evak
PUMP PARTNERS

AES
Automated Environmental Systems

E-Series

HIPPO DN65/80

Instruction and Maintenance Manual

CE

EC DECLARATION OF CONFORMITY

Applicant	:	**EVAK PUMP TECHNOLOGY CORP.**
Address of Applicant	:	**No.551, Zhongshan Rd., Qingshui Dist., Taichung City 436, Taiwan (R.O.C.)**
Product Name	:	**PUMP**
Model No.	:	**ALLIGATOR, ALLIGATOR PRO, DIVA PRO, DIVA, EA, EC, ECF, ECK, ECL, ECM, ECW, EDW, EF, EFSS, EG, EH, EHD, EJ, EL, EM, EP, ERS, ESA, ESV, ETP, EUB, EUBI, EUBL, EUB-M 10-30HP, EUB-M 2-7.5HP, EUBMI, EUBMS, EUBN, EUBR, EUBRI, EUBRS, EUBS, EUS, EUSR, EUT, EW, EWS, EWS-D, EWSS, HIPPO, HIPPO DN, HIPPO PRO, LEOPARD, STEEL, STEEL-D**
TCF No.	:	**EP-2020001-A1**
Directive	:	**2006/42/EC Machinery Directive** **2014/35/EU Low Voltage Directive** **2014/30/EU Electromagnetic Compatibility Directive**

The TCF (No. EP-2020001-A1) is archived by MIB TECHNOLOGY LTD.
JPA Brenson Lawlor House, Argyle Square, Morehampton Road, Dublin 4, Ireland
Country : Ireland

For the most specific risks of this machine, safety and compliance with the essential requirements of the Directive has been based on elements of:

- EN ISO 12100:2010 / Safety of machinery - General principles for design - Risk assessment and risk reduction.
- EN 809:1998+A1:2009/AC:2010 / Pumps and pump units for liquids - Common safety requirements.
- EN 12162:2001+A1:2009 / Liquid pumps - Safety requirements - Procedure for hydrostatic testing.
- EN ISO 3746:2010 / Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010).
- EN 60204-1:2018 / Safety of machinery. Electrical equipment of machines. General requirements.
- EN 61000-6-1:2007 / Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments.
- EN 61000-6-2:2005/AC:2005 / Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.
- EN 61000-6-3:2007/A1:2011/AC:2012 / Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.
- EN 61000-6-4:2007/A1:2011 / Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.

CE

Date : _____

Signature : Kemy K.

Qualification : General Manager

Place : Taichung City, Taiwan

Instruction Manual

2.5" & 3" Full Free Passage Submersible Sewage Pump
HIPPO DN65/80 Series

INDEX

Introduction

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 pump's head, discharge volume, 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		
	Temperature	**Non-Automation**	**1.5~5.5** HP	**0~40**°C (32~104°F)
		Automation	**1.5~2** HP	**0~40**°C (32~104°F)
Materials	Pump Casing	EN-GJL-200		
	Impeller	EN-GJL-200		
	Shaft	**AISI 410** stainless steel		
Motor type		Dry type submersible motor		
Shaft seal lubrication oil		Turbine No.32 ISO **VG-32**		
Maximum water depth		**10m** (33ft)		

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

1.! WARNING : 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.

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

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

4. If there is a flow of liquid inside the tank, support the piping where appropriate.

5.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.

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

7. ! WARNING : 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 lowest water level(H1) as shown in Fig.1, as the automatic cut-off switch incorporated inside the motor will be activated.

8.To avoid dry operation, install an automatic operating system so that this will not happen, as shown in Fig.2 and maintain a safe operating water level.

