BOESCH

BG SERIES

Submersible Grinder Pump

OPERATION AND MAINTENANCE MANUAL

CE

Instruction Manual

Submersible Grinder Pump

BG SERIES

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Introduction

Check the following upon delivery:

1. 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.
2. Has any damage occurred during shipment? Are any bolts or nuts loose?
3. Have all necessary accessories been supplied?
(For a list of standard accessories see Construction section.)

We recommend that you keep a spare pump on hand in case of emergencies.
Keep this instruction manual in a safe place for future reference.

Installation

Check the following before beginning installation:
Insulation resistance measurement
Place the pump on a dry surface. For this test neither the motor nor the cable should be immersed in water. Use a megger to measure the insulation resistance between ground and each phase of the motor. Do the same with any two phases until all pairs are completed. The megger should indicate an insulation resistance of no less than 20 mega ohms. While taking the measurement, keep the power supply cable off the ground.

Installation

1. WARNING: Under no circumstances should cable be pulled while the pump is being moved or installed.

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

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

3. Install the pump in the tank where there is the least turbulence.

4. 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.

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

Electrical wiring

Wiring

A) Wire as indicated for the appropriate start system as shown in **Fig-1 & 2** for single phase version and **Fig-3** for three phases.

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

C) For three phase motors - Operate the pump for a short time (1 or 2 seconds) to verify the rotation of direction of the impeller, switch two of the three power cords to correct the rotation if necessary.

D) Make sure to check the pump's direction of rotation with the pump exposed to the atmosphere. Operating the pump with reversed rotation while in submerged conditions under water will most likely damage the pump, which will lead to leakage and electrical shock.

Cable

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

A) Do not immerse any splicing in water.

B) Do not pull power cable. Use the pump handle.

C) Do not expose any cables to sunlight.

Grounding

Yellow/green cable should be connected to ground. Under no circumstances should the green (yellow/green) wire be connected to the power supply.

WARNING: Use short circuit breakers to prevent danger of electrical shock.

WARNING: Never start the pump while it is suspended, as the pump may jerk and cause serious accident involving injury.

