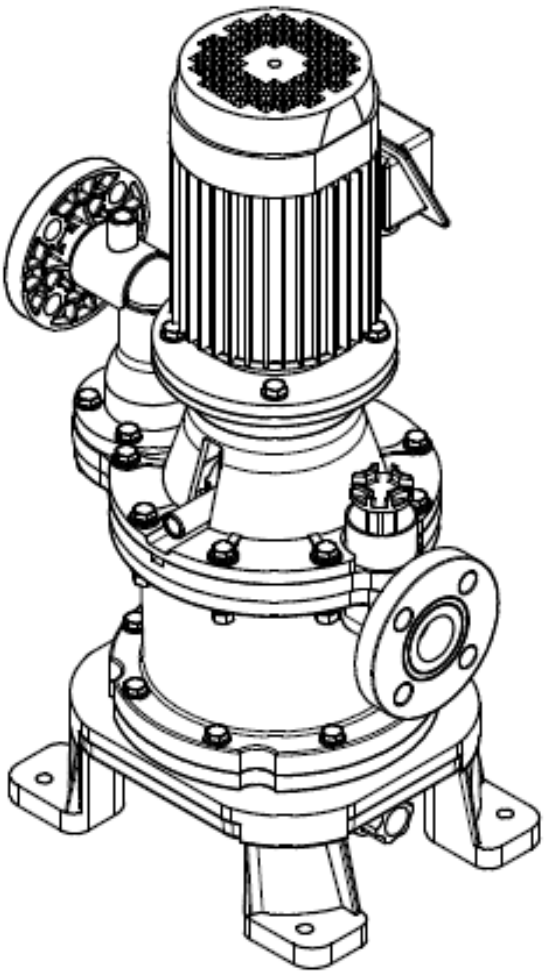
CORROSION RESISTANT SELF-PRIMING PUMP

YD-NSF / SF series

INSTRUCTION MANUAL

Version: 250115



World Chemical Co.,Ltd.

Preface

Thank you for purchasing our corrosion-resistant self-priming pump “SELFREE”. The pump can be used for high temperature non-electrolytic plating and general liquid. The standard model has less breakdown or malfunction, because it is the sealless pump without mechanical seal or bearing.
It is necessary to operate and maintain the pump properly, so please read this instruction manual for the pump effectively and long-life.

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Safety precaution (To be observed at all times)

Warning

Dangerous liquid and surrounding

When using pumps which transfer dangerous liquid or in potentially explosive atmospheres (only explosion- proof type), make sure to perform the daily inspection not to leak liquid while observing the facility standards set forth by law. The pump operation under an abnormal condition such as liquid leakage causes a tragedy like personal injury, explosion or fire. Follow the instructions of your supplier or the liquid manufacturer about handling the liquid.

Prohibition on the use of damaged or modified pumps

Using damaged of modified pumps may cause personal injury, electric shock or the pump damage. It is out of our warranty, so never use them.

Caution in transporting and lifting pumps

Make sure to use the hoist bolt when lifting pumps with it. If pumps do not own the hoist bolt, lift them by a belt sling with care of the weight balance. The qualified person should perform this work with a sling strong enough. The weight of the even lightest pump is approx. 23kg. Carrying pumps by hands may cause an accident, so stop it as possible.

Prohibition on the operation while the power is on

Do not inspect or disassemble pumps or motors while applying power. It causes to get caught in the rotor or personal injury like electric shock. Take multiple safety measures like a handy switch of the pump as well as the main or operation switch.

Connection with an earth wire

The operation of pumps without an earth wire may cause electric shock. Make sure to connect it by a qualified person according to the electric equipment technical standards and interior wiring regulations.

Protection of power supply cords

Stretching, pinching or damaging power or motor cords causes fire or electric shock by the damaged cable. Attach the terminal box cover in the right place after wiring the motor.

Ground Fault Interrupter (GFI)

The operation of pumps without a ground fault interrupter device may cause electric shock. Apply circuit breakers of over-current protection devices to protect electric accidents or the motor damaged.

Caution in removing pumps

When removing pumps from plumbing, make sure to close the suction and discharge valves not to leak liquid. As the direct contacting with liquid may be harmful, always wear protective gears when operating.

Caution

Prohibition on the unauthorized use

Do not use pumps with the specification except for the indication on the nameplate. Install pumps after checking especially the motor specification (phase, voltage and frequency). Wrong use may cause personal injury or the pump and peripheral equipment damaged.

Restriction on handlers

Carry, install, wire, operate and maintain pumps by experts who have full knowledge of pumps.

Caution when unpacking

Checking the upside down, unpack. When wooden crates are unpacked, be careful not to get injured by nails and slivers.

Ventilation

Obstructions which prevent ventilation around the pump make the motor overheat, so not put them. Handling toxic or odorous liquids causes the risk of symptoms of poisoning. Install pumps in a well-ventilated place.

Repair and return

When repairing damaged pumps, contact your supplier or us. If the pump is returned by courier, clean the inside and outside of the pump with water. Check no liquid adheres and pack it with a plastic bag.

Resin parts

Pumps consist of resin parts. Pumps are damaged by strong impact, causing personal injury. Do no hit and climb on it. Besides, attach piping supports to prevent to apply a load directly.

Pump start-up

Make sure to check the rotational direction at the first time of the pump start-up. At the time, open the suction and discharge valves and check is no liquid leakage from the pipe connection. As the air is released from the piping and the pump is full of liquid, turn on the switch instantly to check the rotational direction. If the three-phase motor rotates in reverse, rewire the pump after switching two of the three wires. Perform this wiring after surely turning off the power supply for safety.

Disposal of pump

Disposing pumps, handle them as industrial wastes according to the appropriate law after cleaning .

Leak protection

In case make sure to take appropriate preventative measures in consideration of liquid leakage from pumps and piping damaged.

1. Features

(1) The quality has a stabilized and the parts are supplied promptly, because the pump is molded by general-purpose resin.

(2) It does not have sliding parts during operation, so there is less breakdown or malfunction.

(3) The wet parts kit, pump base and motor bracket are made of corrosive resistant resin. Therefore, the pump is not corroded by chemical or atmosphere gas or spray.

(4) The enclosed structure of the main body and special liquid sealing prevent liquid leakage.

(5) It is possible to use the pump for the high temperature solution by adopting the heat resistant resin and absorption of thermal expansion structure.

(6) There are self-priming and suction ability which enables to pump up, even if the liquid temperature is high,

2. Principle of self-priming

The priming liquid in the pump moves to the self-priming chamber by the impeller at the start-up. Air and liquid are separated with circulation and liquid is pushed to the impeller through the self-priming hole. The self-priming occurs continuously. Air from the bearing is sealed by the sealing blade and also released to the self-priming chamber through the balance hole of the casing. The back flow by siphon action when the pump stops is cut off by the siphon cut hole between the self-priming chamber and the suction chamber. The enough self-priming water remains for the next self-priming action.

3. Performance

(1) Standard performance

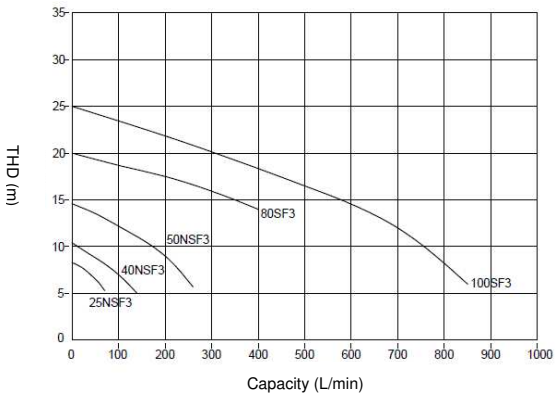
The standard performance curve (Normal temperature, clear water) is Picture 1 & 2. It is available for the motor output to be 1 rank up.

(2) Performance for High temperature

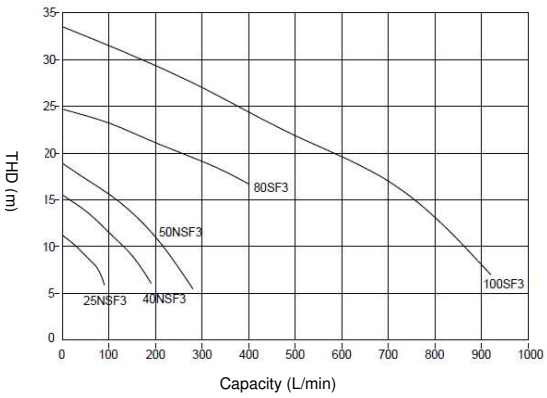
Used liquid temperature: 0 – 80 degrees (NSF/NSF-LR series), 0-70 degrees (SF series)

The self-priming height and time are changed depending on the liquid temperature. Consider the self-priming height. * As the temperature is higher, the ability is decreased.

Picture 1: Standard performance (50Hz) S.G.1.05



Picture 2: Standard performance (60Hz) S.G.1.05



Self-priming limit against S.G. (Tem. 20 degrees)

Model \ S.G.	1.0	1.1	1.3	1.5
YD-2500NSF1-CP- J	2.5m	2.3m	1.9m	1.7m
YD-2501NSF3-CP- J				
YD-2502NSF3-CP- J				
YD-4001NSF3-CP- JN	3.0m	2.7m	2.3m	2.0m
YD-4002NSF3-CP- JN				
YD-4003NSF3-CP- JN				
YD-5002NSF3-CP- JN	3.5m	3.2m	2.7m	2.3m
YD-5003NSF3-CP- JN				
YD-5005NSF3-CP- JN				
YD-8005SF3-EP- M				
YD-8007SF3-EP- M				
YD-8010SF3-EP- M				
YD-10007SF3-EP- M				
YD-10010SF3-EP- M				

- The liquid temperature is 20 degrees. As it is higher, the ability is lower.
- YD-250*NSF-LR type: S.G. is 1.0 and the limit of self-priming is 2.0m.