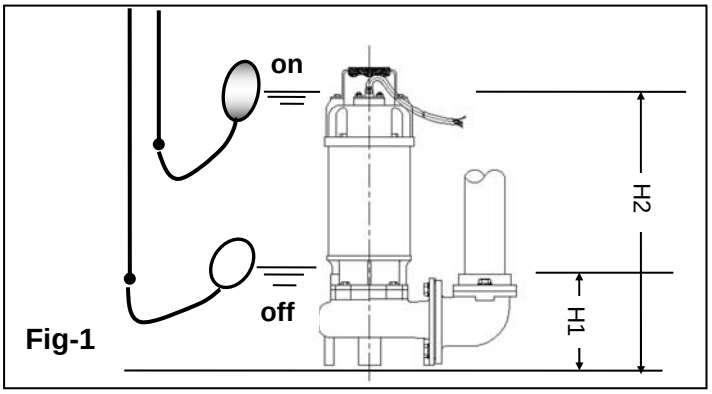


Fig-1

H1: Lowest water level (Motor flange)

H2: Operating water level
This must be above the top of the motor

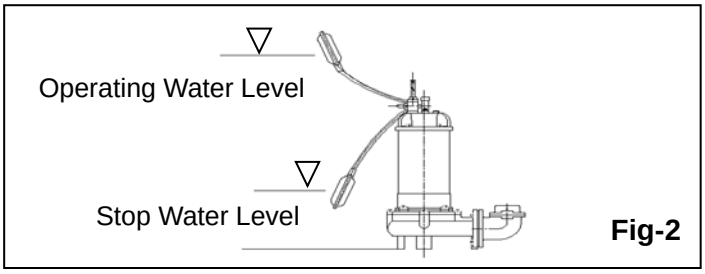


Fig-2

Electrical wiring

1.Wiring

A) Wire as indicated for the appropriate start system as shown in **Fig-3** & **4** for single phase version and **Fig-5** for three phase.

B) Loose connections will stop the pump. Make sure all electrical connections 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, if its recoil is in counterclockwise direction, the direction of its rotation is correct. If not please switch two of the three power cords to correct the rotation of direction of the impeller.

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 condition under water will most likely to damage the pump, which may lead to leakage and electrical shock.

2.Cable

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

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

B) Do not pull the cable.

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

3.Grounding

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

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

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

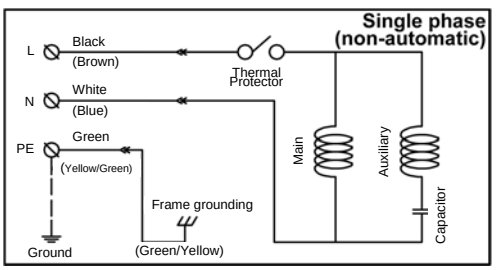


Fig-3

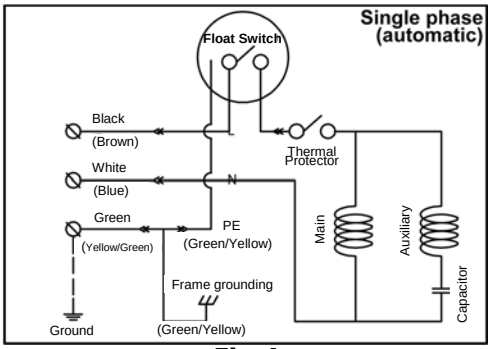


Fig-4

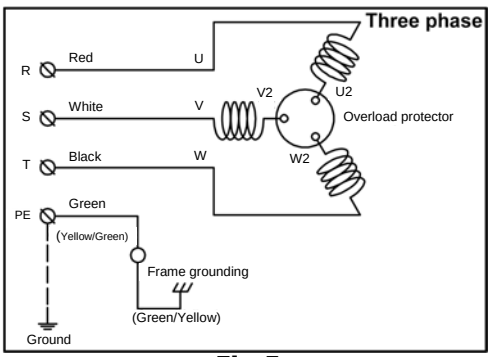


Fig-5

Operation

1. Before starting the pump

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

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. Do not start the pump again in such a situation until after the motor has completely cooled.

