



Operation Manual

Submersible Non-clog pumps

4" & 6"

NE Series.

WDM Water Systems

1. Introduction.

This manual contains instructions for the installation and operation of your NE pumps. Read these recommendations carefully before use. Keep this manual for future reference.

Congratulations! You have purchased a product developed with the latest technology from WDM Pumps, Inc. (referred to as “WDM”).

WDM designs and manufactures our products with the highest quality components. Our experience as a manufacturer and our special care and dedication in production result in products that meet the highest standards.

The information contained in this manual is important for the installation, operation and maintenance of your WDM NE pumps. Read all instructions carefully before installing and using the product. Keep this manual for future reference.

Our products are factory tested to ensure proper operation. Inspect carefully and make sure there are no missing or damaged pieces from shipping. If, upon delivery, parts are damaged or missing, make a claim to the shipping company as soon as possible.

The design of this product, as well as the materials and processes used in its manufacture provide for proper operation. However product performance and lifespan depend on appropriate application, installation, periodic inspection and general preventive maintenance.



WARNING.

WDM is not responsible for any damage or accidents that occur when the instructions given in this manual have not been followed. The warranty is only valid when using WDM original spare parts. Failure to follow these guidelines in installing and starting your pump will void your warranty.

2. Safety Recommendations.

- Wastewater pumps NE, NE 4 and NE 6 are not recommended for use in pools or water recreation facilities.
- WDM pumps are designed to operate safely when used and maintained according to this manual.
- Rotating parts of the pumps are dangerous and can cause injury. Operators and maintenance personnel should be aware of and follow safety recommendations.
- The pumps are considered heavy equipment. Handle them with care.
- Pumps should not pump hazardous material unless they have been designed and designated to do so.
- The pipes and pump should never be forced to fit if using the correct size. If you have to apply force, then get a different size.
- To reduce the risk of electrical shock, all wiring of pumps, motors, overload protection and control panels must be in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances. Requirements will vary depending on usage and location. Improper grounding will void the warranty.
- To reduce the risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Cable should be inspected frequently.
- Never handle connected power cords with wet hands.
- If any product is to be returned, it must be cleaned, sanitized, or decontaminated as necessary according to any applicable laws and regulations prior to shipment, to protect employees from exposure to health hazards.
- Always wear eye protection when working on pumps.
- Loose fitting clothing can easily be caught by the impeller or other moving parts, therefore do not wear loose fitting clothing when doing maintenance or service work on the pump.
- Gloves should be worn whenever handling parts that have sharp edges.
- Wear safety shoes when handling heavy parts or tools.
- For any maintenance always disconnect power.
- Never place hands in the suction or discharge openings.
- Safety handles should always be fastened securely before

- attempting to lift the pump.
- The pump should not be operated without the proper safety devices in place. If such devices are removed during service and repair work, make sure they are replaced before operating the pump again.
 - Do not operate the pump when holding the cable assembly.
 - Blocking or restricting the discharge hose may cause it to whip under the pressure.
 - Do not remove the drain plugs or valves if the pump is operating.
 - The pump should be isolated from a pressurized system before it is removed.
 - Allow pumps time to cool sufficiently before handling or servicing them as heat and pressure build up inside during operation.
 - Never apply heat in disassembling a pump as doing so could cause an explosion.
 - Do not exceed manufacturer's recommendation for maximum performance, as doing so could cause the motor to overheat.
 - If the discharge valve is closed, do not continue operating the pump, the extreme heat from doing so can cause steam to build up creating a dangerous pressure situation. A temperature or pressure relief valve should be installed on the pump body.



CAUTION.

If operating the pump with a plug-in type power cord, it should have a ground fault circuit breaker.



CAUTION.

The pumps are not recommended for: Pumping flammable liquids, for use in areas considered dangerous; for use in pools or water recreation facilities, for unumping liquids with abrasive solids or operating above the recommended submergence level.

The use of these pumps in the cases mentioned will cause the loss of your warranty.

3. Installation.

Receiving

Pumps should be inspected upon receipt. Make note of damage or missing parts, if any, and immediately file a claim with the shipping company. During inspection, if the manual is removed, do not lose or misplace it.

Location.

- Never install the pumps in soft ground trenches. This causes the pump to sink and suction to be covered.
- Upon installation, make sure there is enough room to access the pump for maintenance and inspection. Also make sure a crane can access and lift the pump during removal.
- Be sure there is enough power for the motor to work.
- In order to ensure there is enough power for the motor, electrical characteristics and limits on the motor data plate should be followed.

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

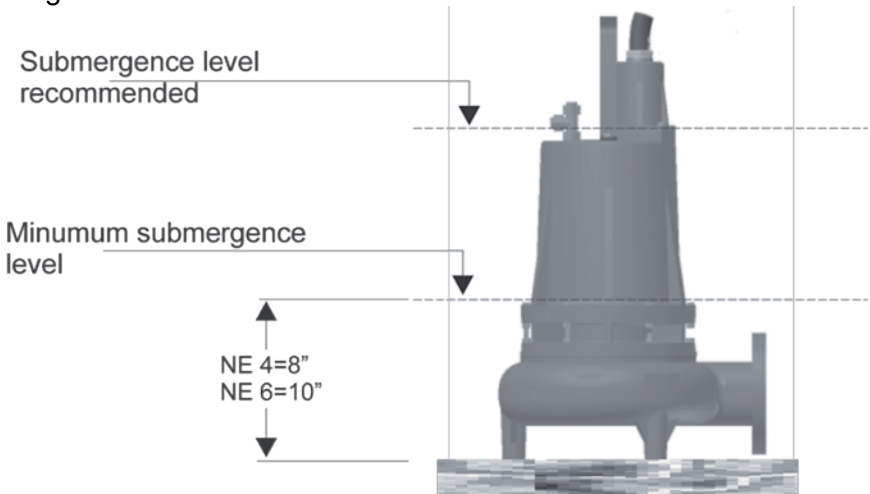


Diagram No. 1



ATTENTION.

