



Installation, Operation, and Maintenance Manual.

-

This manual contains the necessary instructions for the installation and commissioning of its wastewater pumps **NE4 & NE6**. Carefully read these recommendations before starting your pump. **Always keep it at hand!**

Note: Technical specifications are subject to change without prior notice.

1-INTRODUCTION

This manual is a guide for the installation, operation and maintenance of WDM Pumps Wastewater pumps. Read the instructions carefully before installing your equipment. Please, save it for later reference.

The pumps have been built according to the North American manufacturers of pumps (Contractors Pump Bureau) and tested through hydrostatic and performance tests that guarantee their correct operation. Inspect them carefully and make sure that there are no missing parts and that they have not deteriorated during transport. Make the claim to the carrier as soon as possible if necessary.

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



WARNING!

WDM Water Systems is not responsible for any damage or accidents that occur due to failure to comply with the instructions given in this manual. The warranty is only valid when using original spare parts.

2. SAFETY RECOMMENDATIONS

- · Wear safety shoes when handling heavy parts or tools.
- Do not operate pumps with the discharge valves closed.
- Do not remove plugs or drain valves when the equipment is operating.
- Never couple pipes to the pumps by force. Use always the correct sizes.
- Always switch off the power for any maintenance work.
- · Make sure the pump is isolated from a pressurized system before removing it
- Wear safety gloves when handling parts with sharp edges.
- · Never apply heat to disassemble the pump. There may be a risk of explosion.
- Do not wear loose clothing that can be picked up by the impeller or other moving parts.
- Never place your hands in the suction or discharge mouths.
- · Do not handle the pump by cord assembly.
- Secure the pump before operating to prevent it from falling or slipping.
- Operating the pump with the discharge valve closed decreases the life of the bearings and the mechanical seal.
- The NE 4 and NE 6 sewage pumps are not recommended for use in swimming pools or recreational water facilities.
- · Disconnect the pump from the power source before performing any maintenance work.

These pumps are designed to operate safely when used and maintained in accordance with this manual.

A pump is a device that contains parts that are rotating and can therefore be dangerous. Operators and maintenance personnel should be aware of this and follow safety recommendations.

Pumps are heavy equipment: Handle them carefully.



Precautions before installation

- · Be careful not to damage the motor terminals when unpacking the unit
- Check the nameplate and make sure that the data corresponds to the pump you purchased.
- · Make sure the voltages are as specified for the pump duty
- · Keep this manual for later reference.
- Transport and always place this pump in a vertical position.



WARNING!

Wastewater pumps are NOT recommended for:

- (a) Pump flammable liquids
- (b) Be used in areas considered dangerous
- (c) Be used in swimming pools or aquatic recreational facilities
- (d) Pump liquids with abrasive solids
- (e) Operate without the recommended submergence level.

The use of these pumps in the aforementioned cases makes the guarantee void. When it is required to pump abrasive liquids, it is suggested to request a hard-faced seal instead of

the lower standard seal. Consult the factory for the most recommended selection.

3. INSTALLATION

Localization

Never install pumps in trenches with loose soil. The pump may sink and the suction may clog. It is recommended that the level of submergence be as shown in diagram No. 1.

Level of Submergence

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



Diagram No. 1



WARNING!

The pumps must be supported separately of the pipes. Their connections must **NEVER** be forced by stress are generated in the pump causing failures in its operation.

Discharge Connection

The discharge pipe should be as short as possible. Both a check valve and a shut-off valve are recommended for each pump being used. The check valve is used to prevent backflow into the drain. Excessive backflow can cause flooding and/or damage to the pump. The shutoff valve is used to stop the flow in the pump for maintenance of the check valve.

WDM Water Systems supplies a stationary elbow with a discharge system designed to make the submersible wastewater pump easy to install or uninstall without the need for maintenance personnel to enter the well.

See the NE4 and NE 6 PUMP INSTALLATION ACCESSORIES manual for more information, or ask one of our consultants.



WARNING!

The pipe of the safety or relief valve must always be installed, if not installed could cause a malfunction in the operation of the motor that is caused by the entry of water into the chamber of the same. The guarantee does not apply if this recommendation is not met.