Fig-1

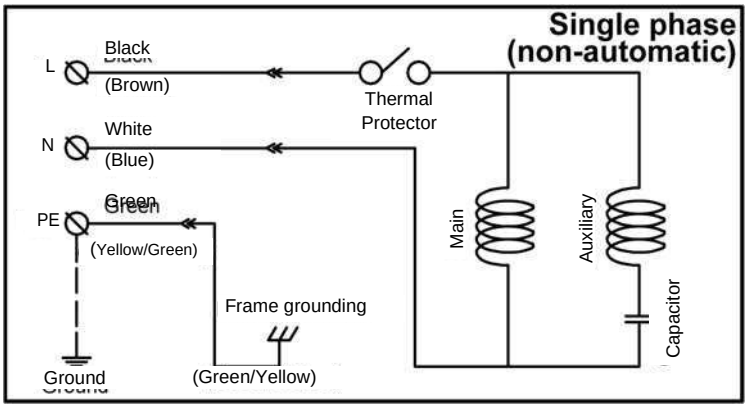


Fig-2

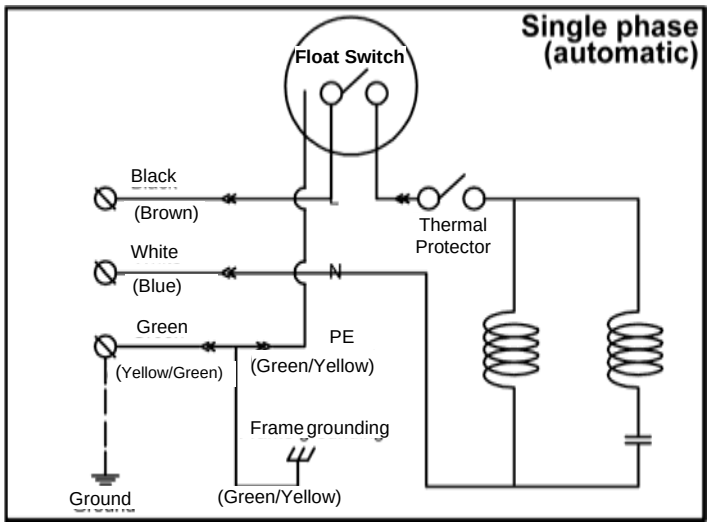
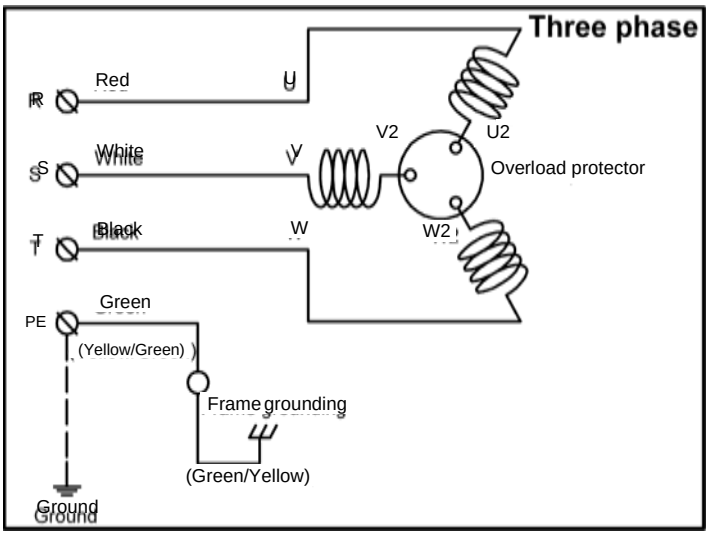


Fig-3



Operation

1. Before starting the pump

a) After installation, measure the insulation resistance again.
b) 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.

2. Test operation

Non-automatic pump (BC)
Automatic pump (BC-Automatic)
a) Turn the operating switch on and off a couple of times to check for normal pump start. Float switch must be raised for the pump to start.
b) Next, check direction of rotation. If discharge volume is low, reverse two of the wires.

Maintenance

Check pressure, flow, voltage and current.
Refer to Troubleshooting section for recommendations.

1. Daily inspections

Check current fluctuation daily. If current fluctuation is great, even though within the limits, 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 insulation resistance as previously described.
Annual inspections
To prolong the service life of the mechanical seal, replace the oil in the mechanical seal chamber once a year. Cloudy oil is an indication 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)