2. Test operation….

Non-automatic pump

Automatic pump

a. Turn the operating switch on and off a couple of times to check for normal pump start.
Floating switch must be raised for the pump to start.

b. 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

a. 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 nay be an indication of trouble and repair work is required.

b. 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. Inject suitable amount turbine oil No.32 (ISO VG-32) .

c. Inspections at 3-5year intervals

Conduct an overhaul of the pump. These intervals will preclude the possibility of future trouble.

3. Parts that will need to be replaced

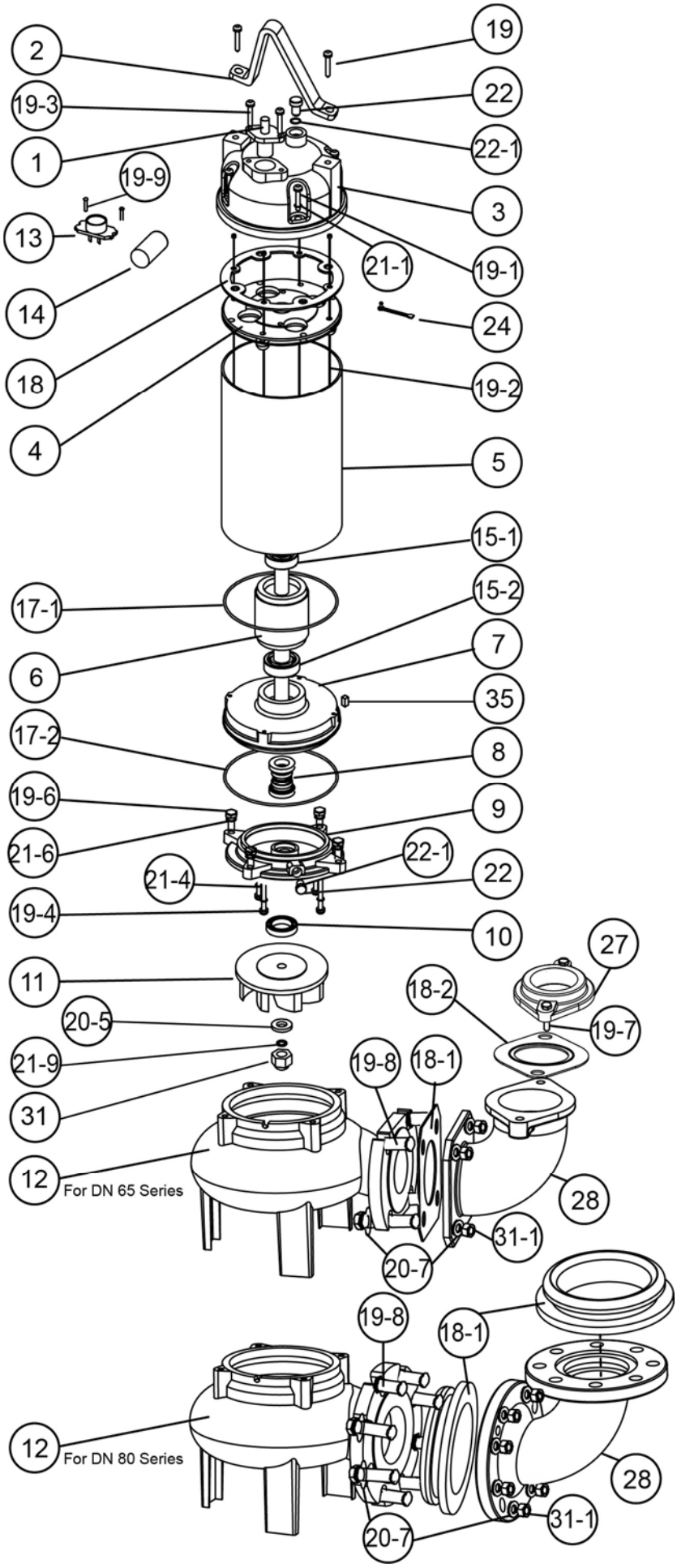
Replace the appropriate part when the following conditions are apparent.

