

SHIMGE[®]
----- *for better life*

SERVICE MANUAL

SUBMERSIBLE ELECTRIC SEWAGE PUMP

Models:WQ(D)、WQ(D)-L1、WQ(D)-L2、WQK、WVSD、DWE、
WQDS、WQ(D)AS-CB、WQ-QG、WQ(D)-4P

SHIMGE PUMP INDUSTRY GROUP CO., LTD.

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Thank you very much for choosing our products, and please read over the operating manual and keep it properly prior to installation and use.



- **The Electric Pump must be grounded reliably before use, and shall be equipped with an electrical leakage protection device;**
- **It's strictly prohibited to touch the Electric Pump during operation;**
- **It's strictly prohibited to run the Electric Pump without water;**
- **For three phase-motors with integrated thermal protector shut down due to overload or overheating, it is NOT allowed to re-connect the power until motor cooling for more than 10 minutes.**

I. Product Introduction

Submersible electric sewage pumps (hereinafter referred to as the “electric pumps”) include WQ(D), WQ(D)-L1, WQ(D)-L2, WQK, WVSD, DWE, WQDS, WQ(D)AS-CB, WQ-QG, WQ(D)-4P electric pumps. The electric pump is composed of water pump and motor; located in the upper part of electric pump, motor is single-phase or three-phase asynchronous motor; located in the lower part of electric pump, water pump is of channel impeller or vortex impeller-volute structure; mechanical seal and framework oil seal are adopted between water pump and motor as seal, and “O”-shaped oil resistant rubber seal rings are adopted at fixed rabbet seals as static seal to ensure the reliability of electric pump.

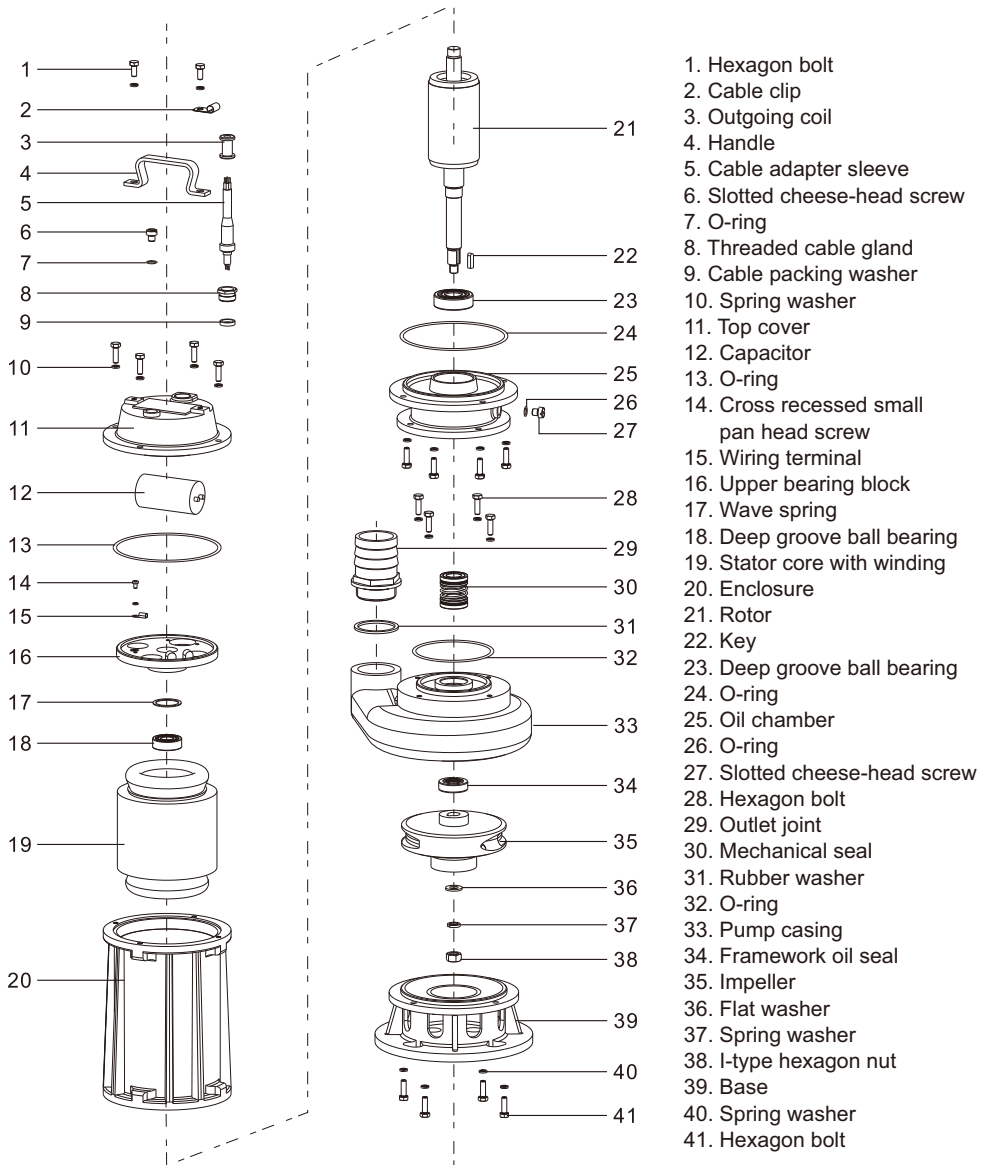
This series of electric pumps are widely used in such fields as industry, agriculture, mining, building construction, and municipal administration and environmental protection, and pump liquids can contain fiber, scrap paper and other solid particles or soft solids, e.g. muddy water, grey water, domestic sewage, wastewater, feces and urine, etc., which are ideal hydraulic equipment for agricultural drainage and irrigation, river/pool dredging, and field construction, but not for applications with explosion-proof requirements.

II. Operating Conditions

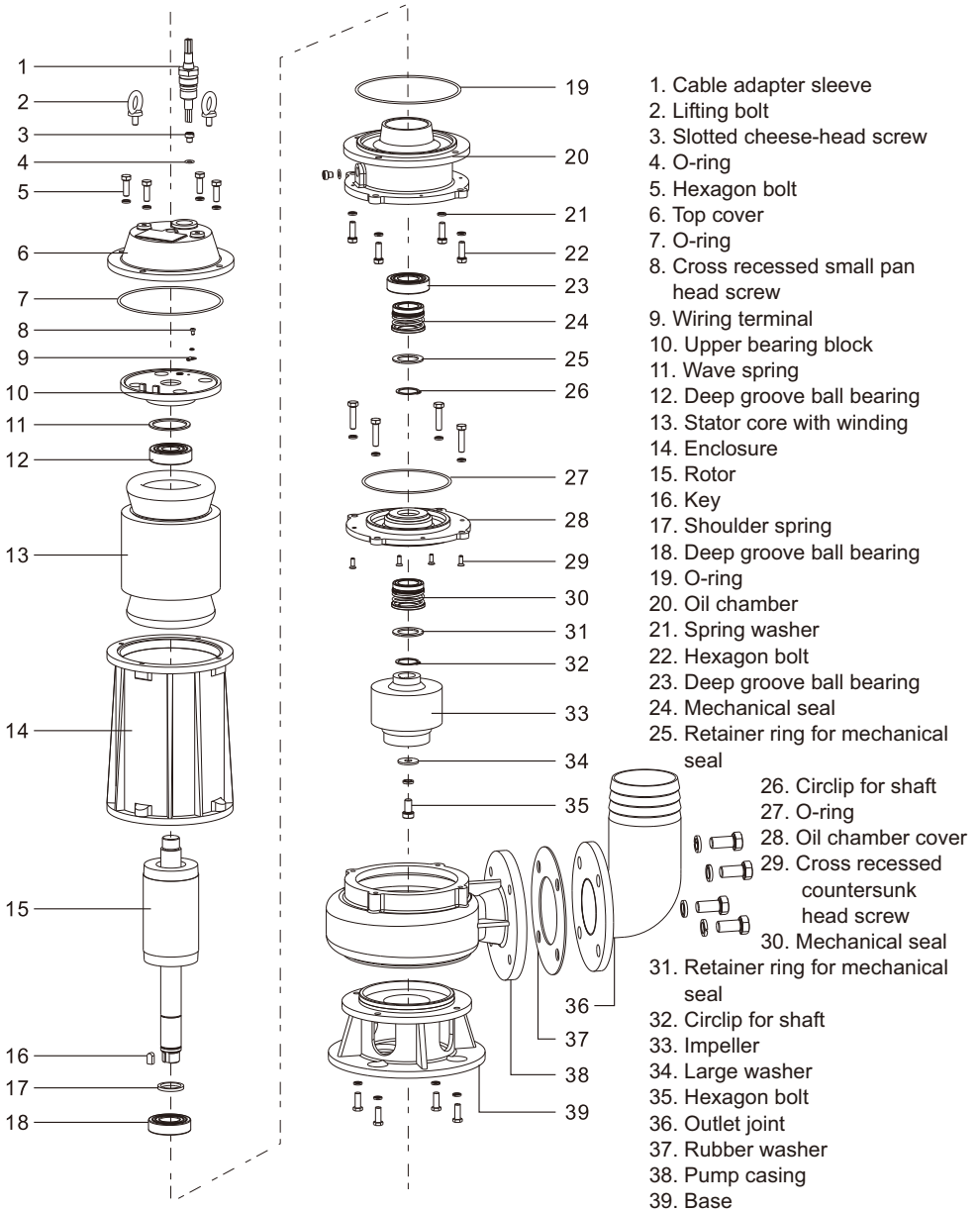
Electric pump shall be able to operate continuously and normally in the following operating conditions:

1. The temperature of medium is no higher than +40°C;
2. The pH value of medium is 4~10;
3. The maximum density of medium is $1.2 \times 10^3 \text{kg/m}^3$;
4. The immersion depth is no less than 0.5m and no more than 5m.

