



LIB400 / LIB750 / LIB1500 & PAL400 / PAL750

Submersible Dewatering Pump

User Information Manual



We

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DECLARATION OF CONFORMITY



Declare that this DOC is issued under the sole responsibility of the manufacturer.

Apparatus model/Product: Pump
Type: Liberator Pump Range

The object of the declaration described above is in conformity with the relevant Statutory Requirements:

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016

EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer

Object of the declaration:

Equipment: Pump
Model name/number: Liberator Pump Range

The object of the declaration described above is in conformity with the following Community harmonization legislation:

Directive 2006/42/EC of Machinery Safety Directive
Directive 2014/30/EU of Electromagnetic Compatibility Directive

Full documents available upon request to TT Pumps Ltd

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DECLARATION OF CONFORMITY



Declare that this DOC is issued under the sole responsibility of the manufacturer.

Apparatus model/Product: Pump
Type: Puddlepal

The object of the declaration described above is in conformity with the relevant Statutory Requirements:

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INTRODUCTION

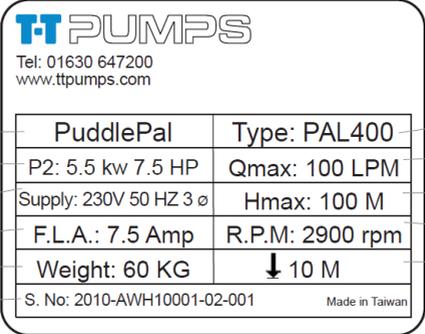
Thank you for selecting the Liberator/Puddlepal submersible dewatering pump.

This instruction manual explains the product operations and gives important precautions regarding its safe use. In order to use the product to maximum benefit, be sure to read the instructions thoroughly and follow them carefully.

To avoid accident, do not use the pump in any way other than as described in this instruction manual especial on ! WARNING . . After reading this instruction manual, keep it nearby as a reference in case questions arise during use.

If this instruction manual should become lost or damaged, ask your nearest dealer or representative for another copy.

NAMEPLATE FORMAT



T.T. PUMPS Tel: 01630 647200 www.ttpumps.com			
Pump Model	PuddlePal	Type: PAL400	Pump Type
Pump Output	P2: 5.5 kw 7.5 HP	Qmax: 100 LPM	Capacity
Voltage	Supply: 230V 50 HZ 3 ϕ	Hmax: 100 M	Head Range
Electric Current	F.L.A.: 7.5 Amp	R.P.M: 2900 rpm	Speed
Pump Weight	Weight: 60 KG	↓ 10 M	Maximum immersion depth
Serial Number	S. No: 2010-AWH10001-02-001		Made in Taiwan

Prior to Operation

Check the following points upon receipt of your pump:

Is the pump exactly what you ordered? **Check nameplate.** It is especially important that you check whether the pump is to be used with **50 or 60 Hz.**

Has any damage occurred during shipment? Are any bolts or nuts loose?

Have all necessary accessories been supplied? (For a list of standard accessories see **Construction.**)

We recommend that you keep a spare pump on hand in case of emergencies.

Keep this instruction manual in a place for future reference.

Specifications

Check the nameplate for your pumps head (Hmax), volume (Qmax), speed (R.P.M.), motor voltage and current. Other specifications are noted in the chart below.

Item		Specifications		
Liquid handled	Type	Sewage, waste water, miscellaneous drain water		
Range	Power Supply	LIB/PAL 400	0.37 kw (1/2 HP)	Single / Three phase
		LIB 400A	0.37 kw (1/2 HP)	Single phase
		LIB/PAL 750	0.75 kw (1 HP)	Single / Three phase
		LIB 750A	0.75 kw (1 HP)	Single phase
		LIB 1500	1.5 kw (2 HP)	Single / Three phase
		LIB 1500A	1.5 kw (2 HP)	Single / Three phase
Materials	Pump Casing	Cast iron		
	Impeller	Hytrel		
	Shaft	SUS410 stainless steel		
Motor type		Dry type submersible motor		
Shaft seal lubrication oil		Turbine No.32 ISO VG-32		

Installation

1. Check the following before beginning installation

Installation resistance measurement:

With the motor and cable (excluding the power supply cable) immersed in water, use a Megger to measure the insulation resistance between ground and each phase of the motor, and again between each phase of the motor. The Megger should indicate an insulation resistance of **not less than 20mega ohms**. While making the measurement, keep the power supply cable off the ground.

