

SUBMERSIBLE PUMP PBX series

OPERATION MANUAL

- Thank you for choosing Koshin's Submersible Pump.
- This manual is prepared for safe operation of the pump.
Please carefully read and fully comprehend before use.
(Incorrect use can cause death or injury.)
- Please keep this manual handy for future reference.

ACCEPTABLE FOR INDOOR AND OUTDOOR USE

CAUTION

Before use, please make sure to read the instruction manual.
Do not operate the pump out of water or insufficient water.
The pump can not be used in explosive or flammable environments
or with flammable liquids.

WARNING

Risk of electric shock. This pump is supplied with a grounding conductor
and grounding-type attachment plug.

NOTE

This pump has been engineered for clean water use only.

LIMITATIONS

- 1) The characteristics of water to be pumped are as follows:
Temperature: 5~40°C (41~104°F)
Viscosity : <5 cP
pH : 6.5~8.0
Intended for clean water use only.
- 2) This pump can be used at a maximum depth of 5 meters (16.4 feet).
- 3) The permissible fluctuation of the power supply must be within the following
ranges :
Voltage : $\pm 10\%$
Frequency : $\pm 1\%$
When both Voltage and Frequency fluctuate, amount of fluctuation must be
within a half of each fluctuation ranges.
- 4) The pump can not be used in explosive or flammable environments or with
volatile liquids.

⚠ CAUTION

1. Ground-fault circuit interrupter

For electrical shock safety, this pump must be plugged into a receptacle with GFCI capabilities.

2. Power voltage and phase requirements

Please check the specifications (voltage, frequency) of the pump by viewing the nameplate on the pump body. Never use a voltage or frequency that does not comply with the pump's specifications.

3. Usable Fluids

Never use the pump with the following fluids.

Oils, salt water, strong alkali or strong acid fluids, agrochemicals, etc.

4. Treatment of the power supply cable

a. Never lift or move the pump by pulling the power cable.

Always lift the pump by the handle or by a rope attached to the handle.

b. Select an extension cord of the appropriate gauge to use with the pump.

Do not use an extension cord in water.

5. If a person is in the water where the pump is submerged, never start the pump.

6. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

7. Children being supervised not to play with the appliance.

8. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

9. Children shall not play with the appliance.

10. Cleaning and user maintenance shall not be made by children without supervision.

⚠ CAUTION

This pump uses an oil bathed double mechanical seal.

When it is necessary to assemble the mechanical seal, refer to Fig. 1.

INSTALLATION AND USE

- This pump has a thermal protector.

INSTRUCTIONS FOR USE

1. Connect the power cord to the electric source

Pay close attention, in particular, to frequency and voltage can cause decreased performance and premature wear and failure.

2. Earth leakage breaker and earthing

Be sure to ground the earthing wire before connecting the cable to the power source.

The green wire is for earthing. Be sure to attach the leakage breaker to prevent any possible leakage trouble.

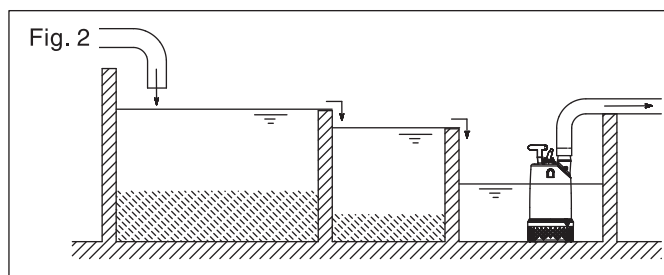
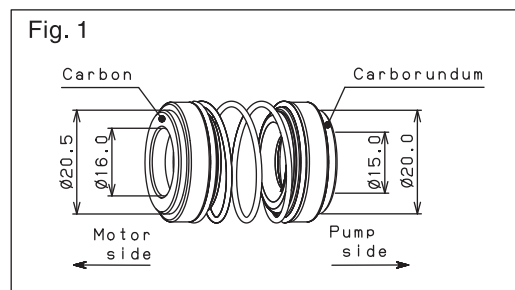
3. Place to use

The pump can be used at almost all places but avoid continuous low-water operation in a sandy place, as such may accelerate wear of the pump.

Install the pump where water can be collected easily. When the pump is installed on soft, muddy or sandy ground, lay wooden board or block under the pump body to prevent the pump from setting.

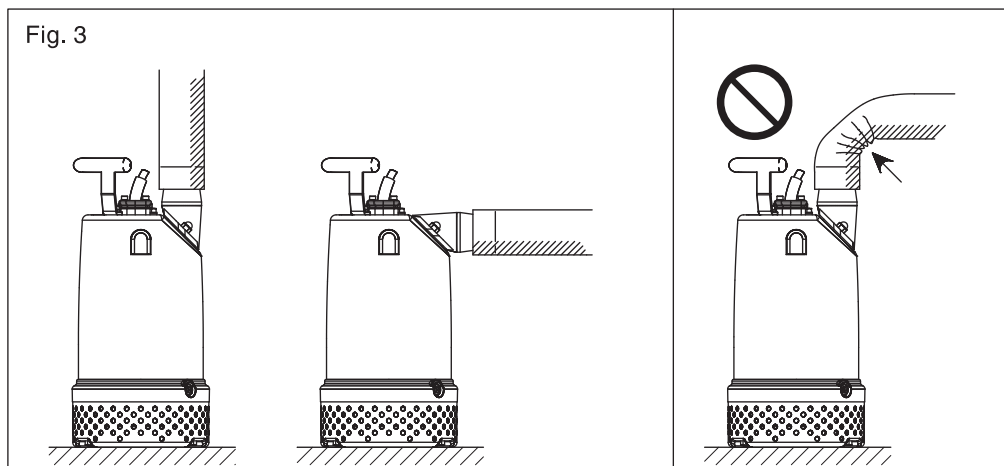
Do not place the pump in the water if a human is in it. Severe electrical shock or death can occur.

