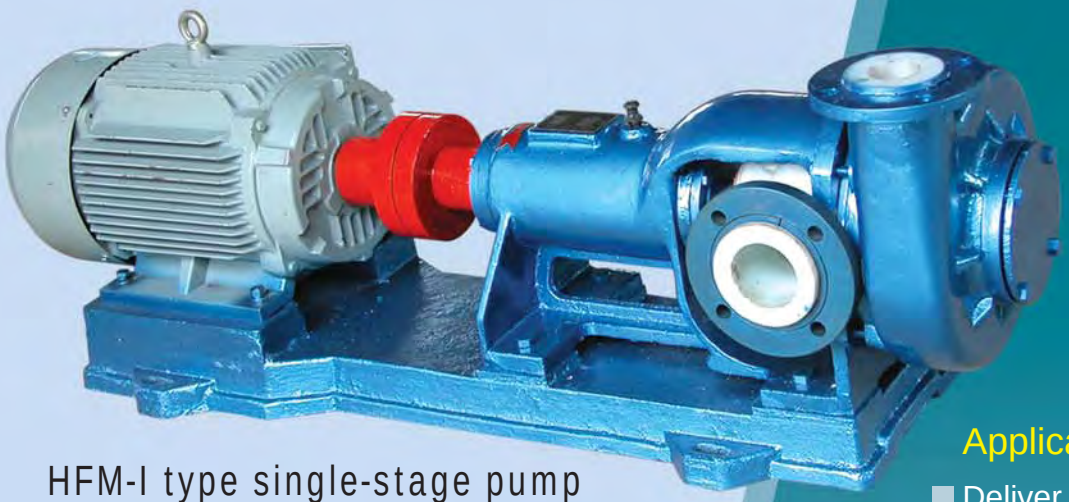
Patent Technology

HFM serial Corrosion and Wear Resistant Pump

Technical characteristics:

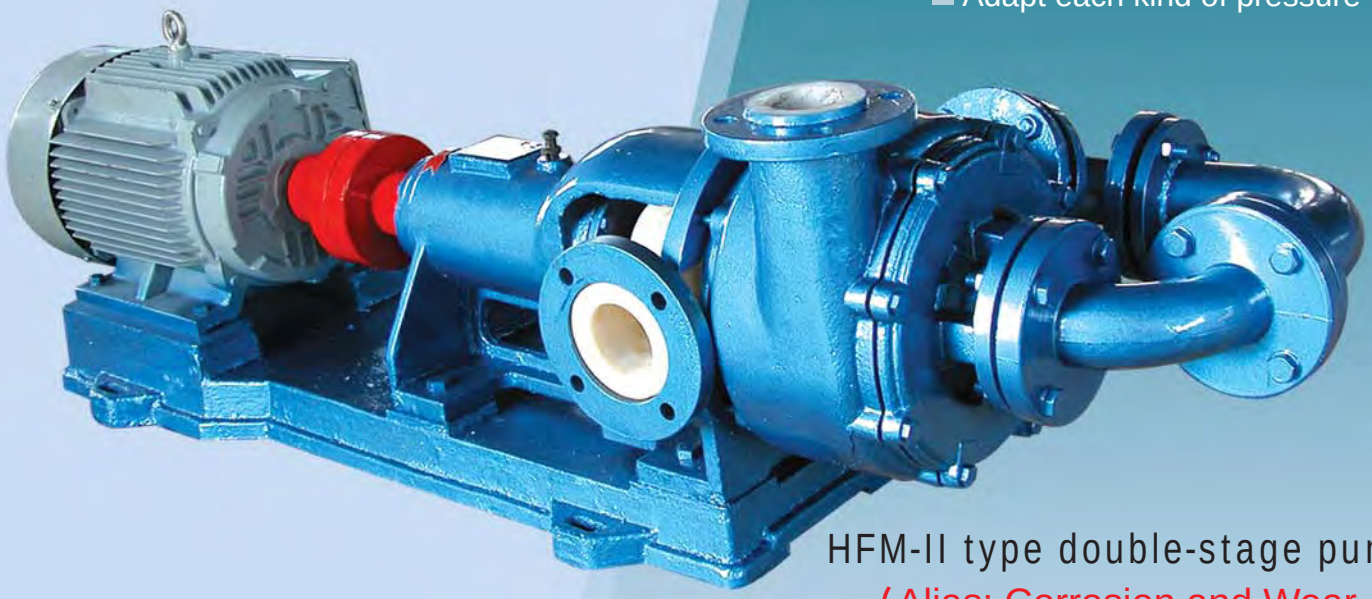
- Negative pressure, sealing, and free from leakage
- Long service life
- Low energy consumption, high efficiency
- Hexsteel lining, firm inner lining
- High pressure, good filter effect



HFM-I type single-stage pump

Applicable to:

- Deliver each kind of corrosive clear liquid and slime
- Adapt each kind of pressure filters



HFM-II type double-stage pump
(Alias: Corrosion and Wear Resistant Booster Pump)

Z-S® 宙斯 Yixing ZEUS Pump Co.,Ltd.

Please read the instructions carefully before using the pump

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Ⅰ Product Introduction

HFM type leakage-free corrosion and wear resistant pump is a kind of novel lining type back suction pump, and the position of the shaft seal is in the same direction of the inlet. The pump is a novel pressure delivery pump by summarizing the situation that the common corrosion and wear resistant pump is easily leaked when running. Five innovative technologies (patents) are applied, and the main features are:

I. The position of the pump inlet is in the same direction of the shaft seal, and the shaft seal is in the environment of negative pressure, so there is no leakage in the pump. The chronic diseases of the pumps are solved, such as the pump is easily damage, and the shaft seal is easily leaked.

II. The application range is wide: the pump is equipped with several kinds of interchangeable lining materials, which is applicable to the delivery of each kind of chemical property, corrosive clear liquid and slime, and the exchange performance of the different materials are good. The users can conveniently adjust.

III. Low operation expense: there are mainly two reasons. The first is split type structure is used in the pump case and suction inlet of the wearing parts, and separate wear-resistant wearing parts are arranged, so, it is convenient to replace and is economic. The second is that the auxiliary impeller (back impeller) is not used in the pump seal to reduce pressure, thus, the power consumption of the shaft and the energy are saved.

IV. Another advantage of the HFM-II type double-stage corrosion and wear resistant slurry pump is good wear-resistant performance. As the linear velocity of single impeller is rather lower, much higher pump outlet pressure can be obtained. The disadvantages of rapid wearing of impeller and pump case caused by increasing the linear velocity of the impeller to increase the pressure of the single-stage slurry pump can be overcome, and the service life of such wearing parts as impeller and pump are effectively improved.

V. As the pressure of the HFM-II type double-stage corrosion and wear resistant pump is high, when equipping with high-pressure pressure filter, the filter effect is good and the water content of the filter cake is low, which overcomes the disadvantage of deficient pump pressure of the adapted pump of the pressure filter.

Ⅱ Applicable Posts

I. The serial pump can delver each kind of corrosive or non-corrosive clear liquid or slurry within 100℃ or can be used as pump for pressurizing and feeding of various filters, such as adapted pump of pressure filter or process filter of hydro smelting process for nonferrous metals like zinc, copper, cobalt, nickel and manganese; slurry delivery pump in the processes of mineral concentration, processing of non-metallic minerals (titanium pigment, kaolin); mud and waste slag delivery pump in environmental protection products; pressure filter pump or pressure delivery pump in other processes, such as chemical engineering, dyestuff, pharmacy and food production.

II. The posts that deliver corrosive mediums with back pressure for long term (outlet pressure of the pump is high), such as flue gas desulfurization, pressure spray pump and pressure flushing pump in air governing, etc.

