AHS series

Installation and operation manual

INDEX

Introduction

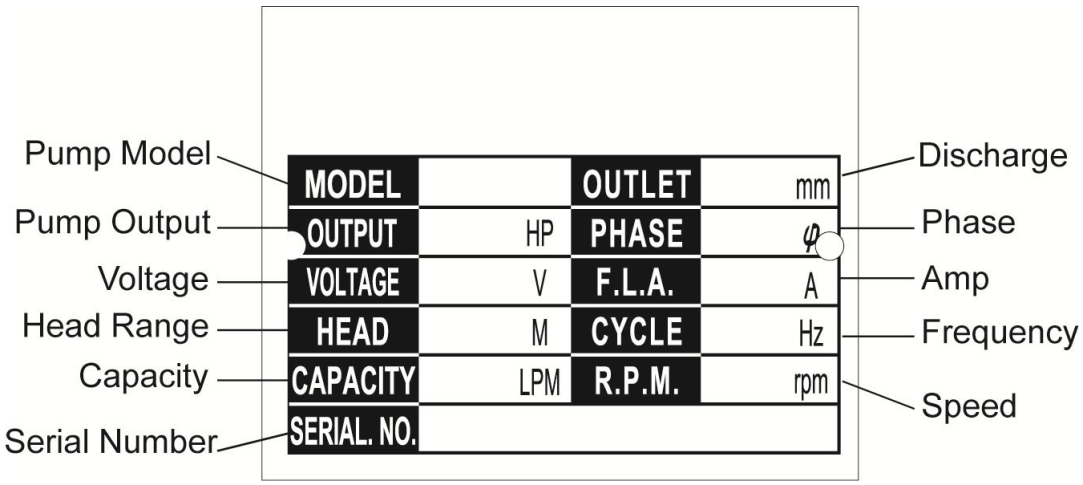
Thank you for selecting the AHS submersible dewatering pump.

This instruction manual contains the product operations and gives important precautions regarding its safety use. In order to use the product in best performance, be sure to read the manual thoroughly and follow instructions carefully.

To avoid accident, do not use the pump in any way other than as described in this instruction manual especial on the text ! WARNING

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

Nameplate format



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 page.8**)

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

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

Item		Specifications		
Liquid handled	Type	Sewage, waste water, miscellaneous drain water		
Range	Power Supply	**AHS-05**	**0.37**kw (**1/2** HP)	Single / Three phase
		AHS-05A	**0.37**kw (**1/2** HP)	Single phase
		AHS-10	**0.75** kw (**1** HP)	Single / Three phase
		AHS-10A	**0.75** kw (**1** HP)	Single phase
		AHS-20	**1.5** kw (**2** HP)	Single / Three phase
		AHS-20A	**1.5** kw (**2** HP)	Single phase
Materials	Pump Casing	FC-200		
	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.

Insulation 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 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 (models AHS) 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 (models AHS-A) so that this will not happen, as shown in Fig.2 and maintain a safe operating water level

Fig-1

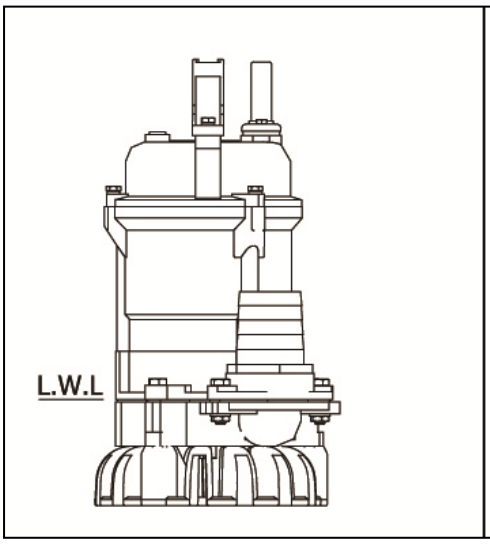
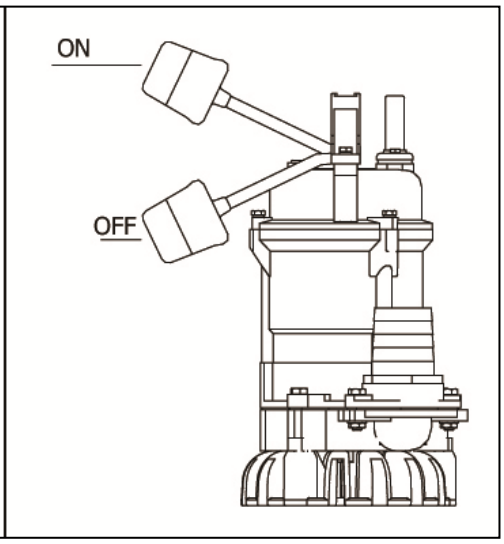


Fig-2



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 phase.