We recommend that an auxiliary pump must be kept on hand in case of emergency.

2. Installation

Under no circumstances should cable be pulled while the pump is being transported or installed.

Attach a chain or rope to the grip and install the pump.

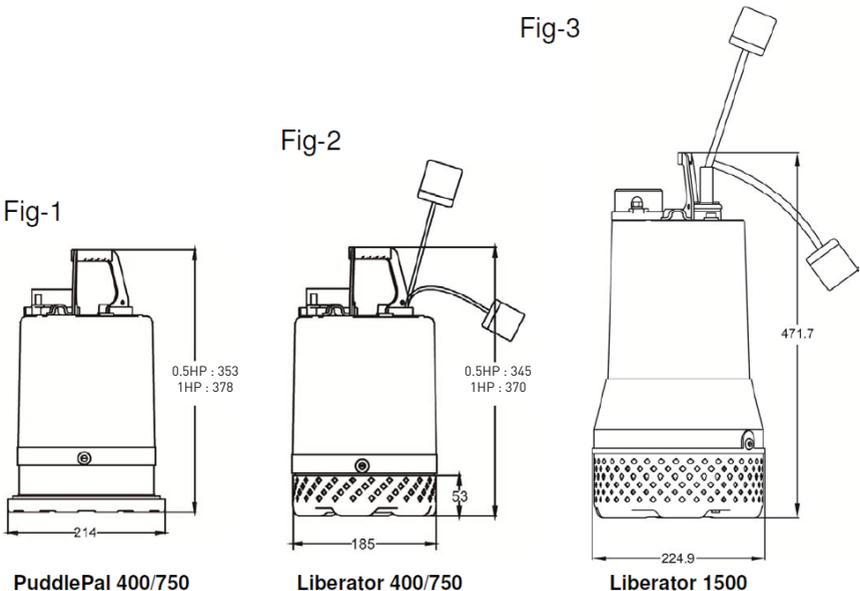
This pump must not be installed on its side or operated a dry condition. Ensure that it is installed upright on a secure base.

Install the pump at a location in the tank where there is the least turbulence.

If there is a flow of liquid inside the tank, support the piping where appropriate. Install piping so that air will not be entrapped. If piping must be installed in such a way that air pockets are unavoidable, install an air release valve wherever such air pockets are most likely to develop.

Do not permit end of discharge piping to be submerged, as backflow will result when the pump is shut down.

Non-automatic pumps do not have an automatic operating system. Do not operate the pump for a long time with the water level near the minimum operating level (L.W.L.) as shown in Fig.1, as the automatic cut-off switch incorporated inside the motor will be activated. To avoid dry operation, install an automatic operating system so that this will not happen, as shown in Fig.2, Fig.3 and maintain a safe operating water level.



Electrical Wiring

1. Wiring

A) Wire as indicated for the appropriate start system as shown in

Fig- 3 for single phase version and **Fig-4** for three one.

B) Loose connections will stop the pump. Make sure all electrical connections secure.

2. Cable

WARNING: Never let the end of the cable contact water.

C) If the cable is extended, do not immerse the splice in water.

D) Fasten the cable to the discharge piping with tape or vinyl strips.

E) Install the cable so that it will not overheat. Overheating caused by coiling the cable and exposing it to direct sunlight.

3. Grounding

To ground the green wire (label G). Under no circumstances should the green wire be connected to the power supply.