The motor output and applicable S.G. at standard performance (50Hz)

Model	Std. performance	0.4kW	0.75kW	1.5kW	2.2kW	3.7kW	5.5kW	7.5kW
YD-2500NSF1-CP- 51-J	6m-60L/min	1.05	-	-	-	-	-	-
YD-2501NSF3-CP- 57-J		-	1.7	-	-	-	-	-
YD-2502NSF3-CP- 5G-J	7m-60L/min	-	-	2.0	-	-	-	-
YD-4001NSF3-CP- 51-JN	7m-100L/min	-	1.05	-	-	-	-	-
YD-4002NSF3-CP- 58-JN		-	-	1.8	-	-	-	-
YD-4003NSF3-CP- 5G-JN		-	-	-	2.0	-	-	-
YD-5002NSF3-CP- 51-JN	9m-200L/min	-	-	1.05	-	-	-	-
YD-5003NSF3-CP- 54-JN		-	-	-	1.45	-	-	-
YD-5005NSF3-CP- 5G-JN		-	-	-	-	2.0	-	-
YD-8005SF3-EP- 51-M	15m-350L/min	-	-	-	-	1.05	-	-
YD-8007SF3-EP- 55-M		-	-	-	-	-	1.5	-
YD-10007SF3-EP- 51-M	12m-700L/min	-	-	-	-	-	1.05	-
YD-10010SF3-EP- 54-M		-	-	-	-	-	-	1.4

- The standard performance of YD-2502NSF3 is 7m-60L/min.

The motor output and applicable S.G. at standard performance (60Hz)

Model	Std. performance	0.75kW	1.5kW	2.2kW	3.7kW	5.5kW	7.5kW
YD-2501NSF3-CP- 61-J	8m-70L/min	1.05	-	-	-	-	-
YD-2502NSF3-CP- 68-J		-	1.8	-	-	-	-
YD-4002NSF3-CP- 61-JN	9m-150L/min	-	1.05	-	-	-	-
YD-4003NSF3-CP- 64-JN		-	-	1.45	-	-	-
YD-5003NSF3-CP- 61-JN	11m-200L/min	-	-	1.05	-	-	-
YD-5005NSF3-CP- 66-JN		-	-	-	1.6	-	-
YD-8007SF3-EP- 61-M	18m-350L/min	-	-	-	-	1.05	-
YD-8010SF3-EP- 63-M		-	-	-	-	-	1.35
YD-10010SF3-EP- 61-M	17m-700L/min	-	-	-	-	-	1.05

- The applicable specific gravity may be changed depending on the conditions.

4. Structure & dimension

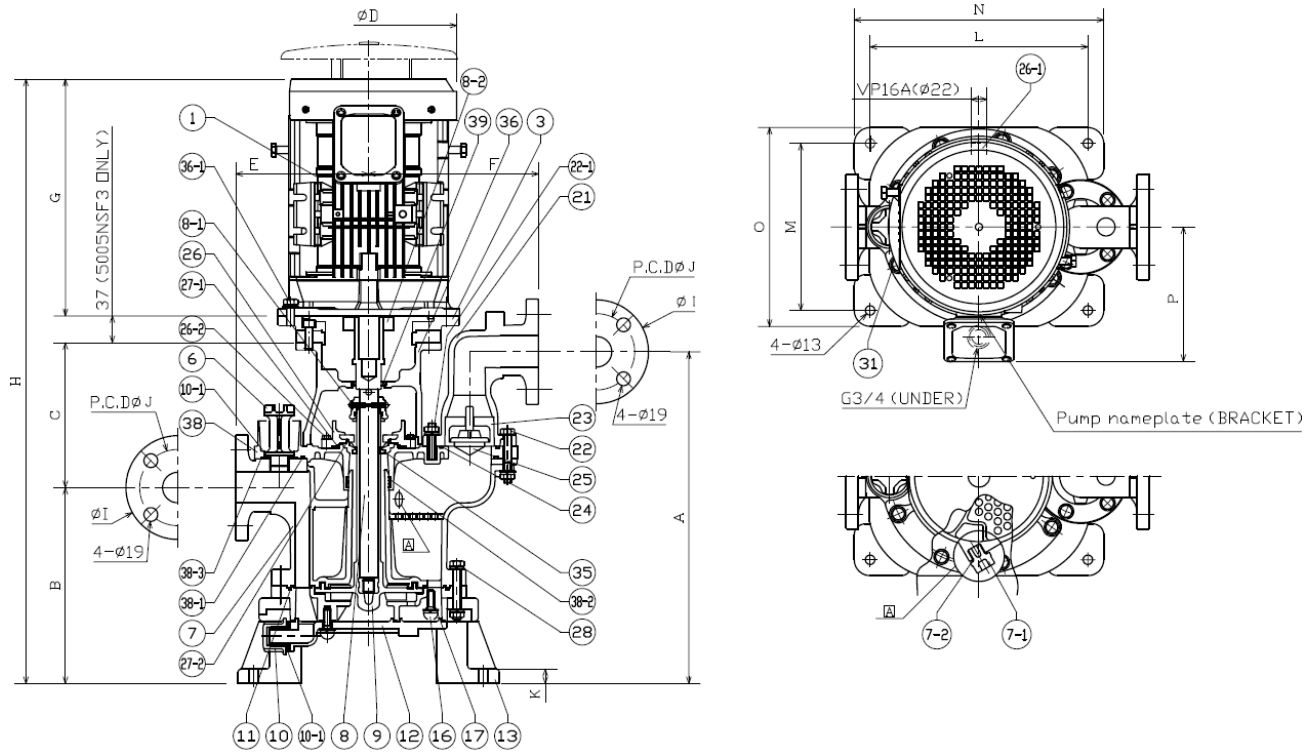
The structure is Picture 3 & 4. Parts list & Dimension table are List 1～6.

Measures for absorption of thermal expansion

The main body comes up by thermal expansion, but the top is free and no restraint. On the other hand, the suction inlet and discharge outlet are restrained by pipes, but it can be alleviated by expansion joints and bending. Especially when the temperature of the liquid is high, it comes up in millimeters, so it is very important to take measures against thermal expansion for pipes.

[YD-NSF series]

Picture 3: Cross-sectional drawing



List 1: Parts list(25**NSF)

No.	PARTS NAME	Q'TY	MATERIAL	NOTE	No.	PARTS NAME	Q'TY	MATERIAL	NOTE
1	Motor	1			23	Valve retainer	1	CFR-PP	
6	Water priming plug	1	CFR-PP		24	O-ring for discharge elbow	1	EPDM/FPM	25-2
7	Main body	1	CFR-PP		25	Valve	1	CFR-PP	
7-1	Cleaning hole plug	1	CFR-PP		26	Seal case	1	CFR-PP	
7-2	O-ring for cleaning hole plug	1	CFR-PP	P-18	26-1	Overflow pipe	1	HT.PVC	
8	Shaft	1	SUS403		26-2	Bolt for seal case	4	SUS304	M5×20 with W,SW
8-1	Locking sleeve	2	Diallyl		27-1	O-ring for seal case	1	EPDM/FPM	G-81
8-2	Slit collar	1	S45C		27-2	O-ring for seal case	1	EPDM/FPM	G-55
9	Impeller	1	CFR-PP		28	Bolt for pump body	8	SUS304	M8×65 with W,SW,N
10	Drain cap	1	CFR-PP		31	Bolt for bracket	8	SUS304	M8×55 with W,SW,N
10-1	Gasket	1	EPDM/FPM		35	Dry seal	1	FPM	
11	O-ring for casing	1	EPDM/FPM	AS568-264(ϕ3.8)	36	Bracket	1	Polyester	
12	Casing	1	CFR-PP		36-1	Bolt for motor	4	SUS304	0.4kW:M8×25
13	Pump base	1	Polyester						0.75～1.5kW:M8×25
16	Bolt for casing	5	SUS304	M8×40 with W,SW	38	Upper flange	1	CFR-PP	
17	O-ring for pump body	5	EPDM/FPM	P-12	38-1	O-ring for upper flange	1	EPDM/FPM	25-1
21	Discharge elbow	1	CFR-PP		38-2	O-ring for inner pipe	2	EPDM/FPM	25-3
22	Bolt for discharge elbow	4	SUS304	M8×55 with W,SW,N	38-3	O-ring priming water	1	EPDM/FPM	P-42
22-1	Bolt for discharge elbow	1	SUS304	M8×41 with W,SW,N	39	Oil seal	1	NBR	VC30425

List 2: Parts list(40**NSF)

No.	PARTS NAME	Q'TY	MATERIAL	NOTE	No.	PARTS NAME	Q'TY	MATERIAL	NOTE
1	Motor	1			23	Valve retainer	1	CFR-PP	
6	Water priming plug	1	CFR-PP		24	O-ring for discharge elbow	1	EPDM/FPM	40-2
7	Main body	1	CFR-PP		25	Valve	1	CFR-PP	
7-1	Cleaning hole plug	1	CFR-PP		26	Seal case	1	CFR-PP	
7-2	O-ring for cleaning hole plug	1	CFR-PP	P-18	26-1	Overflow pipe	1	HT.PVC	
8	Shaft	1	SUS403		26-2	Bolt for seal case	4	SUS304	M6×20 with W,SW
8-1	Locking sleeve	2	Diallyl		27-1	O-ring for seal case	1	EPDM/FPM	G-81
8-2	Slit collar	1	S45C		27-2	O-ring for seal case	1	EPDM/FPM	G-55
9	Impeller	1	CFR-PP		27-3	O-ring for seal case	1	EPDM/FPM	AS568-239(ϕ3.8)
10	Drain cap	1	CFR-PP		28	Bolt for pump body	8	SUS304	M10×70 with W,SW,N
10-1	Gasket	1	EPDM/FPM		31	Bolt for bracket	8	SUS304	M10×65 with W,SW,N
11	O-ring for casing	1	EPDM/FPM	AS568-268(ϕ3.8)	35	Dry seal	1	FPM	
12	Casing	1	CFR-PP		36	Bracket	1	Polyester	
13	Pump base	1	Polyester		36-1	Bolt for motor	4	SUS304	M10×25
16	Bolt for casing	5	SUS304	M10×45 with W,SW	38	Upper flange	1	CFR-PP	
17	O-ring for pump body	5	EPDM/FPM	P-15	38-1	O-ring for upper flange	1	EPDM/FPM	40-1
21	Discharge elbow	1	CFR-PP		38-2	O-ring for inner pipe	2	EPDM/FPM	G-55
22	Bolt for discharge elbow	4	SUS304	M10×65 with W,SW,N	38-3	O-ring priming water	1	EPDM/FPM	P-42
22-1	Bolt for discharge elbow	1	SUS304	M10×45 with W,SW,N	39	Oil seal	1	NBR	VC35485

List 3: Parts list(50**NSF)