TYPICAL INSTALLATION DIAGRAM

Fluid Level Controls: The level controls must be supported to the well wall, the cover or junction box. Cord handles are used to hold the cables in place in the installation. The level control can be changed by adjusting the cord length according to the plans and specifications. Make sure that the level controls are not misplaced, or there is no movement in their swing travel, and that the pump is completely submerged when the level control is in the off mode.

Electric connections:



WARNING!

* The cord assembly should not be used to lift or move the pump, for this use only the handle that comes installed.

Power and Cord Control: The cord assembly installed on the pump must not be modified in any way except to shorten to a specific application. Any splicing between the pump and the control panel must be done in accordance with all electrical standards. Do not expose the cord tips to moisture, as moisture may leak into the motor and cause serious damage.

The white wire is not ground. The black, white and red cables are energy transport (conductors). The green wire is for the ground connection.



WARNING!

All models of submersible pumps must be grounded (green wire).



Temperature sensor

Normally closed is (N/C) integrated into the motor coils and will detect excessive heat in the event of an overload. The thermal sensor will activate when the coils get too hot and will automatically reset when the pump motor cools to a safe temperature. It is recommended that the thermal sensor be connected to an alarm device to alert the operator of an overload condition, and/or the motor power up coil to stop the pump in the case of one overload, the source of the problem must be detected and repaired.

If the current through the temperature sensor exceeds the values listed, a circuit control relay must be used to reduce the current, or the sensor will not function properly.

ELECTRICAL RANGE OF TEMPERATURE SENSOR				
Volts Continuous Startin Amps Amps				
110-120	3.0	30.0		
220-240	01:50	15.0		
440-480	0.75	7.5		
600	0.60	6.0		

Water or moisture detection probe: From 1 watt to 330 kilo ohms, 500 volts, is installed inside the sealed chamber of the pump to detect any moisture or water present.

It is recommended that these probes be connected to a control device, alarm or conductivity relay to alert the operator that some water or moisture has been detected in the internal chambers of the pump. If detected, individually check the cables for the humidity sensor, (∞ resistance = no moisture) and the junction box/humidity control box.

These situations can induce a false signal in the moisture detection circuit. If none of the above tests demonstrate conclusions, the pump(s) must be removed and the source of the failure repaired.

IF MOISTURE HAS BEEN DETECTED, MAINTENANCE MUST BE DONE IMMEDIATELY!

Connection example: Note that it may change depending on the control or alarm device used for the connection of moisture probes



When the sealing chamber is filled with clean oil, no current flows between the probe (W1) and (W2). As soon as water enters the chamber, the conductivity of the oil will increase, a visual alarm should be turned on and the motor turned off.

As the conductivity of the oil-water mixture between probe (W1) and probe 2 (W2) varies according to agitation and rotation (if the motor is stopped or running), the alarm - and the motor with it - would be continuously turning on and off. To avoid this, the moisture detector circuit must keep the alarm on and the motor off with the first pulse. The button P1 resets the alarm.

As conductivity relays have mostly an internal delay circuit (approx. 1s.), and connections 15 and 16 are normally closed (as shown in the figure) when there is no power (and open when the relay is energized), a timer (D1) is recommended for visual alarm. To verify the operation of the alarm, push button P2 is available between connections E1 and E2.

If P1 is pressed once the motor has been stopped and the light goes out, then it would indicate the presence of only a small amount of water in the sealing chamber and that it has probably deposited on the bottom. However, if the light stays on it would indicate that the amount of water that has entered is important and that the pump should be repaired as soon as possible. Because the moisture detection system in the sealing chamber operates as an open circuit and is required to close to indicate a seal failure, IT DOES NOT PROVIDE COMPLETE FAILURE ASSURANCE. One of its terminals may fall off or break, and the system would still be open "indicating" that water has not entered the sealing chamber when the opposite could have occurred.