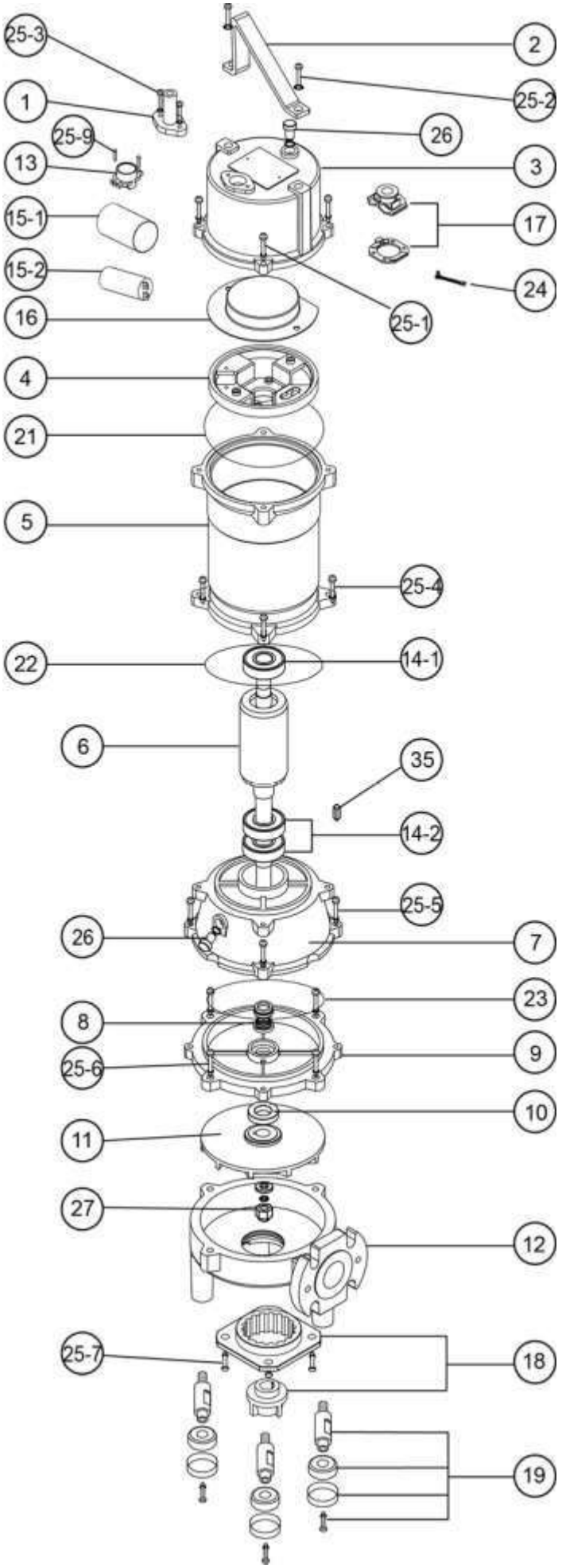
Replacement of Parts

Replace the appropriate part when the following conditions appear:

Replacement part	Mechanical seal	Oil filler plug O-ring	Lubricating oil
Condition	Oil in mechanical seal chamber	Inspect or replace the oil	Oil is cloudy or dirty
Frequency	Annual	6 months	6 months

Note: above replacement schedule is based on normal operating conditions.