III. It is applicable to the posts that are easily leaked when delivering mediums by other pumps.

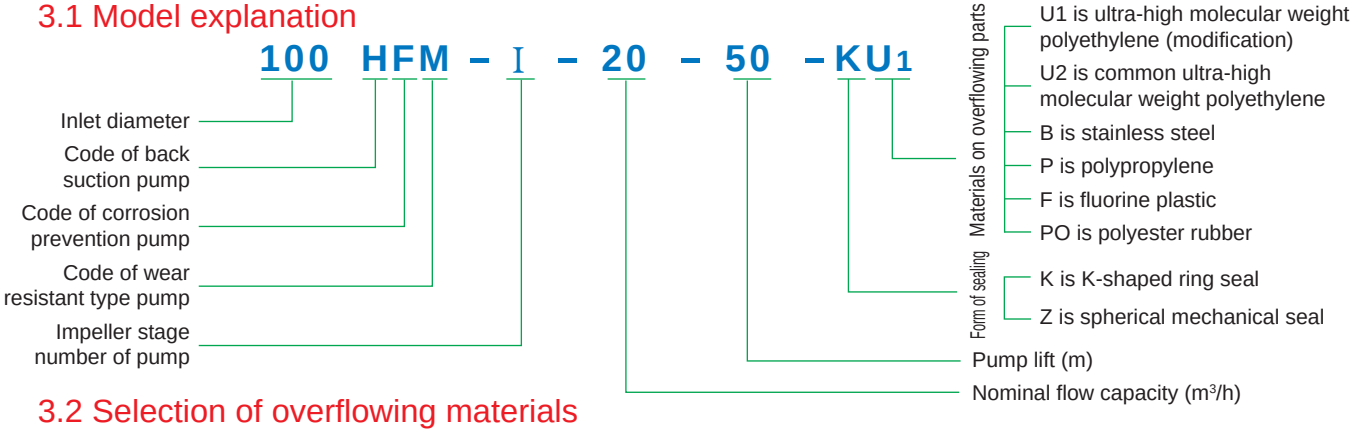
IV. There are two series of the pump: single-stage and double-stage, which can meet the posts requiring small flow and high pressure when delivering corrosive slurry.

Not applicable posts:

The posts that have liquid level of the suction inlet 1.2m lower than the position of the pump or the posts with too high negative pressure of suction inlet.

III Model Selection

3.1 Model explanation



3.2 Selection of overflowing materials

Ultra-high molecular weight polyethylene (material code U): applicable to the delivery of corrosive slurry below 85℃.

Wear and corrosive resistant stainless steel is applicable to the delivery of corrosive slurry with temperature of 110℃, such as the delivery of high-temperature slurry in the high temperature leaching processes of electrolytic zinc and electrolytic manganese, etc, and the effect is better.

Polypropylene (material code P): is used in the delivery of clear liquid free from solid phase materials, such as the back-pressure spray pump in the effluent gas treatment system (flue gas desulfurization, etc.)

Fluorine plastic (material code F): is mainly applicable to deliver the medium with solvent and strong oxidizing property, such as concentrated nitric acid, etc.

Polyurethane rubber (code is PU) is mainly applicable to the posts with low requirements on corrosiveness and heavy abrasiveness, such as slag draining pump, or adapted pump of whirl-cone during mineral concentration.

★ Please contact with our company in case of the overflowing part requires such metallic materials as stainless steel and A3 steel.

3.3 Performance Parameter Table

3.3.1 Performance parameter table of HFM-I type

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
1	50HFM–I–5–25–□	5	25	2830	1.13	1.5	50×40	160
2	50HFM–I–5–30–□	5	30	2840	1.63	2.2	50×40	170
3	50HFM–I–5–35–□	5	35	2870	2.07	3	50×40	180
4	50HFM–I–10–25–□	10	25	2870	1.94	3	50×40	180
5	50HFM–I–15–25–□	15	25	2870	2.6	3	50×40	180
6	50HFM–I–5–40–□	5	40	2890	2.72	4	50×40	200
7	50HFM–I–10–30–□	10	30	2890	2.7	4	50×40	200
8	50HFM–I–15–30–□	15	30	2890	3.2	4	50×40	200
9	50HFM–I–20–25–□	20	25	2890	3.4	4	50×40	200
10	50HFM–I–15–35–□	15	35	2900	4.1	5.5	50×40	220
11	50HFM–I–10–35–□	10	35	2900	3.5	5.5	50×40	220
12	50HFM–I–20–30–□	20	30	2900	4.3	5.5	50×40	220
13	50HFM–I–10–40–□	10	40	2900	4.3	7.5	50×40	245
14	50HFM–I–20–35–□	20	35	2900	5.4	7.5	50×40	245
15	50HFM–I–20–40–□	20	40	2900	6.2	7.5	50×40	245
16	50HFM–I–15–40–□	15	40	2900	5.4	7.5	50×40	245
17	50HFM–I–7.5–10–□	7.5	10	1450	0.55	0.75	50×40	160
18	50HFM–I–5–10–□	5	10	1390	0.45	0.75	50×40	160
19	50HFM–I–10–10–□	10	10	1450	0.78	1.1	50×40	162
20	65HFM–I–10–40–□	10	40	2900	4.3	7.5	65×50	320
21	65HFM–I–10–50–□	10	50	2900	5.44	7.5	65×50	320
22	65HFM–I–H–20–35–□	20	35	2900	5.44	7.5	65×50	320

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
23	65HFM–I–20–40–□	20	40	2900	6.22	7.5	65 × 50	320
24	65HFM–I–30–35–□	30	35	2900	6.35	7.5	65 × 50	320
25	65HFM–I–30–40–□	30	40	2930	9.3	11	65 × 50	360
26	65HFM–I–20–50–□	20	50	2930	9.07	11	65 × 50	360
27	65HFM–I–30–50–□	30	50	2930	11.67	15	65 × 50	370
28	65HFM–I–H–5–15–□	5	15	1400	0.58	1.1	65 × 50	220
29	65HFM–I–H–5–17.5–□	5	17.5	1400	0.68	1.1	65 × 50	220
30	65HFM–I–H–10–60–□	10	60	2930	8.1	11	65 × 50	360
31	65HFM–I–H–10–70–□	10	70	2930	11.2	15	65 × 50	370
32	65HFM–I–H–20–60–□	20	60	2930	10.2	15	65 × 50	370
33	65HFM–I–H–20–70–□	20	70	2930	12.7	15	65 × 50	370
34	65HFM–I–H–15–80–□	15	80	2950	13	15	65 × 50	370
35	65HFM–I–H–10–15–□	10	15	1450	1.3	2.2	65 × 50	280
36	65HFM–I–H–10–17.5–□	10	17.5	1450	1.37	2.2	65 × 50	280
37	65HFM–I–H–30–60–□	30	60	2930	15.31	18.5	65 × 50	400
38	65HFM–I–H–30–70–□	30	70	2940	19.06	22	65 × 50	440
39	65HFM–I–H–15–15–□	15	15	1430	1.75	3	65 × 50	250
40	65HFM–I–H–15–17.5–□	15	17.5	1430	2.04	3	65 × 50	250
41	80HFM–I–30–35–□	30	35	2900	6.35	7.5	80 × 65	320
42	80HFM–I–30–40–□	30	40	2930	9.3	11	80 × 65	360
43	80HFM–I–40–35–□	40	35	2930	8.47	11	80 × 65	360
44	80HFM–I–45–35–□	45	35	2930	9.53	11	80 × 65	360
45	80HFM–I–30–50–□	30	50	2930	11.67	15	80 × 65	370
46	80HFM–I–40–40–□	40	40	2930	11.92	15	80 × 65	370
47	80HFM–I–45–40–□	45	40	2930	12.25	15	80 × 65	370
48	80HFM–I–50–35–□	50	35	2930	10.59	15	80 × 65	370
49	80HFM–I–50–40–□	50	40	2930	12.1	15	80 × 65	370
50	80HFM–I–40–50–□	40	50	2930	15.56	18.5	80 × 65	400
51	80HFM–I–45–50–□	45	50	2930	15.31	18.5	80 × 65	400
52	80HFM–I–50–45–□	50	45	2930	15.31	18.5	80 × 65	400
53	80HFM–I–50–50–□	50	50	2940	17.01	22	80 × 65	440
54	80HFM–I–20–15–□	20	15	1430	2.04	3	80 × 65	250
55	80HFM–I–25–15–□	25	15	1430	2.55	3	80 × 65	250
56	80HFM–I–25–17.5–□	25	17.5	1430	2.97	4	80 × 65	280
57	80HFM–I–H–30–60–□	30	60	2930	15.31	18.5	80 × 65	400
58	80HFM–I–H–30–70–□	30	70	2940	19.07	22	80 × 65	440
59	80HFM–I–H–25–80–□	25	80	2940	20	22	80 × 65	440
60	80HFM–I–H–40–60–□	40	60	2940	18.67	22	80 × 65	440
61	80HFM–I–H–15–15–□	15	15	1430	1.75	2.2	80 × 65	280
62	80HFM–I–H–15–17.5–□	15	17.5	1430	2.04	3	80 × 65	250
63	80HFM–I–H–22.5–15–□	22.5	15	1430	2.3	3	80 × 65	250
64	80HFM–I–H–22.5–17.5–□	22.5	17.5	1430	2.8	4	80 × 65	280
65	80HFM–I–H2–40–70–□	40	70	2940	23.8	30	80 × 65	470
66	80HFM–I–H2–50–60–□	50	60	2950	21.21	30	80 × 65	470
67	80HFM–I–H2–50–70–□	50	70	2950	25.75	30	80 × 65	470
68	100HFM–I–50–35–□	50	35	2930	10.59	15	100 × 80	420
69	100HFM–I–60–35–□	60	35	2930	12.7	15	100 × 80	420
70	100HFM–I–60–40–□	60	40	2930	15.19	18.5	100 × 80	440
71	100HFM–I–50–40–□	50	40	2930	15.31	18.5	100 × 80	440
72	100HFM–I–80–35–□	80	35	2930	15.88	18.5	100 × 80	440
73	100HFM–I–50–50–□	50	50	2940	17.01	22	100 × 80	480
74	100HFM–I–80–40–□	80	40	2940	18.94	22	100 × 80	480
75	100HFM–I–60–45–□	60	45	2940	18.34	22	100 × 80	480

