WDM PUMPS

Operation Manual

Centrifugal Pumps and Pressure Equipment

WDM Water Systems

Operation Manual

1. Introduction

This manual contains instructions for installation and commissioning of your Wastewater pump. Read carefully these recommendations before startingup your pump. **ALWAYS KEEP IN HAND!**

Congratulations! You have purchased a product developed with the latest WDM technology.

Our pumps are designed and manufactured with parts of the highest quality. A long experience as manufacturers and special care and dedication in production, make our products meet the highest standards.

This operation manual contents important information and guidance for the installation, operation and maintenance of our Wastewater pumps.Read instructions carefully before installing the product. Retain it for later.

The pumps have been built according to the standards of American manufacturers pumps (Contractors Pump Bureau) and factory tested by hydrostatic testing performance and ensure proper operation. Inspect carefully and make sure there are not missing pieces or have been damaged in transit. Make a claim to the transportation company as soon as possible if necessary.

The design, materials and processes used in the manufacture of products ensure proper operation. However life and duration depend on appropriate application, installation, periodic inspection and general preventive maintenance.

WARNING!

WDM is not responsible for damage or accidents that occur due to non-compliance with the instructions given in this manual. The warranty is only valid when using original spare parts.

Factory´s counseling is strongly recommended for installation and startup.

2. Safety Recommendations

- Wear safety shoes when handling heavy parts or tools .
- Do not operate the pump with the discharge valve closed.
- Do not remove drain plugs or valves when the machine is running.
- Never attempt to attach pipes to the pumps forcing it. Sizes must be appropriate .
- For any maintenance always disconnect power.
- Ensure that the pump is isolated from a pressurized system before remove.
- Use gloves when handling parts with sharp edges.
- Never apply heat to disarm the bomb. May be a risk of explosion.
- Do not wear loose clothing that could be caught by the impeller or other moving parts.
- Never place hands in the mouth of suction or discharge .
- Do not operate the pump by grasping the cable assembly
- Secure the pump before operating to prevent falling or sliding .
- Operating the pump with the discharge valve closed, decreases the life of bearings and mechanical seal .
- Wastewater pumps NE, NE 4 and 6 are not recommended for use in pools or water recreational facilities .
- Disconnect the pump from the power source before performing any maintenance labor.

These pumps are designed to operate safely when used and maintained according to what is stated in this manual. A pump is a device that contains parts that are in rotation and therefore can be dangerous . Operators and maintenance personnel should be aware of this and follow safety recommendations .

The pumps are heavy equipment : handle them with care.

Operation Manual

Pre-installation Precautions

- Be careful not to damage the motor terminals when unpacking the unit.
- Check the plate and make sure that the data correspond to the bomb you bought .
- Ensure that the voltages are specified for the pump work .
- Retain this manual for future reference.
- Transport and drop this bomb always in an upright position .

WARNING!

The pumps are NOT recommended for:

a. Pumping flammable liquids
b. Be used in areas considered dangerous
c. Being used in pools or aquatic recreational facilities
d. Pumping liquids with abrasive solids
e. Operating without submergence level recommended.

The use of these pumps in the cases mentioned above makes you lose your warranty.

When pumping abrasive liquids it is suggested to request a hard seal faces instead of inferior standard seal. Consult factory for recommended selection.

3. Installation

Location

Never install the pumps in soft ground trenches. The pump can sink and suction can be covered.

It is recommended the level of submergence be the shown in the diagram No. 1

Submergence level

The pump casing where the motor is housed, contains oil to cool the engine, lubricating bearings and mechanical seal. These models can operate for long periods without pumping liquids. However it is recommended submergence level for better cooling and increase the life of the engine as shown in the following diagram:

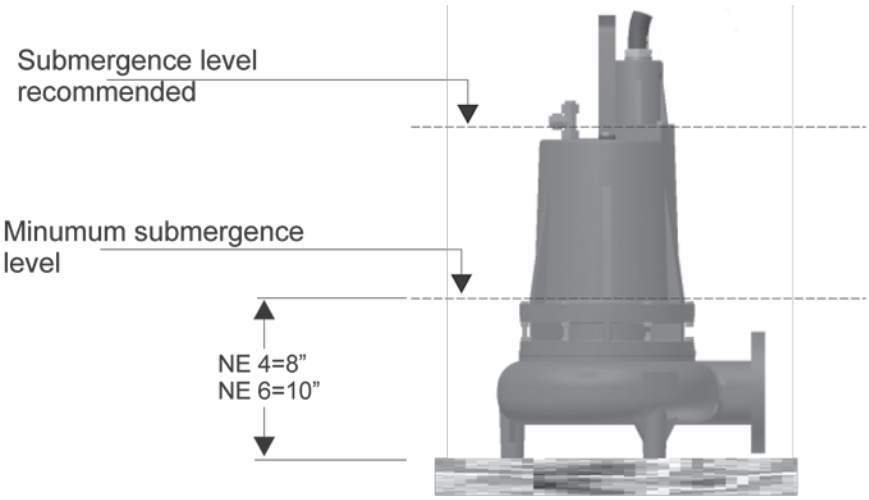


Diagram No. 1

WARNING!

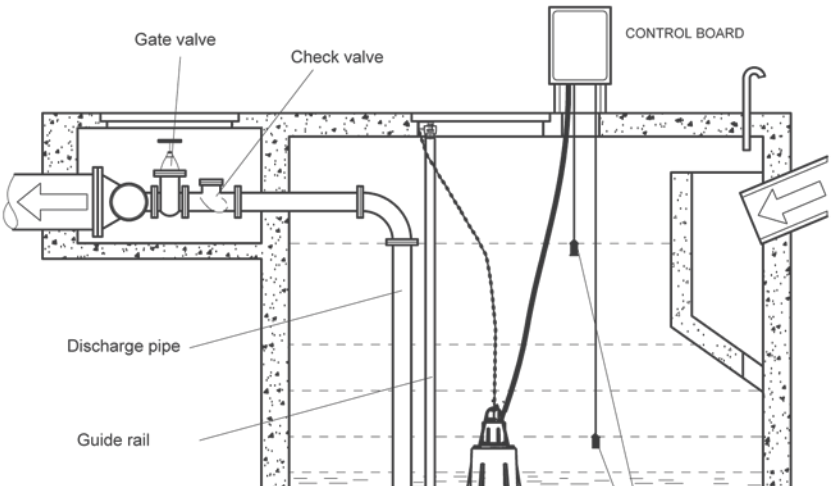
Pumps must be supported independently of the pipes and must NEVER force their connections because they generate efforts to the pump, causing operation failure.

Connecting the Discharge

The discharge pipe should be as short as possible. Either a check valve and gate valve are recommended for each pump used. The check valve is used to prevent backflow into the sump. Reflux can cause excessive flooding and / or damage to the pump. The gate valve is used to stop the flow into the pump for maintenance of the check valve.

WD M provides a stationary elbow with discharge mounting system designed to allow the submersible wastewater pump could be installed or removed without the necessity of personnel to enter the well.

Typical Installation Diagram



See **"Pump Installation Accessories NE4 and NE 6"** manual for more information, or consult one of our advisors .

Liquid level controls

Level controls must be supported by a mounting bracket which is attached to the borehole wall, deck or junction box. Cable grips are used to hold cables in place during assembly . The level of control can be changed by loosening the handle and adjust the cable length according to the plans and specifications. Make sure the level controls are correctly placed and the pump is completely submerged when the level control is “Off”.

Electrical connections

Power and Cables Control: The cable assembly mounted to the pump should not be modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be in accordance with all applicable electrical standards.
Do not leave exposed electrical wire, as this could filtered, reach the engine and cause serious damage.

The white wire is not grounded . The black, white and red wires are energy carriers (conductors) . The green wire is for connecting Ground.

ATTENTION !

Never use the cord to lift the pump, always use the installed handle.

Overload protection

The normally closed (N / C) temperature sensor is embedded in the winding and detects engine overheating in case of an overload condition. Thermal sensor triggers when the engine is too hot and automatically restarts when the pump motor is cooled to a safe temperature. It is recommended that the thermal sensor connects to an alarm to alert the operator that overheating occurred and thus stop the pump operation. In case of overload, the cause should be reviewed and corrected .

ATTENTION !

DO NOT LET THE PUMP WORK , IF OVERLOAD SITUATION OCCURS .