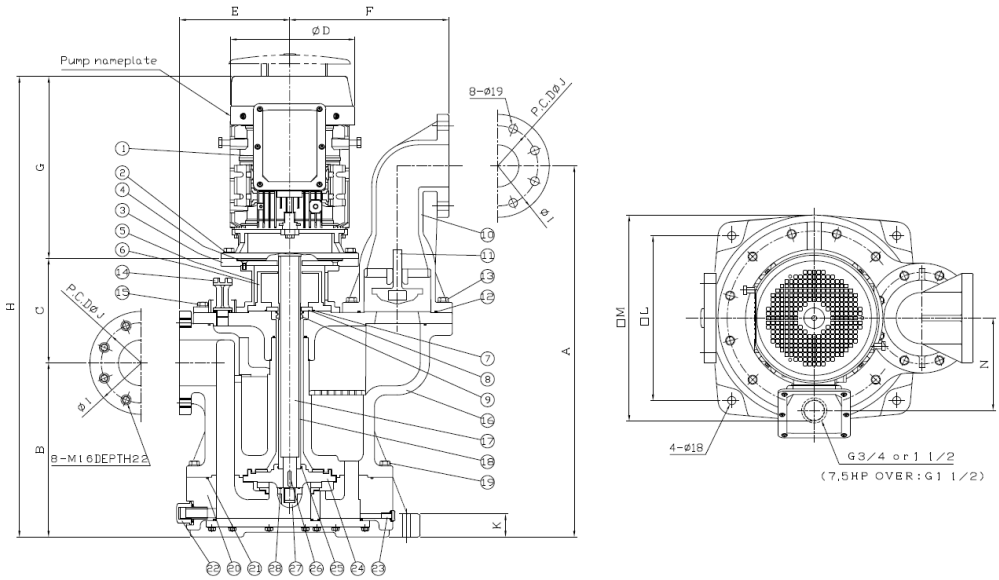
No.	PARTS NAME	Q'TY	MATERIAL	NOTE	No.	PARTS NAME	Q'TY	MATERIAL	NOTE
1	Motor	1			23	Valve retainer	1	CFR-PP	
3	Motor flange	1	FC200・PVC	only for 5005NSF3	24	O-ring for discharge elbow	1	EPDM/FPM	50-2
6	Water priming plug	1	CFR-PP		25	Valve	1	CFR-PP	
7	Main body	1	CFR-PP		26	Seal case	1	CFR-PP	
7-1	Cleaning hole plug	1	CFR-PP		26-1	Overflow pipe	1	HT.PVC	
7-2	O-ring for cleaning hole plug	1	CFR-PP	P-18	26-2	Bolt for seal case	4	SUS304	M6×20 with W,SW
8	Shaft	1	SUS403		27-1	O-ring for seal case	1	EPDM/FPM	G-81
8-1	Locking sleeve	2	Diallyl		27-2	O-ring for seal case	1	EPDM/FPM	G-55
8-2	Slit collar	1	S45C	2 pcs for 3.7kw only	27-3	O-ring for seal case	1	EPDM/FPM	AS568-239(ϕ3.8)
9	Impeller	1	CFR-PP		28	Bolt for pump body	8	SUS304	M10×70 with W,SW,N
10	Drain cap	1	CFR-PP		31	Bolt for bracket	8	SUS304	M10×65 with W,SW,N
10-1	Gasket	1	EPDM/FPM		35	Dry seal	1	FPM	
11	O-ring for casing	1	EPDM/FPM	AS568-272(ϕ3.8)	36	Bracket	1	Polyester	
12	Casing	1	CFR-PP		36-1	Bolt for motor	4	SUS304	1.5/2.2kW:M10×25
13	Pump base	1	Polyester						3.7kW:M12×30
16	Bolt for casing	5	SUS304	M10×45 with W,SW	38	Upper flange	1	CFR-PP	
17	O-ring for pump body	5	EPDM/FPM	P-15	38-1	O-ring for upper flange	1	EPDM/FPM	50-1
21	Discharge elbow	1	CFR-PP		38-2	O-ring for inner pipe	2	EPDM/FPM	G-55
22	Bolt for discharge elbow	4	SUS304	M10×70 with W,SW,N	38-3	O-ring priming water	1	EPDM/FPM	P-42
22-1	Bolt for discharge elbow	3	SUS304	M10×45 with W,SW,N	39	Oil seal	1	NBR	VC35485

List 4: Dimension table

Model	A	B	C	ϕD	E	F	G	H	ϕI	J	K	L	M	N	O	P
YD-2500NSF1-CP- J	435	256	177	154	175	202	231	664	125	90	20	280	200	340	244	135.5
YD-2501NSF3-CP- J	435	256	214	172	175	202	235.5	705.5	125	90	20	280	200	340	244	144
YD-2502NSF3-CP- J	435	256	214	202	175	202	273	743	125	90	20	280	200	340	244	168
YD-4001NSF3-CP- JN	460	272	199	172	185	238	235.5	706.5	145	105	20	300	230	360	274	144
YD-4002NSF3-CP- JN	460	272	199	202	185	238	273	744	145	105	20	300	230	360	274	168
YD-4003NSF3-CP- JN	460	272	199	202	185	238	302	773	145	105	20	300	230	360	274	168
YD-5002NSF3-CP- JN	489	294	206	202	194	264	273	773	155	120	20	320	260	380	304	168
YD-5003NSF3-CP- JN	489	294	206	202	194	264	302	802	155	120	20	320	260	380	304	168
YD-5005NSF3-CP- JN	489	294	206	243	194	264	326	863	155	120	20	320	260	380	304	187

[YD-SF series]

Picture 3: Cross-sectional drawing



List 5: Parts list

NO.	PARTS NAME	Q'TY	MATERIAL	NOTE	NO.	PARTS NAME	Q'TY	MATERIAL	NOTE
1	Motor	1			15	Bolt for motor mount	14	SUS304	4 pieces for M12×25 10 pieces for M12×50
2	Bolt for motor	4	SUS304	3.7kW：M12×25 with W 5.5/7.5kW：M12×30 with W	16	Main body	1	Epoxy	
3	Motor flange	1	SS400		17	Shaft	1	S45C+Hastelloy	
4	Bolt for motor flange	6	SUS304	3.7kW：CAP M8×20 5.5/7.5kW：Countersunk bolt M12×30 with W M8×20	18	Shaft sleeve	1	HT.PVC	
5	Motor mount	1	SS400		19	Bolt for pump body	12	SUS304	M12×45 with W
6	Seal case	1	HT.PVC		20	Casing	1	Epoxy	
7	O-ring for seal case	1	EPDM/FPM	G-100	21	O-ring for casing	1	EPDM/FPM	AS568-280
8	Counter face ring	1	Carbon		22	Drain cap (with Gasket)	1	CFR-PP	
9	Dry seal	1	FPM	3.7kW：ϕ38,5.5/7.5kW：ϕ48	23	Drain bolt	1	PP	
10	Discharge elbow	1	Epoxy		24	Impeller	1	HT.PVC	
11	Valve	1	HT.PVC		25	O-ring for impeller	1	EPDM/FPM	3.7kW:P-38 5.5/7.5kW:P-48
12	O-ring for discharge elbow	1	EPDM/FPM	AS568-260	26	Impeller key	2	Titanium	
13	Bolt for discharge elbow	8	SUS304	2 pieces for M12×35 6 pieces for M12×60	27	Impeller nut	1	HT.PVC	
14	Water priming plug (with Gasket)	1	CFR-PP		28	O-ring for impeller nut	1	EPDM/FPM	3.7kW:P-34 5.5/7.5kW:P-38

List 6: Dimension table

型式	A	B	C	ϕD	E	F	G	H	ϕI	J	K	□L	□M	N
YD-8005SF3-EP- M	810	380	228	243	240	347	359	967	195	150	50	360	450	151.5
YD-8007SF3-EP- M	810	380	228	285	240	347	397	1005	195	150	50	360	450	201.5
YD-8010SF3-EP- M	810	380	228	285	240	347	397	1005	195	150	50	360	450	201.5
YD-10007SF3-EP- M	810	380	228	285	240	347	397	1005	225	175	50	360	450	201.5
YD-10010SF3-EP- M	810	380	228	285	240	347	397	1005	225	175	50	360	450	201.5

5. Model description

YD – 2501 NSF 3 – CP – D D 5 7 – J - N

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1) Bore and Motor output

Model	Suction bore	Discharge bore	Output
YD-2500NSF1-CP- J	25A	25A	0.4kW
YD-2501NSF3-CP- J			0.75kW
YD-2502NSF3-CP- J			1.5kW
YD-4001NSF3-CP- JN	40A	40A	0.75kW
YD-4002NSF3-CP- JN			1.5kW
YD-4003NSF3-CP- JN			2.2kW
YD-5002NSF3-CP- JN	50A	50A	1.5kW
YD-5003NSF3-CP- JN			2.2kW
YD-5005NSF3-CP- JN			3.7kW
YD-8005SF3-EP- M	80A	80A	3.7kW
YD-8007SF3-EP- M			5.5kW
YD-8010SF3-EP- M			7.5kW
YD-10007SF3-EP- M	100A	100A	5.5kW
YD-10010SF3-EP- M			7.5kW

(2) Model name: NSF/SF

(3) Motor type: 1: Other than IE3 3: IE3

(4) Material: CP: CFR-PP EP: Epoxy

(5) Dry seal material: D: Dry seal L: Linear seal

(6) O-ring material: E: EPDM D: FPM

(7) Frequency: 5: 50Hz 6: 60Hz

(8) Specific gravity: 1: 1.05 3: 1.35 4: 1.4/1.45 5: 1.5
6: 1.6 7: 1.7 8: 1.8 G: 2.0

(9) Shaft: J: Joint type

(10) Inner O-ring: N: New type (Standard for only 40/50NSF)

6. Standard performan

Model	Standard performance (50Hz)	Standard performance (60Hz)	Weight (kg)	Liquid temperature in use°C
YD-2500NSF1-CP- J	6m-60L/min	-	23	0～80
YD-2501NSF3-CP- J		8m-70L/min	26	0～80
YD-2502NSF3-CP- J	7m-60L/min		33	0～80
YD-4001NSF3-CP- JN	7m-100L/min	9m-150L/min	28	0～80
YD-4002NSF3-CP- JN			35	0～80
YD-4003NSF3-CP- JN			40	0～80
YD-5002NSF3-CP- JN	9m-200L/min	11m-200L/min	40	0～80
YD-5003NSF3-CP- JN			44	0～80
YD-5005NSF3-CP- JN			62	0～80
YD-8005SF3-EP- M	15m-350L/min	18m-350L/min	150	0～70
YD-8007SF3-EP- M			178	0～70
YD-8010SF3-EP- M	-		178	0～70
YD-10007SF3-EP- M	12m-700L/min	17m-700L/min	203	0～70
YD-10010SF3-EP- M			203	0～70

7. Disassembly / Assembly

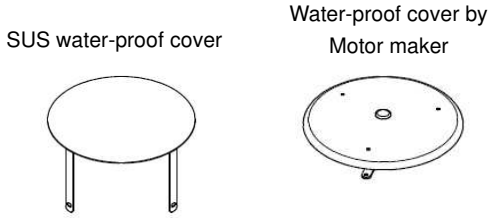
YD-NSF disassembling procedure

A. Remove the pump from plumbing and drain the internal liquid completely through the drain plug (10). Wash the inside thoroughly by water from the suction inlet / discharge outlet and priming hole.

