Hale/TFT Safe Buy Module Specification

DETAILED SPECIFICATIONS

SPECIAL NOTE:
When preparing the specifications for your new apparatus, assure the use of Hale® products by incorporating these specifications as written.

QMAX PUMP ASSEMBLY

1. The pump shall be of size and design to mount on the chassis rails of a commercial and/ or custom truck chassis, and have the capacity of 2250 gallons/ liters per minute as NFPA-1901 rated performance requirements.
2. The entire pump shall be assembled and tested at the pump manufacturer's factory.
3. The pump shall function by the utilization of a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.
4. The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be tested at the pump manufacturer's facility to performance specifications as outlined by NFPA-1901 rated performance requirements. The pump shall be free from objectionable pulsation and vibration.
5. The pump body and related parts shall be constructed of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2,069 bar). All metal moving parts in contact with water shall be manufactured of high quality bronze or stainless steel. Any pump utilizing castings made of lower tensile strength cast iron not acceptable.
6. The pump body shall be horizontally split, on a single plane in two sections, for ease of removal of the impeller assembly. Wear rings and bearings associated with the pump body shall remove easily without disturbing the piping or mounting of the pump in chassis.
7. The pump body shall incorporate the discharge manifold system with a minimum of two (2) 4” (10.16 cm) port and seven (7) 3” (7.62 cm) ports.
8. The pump shall have one (1) double suction impeller. The pump body shall have two (2) opposed discharge volute cutwaters to eliminate radial unbalance.
9. The pump shaft shall be rigidly supported by three (3) bearings for minimum deflection. There shall be one (1) high lead bronze sleeve bearing to be located immediately adjacent to the impeller found on the side opposite of the gearbox. The sleeve bearing shall be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. (No exceptions.) The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.
10. The midship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 PSI. The mechanical seal assembly shall be 2 inches in diameter and consist of: a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon backup seal provided. Only one mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one-piece pump shaft. No Exceptions. A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.
11. The pump impeller shall have clearance rings manufactured of bronze, easy to remove, without replacing impeller or pump volute body. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.
12. The pump shaft shall be manufactured of heat-treated, electric furnace, corrosion resistant stainless steel for longer shaft life. The pump shaft shall be sealed with a double-lip oil seal to keep road dirt and water out of gearbox.

GEARBOX

1. Pump gearbox shall be of sufficient size to withstand up to 18,500 lbs. ft. of drive through torque of the engine system. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature. Gearbox housing is constructed of high strength cast iron with no structural aluminum parts.
2. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.

3. All gears both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut helical high contact design shall be provided with an exclusive Anti-Hop out Design which keeps the unit firmly in the gear selected. The more torque you put to the gearbox the tougher the grip to stay in gear. (No exceptions.)
4. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.
5. The gearbox is equipped with a power shift with progressive engagement to assure consistent reliable shift in pump/road gear. The shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump.
6. For automatic transmissions, three green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on pump operators panel adjacent to the Throttle control. For manual transmissions, one green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

CERTIFICATION

The pump will perform and meet the following tests:
100% of rated capacity @150 PSI net pump press.
100% of rated capacity @ 165 PSI net pumps press.
70% of rated capacity @ 200 PSI net pump press.
50% of rated capacity @ 250 PSI net pump press.
Pump shall be tested at manufacturer under full NFPA suction conditions.

PRIMING PUMP

The priming pump shall be a positive displacement, oil-less rotary vane electric motor driven pump conforming to NFPA-1901 rated performance requirements. The pump body shall be manufactured of heat-treated anodized aluminum for wear and corrosion resistance.
The pump shall be capable of producing a minimum of 24 Hg vacuum at 2,000 feet (609.6m) above sea level.
The electric motor shall be a 12 VDC totally enclosed unit.
The priming pump shall not require lubrication. The priming pump shall operate by a single pull control valve mounted on the pump operator's panel. The control valve shall be manufactured of bronze construction.

6" STEAMER INLETS

Two 6" (15.24cm) steamer inlets will be provided, one (1) on the left side and one (1) on the right side. Both inlets shall have long handle chrome vented caps and a screen. The pump shall have additional 6" flanged connections provided on the right hand bottom and right hand rear (T port) of the pump.