Humidity sensor

It is a normally open contact, installed in the seal chamber to detect any moisture present in the pump. It is recommended that this sensor is connected to an alarm or to the motor starting coil to alert the operator that presence of moisture has been detected. In case of detecting humidity, the pump should be revised and repaired.

Wire Size

Consult a qualified electrician for proper wire size if more cable power is required. See table for electrical information.

Model	HP	Volt.	Phases	RPM	AMPS (max)	AMPS (max) at Locked Rotor	Winding Resistance at Start-up	Cable Size
NE 4 450-4-220	4.5	220	3	1,750	18.2	56.0	1.43	10/4
NE 4 750-4-220	7.5	220	3	1,750	26.8	80.0	0.71	10/4
NE 4 1130-4-220	11.3	220	3	1,750	28.0	126.0	0.43	10/4
NE 4 1500-4-220	15.0	220	3	1,750	38.0	160.0	0.35	8/4
NE 6 180-6-220	18.0	220	3	1,150	50.0	232.0	0.08	2/5
NE 6 240-6-220	24.0	220	3	1,150	64.0	290.0	0.235	2/5

Before operating the pump, check the following points:

- Voltage and other electrical data contained in the nameplate
- Rotation of the engines. Must be correct to prevent damage to the engine and pump. Give a soft start and observe the direction of rotation. It must match the indicated on the plate (clockwise viewing the top of the casing). If rotation is not indicated interchange two connecting cables board control. Do not change the motor connections. Check again.
- Write down the serial number of the pump for later reference.
- Make a reading of the motor insulation resistance. These values, voltage and amperage on the power lines should be saved for future references.
- Once the pump has been connected properly and down the well, should revised its operation for a few cycles. It should list the emptying times of the well or per cycle.
- The casing should contain the motor cooling oil.

5. Maintenance

WARNING!

Before starting any maintenance or repair work on pumps, close the discharge valve and disconnect the power.

Because the engine is lubricated by oil, it doesn't need any other type of lubrication or maintenance work. These pumps are generally very reliable in operation and in most cases last running smoothly for many years.

However, as any mechanical equipment must be regularly scheduled preventive maintenance including:

a. Revising the motor casing to verify level and contamination.
b. Inspection of the state of the impeller and the body for wear or binding.
c. Check engine and bearings.
d. Verification of wear and seal leakage

The pump is supplied from the factory with oil for cooling the engine, only replace the oil if there is a failure or if you perform internal maintenance work; use Texaco dielectric oil Diala-Oil-AX or Mobil DTE Oil Light as the recommended in the following table:

Model	Casing		Seal chamber	
	Gallons	Liters	Gallons	Liters
NE 4 450/750/1130/1500	2.5	9.5	0.3	1.1
NE 6 180/240	15.0	56.8	0.4	1.5
NE 6 300	11.0	41.6	0.4	1.5

WARNING!

Do not completely fill the motor casing with oil. Can cause excessive and dangerous pressure that could destroy the pump.

Pressure Test

Casing: To check the pump for leaks around the joint input shaft, square rings, and cable, the oil level should be in the prescribed amount. Remove the pressure valve (22) of the casing (16). Apply sealant, place a tube with a manometer and fit into the hole (see Diagram 2). Apply air pressure in the housing 10 P.S.I. Use a soapy water around the sealed areas and inspect joints for “air bubbles”. If after 5 minutes the pressure still remains constant, and doesn’t shows “bubbles” remove the tube and the pressure gauge and place the valve again with a sealant. If the pressure does not hold, observe well to locate the leak.

Seal Chamber: Remove plug (31), check recommended oil level, place tube with sealant and manometer and apply air pressure between 20-25 PSI and check for leaks repeating what indicated in the previous step.