Fig.3

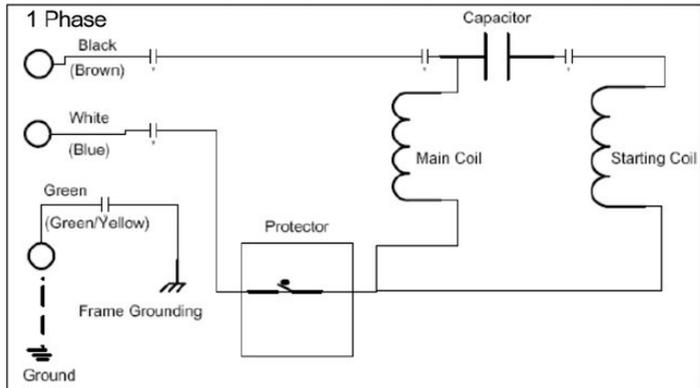
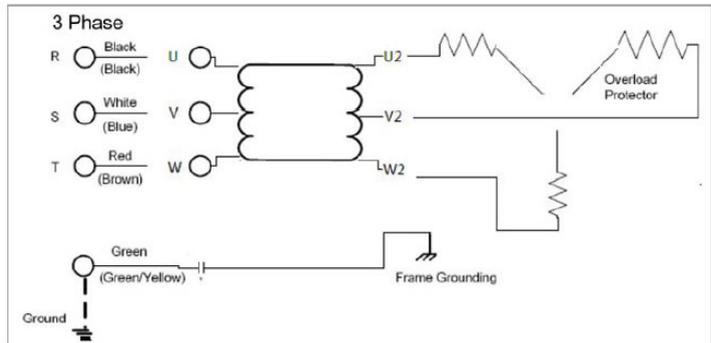


Fig.4



Operation

1. Before starting the pump

1. After completing installation, measure the insulation resistance again as described in Installation.

2. Check water level.

If the pump is operated continuously for an extended period of time in a dry condition or at the lowest water level, the motor protector will be activated. Constant repetition of this action will shorten pump service life. Do not start the pump again in such a situation until after the motor has completely cooled.

2. Test Operation...

Non-automatic pump (LIB/PAL)

Automatic pump (LIB A)

(1) Turn the operating switch on and off a couple of times to check for normal pump start.

For the LIB A

Floating switch must be raised for the pump to start.

(2) Next, check direction of rotation. If discharge volume is low or unusual sounds are heard when the pump is operating, rotation has been reversed. When this happens, reverse two of the wires.

Maintenance

Check pressure, output, voltage, current and other specifications. Unusual readings may indicate. Refer to Troubleshooting and correct as soon as possible.

1. Daily Inspections

Check current and ammeter fluctuation daily. If ammeter fluctuation is great, even though within the limits of pump rating, foreign matter may be clogging the pump. If the quantity of liquid discharged falls suddenly, foreign matter may be blocking the suction inlet.

2. Regular Inspections

Monthly inspections

Measure the insulation resistance. The value should be more than 1M ohm. If resistance starts to fall rapidly even with an initial indication of over 1M ohm, this may be an indication of trouble and repair work is required.

Annual inspections

To prolong the service life of the mechanical seal by replacing the oil in the mechanical seal chamber once a year. Water mixed the oil or cloudy textures are indications of a defective mechanical seal requiring replacement.