MODEL	НР	VOLT.	PHASES	R.P.M	MAX CURRENT (A)	Rotor locked MAX Current (A)	START- POWER UP COIL RESISTOR	CORD SIZE
NE 4 45-4-230	4.5	230	3	1.750	18.2	56.0	1.43	10/4
NE 4 45-4-460	4.5	460	3	1.750	9.1	28.0	5.71	10/4
NE 4 75-4-230	7.5	230	3	1.750	26.8	80.0	0.71	10/4
NE 4 75-4-460	7.5	460	3	1.750	13.0	40.0	2.85	10/4
NE 4 113-4-230	11.3	230	3	1.750	28.0	126.0	0.43	10/4
NE 4 113-4-460	11.3	460	3	1.750	14.0	63.0	1.72	10/4
NE 4 150 4-230	15.0	230	3	1.750	38.0	160.0	0.35	8/4
NE 4 150 4-460	15.0	460	3	1.750	19.0	80.0	1.45	8/4
NE 6 90-6-230	9.0	230	3	1.150	26.0	162	0.445	2/4
NE 6 90-6-460	9.0	460	3	1.150	13.0	81.0	1.780	2/4
NE 6 120-6-230	12.0	230	3	1.150	36.0	162.0	0.445	2/4
NE 6 120-6-460	12.0	460	3	1.150	18.0	81.0	1.780	2/4
NE 6 180-6-230	18.0	230	3	1.150	50.0	232.0	0.080	2/4
NE 6 180-6-460	18.0	460	3	1.150	25.0	116.0	0.320	2/4
NE 6 240-6-230	24.0	230	3	1.150	64.0	290.0	0.235	2/4
NE 6 240-6-460	24.0	460	3	1.150	32.0	145.0	0.940	2/4
NE 6 300-6-230	30.0	230	3	1.150	82.0	364.0	0.123	2/4
NE 6 300-6-460	30.0	460	3	1.150	41.0	182.0	0.490	2/4
NE 6 180-4-230	18.0	230	3	1.750	50.6	232.0	0.270	2/4
NE 6 180-4-460	18.0	460	3	1.750	25.3	116.0	1.080	2/4
NE 6 240-4-230	24.0	230	3	1.750	62.8	290.0	0.205	2/4
NE 6 240-4-460	24.0	460	3	1.750	31.4	145.0	0.820	2/4
NE 6 300-4-230	30.0	230	3	1.750	76.0	364.0	0.188	2/4
NE 6 300-4-460	30.0	460	3	1.750	38.0	182.0	0.750	2/4
NE 6 360-4-230	36.0	230	3	1.750	90.0	434.0	0.110	2/4
NE 6 360-4-460	36.0	460	3	1.750	45.0	217.0	0.460	2/4
NE 6 480-4-460	48.0	460	3	1.750	65.0	290.0	0.540	2/4
NE 6 600-4-460	60.0	460	3	1.750	78.0	363.0	0.310	2/4
NE 6 750-4-460	75.0	460	3	1.750	96.0	576.0	0.187	2/4

Table of electrical consumption

3 -OPERATION

Before operating the pumps, check the following points:

Voltage and phases: Verify the electrical data contained on the nameplate

Rotation of motors: It must be correct to prevent damage to the motor and pump. Give a soft power up and observe the direction of rotation. It must match the one indicated on the plate (clockwise when looking at the top of the casing). If the rotation is not as indicated, swap two cables at the control panel connection. Do not make changes to the motor connections. Please check again.

Pump identification: Record the serial number of the pump for later reference.

Insulation test: Read the insulation resistance of the motor. These values, voltages and amperages in the power lines should be saved for future reference.

Pump Test: Once the pump has been properly connected and lowered into the well, its operation should be checked for a few work cycles. Pit emptying or running times per cycle should be noted. The casing must contain oil to cool the motor.



4. MAINTENANCE



WARNING!

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

Since the motor is of the oil-lubricated type, no other lubrication or maintenance work is required. These pumps are generally very reliable in their operation and in most cases can last smoothly running for many years.

However, like any mechanical equipment, a preventive maintenance program should be carried out that includes:

- a) Check the motor casing for oil level and oil contamination.
- b) Inspect the condition of the impeller and volute for wear or sticking.
- c) Motor and bearing overhaul.
- d) Check seal for wear and leaks.