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
76	100HFM−I−60−50−□	60	50	2950	20.42	22	100 × 80	480
77	100HFM−I−100−35−□	100	35	2940	17.64	22	100 × 80	480
78	100HFM−I−25−15−□	25	15	1430	2.55	3	100 × 80	330
79	100HFM−I−25−17.5−□	25	17.5	1430	3.21	4	100 × 80	340
80	100HFM−I−50−15−□	50	15	1440	4.43	5.5	100 × 80	350
81	100HFM−I−50−17.5−□	50	17.5	1440	5.18	7.5	100 × 80	360
82	100HFM−I−H−30−15−□	30	15	1430	2.72	4	100 × 80	340
83	100HFM−I−H−30−17.5−□	30	17.5	1430	3.4	4	100 × 80	340
84	100HFM−I−H2−50−60−□	50	60	2940	21.20	30	100 × 80	560
85	100HFM−I−H2−80−50−□	80	50	2950	23.67	30	100 × 80	560
86	100HFM−I−H2−100−40−□	100	40	2950	21.8	30	100 × 80	560
87	100HFM−I−H2−60−60−□	60	60	2950	24.5	30	100 × 80	560
88	100HFM−I−H2−50−70−□	50	70	2940	25.71	30	100 × 80	560
89	100HFM−I−H2−40−80−□	40	80	2950	26.1	30	100 × 80	560
90	100HFM−I−H2−40−15−□	40	15	1440	3.63	5.5	100 × 80	340
91	100HFM−I−H2−40−17.5−□	40	17.5	1440	3.63	5.5	100 × 80	340
92	100HFM−I−H2−60−70−□	60	70	2950	28.58	37	100 × 80	580
93	100HFM−I−H2−80−60−□	80	60	2950	29.03	37	100 × 80	580
94	100HFM−I−H2−100−50−□	100	50	2950	27.8	37	100 × 80	580
95	100HFM−I−H2−80−70−□	80	70	2950	33.87	45	100 × 80	620
96	100HFM−I−H2−60−80−□	60	80	2950	35	45	100 × 80	620
97	100HFM−I−H2−100−60−□	100	60	2970	34.03	45	100 × 80	620
98	100HFM−I−H2−100−60−□	100	60	2970	46.3	55	100 × 80	650
99	125HFM−I−100−35−□	100	35	2940	17.61	22	125 × 80	480
100	125HFM−I−50−15−□	50	15	1440	4.36	5.5	125 × 80	380
101	125HFM−I−50−17.5−□	50	17.5	1440	5.05	7.5	125 × 80	400
102	125HFM−I−60−15−□	60	15	1440	5.1	7.5	125 × 80	400
103	125HFM−I−60−17.5−□	60	17.5	1460	6.35	7.5	125 × 80	400
104	125HFM−I−H2−100−40−□	100	40	2950	21.8	30	125 × 80	600
105	125HFM−I−H2−120−35−□	120	35	2940	20.42	30	125 × 80	600
106	125HFM−I−H2−120−40−□	120	40	2950	24.65	30	125 × 80	600
107	125HFM−I−H2−100−50−□	100	50	2950	27.75	37	125 × 80	610
108	125HFM−I−H2−100−60−□	100	60	2970	34.13	45	125 × 80	620
109	125HFM−I−H2−120−50−□	120	50	2950	34.03	45	125 × 80	620
110	125HFM−I−H2−120−60−□	120	60	2950	42.61	55	125 × 80	750
111	125HFM−I−H2−100−60−□	100	60	2970	46.21	55	125 × 80	750

3.3.2 Performance parameter table of HFM-II type

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
1	50HFM−Ⅱ−5−45−□	5	45	2840	1.53	2.2	50 × 40	240
2	50HFM−Ⅱ−5−50−□	5	50	2870	2.06	3	50 × 40	260
3	50HFM−Ⅱ−5−60−□	5	60	2890	2.72	4	50 × 40	270
4	50HFM−Ⅱ−10−45−□	10	45	2900	4.08	5.5	50 × 40	280
5	50HFM−Ⅱ−15−40−□	15	40	2900	4.67	5.5	50 × 40	280
6	50HFM−Ⅱ−10−50−□	10	50	2900	5.44	7.5	50 × 40	300
7	50HFM−Ⅱ−15−45−□	15	45	2900	6.52	7.5	50 × 40	300
8	50HFM−Ⅱ−10−60−□	10	60	2930	7.42	11	50 × 40	320
9	50HFM−Ⅱ−15−50−□	15	50	2930	7.29	11	50 × 40	320
10	50HFM−Ⅱ−20−40−□	20	40	2930	7.26	11	50 × 40	320
11	50HFM−Ⅱ−20−45−□	20	45	2930	8.75	11	50 × 40	320
12	50HFM−Ⅱ−20−50−□	20	50	2930	10.08	11	50 × 40	320

Note: ① H is the type with high lift and same opening diameter specification. ② H2 is pump with high lift and same opening diameter, but compared with H, the shaft seat and the main shaft size are different. Please clearly mark the model when purchasing the spare parts.