B. Remove the water-proof cover (made by the motor maker or made in SUS)

(1) When the water-proof cover is attached, firstly remove it.
Motor maker: Separate the fan cover and remove it, which is three-bolted at the back, by a screwdriver.
SUS: It is bolted with the fan cover, so it can be separated when the fan cover is removed.

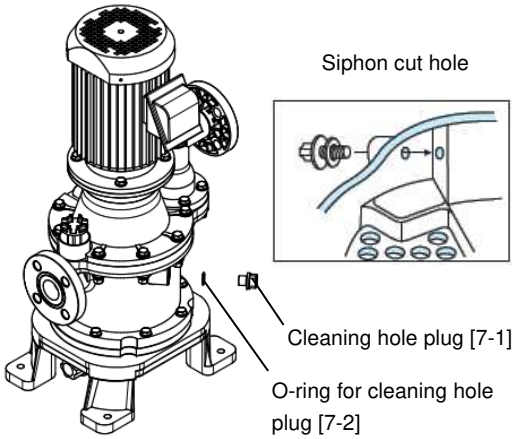
(2) Undo the fan cover after removing the water-proof cover.



C. Clean the siphon cut hole

(1) Remove the cleaning hole plug [7-1] which is attached with the pump body [7].
Remove the O-ring for cleaning hole plug (7-2) together.

(2) Clean the siphon cut hole which is an extension of the cleaning hole.

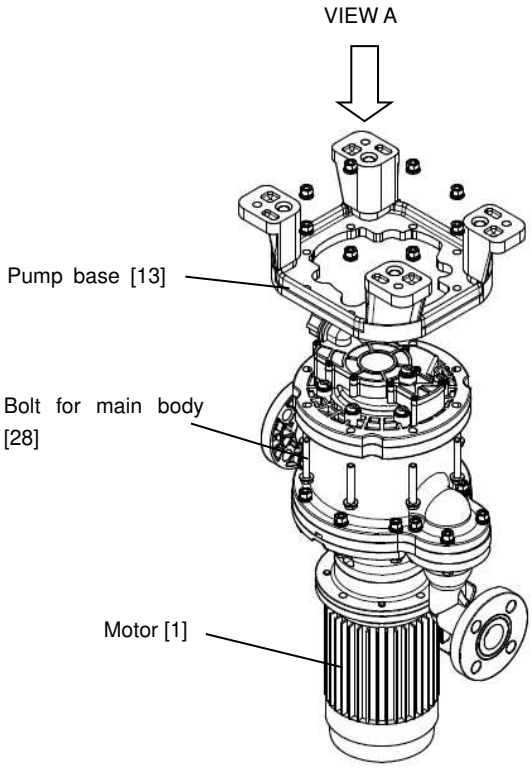


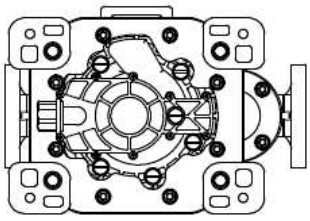
D. Remove the pump base

(1) Turn over the pump that the motor [1] is on the bottom.
*Be very careful not to fall the pump when disassembling.

(2) Remove the 8 pcs of the bolt for pump body [28] which fix the pump base [13] and separate the pump base.

Bolt for the pump body [28]
Recommended torque: 14.7N·m (150kgf·cm)





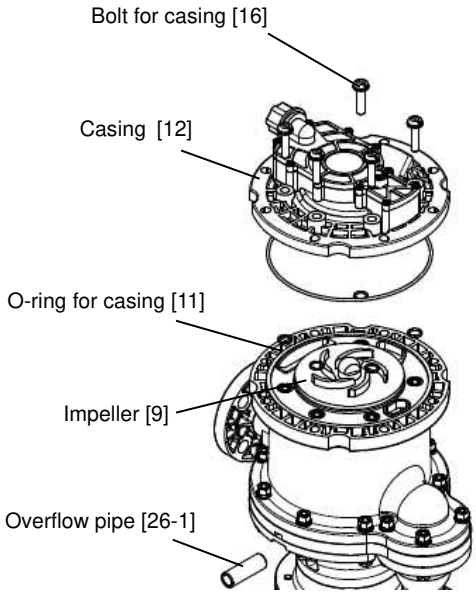
VIEW A

E. Remove the casing

(1) When removing 5 pcs of the bolt for casing [16] and separating the casing [12], the impeller [9] can be seen.

Insert the O-ring for casing [11] and 5 pcs of the O-ring for main body [17] with care when assembling.

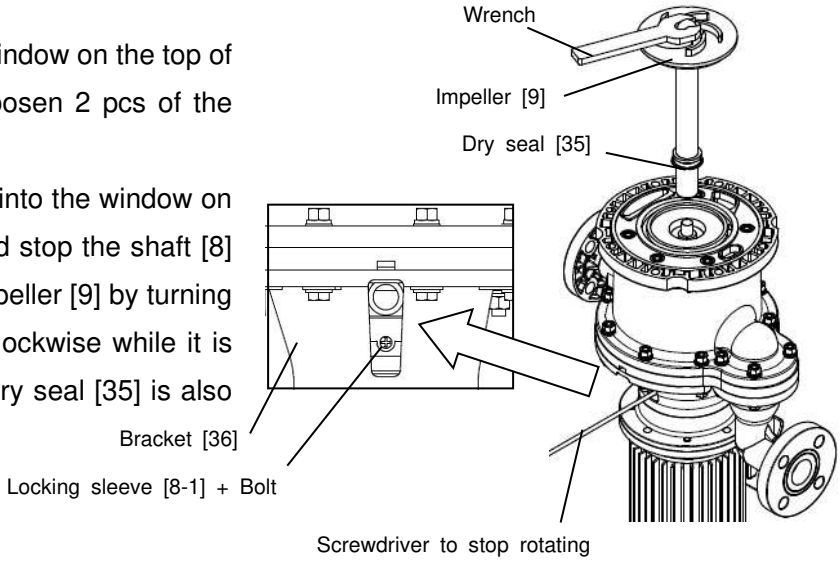
(2) Separate the overflow pipe [26-1] from the seal case [26].



F. Remove the impeller

(1) Insert a screwdriver into the window on the top of the pump bracket [36] and loosen 2 pcs of the bolt which fix the bush [8-1]

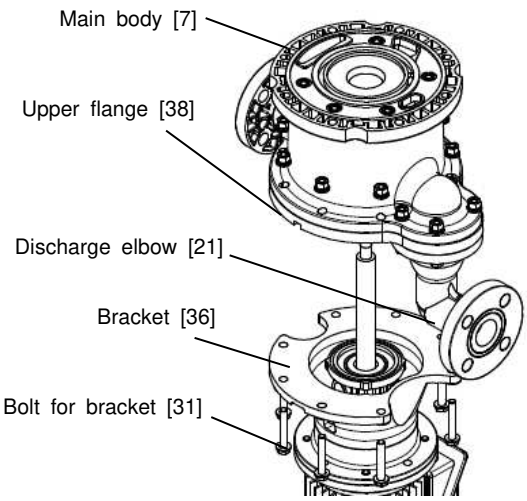
(2) Similarly, insert a screwdriver into the window on the top of the bracket [36] and stop the shaft [8] rotating. Then, remove the impeller [9] by turning the impeller nut [9] the anti-clockwise while it is pinched with a wrench. The dry seal [35] is also removed.



G. Remove the main body, upper flange and discharge elbow

(1) Remove 8 pcs of the bolt for the bracket [31] and separate the main body [7], upper flange [38] and discharge elbow [21] from the bracket [36] as a whole.

Bolt for the bracket [31]
Recommended torque: 14.7N・m (150kgf・cm)



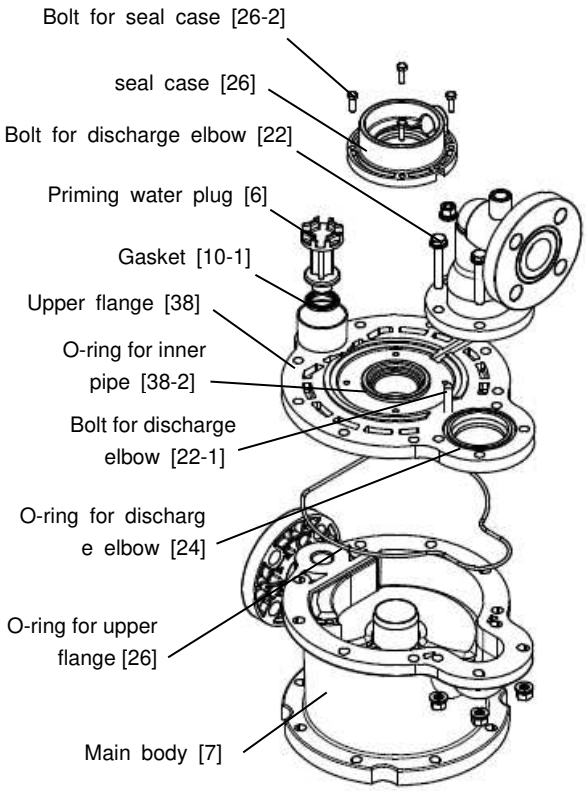
H. Disassemble the upper flange

(1) Remove the priming water plug [6] and gasket [10-1] from the main body [7].

(2) Remove the bolt for discharge elbow [22] [22-1] and separate the discharge elbow [21]. The O-ring for discharge elbow [24] is removed together.