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 handle

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. Under no circumstances should the green wire be connected to the power supply directly.

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

Fig.3

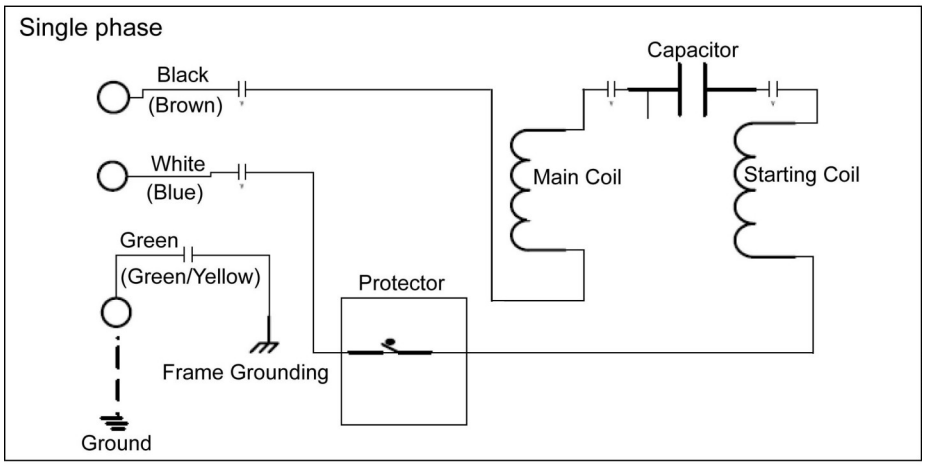
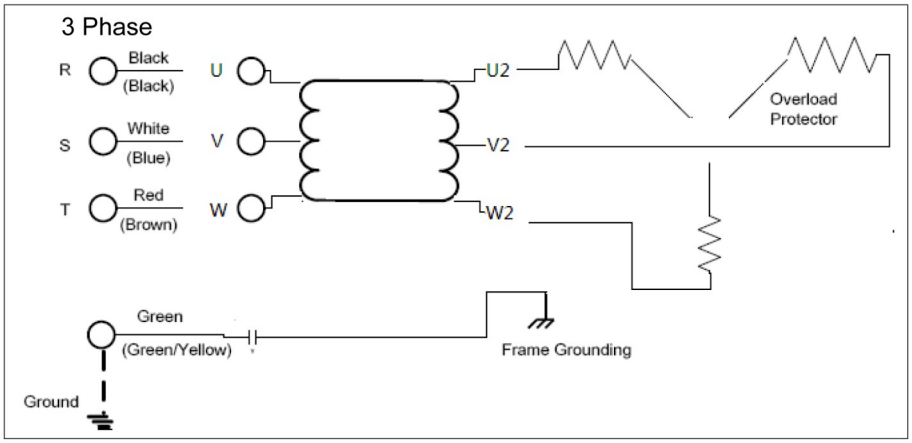


Fig.4



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 shut off the power. Constant operating in above condition will shorten pump life time. Do not start the pump again in such a situation before the motor has completely cooled.

2. Test operation….

Non-automatic pump (AHS)

Automatic pump (AHS-A)

(1) Turn the operating switch on and off a couple of times to check switch function.

For the AHS-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 direction is 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 clogged the pump. If the volume of liquid discharged falls suddenly, foreign matter may be blocked 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 3-5year intervals

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

3. Parts need to be replaced

Replace the appropriate part when the following conditions appear.