OPTIONAL
HIGH FLOW ELECTRIC REMOTE BALL INTAKE

A Task Force Tips model #AX1ST-NX-RC electric remote control operated lightweight aluminum high flow ball intake valve shall be installed on the right hand side steamer inlet. The unit shall be equipped with an adjustable pressure relief valve under the main valve body with an eight position adjustable inlet elbow. The valve shall be controlled by a remote panel-mounted pushbutton switch with LED lights to indicate valve position. The valve can also be controlled with an NFPA compliant slow-close knob which can be configured for left or right hand operation on the valve. A 3/4" bleeder valve shall be provided to exhaust excess air or water from the valve and hose line. A valve-mounted position indicator shall be provided positions. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a powder coat internal and external finish and all components facing the wet side of the valve shall be constructed from stainless steel. The electronic controls shall be compatible with 12 or 24 volt DC systems. The connections shall be: 5" Storz rigid with 30 degree swiveling detent elbow and a 6" female NH swivel long handle connection and include polymer bearing strips for prevention of galvanic corrosion. The unit shall be covered by a five-year warranty.

OPTIONAL
SUCTION HOSE LOW-LEVEL STRAINER

Task Force Tips Model # A03HNX suction hose low-level strainer shall be provided. The strainer shall be made from hard anodized and powder coated aluminum alloy and stainless steel. Suction hose coupling shall be attached with corrosion resistant nylon bearing strip, allowing easy swiveling. A large clog-resistant stainless steel filter screen shall be standard and allow clearing without tools. Low level strainer shall be designed to

allow suction from minimal depths with minimal friction loss. Suction hose coupling pivot shall have 45° range of motion. A large carrying handle shall be standard. Strainer shall have serial number and a 5-year warranty. Suction strainer shall have 6" NH female swivel long handle coupling.

30 DEGREE DETENT ELBOW

Task Force Tips model # AJ3ST-NX 30 degree elbow shall be provided. For corrosion resistance, the elbow shall be constructed of hardcoat anodized aluminum alloy, have a silver powder coat finish inside and out and include a polymer bearing ring for prevention of galvanic corrosion. The elbow shall be capable of 360 degree rotation and include a detent device to secure the elbow at one of eight positions to minimize hose kinking and coupling stress. An eyelet attachment point shall be provided for securing the lanyard or chain for the cap or plug. The elbow shall meet a 900 PSI hydrostatic test and comply with the current NFPA 1965 Standard. The unit shall be covered by a five-year warranty. The elbow shall be configured with a 6" female NH swivel long handle coupling and a 5" Storz swivel coupling.

SUCTION HOSE

Task Force Tips Model # AMF4ST10X suction hose shall be provided. The suction hose shall have a clear PVC hose body to allow visibility of hose fill and remain flexible at low temperatures. The rigid black helix shall provide support and abrasion resistance. TFT's patent pending V-Seal, nylon binding strip and smooth contoured shanks shall be secured by dual stainless steel bands to prevent leakage and prevent hose damage under tight bending conditions. Minimum bending radius is 12-1/2". All aluminum parts are hardcoat anodized for maximum corrosion resistance. Hose is not intended for pressure service. Suction hose shall be 10 feet in length, 6" ID and have 5" Storz swivel folding long handle couplings.

MASTER INTAKE VALVE (MIV)

Electric master intake valves shall be installed on the left hand side steamer inlet, the right hand bottom steamer inlet and the right hand rear (T port) inlet. Optional: A master intake valve shall be installed on the right hand side steamer inlet.

The valves shall meet the following criteria:

1. The inlet valve shall be a full flow butterfly type valve designed to mount on the fire pump between the suction tube extension and suction tube behind the pump compartment panel. The valve shall not interfere with other suction or discharge openings on the fire pump or with pump operating controls when properly mounted.
2. The entire valve shall be manufactured and tested at the pump manufacturers' factory.
3. When the valve is installed in the fire pump suction the fire pump shall be capable of achieving an NFPA / UL test rating of 1500 GPM through a single 6 inch NST suction hose. When two valves are installed on the fire pump, the pump shall be capable of achieving an NFPA/UL test rating of 2000 GPM using dual 6 inch NST suction hoses.
4. The valve body and related components that are in contact with water shall be manufactured of fine grained corrosion resistant bronze.
5. The butterfly disc shall be manufactured from 80,000 PSI minimum yield strength heat treated cast steel then coated with a durable nitrile rubber to provide a positive seal when the valve is closed.
6. Testing and rating of the valve shall be accomplished at the valve manufacturers factory. The valve, less relief valve, shall be hydrostatically tested to 600 PSIG. The valve shall then be vacuum tested to 26 inches Hg.
7. A pressure relief valve shall be provided that is factory set to 125 PSI and field adjustable from 75 to 250 PSI. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed. An integral relief valve mounting pad shall be provided on the valve body. This mounting pad shall provide a Hale type 115 4-3/8 inch bolt circle flange for normal installation. The mounting pad shall have 2-½ inch female NPT threads to permit remote mounting of the relief valve without special adapters. The outlet of the pressure relief valve shall have 2-½ inch NPT threads to allow directing the discharge flow away from the pump operator position.
8. The inlet valve(s) shall be operated by a 12 VDC electric motor with remote capabilities or by a manual handwheel located next to the suction tube.
9. Each valve shall be provided with panel placards indicating control operation. The placards shall have status lights to indicate whether the valve is open, closed or traversing from one position to another.
10. Each valve shall be provided with a gear actuator that will cycle the valve from OPEN to CLOSED position in no less than 3 seconds. The gear actuators shall be sealed units designed to provide reliable service in the harsh pump compartment environment. The ratio of the gear actuator shall be such that the handwheel will close the valve in no more than 10 complete turns.