Fig. 2 shows an example of an installation method for reducing the chance of intaking sediment.



4. Hose piping

When any hose is used for connection, keep the hose as straight as possible, bends or kinks in hoses will reduce water flow, and can cause premature wear or failure of the pump.
quantity. fig.3



Do not allow discharge port to be submersed. Inverse flow may be resulted due to siphoring effect.

5. Power cable

To transfer the pump or to install, hold the pump by the handle or by a rope tied to the handle.
If the power cable is pulled instead of the rope, the core wires may break.
Do not place connection joints to extension cords under water.

6. Thermal protector

The pump incorporates a thermal protector to protect the motor, and the motor stops automatically in an over-load operation.

7. Operation of the air valve

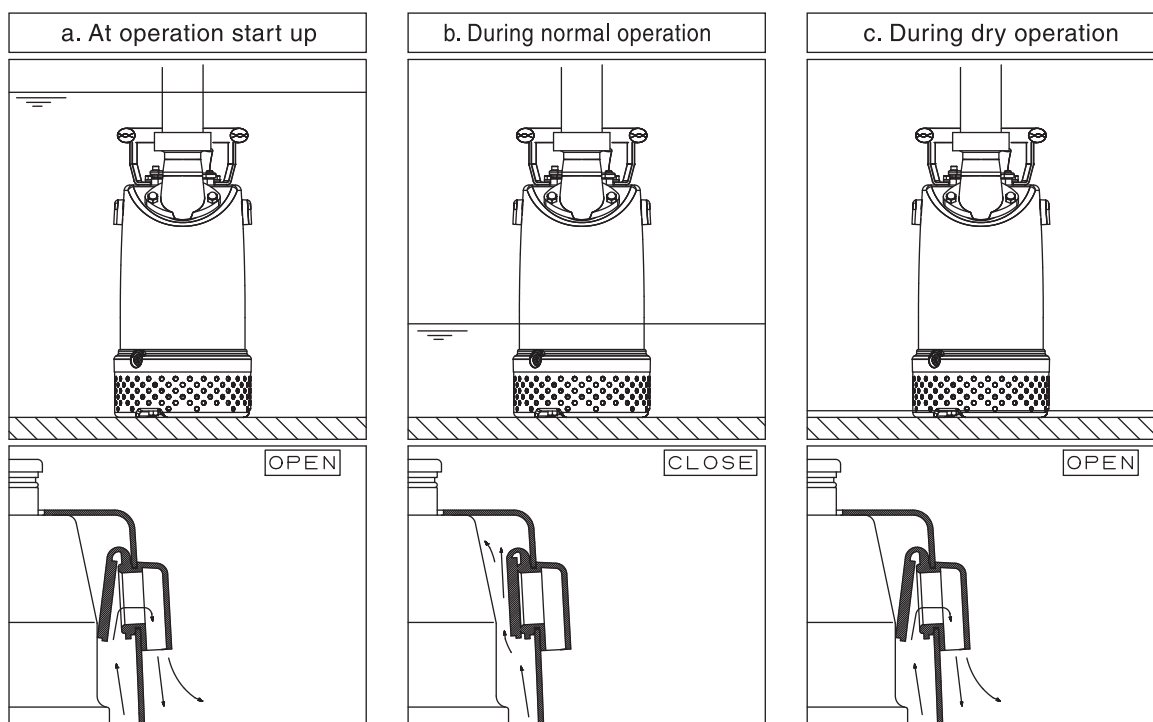
This pump is equipped with air valves.
The air valves prevent air lock when pumping air and effectively expels heat.

CAUTION!

If debris, etc., becomes stuck in the valve, the air valve may not operate correctly.
Check that there is no foreign matter in the valve before installing and operating the pump.

Operation of the cooling value

Fig. 4



AFTER USING PUMP

It is recommended after every use, to clean out the strainer, to protect debris lock up on next use.

1. **In cold climates, do not allow pump to freeze.**
Remove pump from water to prevent damage due to freezing.
2. **Completely drain and dry pump of water before storing.**

OPTIONAL COMPONENTS (SOLD SEPARATELY)

Float switch

This pump can have a float switch installed as an optional component.

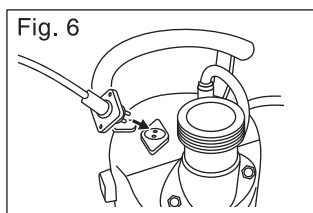
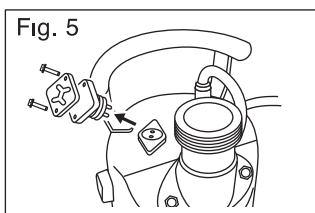
Tools required for attachment operation

- Hexagonal wrench (4 mm)

Attachment of the float switch

Follow the directions below to attach the float switch.