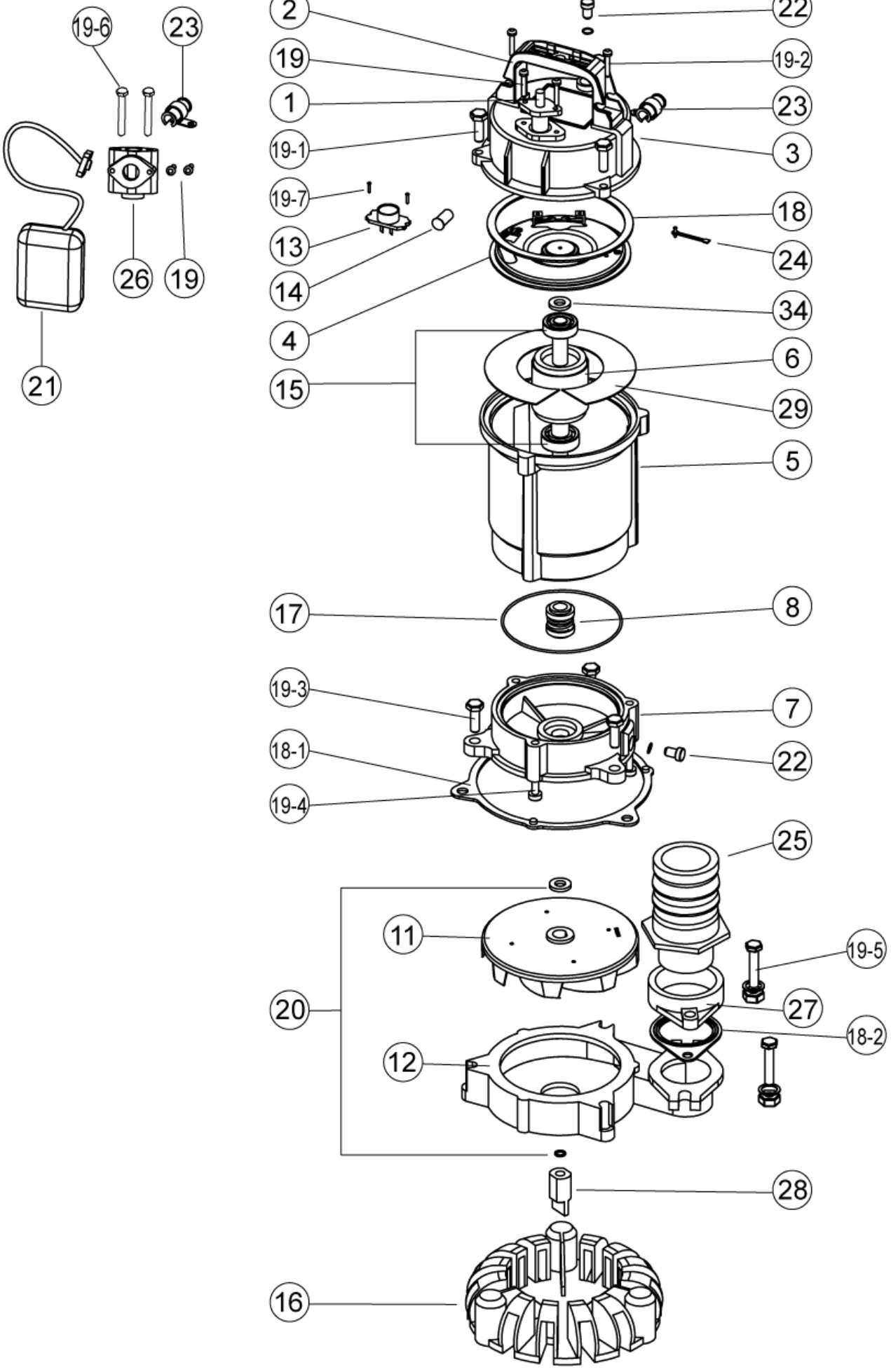
Replaceable part	Mechanical seal	Oil filler plug gasket	Lubricating oil	O-ring
Condition	Oil in mechanical seal chamber	Inspect or replace the oil	Oil is clouded or dirty	Overhaul the pump
Frequency	Annual	Half a year	Half a year	Annual

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

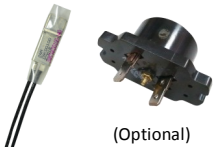
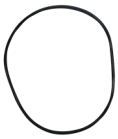
Troubleshooting