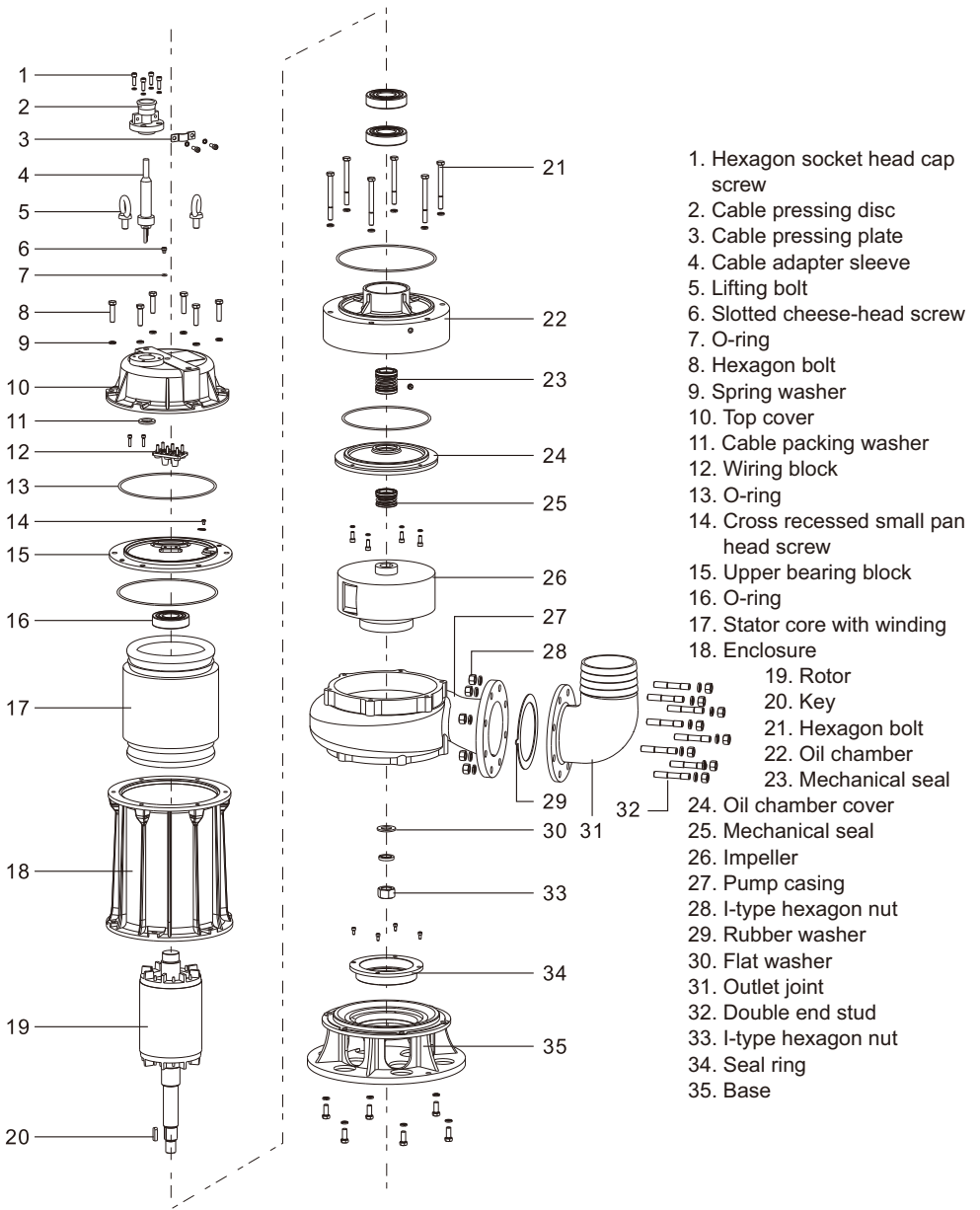
III. Structural Diagrams



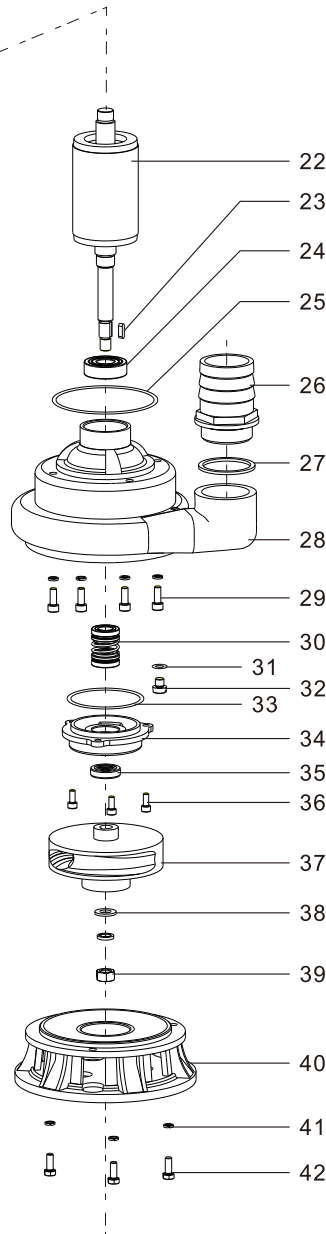
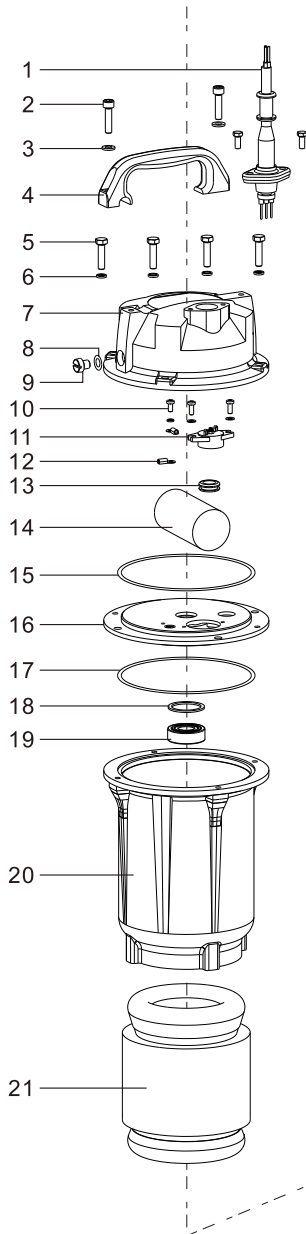
WQ(D) 0.55-1.1kW