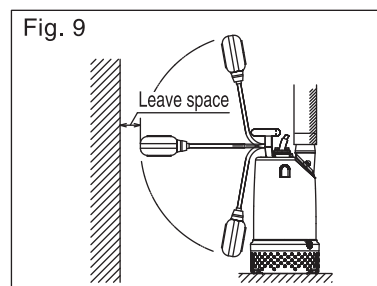
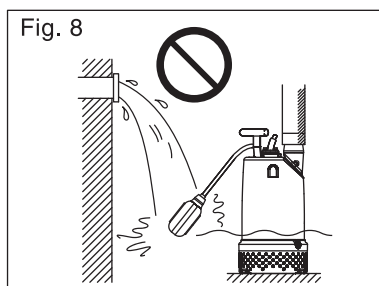
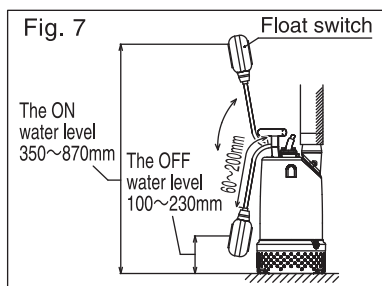
1. Check that the power supply cord is not plugged in, and the pump is dry before attaching float switch.
2. Loosen the bolts securing the float cap (M5 X 2) and remove the float cap. fig. 5
3. Insert the float switch into the terminal opening on the pump side, aligning the pins and pressing. (Neither of the two pins has polarity.) fig. 6



4. Use the bolts for securing the float cap to secure the float switch to the pump side.
Tightening torque: $3.0 \text{ N} \cdot \text{m}$
5. Check that the float switch attachment surface is attached firmly to the pump side without any gaps.
CAUTION: If there is a gap, water will enter through it, leading to a short-circuit or pump failure.
6. Connect the power once before immersing the pump to check the float switch is operating properly.

Movement of the float switch

1. The pump with a float switch works under an automatic surface control system.
2. The pump starts automatically when the water level rises and the float comes up to the ON water level, and stops automatically when the water level falls and the float comes down to the OFF water level.
The ON and OFF water levels can be adjusted by loosening the cord band bolt.
However, the length of the cord between the cord band and the float switch should be between 60mm and 200mm, otherwise the float switch will not operate normally. fig. 7
3. The pump should not be installed where water is discharged directly on to the float. fig. 8
4. The float switch should be installed where it does not come into contact with walls or is any other obstructions. fig. 9

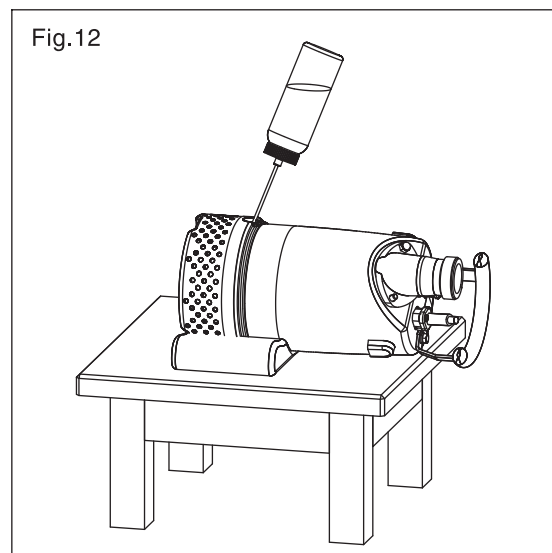
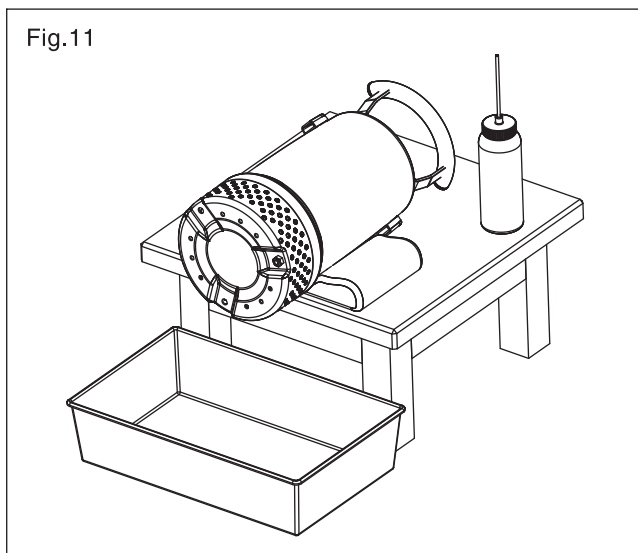
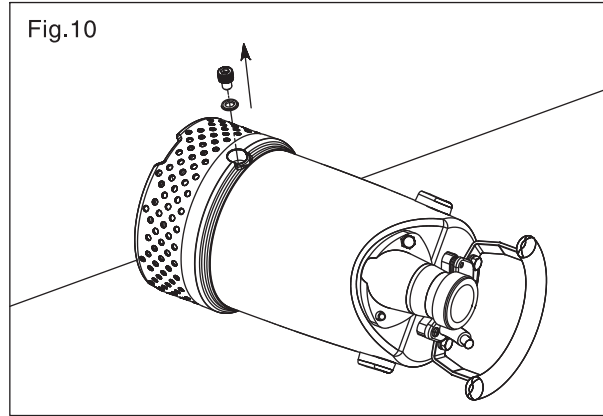


MAINTENANCE

1. The liquid paraffin(fig.10-12)

WARNING: BECAUSE THIS PUMP IS EQUIPPED WITH AN AUTOMATIC RE-SETTING OVERLOAD, IT MUST ALWAYS BE DISCONNECTED FROM ITS POWER SUPPLY BEFORE HANDLING.

The liquid paraffin should be checked every 1,000 Hrs (or three months) and replaced every 2,000 Hrs (or six months). Change the liquid paraffin and the shaft seal (an article of consumption) when the liquid paraffin contains too much water, separated water, i.e. heavily emulsified (milky looking)
Fill with 0.28 liters (9.47 oz) of liquid paraffin.