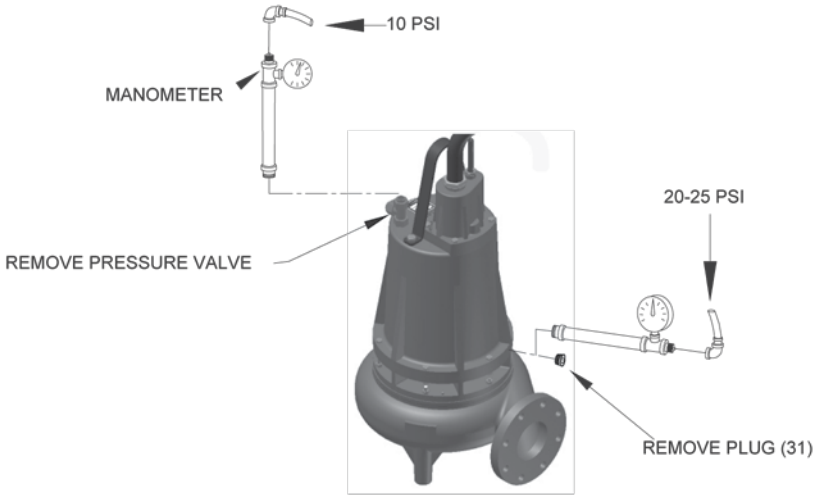


Diagram No.2

Electrical connections

Check the cables to ensure that has no tears or other defects. In case of replacement, replace the entire cable assembly cover (20). Remove the motor cables and check isolates. Replace if needed. Now place the square ring (23) on the top of cable assembly (20). Reconnect the motor terminals to the power cable as shown in Diagram 3.

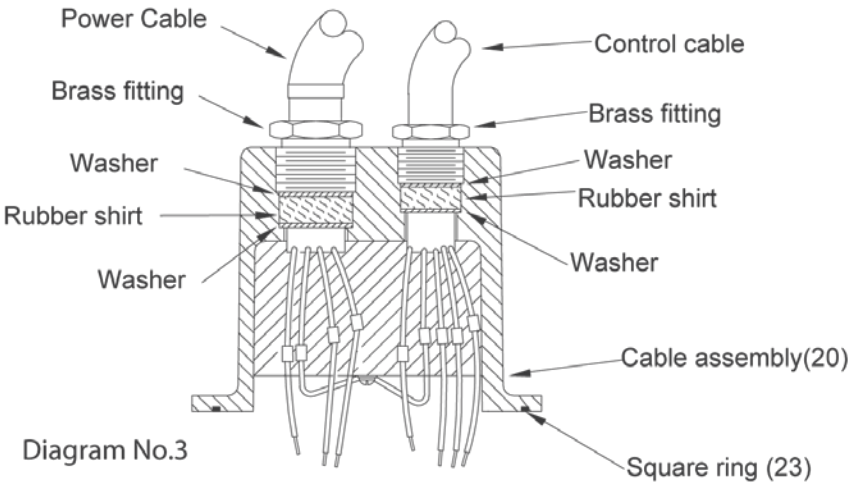
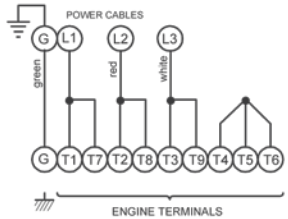