Replaceable part	Mechanical seal	Oil filler plug O-ring	Lubricating oil	O-ring
Replacement guide	Whenever oil in mechanical seal chamber is clouded	Whenever oil is replaced or inspected	Whenever clouded or dirty	Whenever pump is overhauled
Frequency	Annually	A half yearly	A half yearly	Annually

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

Motor output	1.5HP	2HP	3HP	4HP	5.5HP
Mechanical seal	15Ø			20Ø	
Lip seal	15Øx 24Øx 7 t			20Øx 38Øx 7 t	
Oil filler plug O-ring	(Inner diameter) x (outer diameter) x (thickness) = 7.52Øx14.5Øx3.53 t				
Lubricating oil (turbine oil #32)	280 cc			500 cc	

Construction



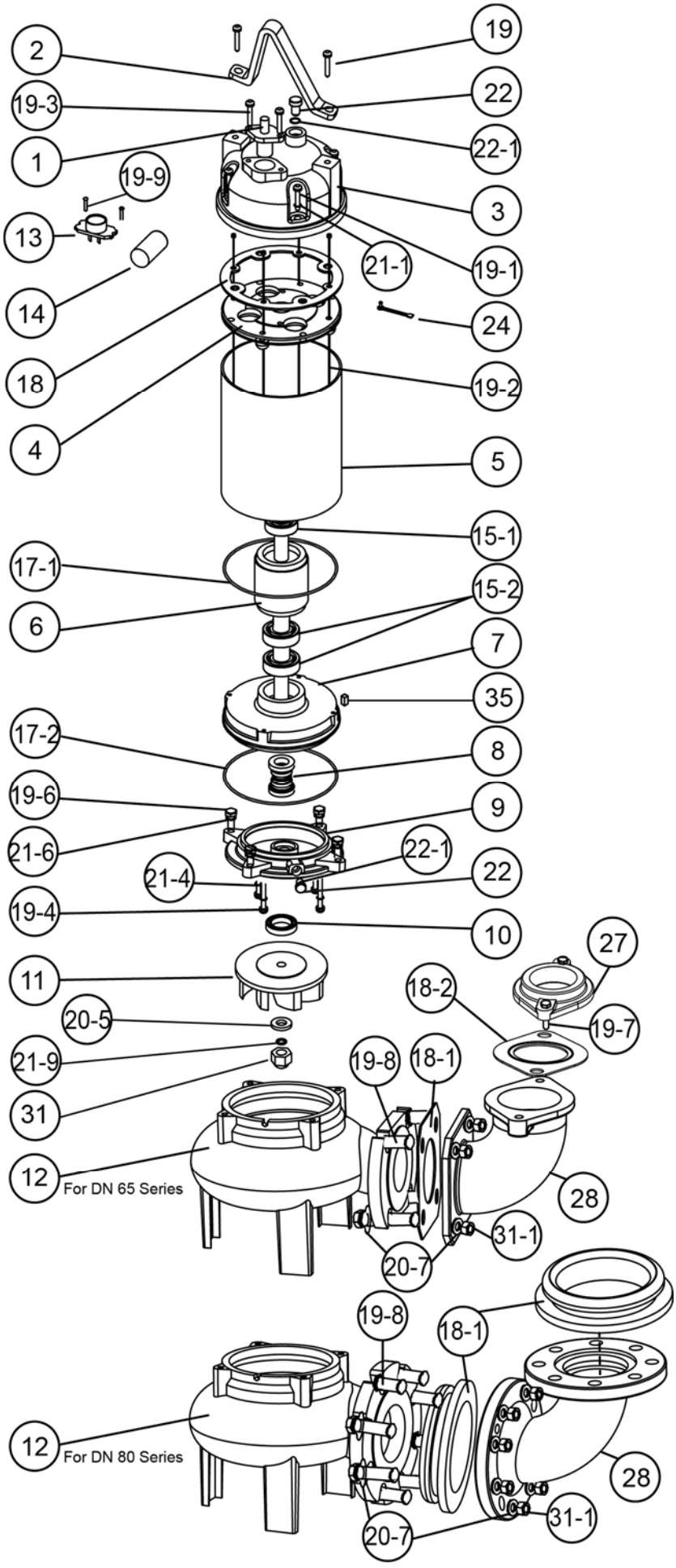
HIPPO DN 1.5~2HP

NO	Part	Material	Photo	NO	Part	Material	Photo
2	Handle	ASTM A36		12	Pump Casing (DN65)	EN-GJL-200	
3	Motor Cover	EN-GJL-200		12	Pump Casing (DN80)	EN-GJL-200	
4	Bracket	EN-GJL-200		15-1 15-2	Upper Bearing Lower Bearing	NTN/TPI	
5	Motor Housing +Stator	AISI 304		17-1 17-2	O-rings	NBR	