2. Insulation check

Motor's insulation resistance check should be examined once a month.

Using a 500V tester, the OHM (Ω) resistance between phases as well as between phase and ground should be as follows:

Above 20M Ω : Satisfactory.

1~20M Ω : Capable of running, but check the power cable and the motor as early as possible.

Below 1M Ω : Unsatisfactory - needs service.

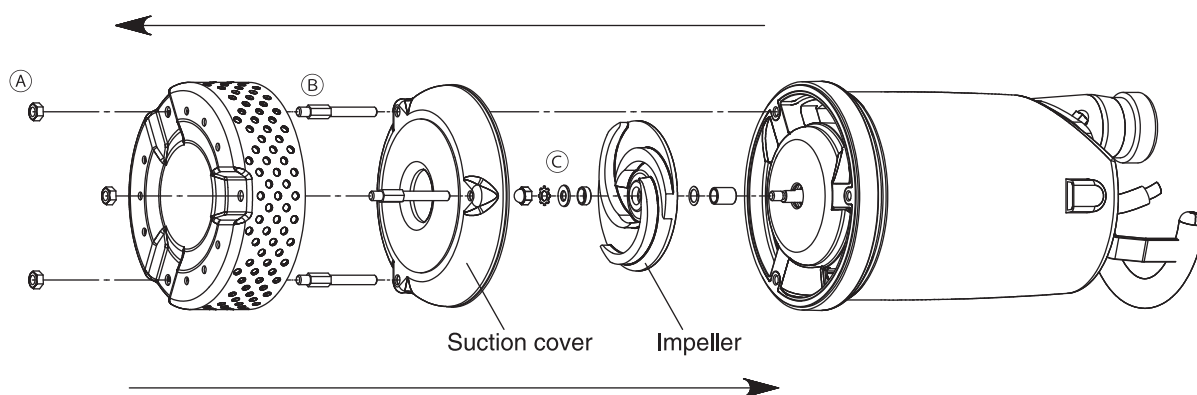
3. Replacement of the impeller

Replace the impeller if it is worn or broken.

Be sure to disconnect the power supply and render the pump inoperable before starting impeller replacement.

Please refer to Fig. 13 for the replacement procedure.

Fig.13



*When replacing the impeller, provide a gap of around 1.5 mm between the suction cover and the impeller end surface.

(Prevent contact between the impeller and the suction cover)

Tightening torque (N · m)	
(A)	15 N · m
(B)	15 N · m
(C)	5 N · m

4. Replacement of the cable

Replace the cable if it is worn or broken.

However, the user cannot change it.

Please contact our service.

TROUBLE SHOOTING

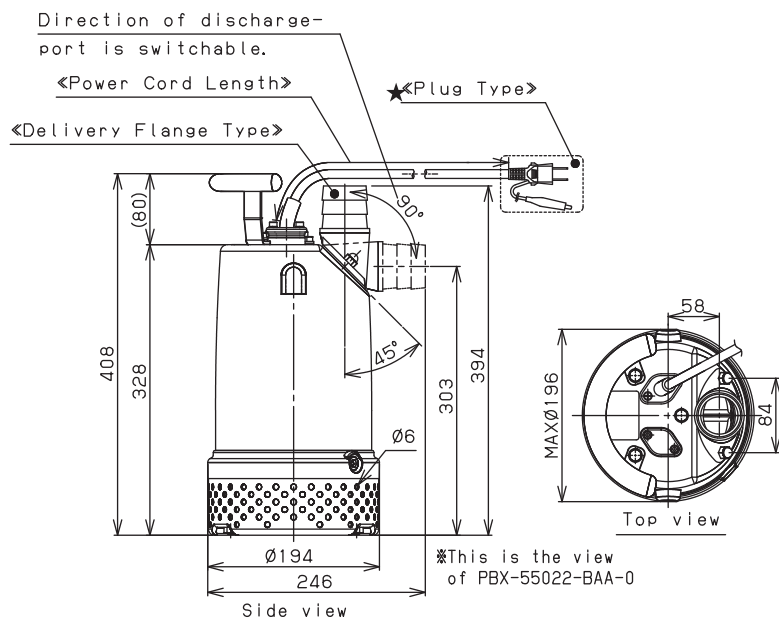
Trouble	Cause	Countermeasure
• The pump does not run.	• Power fuse is blown or circuit breaker tripped.	• Check fuse and replace if needed or reset circuit breaker.
	• Voltage drop.	• Ask the power company to check.
	• Poor connection of electric wiring. (Loose wires)	• Check the contact condition of wiring and tighten.
	• The motor is burned or the motor's insulation is questionable.	• Replace the motor.
	• The impeller is choked with foreign debris.	• Clean strainer, impeller and provide with screen, collector or catcher outside of the pump's strainer.
	• The impeller is locked.	• Check the clearance of the impeller and adjust to the correct clearance.
	• The motor's capacitor is blown.	• Check the power supply and replace the capacitor.
• The pump capacity is lowered.	• Pump snorkeling.	• Raise the pumping water level.
	• Pump is clogged.	• Clean strainer, impeller and provide with screen, collector or catcher outside of the pump's strainer.
	• The impeller is worn.	• Replace the impeller.
	• The total pumping head is too high.	• Review the selection of the pump and piping.
• The pump runs, but no water is discharged.	• The delivery hose is folded and choked.	• Straighten the delivery hose.
	• The total pumping head is too high.	• Review the selection of the pump and piping.
• The air valve does not close. (Water continues to come out of the air valve)	• Foreign debris is stuck in the air valve.	• Clean the valve part.
	• Pump is snoring.	• Raise the pumping water level.
• The pump repeatedly starts/stops.(short cycles)	• The impeller is choked with foreign debris and overloaded.	• Clean strainer, impeller and provide with screen, collector or catcher outside of the pump's strainer.

