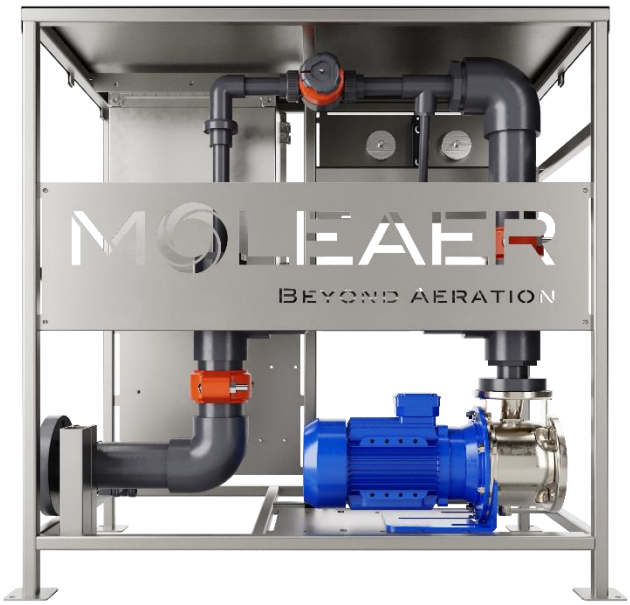

NEO INSTALLATION AND STARTUP GUIDE

REFER TO OPERATING MANUAL FOR IMPORTANT SAFETY INFORMATION

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CONTENTS

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GENERAL INFORMATION

Read instructions thoroughly prior to assembly and installation.

All NEO products are factory adjusted for optimal nanobubble production. Do not adjust factory setpoints.

LOCATION REQUIREMENTS

Carefully select the NEO installation location based on the requirements specified in this section. Locate and secure the NEO on a concrete slab or firm surface with a minimum of 6 ft x 6ft x 6ft of clearance to allow access for servicing and maintenance to the front and back of the NEO. Select a sheltered, (weatherproof), well-ventilated area that is protected from excess moisture (i.e. rain, splashing, etc.), dust and flooding. Use the schematic shown in Figure 2 for mounting hole placement.

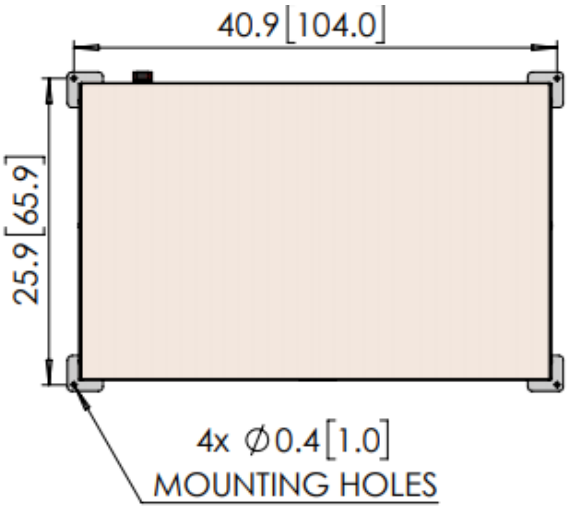


Figure 2. Plan view of NEO frame showing mounting hole placement.

The NEO power, suction and discharge pipe, requirements are summarized in Tables 1, 2 and 3 respectively.

Failure to install the NEO within the limits specified in Tables 1, 2 and 3 may void the system warranty and result in poor nanobubble production and pump cavitation.

Table 1 - Power Requirements

Unit	Version	Voltage	Phase	Hz	Amps	Pump Manufacturer
NEO 50* Standard	US	230	1	60	7.6	Gould
	US	460	3	60	3.8	Gould
	US	230	1	60	8.0	Pacer
	US	230	1	60	8.2	Pentair
	EU	230	3	50	5.6	Lowara
	EU	400	3	50	3.1	Lowara

NEO 150* Standard	US	460	3	60	6.0	Gould
	US	460	3	60	8.2	Pacer
	US	230	1	60	17.2	Pentair
	EU	400	3	50	5.3	Lowara
NEO 250* Standard	US	460	3	60	7.5	Gould
	US	460	3	60	8.1	Pacer
	EU	400	3	50	8.5	Lowara
NEO 50* + O2	US	230	1	60	10.9	Gould
	US	460	3	60	5.5	Gould
	US	230	1	60	10.6	Pacer
	US	230	1	60	10.8	Pentair
	EU	230	3	50	9.0	Lowara
	EU	400	3	50	5.1	Lowara
NEO 150* + O2	US	460	3	60	8.0	Gould
	US	460	3	60	11.6	Pacer
	US	230	1	60	19.8	Pentair
	EU	400	3	50	7.6	Lowara
NEO 250* + O2	US	460	3	60	9.5	Gould
	US	460	3	60	10.7	Pacer
	EU	400	3	50	10.8	Lowara
NEO 50* + O3	US	230	1	60	8.0	Gould
	US	460	3	60	4.0	Gould
	US	230	1	60	8.4	Pacer
	US	230	1	60	8.6	Pentair
	EU	230	3	50	6.0	Lowara
	EU	400	3	50	3.3	Lowara
NEO 150* + O3	US	460	3	60	6.2	Gould
	US	460	3	60	9.4	Pacer
	US	230	1	60	17.6	Pentair
	EU	400	3	50	5.5	Lowara
NEO 250* + O3	US	460	3	60	7.7	Gould
	US	460	3	60	8.5	Pacer
	EU	400	3	50	8.7	Lowara
NEO 50* + O2 + O3	US	230	1	60	11.3	Gould
	US	460	3	60	5.7	Gould
	US	230	1	60	11.0	Pacer
	US	230	1	60	11.2	Pentair
	EU	230	3	50	9.4	Lowara
	EU	400	3	50	5.3	Lowara
NEO 150* + O2 + O3	US	460	3	60	8.2	Gould
	US	460	3	60	12.0	Pacer
	US	230	1	60	20.2	Pentair
	EU	400	3	50	7.8	Lowara
NEO 250* + O2 + O3	US	460	3	60	9.7	Gould
	US	460	3	60	11.1	Pacer
	EU	400	3	50	11.0	Lowara

**Refer to order form or pump name plate to verify power requirements.*

PARTS AND ACCESSORIES

The parts shown in Table 4 are offered as accessories available for purchase with all NEO Standard products.