11. The 12 VDC motor on the electric operated valve shall be provided with an automatic resetting, thermally compensated, over current protection circuit breaker to protect the 12 VDC motor and apparatus electrical systems.
12. The electrical wiring for the valve shall be minimum 14 AWG, type SXL or GXL (SAE J1128) and shall be protected using 257 F minimum flame retardant, moisture resistant loom or braid. All electrical connections shall use sealed Packard Weather Pack connectors to provide extra protection from the harsh pump compartment environment to ensure long life and reliable operation.
13. The valve body shall have a ¾ inch female NPT threaded port on the top to allow installation of an NFPA compliant large diameter hose air bleeder valve. The air bleeder valve shall be mounted on the operator panel and be controllable by the pump operator. Air bleeder valve connections shall have a restriction no larger than ¾ inch to prevent water hammer when filling hose.
14. The valve body shall have a ¼ inch female NPT threaded port on the bottom to permit connection of an individual water drain valve.
15. A suction tube extension 7-¼ inches wide shall be used to allow for the additional length of the inlet valve. The shorter suction tube extension, along with a 4, 6 or 9 inch suction tube, will keep the suction tube threads within the apparatus running boards while maintaining clearance for adapters.
16. A panel mounted manual override shall be provided to permit operation of the electric remote control valve in the event of abnormal operating conditions. The manual override shall be designed to permit operation of the valve without the use of special tools or disassembly of the pump compartment panel or valve.
17. The valve shall be equipped with o-ring seals for the mounting flanges. The o-ring seal groove shall be sized for proper squeeze of the o-ring for pressures in excess of 600 PSIG.

RELIEF VALVE

There shall be one (1) suction side stainless steel relief pump valve provided on the pump system.

PUMP MODULE BODY

The pump module body shall be a self-supported structure mounted independently from the body and chassis cab. The pump module shall be constructed entirely of extrusions and aluminum plate. The framework shall be formed from beveled aluminum alloy extrusions and shall be electrically seam welded at each joint using 5356 aluminum alloy welding wire. The main framework to be 3.00 x 3.00 x 0.18, or 3.00 x 1.5 webbed 0.25, 6063-T5 aluminum extrusion. The pump module design must allow normal frame deflection through isolation mounts without imposing stress on the pump module structure or side running boards. The pump module shall consist of a welded framework, properly braced to withstand chassis frame flexing. The pump module support shall be bolted to the frame rails of the chassis.

PUMP MODULE PANELS

The pump module panels shall be 14 gauge brushed stainless steel. The panels shall be an integral part of the module.

PUMP CERTIFICATION TEST PLATE

A permanently affixed plate shall be installed at the pump operators position that will provide the rated discharge and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump used and the no load governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

DISCHARGE VALVES

The valves including the ball shall be constructed of 304 stainless steel. The valves shall be bi-directional with full flow capability. The valves shall be of fixed pivot ball design with a flow pressure rating to meet NFPA-1901 standards. The valve shall have a single piece seat and seal design and shall have an operating pressure of 400 psi. All 3.0” (7.62cm) discharge valves shall be supplied with a true slow close mechanism per NFPA specifications. The valve shall be warranted for a period of ten (10) years on all stainless steel components, against defects in design and manufacturing processes.

PIPING AND MANIFOLDS

All the plumbing and/or piping in the pump module shall be of 304 stainless steel or flexible piping for long life. All stainless steel castings shall be a minimum of schedule 40. All NPT pipe thread connections larger than ¾” connections shall be avoided in the construction of the plumbing system. The following valves shall have groove connection: rear discharge, tank fill, all 2” and 2-½” (5.08 and 6.35cm) pre-connect valves.

The flexible piping shall be black SBR synthetic rubber hose with 300 working pounds and 1200 pounds burst pressure for sizes 1.5 through 4”. Sizes ¾”, 1” and 5” are rated at 250 pound working and 1000 pound burst pressure. All sizes are rated at 30 HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes sand helix wire installed in sizes 1 through 5” for maximum performance in tight bend applications. The material has a temperature rating of –40 degrees F to 210 degrees F. Full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. ¾” and 1” male and Victaulic couplings are brass.

