

NEPTUNE

LONG RANGE PUMPING SYSTEM

NBF210

- High Capacity Mobile Pumping System
- Access to Any Open Water Source at up to 150 Feet Horizontal and 50 Feet Vertical
- 3000, 4000, 5000, 6000, 8000, 10000 GPM Models Available
- Configurations: Skid, Trailer, or Rail Mounted
- Environmentally Responsible Design
- User Safe Control System
- Wireless Monitoring and Controls



Description

The Neptune pumping system is a single, integrated, diesel powered mobile unit capable of pumping up to 10,000 gpm at 150 psi discharge pressure.

Neptune utilizes two hydraulically driven, floating Satellite Pumps to supply water to a Boost Pump mounted in the module. The Satellite Pumps and associated hoses are stored in the rear of the module for transport but can be located at distances up to 150 ft from the Boost Pump when deployed. In addition, the Satellite Pumps can provide up to 90 ft of vertical lift. This operational functionality increases tactical flexibility of pumping operations in two primary areas;

- The Neptune can be placed up to 150 ft from a water source allowing the operator accessibility to more open water sources than with standard pumps which have suction limitations of typically 15 ft in horizontal distance.
- Floating Satellite Pumps can supply up to 124 ft of vertical lift allowing the operator accessibility to open water sources previously not available to standard suction pumps which can only draw up to 10 ft of vertical lift.

Neptune design also permits the floating Satellite Pumps to be operated independently of the Neptune's Boost Pump. This capability allows the Satellite Pumps to supply water

directly to pumping devices, other than Neptune, located within reach of its 150 ft hoses.

The Boost Pump, powered by a direct-drive diesel engine, can deliver up to 10,000 gpm of water at a discharge pressure of 150 psi for firefighting support or water transfer.

The Boost Pump discharges through one or two connections, depending on flow, to which a flexible pipeline is connected that enables the water to be delivered over long distances. The discharge manifold diameter and configuration can be customized to suit customer needs.

Neptune has been designed to facilitate periodic maintenance requirements. Light maintenance is facilitated by locating all fluid fill and drain connection positions through access doors. All air filters and fluids level check locations have been remotely located so that they are accessible at operator access doors. Heavy maintenance is easily accomplished via removal of enclosure skins, allowing personnel to access all interior equipment. All main engine and pump assemblies are removable from the enclosure via crane from the top of unit, and through the roof should heavy maintenance require such operations. An onboard lighting system for 24 VDC has been provided to illuminate the entire interior and exterior of unit during maintenance and pumping operations.

Neptune Platform and Transport

Neptune is covered by a weather resistant enclosure, which incorporates structural lifting points and tie-downs to facilitate movement from one location to another via crane, rail, truck, or marine vessel. Neptune is designed in 3 standard configurations: skid, trailer or rail mounted. It can be quickly deployed and retrieved by an appropriate towing roll-on/roll-off or hook lift vehicle. If a trailer option is chosen, the running gear will be dual axle and dual wheel with dual landing gear jack stands included to support the trailer in a four point stable stance during operation.

Neptune Controls

National Foam Big Flow control systems offer optimal simplicity to operators while ensuring Maximum Control which equates to Maximum Safety. All controls are common for all National Foam Big Flow pumps - Neptune, Triton, and Dominator - therefore NF is able to link control panels for easy relay pumping operations.

All control panels utilize state of the art touchscreen HMI's loaded with National Foam's 2018 proprietary Big Flow Control architecture. The control programming unites automotive J1939 data associated with engine operation and National's Hydraulic Power and Water Pressure Management systems to link capabilities into a very unique, efficient and effective user interface.

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The Functionality offered by this system gives operators the power to set system parameters tailored to any pre-plan for both the satellite pump system and boost pump system from one simple easy to use interface. Engine, Hydraulic Power and Pump speed ramping functions, inlet pressure set points, discharge pressure set points and multi-unit relay pumping control actively ensures that pumps stay on track and within safe parameters while operating in a synchronized fashion.

Pre-planned maintenance alerts are also built-in to notify owners to conduct engine and system maintenance according to schedule, thereby helping to enhance the unit readiness and overall life span.