Table 4 - Regulator Kit Parts List

Image	QTY	Part Description
	1	Regulator
	1	High Pressure Oxygen Hose

INSTALLATION GUIDELINES

The site conditions unique to each irrigation reservoir, irrigation room, or water treatment project should be carefully considered when identifying the NEO installation location. Refer to the Location Requirements section for addition details.

The following guidelines are recommendations for tanks with intake structure depths less than 15 ft or 4.5m.

Upon delivery, unscrew the shipping screws to remove the NEO from the shipping crate. Inspect the NEO for any damage or loose parts that may have occurred during transport. Tighten any loose parts.

Installation Parts and Materials

The parts and materials required to install the NEO include:

- 3/8 in wrench or 14mm wrench.
- 7/8 in wrench or 34mm wrench (if regulator kit purchased).

Pipe Assembly

Use only Schedule 40 or Schedule 80 polyvinyl chloride (PVC) pipe and fittings. Use only PVC cement formulated for wet condition and fast installation to connect PVC pipe to PVC fittings. Do not use black, ABS piping or mix ABS pipe with PVC pipe or fittings.

All PVC pipe connections must be airtight and leakproof. **Failure to provide airtight suction pipe connections may negatively impact nanobubble generator performance**. Large

bubbles visible at the pump strainer basket are an indication of suction pipe leaks. Difficulty with pump priming may also be the result of suction pipe leaks.

Gas Connection

For NEO models without onboard gas generation, connect a high pressure rated oxygen gas line to the standard CGA-022 connection. Adjust the oxygen gas regulator on the gas supply to 100 – 140 PSIG.

DO NOT EXCEED 140 PSIG SUPPLY GAS PRESSURE. Excessive pressure may void warranty and compromise gas seals resulting in a sudden drop in backpressure.

NEO Flooded Suction Installation.

Refer to Figures 3 and 4 for installation with a flooded suction. A flooded suction is when the waterbody surface is above the centerline of the pump suction. The pipe between the tank and the NEO should fills with water via gravity. Refer to Figure 9 for NEO frame dimensions and suction and discharge fitting locations.

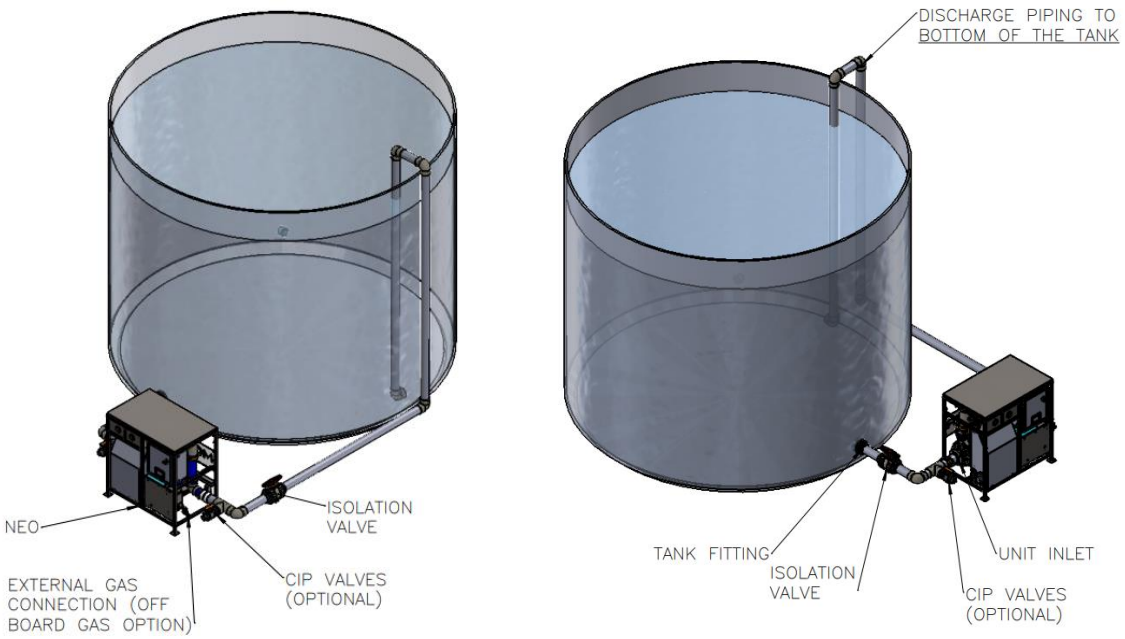


Figure 3: Isometric View of NEO suction and discharge in a flooded suction installation.

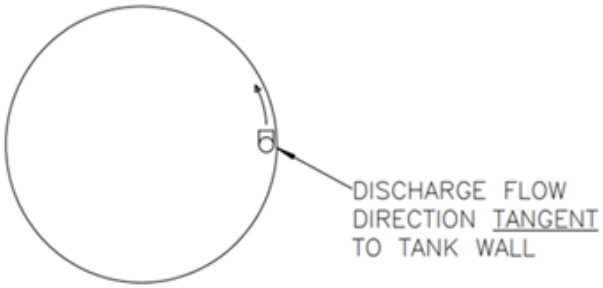


Figure 4: Plan view of NEO suction and discharge layout in a flooded suction installation.