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
13	65HFM－Ⅱ－15－60－□	15	60	2930	7	11	65 × 50	460
14	65HFM－Ⅱ－10－60－□	10	60	2930	7.15	11	65 × 50	460
15	65HFM－Ⅱ－10－70－□	10	70	2930	8.66	11	65 × 50	460
16	65HFM－Ⅱ－10－80－□	10	80	2930	10.37	15	65 × 50	480
17	65HFM－Ⅱ－10－90－□	10	90	2930	12.25	15	65 × 50	480
18	65HFM－Ⅱ－15－70－□	15	70	2930	10.2	15	65 × 50	480
19	65HFM－Ⅱ－15－80－□	15	80	2930	13.06	15	65 × 50	480
20	65HFM－Ⅱ－20－60－□	20	60	2930	10.89	15	65 × 50	480
21	65HFM－Ⅱ－20－70－□	20	70	2930	12.65	15	65 × 50	480
22	65HFM－Ⅱ－15－90－□	15	90	2930	15.8	18.5	65 × 50	520
23	65HFM－Ⅱ－20－80－□	20	80	2930	15.56	18.5	65 × 50	520
24	65HFM－Ⅱ－30－60－□	30	60	2930	14.84	18.5	65 × 50	520
25	65HFM－Ⅱ－10－100－□	10	100	2930	14.32	22	65 × 50	550
26	65HFM－Ⅱ－15－100－□	15	100	2930	19.44	22	65 × 50	550
27	65HFM－Ⅱ－30－70－□	30	70	2940	17.8	22	65 × 50	550
28	65HFM－Ⅱ－30－80－□	30	80	2940	18.65	22	65 × 50	550
29	65HFM－Ⅱ－30－90－□	30	90	2950	24.5	30	65 × 50	580
30	65HFM－Ⅱ－30－100－□	30	100	2950	29.16	37	65 × 50	630
31	80HFM－Ⅱ－20－60－□	20	60	2930	10.89	15	80 × 65	490
32	80HFM－Ⅱ－20－70－□	20	70	2930	12.65	15	80 × 65	490
33	80HFM－Ⅱ－40－60－□	40	60	2930	16.33	18.5	80 × 65	530
34	80HFM－Ⅱ－20－80－□	20	80	2930	15.56	18.5	80 × 65	530
35	80HFM－Ⅱ－30－60－□	30	60	2930	15.31	18.5	80 × 65	530
36	80HFM－Ⅱ－40－70－□	40	70	2940	18.15	22	80 × 65	560
37	80HFM－Ⅱ－30－70－□	30	70	2940	17.32	22	80 × 65	560
38	80HFM－Ⅱ－30－80－□	30	80	2940	18.31	22	80 × 65	560
39	80HFM－Ⅱ－30－90－□	30	90	2950	24.3	30	80 × 65	580
40	80HFM－Ⅱ－40－80－□	40	80	2950	22.92	30	80 × 65	580
41	80HFM－Ⅱ－40－90－□	40	90	2950	24.5	30	80 × 65	580
42	80HFM－Ⅱ－30－100－□	30	100	2950	29.1	37	80 × 65	630
43	80HFM－Ⅱ－40－100－□	40	100	2950	38.65	37	80 × 65	630
44	100HFM－Ⅱ－40－60－□	40	60	2930	16.33	18.5	100 × 80	540
45	100HFM－Ⅱ－40－70－□	40	70	2940	18.15	22	100 × 80	570
46	100HFM－Ⅱ－50－60－□	50	60	2940	19.44	22	100 × 80	570
47	100HFM－Ⅱ－40－80－□	40	80	2950	22.92	30	100 × 80	590
48	100HFM－Ⅱ－50－70－□	50	70	2950	23.23	30	100 × 80	590
49	100HFM－Ⅱ－50－80－□	50	80	2950	26.56	30	100 × 80	590
50	100HFM－Ⅱ－60－55－□	60	55	2950	22.46	30	100 × 80	590
51	100HFM－Ⅱ－60－60－□	60	60	2950	24.5	30	100 × 80	590
52	100HFM－Ⅱ－70－50－□	70	50	2950	23.82	30	100 × 80	590
53	100HFM－Ⅱ－50－90－□	50	90	2950	30.63	37	100 × 80	680
54	100HFM－Ⅱ－60－70－□	60	70	2950	28.58	37	100 × 80	680
55	100HFM－Ⅱ－60－80－□	60	80	2950	31.11	37	100 × 80	680
56	100HFM－Ⅱ－70－60－□	70	60	2950	28.58	37	100 × 80	680
57	100HFM－Ⅱ－70－70－□	70	70	2950	31.75	37	100 × 80	680
58	100HFM－Ⅱ－80－50－□	80	50	2950	27.22	37	100 × 80	680
59	100HFM－Ⅱ－80－60－□	80	60	2950	32.67	37	100 × 80	680
60	100HFM－Ⅱ－80－70－□	80	70	2970	36.29	45	100 × 80	710
61	100HFM－Ⅱ－60－90－□	60	90	2970	35	45	100 × 80	710
62	100HFM－Ⅱ－50－100－□	50	100	2970	35.82	45	100 × 80	710

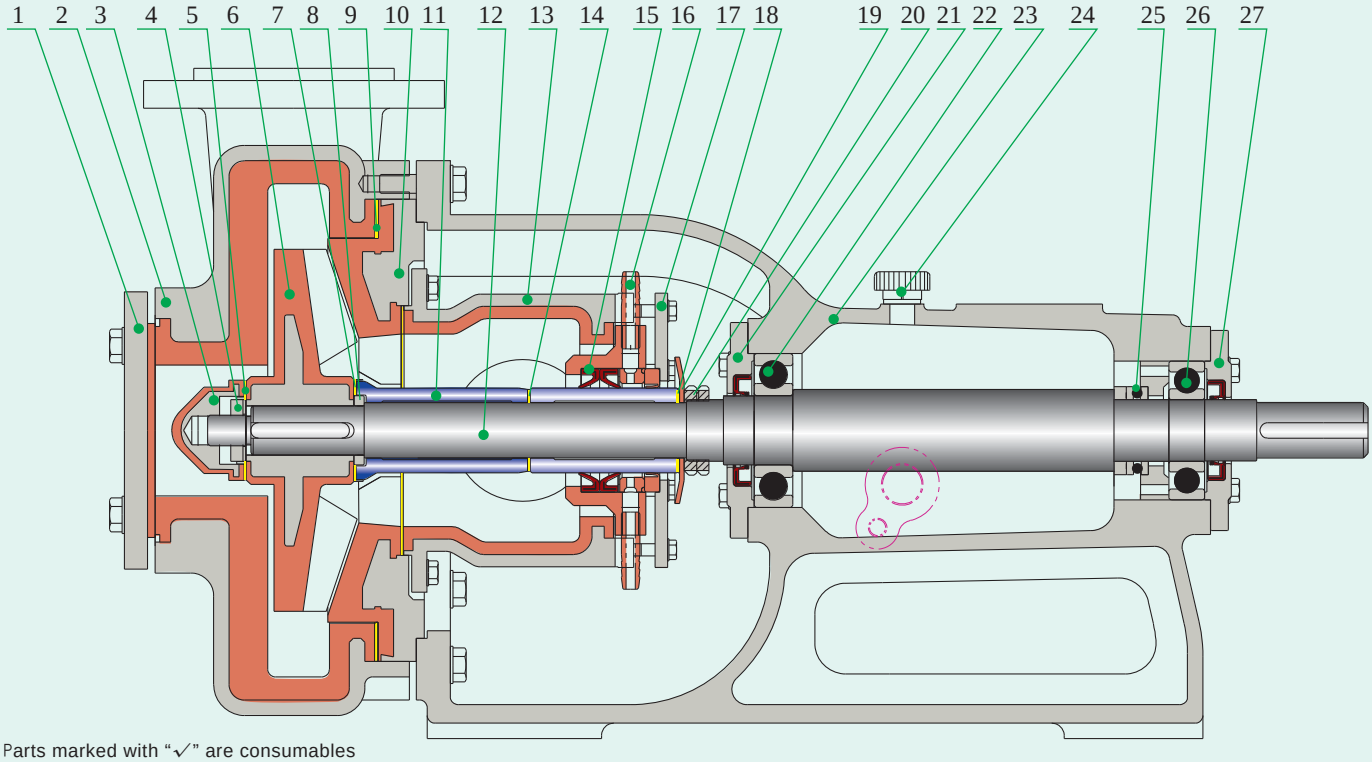
Note: ① H is the type with high lift and same opening diameter specification. ② H2 is pump with high lift and same opening diameter, but compared with H, the shaft seat and the main shaft size are different. Please clearly mark the model when purchasing the spare parts.