SPECIFICATIONS

MODEL TYPE	PBX-55022	PBX-55022	PBX-55022	PBX-55011	PBX-65011
	PBX-55022-BAA	PBX-55022-BAB	PBX-55022-BAC		PBX-65011-BAB
Connection Dia	mm	50			
	inch	2			
Max.Head	m	9.5			10
	ft	31			33
Max.Delivery	L/min	310			
	GPH	4,870			
Output [W]		400			
Revolution [rpm]		2,800			
Rated Current [A]		4.2			8.1
Consumption [W]		680			690
Voltage [V]		AC 220			AC 110
Frequency [Hz]		50			60
Net Weight		14.5	15.0	15.5	15.0
Standard Accessories	Hose band, Rope		Hose Coupling, Hose band		Hose band

MODEL TYPE	PBX7-55022	PBX7-55022	PBX7-55022	PBX7-55011	PBX7-65011
	PBX7-55022-BAA	PBX7-55022-BAB	PBX7-55022-BAC	PBX7-55011-BAB	PBX7-65011-BAB
Connection Dia	mm	50			
	inch	2			
Max.Head	m	15			16
	ft	50			54
Max.Delivery	L/min	330			
	GPH	5,240			
Output [W]		750			
Revolution [rpm]		2,800			
Rated Current [A]		6.0			12.0
Consumption [W]		1,250			
Voltage [V]		AC 220			AC 110
Frequency [Hz]		50			60
Net Weight		15.5			16.5
Standard Accessories	Hose band, Rope		Hose Coupling, Hose band		Hose band

DEMENSION

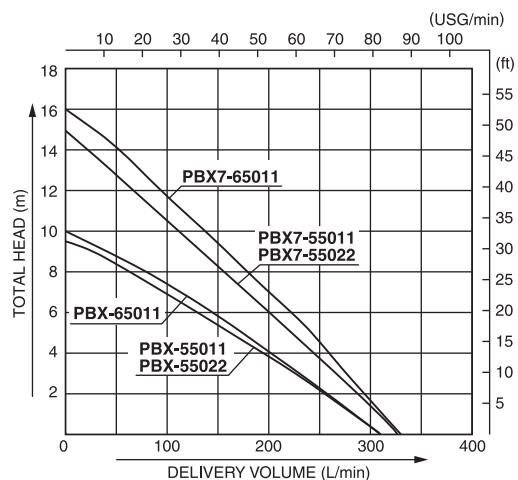


★ «Type of Plug shape»

A	A(with ground pin)	B	C	B3	BF
		*Pin diameter: Ø5mm		*Pin diameter: Ø4mm	

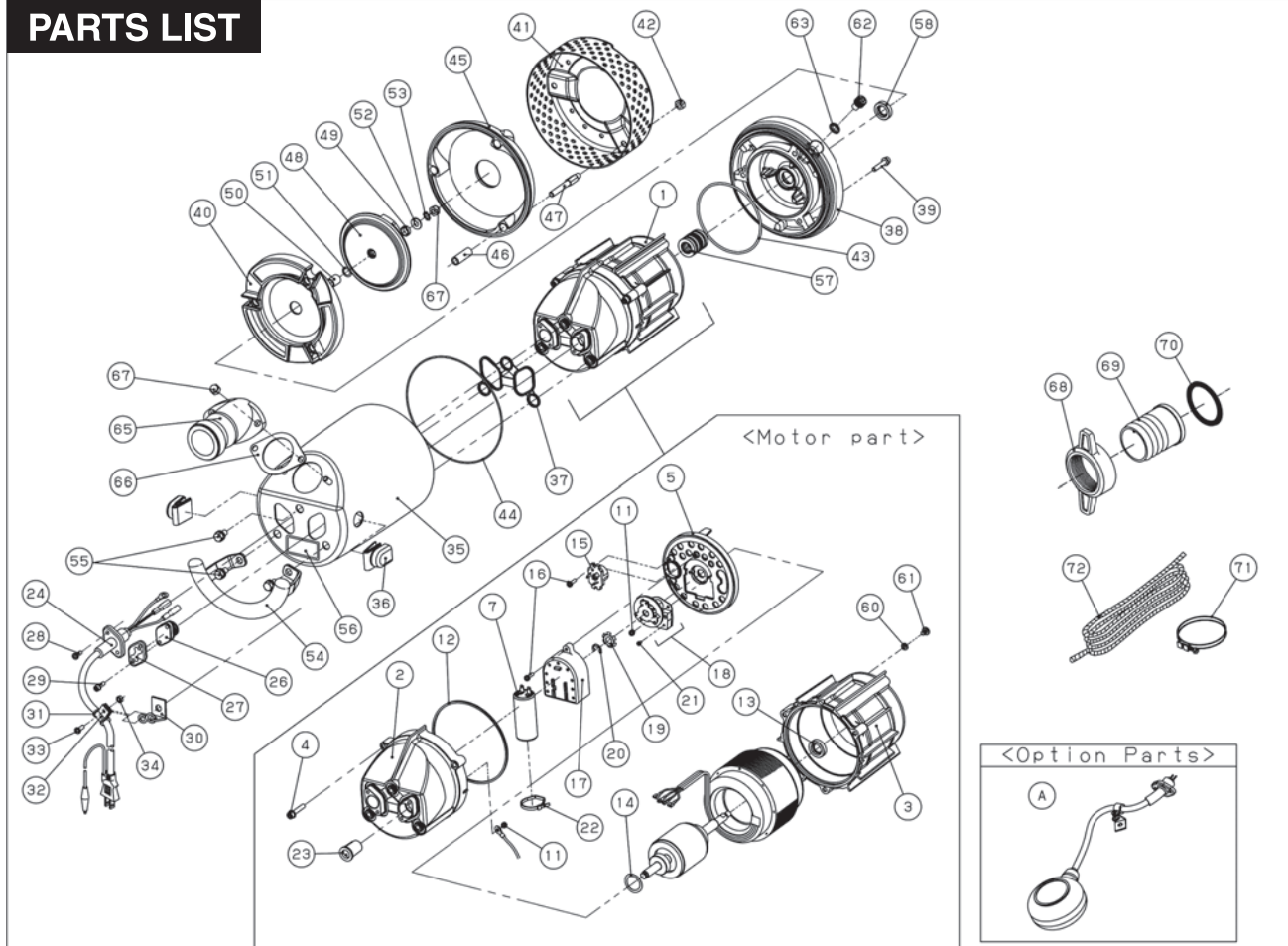
Model Number	Model	Voltage/Freq.	★ Plug Type	Power Cord Length(m)	Delivery Flange Type/Size
0438623	PBX-55022-BAA	220/50	A	6	Barb fitting / 2 inch
0438628	PBX-55022-BAB	220/50	C	10	G thread / 2 inch
0438629	PBX-55022-BAC	220/50	BF	10	G thread / 2 inch
0438622	PBX-55011-BAB	110/50	B3	10	G thread / 2 inch
0438624	PBX-65011-BAB	110/60	A(with ground pin)	10	NPT thread / 2 inch
0438626	PBX7-55022-BAA	220/50	A	6	Barb fitting / 2 inch
0438630	PBX7-55022-BAB	220/50	C	10	G thread / 2 inch
0438631	PBX7-55022-BAC	220/50	BF	10	G thread / 2 inch
0438625	PBX7-55011-BAB	110/50	B3	10	G thread / 2 inch
0438627	PBX7-65011-BAB	110/60	A(with ground pin)	15	NPT thread / 2 inch