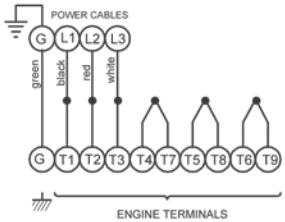
Diagram No.3

CONNECTIONS NE 4

CONNECTION DIAGRAM
TRIPHASE 230v

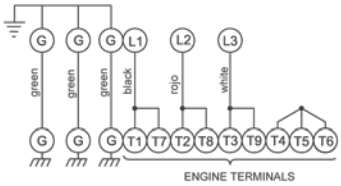


CONNECTION DIAGRAM
TRIPHASE ENGINE 460V

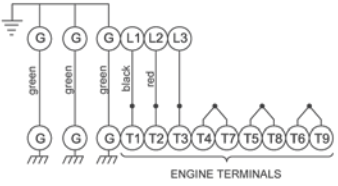


CONNECTIONS NE 6

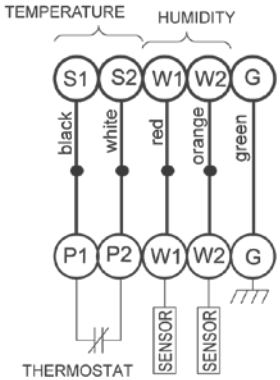
CONNECTION DIAGRAM
TRIPHASE 230v



CONNECTION DIAGRAM
TRIPHASE ENGINE 460V



Humidity and Temperature Sensor

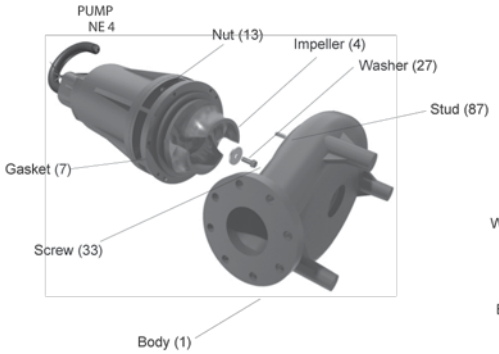


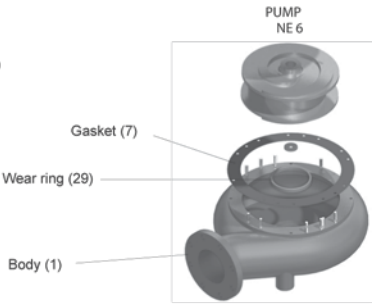
Cleaning

If the pump is used for transportable applications, it should be cleaned after each usage by pumping clean water, thus preventing the formation of deposits of dirt and scale.

Impeller replacement

To clean the body (1), or replace the impeller (4), or replace the wear ring (pump NE 6), disconnect the power, remove the hex screws (13) lift the vertical motor and the assembly body seal (1). Clean the body if necessary. Clean and examine impeller (4), pitting or wear and replace if necessary, inspect gasket (7) and replace if cut or damaged. If the impeller (4) requires replacement, remove the screw (33) and washer (27) and take away, take out the impeller directly from the shaft by a puller. If the wear ring (31) in the NE 6 pump requires replacing, cut the ring (29) and remove, be careful not damage the body (1).



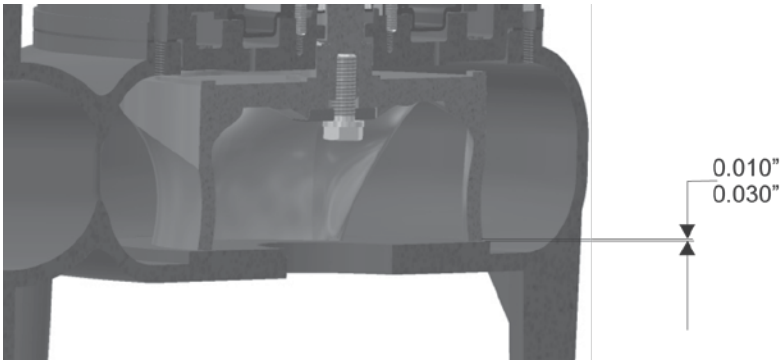


Mounting

To install the wear ring (31) in the NE 6, press pump wear ring (29) in the body orifice (1) until it is seated. To install impeller (4) in all the models, apply a thin coat of engine oil to the shaft and slide directly into the axis, keeping keyways aligned. Apply thread locking compound on the screw (33) and tight up to 35 lb / ft impeller to check for binding. Place the gasket (41) fl ange the volute and install the impeller and motor casing on the posts and spiral (26). Apply thread locking compound to threads of each bolt (24) the nut thread (20) in the stud (24) and torque to 24 lb ft Engine Free admission twist and impeller.

ATTENTION!

When installing the pump impeller series again, in NE 4, check that the clearance between the impeller and the flat face of the body is within 0.010 “(0.25mm) to 0.030” (0.7mm).