WQ 1.5-7.5kW

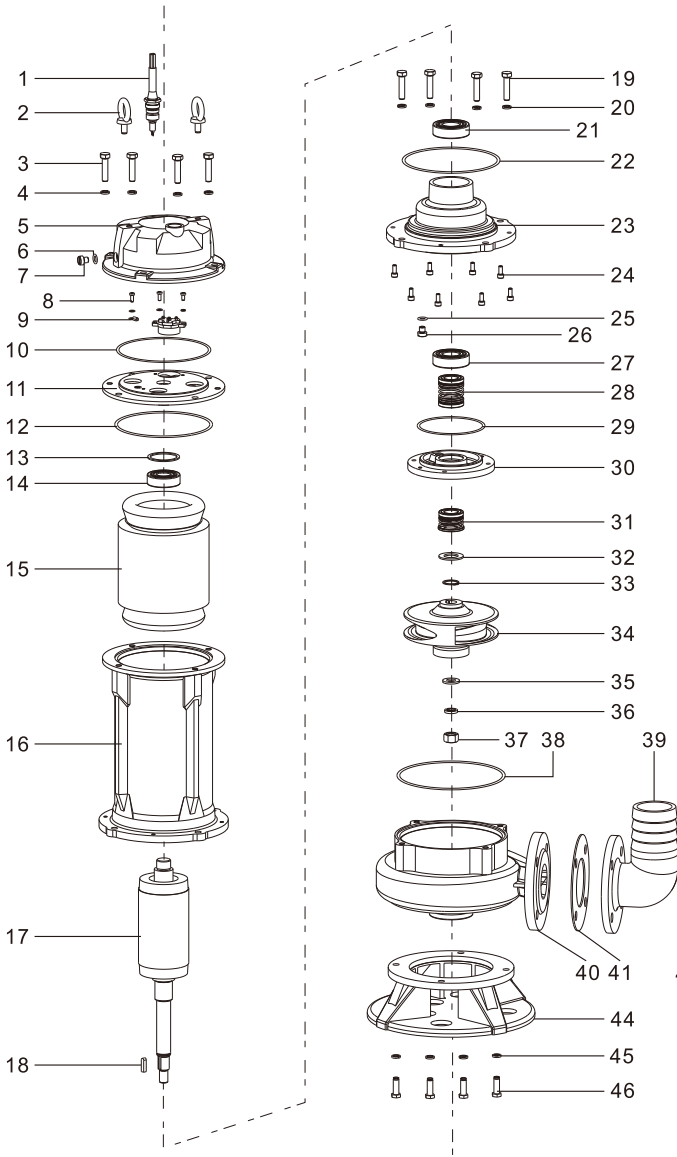


WQ 11-22kW



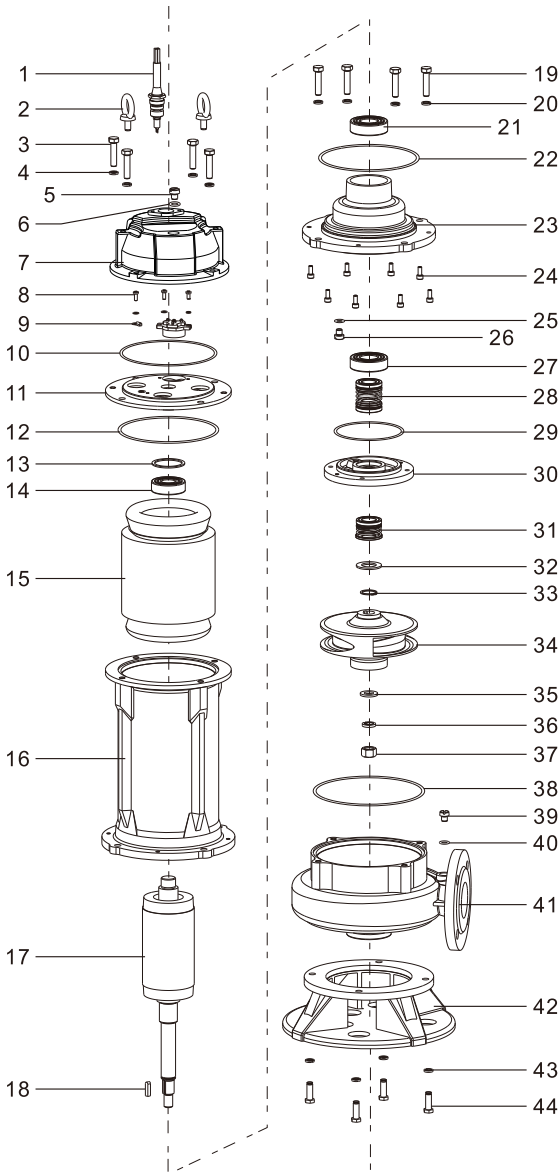
1. Cable adapter sleeve
2. Hexagon socket head cap screw
3. Flat washer
4. Handle
5. Hexagon bolt
6. Spring washer
7. Top cover
8. O-ring
9. Slotted cheese-head screw
10. Cross recessed small pan head screw
11. Thermal protector
12. Wiring terminal
13. Lead wire sheath
14. Capacitor
15. O-ring
16. Upper bearing block
17. O-ring
18. Wave spring
19. Deep groove ball bearing
20. Enclosure
21. Stator core with winding
22. Rotor
23. Key
24. Deep groove ball bearing
25. O-ring
26. Outlet joint
27. Rubber washer
28. Pump casing
29. Hexagon socket head cap screw
30. Mechanical seal
31. O-ring
32. Slotted cheese-head screw
33. O-ring
34. Oil chamber cover
35. Framework oil seal
36. Hexagon socket head cap screw
37. Impeller
38. Flat washer
39. I-type hexagon nut
40. Base
41. Spring washer
42. Hexagon bolt

WQ(D)-L1 0.55-1.5kW



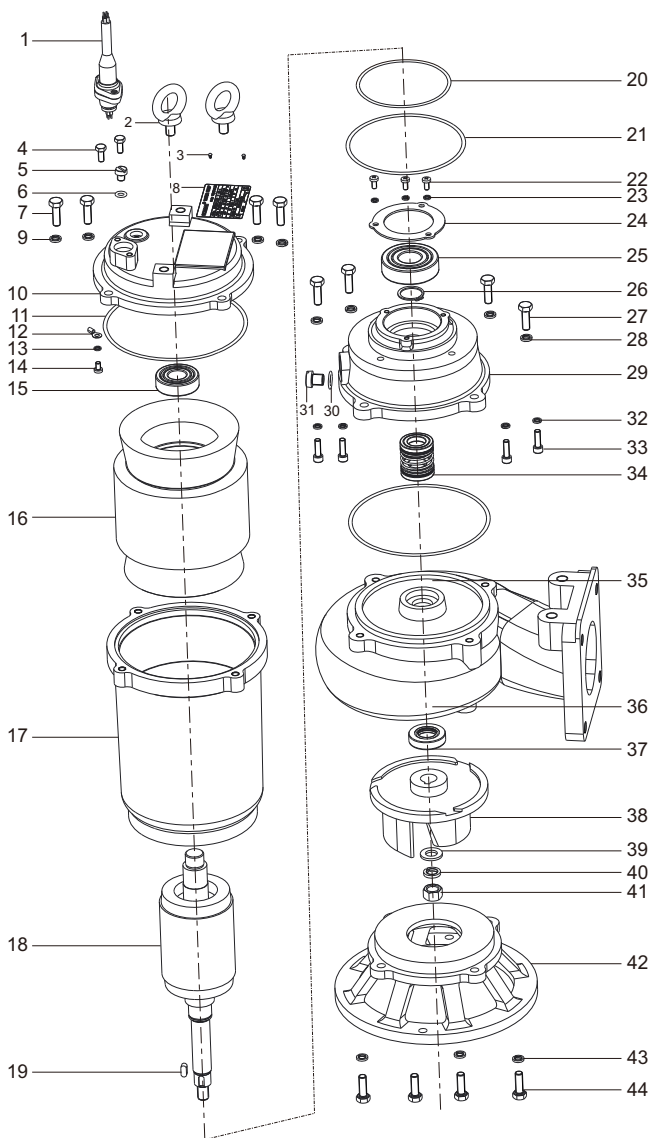
1. Cable adapter sleeve
2. Lifting bolt
3. Hexagon bolt
4. Spring washer
5. Top cover
6. O-ring
7. Slotted cheese-head screw
8. Cross recessed small pan head screw
9. Wiring terminal
10. O-ring
11. Upper bearing block
12. O-ring
13. Wave spring
14. Deep groove ball bearing
15. Stator core with winding
16. Enclosure
17. Rotor
18. Key
19. Hexagon bolt
20. Spring washer
21. Deep groove ball bearing
22. O-ring
23. Oil chamber
24. Hexagon socket head cap screw
25. O-ring
26. Slotted cheese-head screw
27. Deep groove ball bearing
28. Mechanical seal (single end face mechanical seal for 2.2kW-5.5kW)
29. O-ring
30. Oil chamber cover
31. Mechanical seal
32. Retaining ring for mechanical seal
33. Circlip for shaft
34. Impeller
35. Flat washer
36. Spring washer
37. I-type hexagon nut
38. O-ring
39. Outlet joint
40. Pump casing
41. Rubber washer
42. Spring washer
43. Hexagon bolt
44. Base
45. Spring washer
46. Hexagon bolt