No.	Model	Flow Rate (m^3/h)	Pump lift (m)	Rotation speed (r/min)	Power(kW)		Diameter of inlet and outlet (mm×mm)	Weight (kg)
					Shaft power	Equip motor		
63	100HFM－Ⅱ－70－80－□	70	80	2970	36.29	45	100 × 80	710
64	100HFM－Ⅱ－70－90－□	70	90	2970	42.87	55	100 × 80	800
65	100HFM－Ⅱ－80－80－□	80	80	2970	41.48	55	100 × 80	800
66	100HFM－Ⅱ－80－90－□	80	90	2970	46.55	55	100 × 80	800
67	125HFM－Ⅱ－H2－80－50－□	80	50	2950	27.22	37	125 × 80	730
68	125HFM－Ⅱ－H2－80－60－□	80	60	2950	32.67	37	125 × 80	730
69	125HFM－Ⅱ－H2－35－110－□	35	110	2970	38.82	45	125 × 80	760
70	125HFM－Ⅱ－H2－80－70－□	80	70	2970	36.29	45	125 × 80	760
71	125HFM－Ⅱ－H2－80－80－□	80	80	2970	41.48	55	125 × 80	820
72	125HFM－Ⅱ－H2－80－90－□	80	90	2970	46.55	55	125 × 80	820
73	125HFM－Ⅱ－H2－70－100－□	70	100	2970	44.31	55	125 × 80	820
74	125HFM－Ⅱ－H2－100－80－□	100	80	2970	46.8	55	125 × 80	820

Ⅳ The integral structure drawing and part name of the pump

4.1 Single-stage structure drawing of HFM-I type

Note: this drawing is simple structure drawing, so please refer to the detailed structure drawing supplied by the factory when you repair the pump.

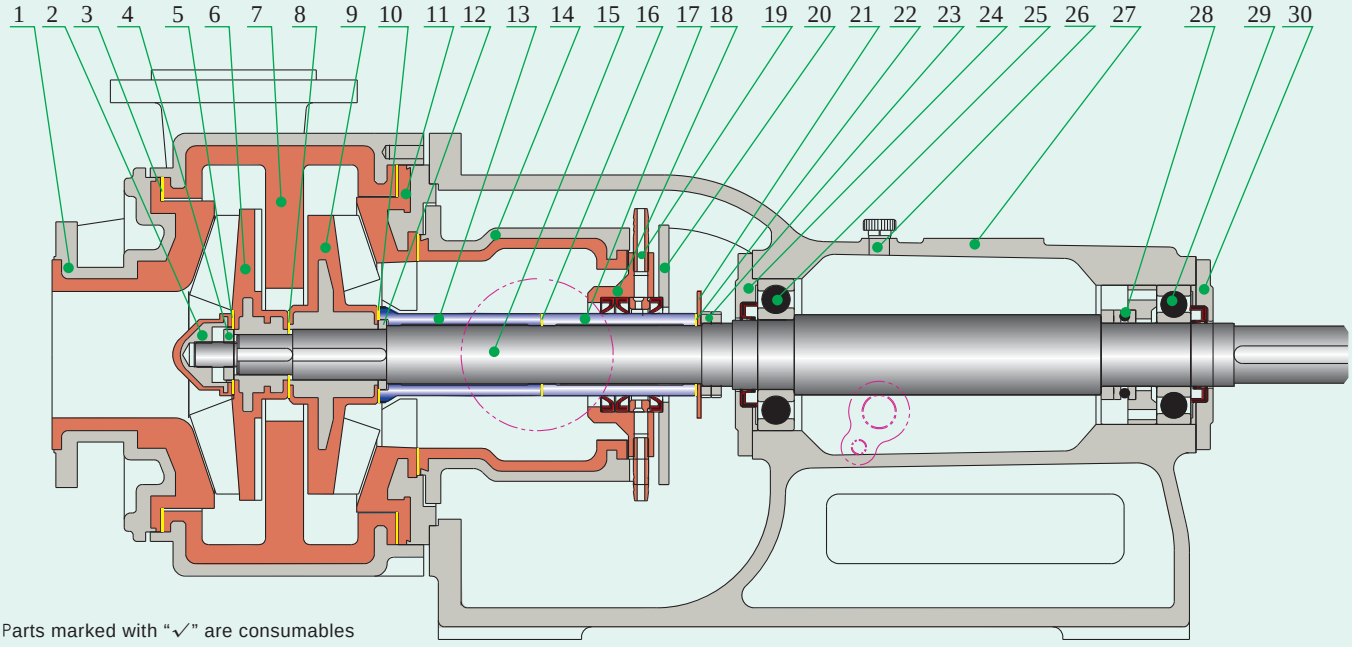


Parts marked with "✓" are consumables

	1.Stuffy cover of pump case	A3 Steel	✓	10.Pump cover	QT/UHMWPE		19.Acid separation blade	Phenolic fiberglass reinforced plastics
✓	2.Pump case	QT/UHMWPE	✓	11.Shaft housings	299Al2O3		20.Spindle nut	45# Steel
✓	3.Locknut	A3/UHMPWE	✓	12.Main shaft	40Cr Steel		21.Gland bush and oil seal of front bearing	NBR/HT-200
✓	4.Nut	A3钢		13.Tee joint T of suction inlet	QT/PP		22.Front bearing	
✓	5.Locknut pad	F26B	✓	14.Shaft housing gap I	F26B		23.Bearing support	HT-200
✓	6.Impeller	A3/UHMPWE	✓	15.Shaft seal	F4/F26B		24.Oil plug	NBR/Al
✓	7.Impeller pad	F26B		16.Cooling water faucet	PP/1Cr18Ni9Ti		25.Plane bearing	
	8.Top ring of impeller	45# Steel		17.Sealing clamping cap	A3 Steel		26.Back bearing	
✓	9.Pad of pump cover	NCR/F26B	✓	18.Shaft housing gap II	F26B		27.Gland bush and oil seal of back bearing	NBR/HT-200

4.2 Double-stages structure drawing of HFM-II type

Note: this drawing is simple structure drawing, so please refer to the detailed structure drawing supplied by the factory when you repair the pump.

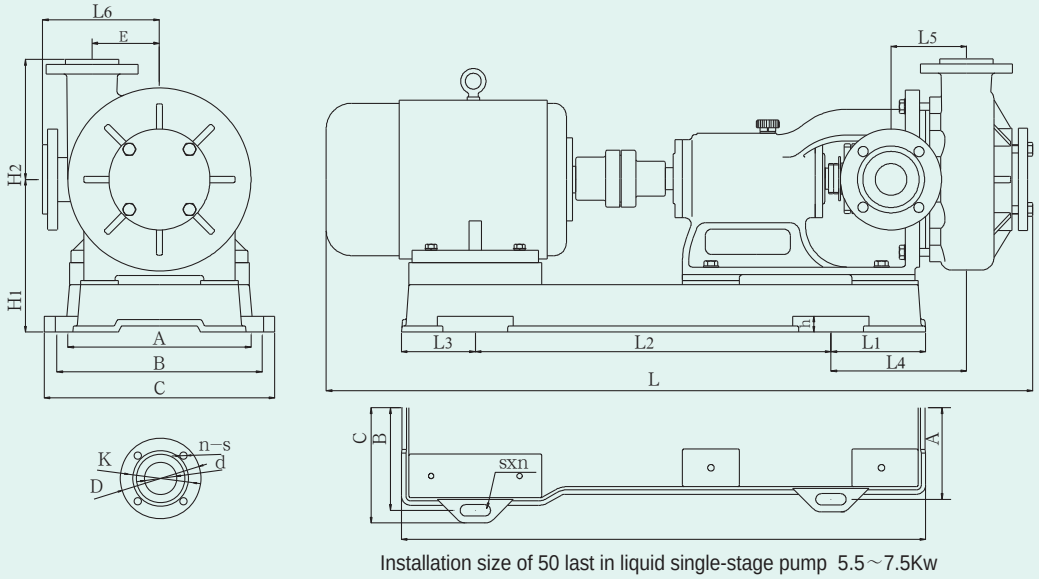


Parts marked with "✓" are consumables

✓	1.Pump cover	QT/UHMWPE	✓	11.Back pump cover	HT-200/UHMWPE		21.Acid separation blade	Phenolic fiberglass reinforced plastics
✓	2.Locknut	A3/UHMPWE		12.Top ring of impeller	45# Steel		22.Shaft housing gap II	F26B
✓	3.Pad of back pump cover	NCR/F26B	✓	13.Front shaft housings	299Al_2O_3		23.Shaft nut	45# Steel
	4.Nut	A3 Steel		14.Tee joint T of suction inlet	QT/PP		24.Gland bush and oil seal of front bearing	NBR/HT-200
✓	5.Locknut pad	F26B	✓	15.Main shaft	40Cr钢		25.Front bearing	
✓	6.Back impeller	A3/UHMPWE	✓	16.Shaft housing gap I	F26B		26.Oil plug	NBR/Al
✓	7.Pump case	A3/UHMPWE	✓	17.Back shaft housings	299Al_2O_3/Si_3N_4		27.Bearing support	HT-200
✓	8.Impeller pad	F26B	✓	18.Shaft seal	F26B/F4		28.Plane bearing	
✓	9.Front impeller	A3/UHMPWE		19.Cooling water faucet	PP/1Cr18Ni9Ti		29.Back bearing	
✓	10.Front impeller pad	F26B		20.Sealing clamping cap	A3 Steel		30.Gland bush and oil seal of back bearing	NBR/HT-200