Construction

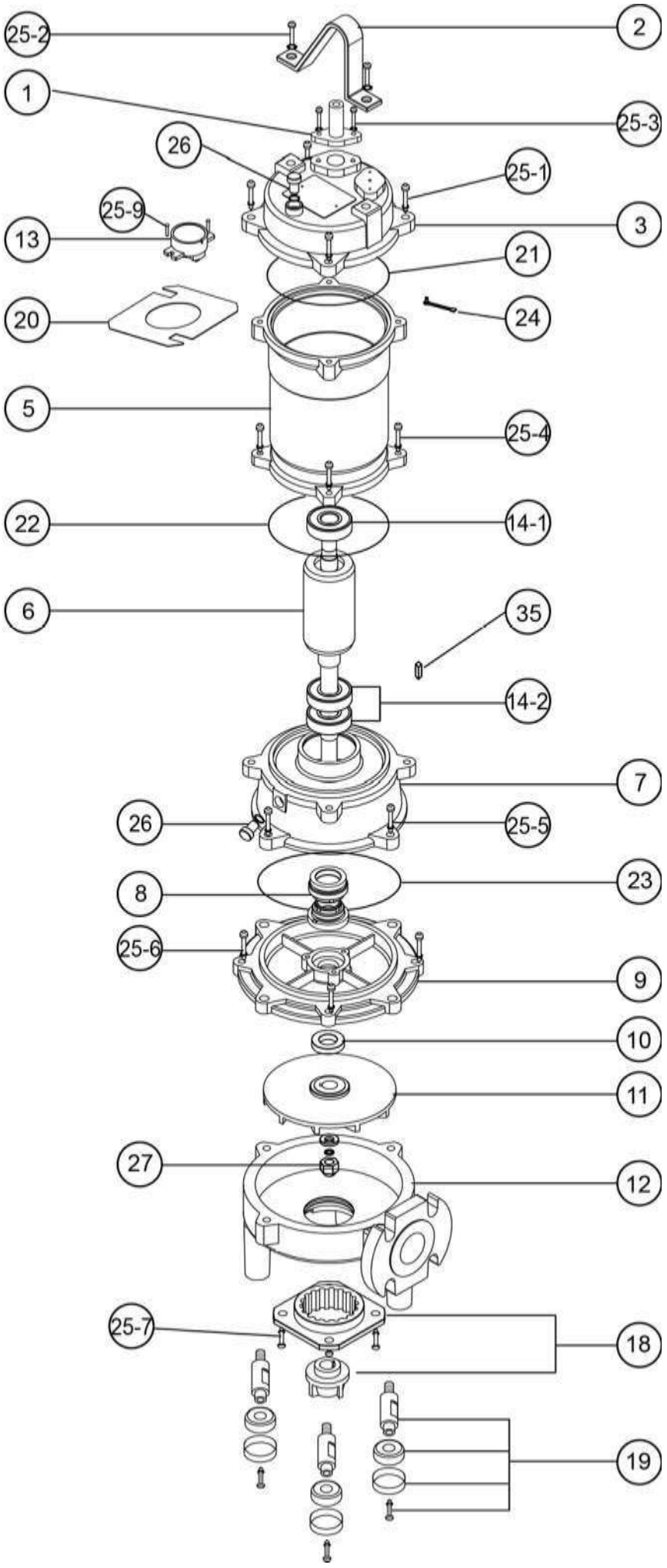


BG SERIES 1.5~3HP

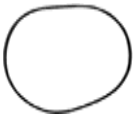
NO	Part	Material	Photo	NO	Part	Material	Photo
1	Cable	H07RN-F / SJTOW/ STOW		11	Impeller	EN-GJL-200	
2	Handle	ASTM A36		12	Pump Casing	EN-GJL-200	
3	Motor Cover	EN-GJL-200		13	Protector	KLIXON	
4	Bracket	EN-GJL-200		14-1 14-2	Upper Bearing Lower Bearing	NTN/TPI	
5	Motor Housing	EN-GJL-200		15-1	Run Capacitor **(Single Phase Only)**	-	
6	Shaft with Rotor	AISI 410		15-2	Start Capacitor **(Single Phase Only)**	-	
7	Oil Chamber	EN-GJL-200		16	Centrifugal Switch Cover **(Single Phase Only)**	Iron	
8	Mechanical Seal	Upper : CA/CE Lower : SIC/SIC		17	Centrifugal Switch **(Single Phase Only)**	-	
9	Seal Housing	EN-GJL-200		18	Cutter Set	AISI 440C	
10	Lip Seal	NBR		19	Base stand	AISI 304 + NBR	

NO	Part	Material	NO	Part	Material
21	O-ring	NBR	25-5	Screw+Spring Washer	AISI 304
22	O-ring	NBR	25-6	Screw+Spring Washer	AISI 304
23	O-ring	NBR	25-7	Screw+Spring Washer	AISI 304
24	Wire and Screw	AISI 304	25-9	Screw	AISI 304
25-1	Screw+Spring Washer	AISI 304	26	Oil Filler Plug+O-ring	AISI 304+NBR
25-2	Screw+Spring Washer	AISI 304	27	Nut, Spring Washer, Washer of impeller	AISI 304
25-3	Screw+Spring Washer	AISI 304			
25-4	Screw+Spring Washer	AISI 304	35	Key	AISI 304

Construction



BG SERIES 5~7.5HP

NO	Part	Material	Photo	NO	Part	Material	Photo
1	Cable	H07RN-F / SJTOW/ STOW		12	Pump Casing	EN-GJL-200	
2	Handle	ASTM A36		13	Protector	KLIXON	
3	Motor Cover	EN-GJL-200		14-1	Upper Bearing	NTN/TPI	
5	Motor Housing	EN-GJL-200		14-2	Lower Bearing	NTN/TPI	
6	shaft with Rotor	AISI 410		18	Cutter	AISI 440C	
7	Oil Chamber	EN-GJL-200		19	Base stand	AISI 304 + NBR	
8	Mechanical Seal	Upper : CA/CE Lower : SIC/SIC		20	Bakelite	-	
9	Seal Housing	EN-GJL-200		21	O-ring	NBR	
10	Lip Seal	NBR		22	O-ring	NBR	
11	Impeller	EN-GJL-200		23	O-ring	NBR	