WDM does not supply all the accessories (valves, gauges, pipes, extensions, etc.) mentioned in this manual.

Always use the handle, and never the cord, to lift the pump.



WARNING.

Pumps and pipes should be supported independently and their connections must never be forced. Doing so will generate stress on the pump and cause the pump to fail.

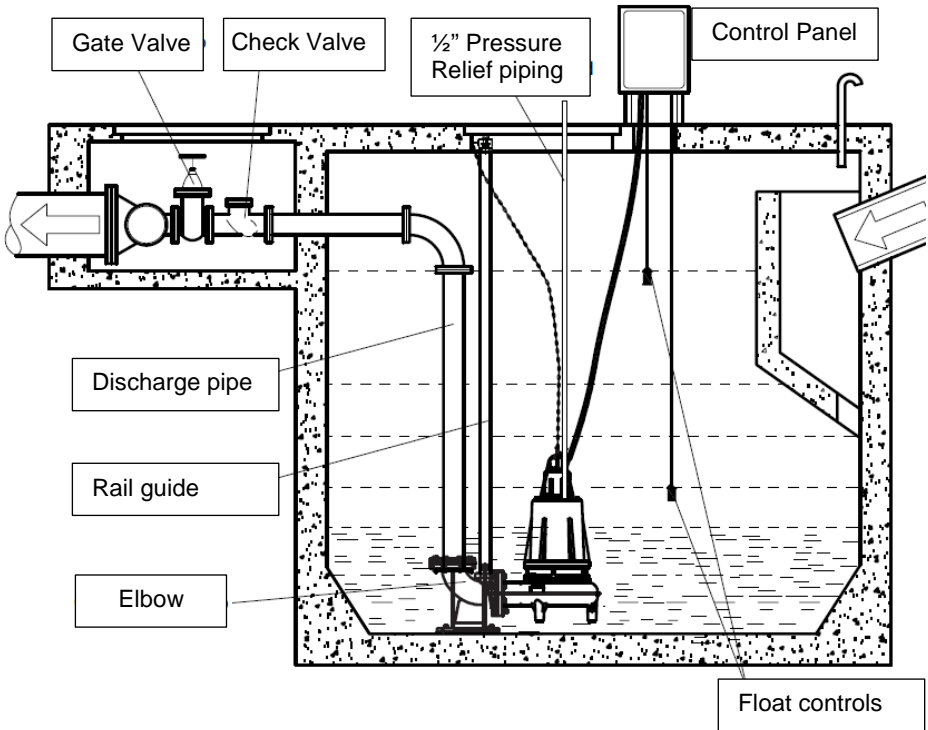
Discharge (outlet) piping.

The discharge pipe should be as short as possible and fitted with either a check or gate valve for each pump that uses the same line. This valve is used to prevent backflow into the pump which can cause excessive flooding and damage to the pump. The valve may also be used to stop flow into the pump to help with priming and starting, shutdown, maintenance, and pump removal.

- The discharge gate valve should be closed before the pump is shut down if check valves are used.
- If the piping is short then it may be the same diameter as the discharge opening.
- Like the suction piping, discharging piping's diameter should be 1 - 2 sizes larger the longer the pipe.
- If the discharge piping is horizontal, it is best to have an even gradient.
- Air or gas may get trapped in high points along the piping which retards the pump's operation.

The NE pump is designed to allow installation or removal without requiring personal to enter the well. If need it you can use WDM slide rail system (Sold separately, does not includes rails).

Installation Diagram



Liquid level controls:

Float controls are supported by mounting a bracket which is attached to the borehole wall, deck, or junction box. Use cable grips to hold the cables in place during installation. The level of control can be changed by loosening the handle and adjusting the cable length according to the plans and specifications. Make sure the float 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 the electrical wire exposed, as it may cause serious damage. The black, white, and red wires are all energy carriers or conductors. The green wire is the grounding wire.

Overload protection:

For 3 phase pumps a normally closed (N/C) temperature sensor has been embedded to detect when the motor is overheating because of overload conditions. These thermal sensors trigger a shutdown when the motor is too hot, and will automatically restart the pump once the motor has cooled to a safe temperature. We recommend connecting the sensors to an alarm that alerts the operator an overheating situation has occurred and to stop the operation. If this situation occurs, it should be reviewed to determine the cause and correct the situation.



ATTENTION.

Always use the installed handle, never the cord, to lift the pump.



ATTENTION.

WDM does not supply all the accessories (valves, gauges, pipes, extensions, etc.) mentioned in this operation manual and installation.



ATTENTION.

Do not continue to operate the pump if an overload situation arises.

Humidity sensor

A normally open (N/O) contact is installed in the seal chamber in order to detect if any moisture is present in the pump. We recommend that this sensor be connected to an alarm to alert the operator that moisture has been detected. If moisture is detected the pump should be inspected and repaired.

Wire Size

A licensed electrician should be consulted to determine what wire size should be used if more power is required. Consult the table for electrical information.