The pump is supplied from the factory with the oil for motor cooling, only replace the oil if there is a failure or perform internal maintenance work, for that use Texaco Diala-Oil- AX or Mobil D.T.E Oil Light dielectric oil according to the amount recommended in the following table:

MODEL	CAS	SING	SEAL CHAMBER		
	GAL	LITERS	GAL	LITERS	
NE 4 450/750/1130/1500 NE 6 9/180/240 NE 6 300/480/600/750	2.5 15.0 11.0	9.5 56.8 41.6	0.3 0.4 0.4	1.1 1.5 1.5	



WARNING!

Check that the oil is below the oil level at the top about 1,6 Inches, if not, this will result in excessive hydraulic pressure that could destroy the pump. Oil overfills voids warranty.

Pressure test

Casing: To check that the pump is not leaking around the shaft seal inlet, square rings, and cord, the oil level should be in the quantity indicated. Remove the pressure valve (22) from the volute (16). Apply sealant and fit a pipe with a manometer and adjust to the pressure valve orifice (**See** Diagram 2). Apply pressurized air to the casing at 10 P.S.I. Use soap in water around sealed areas and inspect the joints for air bubbles. If, after 5 minutes the pressure still constant, and no "bubbles" are visible. Remove the pipe and manometer and reposition the pressure valve with a sealant. If the pressure is not maintained check well until the leak is located.

Seal chamber: Remove plug (31), check recommended oil level, fit pipe with sealant and manometer and apply air at 20- 25 P.S.I. pressure and check for leaks by repeating the previous step.



Cleaning

If the pump is used in transportable applications, it must be cleaned after each use by pumping clean water to prevent the formation of deposits of dirt and inlays.

Impeller replacement.

To clean the volute (1) or replace the impeller (4), or replace the wear ring (29) (NE pump 6), disconnect the power, remove the hex nuts (13) and lift the vertical motor and the seal assembly from the volute (1). Clean the volute if necessary. Clean and inspect the impeller (4), for pitting or wear and replace, if necessary, inspect the gasket (7) and replace if cut or damaged. If the impeller (4) requires replacement, remove the screw (33) and washer (27) remove and pull it directly from the shaft using a puller. If the wear ring (29) on NE 6 pump requires replacement, cut the ring and remove it, be careful not to damage the volute (1).



Installation:

To install the wear ring (29) on NE 6 pumps press the wear ring into the volute hole (1) until it is seated. To install impeller (4), on all models, apply a thin coat of oil to the motor shaft and the impeller will slide directly onto the shaft, keeping keys aligned. Apply threadlocking compound to the screw (33) and torque to 35 lb-ft.

Fit the gasket (7) on the pump volute (1) after installing the impeller (4) match the studs (8) with the holes in the volute (16). Screw the nut (13) onto the stud (8) applying Loctite 277 threadlocker and tighten with a torque of 24 lb/ft.



ATTENTION!

When installing the impeller again on the NE 4 Series pump, 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).





Motor maintenance and mechanical seal.

- Remove volute (1) and impeller (4) as noted above.
- Remove the oil from the volute (16). removing valve (22)
- Remove the nuts (13) and separate the motor (5) with the coupling (3) from the volute (16)
- Disconnect the motor (5) from the cord assembly (20), release screws from the coupling and remove the coupling (2) together with the stationary part of the seal (6) from the motor (5)
- Now, examine the motor, bearing and seal components
- Replace if any wear or damage.
- If one of the seal components requires replacement, replace the entire seal.

CAUTION!

Handle the seal parts carefully.

- · Do not scratch or damage the ground faces.
- When replacing the seal, remove the rotating component and the spring from the motor shaft.
- Also, the fixed part of the coupling. Clean the double seal coupling cavity (3).
- Place new fixed component on the double seal coupling (3), and the fixed part on hard faces on the coupling (2). Make sure that the spring is properly secured over the rotating component.
- Carefully assemble the coupling (3) over the motor (5) using the motor screws. Then tighten the coupling (2) with screws (9) on the coupling (3), insert this assembly into the casing (16) and volute (1) and secure with nuts (13), add the oil specified above.