NEO Suction Lift Installation

Refer to Figures 5 and 6 for installations requiring suction lift. In this type of installation type, the waterbody surface is below the centerline of the pump suction. A self-priming pump is required to draw water up through the suction line and prime the pump for operation and the pipe between the tank and the NEO will not fill with water without the use of the pump.

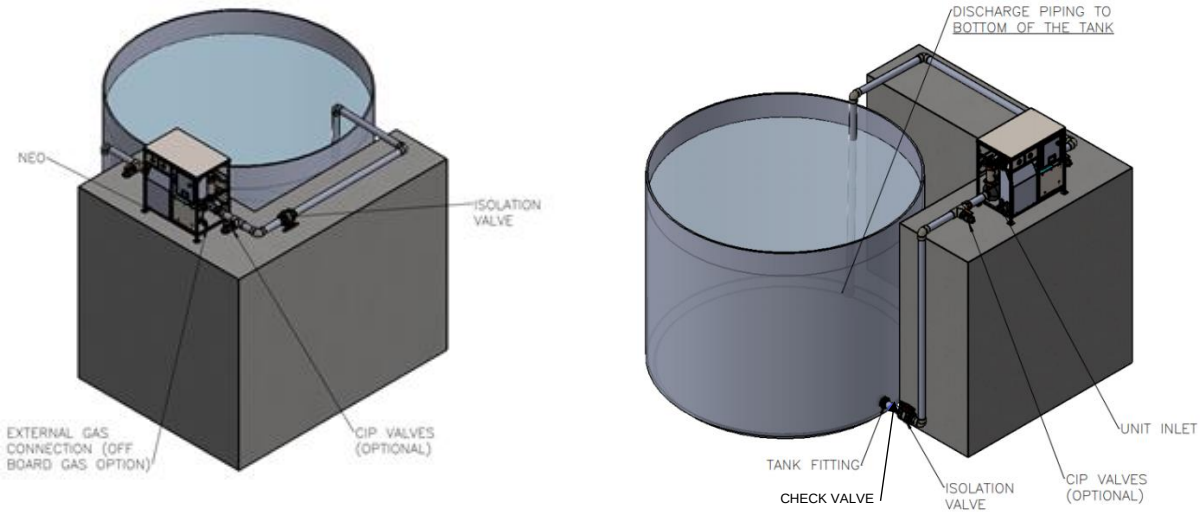


Figure 5: Isometric View of NEO Suction and Discharge layout in self-priming installation.

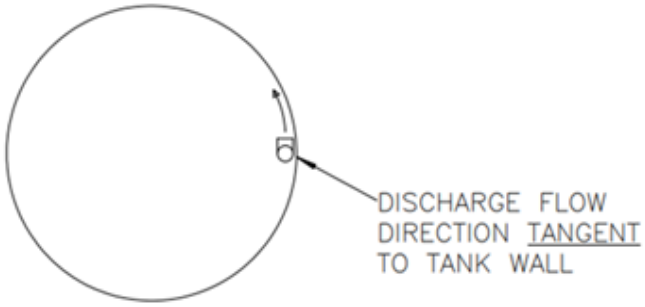


Figure 6: Plan View of NEO discharge layout in a self-priming installation.

NEO Multi Tank Set Up Installation Example.

The NEO can be connected to treat the water in multiple tanks. Refer to Figure 7 for multi-tank installation.

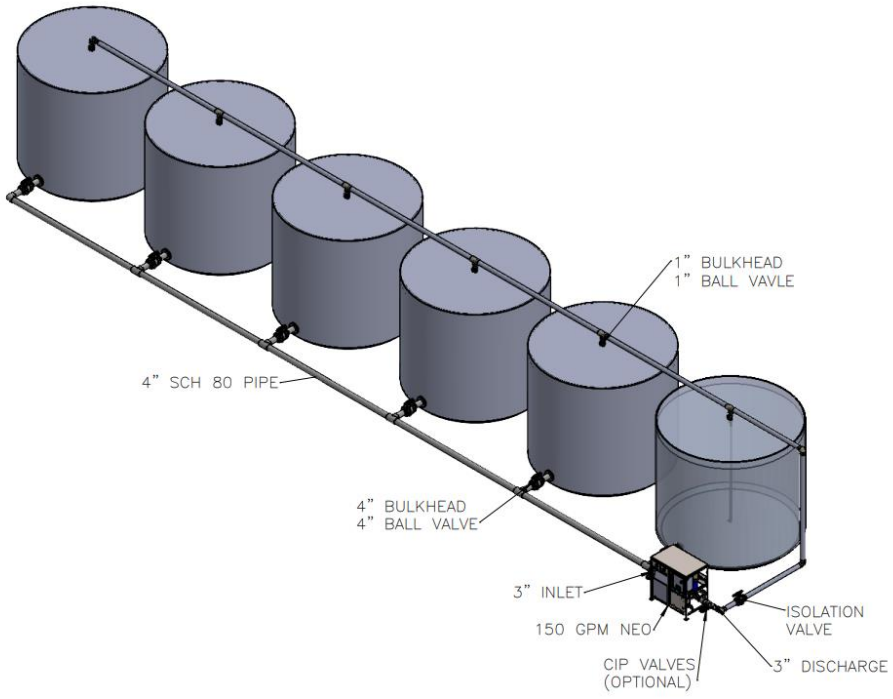


Figure 7: Isometric View of NEO suction and discharge layout in a multi-tank installation

NOTE: Contact Moleaer Engineering for multi-tank installation.