PERFORMANCE CURVE



*Starting current is three times higher than rated current.

PARTS LIST



PBX-55022-BAA, -BAB, -BAC / 55011-BAB / 65011-BAB

No.	PARTS CODE	PARTS NAME	QTY
1	0438190	PBX-5011 Motor Set (400W 110V 2~23, 60~61)	1
	0438191	PBX-5022 Motor Set (400W 220V 2~23, 60~61)	1
2	0430603	PBX-50 Head Cover	1
3	0430611	PBX-50 Motor Frame	1
4	734605054	Bolt (M6x32)	3
5	0430610	PBX-50 Motor Bracket	1
6	0390140	Grease	1
7	0390002	Condenser(125VAC 150μF)	1
8	0398127	Ground Wire Assy	1
9	0398141	Lead Wire Assy A	1
10	0398142	Lead Wire Assy B	1
11	0430073	+SCREW(M4x6)	3
12	0390149	PS-40 Head Packing	1
13	893555043	Oil Seal	1
14	857627023	Wave Washer	1
15	0390079	PS-5010 Thermal Protector (Spec. 400W 110V)	1
	0430677	PBX-5022 Thermal Protector (Spec. 400W 220V)	1
16	708119040	Bolt (M4x16)	3
17	0430615	PBX-50 Centrifugal Force Switch-cover	1
18	0398161	Centrifugal Force Switch	1
19	0390141	Toothed Washer	1
20	888727008	Stop Ring	1
21	707825018	+ Screw (M3x6)	2
22	0390142	PS-40 Band	1
23	0430607	PBX Connector	1
24	0430573	PB-50 Power Cord (PBX-55022-BAA)	1
	0438160	PB-50 Power Cord (PBX-55022-BAB)	1
	0430681	PB-50 Power Cord (PBX-55022-BAC)	1
	0438158	PB-50 Power Cord (PBX-55011-BAB)	1
	0430670	PBX-50 Power Cord (PBX-65011-BAB)	1

No.	PARTS CODE	PARTS NAME	QTY
25	0430599	PB-50 UK Plug (PBX7-55022-BAB)	1
26	0430620	PBX Float Cap	1
27	0430633	PBX Float Cap Holder	1
28	703305102	+ Screw (M5x14)	2
29	734605035	Bolt (M5x16)	2
30	0438189	PBX Chain Assy	1
31	0390031	PS-40 Cord Supporter	1
32	0260018	BL-3224 Cord Band	1
33	703305100	+ Screw (M5x10)	1
34	827305005	Nut (M5)	1
35	0430605	PBX-50 Out Cover (PONSTAR)	1
	0430653	PBX-50 Out Cover (KOSHIN)	1
36	0430625	PBX-50 Air Valve	2
37	0430621	PBX-50 Out Packing	1
38	0430613	PBX-50 Outer Casing	1
39	734605055	Bolt (M6x35)	3
40	0430617	PBX-50 Inner Casing	1
41	0430225	PB7 Strainer	1
42	827405008	Nut (M8)	3
43	889955110	O-Ring (G110)	1
44	0430634	O-Ring (S170)	1
45	0430619	PBX-50 Suction Cover	1
46	0430632	PBX-50 Spacer	3
47	0430631	PBX-50 Stud Bolt	3
48	0430614	PBX-50 50Hz Impeller	1
49	0430612	PBX-50 60Hz Impeller	1
49	0430441	PX-50 Impeller Bush	1
50	0430656	PBX Sleeve	1
51	0390025	PS-40 Impeller Adjusting Washer	2
52	846505008	Washer	1
53	845305008	Toothed Washer	1
54	0430604	PBX-50 Handle	1
55	0430638	Bolt (M8x18)	3
56	0430646	PBX-55022-BAA-0 LABEL	1
	0430660	PBX-55022-BAB-0 LABEL	1
	0430661	PBX-55022-BAC-0 LABEL	1
	0430645	PBX-55011-BAB-0 LABEL	1
	0430644	PBX-65011-BAB-0 LABEL	1
57	0390003	PS-40 Mechanical Seal	1