WQ-L1 2.2-7.5kW



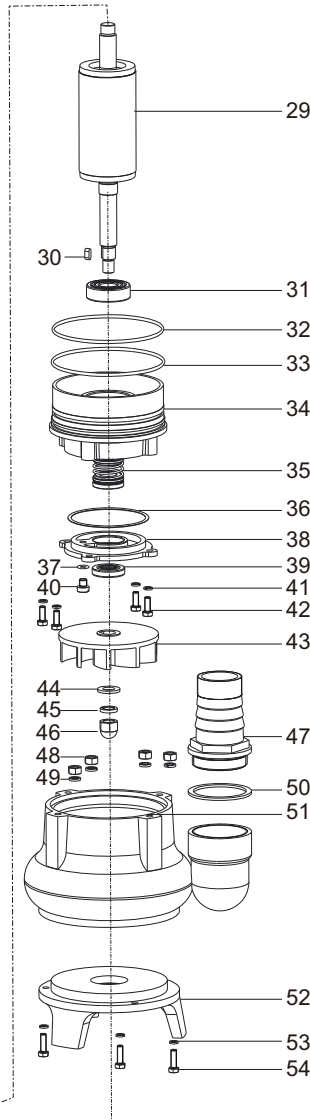
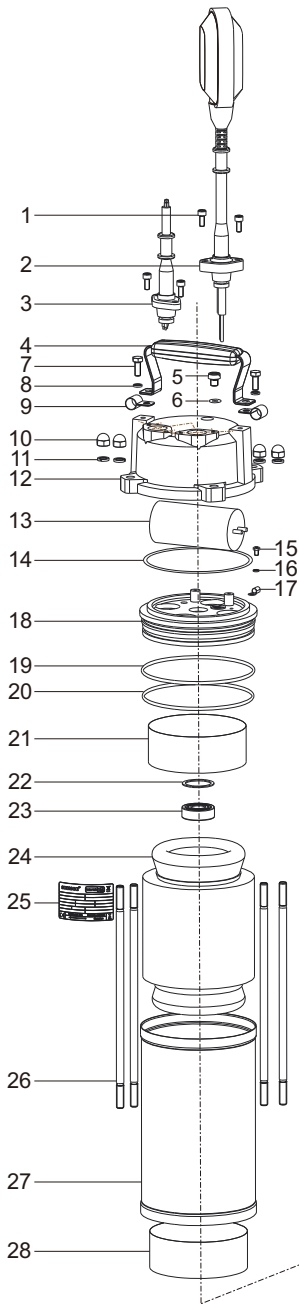
1. Cable adapter sleeve
2. Lifting bolt
3. Hexagon bolt
4. Spring washer
5. Slotted cheese-head screw
6. O-ring
7. Top cover
8. Cross recessed small pan head screw
9. Wiring terminal
10. O-ring
11. Upper bearing block
12. O-ring
13. Wave spring
14. Deep groove ball bearing
15. Stator core with winding
16. Enclosure
17. Rotor
18. Key
19. Hexagon bolt
20. Spring washer
21. Deep groove ball bearing
22. O-ring
23. Oil chamber
24. Hexagon socket head cap screw
25. O-ring
26. Slotted cheese-head screw
27. Deep groove ball bearing
28. Mechanical seal
29. O-ring
30. Oil chamber cover
31. Mechanical seal (framework oil seal for 0.55kW ~ 1.5kW)
32. Retaining ring for mechanical seal
33. Circlip for shaft
34. Impeller
35. Flat washer
36. Spring washer
37. I-type hexagon nut
38. O-ring
39. Slotted cheese-head screw
40. O-ring
41. Pump casing
42. Base
43. Spring washer
44. Hexagon bolt

WQ(D)-L2



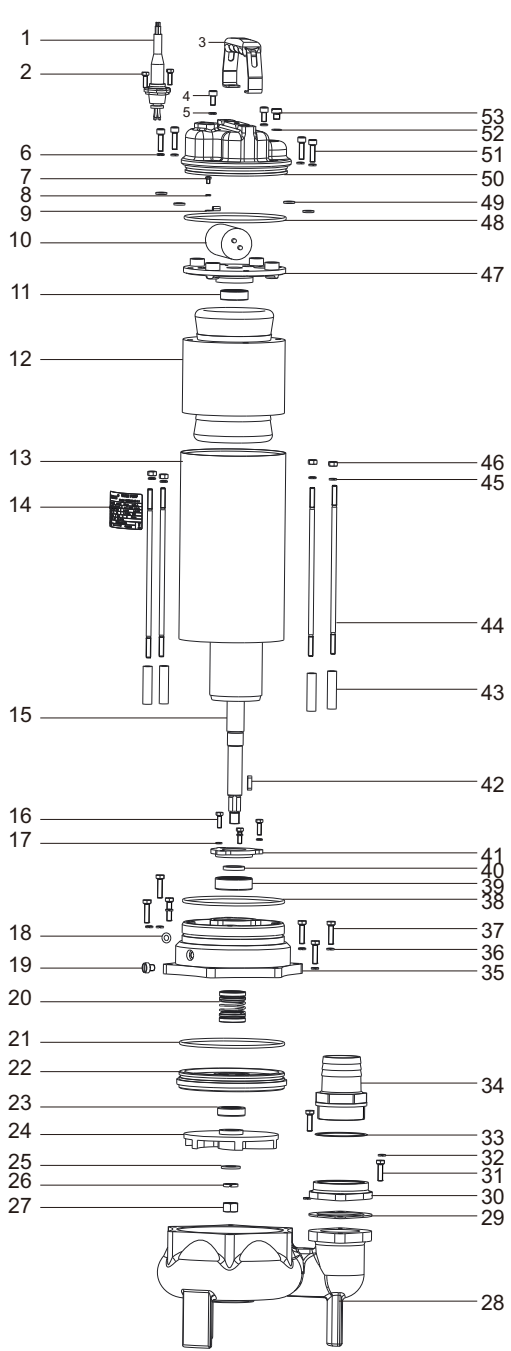
1. Cable adapter sleeve
2. Lifting bolt
3. Rivet for nameplate
4. Hexagon bolt – full thread
5. Slotted cheese-head screw
6. O-ring
7. Hexagon bolt – full thread
8. Nameplate
9. Spring washer
10. Top cover
11. O-ring
12. Closed wiring terminal
13. Spring washer
14. Cross recessed small pan head screw
15. Deep groove ball bearing
16. Stator core with winding
17. Enclosure
18. Rotor
19. Flat key
20. O-ring
21. O-ring
22. Cross recessed small pan head screw
23. Spring washer
24. Bearing gland
25. Deep groove ball bearing
26. Circlip for shaft
27. Hexagon bolt – full thread
28. Spring washer
29. Oil chamber
30. O-ring
31. Slotted cheese-head screw
32. Spring washer
33. Hexagon socket head cap screw
34. Mechanical seal
35. O-ring
36. Pump casing
37. Framework oil seal
38. Impeller
39. Flat washer
40. Spring washer
41. I-type hexagon nut
42. Base
43. Spring washer
44. Hexagon bolt – full thread

WQK



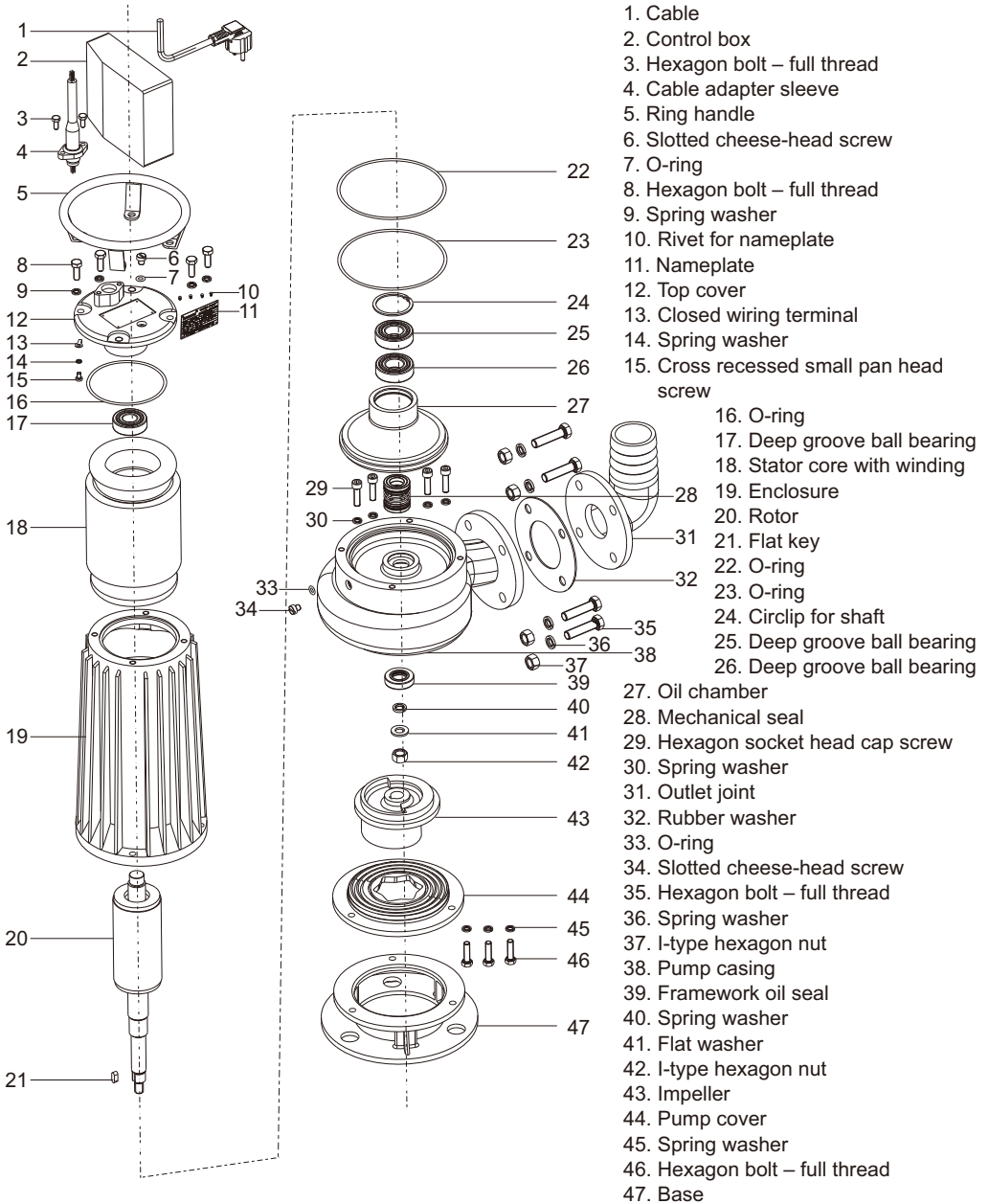
1. Hexagon socket head cap screw
2. Float switch adapter sleeve
3. Cable adapter sleeve
4. Handle
5. Slotted cheese-head screw
6. O-ring
7. Hexagon bolt – full thread
8. Spring washer
9. Cable clip
10. Hexagon cap nut
11. Spring washer
12. Top cover
13. Capacitor
14. O-ring
15. Cross recessed small pan head screw
16. Spring washer
17. Closed wiring terminal
18. Upper bearing block
19. O-ring
20. O-ring
21. Insulation paper
22. Wave spring
23. Deep groove ball bearing
24. Stator core with winding
25. Nameplate
26. Double end stud
27. Enclosure
28. Insulation paper
29. Rotor
30. Flat key
31. Deep groove ball bearing
32. O-ring
33. O-ring
34. Oil chamber
35. Mechanical seal
36. O-ring
37. O-ring
38. Oil chamber cover
39. Framework oil seal
40. Slotted cheese-head screw
41. Spring washer
42. Hexagon bolt – full thread
43. Impeller
44. Flat washer
45. Spring washer
46. Hexagon cap nut
47. Outlet joint
48. I-type hexagon nut
49. Spring washer
50. Rubber washer
51. Pump casing
52. Base
53. Spring washer
54. Hexagon bolt – full thread