Cord assembly connections:

Check the cables for tears or other defects. If replaced, replace the entire cord assembly cap (20). Remove the cables from the motor and check the insulation. Replace them if needed. Now install the square ring (23) on the cord assembly cover (20). Reconnect the motor terminals to the power cord as shown in diagram 3.



Diagram 3





HUMIDITY AND TEMPERATURE SENSOR TEMPERATURE HUMIDITY ์S1 S2 Ŵ W2 G orange white green black -ed (P1 ́Р2 (W1)(W2 G SENSOR SENSOR THERMOSTAT



PLUG 1/4" NPT

33 SCREW 1/2"X1-1/2"NC SS.

32 WASHER 1/2" SS



'N D.'

(21)



No	DESCRIPTION	DEE	QUANTITY					
NO	DESCRIPTION	REF	9	12	18	24	30	
1	VOLUTE	42167	1	1	1	1	1	
2	COUPLING	72593	1	1	1	1	1	
3	DOUBLE SEAL COUPLING	72330	1	1	1	1	1	
4	IMPELLER ø11,500"	58115	1					
4	IMPELLER ø12,000"	41324		1				
4	IMPELLER ø13,000"	41325			1			
	IMPELLER ø14,000"	41326				1		
4	IMPELLER ø14,625"	41327					1	
5	MOTOR 9 HP 1200RPM	62323	1					
	MOTOR 12 HP 1200RPM	62324		1				
5	MOTOR 18 HP 1200RPM	62317			1			
5	MOTOR 24 HP 1200RPM	62315				1		
5	MOTOR 30 HP 1200RPM	62319					1	
6	MECHANICAL SEAL 1-7/8" MIX	00056	1	1	1	1	1	
7	HOUSING GASKET	51936	1	1	1	1	1	
8	STUD 7/16"X 2-1/4"NC SS.	02424	12	12	12	12	12	
9	SCREW BCC 1/4" X1" SS.	16673	2	2	2	2	2	
10	DIAPHRAGM 4SEH	00193	1	1	1	1	1	
11	DIAPHRAGM PIPING RING	52206	1	1	1	1	1	
12	SCREW 1/4"X1" NC SS.	02452	4	4	4	4	4	
13	NUT 7/16"NC SS	02451	18	18	18	18	18	
14	BEARING 3310 A/C3	28255	1	1	1	1	1	
15	BEARING 6207 C3	2300081	1	1	1	1	1	
16	CASING	41303	1	1	1	1	1	
17	SCREW 7/16"X 2-1/4" NC SS.	02450	6	6	6	6	6	
18	RING "O" CASING	52082	2	2	2	2	2	
19	SCREW 3/8"X1" NC SS.	02218	4	4	4	4	4	
20	CORD ASSEMBLY	61288	1	1	1	1	1	
21	LIFT HANDLE	52215	1	1	1	1	1	
22	1/2" RELIEF VALVE	70426	1	1	1	1	1	
23	SQUARE RING ASSY	27248	1	1	1	1	1	
24	ELECTRODE FOR SENSOR	39383	2	2	2	2	2	
25	SENSOR CORD	90198	1	1	1	1	1	
26	RETAINING WASHER	02458	1	1	1	1	1	
27	SCREW 5/8"X -1-1/2" NC SS.	02457	2	2	2	2	2	
28	SCREW #6-32NC X5/16 T.F.	21765	3	3	3	3	3	
29	FRICTION RING	30677	1	1	1	1	1	
30	PLUG 1/4" NPT	03201	2	2	2	2	2	
31	PRESSURE WASHER 5/8" SS	02617	3	3	3	3	3	
32	SCREW 5/8"X1-3/4"NC SS.	22841	1	1	1	1	1	
33	STUD 3/8"X 4-1/2"NC SS.	02430	4	4	4	4	4	
34	PRESSURE WASHER 3/8" SS	02616	4	4	4	4	4	
35	NUT 3/8"NC SS	02521	4	4	4	4	4	
36	NIPPLE 1-1/4" x 2" LONG SS.	72296	3	3	3	3	3	
37	FEMALE PLUG 1-1/4 STEEL	03235	3	3	3	3	3	