Model	hp	V	Phases	rpm	Amps (max.)	Amps (max) at locked rotor	Winding resistance at Start-up	Cable size
NE 4 45-4-220	4.5	220	3	1,750	18.2	56.0	1.43	10/4
NE 4 45-4-440	4.5	440	3	1,750	9.1	28.0	5.71	10/4
NE 4 75-4-220	7.5	220	3	1,750	26.8	80.0	0.71	10/4
NE 4 75-4-440	7.5	440	3	1,750	13.0	40.0	2.85	10/4
NE 4 113-4-220	11.3	220	3	1,750	28.0	126.0	0.43	10/4
NE 4 113-4-440	11.3	440	3	1,750	14.0	63.0	1.72	10/4
NE 4 150-4-220	15.0	220	3	1,750	38.0	160.0	0.35	8/4
NE 4 150-4-440	15.0	440	3	1,750	19.0	80.0	1.45	8/4
NE 6 90-6-220	9.0	220	3	1,150	36.0	162.0	0.445	2/5
NE 6 90-6-440	9.0	440	3	1,150	18.0	81.0	1.780	2/5
NE 6 180-6-220	18.0	220	3	1,150	50.0	232.0	0.080	2/5
NE 6 180-6-440	18.0	440	3	1,150	25.0	116.0	0.320	2/5
NE 6 240-6-220	24.0	220	3	1,150	64.0	290.0	0.235	2/5
NE 6 240-6-440	24.0	440	3	1,150	32.0	145.0	0.940	2/5
NE 6 300-6-220	30.0	220	3	1,150	82.0	364.0	0.123.	2/5
NE 6 300-6-440	30.0	440	3	1,150	41.0	182.0	0.490	2/5
NE 6 180-4-220	18.0	220	3	1,750	50.6	232.0	0.270	2/5
NE 6 180-4-440	18.0	440	3	1,750	25.3	116.0	1.080	2/5
NE 6 240-4-220	24.0	220	3	1,750	62.8	290.0	0.205	2/5
NE 6 240-4-440	24.0	440	3	1,750	31.4	145.0	0.820	2/5
NE 6 300-4-220	30.0	220	3	1,750	76.0	364.0	0.188	2/5
NE 6 300-4-440	30.0	440	3	1,750	38.0	182.0	0.750	2/5
NE 6 360-4-220	36.0	220	3	1,750	90.0	434.0	0.110	2/5
NE 6 360-4-440	36.0	440	3	1,750	45.0	217.0	0.440	2/5
NE 6 480-4-440	48.0	440	3	1,750	65.0	290.0	0.540	2/5
NE 6 600-4-440	60.0	440	3	1,750	78.0	363.0	0.310	2/5
NE 6 750-4-440	75.0	440	3	1,750	96.0	576.0	0.187	2/5

Pre-start checklist.

To avoid damage to the seal, and to maximize seal life observe the following precautions:

- Stay within the temperature or pressure limitations specified for the mechanical seal used.
- Do not run the pump dry or against a closed valve! Dry operation will cause seal failure within minutes.



CAUTION.

Operation of the pump while dry will result in serious damage.



WARNING.

The pump should be operated within the conditions on the name plate in order to protect the safety of the operator. If operated outside such conditions, the pump could fail causing injury to operating personal. In order to properly operate and maintain the pump and its components, an instruction book should be consulted.

Before starting the pump, the following inspections should be made:

- All wiring to the motor and starting device should match the wiring diagram. The motor should move in a clockwise rotation when looking at it from the back. If the motor has been in storage for any length of time, whether used or new, then consult the motor instructions before starting. Use the motor data plate to check the voltage, phase, and line circuit frequency.
- In order to make sure it rotates freely, use your hands to turn the rotating element..
- All piping should be checked for leaks. Also all flange bolts should be checked to make sure they are tightened securely..
- Write down the serial number of the pump for future reference.

- Perform an insulation (or megger) test on the motor before putting the pump into service.
- Resistance values (ohms), voltage, and current (amps) should all be recorded and saved for future reference.

Motor rotation.



CAUTION.

To check the driver rotation, make sure pump and driver couplings are fully disconnected and separated physically. Serious damage will occur to both the pump and driver if the rotation is wrong.

Before checking motor rotation, make sure all components in the system are wired and properly connected. If so then check the motor rotation as follows.

If a 3 phase unit (only) – energize the motor briefly to make sure the rotation is going in the direction indicated by the arrow in the pump volute. If the rotation is not following the arrow, then switch the two wires from the motor starter's terminal.



CAUTION.

As pumps should not be operated while dry, be extremely cautious in making sure the motor is energized only momentarily, just long enough to determine if the rotation is proper.

Pump should be lowered into sump or basin, you can use NE lift rail system sold separately to do so.

4. Starting the pump.

Start the pump by turning on the power to the motor as instructed in the motor manual and follow this recommendation:

- Upon the pump reaching full operating speed, begin to open the discharge gate valve slowly until complete system flow is achieved.
- If there are pressure gauges on the pump, record pressure readings to use as a reference in the future
- Also make sure the pump is falling within the parameters of the performance curve.
- Check and record Voltage, amperage per phase, and kilowatts.
- Check system by filling the sump and allowing pump to operate.

Voltage regulation.

While the motor will operate satisfactorily under these voltage and frequency variations, such operation may not be in accordance with the standards established for operation in underrated conditions:

- Variation in the voltage may not exceed $\pm 10\%$ the rating specified on the motor data plate.
- Frequency variation may not exceed $\pm 5\%$ the rating specified on the motor data plate.
- The sum of the voltage and frequency variation may not exceed $\pm 10\%$ the motor rating while the frequency variation does not exceed $\pm 5\%$.

Pump shutdown.

The following shutdown procedures will apply in most normal shutdowns for the WDM pumps types NE.

- Close the discharge gate valve slowly to prevent hydraulic shock, and then cut power to the motor.
- Cut power to motor.

5. Maintenance.



WARNING.

If equipment is rotating, do not attempt to complete any maintenance, inspection, repair, or cleaning until rotation has stopped as such actions could result in injury to personnel..

Before attempting any inspection or repair on the pump, the driver controls must be in the “OFF” position, locked and tagged to prevent injury to personnel performing service on the pump.

Motor lubrication.

As the motor is filled with oil, there is no need to add lubricant of any kind or additional motor maintenance work as these pumps are generally very reliable and in most cases are able to continue to operate smoothly for many years with little problems.

Preventative maintenance should be performed regularly, including:

1. Inspecting the motor and seal chambers for proper oil levels and the presence of contamination and repair as necessary.
2. Inspecting the impeller and body for any excessive build-up or clogging and repair as necessary.
3. Inspecting the motor and bearings and repair as necessary.
4. Inspecting the seal and diaphragm for any leakage or wear and repair as necessary.