WVSD

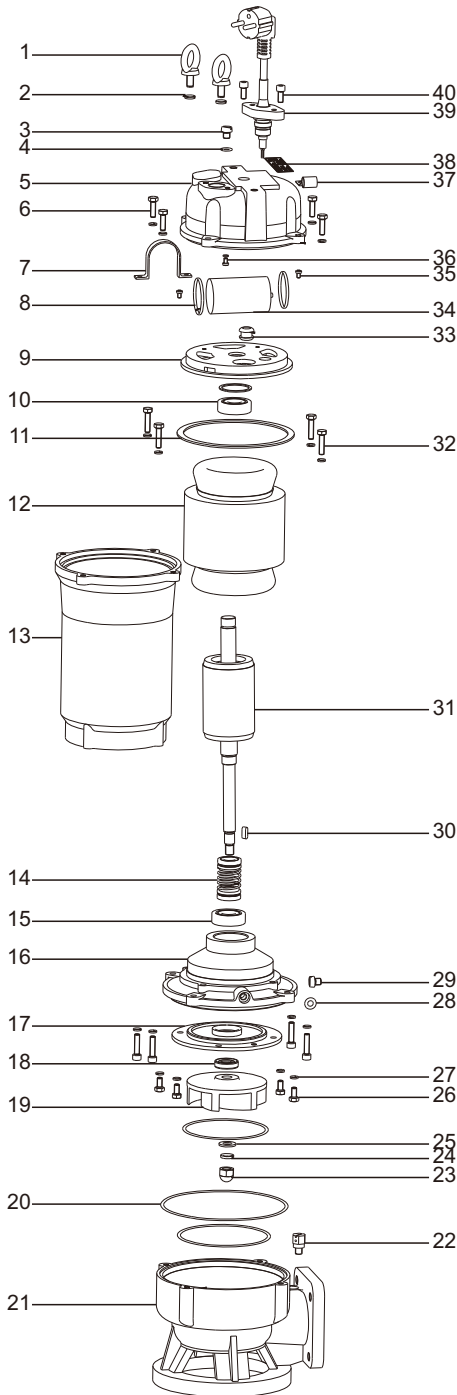


1. Cable adapter sleeve
2. Hexagon bolt – full thread
3. Handle
4. Hexagon socket head cap screw
5. Spring washer
6. Spring washer
7. Cross recessed small pan head screw
8. Spring washer
9. Closed wiring terminal
10. Capacitor
11. Deep groove ball bearing
12. Stator core with winding
13. Enclosure
14. Nameplate
15. Rotor
16. Hexagon bolt – full thread
17. Spring washer
18. O-ring
19. Slotted cheese-head screw
20. Mechanical seal
21. O-ring
22. Oil chamber cover
23. Framework oil seal
24. Flat washer
25. Impeller
26. Spring washer
27. I-type hexagon nut
28. Pump casing
29. Rubber gasket
30. Flange plate
31. Hexagon bolt – full thread
32. Spring washer
33. O-ring
34. Outlet joint
35. Oil chamber
36. Spring washer
37. Hexagon bolt – full thread
38. O-ring
39. Deep groove ball bearing
40. Shoulder ring
41. Bearing gland
42. Flat key
43. Stud sleeve
44. Double end stud
45. Spring washer
46. I-type hexagon nut
47. Upper bearing block
48. O-ring
49. Rubber washer
50. Top cover
51. Hexagon socket head cap screw
52. O-ring
53. Slotted cheese-head screw

WQDS

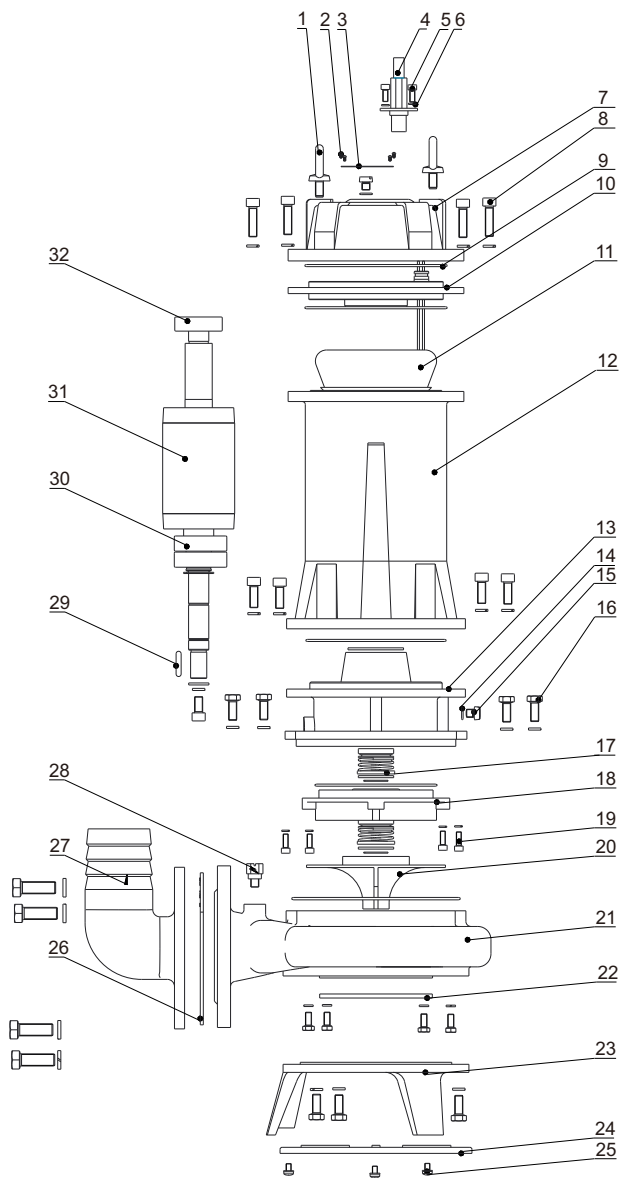


WQ(D)AS-CB



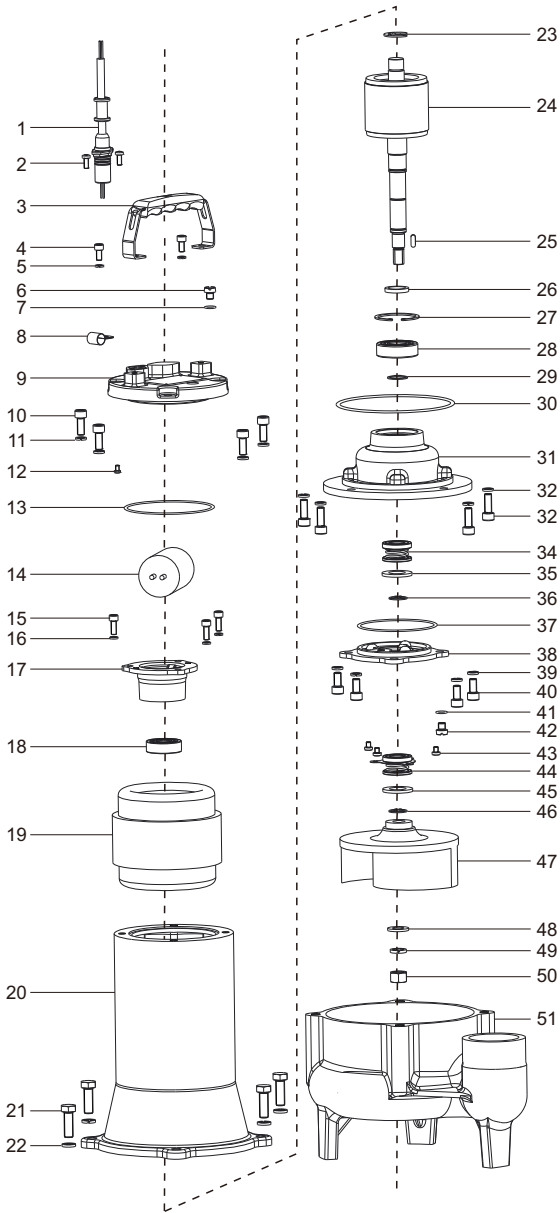
1. Lifting bolt
2. Spring washer
3. Slotted cheese-head screw
4. O-ring
5. Top cover
6. Hexagon bolt – full thread
7. Capacitor clamp
8. O-ring
9. Upper bearing block
10. Deep groove ball bearing
11. Rubber gasket
12. Stator core with winding
13. Enclosure
14. Mechanical seal
15. Deep groove ball bearing
16. Oil chamber
17. Oil chamber cover
18. Framework oil seal
19. Impeller
20. O-ring
21. Pump casing
22. Air vent screw
23. Cap nut
24. Spring washer
25. Flat washer
26. Hexagon bolt – full thread
27. Spring washer
28. O-ring
29. Slotted cheese-head screw
30. Flat key
31. Rotor
32. Hexagon bolt – full thread
33. Lead wire sheath
34. Capacitor
35. Cross recessed small pan head screw
36. Cross recessed small pan head screw
37. Cable clip
38. Nameplate
39. Cable adapter sleeve
40. Hexagon bolt – full thread