NO	Part	Material	NO	Part	Material
24	Wire and Screw	AISI 304	25-7	Screw+Spring Washer	AISI 304
25-1	Screw+Spring Washer	AISI 304	25-9	Screw	AISI 304
25-2	Screw+Spring Washer	AISI 304	26	Oil Filler Plug+O-ring	AISI 304+NBR
25-3	Screw+Spring Washer	AISI 304	27	Nut, Spring Washer, Washer of impeller	AISI 304
25-4	Screw+Spring Washer	AISI 304			
25-5	Screw+Spring Washer	AISI 304	35	Key	AISI 304
25-6	Screw+Spring Washer	AISI 304			

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 turn off power source before starting disassembly.

(a) Remove pump casing bolts, raise the motor section, and remove pump casing.
(b) Remove shaft head bolt and impeller.
(c) Remove oil filler plug and drain lubricating oil.
(d) Remove intermediate casing bolts and intermediate oil chamber.
(Remember that any lubricating oil remaining in the mechanical seal chamber will flow out.)
(e) Carefully remove mechanical seal, taking care not to scratch sliding surface or motor shaft.

2. Assembly

Re-assemble in reverse order of disassembly.

(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 rotate the impeller by hand from the suction inlet and check that it rotates smoothly.

Please obtain “O” rings, shaft seals and other parts from your dealer. Refer to part lists attached.

Nameplate format

BOESCH

MODEL:			**MADE IN TAIWAN**	
P2:	**kW**	**HP**	**QMAX:**	**GPM**
V	**HZ**	**PHASE**	**HMAX:**	**FT**
FLA:		**A**	**RPM:**	**RPM**
WEIGHT:		**LBS**		
S.NO:				

Troubleshooting

Trouble	Cause	Remedy
Does not start. Starts, but immediately stops.	(1) Power failure	(1)~(3) Check power supply.
	(2) Voltage varies more than 10% of nominal value	
	(3) Significant drop in voltage	
	(4) Motor phase malfunction	(4) Inspect electrical circuit
	(5) Electric circuit connection faulty	(5) Correct wiring
	(6) Faulty connection of control circuit	(6) Inspect connections and magnetic coil
	(7) Fuses are blown	(7) Check circuit then replace fuse
	(8) Faulty magnetic switch	(8) Replace with correct switch
	(9) Water is not at level indicated by Float	(9) Raise water level
	(10) Float is not at appropriate level	(10) Adjust the position of float
	(11) Float is not effective	(11) Repair or replace
	(12) Short circuit breaker is activated	(12) Repair location of short circuit
	(13) Foreign matter clogging pump	(13) Remove foreign matter
	(14) Motor burned out	(14) Repair or replace
	(15) Motor bearing broken	(15) Repair or replace
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) Check power supply
	(3) Operating a 60Hz pump with 50Hz	(3) Check nameplate
	(4) Discharge head is high	(4) Recalculate and adjust operating point
	(5) Low operating water level causes air suction	(5) Raise water level or lower pump
	(6) Leaking from discharge piping	(6) Inspect, repair
	(7) Clogging of discharge piping	(7) Remove foreign matter
	(8) Foreign matter in suction inlet	(8) Remove foreign matter
	(9) Foreign matter clogging pump	(9) Remove foreign matter
	(10) Worn impeller	(10) Replace impeller
Over load	(1) Unbalanced current and voltage	(1) Check power supply
	(2) Significant voltage drop	(2) Check power supply
	(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 Operation)
	(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

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