The pump is supplied from the factory with oil for cooling the motor, 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 9/180/240	15.0	56.8	0.4	1.5
NE 6 300/480/600/750	11.0	41.6	0.4	1.5



CAUTION.

Do not completely fill the motor casing with oil as this can cause buildup dangerous pressure that may destroy the pump. Allow 1.75" of air space below top of the motor housing.

Pressure Test

Casing: The oil should be at the correct level to check for any leaks around the shaft seal, square rings, and cables. Remove the pressure valve (22) from the motor housing (16). Apply the sealant and then tighten the pressure gauge into the pressure valve (Diagram No. 3). Apply air pressure into the motor housing at 10 P.S.I. Next, pour soapy water around the sealed areas to see if any "air bubbles" occur. If after 5 minutes at a constant air pressure of 10 P.S.I. no "bubbles" occur then remove the pressure gauge and air pressurizer and replace the valve and seal. If "bubbles" do occur, then there is a leak that must be located and repaired.

Seal Chamber: Remove the pipe plug (31) and check that the chamber is full of oil. Then apply pipe sealant to the pressure gage and tighten into the bearing bracket's hole. Pressurize the seal to 20-25 P.S.I. and follow the steps above to see if any "bubbles" occur indicating a leak.

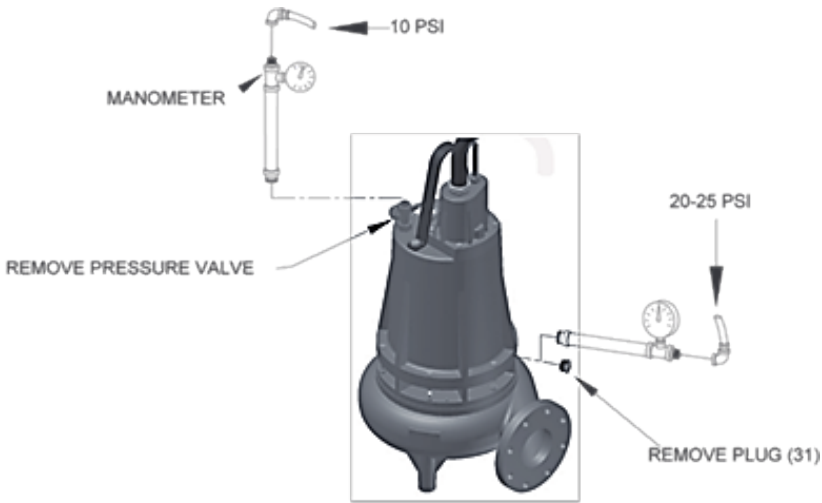


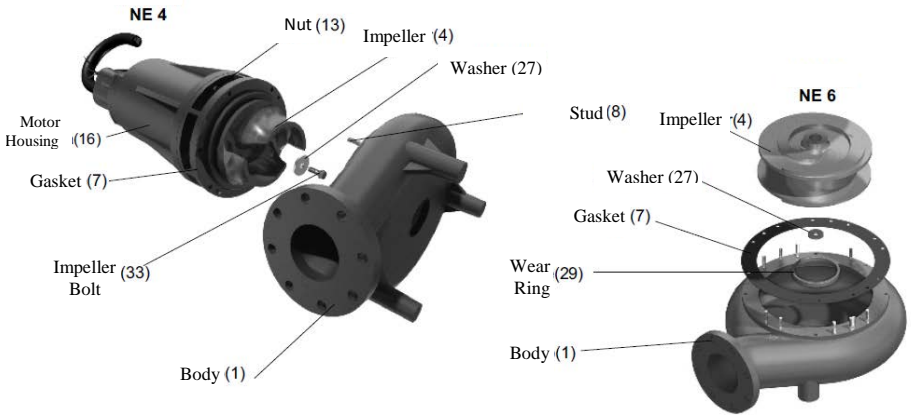
Diagram No. 3

Cleaning.

If the pump is used for portable applications, pump clean water through it after each use to prevent deposits of dirt and scale from forming.

Impeller replacement.

In cleaning out the body (1), replacing the impeller (4), or replacing the wear ring (on NE 6 pumps), disconnect the power, remove any hex screws (13), and then lift the vertical motor and seal out of the body. If necessary clean the body. Clean and examine the impeller (4) for any pitting or wearing and replace as necessary. Inspect the gasket (7) for any cuts or damage and replace as necessary. If the impeller needs to be replaced remove the screw (33) and washer. As the impeller is keyed onto the shaft with a square key (#), the impeller should be pulled straight off the shaft using a wheel puller as necessary. In the NE 6 pump, if the wear ring needs to be replaced simply cut the ring (29) and remove being careful not to damage the body (1).



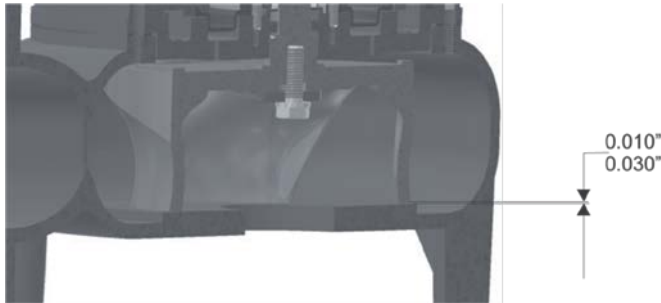
Mounting.

To install a new wear ring in the NE 6 apply a retaining compound into the body wear ring housing (26) and press the wear ring in until seated. In all models, when installing an impeller, apply a thin coat of motor oil to the shaft and slide the impeller up and down the shaft while keeping the keyways aligned. Then drive the key (#) into the keyway, locate and affix the washer, and apply thread lock, set according to the manufacturer's instructions. Apply the thread locking compound on the screw (33) then thread into the shaft and torque to 35lb/ft. Place the gasket (41) on the flange of the body and install the impeller and motor housing on the posts and spiral (26). Next apply the thread locking compound onto the threads of each bolt (24) and nut (20) on the stud (24). Then torque to 24 ft/lb. Finally check to see if motor and impeller rotate freely.



