Hale Products Inc.
Fire Suppression Equipment Division
A Unit of IDEX Corporation
700 Spring Mill Avenue
Conshohocken, PA 19428

Phone: 610 825 6300
Fax: 610 825 6440
www.haleproducts.com

FoamLogix® Model 3.3 Detailed Specifications

IMPORTANT: When preparing specifications for your foam capable fire fighting apparatus, assure the use of an unrivaled Hale FoamLogix foam proportioning system by incorporating the following specifications verbatim.

The apparatus shall be equipped with an automatic electronically controlled, direct injection, rotary gear pump, and discharge side foam proportioning system. Foam proportioning operation shall be based on direct measurement of water flow, and remain consistent within the specified flows and pressures.

SYSTEM REQUIREMENTS

The complete foam proportioning system shall include the following:

1. Foam Pump
2. Control System
3. Tank Selector and Flushing Valves
4. Foam Concentrate Strainer
5. Integral Check Valve/ Injector Fitting.
6. Flowmeter
7. Control Cables
8. SAE J1939 CAN Capable Connection
9. Low Tank Level Switch(es)
10. Water Discharge Check Valves
11. Foam Tank(s)
12. Documentation

FOAM PUMP

The foam proportioning system shall be compatible with most Class A foam concentrates and most high viscosity normal hydrocarbon or polar solvent Class B foam concentrates. The foam proportioning system shall be capable of delivering the rated foam concentrate flow with the above mentioned foam concentrate types. Foam system manufacturer shall provide a list of foam chemicals that have been tested for compatibility with the foam pump.

The foam proportioning system shall be based on an electric motor driven, rotary gear foam concentrate pump, rated at 3.3 GPM (12 LPM) foam concentrate flow rate with maximum operating pressure of 400 PSIG (28 BAR). The electric motor shall be powered by 12 volts direct current with a ¾ Hp (0.5 Kw) power rating at a maximum current draw of 60 AMPS.

The rotary gear pump shall be close coupled to the motor without an oil filled gearbox. The foam concentrate pump and all wetted parts of the system shall be constructed of corrosion resistant materials compatible with all foam concentrates being used. The pump body, pump head and pump cover shall be constructed of bronze with pump shaft, gears and bearings constructed of stainless steel. A mechanical pump shaft seal shall be provided to prevent foam concentrate leakage around the rotating shaft. An internal foam concentrate relief valve constructed of stainless steel and preset at the factory for maximum system operating pressure shall be incorporated into the foam pump to protect the pump from over-pressurization. NO components of the foam concentrate pump and wetted parts of the foam system will be manufactured of aluminum.

The foam pump/motor assembly shall be permanently attached to an apparatus mountable base plate. A foam concentrate flowmeter shall be integral to the foam concentrate pump. The foam concentrate flowmeter will provide a signal to the electronic control unit to make sure the proper amount of foam concentrate is injected into the discharge stream.

The entire base plate mounted assembly shall have electrical components sealed to NEMA 4X or equiv. for mounting in the apparatus pump compartment or any suitable location on the apparatus. The pump will be mounted to allow gravity feed of foam concentrate from the foam tank to the pump.

CONTROL SYSTEM

The system shall be equipped with an electronic control unit, suitable for installation on the pump operator panel as the single point of operation for the foam proportioning system. Incorporated within the control unit shall be a microprocessor that receives input from water flowmeter(s) while receiving foam concentrate pump output information from the foam concentrate flowmeter. The microprocessor, through constant comparison of the flow signals, will ensure the operator preset proportional amount of foam concentrate is injected into the discharge stream of the fire pump. Control unit will utilize a single sealed electrical connector on the rear panel. Wiring harness shall provide an SAE J1939 CAN connection for diagnostics and systems operations/communications. Control unit will have an environmentally sealed membrane front panel and sealed metallic housing.

The electronic control unit shall permit the pump operator to perform the following control and operation functions for the foam proportioning system:

- Provide push-button ON/OFF control of foam proportioning system.
- Provide push-button control of foam proportioning rates from 0.1% to 10.0%, in 0.1% increments.
- Show real time flow rate of water or foam solution.
- Show total volume of water or foam solution discharged during and after foam operations.
- Show foam concentrate injection rate.
- Show total amount of foam concentrate consumed.
- Permit resetting of totalized values for water and foam concentrate.
- Simulate water flow rates for manual operation, calibration and testing of foam system.
- Enable system setup and full range system diagnostic functions.
- Indicate on LED bargraph foam concentrate is being injected and the foam system capacity.
- Indicate on LED bargraph when system capacity is not within design parameters.
- Store independent default values for Class A and Class B foam concentrate injection.
- Flash a “low concentrate” warning when the foam concentrate tank runs low.
- Flash a “no concentrate” warning and shut the system off when the foam tank is empty.
- Flash a “low battery” warning when battery voltage is low enough to affect system operation.
- Flash a “hot” warning when system is running hot due to low voltage or radiant heat.
- Read out calibration valves to allow setting up a replacement unit.