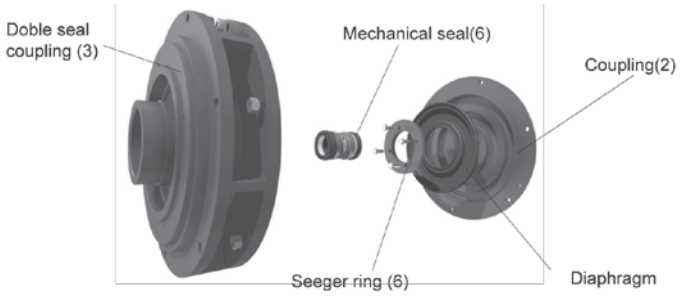


Service Engine and mechanical seal

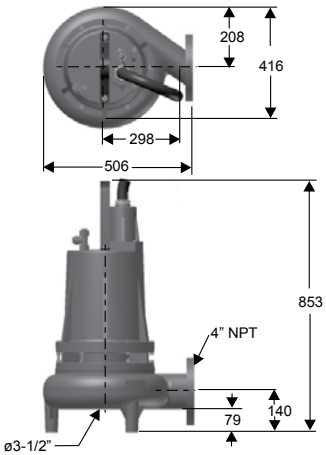
• Remove body (1) and impeller (4) as previously typed.
• Remove the oil from the casing (16), removing valve (22).
• Remove the screws (13) and separate the motor (5) with the coupling (3) of the casing (16).
• Disconnect the motor (5) of the cable assembly (20), release the coupling screws and remove the coupling (2) together with the stationary part of the seal. (6) of the motor (5)
• Examine now the motor, bearing and seal components
• Change what you have worn or is damaged.
• If a change requires seal components, replace everything.

CAUTION!

• Drive carefully the parts of the seal.
• Do not scratch or mark the rectified faces.
• When replacing the seal, remove the rotating component and the motor shaft spring. Also the fixed part of the coupling. Clean double seal cavity coupling (3).
• Place new component fixed onto the double seal coupling (3) and the fixed part on the hard faces in the coupling (2). Make sure the spring is set properly on the rotating component. Carefully assemble the coupling (3) onto the motor (5) using motor screws. Then tighten the coupling (2) with screws (9) in the coupling (3), insert this assembly into the casing (16) and body, and fix with nuts (13) add the oil specified above.



NE 4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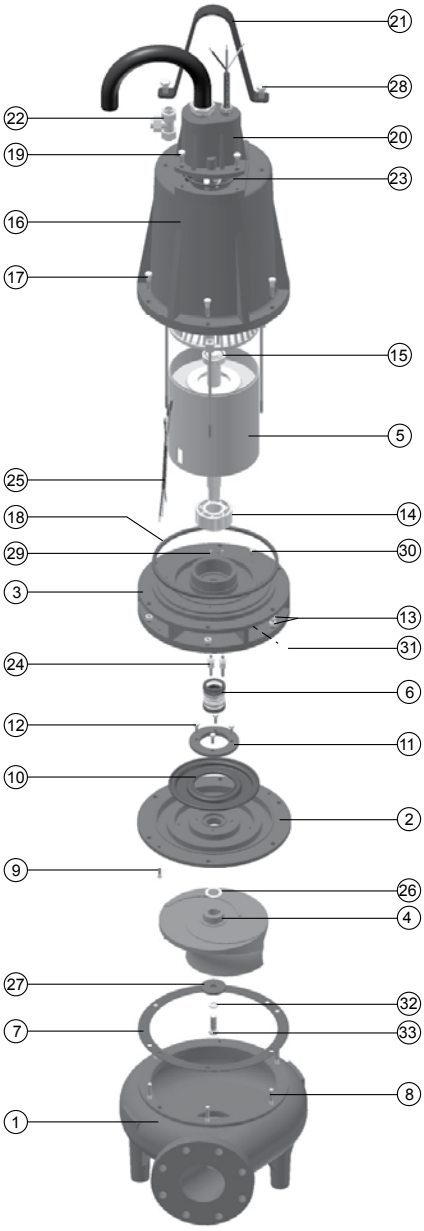
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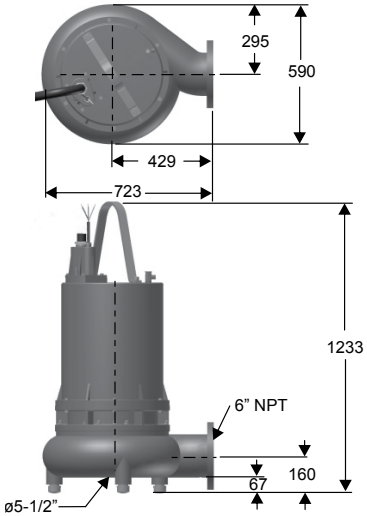
No.	Description	Ref.	Amount			
			45	75	113	150
1	Iron body	61575	1	1	1	1
2	Iron coupling	62485	1	1	1	1
3	Double seal coupling	62484	1	1	1	1
4	Impeller 6.500”	53265	1			
4	Impeller 7.000”	53270		1		
4	Impeller 8.000”	53282			1	
4	Impeller 8.500”	53278				1
5	Engine 4.5 HP	62310	1			
5	Engine 7.5 HP	62311		1		
5	Engine 11.3 HP	62312			1	
5	Engine 15.0 HP	62313				1
6	Mechanical seal 1-1/4” Mixed	00052	1	1	1	1
7	Body gasket	27346	1	1	1	1
8	Stud 3/8” x 2” NC stainless	02423	6	6	6	6
9	Screw BCC 1/4” x 3/4” stainless	16673	2	2	2	2
10	Diaphragm 4SEH	00194	1	1	1	1
11	Seeger ring diaphragm	22756	1	1	1	1
12	Screw 1/4” x 3/4” NC stainless	16670	4	4	4	4
13	Nut 3/8” NC stainless	02521	12	12	12	12
14	Bearing 5307	39495	1	1	1	1
15	Bearing 6205 ZZ	17807	1	1	1	1
16	Casing	62050	1	1	1	1
17	Screw 3/8” x 1” NC stainless	02237	6	6	6	6
18	Square ring	27347	1	1	1	1
19	Screw 3/8” x 1” NC stainless	02218	4	4	4	4
20	Cable assembly	61282	1	1	1	
20	Cable assembly	61283				1
21	Lifting handle	52214	1	1	1	1
22	Relief valve 1/2”	70426	1	1	1	1
23	Square ring	27348	1	1	1	1
24	Electrode sensor	39383	2	2	2	2
25	Cable sensor	90085	1	1	1	1
26	Esp. washer 0.010”	01348	1	1	1	1
27	Retention washer	30657	1	1	1	1
28	Screw 1/2” x -1” NC Br.	02231	2	2	2	2
29	Screw #6-32NC x 5/16 T.F	21765	2	2	2	2
30	Tornillo 3/16” x 1/2 NC Br.	16955	1	1	1	1
31	Plug 1/4” NPT	03201	1	1	1	1
32	Washer 1/2” stainless	02609	1	1	1	1

