

NAN-SUB25

Submersible Passive Ionic Cavitation System

PRODUCT DESCRIPTION & INSTALLATION GUIDE



Designed for 600–1,500 gallon water holding tanks

Product Description

The **NAN-SUB25** is a self-contained water recirculation and conditioning system designed for holding tanks ranging from approximately **600 to 1,500 gallons**. It combines a **Liberty Pumps Model 237 submersible pump** with a **CRS NAN1025 Passive Ionic Cavitation Generator**.

The recirculation pump is essential to the operation of the CRS generator. The NAN1025 contains no motor, compressor, or powered internal components; it depends entirely on the hydraulic energy produced by the pump. As the pump draws water from the tank and forces it through the generator, the CRS internal geometry creates controlled changes in water velocity, pressure, shear, and cavitation. This hydraulic action produces an estimated **308 million nanobubble-sized charged particles per milliliter** of water passing through the generator.

Why Recirculation Matters

- Provides the hydraulic energy required for the passive CRS generator to operate.
- Repeatedly processes the stored water, allowing multiple passes through the NAN1025 instead of a single treatment event.
- Distributes treated water throughout the tank, reducing stagnant zones and promoting more uniform water characteristics.

The pump and generator function as a matched treatment system. The pump is not simply moving water; it supplies the flow and pressure required to activate the passive ionic cavitation process. Each pass through the NAN1025 increases contact between the water and the generated nanobubble-sized charged particles, while the recirculation pattern distributes those particles throughout the tank.

This repeated-pass treatment increases the Oxidation-Reduction Potential (ORP) of the stored water by adding valuable oxygen and electrical charge to the water for improved water characteristics.

The NAN-SUB25 is recommended for spot-free water holding tanks, domestic water conditioning tanks, and recovered wash-water (reclaim-water) tanks where dispersion of solids and other suspended material is required.

System Specifications

Specification	NAN-SUB25
Pump	Liberty Pumps Model 237
Electrical	115 VAC
Motor	1/3 HP, thermally protected
Float Control	Vertical magnetic float switch
Housing	Aluminum with deep fine-powder coating
Impeller	Vortex-style impeller for reduced clogging and improved flow
Discharge	1.5" connection
CRS Generator	NAN1025 Passive Ionic Cavitation Generator
Particle Production	Approximately 308 million nanobubble-sized charged particles per mL
Recommended Tank Size	600–1,500 gallons
Installation	Tank-floor mounted or suspended from pump handle

Installation Guide

1. Pre-Installation Requirements

1. Confirm that the tank capacity is approximately 600–1,500 gallons.
2. Verify that the stored liquid is compatible with the pump, coating, seals, electrical components, and NAN1025 generator.
3. Inspect the pump, cord, float switch, discharge assembly, and generator for damage.
4. Provide a properly grounded 115 VAC, GFCI-protected electrical circuit suitable for a wet location.
5. Remove rags, plastic, large debris, and other material that could obstruct the intake or float switch.

Electrical Requirement: Permanent wiring, receptacles, controls, and wet-location protection must comply with applicable national and local electrical codes. Use a qualified electrician where required.

2. Select the Installation Location

Position the NAN-SUB25 where it can create broad circulation without interfering with tank plumbing, level sensors, suction lines, chemical feed lines, baffles, access covers, or other submerged equipment.

Whenever practical, install the unit away from the tank's primary suction outlet so treated water travels through a greater portion of the tank before being withdrawn. The vertical float switch must move freely without contacting the tank wall, piping, electrical cable, or suspension line.

3. Floor-Mounted Installation

6. Attach a secure lowering line to the pump's designated lifting handle.
7. Lower the NAN-SUB25 carefully into the tank while keeping the unit upright.
8. Place the pump on a stable, reasonably level section of the tank floor.
9. Confirm that the intake is not buried in sludge, sediment, or debris.
10. Orient the NAN1025 discharge toward the open body of the tank to establish broad circulation.
11. Verify that the float switch has unrestricted vertical movement.

Never lower, raise, carry, or suspend the unit by the electrical cord, float-switch cable, or CRS generator.