A power distribution box shall be attached to the base plate to provide ease of installation. The distribution box shall be sealed to a NEMA 4X or equiv. rating to permit installation in the pump compartment.

Foam concentrate flow feedback shall be provided to the control unit through the distribution box by a sensor mounted in the foam pump body. Rotors in the foam discharge side of the foam pump will provide the targets to pulse the sensor to generate a feedback signal.

The distribution box shall receive 12 volt direct current power from the apparatus electrical system as the only source of power to operate the system and power component sensors. Control power will be distributed to the control unit, flowmeter sensor and foam concentrate feedback sensor through a conductor in the cable sets provided by the foam proportioner manufacturer. The microprocessor in the control unit will process input signals from the flowmeter sensor and foam feedback sensor to determine the proper duty cycle for the electric motor to run. The distribution box will provide power to the electric motor, based on signals received from the control unit, at a variable rate to ensure that the correct proportion of foam concentrate, preset by the pump operator on the control unit, is injected into the water pump discharge stream. The distribution box shall have a main power control switch and over current protection for the foam proportioning system.

All primary electrical wires for the foam concentrate system shall be type SXL or GXL (SAE J1128) per NFPA requirements. Electrical connections shall be made using heavy duty 5/ 16 inch (min) diameter studs and nuts.

TANK SELECTOR AND FLUSHING VALVES

When dual foam concentrate tanks are installed on the apparatus a dual tank switch over system consisting of either of the following options shall be installed to provide rapid change-over of foam concentrate reservoirs. The dual tank selector valves shall also have provision for connection of flushing water to prevent mixing of dissimilar incompatible foam concentrates:

AIR OPERATED DUAL TANK SELECTOR

An air operated dual tank selector shall provide dual foam tank selection via a three-position toggle switch located on the pump operator panel. Indicator lights on the switch placard will indicate which tank is selected. The air operated dual tank system shall be provided as an integral part of the foam concentrate pump. The air dual tank system shall be installed and tested at the foam system manufacturer. Operating air shall be provided continuously from the apparatus compressed air system. A foam concentrate bypass valve shall be provided integral to the air operated dual tank valve to permit operation of the foam concentrate pump for test and calibration purposes without injecting foam concentrate into the water discharge.

The air operated dual tank selector will be electrically interlocked with the low tank switches and control unit. When the selector is switched from one tank to the other the default foam concentrate injection rate will automatically change without operator intervention. Also, when the selector is switched from one tank to the other the low level sensor in the selected tank will be active and the other one will be isolated from the system.

The center position of the panel mounted dual tank switch will provide a clean water flush of the foam concentrate pump to prevent concentrate mixing and possible jelling. When FLUSH is selected the foam pump will only run for 10 seconds. All NFPA required check valves and flushing water strainers shall be provided integral to the air dual tank selector.

MANUAL DUAL TANK SELECTOR: An operator panel mounted manual dual tank valve to provide manual selection of dual foam concentrate tanks from the operator panel shall be provided. The manual dual tank selector will be electrically interlocked with the low tank switches and control unit. When the selector is switched from one tank to the other the default foam concentrate injection rate will automatically change without operator intervention. Also, when the selector is switched from one tank to the other the low level sensor in the selected tank will be active and the other one will be isolated from the system.
The manual dual tank selector handle will have a “FLUSH” position between the tank settings. The “FLUSH” position will provide a clean water flush of the foam concentrate pump preventing foam concentrates from mixing and possibly jelling. Switches provided on the manual dual tank valve will determine which low tank level sensor is providing feedback and which foam concentrate injection rate to use. When FLUSH is selected the foam pump will only run for 10 seconds. All NFPA required flushing water check valves shall be provided with the manual dual tank selector.