Commonality of Controls and interfaces across all National Foam Big Flow pumps ensures that operators are confident while operating any type of National Foam Big Flow Pumping Equipment because of the familiar feel and use of common controls. This feature offers companies that ability to take advantage of knowledge continuity and flexibility amongst teams of operators.

Wireless & Remote Operation offers users the ability to control or monitor any National Foam Pumping Unit via a remote location through a cloned HMI screen located on a laptop or other compatible device which is identical to the screen located at the pumping unit. These controls can be either wireless, hardwired via serial connections or both. This gives users 3 levels of the redundancy needed for emergency equipment protecting critical assets.

Data Recording and event logging allow users to recall events for maintenance and future preplan adjustment. Data outputs to Microsoft Excel format for easy of manipulation graphing and evaluation.

Technical Specification

The Neptune pumping system shall be capable of delivering up to 6,000 gpm of water at 150 psig and 8,000 and 10,000 gpm @ 100 psi through one or two 12 in. diameter flexible pipelines. Neptune shall be equipped with one or two submersible Satellite Pumps for a total individual output ranging from 3,000 to 5,000 gpm minimum each, hydraulically driven and individually deployed, to provide water to the suction side of a boost pump at a minimum of 10 psig. The Satellite pumps shall have sufficient head to deliver specified quantity of water to feed the main fire pump from a remote distance of up to 150 ft and an elevation difference of up to 124 ft below the suction of the main pump depending on the pump model and set-up.

The system control shall offer operators the ability to control both engines automatically based on inlet pressure, discharge pressure or both inlet and discharge pressure set points. The control system shall include a low water pressure start prevention feature.

The Boost Pump shall be directly driven by a diesel engine through a universal driveshaft coupling capable of withstanding transmitted horsepower throughout operating range of the engine while preventing potential pump misalignment problems due to repeated loading and unloading.

The pumping system shall be entirely self-contained, mounted on a common frame of sufficient strength to allow lifting by crane or roll-on/roll-off vehicle. Fuel oil, lubricating oil, and hydraulic oil tanks shall be incorporated into the structure of the frame. Equipment shall be protected by a weather resistant enclosure, provided with access doors to permit ease of operation and maintenance of all equipment items. The Boost Pump and Satellite pumps shall be able to be operated without damage when rotating without a water prime. The Boost Pump shall be linked

to the driver via a dual universal shaft to eliminate stress on pump bearings and ensure alignment for the life of the unit. The Boost Pump shall incorporate National Foam's periodic maintenance seal protection system.

Electric power shall be 24VDC, supplied by batteries, one set per engine, mounted on the module. An external connection to the VAC network shall be provided for power to the engine heaters and battery charger. Exterior 24VDC scene and operator panel lighting is provided for nighttime operations. Primary starting system shall include a battery pack power jump/transfer system for allowing the use of either battery system for starting either engine in the event of a low voltage condition.

Technical Data

Satellite Pumps:

One or Two 3000 to 5,000 gpm centrifugal pumps for a total output ranging from 3,000 to 10,000 gpm.

- 8" or 10" Storz discharge connection
- Flooded suction
- SS Impeller
- Aluminum body
- Mounted on wheeled cart with strainer and flotation device
- Hydraulic motor driven
- Integral heat exchanger
- Integral flotation device

Satellite Pump Driving Engine:

One Diesel Engine - Tier IV.

- Turbocharged
- Radiator cooled
- Electric start
- Industrial grade silencer
- Block heater
- Safety guards
- 24VDC

Boost Pump:

One Horizontal Split Case Mounted Pump rated at 150-160 psi discharge pressure.

- Cast iron casing
- Bronze impeller

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- 12 in. 125# flanged suction (can change depending on size of pump)
- 10 in. 250# flanged discharge (can change depending on size of pump)
- Mechanical packing
- Maintenance operation seal protection system
- Drive shaft driven

Boost Pump Driving Engine:

- One Diesel Engine - Tier IV.
- Turbocharged
- Radiator cooled
- Electric start
- Industrial grade silencer
- Block heater
- Safety guards
- 24VDC

Fuel Tank:

- 8 hour supply at max RPM integral to trailer manufactured to UL requirements

Connections: (Standard varies depending on flow capacity)

- Connections are at a low point to create smooth transitions to the ground preventing hose kinks and to ease the operator when connecting hose.
- Suction - One or Two 8 in. Storz connections and one 5 in. Storz additive connection
 - Discharge - One 10 or 12 in. grooved, Storz, or multilug connection and two 5 in. auxiliary Storz connection. More outlets may be necessary for flows above 5000 gpm.