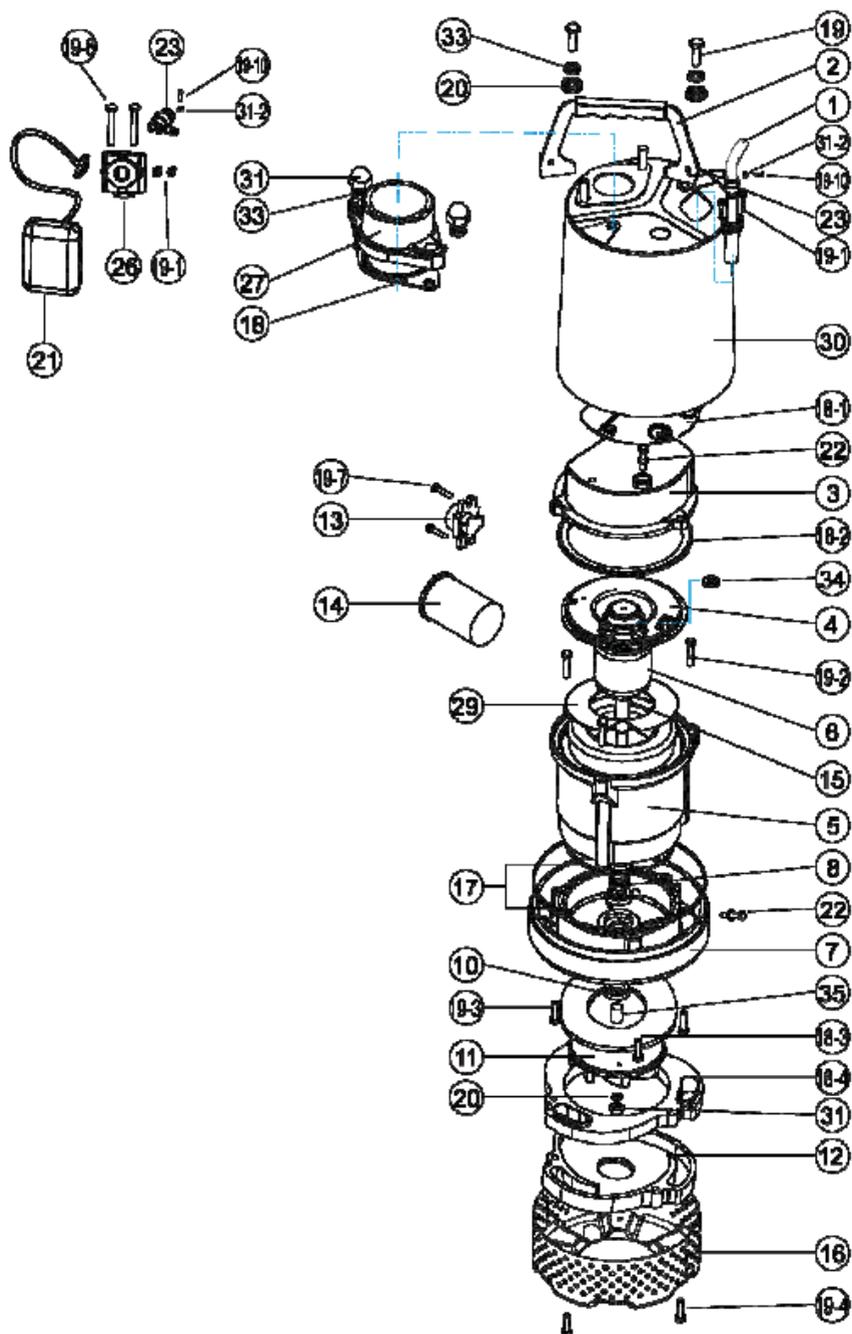
When replacing the oil, lay the pump on its side with filler plug on top. Fill suitable amount turbine oil No.32 (ISO VG-32)

Inspections at 3-5 year intervals

Conduct an overhaul of the pump. These intervals will help to avoid possible failure in future.