V Installation, application and maintenance of pump

5.1 HFM-I type single-stage installation drawing

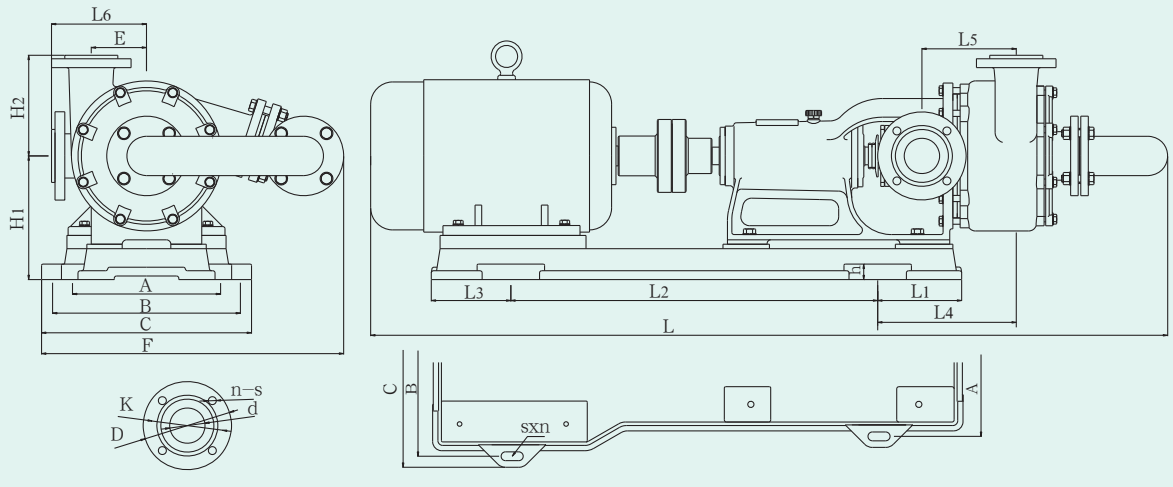


Installation size of 50 last in liquid single-stage pump 5.5～7.5Kw

Appearance and installation size of HFM-I type pump

No.	Model	Equip motor	A	B	C	E	H1	H2	L	L1	L2	L3	L4	L5	L6	h	s×n
1、2	50HFM-I	1.5-2.2KW-2	290	290	330	106.5	242	190	1015	150	500	117	215	119	185	25	4×M16
3-5	50HFM-I	3KW-2	290	290	330	106.5	242	190	1045	150	530	125	215	119	185	25	4×M16
6-9	50HFM-I	4KW-2	290	290	330	106.5	242	190	1065	150	530	126	215	119	185	25	4×M16
10-12	50HFM-I	5.5KW-2	290	325	365	106.5	242	190	1120	150	563	117	215	119	185	25	4×M16
13-16	50HFM-I	7.5KW-2	290	325	365	106.5	242	190	1120	150	563	117	215	119	185	25	4×M16
17、18	50HFM-I	0.75KW-4	290	290	330	106.5	242	190	975	150	500	117	215	119	185	25	4×M16
19	50HFM-I	1.1KW-4	290	290	330	106.5	242	190	1015	150	500	117	215	119	185	25	4×M16
20-24	65HFM-I	7.5KW-2	335	355	405	125	280	228	1450	190	690	180	250	150	215	35	4×M18
25、26	65HFM-I	11KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
27	65HFM-I	15KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
28、29	65HFM-I-H	1.1KW-4	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
30	65HFM-I-H	11KW-2	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
31-34	65HFM-I-H	15KW-2	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
35、36	65HFM-I-H	2.2KW-4	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
37	65HFM-I-H	18.5KW-2	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
38	65HFM-I-H	22KW-2	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
39、40	65HFM-I-H	3KW-4	335	425	475	125	280	230	1200	190	630	180	250	150	215	35	4×M18
41	80HFM-I	7.5KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
42-44	80HFM-I	11KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
45-49	80HFM-I	15KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
50-52	80HFM-I	18.5KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
53	80HFM-I	22KW-2	335	425	475	125	280	228	1450	190	830	180	250	150	215	35	4×M18
54、55	80HFM-I	3KW-4	335	425	475	125	280	228	1450	190	630	180	250	150	215	35	4×M18
56	80HFM-I	4KW-4	335	425	475	125	280	228	1450	190	630	180	250	150	215	35	4×M18
57	80HFM-I-H	18.5KW-2	335	425	475	125	280	230	1450	190	830	180	250	150	215	35	4×M18
58-60	80HFM-I-H	22KW-2	395	433	483	125	280	230	1450	190	830	180	250	150	215	35	4×M18
61	80HFM-I-H	2.2KW-4	335	425	475	125	280	230	1200	190	630	180	250	150	215	35	4×M18
62、63	80HFM-I-H	3KW-4	335	425	475	125	280	230	1200	190	630	180	250	150	215	35	4×M18
64	80HFM-I-H	4KW-4	335	425	475	125	280	230	1200	190	630	180	250	150	215	35	4×M18
65-67	80HFM-I-H2	30KW-2	395	472	522	125	280	230	1550	190	830	180	250	150	215	35	4×M18
68、69	100HFM-I	15KW-2	335	425	475	130	280	225	1460	190	830	180	250	150	225	35	4×M18
70-72	100HFM-I	18.5KW-2	335	425	475	130	280	225	1505	190	830	180	250	150	225	35	4×M18
73-77	100HFM-I	22KW-2	395	433	483	130	280	225	1525	190	830	180	250	150	225	35	4×M18
78	100HFM-I	3KW-4	335	425	475	130	280	225	1325	190	660	180	250	150	225	35	4×M18
79	100HFM-I	4KW-4	335	425	475	130	280	225	1325	190	660	180	250	150	225	35	4×M18
80	100HFM-I	5.5KW-4	335	425	475	130	280	225	1325	190	660	180	250	150	225	35	4×M18
81	100HFM-I	7.5KW-4	335	425	475	130	280	225	1325	190	660	180	250	150	225	35	4×M18
82、83	100HFM-I-H	4KW-4	335	425	475	130	280	235	1325	190	660	180	250	150	225	35	4×M18
84-89	100HFM-I-H2	30KW-2	395	472	522	130	280	235	1525	190	860	180	250	150	225	35	4×M18
90、91	100HFM-I-H2	5.5KW-4	335	425	475	130	280	235	1325	190	860	180	250	150	225	35	4×M18
92-94	100HFM-I-H2	37KW-2	395	472	522	130	280	235	1525	190	860	180	250	150	225	35	4×M18
95-97	100HFM-I-H2	45KW-2	395	510	560	130	280	235	1525	190	860	180	250	150	225	35	4×M18
98	100HFM-I-H2	55KW-2	395	560	610	130	280	235	1625	190	860	180	250	150	225	35	4×M18
99	125HFM-I	22KW-2	395	433	483	130	370	225	1630	280	860	204	340	165	225	35	4×M18
100	125HFM-I	5.5KW-4	395	433	483	130	370	225	1430	280	660	204	340	165	225	35	4×M18
101-103	125HFM-I	7.5KW-4	395	433	483	130	370	225	1430	280	660	204	340	165	225	35	4×M18
104-106	125HFM-I-H2	30KW-2	395	472	522	130	370	235	1430	280	860	220	340	165	225	35	4×M18
107	125HFM-I-H2	37KW-2	395	472	522	130	370	235	1705	280	860	220	340	165	225	35	4×M18
108、109	125HFM-I-H2	45KW-2	395	510	560	130	370	235	1900	280	878	220	360	165	225	35	4×M18
110、111	125HFM-I-H2	55KW-2	395	560	610	130	370	235	1900	280	950	240	360	165	225	35	4×M18