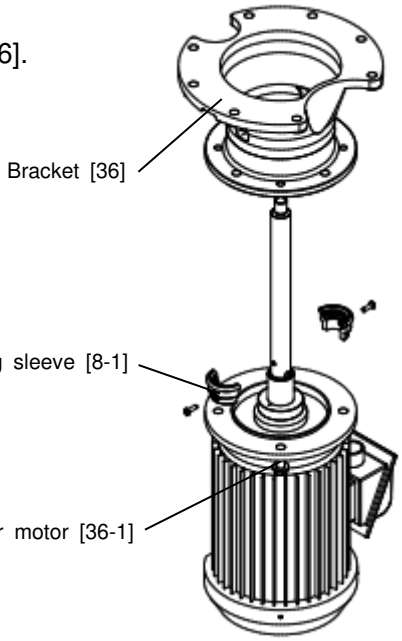
(3) Remove the upper flange [38] and O-ring for upper flange from the main body [7] together.
At this time, it may be slightly hard for the O-ring for inner pipe [38-2], so remove them by using 2 notches under the upper flange [38].

Bolt for discharge elbow [22] [22-1]
Recommended torque: 14.7N·m (150kgf·cm)



I. Remove the seal case

(1) Remove 4 pcs of the bolt for seal case [26-2] and seal case [26].



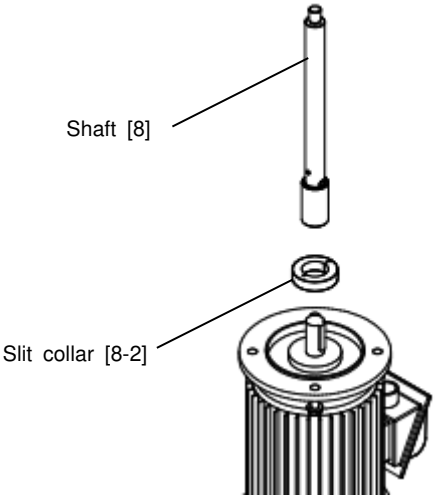
J. Remove the bracket

(1) Remove the locking sleeve [8-1] (2 pcs of halved) from the shaft [8].

(2) When 4 pcs of the bolt for motor [36-1] is removed, the bracket [36] is separated.
Notice: Never disassemble the motor bracket and pump bracket, because they are integrated.

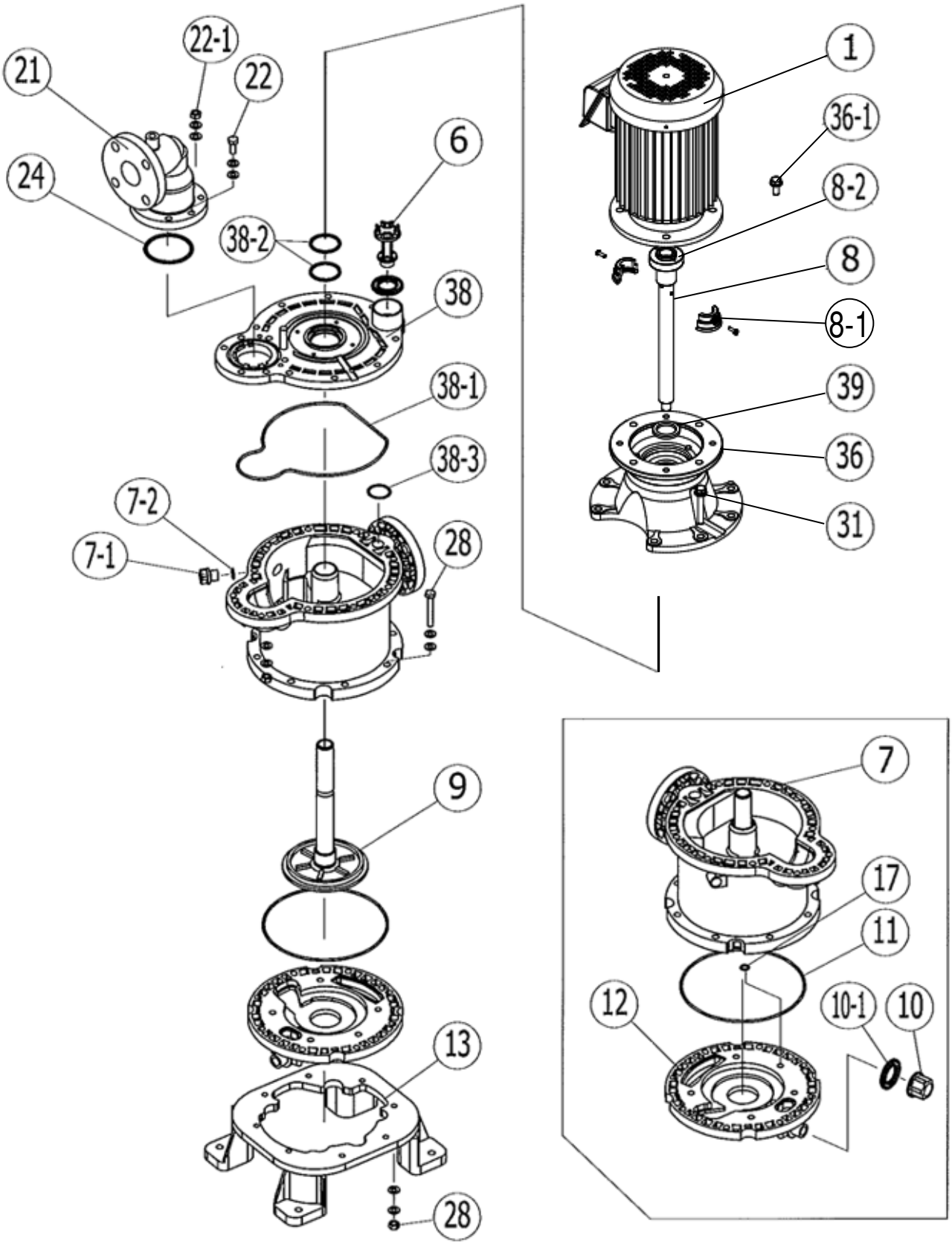
K. Remove the shaft

(1) Loose the slit collar [8-2] and pull the shaft [8] out from the motor [1].



This is the end of the procedure of disassembly and the assembly is the opposite. All bolts are for right screw. Tighten them the clockwise.

YD-NSF exploded view



YD-SF disassembling procedure

A. Remove the pump from plumbing and drain the internal liquid completely through the drain plug (22). Wash the inside thoroughly by water from the suction inlet / discharge outlet and priming hole.

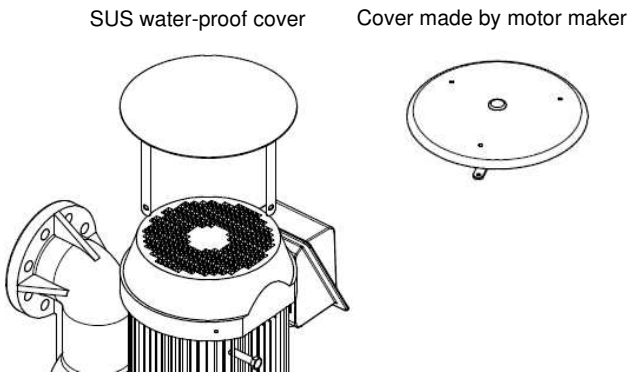
B. Remove the water-proof cover (made by the motor maker or made in SUS)

(1) When the water-proof cover is attached, firstly remove it.

Motor maker: Separate the fan cover and remove it, which is three-bolted at the back, by a screwdriver.

SUS: It is bolted with the fan cover, so it can be separated when the fan cover is removed.

(2) Undo the fan cover after removing the water-proof cover.



C. Remove the discharge elbow and overflow pipe

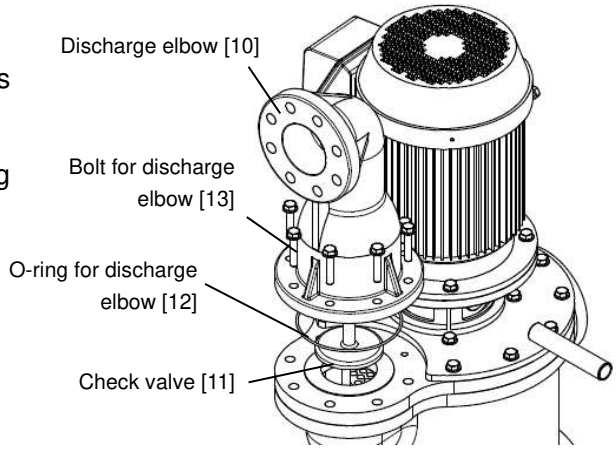
Remove the discharge elbow [10] by removing 8 pcs of the bolt for discharge elbow [13].

At that time, remove the check valve [11] and O-ring for discharge elbow [12] together.

Bolt for discharge elbow [13]

Recommended torque: 23.5N・m (240kgf・cm)

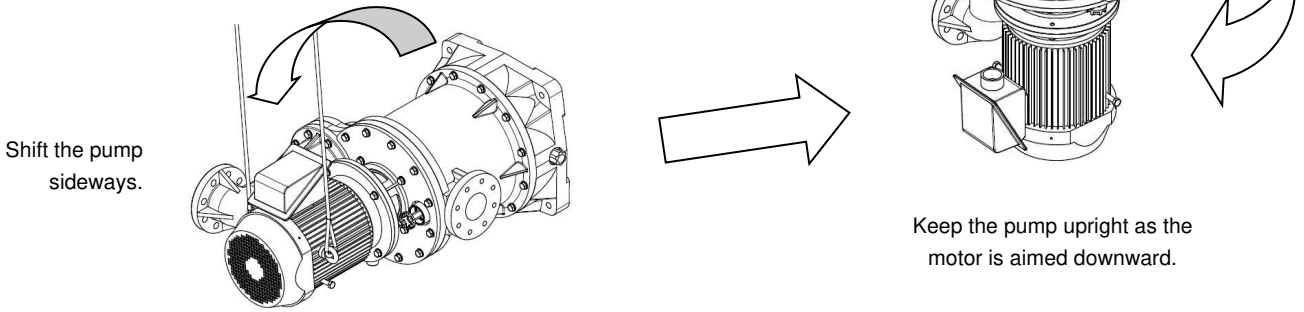
Remove the overflow pipe.



D. Turn the pump upside down

Shift the pump sideways by a crane as the terminal box of the motor [1] is shown an upward.

Attach a rope of the crane with the motor and keep the pump upright as the motor [1] is aimed downward.