SINGLE FOAM TANK FLUSH: When dual foam concentrate tanks ARE NOT installed flushing capabilities can be provided with a three-way flush valve. A switch provided integral to the three-way valve will indicate when the valve is in the “FLUSH” position. The “FLUSH” position will provide fresh water-flushing capabilities to prevent foam concentrate deterioration of the foam pump. When FLUSH is selected the foam pump will only run for 10 seconds. NFPA required flushing water check valves shall be provided with the single tank flush selector valve.
BYPASS VALVE: When the manual dual tank selector, single tank flush valve or a single tank system without flushing capabilities is installed a three way bypass valve shall be provided on the discharge of the foam pump to permit operation of the foam concentrate pump for test and calibration purposes without injecting foam concentrate into the water discharge. The bypass valve shall be capable of being panel mounted.

FOAM CONCENTRATE STRAINERS

Field serviceable foam concentrate strainers shall be provided in the foam concentrate suction line. When the strainer will not be subject to flushing water pressure a plastic bodied in-line strainer shall be used. The strainer body shall be constructed of plastic with a stainless steel mesh screen and shall be compatible with both Class A and Class B foam concentrates. A shutoff valve will be provided to enable isolation of the strainer for service. The strainer will be mounted in the pump compartment. The strainer will be a low pressure device and will not be subject to flush water pressure.
Where strainers are subject to flush water pressure, panel mounted field serviceable foam concentrate strainers rated at 500 PSIG (34 BAR) minimum shall be installed on the pump panel. The strainer body shall be constructed of brass with a chrome cap and an easily removable stainless steel mesh screen for field servicing. A 1- ½ inch strainer with ¾ inch NPT connection ports will be used for Class A foam concentrate and a 2-½ inch strainer with 1 inch NPT connection ports shall be used for Class B foam concentrate.

INTEGRAL CHECK VALVE/ INJECTOR FITTING and WATERWAY CHECK VALVES
To prevent contamination of the foam concentrate supply, foam concentrate shall be injected into the water pump discharge stream through an integral check valve/ injector fitting. The check valve/ injector fitting shall be of one piece body construction of brass, with stainless steel wetted parts.

To prevent contamination of the water pump and apparatus booster tank spring loaded double-door type check valves shall be installed in the water pump discharge piping prior to the foam injection point.

FLOWMETER
A paddlewheel type flowmeter with a stainless steel impeller wheel shall monitor water flow in foam capable discharges. The flowmeter shall have a 500 PSIG (34 BAR) pressure rating per NFPA requirements.
One flowmeter is required for proper operation of the foam proportioning system. Power for the flowmeter sensor will be provided through the cable set from the control unit. Flowmeters shall have saddle clamp mounting shall be used to mount in stainless steel, brass or iron OEM manifold assembles.
The flowmeter selected shall be sized to adequately monitor the minimum and maximum flow expected in the foam capable discharges.

CONTROL CABLES
The cables for connection of the control unit, distribution box, flowmeter sensor, flowmeter display units, pressure transducers and feedback sensor shall have the ability to connect together and total length shall not exceed 40 feet (12 meters). The connections shall be keyed to prevent misconnection and improper system operation. Where required a shield drain wire shall be tied to one of the pins on each end of the cable. No externally attached ferrite beads shall be installed for the purpose of electrical shielding. When properly connected the connections shall be sealed to NEMA 4X or equivalent.

LOW TANK LEVEL SWITCH
A low tank level switch shall be installed in each foam concentrate tank that supplies foam concentrate to the foam proportioning system. The low tank level sensor shall be connected to the foam proportioning system to provide protection against dry running of the foam pump. The low tank level sensor can be mounted on the side, bottom or top of the foam concentrate tank. The low tank level sensor and electrical connections shall be sealed to prevent infusion of foam concentrate into the wiring and possible short circuit of the tank level sensor. The low tank sensor shall be mounted so that the flow of foam concentrate from the tank does not cause a false low tank reading.

FOAM TANK
The foam proportioning system shall be supplied from apparatus mounted foam concentrate storage tank(s). The tanks shall be constructed of materials compatible with foam concentrates being used in the system. Provision shall be made for installation of low tank level sensors and routing of the wiring for the sensors. Tank capacity, venting, fill opening and foam outlet plumbing connections shall be in accordance with NFPA requirements. Foam tank lid shall be sealed and latched in accordance with NFPA standards.

DOCUMENTATION
The foam proportioning system when delivered to the end user shall include: a foam concentrate compatibility list and (2) two Description, Installation and Operation Manuals. The foam proportioning system shall have a one-year limited manufacturer warranty.