5.2 HFM-II type double-stages installation drawing



Appearance and installation size of HFM-II type pump

No.	Model	Equip motor	A	B	C	E	F	H1	H2	L	L1	L2	L3	L4	L5	L6	h	s×n
1	50HFM-II	2.2KW-2	290	290	330	106.5	546	242	190	1285	150	500	117	267	171.5	185	25	4×M16
2	50HFM-II	3KW-2	290	290	330	106.5	546	242	190	1315	150	530	126	267	171.5	185	25	4×M16
3	50HFM-II	4KW-2	290	290	330	106.5	546	242	190	1335	150	530	126	267	171.5	185	25	4×M16
4-7	50HFM-II	5.5-7.5KW-2	290	325	365	106.5	564	242	190	1390	150	563	117	267	171.5	185	25	4×M16
8-12	50HFM-II	11KW-2	290	370	410	106.5	586	242	190	1532	150	620	180	267	171.5	185	25	4×M16
13-15	65HFM-II	11KW-2	335	425	475	125	685	280	218	1740	190	830	180	313.5	213.5	215	35	4×M18
16-21	65HFM-II	15KW-2	335	425	475	125	685	280	218	1740	190	830	180	313.5	213.5	215	35	4×M18
22-24	65HFM-II	18.5KW-2	335	425	475	125	685	280	218	1785	190	830	180	313.5	213.5	215	35	4×M18
25-28	65HFM-II	22KW-2	335	425	483	125	685	280	218	1805	190	830	180	313.5	213.5	215	35	4×M18
29	65HFM-II	30KW-2	335	470	520	125	706	280	218	1879	190	860	200	313.5	213.5	215	35	4×M18
30	65HFM-II	37KW-2	335	470	520	125	706	280	218	1879	190	860	200	313.5	213.5	215	35	4×M18
31、32	80HFM-II	15KW-2	335	425	475	125	685	280	228	1805	190	830	180	313.5	213.5	215	35	4×M18
33-35	80HFM-II	18.5KW-2	335	425	475	125	685	280	228	1805	190	830	180	313.5	213.5	215	35	4×M18
36-38	80HFM-II	22KW-2	335	425	475	125	685	280	228	1805	190	830	180	313.5	213.5	215	35	4×M18
39-41	80HFM-II	30KW-2	335	470	520	125	685	280	228	1879	190	860	200	313.5	213.5	215	35	4×M18
42、43	80HFM-II	37KW-2	335	470	520	125	685	280	228	1879	190	860	200	313.5	213.5	215	35	4×M18
44	100HFM-II	18.5KW-2	395	433	475	125	700	280	225	1810	280	800	180	325	225	215	35	4×M18
45、46	100HFM-II	22KW-2	395	433	483	130	700	280	225	1972	280	800	180	325	225	215	35	4×M18
47-52	100HFM-II	30KW-2	395	472	522	130	700	280	225	2080	280	860	200	325	225	215	35	4×M18
53-59	100HFM-II	37KW-2	395	472	522	130	700	280	225	2080	280	860	200	325	225	215	35	4×M18
60-63	100HFM-II	45KW-2	395	510	560	130	700	280	225	2120	280	870	200	325	225	215	35	4×M18
64-66	100HFM-II	55KW-2	395	560	610	130	835	370	225	2235	280	950	200	325	225	215	35	4×M18
67、68	125HFM-II-H2	37KW-2	395	472	522	130	790	370	225	2080	280	860	220	415	240	225	35	4×M18
69、70	125HFM-II-H2	45KW-2	395	510	560	130	810	370	225	2120	280	878	220	415	240	225	35	4×M18
71-74	125HFM-II-H2	55KW-2	395	560	610	130	835	370	225	2235	280	950	240	415	240	225	35	4×M18

◆ Connection size of flange

d	40	50	65	80	100
D	145	160	180	200	215
K	110	125	145	160	180
n-s	4-⌀18	4- ⌀18	4- ⌀18	4- ⌀18	4- ⌀18

5.3 Installation notice and installation diagrammatic sketch of pump

1. Installation notices:

1.1 Valve and rubber quake-proof node shall be orderly installed in the inlet and outlet of the pump, so as to be convenient for the maintenance. (See the drawing)

1.2 As for the installation sequence of the pump, the bolts of the inlet and outlet pipelines shall be firstly connected, and then the foundation bolt shall be fastened, so as to avoid damaging pump due to extensibility stress when connecting pipelines.

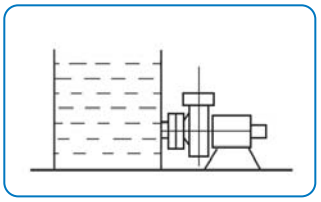
1.3 As for the posts with long distance of outlet pipeline and HFM-II type pump, check valve shall be installed in the outlet, so as to avoid damaging the pump by outlet high-pressure water hammer when stopping.

1.4 Allocation of inlet and outlet pipelines of the pump: the pipes of the pump shall be one level higher than the inlet and outlet of the pump in order to reduce the flow resistance of the pipelines and to improve the delivery efficiency of the pipelines.

1.5 Gravity supporting system shall be arranged for the inlet and outlet pipelines of the pump, as the pump can not bear the weight of the pipelines.

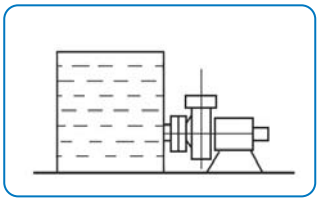
2. Installation instructions and notices of trench

2.1 Positive pressure state of overhead tank



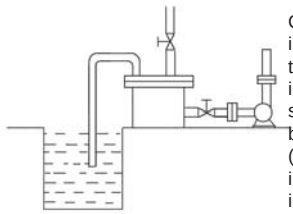
When the pump is installed on the bottom of the store tank, the medium in the store tank is in the state of positive pressure. When the valve in the pump inlet is open, the liquid in the store tank can freely flow to the pump chamber, which is the ideal installation mode of the HFM type wear and corrosive resistant pump.

2.2 Negative pressure state of overhead tank



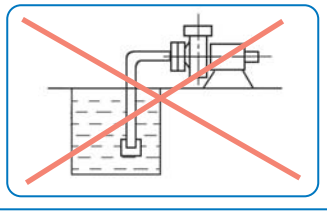
When the pump is installed on the bottom of the store tank, the airtight store tank is in the state of negative pressure. If you select pump in this situation, you must make clearly the exact data of the negative pressure in the store tank, and then contact with our company, and you can finally determine the type.

2.3 The low tank shall not be equipped with bottom valve but be installed with Siphon barrel state



Characteristics explanation: the pump is installed on the upper part of the storage tank, and a Siphon barrel shall be installed in the pump inlet to help starting. Fill the Siphon barrel with liquid before starting the pump. The suction lift (refer to the height from pump suction inlet to the liquid level) of the pump installed with this method shall be controlled within 1.2m. Suitable materials and manufacturing techniques shall be selected according to different medium features for the manufacturing of the Siphon barrel. The manufacturing requirements on the Siphon barrel are good leak tightness and free from water and gas leakage. The calculation method of the size of Siphon barrel is as follows: $V=(3\sim5)\times\frac{\pi d^2}{4}\times L$ d:Diameter of inlet pipe, L:Total length of inlet pipe, V:The capacity of the Siphon barrel. The diameter and height of the Siphon barrel shall be determined according to the calculated capacity and the size of the existing materials.