NEO Frame Dimensions and Component Descriptions.

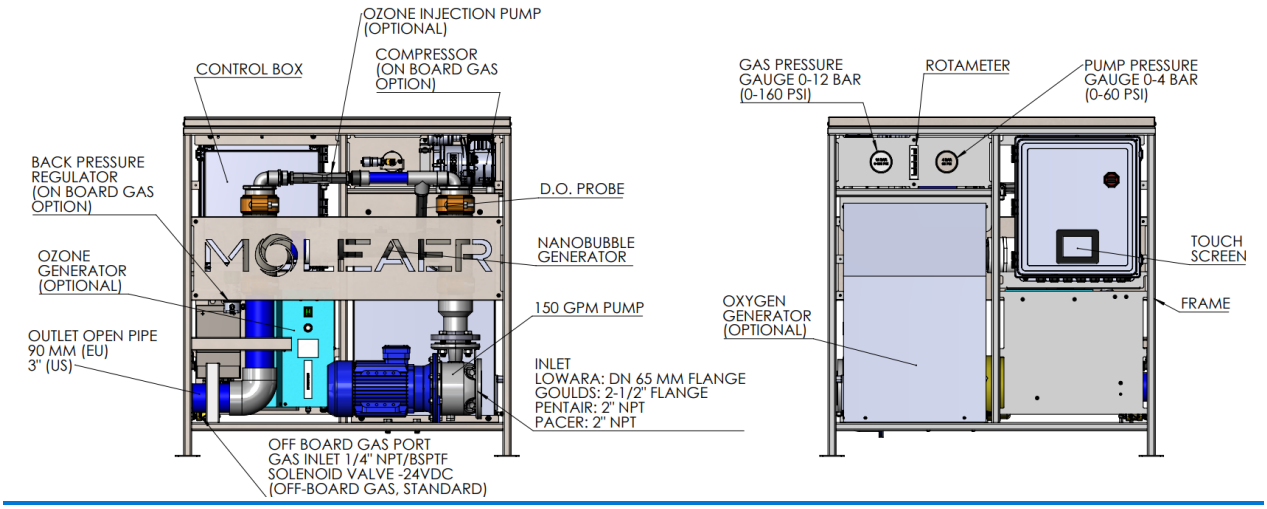


Figure 8: Back and Front View of NEO with Component Descriptions.

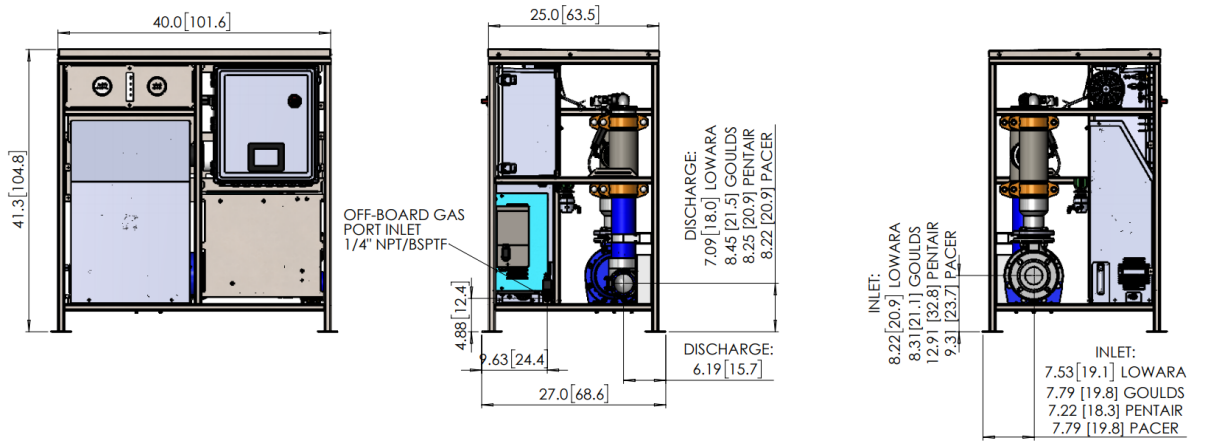


Figure 9: NEO with suction and discharge connection locations.

Piping connections for all sizes of NEO are provided below. Verify the type of pump provided with your NEO before beginning installation.

Table 2. NEO Piping Connections.

UNIT	TANK FITTING	ISO VALVE	CIP VALVE	UNIT INLET CONNECTION	UNIT OUTLET CONNECTION	PIPE DISCHARGE RECOMMENDED SIZE
50 NEO	2"(US) 63MM(EU)	2"(US) 63MM(EU)	1" TO 2"(US) 32MM TO 63 MM(EU)	2-1/2"FLANGE-GOULDS DN50 MM FLANGE-LOWARA 2"NPT-PENTAIR 2"NPT-PACER	2"(US) 63MM(EU)	1.5"(US) 50MM(EU)
150 NEO	3"(US) 90MM(EU)	3"(US) 90MM(EU)	1" TO 2"(US) 32MM TO 63 MM(EU)	2-1/2"FLANGE-GOULDS DN65 MM FLANGE-LOWARA 2"NPT-PENTAIR 2"NPT-PACER	3"(US) 90MM(EU)	2.0"(US) 63MM(EU)
250 NEO	3"(US) 90MM(EU)	3"(US) 90MM(EU)	1" TO 2"(US) 32MM TO 63 MM(EU)	3"FLANGE-GOULDS DN80 MM FLANGE-LOWARA 3"NPT-PACER	3"(US) 90MM(EU)	3.0"(US) 90MM(EU)

Suction Piping Installation

Keep suction piping as short as possible and avoid unnecessary bends. If NEO is in installation requiring suction lift, keep the NEO as close as to the water level as possible.