STATIONARY ELBOW PARTS

No	DESCRIPTION	DEE	QUANTIT		
	DESCRIPTION		4" 91549	6" 91550	
1	STATIONARY PART 4" ELBOW	62486	1		
1	STATIONARY PART 6" ELBOW	64487		1	
2	FLANCHE ELBOW GUIDE	62487	1		
2	FLANCHE ELBOW GUIDE 6"	64488		1	
3	RAIL GUIDE CONNECTOR	64496	4		
3	RAIL GUIDE CONNECTOR 6"	64490		4	
4	SUPPORT TUBOGUIA 4"	64495	1		
4	SUPPORT TUBOGUIA 6"	64489		1	
5	RING "O" FLANCHE GUIDE	17705	1		
5	RING "O" FLANCHE GUIDE	17704		1	
6	RING "O" CONNECTOR	17703	4	4	
7	FLANCHE 4" GASKET	20382	2	2	
8	SCREW 1/2NCX1-1/2NC SS.	02233	4		
8	SCREW 5/8NCX1-3/4NC SS.	22841		4	
9	NUT 1/2NC SS	02514	2		
9	NUT 5/8NC SS	02518		2	
10	WASHER 1/2" SS	02609	2		
10	WASHER 5/8" SS	02617		2	

-ONLY SUPPLIED WITH THE NUMBERED

PUMP DISCHARGE

5- FAILURES, CAUSES AND SOLUTIONS.

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

If the operating problems are not corrected, the following guide can help in identifying and correcting them:

TYPE OF FAILURE	PROBABLE CAUSE	SOLUTION		
1The pump does not start	There is no power at the connections to the motor.	Review and correct.		
	Impeller blocked by larger solids than the pump can handle.	Measure the current at the motor terminals if it measures +/- 20% max. rotor amperage blocked, disconnect the pump and remove the obstruction.		
	Overload protector tripped.	If the current at the motor terminals is zero in single phase, disconnect the motor terminals, allow the motor to cool and reconnect. In three phases allow the guard to cool, press and re-measure current. If it is still zero, check the installation connections of the pump, starter, or cables in general. On three-phase motors, after fitting the guards, if the current is within the acceptable limits a screw of the overload relays may be loose		
2The pump works manually but not automatically.	Faulty float switch	Check the connections to the switch in the well. Make sure there is enough water to operate the controls. If an ohmmeter is available, place the switch terminals, use a 100-ohm scale, operate manually, and observe if it marks zero when closed.		
3The pump starts but then the overload relay is tripped.	Failure in a power stage. Phase	Control the balance of the phases.		
	Poor regulation or faulty relay. rotor	Control the setting. Replace the overload relay Send to specialized service.		
	locked.			
	The supply voltage does not correspond to that of the motor.	Replace the motor or control the power supply.		
4The pump starts but	Pump suction completely or partially	Remove the obstruction		
tripped.	blocked.	Clean the pipeline.		
	Discharge pipeline clogged.	Open valve.		
	Relief valve closed. Air trapped in the pump volute. Actual lift height much higher than expected	Proceed to raise and lower the pump again, or open the valve until all the air comes out. Replace model with a different		
		one.		



6. WARRANTY

WDM Water Systems., Guarantees its NE 4 & NE 6 wastewater pumps for a period of 12 months from the date of delivery, against all defects in materials and workmanship, in accordance with its general conditions of sale. Please contact our commercial team for special condition depending on the sales country.

Failure to comply with the suggestions and recommendations in this manual, as well as incorrect use or unauthorized handling of the product, totally invalidates the warranty.

The warranty excludes wear and tear from use, misuse, repair or replacement of the defective part by the user or by unqualified personnel without the express authorization of WDM Water Systems



ATTENTION!

Any anomaly detected must be reported immediately to WDM Water Systems.





www.wdmpumps.com

- USA Tulsa
- Address: D4501 S 86th E Ave, OK 74145
- usasales@wdmpumps.com
- support@wdmpumps.com