6	Shaft with Rotor	AISI 410		18	Gasket	NBR	
7	Oil Chamber	EN-GJL-200		18-1	Elbow Gasket (DN65)	NBR	
8	Mechanical Seal	CA/CE + SIC/SIC		18-1	Elbow Gasket (DN80)	NBR	
9	Seal Housing	EN-GJL-200		18-2	Flange Packing	NBR	
10	Lip Seal	NBR		27	Flange (DN65)	EN-GJL-200	
11	Impeller	EN-GJL-200		28	Elbow	EN-GJL-200	

NO	Part	Material	NO	Part	Material
1	Cable	H07RN-F/ SJTOW/STOW	20-5	Washer	AISI 304
13	Protector (3 Phase)	KLIXON	20-7	Washer	AISI 304
14	Capacitor (1 Phase)	-	21-1	Spring Washer	AISI 304
19	Screw	AISI 304	21-4	Washer with O-ring	AISI 304+NBR
19-1	Screw	AISI 304	21-6	Spring Washer	AISI 304
19-2	Long Screw of motor	Steel	21-9	Spring Washer	AISI 304
19-3	Screw	AISI 304	22	Oil Filler Plug	AISI 304
19-4	Screw	AISI 304	22-1	O-ring of Oil Filler Plug	NBR
19-6	Screw	AISI 304	24	Wire and Screw	AISI 304
19-7	Screw	AISI 304	31	Nut of impeller	AISI 304
19-8	Screw	AISI 304	31-1	Nut of Elbow	AISI 304
19-9	Screw	AISI 304	35	Key	AISI 304

TPI is a family brand of NTN group.