Run a length of straight horizontal piping to the suction side of the pump. The length of this pipe should a minimum of five (5) pipe diameters. Example: If system is to be plumbed with 90mm diameter PVC pipe, then a straight section of pipe 38cm long should be used immediate to the suction side of the pump.

Locate and install the suction pipe following the recommendations detailed in Figures 3 and 4 for a flooded suction installation and Figures 5 and 6 for suction lift installations. Use fittings as necessary to route the suction piping from the NEO to the tank.

For suction lift installations, install a PVC swing check valve on the suction pipe. Install the check valve above the maximum liquid level of the tank to maintain accessibility for inspection and service.

Water flows through a check valve in only one direction as indicated by the flow arrow on the check valve. The check valve prevents water in the suction line from draining when the pump is stopped, preventing loss of prime. Ensure the check valve is installed with the flow arrow in the direction of suction flow so as not to restrict flow from the waterbody to the pump.

For installations where debris is approximately 1/8” or 3 mm in size, install a screen on the intake of the suction pipe to ensure that large solids do not pass through the NEO. Verify that the intake screen is rated for the flow liquid capacity of your NEO and does not restrict the generator’s designed liquid flow rate.

Discharge Piping Installation

Locate and install the discharge piping following the recommendations detailed in Figures 4 and 6. Use available fittings as necessary to route the discharge piping from the NEO unit to inside

the tank. Install discharge pipe at the maximum tank depth and connect a 90-degree elbow to the end. Angle the discharge tangential to the tank to create a circular current to assist with mixing.

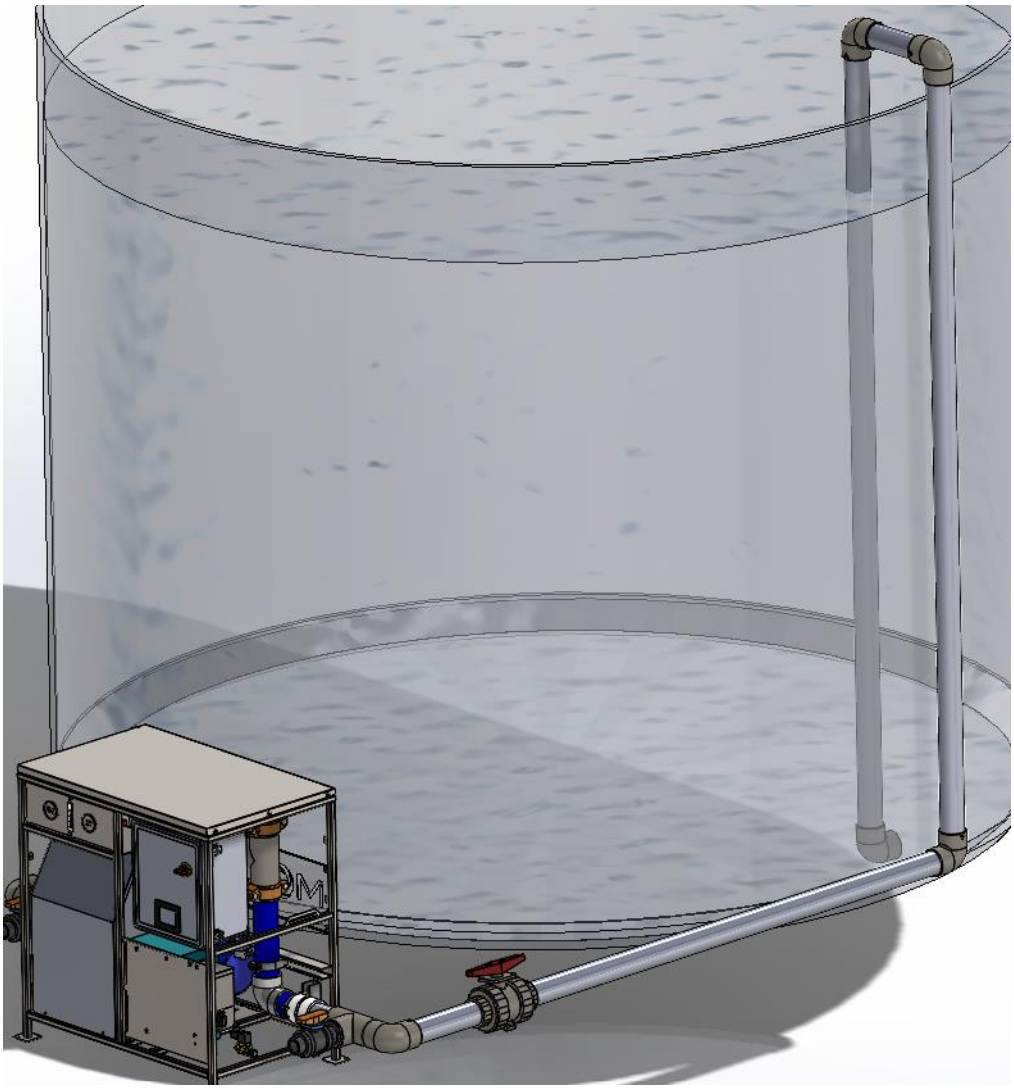


Figure 10 – NEO discharge layout at maximum tank depth.

CIP Valve Installation (Optional)

Two optional three-way valves can be used to isolate the NEO from the rest of the system for Clean in Place maintenance. See Table 2 for CIP valve sizes recommendations.

Refer to manual for directions.

Connect Power to Control Box.

Before connecting power, verify the voltage, phase and amps requirements of your unit. Neo 50 and 150 models come in single phase and three phase models while all Neo 250 models are three phase.