2.4 Lower Tank with Bottom Valve



Characteristics: the pump is positioned above the tank and a bottom valve is installed on the bottom end of the inlet pipe. For every start, fill liquid fully into the pump, no empty running allowed. Normally, it is not recommended for HFM pumps to be used on such positions.

5.4 Starting, running and lubrication protection of pump

5.4.1 Examination before running

Firstly check whether the rotation direction is right and whether the rotation is free by rolling the coupler or shaft with hands. In case of it is can not rolled or there is abnormal noise, please timely check. Firstly check whether the coupler is horizontal from the external part, and whether the position of the lubrication oil is nearby the center line of the oil glass from the oil glass hole on the bearing support (in case of too much lubrication oil, drain off some; in case of too little, fill some). Rotate when examining. In case of problems still exist, disassemble the pump to examine (the disassembly shall be in accordance with the simple structure drawing and procedure of assembly and disassembly in the instructions), and clean the foreign matters. Please contact with our company to consult the solution, and meanwhile, check whether cooling water or cooling oil is filled in the external cooling system.

5.4.2 Starting steps

a. Fill liquid in the pump b. Firstly open the inlet valve

c. Switch on d. Open outlet valve

5.4.3 Running

In case of abnormal noise or abnormal situations like motor heat during running, please stop and examine, and the examination methods and steps are same as (5.4.1).

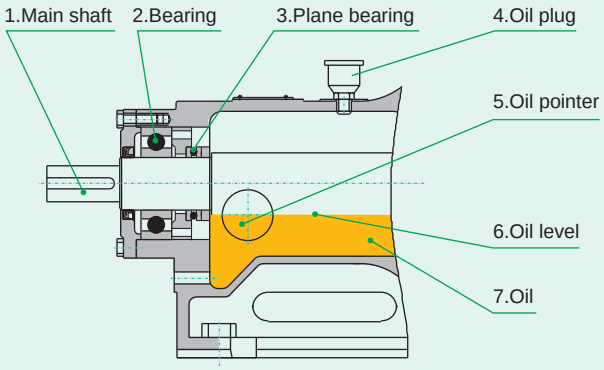
5.4.4 Stopping

a. Firstly close the outlet valve;

b. Shut off the power supply and timely close the outlet valve;

5.4.5 Lubrication and maintenance of the bearing support

Periodically replace lubrication oil (CD40 diesel engine oil) of the bearing support, and generally the replacement cycle is 6 months. The lubrication oil level shall be at the center line of the oil glass (see drawing). Too low oil level can not play the role of lubrication, and too high oil level will increase the shaft power consumption load.



5.5 Disassembly procedures during maintenance

5.5.1 Disassembly (single-stage type): see single-stage structure drawing

A: Remove the connection bolts between the bearing support (23) and the pump case (2), and demount the pump case (2).

B: Screw off the locknut (3) and the nut (4) with special spanner; take down pad bed of the locknut (5).

C: Take down the pump cover (10) and the tee joint T of the suction inlet (13) from the bearing support after demounting the impeller (6). Firstly screw off the clamping cap of the seal ring (17) before taking down the tee joint T of the suction inlet.

D: Demount the pump cover (10) and the tee joint T of the suction inlet (13), and then the shaft seal (15).

E: After demounting the shaft cover (11), orderly demount the gland bush of the bearing (21), the bearing (22) and the main shaft (12).

5.5.2 Disassembly (double-stage type): see double-stage structure drawing

A: Different with the single-stage type, firstly demount the connection pipes in the first stage outlet and the second stage inlet, and then the second stage pump cover (1), the locknut (2) and the nut (4) (demount with the special tool supplied by the factory) and the impeller (6).

B: The demounting methods of other parts are same as the HFM-I (single-stage type).

5.5.3 Installation (single-stage type): see single-stage structure drawing

Install by reverse order during installation, and the notices are:

A: Make the pad beds of each part and free from neglected pad. There are totally 6 sets of pad beds as follows: ①. Between the back shaft housing (11) and the acid separation blade (19); ②. Between the front shaft housing (11) and the impeller (6); ③. Between the back shaft housing and the front shaft housing; ④. Between the impeller (6) and the locknut (3); ⑤. Between the pump case (2) and the pump case (10); ⑥. Between the pump cover (10) and the tee joint T of the suction inlet (13).

B: Please control the clearance between the impeller (6) and the pump cover (10) during installation, which is generally controlled within 1-2mm. In case of the clearance is too small, the pump cover and the impeller will be damaged due to the friction produced by expanding when heated; in case of the clearance is too large, the pump efficiency shall be influenced.

C: Notices of installation of the K-shaped seal ring (15): after the pump assembly is installed, loosen the clamping cap of the seal ring (17), and rotate the main rotation shaft (12); and after adjusting the concentricity of the K-shaped ring and the shaft housing, fasten the clamping cap of the seal ring (17).

D: Fill CD40 diesel engine oil in the bearing support, and the oil level of the engine oil shall be the midline of the sight glass.

E: Roll the coupler to check whether the driving is free; in case of stuck point, please find out reasons and then start after proper adjustment.

5.5.4 Installation (double-stage type): see double-stage structure drawing

A:The different of installation method between the HFM-II type pump and the HFM-I type pump is that the connection pipe of the suction inlet is installed and the procedures of the back impeller (6) and the pump case (1).

B: Other installation methods are same.

Special suggestion: Easily neglected work pieces: I. Pad bed of the acid separation blade, the neglecting installation will make the shaft housing crack. II. Neglected installation of the top ring of the impeller (8) (the top ring of impeller 12 in the double-stage pump), the neglecting will cause replacement due to too small stress surface of the impeller. Please maintain and install by referring to the detailed installation drawing supplied by the company, and please ask for the drawing in case of the detailed drawing is not available.

VI Main failures analysis and troubleshooting

Failures	Reason	Solution
The noise is high	①The couplers are not on a same shaft; ②The hexagonal elastic block of the couplers are worn; ③The inlet pipeline is too small, or the inlet valve is not open; ④The outlet valve is oversize opened; ⑤The soleplate of the loosening face of the foundation bolt is not flat; ⑥Caused by damage bearing; ⑦There are sundries in the pump chamber or the impeller is out of shape.	Remove the above reasons
The liquid can not drain; flow rate is deficiency or the pressure drops	①The pipelines of the inlet and outlet are jammed; ②The pipelines of the suction inlet is too long and thin; ③There are sundries like plastic paper in the pump inlet; ④The concentration of the materials is too high; ⑤The impeller or pump case is worn, volumetric efficiency is reduced; ⑥Motor phase loss; ⑦The motor rotates inversely or the rotation speed is wrong; ⑧The suction lift is too high; ⑨The pipelines of suction inlet is leaked.	Investigate thoroughly the above reasons, and adjust one by one
Stop sealing is leaked	①The seal ring is worn; ②The proper alignment of the seal roll and the shaft housing has not yet adjusted in place. ③The shaft housing is cracked; ④The connections between the pump case, pump cover and shaft seat are not parallel, which influences the proper alignment of the sealing elements .	Investigate thoroughly the reasons, and adjust one by one
The motor is hot	①The load is too heavy; ②Problem of motor bearing is found; ③The clearance between the main electrical couplers is too small.	①Adjust the power of the motor; ②Turn down the outlet valve of the pump; ③Change bearing; ④Adjust the clearance between the main electrical couplers.
The shaft seat is hot	①The bearings run outside lane; ②The installation of the bearings is not flat; ③The front and back holes of the bearing support are not on one same bearing; ④The side cover of the bearing support is too tight and unbalance; ⑤Quality problem of the bearing is found.	Investigate thoroughly the reasons, and adjust one by one
The coupler can not rotate freely	①The bearing is damage; ②The impeller in the pump chamber and the pump case (cover) are jammed as the clearance is too small; ③Argillaceous silt and slurry in the pump chamber obstruct the rotation of the impellers; ④The clearance between main electrical couplers is too small.	Investigate thoroughly the reasons, and adjust one by one

Yixing ZEUS Pump Co.,Ltd.

Add：Zhangze Yixing Jiangsu China Post Code：214225 Website：http://www.zsby.com

Tel：0510—

Fax：0510—

Version：2007.01