquid to prevent pump from being damaged. If antifreeze is not used, pump shall be stopped when it is frozen. Pumps which are not being used should be drained.

8. The following should be checked regularly for pump.

- Pump working and operating pressure
- Possible leakage
- Possible motor overheat
- Cleaning/replacement of all strainers
- The switch off time of motor when overload
- Frequency of starts and stops.
- All control operation

If malfunction is found, check system according to "Fault finding and solution chart"

9. Pump shall be cleaned and kept appropriately when it is not used for a long time.

10. Pump shall be prevented from being corrupted and damaged in storage.

VI. Assemble and disassemble

1. CDL and CDLF 1, 2, 3, 4

- Put the circlip cover on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser. Continue the assemble order till the last impeller is fitted. Then fit the impeller cover, washer, screw the nut. Pay attention to the position of the support diffuser, for less stages pump, the last one is support diffuser. For more stages pump, support diffuser should be increased accordingly, the distance of each support diffuser should be even, and put on the support sleeve and bearing with support diffuser.

- Put the inducer on the inlet & outlet chamber, and then fit the finished parts as above on the inducer.

- Fit the O-ring on the inlet & outlet chamber, put on the cylinder and the top diffuser.

- Put the pump head installed with O-ring, lining and corrugated spring on the cylinder. Screw the four nuts of the stay bolts on the base plate. Do not tighten one nut completely at one time, but tighten them symmetrically in turn.

- Fit the mechanical seal and tighten it, then install motor and coupling, screw the bolts in coupling (but not tightly), press the coupling and shaft down to the direction of the base plate. Then lift it about 1mm in reverse direction, tighten the screws. Note that the space between the two couplings should be equal.

- Tighten fixing bolts in mechanical seal, rotate the coupling to ensure that the shaft can rotate freely and not be choked.

Reverse the process above can disassemble a pump.

2. CDL and CDLF 8, 16, 16, 20

- Put the circlip cover on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser, bearing, support sleeve. Continue the assemble order till the last impeller is fitted, and then install the impeller cover, washer, tighten the nuts.

- Put the inlet & outlet chamber on the base plate, then put the O-ring, clamp plate, inducer on inlet & outlet chamber, then put the finished parts on the inducer, and put the top diffuser on the top, tighten nuts of straps. At last, put on the cylinder.

- Put the pump head installed with O-ring, lining and adjusting rubber on the cylinder, then tighten the four stay bolts symmetrically in turn.

- Fit the mechanical seal and tighten it, then install motor and coupling, screw the bolts in coupling (but not tightly), press the coupling and shaft down to the direction of the base plate. Then lift it about 1mm in reverse di-

rection, tighten the screws. Note that the space between the two couplings should be equal.

- Tighten fixing bolts in mechanical seal, rotate the coupling to ensure that the shaft can rotate freely and not be choked.

Reverse the process above can disassemble a pump.

3. CDL and CDLF 32, 42, 65, 85

- Put the inlet & outlet chamber on the base plate, fit flanges on inlet & outlet chamber at two sides, and fit the inducer.

- Put the first impeller on the shaft, tighten the nuts and put the impeller on the neck ring base of inducer, then put on the diffuser, impeller, support diffuser, until the top diffuser, then fix all the diffuser with the straps.

- shaft parts: fit the bottom sleeve, cover, washer on the shaft, tighten the bolts, fit bottom bearing on the inlet & outlet chamber, fit washer. Then put the shaft parts on the inlet & outlet chamber, fit on O-ring, lubricate the O ring and then put on the cylinder.

- Fit stay bolts on the base plate, then fit the O-ring, adjusting rubber, air vent gag on the pump head, and put the pump head on the stay bolts, then put on the washer and tighten all the nuts.

- Fit the mechanical seal on the pump head, then fit the seal cover, tighten the bolts, and the bolts in the seal. Lift the shaft and insert the adjusting slice.

- Fit the bracket and motor on the pump head.

Finally fit the coupling, tighten the bolts, and take out the adjusting slice. Rotate the coupling to ensure that the shaft can rotate freely and not be choked. Reverse the above process to disassemble a pump.

4. CDL and CDLF 120, 150

- Put the inlet & outlet chamber on the base plate, fit flanges on inlet & outlet chamber at two sides, and fit the inducer.

- Fit washer (PN58), shaft sleeve (PN17), inlet impeller sleeve (PN57), cover (PN18), washer, fasten the nut.

- Fit impeller shaft sleeve (PN16), impeller, fasten impeller nut ((PN15), ensure the size is 14.3 as figure 4 shows.