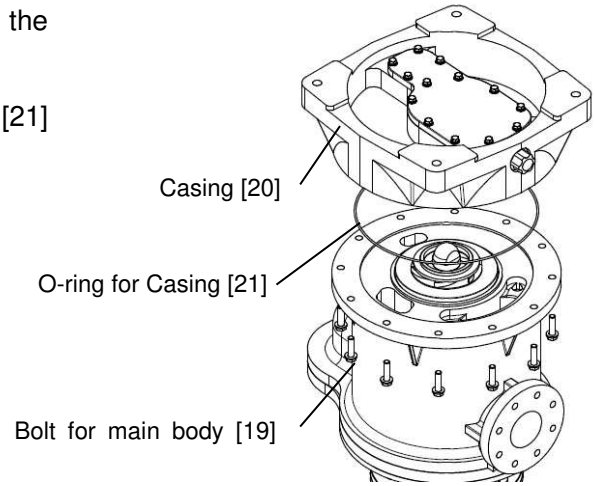
E. Remove the casing

Remove the casing [20] by removing 12 pcs of the bolt for main body.

At that time, remove the O-ring for casing [21] together.

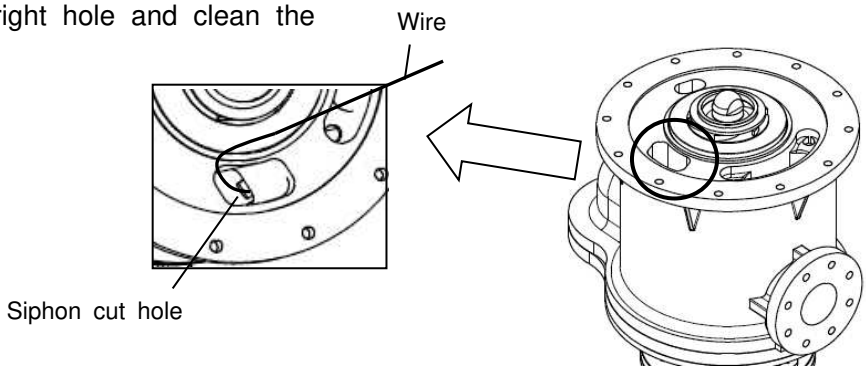
Bolt for the main body [19]

Recommended torque: 23.5N・m (240kgf・cm)



F. Clean the siphon cut hole

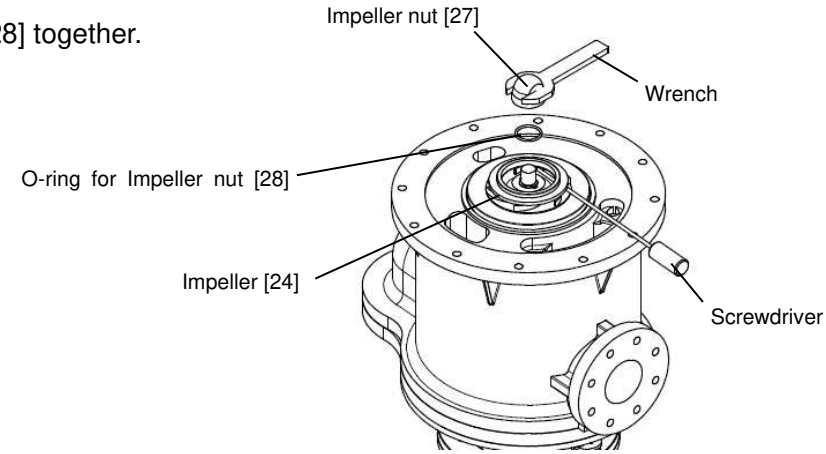
After removing the casing [20], insert the hook shaped wire through the right hole and clean the siphon cut hole.



G. Remove the impeller nut

Fix the blade of the impeller by a screwdriver not to rotate it and remove the impeller nut [27] by rotating it the anti-clockwise with a wrench.

Remove the O-ring for impeller nut [28] together.

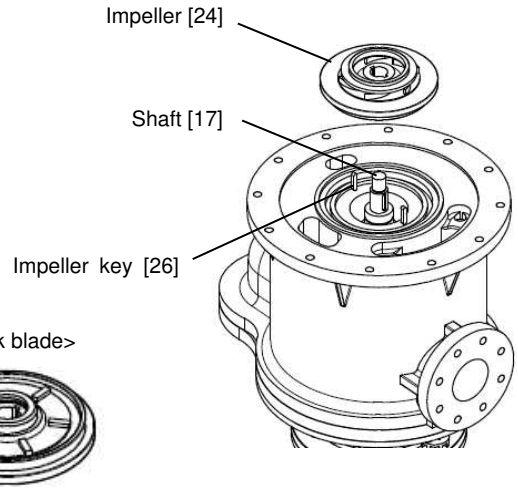


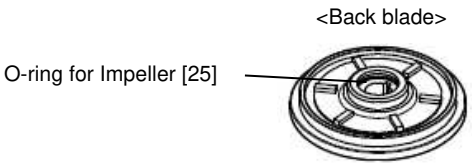
H. Remove the impeller

Pull out the impeller [24] from the shaft [17].

The O-ring for impeller [25] is separated with the impeller [24].

After that, remove the 2 pcs of the impeller key [26].

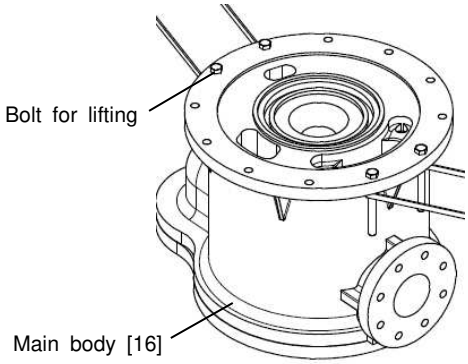




I. Remove the main body

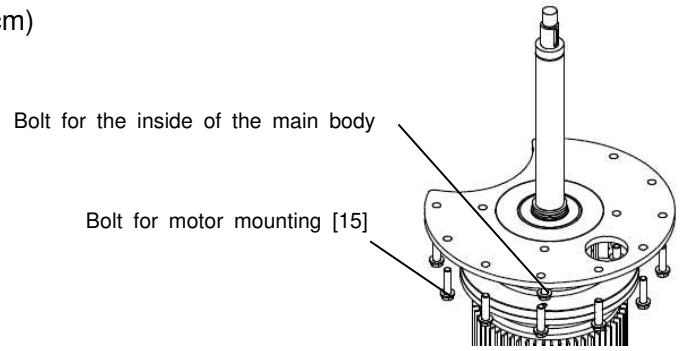
Remove 10 pcs of the bolt for motor mounting [15] and 4 pcs of the bolt inside the main body and lift the main body [16] by using a crane.

*Attaching 4 pcs of long bolt to the main body makes it easier to lift the pump.



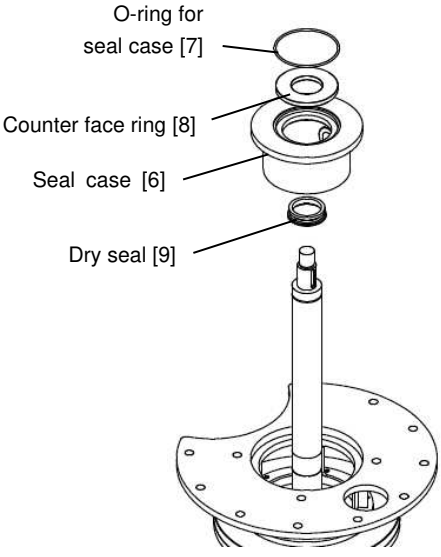
Bolt for motor mounting [15], Bolt for the inside of the main body

Recommended torque: 23.5N・m (240kgf・cm)



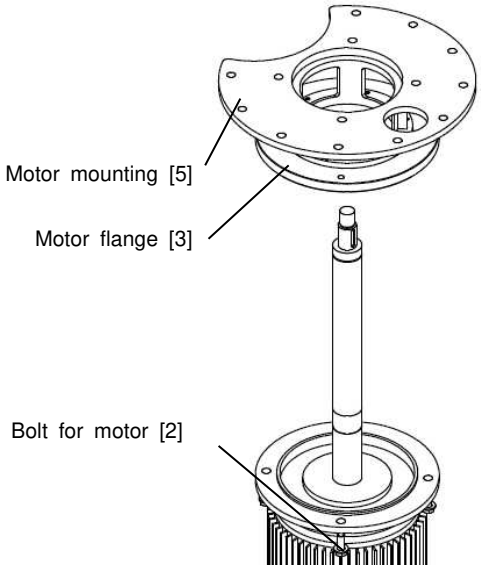
J. Remove the seal case

Remove the seal case [6] from the shaft [17]. At that time, separate the counter face ring [8], O-ring for seal case [7] and dry seal [9] as a whole.