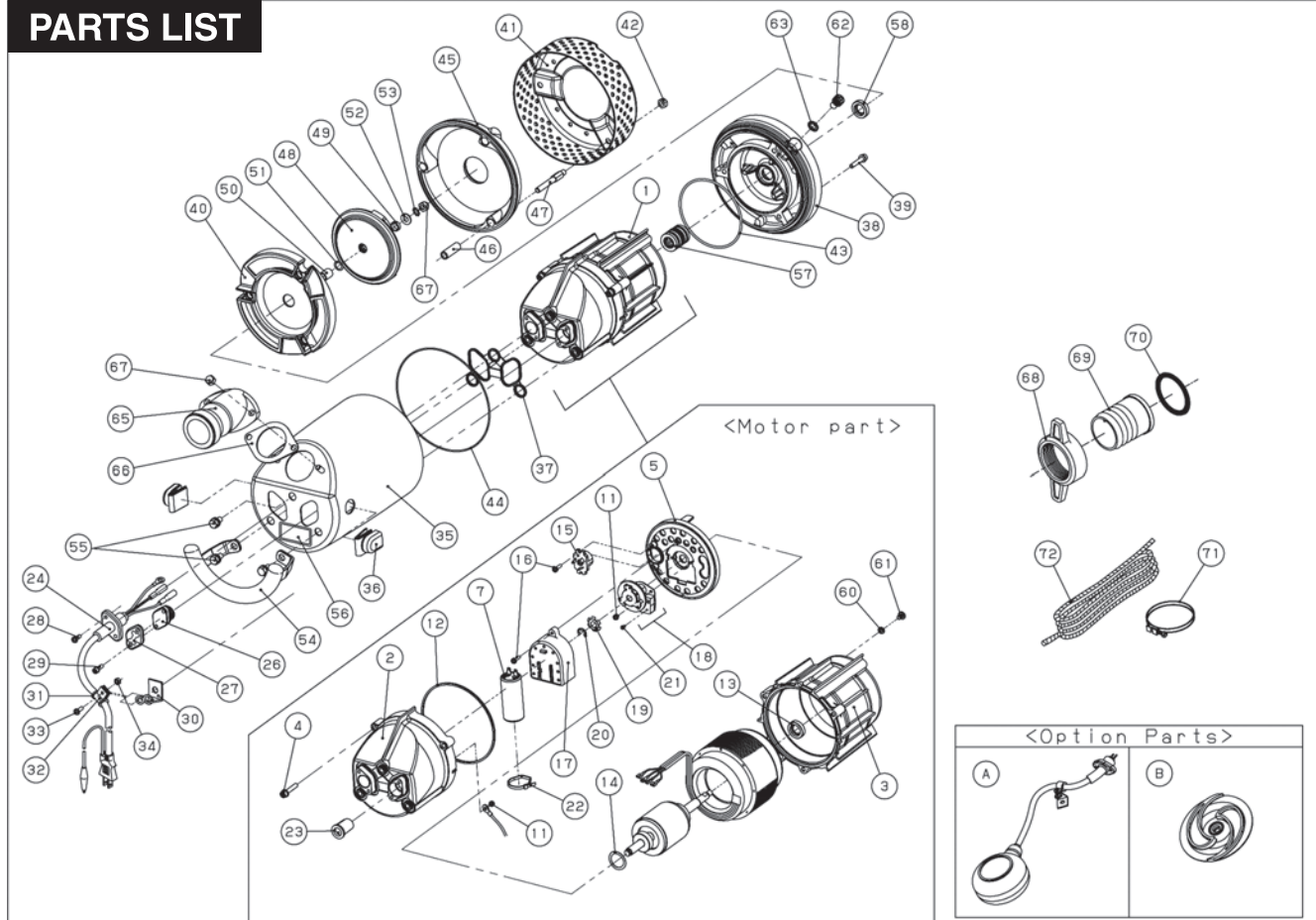
No.	PARTS CODE	PARTS NAME	QTY
58	893555043	Oil Seal	1
59	0390383	Paraffin	0.28
60	0340142	SM Seal Ring	1
61	0340153	SM + Screw (M6x8)	1
62	0390037	Socket Bolt (M10x12)	1
63	854255010	Seal Washer	1
64	0390140	Grease	1
65	0430624	PBX-50 Delivery Flange (G)	1
	0430630	PBX-50 Delivery Flange (Nipple)	1
	0430623	PBX-50 Delivery Flange (NPT)	1
66	0390559	PS-50 Delivery Packing	1
67	835305008	Cap Nut (M8)	3
68	0113390	SE-50X Coupling	1
69	0110356	SE-50 Nipple	1
70	0113391	SE-50X Coupling Packing	1
71	940019060	Hose Band (60)	1
72	039815701	Rope	1

