**SAM™ BOOST Detailed Specifications**

The apparatus shall be equipped with the SAM BOOST Pressure Governor System. The BOOST Governor System is a J1939 CAN based pressure governing system that consists of a BOOST display, pressure transducers, electric valves, pump recirculation circuit, water tank level sensor, two SAM Smart nozzles, Matrix control module, and associated wiring that is assembled and tested as a system at the factory. The BOOST governor advanced diagnostic capability notifies the operators of out of parameter conditions. Graphic diagnostics also provides wiring and troubleshooting information.

The SAM BOOST display utilizes Class1’s UltraView technology. It is a custom tooled and programmed, 4.3 inch, full color LCD display with an (8) buttons. It shall be bonded for direct sunlight viewing. The BOOST governor is sealed to IP67 and allows for panel mounting. The governor display provides the interface to the Engine Control Module (ECM) mounted on the engine and the Matrix governor. The SAM BOOST governor display will operate as a pressure sensing governor (PSG) utilizing the engine’s J1939 CAN data for optimal resolution and response. The SAM BOOST system utilizes control algorithms that minimize pressure spikes during low or erratic water supply situations. The SAM BOOST display shall be backwards compatible to any late model engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability and reduce operator cross training and confusion.

The SAM BOOST governor shall provide the operator with the following parameters visible at all times:

* Pump Intake Pressure
* Pump Discharge Pressure
* Engine RPM
* Engine Oil Pressure Warning
* Engine Coolant Temperature Warning
* System Voltage
* Interlock Status
* OKAY to Pump Interlock Status
* Operating Mode Status (RPM or Pressure)
* Target Pressure Indication (when in pressure mode)

When operating a SAM Smart Nozzle with SAM BOOST the following information can be displayed for each individual Smart Nozzle discharge:

* Rated nozzle pressure
* Actual nozzle pressure
* Valve line pressure
* Hose loss
* SAM Smart nozzle battery condition
* Signal strength

**SYSTEM FUNCTIONALITY**

The SAM BOOST system shall automatically control the following elements of the pumping process:

* When pump is placed in gear the tank to pump automatically opens and the recirculation circuit bleeds the air from the pump.
* When activated from the SAM Smart Nozzle, opens one or both preconnected valves and charges to the required set pressure and then maintains the required line pressure by gating the discharge valves as necessary and/or managing the pump discharge pressure to deliver the required nozzle pressure and flow.
* Controls engine speed as needed to maintain individual preconnect line discharge pressures set by the operator or the calibrated nozzle pressure.

The system shall include automatic control of the following components:

* Two preconnect valves
* Tank to pump valve (opening on pump engagement)
* Engine speed

The system shall accomplish the above by having the discharge valves, intake valve, and pressure governor on networks with all components in communication with each other at all times. These components must be configured, networked, and tested as part of the pump assembly prior to shipment to the installer.

The system shall allow the manual increase of discharge pressure using the BOOST governor similar to traditional pump pressure governors and allow operation of the other mechanical valves in a traditional manner.

The system shall include the following base components installed on the apparatus:

* SAM BOOST governor display with alarm
* Matrix governor
* 3” or 4 electric tank to pump valve
* Two 2” preconnect electric valves with pressure transducers
* Pump recirculation circuit
* Water tank level sensor
* Pump intake and discharge pressure transducers
* Can network module and harnessing
* Two SAM Smart Nozzles with N2P Technology
* Radio module
* Antenna with coaxial cable for truck mounting
* Optional antenna protection kit.

**SAM™ Smart Nozzle With N2P Technology Detailed Specifications**

A SAM Smart Nozzle system shall be provided. The wireless, battery-operated Smart Control Console is an integrated unit mounted to the inlet of the Akron nozzle. The system shall include the following components:

* Two SAM Smart Nozzles – Available with Akron’s Turbojet™, Assault, and Smooth Bore Nozzles
* Batteries, spare batteries and USB charger

**SYSTEM FUNCTIONALITY**

The SAM Smart Nozzle shall include space for two batteries that are easily removeable to facilitate charging. Two additional batteries and charger shall be included with each SAM Smart Nozzle.

The SAM Smart Nozzle shall be designed to work with SAM BOOST automated systems. The nozzle will include an easy-to-read incorporated tank level gauge. When the system is operating off the apparatus tank the gauge will work as a normal tank level gauge with green (full tank), yellow (partially filled tank), and red (low tank) lights indicating the tank level. The tank level gauge will flash red when running out of water is imminent. When the apparatus transitions to a permanent water source indicated by the pump operator closing the tank to pump valve the tank level gauge will switch to a blue light indicating the transition has been made.

The SAM Smart Nozzle will include two function buttons on each side of the Smart Control Console. When the two buttons are pressed simultaneously, for a minimum of 3 seconds, the SAM Smart Nozzle communicates with the SAM BOOST system to charge the line. The SAM BOOST system will open the valve corresponding to the preconnect and set it to a pressure level to achieve the calibrated nozzle pressure.

The SAM Smart Nozzle uses wireless technology that allows it to operate up to 300 feet of preconnected hose into structures.

The SAM Smart Nozzle shall include an integrated pressure transducer. The pressure transducer feeds pressures back to the SAM BOOST system in a continuous closed loop system. This closed loop system automatically maintains the proper nozzle calibrated pressure of the nozzle. The SAM Smart Nozzle in a BOOST system maintains the calibrated pressure during elevation changes of up to four (4) floors above and two (2) floors below grade. If communication is lost between the SAM Smart Nozzle and the SAM system, the system will maintain the last known setting of the valve and the nozzle will still function as a normal handline nozzle.

When used with a SAM BOOST system the SAM Smart Nozzle allows for kinked hose detection. When the system sees low pressure at the nozzle the system triggers an increase of pressure at the valve on the apparatus. If the nozzle pressure does not rise, the pressure in the line is increased, up to 20 psi, to overcome the kink. Once the kink is overcome the system transitions to the normal line pressure required to attain the correct nozzle pressure.

With the SAM Smart Nozzle installed, the pump operator will be able to see valve pressure, rated nozzle pressure, actual nozzle pressure, hose/friction loss, battery life and signal strength for each discharge on the SAM display.