Trouble	Cause	Remedy
Does not start. Starts, but immediately stops.	(1) Power failure	(1)~(3) Contact electric power company and devise counter-measures
	(2) Large discrepancy between power source and voltage	
	(3) Significant drop in voltage	
	(4) Motor phase malfunction	(4) Inspect electric circuit
	(5) Electric circuit connection faulty	(5) Correct wiring
	(6) Faulty connection of control circuit	(6) Inspect connections and magnetic coil
	(7) Fuses is blown	(7) Check circuit then replace fuse
	(8) Faulty magnetic switch	(8) Replace with correct one
	(9) Water is not at level indicated by Float	(9) Raise water level
	(10) Float is not in appropriate level	(10) Adjust the position of float
	(11) Float is not effective	(11) Repair or replace
	(12) Short circuit breaker is functioning	(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) 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

Construction

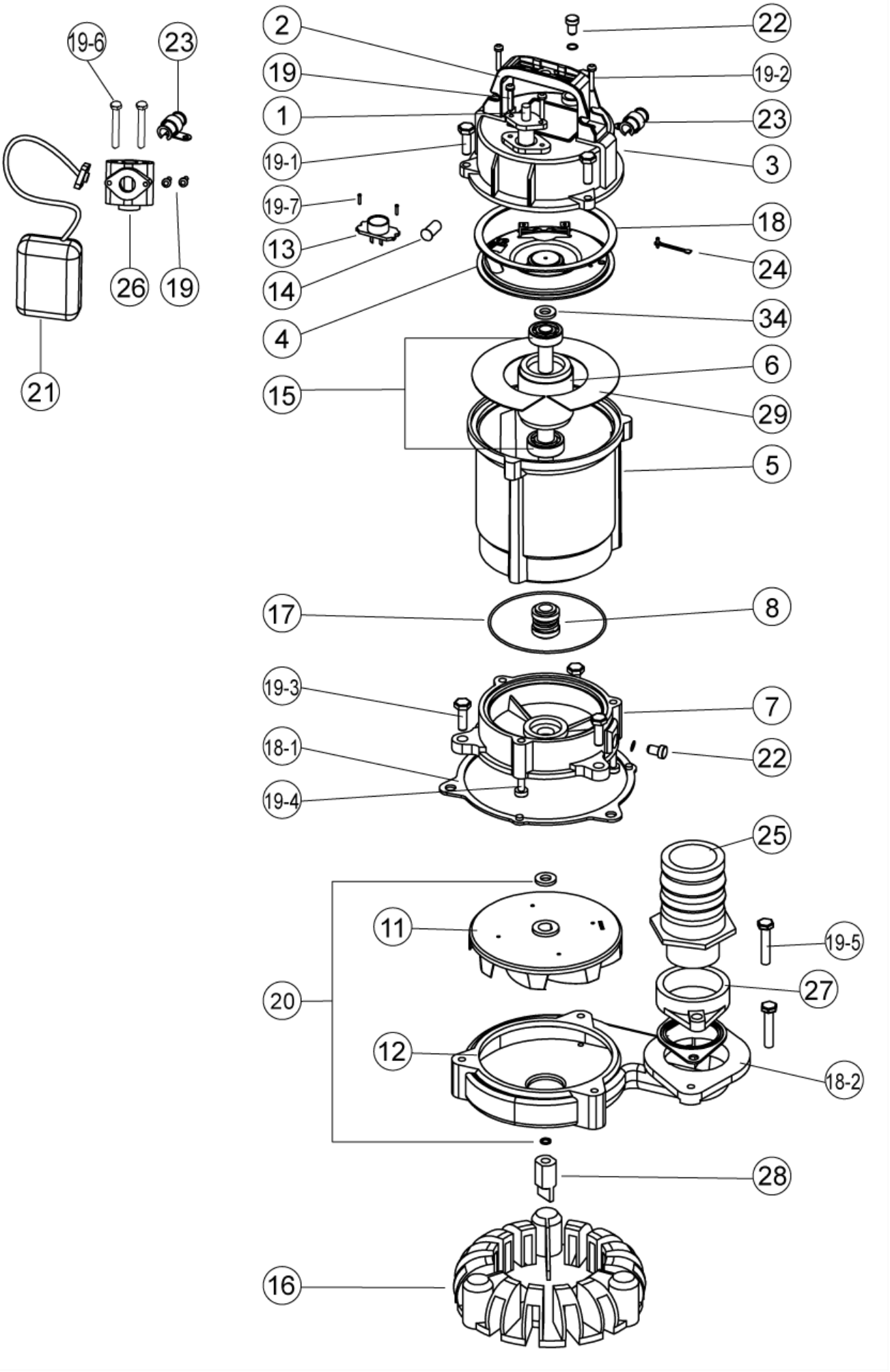


AHS 0.5 HP

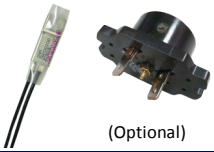
NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		13	Protector (1 Phase)		 (Optional)
2	Handle	Nylon 6		13	Protector (3 Phase)		
3	Motor Cover	ADC12		14	Capacitor		
4	Bracket	SECC		15	Bearing		
5	Motor Housing + Stator	ADC12		16	Strainer	PVC	
6	Shaft with Rotor	SUS 410		17	O-ring	NBR	
7	Oil Chamber	Cast Iron		21	Float Switch (Optional)		
8	Mech. Seal	Upper : CA/CE Lower : SIC/SIC		25	Plastic Hosetail		
11	Impeller	Hytrel		27	Flange	FC-15	
12	Pump Casing	Cast Iron		28	Agitator	SMF5030	

NO	Name	Mtrl	NO	Name	Mtrl
18	Gasket	NBR	19-6	Screw	SUS 304
18-1	Gasket	NBR	19-7	Screw	SUS 304
18-2	Gasket	NBR	20	Washer	SUS 304
19	Screw	SUS 304	22	Screw with O-ring	
19-1	Screw	SUS 304	23	Cable Seat	
19-2	Screw	SUS 304	24	Earth Line and Screw	
19-3	Screw	SUS 304	26	T adapter (Optional)	
19-4	Screw	Steel	29	Insulating Paper	
19-5	Screw	SUS 304	34	Corrugated Spring	Steel