3. Parts need to be replaced.

Construction

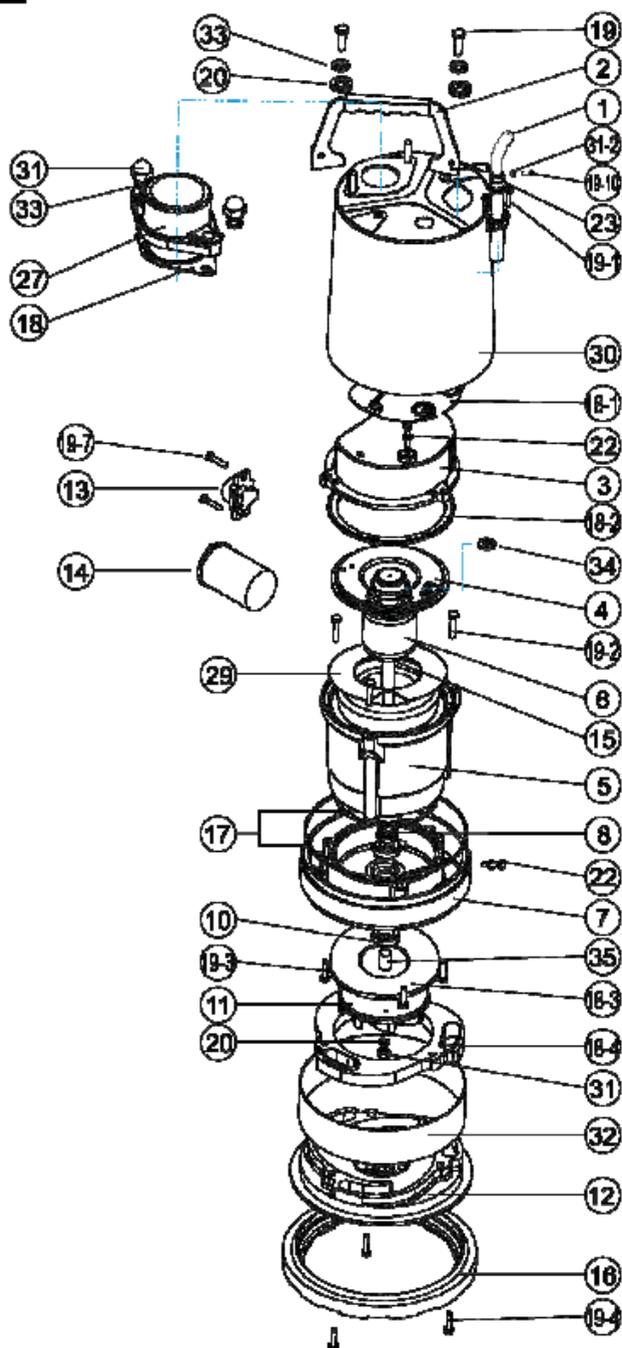


LIB 400/750

NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		13	Protector (1 Phase)		
2	Handle	Steel		13	Protector (3 Phase)		
3	Motor Cover	ADC12		14	Capacitor		
4	Bracket	Steel		15	Bearing		
5	Motor Housing +Stator	ADC12		16	Strainer	SUS 304	
6	Shaft with Rotor	SUS 410		17	O-ring	NBR	
7	Oil Chamber	ADC12		18-3	Wearing Plate	PA66+20% GF	
8	Mech. Seal	CA/CE +SIC/SIC		18-4	Volute Liner	NBR	
10	Oil Seal	NBR		21	Float Switch (Optional)		
11	Impeller	HytreI		27	Flange	FC 15	
12	Pump Casing	FC 20		30	Pump Housing	SUS 304	

NO	Name	Mtrl	NO	Name	Mtrl
18	Gasket	NBR	20	Washer	SUS 304
18-1	Gasket	NBR	22	Screw with O-ring	
18-2	Gasket	NBR	23	Cable Seat	
19	Screw	SUS 304	26	T adapter (Optional)	
19-1	Screw	SUS 304	29	Insulating Paper	
19-2	Screw	SUS 304	31	Nut	SUS 304
19-3	Screw	SUS 304	31-2	Nut	SUS 304
19-4	Screw	SUS 304	33	Spring Washer	SUS 304
19-6	Screw	SUS 304	34	Corrugated Spring	Steel
19-7	Screw	Steel	35	Sleeve	SUS 304
19-10	Screw	SUS 304			