ATTENTION.

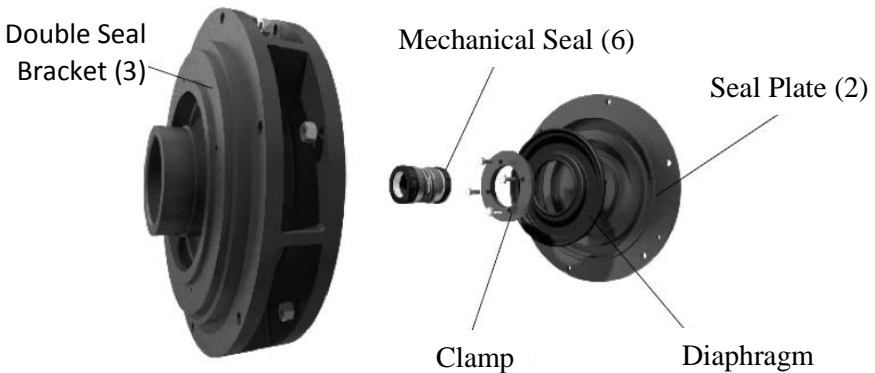
When installing the pump impeller in a NE 4 unit, check that the clearance between the impeller and the flat face of the body is within 0.010" (0.25mm) to 0.030" (0.7mm).



Servicing Motor and Mechanical Seal:

- Remove the body (1) and impeller (4) as stated above.
- Drain the oil from the casing (16) and remove the valve (22).
- Remove the screws (13) and separate the motor (5) with the coupling (3) from the casing (16).
- Disconnect the motor (5) from the cable assembly (20), release the coupling screws and remove the seal plate (2) together with the stationary part of the seal (6) of the motor (5).
- Now examine the motor, bearings, and seal components.
- Upon observation, replace what is worn or damaged.
- If a replacement requires a seal component, then replace everything.
- Carefully reassemble the seal, making sure not to scratch or mark up the new surfaces.
- When replacing the seal remove the rotating component, motor shaft spring, and the fixed part of the coupling. Then clean the double seal cavity (3).
- Place the new component into the double seal plate (3) with the hard side of the fixed part in the seal plate (2). Make sure the spring on the rotating component is set properly.

Carefully assemble the double seal bracket (3) onto the motor (5) using motor screws. Then tighten the screws and insert into the body housing (16). Secure the coupling with nuts (13) and then add oil as specified above.



Electrical connections.

Check the cables to ensure there are no tears or defects. In case of damage, replace the entire cable assembly cover (20). Remove the motor cables through the top of the pump housing, check their sleeves, and replace as necessary. Place the square ring (23) in the conduit housing (20) reconnecting motor leads to power cables and moisture and temperature sensors to control cables as shown in Diagram 4.

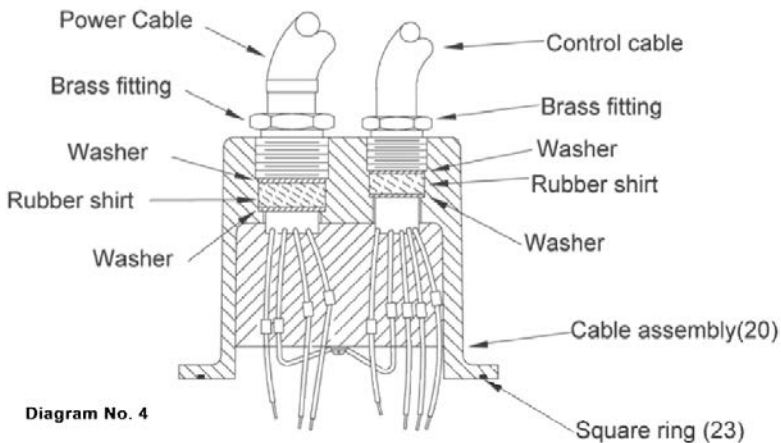
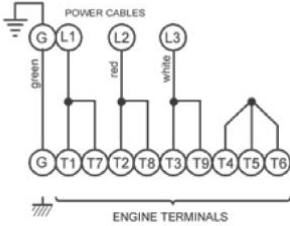