DWE



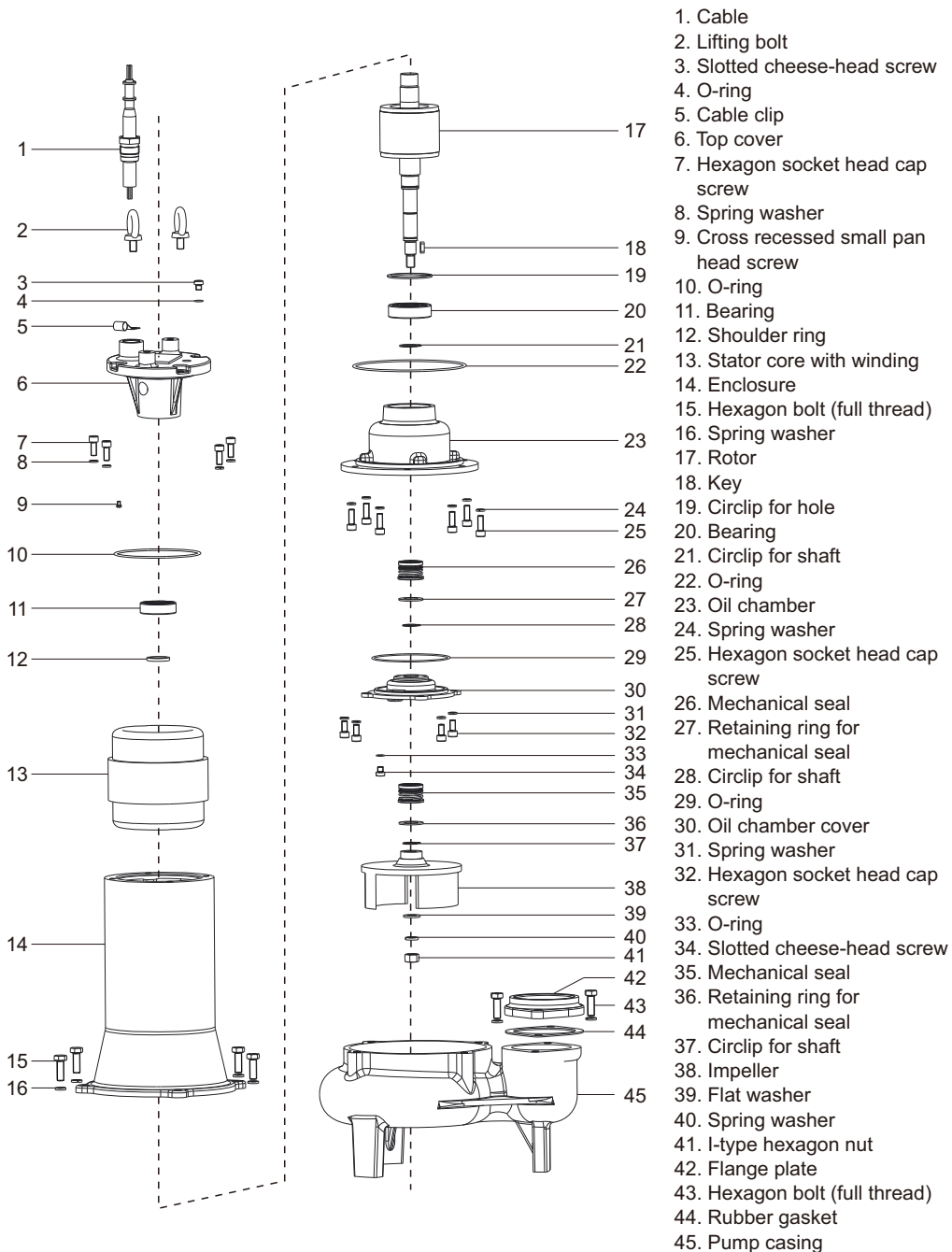
1. Lifting bolt
2. Rivet for nameplate
3. Nameplate
4. Cable
5. Hexagon socket head cap screw
6. Spring washer
7. Top cover
8. Hexagon socket head cap screw
9. O-ring
10. Upper bearing block
11. Stator core with winding
12. Enclosure
13. Oil chamber
14. O-ring
15. Slotted cheese-head screw
16. Hexagon bolt – full thread
17. Mechanical seal
18. Oil chamber cover
19. Hexagon socket head cap screw
20. Impeller
21. Pump casing
22. Cutting disk
23. Base
24. Base plate
25. Cross recessed flange screw
(combination screw)
26. Rubber washer
27. Outlet joint
28. Air vent screw
29. Ordinary flat key
30. Deep groove ball bearing
31. Rotor
32. Deep groove ball bearing

WQ-QG



1. Cable
2. Cross recessed small pan head screw
3. Handle
4. Hexagon socket head cap screw
5. Flat washer
6. Slotted cheese-head screw
7. O-ring
8. Cable clip
9. Top cover
10. Hexagon socket head cap screw
11. Spring washer
12. Cross recessed small pan head screw
13. O-ring
14. Capacitor
15. Hexagon socket head cap screw
16. Spring washer
17. Upper bearing block
18. Bearing
19. Stator core with winding
20. Enclosure
21. Hexagon bolt (full thread)
22. Spring washer
23. Split washer
24. Rotor
25. Key
26. Shoulder ring
27. Circlip for hole
28. Bearing
29. Circlip for shaft
30. O-ring
31. Oil chamber
32. Spring washer
33. Hexagon socket head cap screw
34. Mechanical seal
35. Retaining ring for mechanical seal
36. Circlip for shaft
37. O-ring
38. Oil chamber cover
39. Spring washer
40. Hexagon socket head cap screw
41. O-ring
42. Slotted cheese-head screw
43. Cross recessed pan head screw
44. Mechanical seal
45. Retaining ring for mechanical seal
46. Circlip for shaft
47. Impeller
48. Flat washer
49. Spring washer
50. I-type hexagon nut
51. Pump casing

50WQD-4P

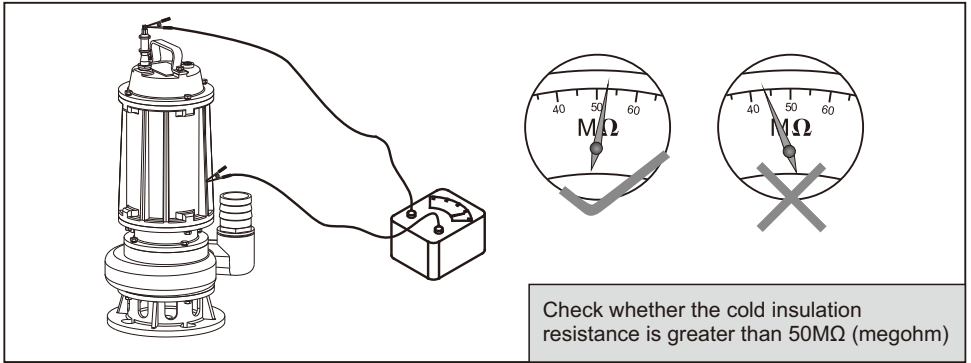


80WQ-4P

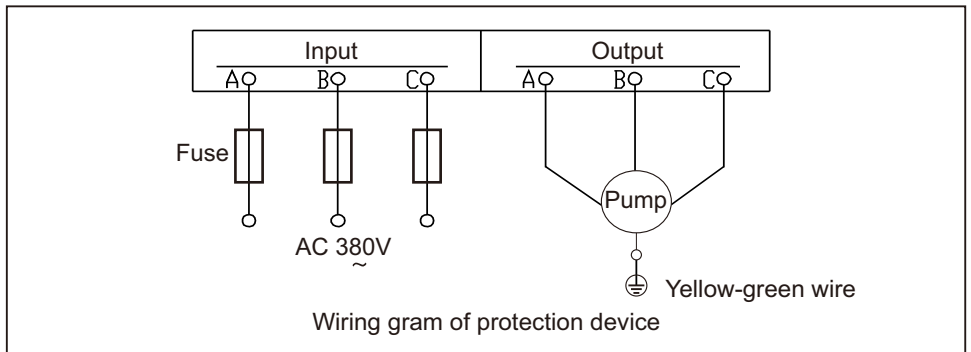
IV. Installation & Use and Matters Needing Attention

1. Electric pumps shall be comprehensively checked for damage during transportation and storage prior to installation and use, e.g. whether cable is in good condition, and in case of any damage, replacement or repair shall be made by professionals prior to use.