Construction

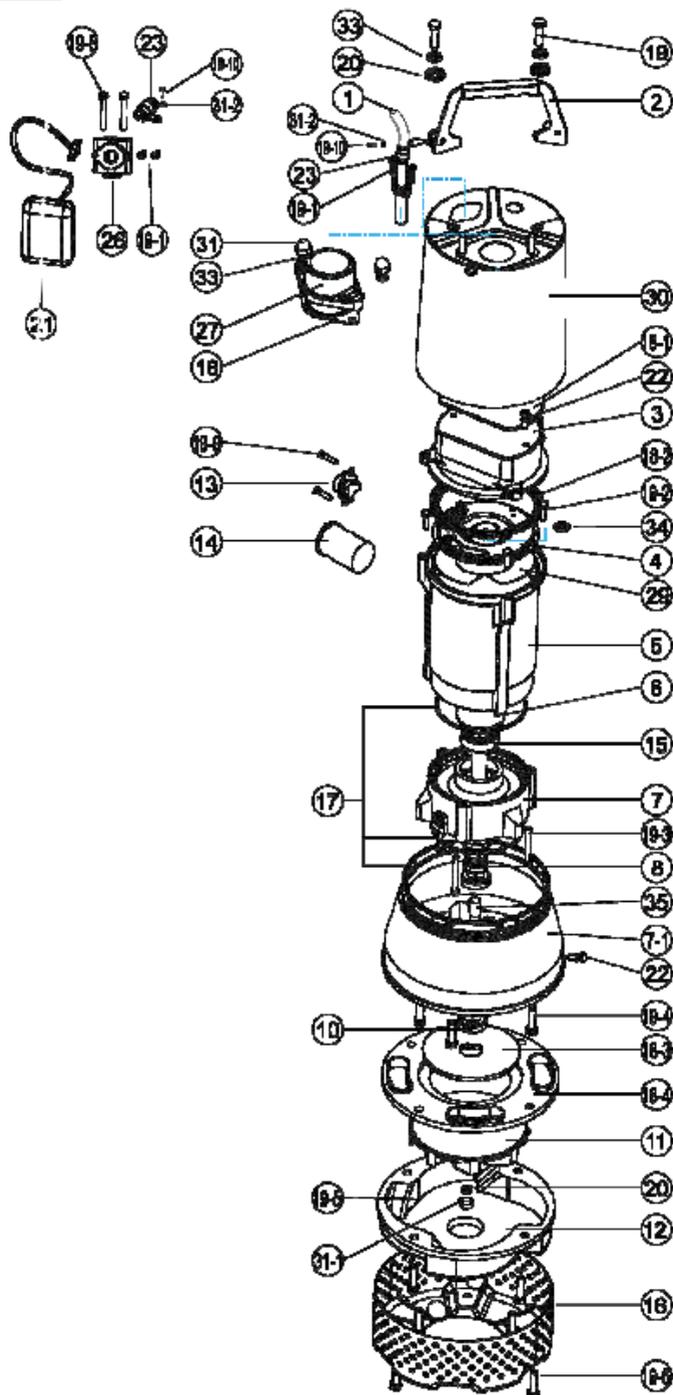


PAL 400/750

NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		13	Protector (1 Phase)		
2	Handle	Steel		13	Protector (3 Phase)		
3	Motor Cover	ADC12		14	Capacitor		
4	Bracket	Steel		15	Bearing		
5	Motor Housing +Stator	ADC12		16	Strainer	NBR	
6	Shaft with Rotor	SUS 410		17	O-ring	NBR	
7	Oil Chamber	ADC12		18-3	Wearing Plate	PA66+20% GF	
8	Mech. Seal	CA/CE +SIC/SIC		18-4	Volute Liner	NBR	
10	Oil Seal	NBR		27	Flange	FC 15	
11	Impeller	Hytrel		30	Pump Housing	SUS 304	
12	Pump Casing	FC 20					

NO	Name	Mtrl	NO	Name	Mtrl
18	Gasket	NBR	20	Washer	SUS 304
18-1	Gasket	NBR	22	Screw with O-ring	
18-2	Gasket	NBR	29	Insulating Paper	
19	Screw	SUS 304	31	Nut	SUS 304
19-1	Screw	SUS 304	31-2	Nut	SUS 304
19-2	Screw	SUS 304	32	Pump Casing Ring	SUS 304
19-3	Screw	SUS 304	33	Spring Washer	SUS 304
19-4	Screw	SUS 304	34	Corrugated Spring	Steel
19-7	Screw	Steel	35	Sleeve	SUS 304
19-10	Screw	SUS 304			

Construction



NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		13	Protector (1 Phase)		 (Optional)
2	Handle	Steel		13	Protector (3 Phase)		
3	Motor Cover	ADC12		14	Capacitor		
4	Bracket	Steel		15	Bearing		
5	Motor Housing +Stator	ADC12		16	Strainer	SUS 304	
6	Shaft with Rotor	SUS 410		17	O-ring	NBR	
7	Oil Chamber A	A356		18-3	Wearing Plate	PA66+20% GF	
7-1	Oil Chamber B	A356		18-4	Volute Liner	NBR	
8	Mech. Seal	CA/CE + SIC/SIC		21	Float Switch (Optional)		
10	Oil Seal	NBR		27	Flange	FC 15	
11	Impeller	Hytrel		30	Pump Housing	SUS 304	
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NO	Name	Mtrl	NO	Name	Mtrl
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19-4	Screw	SUS 304	31-1	Nut	SUS 304
19-5	Screw	SUS 304	31-2	Nut	SUS 304
19-6	Screw	SUS 304	33	Spring Washer	SUS 304
19-8	Screw	SUS 304	34	Corrugated Spring	Steel
19-9	Screw	Steel	35	Sleeve	SUS 304