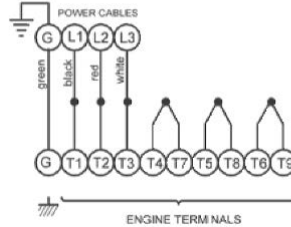
Diagram No. 4

CONNECTIONS NE 4

CONNECTION DIAGRAM
TRIPHASE 230v

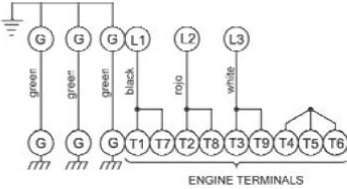


CONNECTION DIAGRAM
TRIPHASE ENGINE 460V

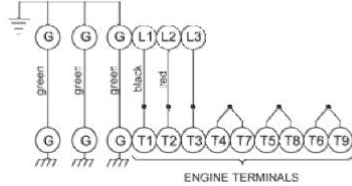


CONNECTIONS NE 6

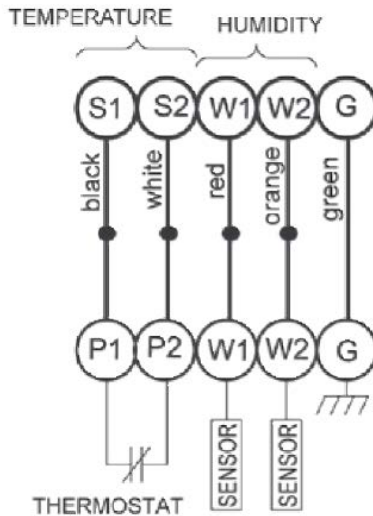
CONNECTION DIAGRAM
TRIPHASE 230v



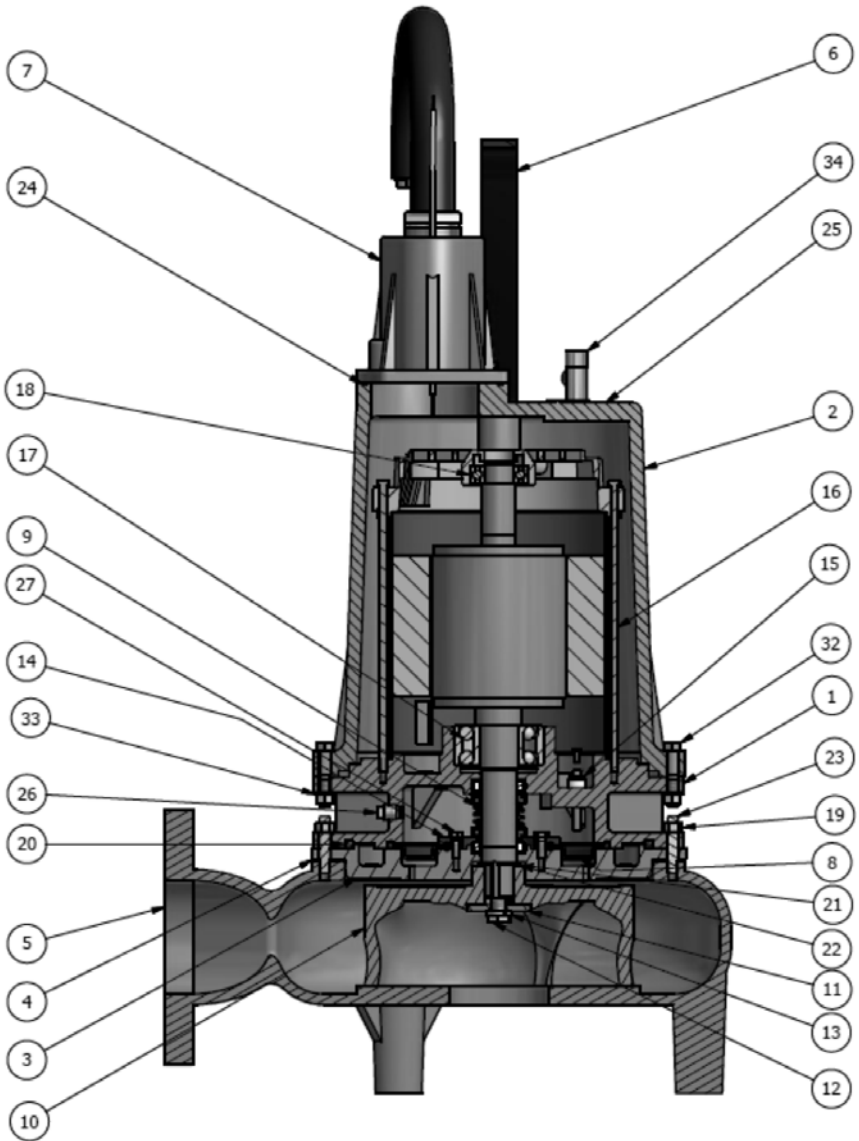
CONNECTION DIAGRAM
TRIPHASE ENGINE 460V



Humidity and Temperature Sensor



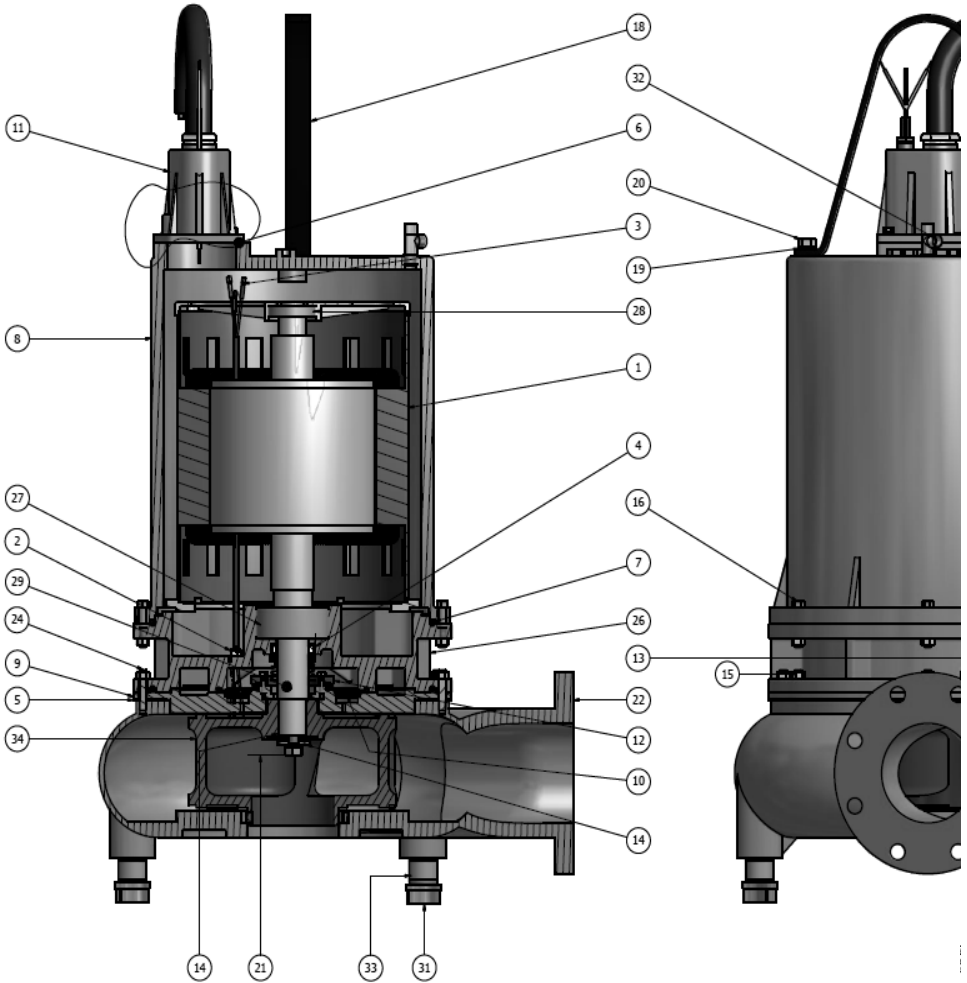
NE 4





Parts List	
ITEM	DESCRIPTION
1	BEARING BRACKET
2	MOTOR HAUSING
3	SEAL PLATE
4	GASKET
5	VOLUTE
6	S.S. LIFTING STRAP
7	CABLE ASSEMBLY
8	DIAPHRAGM
9	SHAFT SEAL
10	IMPELLER CAST IRON
11	IMPELLER WASHER
12	HEX CAP SCREW
13	LOCK WASHER
14	DIAPHRAGM CLAMP RING
15	MOISTURE SENSOR WIRE
16	MOTOR
17	BEARING
18	BEARING
19	HEX NUTS
20	SQUARE RING
21	WASHER
22	WASHER
23	STUD
24	SQUARE RING
25	PLATE SERIES
26	PIPE PLUG
27	CAP SCREW
28	KEY
29	CAP SCREW
30	CAP SCREW
31	SOCKET HEAD CAP
32	CAP SCREW
33	LOCK WASHER
34	PRESSURE RELIEF VALVE

NE 6



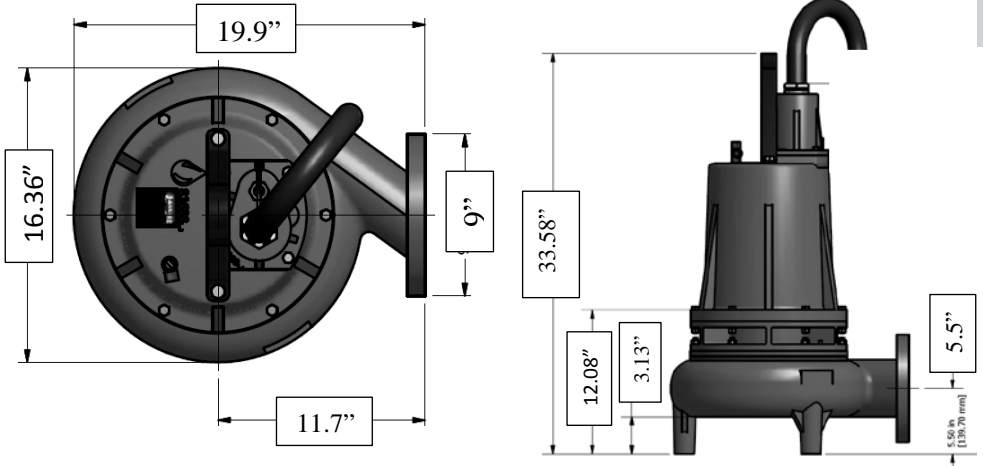
Parts List	
ITEM	DESCRIPTION
1	MOTOR
2	MOISTURE SENSOR WIRE
3	GROUNDING
4	SHAFT SEAL
5	GASKET
6	SQUARE RING
7	O-RING
8	MOTOR HOUSING
9	SEAL PLATE
10	DIAPHRAGM
11	CABLE ASSEMBLY
12	DIAPHRAGM CLAMP
13	SOCKET HEAD CAP
14	WASHER
15	HEX NUTS
16	CAP SCREW
18	LIFTING STRAP
19	LOCK WASHER
20	CAP SCREW
21	CAP SCREW
22	BODY
23	WEAR RING
24	STUD
25	HEX NUTS
26	BEARING BRACKET
27	BEARING
28	BEARING
29	CAP SCREW
30	PIPE PLUG
31	CAP
32	PRESSURE VALVE
33	LEG
34	IMPELLER
37	Hex Bolt

6. Trouble Shooting

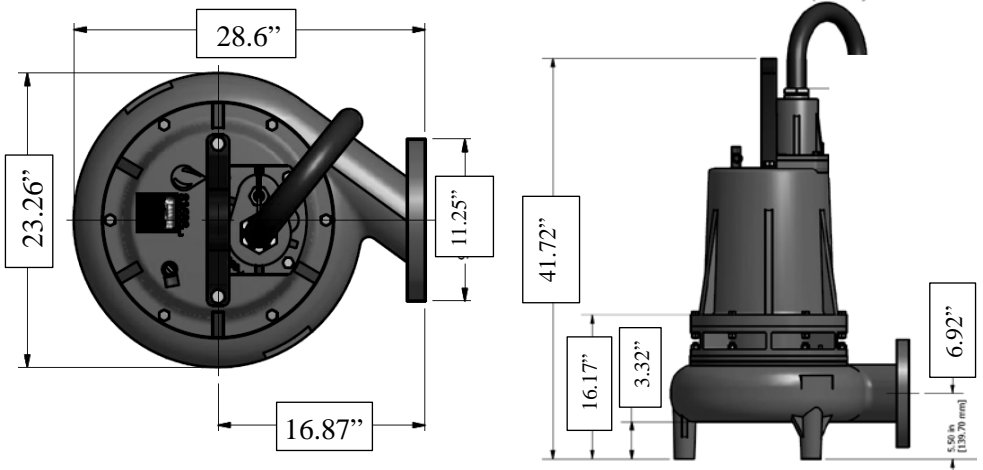