Single Phase Wiring:

Verify that the NEO is a single-phase model be checking the number of wires coming out of the main disconnect. In a single-phase model, there will be two wires coming out of this disconnect, shown in the orange circle in figure 11 (a) and (b).
(These pictures are for illustration purposes only).

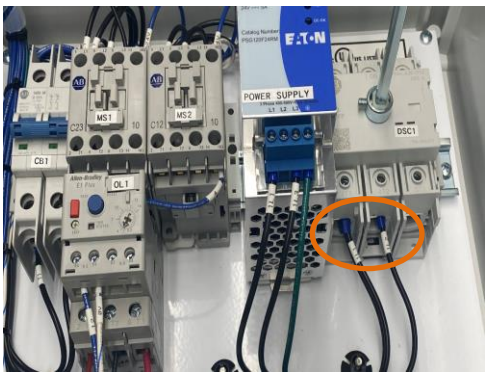


Figure 11 (a)

Figure 11 (b)

Figure 11: Output Terminal Connections on Main Disconnect Wired for Single Phase.

Connect the leads from the power cable to 1L1 and 3L2 on the top of the disconnect switch as shown in figures 12(a) and 12(b). These terminals are circled in orange in the figures below.

Figure 12 (a)

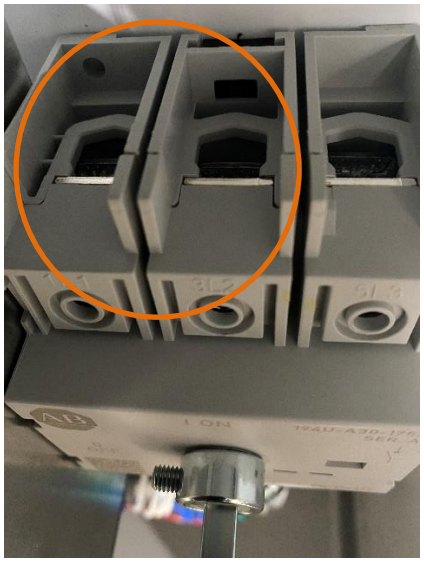


Figure 12 (b)

Figure 12: Input Terminal Connections on Main Disconnect Wired for Single Phase.

WARNING: Ensure that the ground wire from the power cable is connected to the grounding blocks inside the enclosure.

Three Phase Wiring:

Verify that the NEO is a three-phase model by checking the number of wires coming out of the main disconnect. In a tree-phase model, there will be three wires coming out of this disconnect, shown in the orange circle in figure 13.

Figure 13: Output Terminal Connections on the Main Disconnect Wired for Three-Phase.

Connect the leads from the power cable to 1L1, 3L2 and 5L3 on the top of the disconnect switch as shown in circled orange in Figure 14.

Figure 14: Input Terminal Connections on the Main Disconnect

NOTE: For three phase models, check the rotation of the shaft matches the rotation arrow of the pump casing. If it does not match, then reverse any two of the three power leads from the control box.

Ground Connection

Figure 15: Shows the ground connection blocks.

WARNING: Ensure that the ground wire from the power cable is connected to the grounding blocks inside the enclosure.

Bypass Valve Adjustment

Open the valve completely and let the system run for a minimum of 30 minutes. This will allow to any trapped air bubbles to be purged from the pipes. Readjust the valve by turning the knob to the third orange indicator line as shown in the figure 15(a) and 15(b) below.

Figure 16(a)

Figure 16(b)

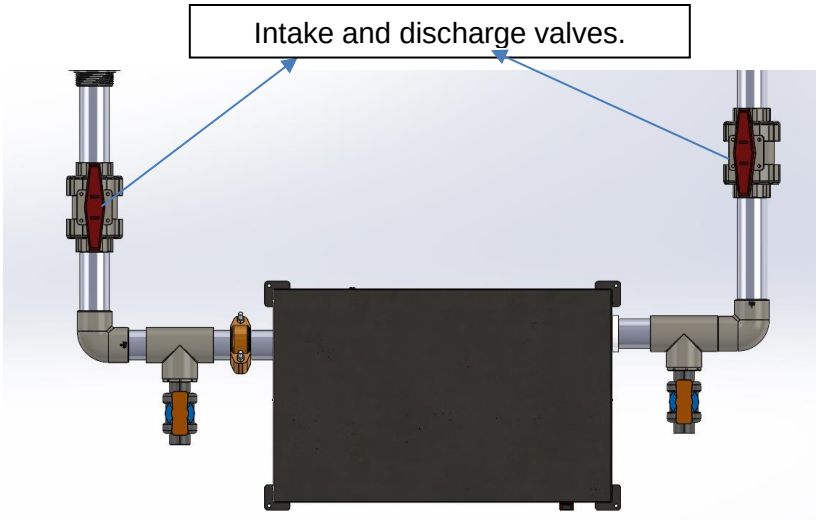
Figure 16(a) and 16(b)– Bypass valve readjustment and close view of position readjusted.

QUICK STARTUP GUIDELINES

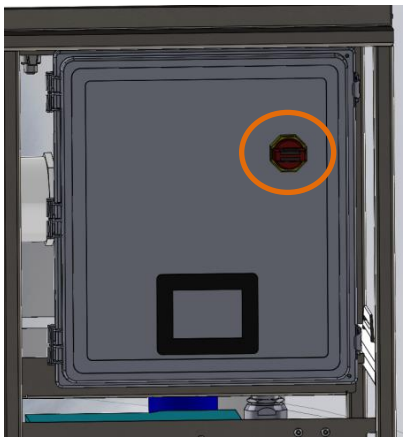
WARNING: Refer to the operating manual for important safety and startup information. When all piping is installed and pipe glue cure time has been met, connect electricity in accordance with applicable Local Electrical Code and ordinances. The use of an extension cord is hazardous and should be avoided.