Construction



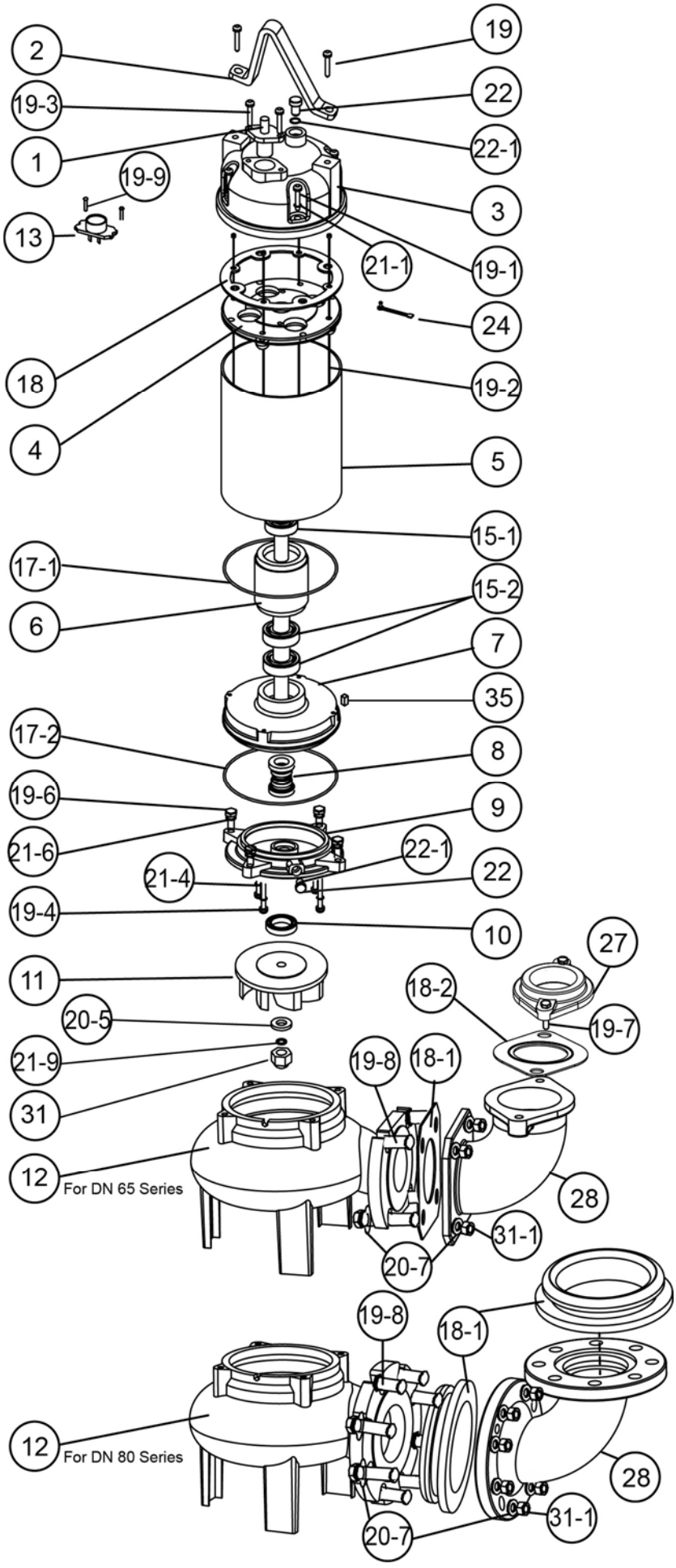
HIPPO DN 3HP

NO	Part	Material	Photo	NO	Part	Material	Photo
2	Handle	ASTM A36		12	Pump Casing (DN65)	EN-GJL-200	
3	Motor Cover	EN-GJL-200		12	Pump Casing (DN80)	EN-GJL-200	
4	Bracket	EN-GJL-200		15-1 15-2	Upper Bearing Lower Bearing	NTN/TPI	
5	Motor Housing +Stator	AISI 304		17-1 17-2	O-rings	NBR	
6	Shaft with Rotor	AISI 410		18	Gasket	NBR	
7	Oil Chamber	EN-GJL-200		18-1	Elbow Gasket (DN65)	NBR	
8	Mechanical Seal	CA/CE + SIC/SIC		18-1	Elbow Gasket (DN80)	NBR	
9	Seal Housing	EN-GJL-200		18-2	Flange Packing	NBR	
10	Lip Seal	NBR		27	Flange (DN65)	EN-GJL-200	
11	Impeller	EN-GJL-200		28	Elbow	EN-GJL-200	

NO	Part	Material	NO	Part	Material
1	Cable	H07RN-F/ SJTOW/STOW	20-5	Washer	AISI 304
13	Protector (3 Phase)	KLIXON	20-7	Washer	AISI 304
14	Capacitor (1 Phase)	-	21-1	Spring Washer	AISI 304
19	Screw	AISI 304	21-4	Washer with O-ring	AISI 304+NBR
19-1	Screw	AISI 304	21-6	Spring Washer	AISI 304
19-2	Long Screw of motor	Steel	21-9	Spring Washer	AISI 304
19-3	Screw	AISI 304	22	Oil Filler Plug	AISI 304
19-4	Screw	AISI 304	22-1	O-ring of Oil Filler Plug	NBR
19-6	Screw	AISI 304	24	Wire and Screw	AISI 304
19-7	Screw	AISI 304	31	Nut of impeller	AISI 304
19-8	Screw	AISI 304	31-1	Nut of Elbow	AISI 304
19-9	Screw	AISI 304	35	Key	AISI 304

TPI is a family brand of NTN group.