Symptoms	Possible cause(s)	Possible solution(s)
1. The pump does not start.	There may not be power to the motor's connections.	Check and correct.
	Impeller is blocked by solids larger than the pump can handle.	Measure the current in the motor terminals as it cannot exceed $\pm 20\%$. If amps are blocked switch off the pump and remove the obstruction.
	Overload protector is tripped.	If the current in the motor terminals is zero in single phase, disconnect, let it cool then reconnect. In 3 phase allow protector to cool, press, and measure current again. Even if zero, check installation connections of the pump, starter, or cables in general. In 3 phase motors, after placing guards, if the current is within the limits.
2. Pump runs on manual but not 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 hits zero when closed.
3. Pump starts but quickly activates the overload relay.	a) Failure of supply phase.	a) Check the phase equilibrium.
	b) Phase unbalance.	b) Check the setting and replace the overload relay as necessary.
	c) Poor regulation or defective relay and locked rotor.	c) Send to the service shop.
	d) The supply voltage does not match the engine.	d) Replace the engine or power control.
4. Pump is running but not draining the sump.	a) Pump Suction is totally or partially obstructed.	a) Remove the obstruction.
	b) The discharge line is clogged.	b) Clean the pipe.
	c) The discharge valve is closed.	c) Open valve.
	d) Air is trapped in the body of the pump.	d) Proceed up and back down the pump or valve open until all the air.
	e) Actual altitude is much higher than expected.	e) Replace with another model.