2. Before operation, electric pumps shall be checked for whether the insulation resistance meets the requirements of relevant standards, and whether the cold insulation resistance is greater than 50MΩ (megohm).

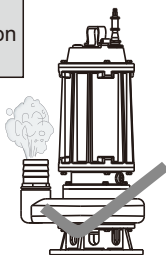


3. At wiring, electric pumps should be correctly installed with electrical leakage protector, and a yellow-green wire attached with earthing mark in the outgoing cable of electric pump shall be earthed reliably. For electric pumps provided with plug at delivery, the matched patch board must be reliably earthed. Matched overload protection devices shall be selected by current or power for all electric pumps. The wiring of electric pumps can be carried out according to the figure below.

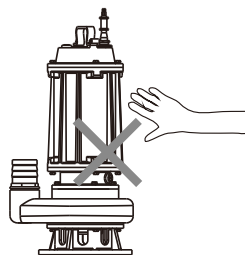


4. Electric pumps shall be subjected to test run for no more than 10s before immersion into water, and it shall be checked whether the direction of rotation of electric pump is consistent with the indication arrow; if it's found a three-phase electric pump reserves, any two of the three phases should be exchanged with each other.

After powered on, the wind power at outlet is very large: The direction of rotation is correct



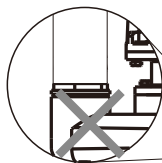
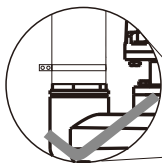
After powered on, the wind power at outlet is very small and even there is no wind: Electric pump reverses



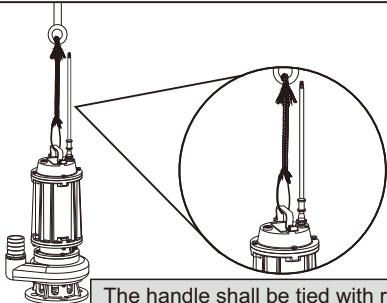
⚠ After powered on, it's strictly prohibited to touch electric pump with hand

5. At the connection of deliver pipe matching with outlet joint (the specification of delivery pipe can be selected according to Table 1), flexible delivery pipe can be tightened with iron wire or clamp, steel delivery pipe can be reliably connected with screwed joint or welded flange plate, and a rope should be reeved through the handle or lift ring for lifting of electric pump in the water.

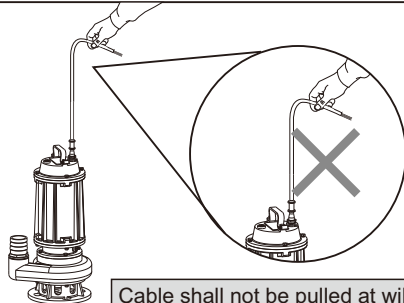
Tighten flexible delivery pipe with iron wire or clamp



6. It's strictly prohibited to strike or roll over cable, nor shall it be used as lifting rope; during the operation of electric pump, cable shall not be pulled at will to avoid electric shock accidents due to damage of cable.

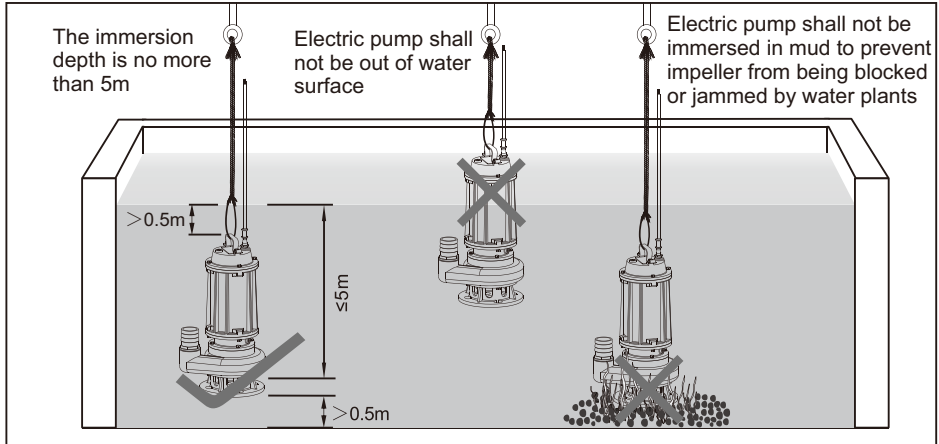


The handle shall be tied with rope with enough strength prior to putting electric pump into the water

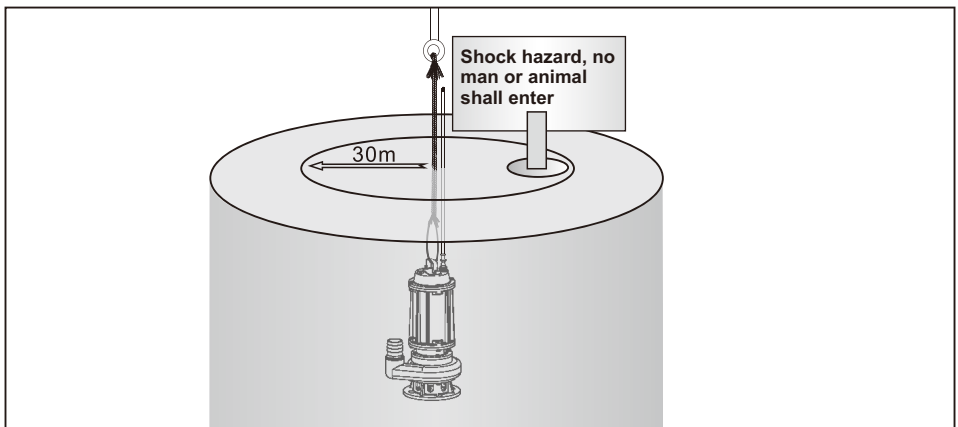


Cable shall not be pulled at will or used as lifting rope during operation of electric pump

7. When electric pump is immersed in the water, the depth shall not exceed 5m, and it shall be more than 0.5m from the water bottom. Electric pump shall not immerse into mud, and the impeller shall be prevented from being blocked or jammed by water plants or debris, resulting in that electric pump cannot work normally; the fall of water level should be checked frequently during operation so as not to let electric pump work out of water surface.



8. When electric pump is running, the safety warning sign of "Shock hazard, no man or animal shall enter" shall be arranged at the work site to avoid accidents.



9. For single-phase electric pumps with built-in automatic reset type thermal protector, after the protector acts, it can reset automatically when the temperature rise of motor lowers to a certain value, and in case of frequent action of protection, the power shall be cut off for troubleshooting prior to further use.

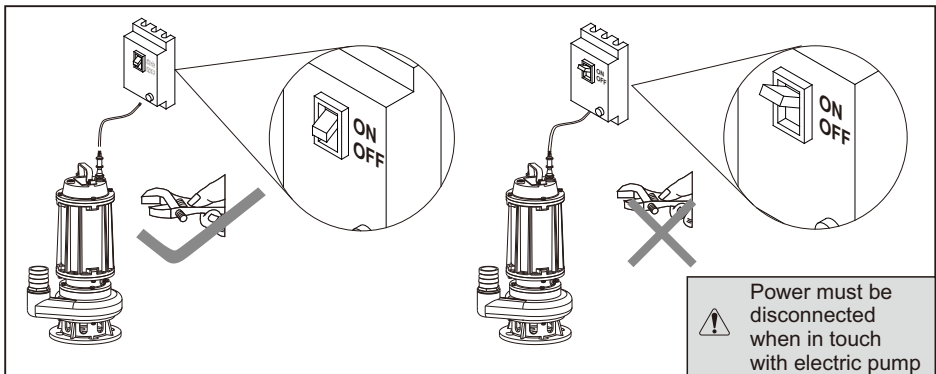
For three-phase electric pumps with power-off reset type thermal protector, after the protector acts, the power must be cut off for 10min, and then the electric pump can run normally; in case of frequent action of protection, the power shall be cut off for troubleshooting prior to further use.

10. For electric pumps not used with total lift (the upper and lower limits of lift are specified), they must be used within the usable range of lift to avoid damage of electric pumps due to overload. For electric pumps used with total lift, the pipe diameter adopted shall be consistent with but not greater than the specified pipe diameter to avoid overload.