Troubleshooting

Trouble	Cause	Remedy		
Does not start.	(1) Power failure	(1)~(3) Contact electric power company and devise counter-measures		
	(2) Large discrepancy between power source and voltage			
Starts, but immediately stops.	(3) Significant drop in voltage	(4) Inspect electric circuit (5) Correct wiring (6) Inspect connections and magnetic coil (7) Check circuit then replace fuse (8) Replace with correct one (9) Raise water level (10) Adjust the position of float (11) Repair or replace (12) Repair location of short circuit (13) Remove foreign matter (14) Repair or replace (15) Repair or replace		
	(4) Motor phase malfunction			
	(5) Electric circuit connection faulty			
	(6) Faulty connection of control circuit			
	(7) Fuses is blown			
	(8) Faulty magnetic switch			
	(9) Water is not at level indicated by Float			
	(10) Float is not in appropriate level			
	(11) Float is not effective			
	(12) Short circuit breaker is functioning			
	(13) Foreign matter clogging pump			
	(14) Motor burned out			
	(15) Motor bearing broken			
	Operates, but stops after a while.		(1) Prolonged dry operation has activated motor protector and caused pump to stop	(1) Raise water level to C.W.L
			(2) High liquid temperature has activated motor protector and caused pump to stop	(2) Lower liquid temperature
(3) Reverse rotation		(3) Correct rotation		
Does not pump. Inadequate volume.	(1) Reverse rotation	(1) Correct rotation (see Operation)		
	(2) Significant drop in voltage	(2) Contact electric power company		
	(3) Operating a 60Hz pump with 50Hz	(3) Check nameplate		
	(4) Discharge head is high	(4) Recalculate and adjust		
	(5) Large piping loss	(5) Recalculate and adjust		
	(6) Low operating water level causes air suction	(6) Raise water level or lower pump		
	(7) Leaking from discharge piping	(7) Inspect, repair		
	(8) Clogging of discharge piping	(8) Remove foreign matter		
	(9) Foreign matter in suction inlet	(9) Remove foreign matter		
	(10) Foreign matter clogging pump	(10) Remove foreign matter		
	(11) Worn impeller	(11) Replace impeller		
Over current	(1) Unbalanced current and voltage	(1) Contact electric power company		
	(2) Significant voltage drop	(2) Contact electric power company and devise counter-measure		
	(3) Motor phase malfunction	(3) Inspect connections and magnetic switch		
	(4) Operating 50Hz pump on 60Hz	(4) Check nameplate		
	(5) Reverse rotation	(5) Correct rotation (see Operation2)		
	(6) Low head. Excessive volume of water	(6) Replace pump with high head pump		
	(7) Foreign matter clogging pump	(7) Remove foreign matter		
	(8) Motor bearing is worn out or damaged	(8) Replace bearing		
Pump vibrates; excessive operating noise.	(1) Reverse rotation	(1) Correct rotation		
	(2) Pump clogged with foreign matter	(2) Disassemble and remove foreign matter		
	(3) Piping resonates	(3) Improve piping		
	(4) Strainer is closed too far	(4) Open strainer		

Disassembly and Assembly

1. Disassembly -

When disassembling pump, have a piece of cardboard or wooden board

ready to place the different parts on as you work. Do not pile parts on top of each other. They should be laid out neatly in rows. The “O” ring and gasket cannot be used again once they are removed. Have replacement parts ready.

Disassemble in the following order, referring to the sectional view.

Be sure to cut off power source before disassembly.

(1) Remove pump casing bolts, raise the motor section and remove pump casing.

(2) Remove shaft head bolt and impeller.

(3) Remove oil filler plug and drain lubricating oil.

(4) Remove intermediate casing bolts and oil chamber.

(Remember that any lubricating oil remaining in the mechanical seal chamber will flow out.)

(5) Carefully remove mechanical seal, beware of not to scratch sliding surface of motor shaft.

2. Assembly -

Re-assemble in reverse order of disassembly.

Be careful of the following points.

(A) During re-assembly, rotate the impeller by hand and check for smooth rotation. If rotation is not smooth, perform steps-(3) through -(5) again.

(B) Upon completion of re-assembly step -(1) rotate the impeller by hand from the suction inlet and check that it rotates smoothly without touching the suction inlet.

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