Flooded Suction Applications: Pump Priming Instructions

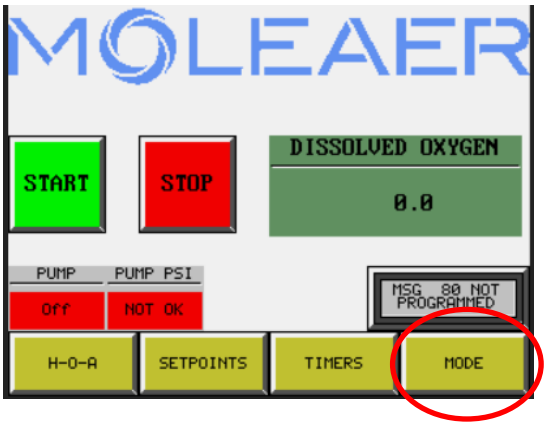
Step 1. Open the intake and discharge valves to flood piping.

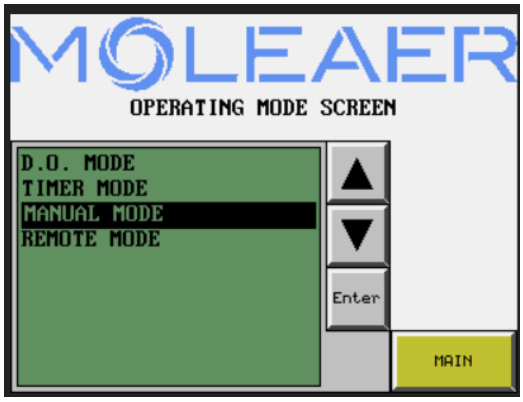


Step 2. Turn on main power using Disconnect on NEO power panel.



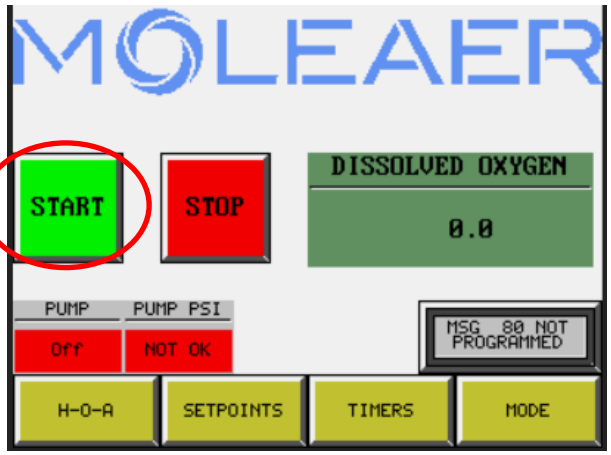
Step 3. On the touch screen*, tap the MODE button to and select MANUAL





*Touch screen will automatically power OFF after 15 minutes of inactivity. Tap the touch screen to turn ON display.

Step 4. Tap START on the main screen to start the pump in MANUAL mode.



WARNING: Do not use isolation valves to throttle the pump. This may cause loss of prime, excessive temperatures, and damage to the pump, voiding warranty.

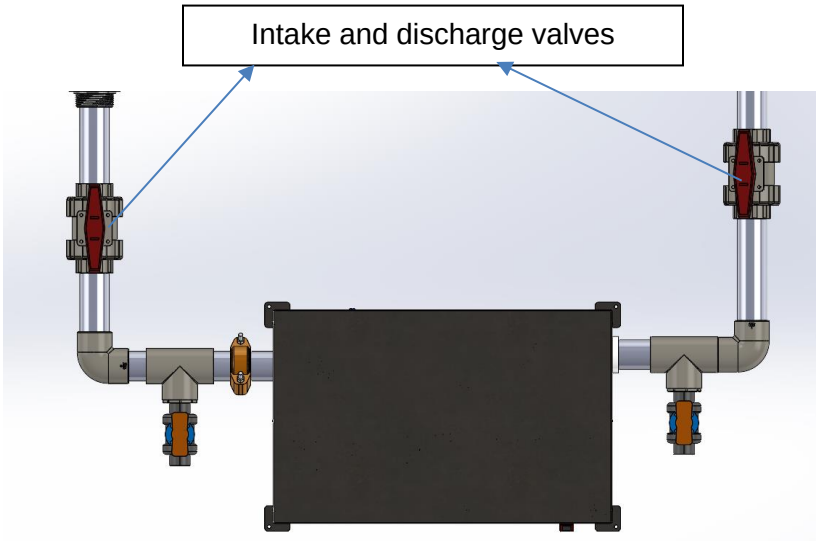
Step 5. Check piping for visible leaks. If your NEO pump is equipped with a pump strainer, verify through the clear window in the strainer lid that there are no bubbles entering in through the liquid suction stream.

A large air pocket or large bubbles should not be visible in the strainer basket. If large bubbles or an air pocket is visible in the strainer basket there is a suction pipe leak. Turn OFF NEO and check suction pipe for leaks and ensure all pipe connections are airtight.

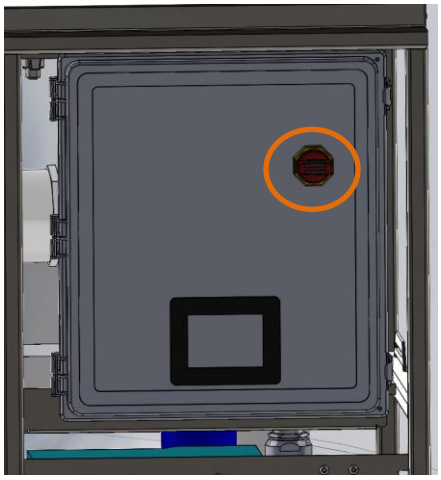
Refer to the NEO Manual to configure the operational mode of the NEO.