Construction

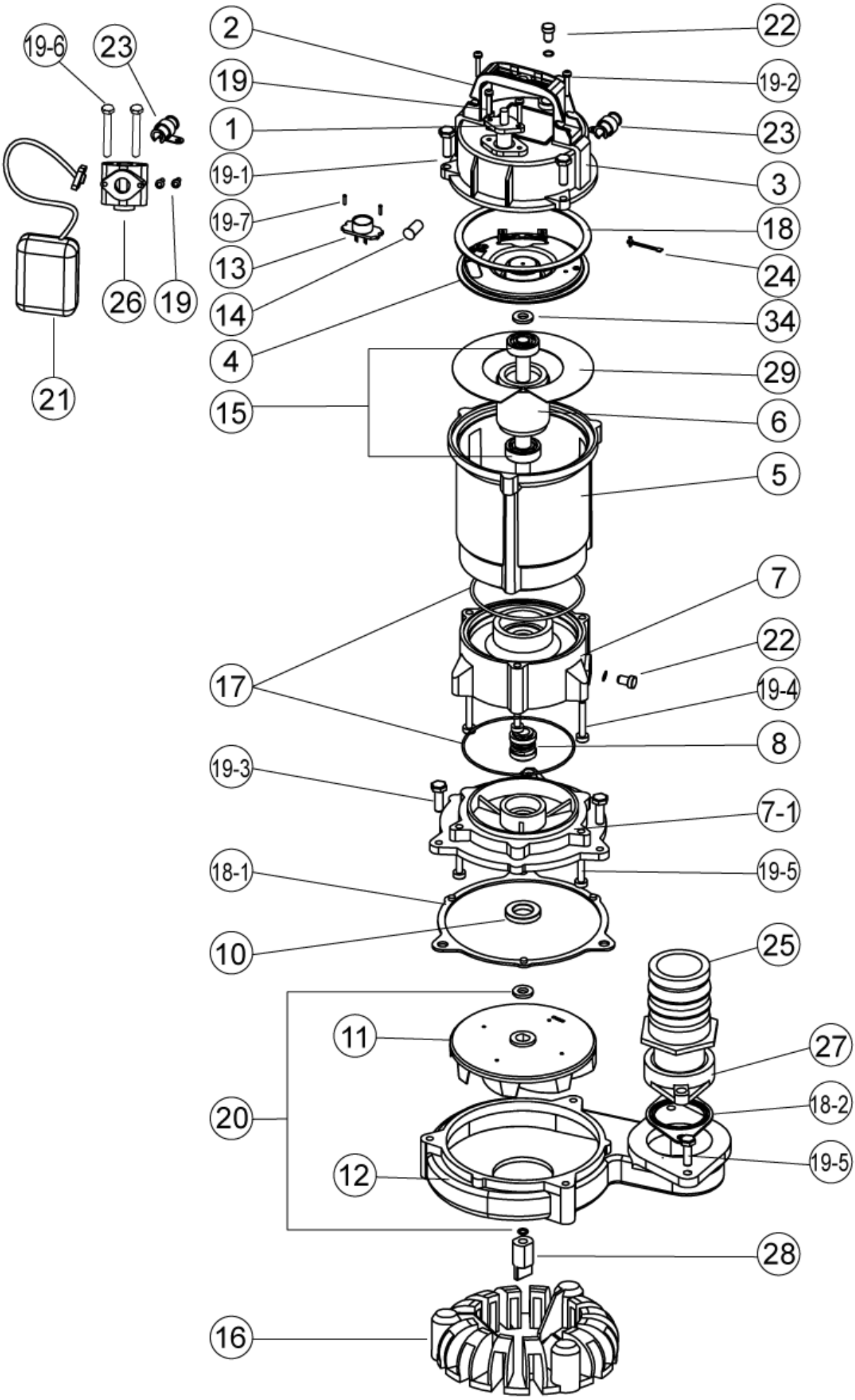


AHS 1 HP

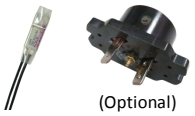
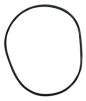
NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		13	Protector (1 Phase)		 (Optional)
2	Handle	Nylon 6		13	Protector (3 Phase)		
3	Motor Cover	ADC12		14	Capacitor		
4	Bracket	SECC		15	Bearing		
5	Motor Housing + Stator	ADC12		16	Strainer	PVC	
6	Shaft with Rotor	SUS 410		17	O-ring	NBR	
7	Oil Chamber	Cast Iron		21	Float Switch (Optional)		
8	Mech. Seal	Upper : CA/CE Lower : SIC/SIC		25	Plastic Hosetail		
11	Impeller	Hytrel		27	Flange	FC-15	
12	Pump Casing	Cast Iron		28	Agitator	SMF5030	

NO	Name	Mtrl	NO	Name	Mtrl
18	Gasket	NBR	19-6	Screw	SUS 304
18-1	Gasket	NBR	19-7	Screw	SUS 304
18-2	Gasket	NBR	20	Washer	SUS 304
19	Screw	SUS 304	22	Screw with O-ring	
19-1	Screw	SUS 304	23	Cable Seat	
19-2	Screw	SUS 304	24	Earth Line and Screw	
19-3	Screw	SUS 304	26	T adapter (Optional)	
19-4	Screw	Steel	29	Insulating Paper	
19-5	Screw	SUS 304	34	Corrugated Spring	Steel

Construction



AHS 2 HP

NO	Name	Mtrl	Photo	NO	Name	Mtrl	Photo
1	Cable	H07/UL		12	Pump Casing	Cast Iron	
2	Handle	Nylon 6		13	Protector (1 Phase)		 (Optional)