Construction



HIPPO DN 4~5.5HP

NO	Part	Material	Photo	NO	Part	Material	Photo
2	Handle	ASTM A36		12	Pump Casing (DN65)	EN-GJL-200	
3	Motor Cover	EN-GJL-200		12	Pump Casing (DN80)	EN-GJL-200	
4	Bracket	EN-GJL-200		15-1 15-2	Upper Bearing Lower Bearing	NTN/TPI	
5	Motor Housing +Stator	AISI 304		17-1 17-2	O-rings	NBR	
6	Shaft with Rotor	AISI 410		18	Gasket	NBR	
7	Oil Chamber	EN-GJL-200		18-1	Elbow Gasket (DN65)	NBR	
8	Mechanical Seal	CA/CE + SIC/SIC		18-1	Elbow Gasket (DN80)	NBR	
9	Seal Housing	EN-GJL-200		18-2	Flange Packing	NBR	
10	Lip Seal	NBR		27	Flange (DN65)	EN-GJL-200	
11	Impeller	EN-GJL-200		28	Elbow	EN-GJL-200	

NO	Part	Material	NO	Part	Material
1	Cable	H07RN-F/ SJTOW/STOW	20-7	Washer	AISI 304
13	Protector (3 Phase)	KLIXON	21-1	Spring Washer	AISI 304
19	Screw	AISI 304	21-4	Washer with O-ring	AISI 304+NBR
19-1	Screw	AISI 304	21-6	Spring Washer	AISI 304
19-2	Long Screw of motor	Steel	21-9	Spring Washer	AISI 304
19-3	Screw	AISI 304	22	Oil Filler Plug	AISI 304
19-4	Screw	AISI 304	22-1	O-ring of Oil Filler Plug	NBR
19-6	Screw	AISI 304	24	Wire and Screw	AISI 304
19-7	Screw	AISI 304	31	Nut of impeller	AISI 304
19-8	Screw	AISI 304	31-1	Nut of Elbow	AISI 304
19-9	Screw	AISI 304	35	Key	AISI 304
20-5	Washer	AISI 304			

TPI is a family brand of NTN group.

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-

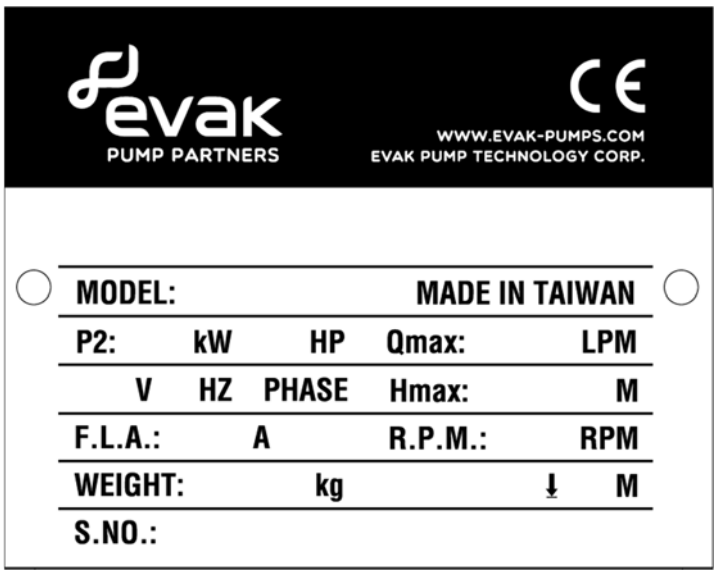
Re-assemble in reverse order of disassembly.

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 cover before operating the pump.

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

Nameplate format



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
	(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

Note

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