Suction Lift Applications: Pump Priming Instructions

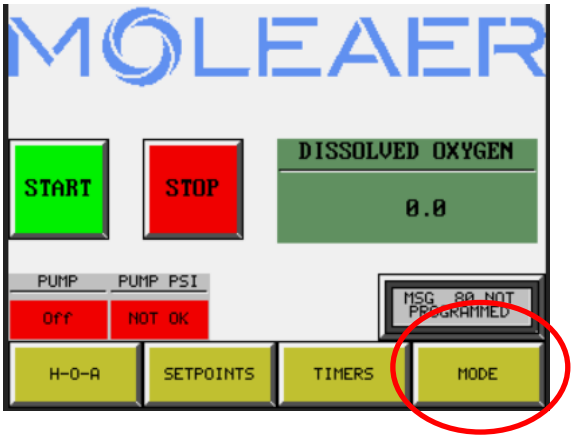
Step 1. Open the intake and discharge valves.

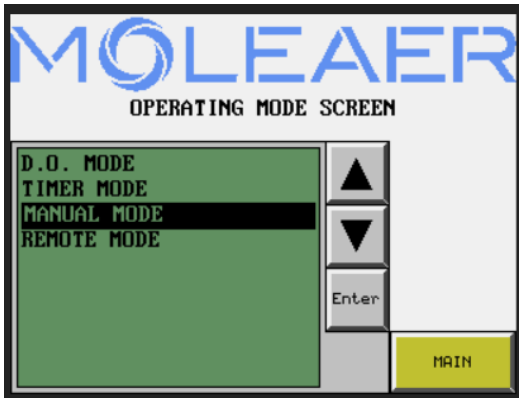


Step 2. Remove the lid from the pump basket and fill the basket with water using a bucket or hose. Fill the basket until the water level is above the suction opening. Replace the basket lid.



Step 3. Turn on main power using the Disconnect on NEO power panel.

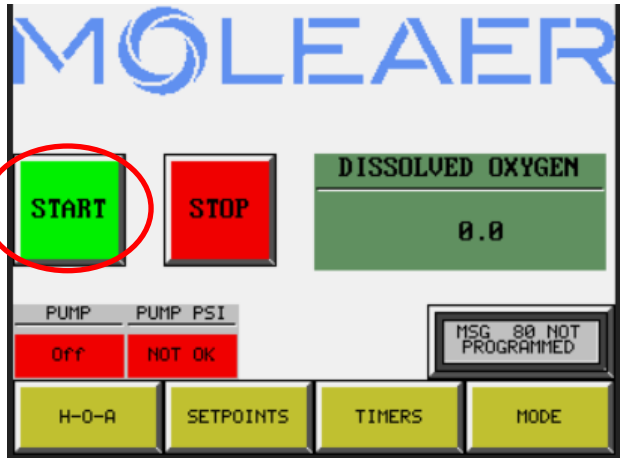




*Touch screen will automatically power OFF after 15 minutes of inactivity. Tap the touch screen to turn ON display.

Step 4. On the touch screen*, tap the MODE button to and select MANUAL.

Step 5. Tap START on the main screen to start the NEO in MANUAL mode. The pump will begin self-priming.



Pump priming may take several minutes. If the pump does not prime after five minutes, turn the NEO off by pressing the STOP button. Review all suction pipe field connections to ensure airtight connections. Remove the suction basket lid and re-fill with water. Wait five minutes to allow the pump seal to cool before trying Step 4 again.

WARNING: Do not use isolation valves to throttle the pump. This may cause loss of prime, excessive temperatures, and damage to the pump, voiding warranty.

Step 6. Check piping for visible leaks. If your NEO pump is equipped with a pump strainer, verify through the clear window in the strainer lid that there are no bubbles entering in through the liquid suction stream.

A large air pocket or large bubbles should not be visible in the strainer basket. If large bubbles or an air pocket is visible in the strainer basket there is a suction pipe leak. Turn OFF NEO and check suction pipe for leaks and ensure all pipe connections are airtight. Refer to the NEO Manual to configure the operational mode of the NEO.

Suction and Discharge Operation

Turn the NEO on and observe the suction and discharge locations in the waterbody. The intake should not create a vortex at the surface. If a vortex is visible, the suction intake is not properly submerged. Verify that the suction is at least 2 ft beneath the minimum water level. The bubble pattern visible at the surface of the water above the discharge should consist primarily of small bubbles, roughly the size of a pea or smaller.

If bubbles are consistently larger than the size of a pea, contact a Moleaer technical service representative at (424) 558-3567.

Operating Parameter Ranges

Normal operating ranges for the NEO units are shown in Table 5.

Table 5. NEO Normal Operating Ranges

Parameter	NEO 50	NEO 150	NEO 250
Gas Pressure (Gauge)	40-120 psig	40-120 psig	40-120 psig
Liquid Pressure (Gauge)	10-20 psig	10-20 psig	10-20 psig
Gas Flow Rate (Standard) (US) & (EU) (Rotameter)	0-2.5 lpm	0-10 lpm	0-15 lpm
Gas Flow Rate (Enriched) (US) & (EU) (Rotameter)	0-2.5 lpm	0-4.8 lpm	0-8.5 lpm
Gas Flow Rate (Oxygen Gen.) (US) & (EU) (Rotameter)	0-2.23 lpm	0-3.91 lpm	0-4.48 lpm

If the NEO unit is consistently operating outside of the ranges shown in Table 5, contact a Moleaer technical service representative at (424) 558-3567.

- End of Section –