3	Motor Cover	ADC12		13	Protector (3 Phase)		
4	Bracket	SECC		14	Capacitor		
5	Motor Housing + Stator	ADC12		15	Bearing		
6	Shaft with Rotor	SUS 410		16	Strainer	PVC	
7	Oil Chamber A	A356		17	O-ring	NBR	
7-1	Oil Chamber B	A356		21	Float Switch (Optional)		
8	Mech. Seal	Upper : CA/CE Lower : SIC/SIC		25	Plastic Hosetail		
10	Oil Seal	NBR		27	Flange	FC-15	
11	Impeller	Hytrel		28	Agitator	SMF5030	

NO	Name	Mtrl	NO	Name	Mtrl
18	Gasket	NBR	19-6	Screw	SUS 304
18-1	Gasket	NBR	19-7	Screw	SUS 304
18-2	Gasket	NBR	20	Washer	SUS 304
19	Screw	SUS 304	22	Screw with O-ring	
19-1	Screw	SUS 304	23	Cable Seat	
19-2	Screw	SUS 304	24	Earth Line and Screw	
19-3	Screw	SUS 304	26	T adapter (Optional)	
19-4	Screw	Steel	29	Insulating Paper	
19-5	Screw	SUS 304	34	Corrugated Spring	Steel

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.

(1) During re-assembly, rotate the impeller by hand and check for smooth rotation. If rotation is not smooth,
perform steps-(3) through -(5) again.
(2) 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 cover before operating the pump.

Please order “O” rings, packing, shaft seals and other parts from your dealer.