11. Electric pumps are of dry structure, and it's not allowed to fill the cavity of motor with oil or water.

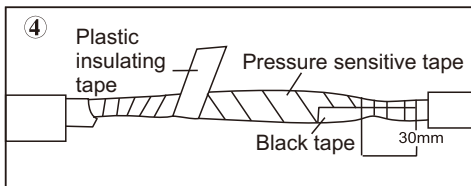
12. The oil chamber of the product is filled with No.10 white oil for food-level machinery to ensure that mechanical seal is lubricated and cooled effectively, and leakage may occur when the product is damaged or out of order. In such service environment as plantation, cultivation, or delivery and processing of drinking water or food, leaking white oil may cause damage to planted plants or farmed animals or pollute drinking water or food. The user shall evaluate the service environment and the consequence of using the product prior to selection and use of the product to confirm whether the product is applicable, and shall invite related professionals for confirmation where necessary. In case of leakage of white oil, the user shall immediately stop using the product and handle it properly.

13. When electric pump is running, if it is needed to adjust the position of electric pump or touch the electric pump, the power must be disconnected first to avoid accidents.

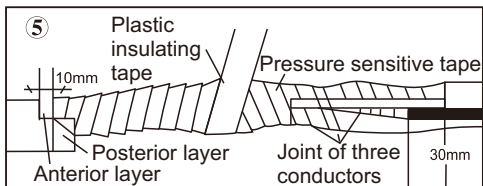


14. When electric pump is running, it's strictly prohibited to immerse cable joints or plug boards into the water; if this is needed for extension of cable, the joints shall be sealed and covered strictly to avoid electric leakage due to water seepage. (Refer to the figure below)

<p>① $\geq 60\text{mm}$</p>	<p>②</p>	<p>③</p> <p>No less than 10 times of conductor diameter</p>
<p>1. Remove the insulating layer without damaging conductor 2. Stagger several conductors in length 3. Ensure no oil, water or other dirt at the joint</p>	<p>1. Tighten up the joint by dividing it into several strands evenly (at least 6 strands). 2. Cross two joints by such a length that the wire ends reach the insulating layer at both ends.</p>	<p>1. Tighten up the strands together, take out one strand from the middle and twine it to one end (the twined core wire contains the other strands), and then twine other strands one by one. 2. Repeat the step above at the other end. 3. Tighten the joint with pliers, and coat the joint with tin to achieve the best effect. Note: See the attached figure 1 and attached figure 2 for other methods</p>



1. Wrap the joint tightly with black tape, with no copper wire exposed, see Figure 3.
2. Wrap the joint with pressure sensitive tape (self-adhesive tape) for three layers, with the posterior layer exceeding the two ends of the previous layer by about 10mm; stretch the tape to two times of the original length prior to wrapping.
3. Wrap the joint with plastic insulating tape (yellow transparent) for one layer.



1. Tidy up the core wire joint, and wrap it with pressure sensitive tape for four layers to cover the cable sheath by 30mm at two ends, with the posterior layer exceeding the two ends of the previous layer by about 10mm.
2. Wrap the joint with plastic insulating tape for three layers, with the posterior layer exceeding the two ends of the previous layer by about 10mm.

Figure 1

It's better to adopt air welded joint

Figure 2

Cold-pressed sleeve joint method can also be adopted

Figure 3

When wrapping the anterior layer of black tape, it's not allowed to let copper wire expose or penetrate the tape

Cable Wiring Diagram

15. After electric pump is powered off, it can be lifted out of water surface only after electric motor is cooled to room temperature to ensure safety.

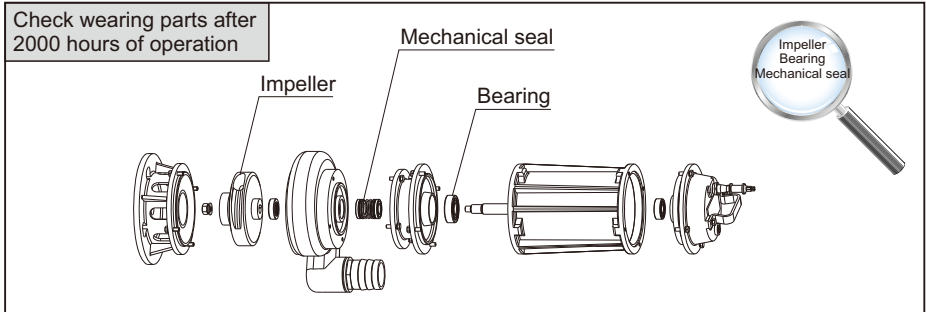
V. Maintenance

1. The insulation resistance between pump winding and enclosure shall be checked regularly, and the insulation resistance must be greater than 1MΩ (megohm) when approaching the working temperature; otherwise, corresponding measures must be taken to reach the requirements prior to use.

The insulation resistance must be greater than 1MΩ (megohm) when approaching the working temperature

2. After electric pump is normally used for 2000 hours, it shall be sent to qualified maintenance stations for maintenance by the following steps:

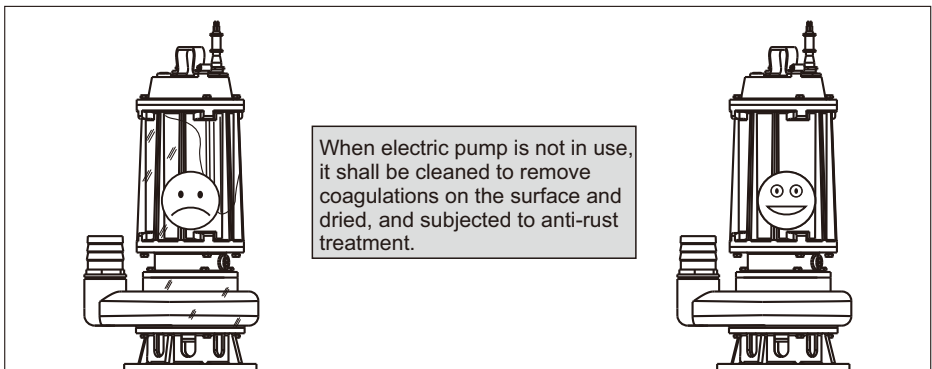
Disassembly: Check wearing parts, e.g. rolling bearing, mechanical seal, and impeller, which shall be replaced if damaged.



Air pressure test: After electric pump is disassembled for repair or a seal is replaced, the motor cavity and seal cavity must be subjected to air pressure test, the test pressure is 0.2Mpa (megohm), and no leakage or sweating shall occur in a duration of 3min.

Oil replacement: Unscrew the oiling screw at oil chamber, and replace used oil with No.10 white oil for food-level machinery to reach 95% volume of chamber.

3. If electric pump is not used for a long time, it should not be immersed in the water; electric pump shall be placed in clean water to run several minutes, cleaned to remove coagulations inside and outside the pump, dried, subjected to anti-rust treatment, and placed at dry and ventilated place. Electric pump which has been used for a long time shall be repainted and subjected to anti-rust treatment depending on its surface corrosion situation.



VI. Troubleshooting

Fault	Causes	Remedy
Difficulty in starting	<ol style="list-style-type: none"> 1. The supply voltage is too low 2. Phase loss 3. The impeller is jammed 4. The voltage drop of cable is too large 5. Stator winding is burnt out 	<ol style="list-style-type: none"> 1. Adjust the voltage to $\pm 10\%$ of the rated value 2. Check switch outlet and cable and plug 3. Fix the jammed part 4. Select and use reasonable cable 5. Insert winding again for overhaul
Low water output	<ol style="list-style-type: none"> 1. The lift is too large 2. The mesh enclosure is blocked 3. The impeller is worn seriously 4. The immersion depth of electric pump is shallow, with air sucked 5. The impeller reverses 	<ol style="list-style-type: none"> 1. Use the pump within the usable range of lift 2. Clear away water plants and other foreign matters 3. Replace the impeller 4. Adjust the immersion depth of electric pump, which shall not be less than 0.5m 5. Exchange any two of the three phases
Stop running suddenly	<ol style="list-style-type: none"> 1. Switch is off, or fuse is burnt out 2. The impeller is jammed 3. Stator winding is burnt out 	<ol style="list-style-type: none"> 1. Check whether the lift used or supply voltage meets requirements and adjust it 2. Clear away foreign matters 3. Insert winding again for overhaul
Stator winding is burnt out	<ol style="list-style-type: none"> 1. Phase loss occurs to electric pump or the running time is too long 2. Water leaks due to damage of mechanical seal, resulting in turn-to-turn or phase-to-phase short circuit 3. The impeller is jammed 4. Electric pump starts up frequently or runs out of water too long 5. Electric pump is overloaded 	Eliminate the faults, remove the winding and insert the winding again according to the original technical requirements, and apply insulating paint by impregnating and drying, or send it to the maintenance company for repair

Notes:

1. All the figures in this manual are schematic diagrams, and please understand that the electric pumps and accessories you buy may be different from the diagrams in this manual.

2. The performance of the product is improved constantly, and all products (including appearance and color, etc.) are subject to physical products; no further notice will be given in case of any change.