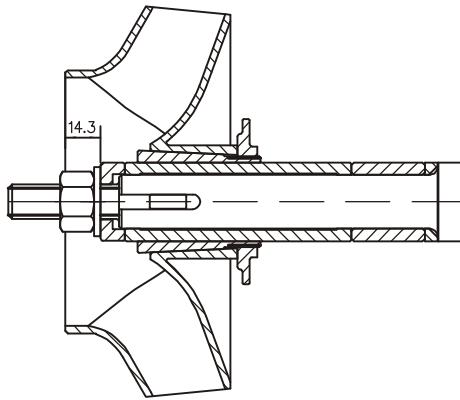


Figure 4

- Put the shaft parts on the inducer, fit support diffuser, impeller sleeve, impeller, fasten impeller nut, then, fit diffuser, impeller, etc. till the last diffuser.
- Fit the top diffuser, use straps to fasten all diffusers. Fit O-ring on the inlet and outlet chamber, lubricate them and put on cylinder.
- Fit stay bolts on the base plate, fit O-ring on the pump head, adjusting rubber, air vent screw, etc. Then put pump head on the stay bolts, fit washer, fasten nut.
- Fit the mechanical seal on the pump head, then fit the seal cover, tighten the bolts, and tighten the bolts in the seal. Lift the shaft and insert the adjusting slice.
- Fit the bracket and motor on the pump head. Finally fit the coupling, tighten the bolts, and take out the adjusting slice. Rotate the coupling to ensure that the shaft can rotate freely and not be choked and loose. Reverse the above process to disassemble a pump.

VII. Fault finding and solution chart

Caution: Before removing the terminal box cover and before any removal/dismantling of the pump, make sure that the power supply has been switched off.

Fault	Cause	Solution	Remarks
Motor does not run when started	a) Power supply failure.	a) Check power supply.	
	b) Fuses are blown.	b) Replace fuses.	
	c) Motor is overloaded.	c) Check system.	
	d) Main contacts of starter are not connected well or the coil is defective.	d) Replace motor starter.	
	e) Control circuit is defective.	e) Check control circuit.	
	f) Motor is defective.	f) Repair.	
Overload device of motor starter trips out immediately when power supply is switched on.	a) Fuses are blown.	a) Replace fuses.	In the case of d) and e), users shall not disassemble the pump by themselves.
	b) Contacts of overload device are faulty.	b) Check motor starter.	
	c) Cable connection is loose or faulty.	c) Check cables and power supply	
	d) Motor winding is defective.	d) Replace motor	
	e) Pump mechanically blocked.	e) Check and repair pump	
Overload device trips out occasionally.	a) The setting of overload is too low.	a) Reset overload setting	
	b) Periodic power supply faults.	b) Check power supply	
	c) Low voltage at peak times.	c) Add regulator.	
Motor starter has not tripped out but the pump does not run.	a) Contacts of starter are not contacted well or the coil is faulty.	a) Change motor starter	
	b) Control circuit are defective	b) Check control circuit	

Continued

Fault	Cause	Solution	Remarks
Pumped water does not flow constantly	a) Suction pipe is too small.	a) Enlarge inlet pipeline	
	b) There is not sufficient water in pump water inlet.	b) Improve system and increase coming water	
	c) Liquid level is low.	c) Try to lift liquid level.	
	d) Pump inlet pressure is too low compared with water temperature, pipeline loss and flow.	d) Improve system and try to increase the inlet pressure.	
	e) Suction pipe is partly blocked by impurities.	e) Check and clear impurities.	
Pump runs but gives no water.	a) Suction pipe is blocked by impurities.	a) Check and clean suction pipe.	
	b) Foot valve or check valve is closed.	b) Check and repair foot valve or check valve.	
	c) Leakage in suction pipe.	c) Check and repair suction pipe.	
	d) There is air in suction pipe or pump.	d) Refill liquid, release air.	
Pump runs backwards when switched off.	a) Leakage in suction pipe.	a) Check suction pipe	
	b) Foot valve or check valve is defective.	b) Check and repair foot valve or check valve.	
	c) Foot valve is blocked in opened or partly opened position.	c) Check and repair foot valve.	
	d) There is air in suction pipe.	d) Check and repair suction pipe and release air.	

Continued

Fault	Cause	Solution	Remarks
Abnormal vibration or noise from pump	a) Leakage in suction pipe.	a) Check and repair suction pipe.	In the case of e), users shall not disassemble the pump by themselves.
	b) Suction pipe is too small or suction pipe is partly blocked by impurities.	b) Enlarge or check suction pipe.	
	c) There is air in suction pipe or pump.	c) Refill liquid to the pump and vent air.	
	d) The comparison of the delivery head of device with delivery head of pump is very low.	d) Improve system or choose another pump model.	
	e) Pump mechanically blocked.	e) Check and repair pump.	

VIII. Important notice

1. Customers will not be advised if this manual is updated.
2. Pump will be guaranteed for one year under normal operation with the correct model. Wearing part is not included.
3. Users shall be responsible for the damage if they disassemble the pumps by themselves in guaranteed period.