4. Suspended Installation

12. Attach a water-resistant, load-rated line to the pump's designated lifting handle.
13. Secure the opposite end to a structurally suitable anchor point.
14. Lower the unit to the desired depth while keeping the pump fully submerged during operation.
15. Maintain clearance below and around the intake so sediment is not drawn directly into the pump.
16. Keep the suspension line clear of the intake, float switch, and discharge flow.
17. Confirm that the system remains upright and stable when operating.

5. Float-Switch Clearance

- Confirm that the vertical magnetic float moves freely.

- Keep the float clear of walls, piping, cables, and suspension lines.
- Maintain adequate water level to keep the pump submerged.
- Do not defeat or permanently bypass the float switch unless an approved alternative low-water protection system is installed.

6. Electrical Connection and Smart-Switch Control

A properly rated electrical smart switch, programmable timer, or approved pump-control device is recommended to manage the NAN-SUB25 operating schedule.

- Use a control rated for 115 VAC and the pump's motor-starting current.
- Install the control in a dry, protected location suitable for the environment.
- Maintain grounding and GFCI protection.
- Keep plugs, connections, timers, and controls protected from standing water and direct washdown.
- Do not modify the factory cord or plug.
- Do not configure the control in a manner that defeats the float switch or thermal protection.

Operating hours should be based on tank volume, water use, contamination load, desired turnover, and water-quality objectives. For a new installation, begin with several treatment cycles distributed throughout the day, then adjust run time using observed circulation and measured water quality.

7. Initial Startup

18. Confirm that the pump is stable, properly submerged, and correctly oriented.
19. Verify that the float switch and intake are unobstructed.
20. Confirm that the NAN1025 generator and discharge connection are secure.
21. Energize the pump and verify visible discharge flow through the generator.
22. Observe the tank for broad circulation and check for unusual vibration or mechanical contact.
23. Confirm that the pump does not short-cycle because of inadequate water depth.
24. Record the initial operating schedule and baseline water-quality measurements.

Recommended Baseline Measurements

- Oxidation-Reduction Potential (ORP)
- Dissolved oxygen
- pH and temperature
- Turbidity
- Odor
- Total dissolved solids (TDS)
- Total suspended solids (TSS)

Operating Guidance

Recommended Placement

- Direct the discharge toward the open body of the tank.
- Avoid aiming the discharge directly into a nearby wall.
- Avoid locating the unit immediately beside the tank outlet or suction line.
- Prevent the discharge from unnecessarily disturbing settled sludge.
- In baffled tanks, orient the system to support the intended water-flow path.

Treatment performance depends on tank geometry, water chemistry, temperature, contamination load, operating hours, and the number of tank turnovers achieved each day.

Inspection and Maintenance

Inspect the NAN-SUB25 regularly. Increase inspection frequency where reclaim water, mineral scale, heavy solids, or high organic loading are present.

Routine Inspection Checklist

- Pump intake for debris or solids accumulation
- NAN1025 generator for obstruction or mineral scale
- Float-switch movement
- Electrical cord and plug condition
- Suspension line and anchor condition, when used
- Pump stability and discharge orientation
- Unusual sound, vibration, reduced flow, or frequent thermal shutdown
- Coating damage or corrosion

Cleaning Procedure

25. Disconnect electrical power and confirm that the pump cannot restart.
26. Remove the unit using the lifting handle and secured line.
27. Rinse the pump intake, housing, and exterior with clean water.
28. Remove debris from the vortex intake area without damaging the impeller.
29. Inspect the NAN1025 generator for restriction or mineral accumulation.
30. Clean the generator only with approved, material-compatible procedures.
31. Inspect the float switch and verify unrestricted movement.
32. Reinstall the unit and repeat the startup inspection.

Important Operating Precautions

- Do not operate the pump without adequate water coverage.
- Do not use the electrical cord as a lifting or suspension device.
- Do not allow the float switch to become trapped or obstructed.
- Do not operate with a damaged cord, plug, housing, switch, or discharge assembly.
- Do not expose electrical connections or smart controls to standing water or direct washdown.
- Do not use with flammable, explosive, highly corrosive, or otherwise incompatible liquids.
- Disconnect and lock out electrical power before moving, inspecting, cleaning, or servicing the system.
- Follow the Liberty Pumps installation, operation, maintenance, and safety instructions.

NAN-SUB25

Recirculation-driven passive ionic cavitation for 600–1,500 gallon holding tanks