7. Dimensions

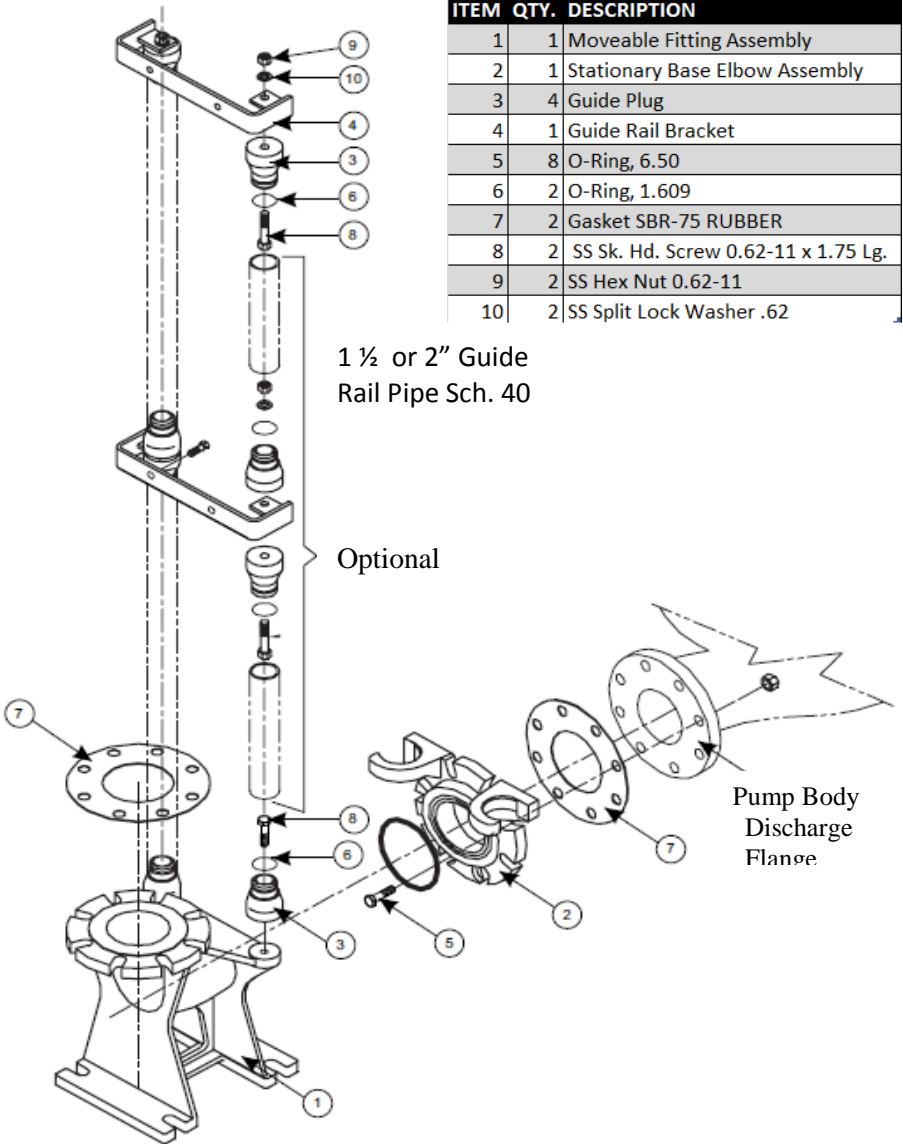
NE 4



NE 6



8. Rail Lift System (Accessory)

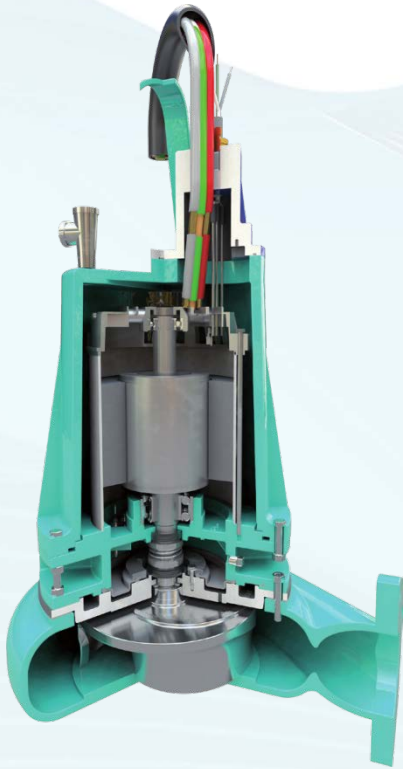


9. Warranty.

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

Failure to follow the suggestions and recommendations in this manual, as well as improper product use or handling, will completely invalidate 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 Pumps.



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