Pumping Unit Enclosure:

- Framing - Mechanical structural steel
- Roof - Removable panels for easy access to all mechanical equipment. Access shall be designed to facilitate heavy maintenance up to and including major component removal
- Side/Rear Walls - Lockable painted, louvered steel doors to allow for

- complete access to all equipment on three sides as well as to offer optimum airflow for engine cooling
- Built-in satellite pump storage with bifold deployment ramp
- Hose and tool storage on board
- Undercarriage - Structurally enhanced flatrack
 - Main beams - steel box channel
 - Side rails - steel
 - Cross members - steel
- Complete with rollers and lift arm "A" frame for loading and deployment when appropriate
- Complete with DOT/NFPA compliant trailer when appropriate

Control Panels:

Emergency shutdowns located on the Control Panel and on the sides of the unit. Control Panel shall be located inside main Nema 4 enclosure protected from the elements and shall be lit for low light conditions.

Measuring and control devices including:

- Hydraulic hose retrieval controls
- Satellite Pump retrieval system controls
- Exterior/interior lighting controls
- Fuel Level
- Hydraulic oil pressure transducers and gauges for suction, discharge and charge pressure

Touch screen controls including:

- Engines' controls:
 - Startup and shutdown
 - Required RPM
- Engines' parameters display:
 - Actual RPM
 - Load %
 - Torque %
 - Power
 - Turbo boost pressure
 - Intake manifold temperature
 - Voltage
 - Oil pressure
 - Coolant temperature
 - Fuel rate
 - Fuel consumption
 - Operation time

• Engines' alarms:

- High coolant temperature
- High exhaust temperature
- High fuel pressure
- High inlet air temperature
- Low coolant level
- Low oil pressure
- Overspeed
- Low fuel level

• Boost Pump controls and parameters displays:

- Flow % control
- Inlet pressure
- Discharge pressure
- Automatic setpoints for suction and discharge pressures
- Minimum inlet pressure start prevention feature
- Automatic speed ramping
- Remote monitoring and control (optional)
- Relay pumping functionality
- Data Tracking and download

• Satellite Pump hydraulic actuation parameters displays:

- Supply pressure
- Return pressure
- Charge pressure
- Automatic set points for discharge pressure
- Individual left & right pump controls
- Pump powered flushout capability
- Automatic Boost Pump tracking and adjustment
- Data tracking and download

• Alarms for:

- Low battery voltage
 - Hydraulic filter change
 - Low hydraulic charge pressure
 - Low water inlet pressure
 - High water discharge pressure
- ### • Operational Presets:
- Recipe functionality for saving groups of operator preferred setpoints

Lighting:

- 360° LED scene lighting
- Interior LED maintenance lighting
- Control Panel lighting

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Hydraulics:

- Lightweight high performance welded ribbon hose
- Leakproof face seal hose connections
- Environmentally friendly oils
- Hydrostatic power adjustment

Weight:

- Approximately 30,000 lbs. May vary depending on size and configuration of system.

Dimensions:

- Skid/Rail Mounted*:
 - 334" L x 96" W x 102" H
- Trailer Mounted*:
 - 375" L x 96" W x 123" H

* Dimensions may vary upon final equipment specification.

Options

- Colors other than red
- Custom suction and discharge connections and configurations, including grooved connections for large diameter hose and special hose threads
- Corporate logos installed
- Foam induction system
- On-board storage for additional hose and accessories
- Wireless monitoring and operation
- Trailer (DOT/NFPA compliant)
- Hook arm
- Skid mounted
- Silencers
- Hose couplings
- Maintenance alerts
- Data mapping
- Alternate fuels (NG)



Rail Mounted Configuration



Satellite Pumps



Trailer Mounted Configuration