Optional Components

A	PARTS CODE	PARTS NAME	QTY
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※68~70 is Attachment for
PBX-55022-BAB/BAC/PBX-55011-BAB
※72 is Attachment for PBX-55022-BAA

PARTS LIST



PBX7-55022-BAA, -BAB, -BAC / 55011-BAB / 65011-BAB

No.	PARTS CODE	PARTS NAME	QTY
1	0438192	PBX7-5011 Motor Set (750W 2~23, 61~62)	1
	0438193	PBX7-5022 Motor Set (750W 2~23, 61~62)	1
2	0430603	PBX-50 Head Cover	1
3	0430616	PBX7-50 Motor Frame	1
4	734605054	Bolt (M6x32)	3
5	0430610	PBX-50 Motor Bracket	1
6	0390140	Grease	1
7	0390002	Condenser(125VAC 150μF)	1
8	0398127	Ground Wire Assy	1
9	0398141	Lead Wire Assy A	1
10	0398142	Lead Wire Assy B	1
11	0430073	+SCREW(M4x6)	3
12	0390149	PS-40 Head Packing	1
13	893555043	Oil Seal	1
14	857627023	Wave Washer	1
15	0430606	PBX7-5011 Thermal Protector (Spec. 750W 110V)	1
	0430676	PBX7-5022 Thermal Protector (Spec. 750W 220V)	1
16	708119040	Bolt (M4x16)	3
17	0430615	PBX-50 Centrifugal Force Switch-cover	1
18	0398161	Centrifugal Force Switch	1
19	0390141	Toothed Washer	1
20	888727008	Stop Ring	1
21	707825018	+ Screw (M3x6)	2
22	0390142	PS-40 Band	1
23	0430607	PBX Connector	1
24	0430672	PBX7-50 Power Cord (PBX7-55022-BAA)	1
	0430673	PBX7-50 Power Cord (PBX7-55022-BAB)	1
	0430671	PBX-50 Power Cord (PBX7-55022-BAC)	1
	0438158	PB-50 Power Cord (PBX7-55011-BAB)	1
	0430675	PBX7-50 Power Cord (PBX7-65011-BAB)	1

No.	PARTS CODE	PARTS NAME	QTY
25	0430599	PB-50 UK Plug (PBX7-55022-BAB)	1
	0430659	PBX7-50 USA Plug (PBX7-65011-BAB)	1
26	0430620	PBX Float Cap	1
27	0430633	PBX Float Cap Holder	1
28	703305102	+ Screw (M5x14)	2
29	734605035	Bolt (M5x16)	2
30	0438189	PBX Chain Assy	1
31	0390031	PS-40 Cord Supporter	1
32	0260018	BL-3224 Cord Band	1
33	703305100	+ Screw (M5x10)	1
34	827305005	Nut (M5)	1
35	0430605	PBX-50 Out Cover (PONSTAR)	1
	0430653	PBX-50 Out Cover (KOSHIN)	1
36	0430625	PBX-50 Air Valve	2
37	0430621	PBX-50 Out Packing	1
38	0430613	PBX-50 Outer Casing	1
39	734605055	Bolt (M6x35)	3
40	0430617	PBX-50 Inner Casing	1
41	0430225	PB7 Strainer	1
42	0390524	Nut (M8)	3
43	889955110	O-Ring (G110)	1
44	0430634	O-Ring (S170)	1
45	0430619	PBX-50 Suction Cover	1
46	0430632	PBX-50 Spacer	3
47	0430631	PBX-50 Stud Bolt	3
48	0430609	PBX7-50 50Hz Impeller	1
	0430608	PBX7-50 60Hz Impeller	1
49	0430441	PX-50 Impeller Bush	1
50	0430656	PBX Sleeve	1
51	0390025	PS-40 Impeller Adjusting Washer	2
52	846505008	Washer	1
53	845305008	Toothed Washer	1
54	0430604	PBX-50 Handle	1
55	0430638	Bolt (M8x18)	3
56	0430643	PBX7-55022-BAA-0 Label	1
	0430662	PBX7-55022-BAB-0 Label	1
	0430663	PBX7-55022-BAC-0 Label	1
	0430642	PBX7-55011-BAB-0 Label	1

No.	PARTS CODE	PARTS NAME	QTY
56	0430641	PBX7-65011-BAB-0 Label	1
57	0390003	PS-40 Mechanical Seal	1
58	893555043	Oil Seal	1
59	0390383	Paraffin	0.28
60	0340142	SM Seal Ring	1
61	0340153	SM + Screw (M6x8)	1
62	0390037	Socket Bolt (M10x12)	1
63	0390517	Seal Washer	1
64	0390140	Grease	1
65	0430624	PBX-50 Delivery Flange (G)	1
	0430630	PBX-50 Delivery Flange (Nipple)	1
	0430623	PBX-50 Delivery Flange (NPT)	1
66	0390559	PS-50 Delivery Packing	1
67	835305008	Cap Nut (M8)	3
68	0113390	SE-50X Coupling	1
69	0110356	SE-50 Nipple	1
70	0113391	SE-50X Coupling Packing	1
71	940019060	Hose Band (60)	1
72	039815701	Rope	1

Optional Components

A	PARTS CODE	PARTS NAME	QTY
B	0438200	Float Switch	1
	0430618	High Pressure Impeller For the PBX7 series PBX7-50H 60Hz	1
	0430622	High Pressure Impeller For the PBX7 series PBX7-50H 50Hz	1

※68~71 is Attachment for PBX7-55022-BAB/BAC/PBX7-55011-BAB
 ※72 is Attachment for PBX7-55022-BAA

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