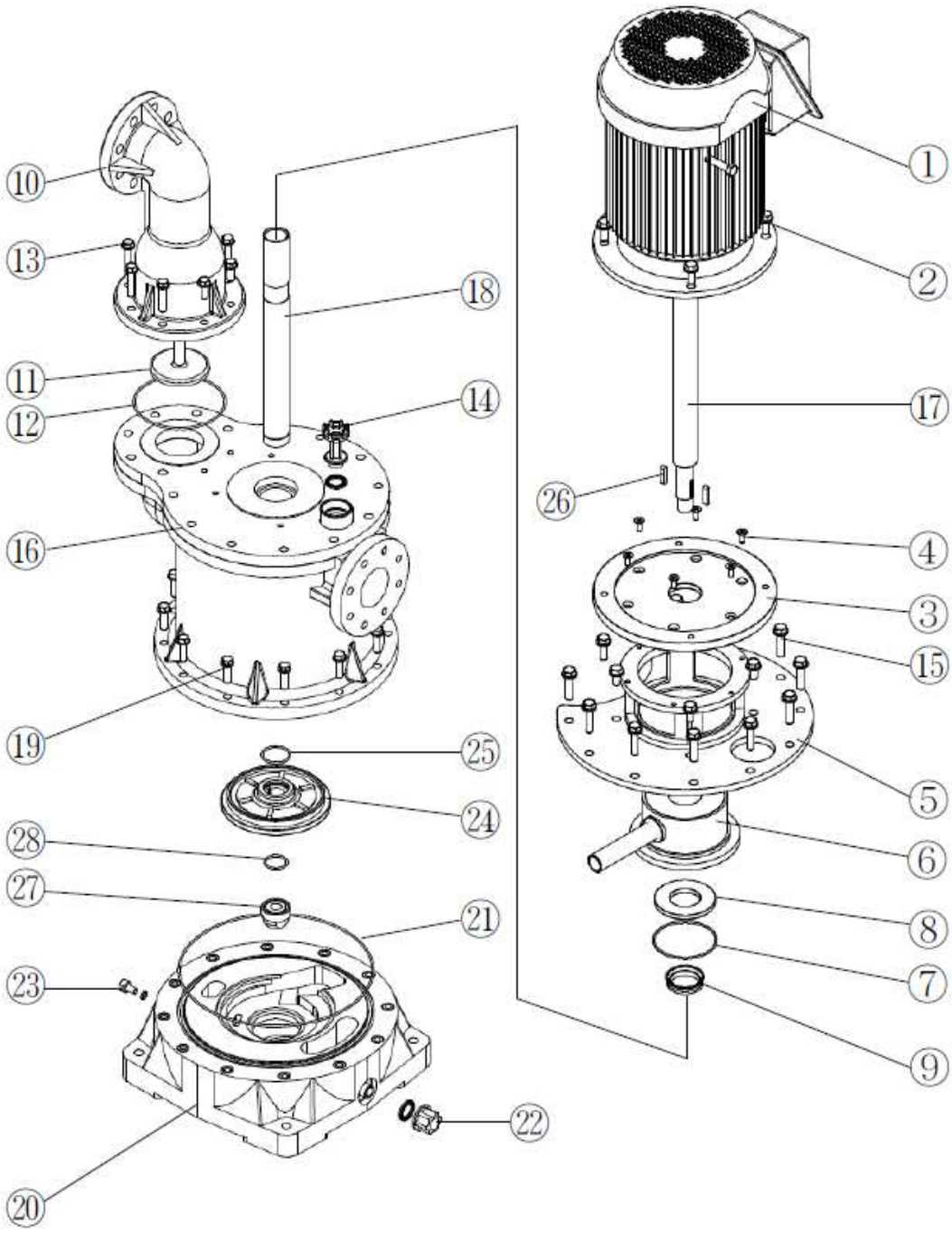
K. Remove the motor mounting and motor flange
Remove 4 pcs of the bolt for motor mounting [2] and separate the motor mounting set (Motor mounting [5] & Motor flange [3]).

Bolt for motor [2]
Recommended torque: 23.5N·m (240kgf·cm)

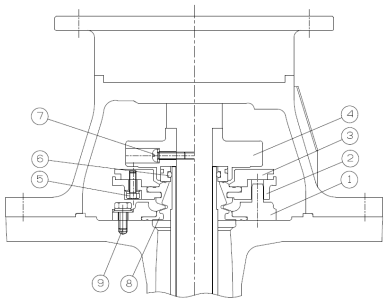


The above is how to disassemble the pump. The assembly is opposite of this procedure.
Replace the new O-ring, gasket or seal when assembling the pump.

YD-SF: Exploded view



8. YD-NSF-LR (Linear seal structure)



1	Movable seal base	CFR PP	1
2	Movable seal lower	CFR PP	1
3	Movable seal upper	CFR PP+Magnet	1
4	Rotating disk	CFR PP +Magnet+Ceramic	1
5	Cross-recessed hex. bolt	SUS	8
6	O-ring for rotating disk	FPM	1
7	Cross-recessed pan head bo	SUS	2
8	Phragm	FPM	1
9	Cross-recessed hex. bolt	SUS	8

General description

The pump can be operated as the end suction because the liquid is sealed by the back blade during operation and the linear seal seals liquid at the stoppage of the operation.

- Linear seal

  Linear seal is a shaft sealing to prevent liquid leaks when the pump stops. The sealing part is contact-less state during operation, so there are no abrasion and no contact with liquid. It is a special sealing structure which us not affected by slurry.

  At the stoppage of the operation, the movable seal goes upwards and contacts with the rotating disk to seal liquid. At the same time of the operation, the movable seal goes down and the seal part is opened and contact-less state. The state continues during operation.

  Visually check that the movable seal goes down when the pump starts.

  If the pump is operated without the movable seal going down, the sealing failure occurs.

  * Make sure to wear protectors because liquid may spill out for any error.

- Caution

  If the pump is controlled by an inverter

  As the rotating speed (Frequency) of the pump shaft (Motor) is low, the linear seal has trouble. Therefore, when the frequency is controlled, set 40Hz or less (Rotating speed: 2400rpm or less) as the lowest frequency.

  If it is operated lower the above frequency (Rotating speed), the linear seal may not work properly and it leads to the pump damage. Besides, set the frequency of the addition-subtraction at the start/stop of the inverter minimum (approx. 0.5 seconds).

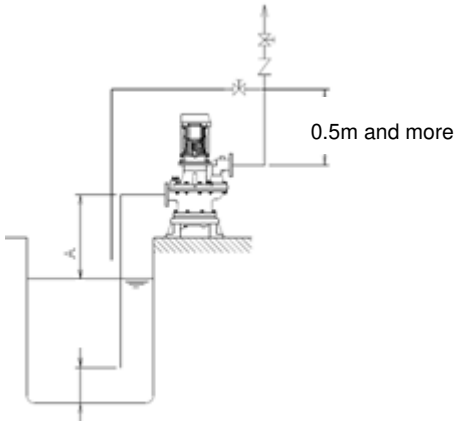
  If the time of addition-subtraction is long, the linear seal may not work properly and liquid leaks may occur.

9. Handling precautions

(1) Remove the bore stickers for the inlet and outlet before piping.
(2) Do not rotate the pump backwards. (Except for instantly rotating to check the direction.)
(3) The structure is that a certain amount of liquid remains in the casing when the pump stops.
(4) If liquid is easily bubbling, pumping liquid may take a longer time or failure. It causes the pump damage.
(5) If much slurry enters into the pump, it infills the back blade of the impeller and the pump loses the sealing ability. It causes liquid leaks.
(6) Liquid of high S.G. or temperature takes much time for self-priming and it is recommended to shorten the length of the suction pipe.
(7) If much air enters during pumping, the self-priming failure occurs. If the pump continues to be operated, it leads the deformation or burn out of the pump and casing because the liquid temperature rises.
(8) Install a vertical pipe at the discharge side more than 0.5 meter and attach a bypass pipe for air release not to reduce the self-priming ability.
(9) Shorten the suction pipe length to minimize the resistance loss.
(10) The suction height is decreased depending on the type, specific gravity and temperature of the liquid. It is recommended to set the height enough low by considering them.
(11) It is recommended to place bending and expansion joints to prevent the deformation of the pump or liquid leak by the thermal expansion of piping.
(12) When using the pump for waste liquid, set the strainer at the suction inlet to prevent dust or foreign object.
(13) When transferring the pump to change the installation site or repair, drain the liquid completely and wash the pump with water to ensure safety.
(14) Be careful about handling the pump not to make an impact, because of the plastic pump base.
(15) Make sure to pour priming water (Liquid in use) through the priming plug before the first operation.
(16) If the dry running or liquid sealing operation occurs by mistake, the inside may be high temperature. If the priming plug is opened at that time, the steam or hot liquid spills out. Make sure to open it after fully decreasing in temperature.
The minimum capacity of YD-2500NSF1 during operation is 10L/min and other model is 20L/min. Operate the pump with the capacity more than the above minimum one.
(17) The stop-start frequency of the pump should be less than six times per hour. More frequent operation strains the motor and pump. Prevent it because of their damage.
(18) Re-tighten the drain and priming plug periodically. If not, liquid leakage or self-priming failure may occur.
(19) Using an inverter makes the pump performance change.
The self-priming ability is declined or the failure occurs at once. In this case, stop to use the inverter.

10. Installing & piping

The correct installation and piping make the pump perform appropriately. The necessary requirements of a self-priming pump are to exhaust the air entered during self-priming and keep priming liquid for the next operation completely. For the smooth operation, install the pump in accordance with the following instruction.



1. Attach the check valve to the discharge piping.
2. Set a pipe vertically more than 0.5 m
   at the discharge outlet and install the air release pipe with a valve. * Always slightly open the air release pipe and back to the tank.
3. Limit of suction height (Normal tem. / Clear water) A

Model	A (in terms of water)
YD-250*NSF(1)3	2.5m or less
	* LR: 2.0m or less
YD-400*NSF3	3.0m or less
YD-500*NSF3	3.5m or less
YD-800*SF3	
YD-100**SF3	

4. Limit of end suction(Only LR series)：2.0m or less.

D: Piping diameter

(1) The limit of suction height “self-priming ability” assumes that the suction pipe is plumbed to the surface of clear water at 20 degrees. The actual self-priming ability is reduced by the type, temperature, viscosity and specific gravity of liquid, the shape, length and diameter of the suction pipe, the number of valves and the mixed air from the flange and valves. It is recommended to use the pump under the condition with enough allowance.

(2) Install expansion joints with 2 and more bents to the pipe and release heat, so that the pipe is not deformed or damaged by thermal expansion.

(3) Do not use a foot valve in the suction piping. (It is available for NSF-LR)

(4) Align the surface of the pipe and pump flange and do not tighten bolts too much.
Recommended tightening torque of M16 bolt: 19.6N･m(200kgf･cm)

(5) When piping, match the assembly dimensions. If not, the casing may be damaged.

(6) When piping, do not use woven fabric or resin gaskets as a flange gasket. Use the rubber gasket for sealing because the pump sealing is made of resin.

(7) Secure the pump with anchor bolts.

(8) Make sure to close the priming water plug firmly after pouring priming water (liquid in use) to the pump. If O-ring does not work well during operation, self-priming failure may occur.

11. Maintenance

◆ Daily inspection

- Check no liquid leakage before the operation. If any, stop the operation and take appropriate measures.
- Check that the pump works smoothly without generating abnormal sounds or vibration.
- Check the liquid level in the suction tank and the suction pressure.
- Compare the flow rate, discharge pressure and current value during operation with the figures in the nameplate to check if the load of the pump is normal.
  ※ The indication of the pressure gauge is proportional to the specific gravity of the liquid.
- If there are spare pumps, keep them ready for use by operating from time to time.
  ※ As a guide, it is recommended to operate them once three months.
- Check for fluctuations of discharge pressure, discharge flow rate and motor current/voltage. If they fluctuate greatly, see “Troubleshooting” and take appropriate actions.