NE 6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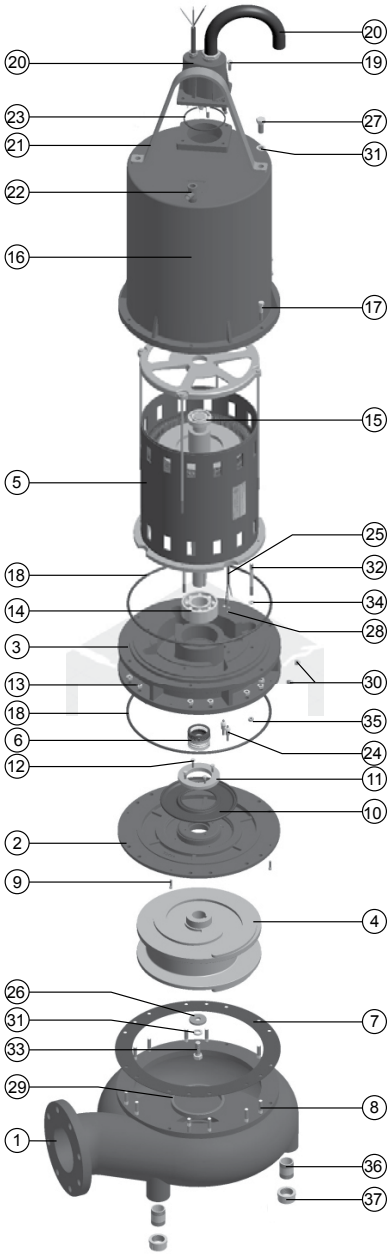
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No.	Descripción	Ref.	Cantidad		
			180	240	300
1	Iron body	42167	1	1	1
2	Iron coupling	72593	1	1	1
3	Double seal coupling	72330	1	1	1
4	Impeller 13..00”	41325	1		
4	Impeller 14.000”	41326		1	
4	Impeller 14.625”	41327			1
5	Engine 18 HP 460V	62316	1		
5	Engine 24 HP 460V	62315		1	
5	Engine 30 HP 460V	62314			1
6	Mechanical seal 1-1/4” mixed	00056	1	1	1
7	Body gasket	51936	1	1	1
8	Stud 7/16” x 2-1/4” NC stainless	02424	12	12	12
9	Screw BCC 1/4” x 1” stainless	16673	2	2	2
10	Diaphragm 4SEH	00193	1	1	1
11	Seeger ring diaphragm	52206	1	1	1
12	Screw 1/4” x 1” NC stainless	02452	4	4	4
13	Nut 7/16” NC stainless	02451	18	18	18
14	Bearing 3310 A/C3	28255	1	1	1
15	Bearing 6207 C3	2300081	1	1	1
16	Casing	41303	1	1	1
17	Screw 7/16” x 2-1/4” NC stainless	02450	6	6	6
18	“O” ring casing	52082	2	2	2
19	Screw 3/8” x 1” NC stainless	02218	4	4	4
20	Cable assembly	X	1	1	
20	Cable assembly	61288			1
21	Lifting handle	52215	1	1	1
22	Relief valve 1/2”	70426	1	1	1
23	Square ring conj.	27248	1	1	1
24	Electrode sensor	39383	2	2	2
25	Cable sensor	90198	1	1	1
26	Retention washer	02458	1	1	1
27	Screw 5/8” x 1-1/2” NC stainless	02457	2	2	2
28	Screw #6-32NC x 5/16 T.F	21765	3	3	3
29	Friction ring	30677	1	1	1
30	Plug 1/4” NPT	03201	2	2	2
31	Washer 5/8” stainless	02617	3	3	3
32	Stud 3/8” x 4-1/2” NC stainless	02430	4	4	4
33	Screw 5/8” x 1-3/4” NC stainless	22841	1	1	1
34	Washer 3/8” stainless	02616	4	4	4
35	Nut 3/8” NC stainless	02521	4	4	4
36	Niple 1-1/4” x 2” long. stainless	72296	3	3	3
37	Female plug 1-1/4 steel	03235	3	3	3