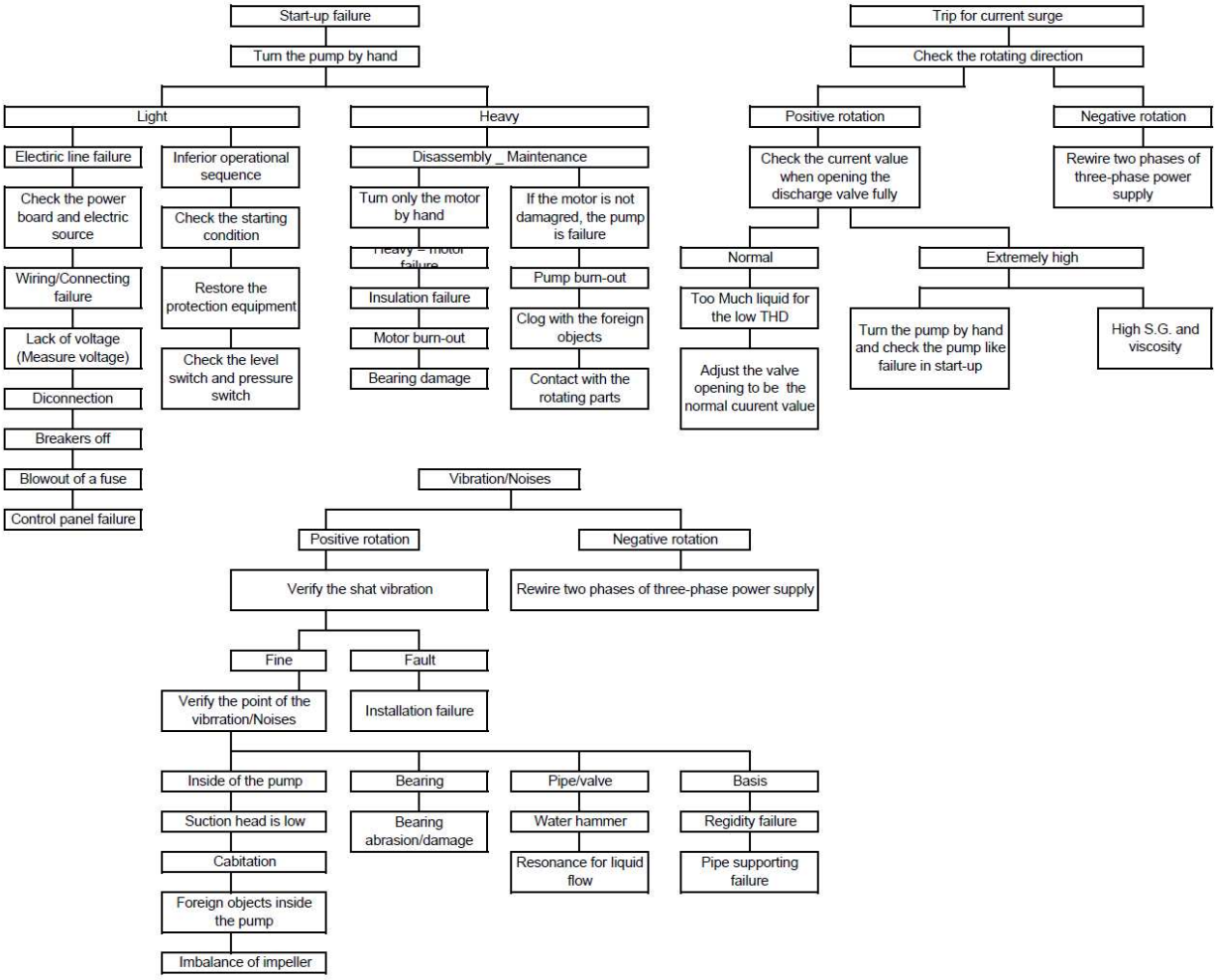
◆ Periodic inspection

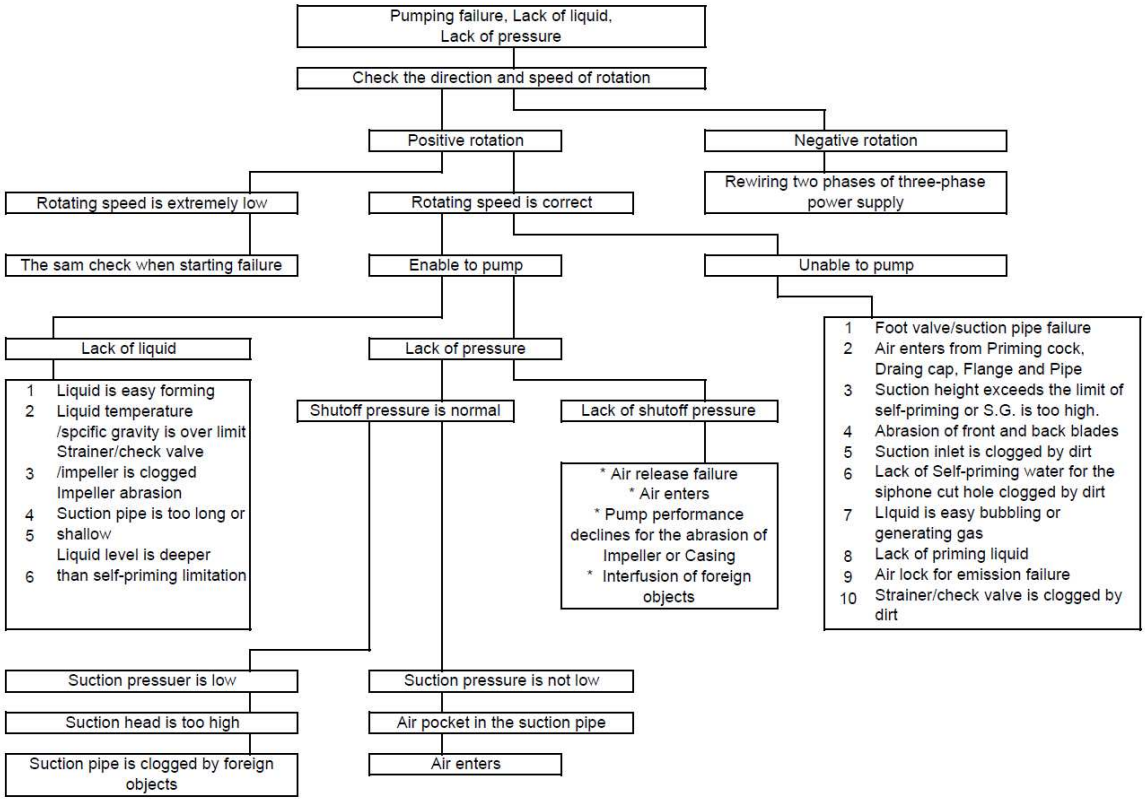
To ensure smooth operation of the pump, carry out the following periodic inspection procedures.

At the time of the overhaul inspection, take care not to damage the seal parts.

Inspection period	Parts name	What to be checked	Correction
Once a year or 1,000 hours ※ Keep the check record.	Motor	● Sound of bearing (Check for abnormal sounds during operation). ● Vibration. ● Tightness of pump base bolts.	○ Replace the bearing. ○ Contact us or the nearest distributer in the event of abnormality. ○ Retighten the bolts.
	Bracket	● Scratch, flaw or crack. ● Corrosion. ● Worn/corroded oil seal.	○ Replace the part in the event of abnormality. ○ Replace the part in the event of abnormality. ○ Replace the oil seal if it is corroded or worn away greatly.
	Discharge elbow Pump body Casing	● Scratch, flaw, crack or wear. ● Adhere scales inside Wet Parts Kit. ● Swelling or corrosion of O-ring. ● Deformation Check whether the siphon cut hole is clogged.	○ Replace the parts in the event of abnormality. ○ Remove scales. ○ Replace the parts in the even to abnormality. (Replace O-rings to new ones at the time of disassembly and inspection.) ○ If piping is applied a load, remove it. ○ If it is clogged, remove the cleaning plug and clean the siphon cut hole.
	Impeller	● Sliding mark on the whole impeller. ● Corrosion. ● Looseness of impeller nut.	○ Replace the part in the event of abnormality. ○ Replace the part in the event of abnormality. ○ In the event of abnormality, remove the impeller and nut, check for corrosion on the shaft and retighten the impeller nut. If the shaft is corroded, contact your supplier.

12. Troubleshooting





Warranty / Repair

1. Warranty period and coverage
   (1) The warranty period is 12 months from dispatched from our factory.
   (2) During warranty period, if the pump breaks down or is damaged at the use under the condition instructed in this manual due to manufacturing defect(s), the failure parts are repaired free of charge.
   (3) Even if the failure occurs within the warranty period, the followings are repaired or replaced for compensation in principle.
   - Breakdown or damage due to different use or safekeeping from the instructions in this manual.
   - Breakdown or damage due to incorrect use or unjust repair or modification.
   - Breakdown or damage as result of pollution, salt damage, gas damage, abnormal voltage or undesigned power (voltage, frequency) as well as fire, earthquake, flood disaster, lightning strike or other natural disaster.
   - Abrasion or degradation of consumable parts like a gasket or O-ring.
   - Breakdown or damage during transportation, for relocation or fall after your purchase

   (4) We cannot be responsible for the break down or damage of the customer-specified pump.
   (5) Irregularities or breakdowns due to chemical or hydrodynamic corrosion by liquid are not covered under the warranty. The material chosen at the time of the contract is only a recommendation. We do not guarantee the chemical resistance of the material.
   (6) If the determination of the cause for the breakdown or damage is questionable, it attributes to the negotiation between the customer and us.
   (7) Expenses or other damage incurred as a result of breakdowns at the use under the different condition from the instruction in this manual are not covered under the warranty.
2. Repair

Notice:
For repair, consult the supplier. When returning a pump, thoroughly clean and pack the wet parts kit.

If irregularities are detected during operation, stop the operation immediately for check. (Refer to the section on “troubleshooting”).

(1) Consult your supplier or us for repair.
(2) Read this manual again and re-check before requesting repair.
(3) When visiting to a distance location for repair, the travel expenses are charged.
(4) Inform the followings when requesting repair.
- Model name and serial number
- Use duration and condition
- Damages parts and condition
- Liquid (Name, Specific gravity, Temperature, Slurry)

If liquid leaks during transportation, it is very dangerous, so make sure to clean inside thoroughly. When ordering replaced parts, specify the name in the parts name list (P7～10). Although, inform the parts’ number and material, too.

Installation record

Model:	
Purchase date:	Serial number:
Start date:	Supplier:

Ver.20240819

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