6. Failures, Causes and Solutions

If the system does not operate properly, carefully read instructions and perform the maintenance recommendations.

If operating problems persist, the following chart may be helpful in identifying and correcting them:

Tipo de falla	Causa problable	Soluciones
1. Pump doesn't start	There's no power to the motor connections.	Review and correct.
	Impeller blocked by solids larger than the pump can handle.	Measure the current in the motor terminals it has to be more or less 20% max. broken amps blocked, switch off the pump and remove the obstruction.
	Overload protector tripped.	If the current in the motor terminals is zero in single phase, disconnect, let it cool and reconnect. In triphase allow protector to cool, press and measure current again. If even zero, check installation connections of the pump, starter or cables in general. In triphase motors, after placing guards, if the current is within the limits.
2. Pump runs manual but no automatically	Faulty float switch.	Check the connections to the switch in the pit. Make sure there is enough water to operate the controls. If an ohmmeter is available, place the switch terminals, use a scale of 100 phmnios, operate manually and observe if mark zeros when closed.
3. Pump starts, but after the activation of the overload relay	a) Failure of supply phase. b) Phase unbalance. c) Poor regulation or defective relay and locked rotor. d) The supply voltage does not match the engine.	a) Check the phase equilibrium. b) Check the setting. Replace the overload relay. c) Send to the service shop. d) Replace the engine or power control.
4. Pump runs but does not drain the pond	a) Pump Suction totally or partially obstructed. b) Discharge line clogged. c) Discharge valve closed. d) Air trapped in the body of the pump. e) Actual altitude much higher than expected.	a) Remove the obstruction. b) Clean the pipe. c) Open valve. d) Proceed up and back down the pump or valve open until all the air. e) Replace with another model.

7. Warranty

WDM guarantees its Wastewater Pumps for a period of 12 months from the date of delivery, against defects in material and workmanship, according the indicated in its general conditions of sale.

Failure of the suggestions and recommendations in this manual, as well as improper product use or handling, totally invalidates the warranty.

The warranty excludes wear and tear, misuse, repair or replacement of the defective part by the user or unskilled personnel without specific permission of **WDM.**

ATTENTION!

Any abnormalities detected should be reported immediately to **WDM.**

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