PUMP COOLER and ENGINE COOLER VALVES
An engine cooler and pump cooler valve shall be installed in the instrument panel.
The valves shall be a 1/4" quarter turn valve installed thru the instrument panel and labeled.

LEFT SIDE FRONT DISCHARGE
One (1) 2-½" (6.35cm) discharge with a stainless steel valve shall be located on the left side panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2-½" (6.35cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 2-½" (6.35cm) MNST threads. A chrome vented cap and chain shall also be supplied. The valve shall be controlled at the side panel with a swing handle. There shall be a Class 1 2 ½” pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge must be capable of flowing 700 GPM or greater.

LEFT SIDE REAR DISCHARGE
One (1) 2-½" (6.35cm) discharge with a stainless steel valve shall be located on the left side panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2-½" (6.35cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 2-½" (6.35cm) MNST threads. A chrome vented cap and chain shall also be supplied. The valve shall be controlled at the side panel with a swing handle. There shall be a Class 1 2 ½” pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge must be capable of flowing 700 GPM or greater.

LEFT SIDE AUXILLLARY SUCTION
One (1) 2-½" (6.35cm) intake with a stainless steel valve shall be located on the left side panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The valve shall be controlled at the side pump panel with a swing handle. The valve shall come equipped with a chrome plug, chain, inlet strainer, 2-½ (6.35 cm) NST chrome inlet swivel and ¾” drain valve.

RIGHT SIDE FRONT DISCHARGE
One (1) 4" (10.16cm) electric controlled discharge valve shall be located on the right side panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The valve shall be controlled with a switch panel mounted on the pump panel. There shall be a Class 1 2 ½” pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge must be capable of flowing 2250 GPM or greater.

30 DEGREE ELBOW
Task Force Tips model #AH3ST-NP 30 degree elbow shall be installed on the right side front discharge. For corrosion resistance, the elbow shall be constructed of hardcoat anodized aluminum alloy, have a silver powder coat finish inside and out and include a polymer bearing ring for prevention of galvanic corrosion. An eyelet attachment point shall be provided for securing the lanyard or chain for the cap or plug. The elbow shall meet a 900 PSI hydrostatic test and comply with the current NFPA 1965 Standard. The unit shall be covered by a five year warranty. The elbow shall be configured with a 5" rigid Storz coupling and a 4" female NH swivel rocker lug coupling.

STORZ BLIND CAP
Task Force Tips model #A01ST lightweight, heat treated aluminum 5" Storz cap with suction gasket shall be provided. An 18" lanyard with 1/4" eyelet for attachment shall also be supplied. Cap is provided without locking lever. The unit shall be covered by a five-year warranty.

RIGHT SIDE REAR DISCHARGE
One (1) 3" (7.62cm) discharge with a stainless steel valve shall be located on the right side panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 3" (7.62cm) outlet shall be equipped with an integral, stainless steel, 30-degree elbow terminating with 3"(7.62cm) MNST threads. The valve shall be of the slow-close design so as not to allow the valve to open or close in less than 3 seconds. The valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge must be capable of flowing 1500 GPM or greater.

STORZ ADAPTER
Task Force Tips model #AA1ST-NL adapter shall be installed on the right side rear discharge. For corrosion resistance, the adapter shall be constructed of hardcoat anodized aluminum alloy and include a polymer bearing ring for prevention of galvanic corrosion. The adapter shall meet a 900 PSI hydrostatic test and comply with the current NFPA 1965 Standard. The adapter shall be configured with a 5" rigid Storz coupling and a 3" female NH rigid rocker lug coupling. The unit shall be covered by a five-year warranty.

STORZ BLIND CAP
Task Force Tips model #A01ST lightweight, heat treated aluminum 5" Storz cap with suction gasket shall be provided. An 18" lanyard with 1/4" eyelet for attachment shall also be supplied. Cap is provided without locking lever. The unit shall be covered by a five-year warranty.

DECK GUN DISCHARGE
There shall be a 4"(10.16cm) discharge valve installed at the top of the pump. The valve shall be a quarter turn ball type of fixed pivot design and be electronically controlled. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a ¾" automatic drain valve. The discharge must be capable of flowing 2000 GPM or greater.

REMOTE CONTROL TELESCOPING MONITOR PIPE
Task Force Tips model # XGA48VP-RP 4" electrically telescoping waterway shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height of 18" using Auxiliary 1 push button and retract after the monitor has been parked by pressing the Park button on Task Force Tips RC monitor control stations or from optional panel mounted push buttons. The unit shall include a 12 volt motor capable of moving the waterway to either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees. The motor shall be weatherproof in design and have an accessible manual override control for use in the event power failure occurs. An interface box with cables and waterproof plugs shall be provided for connection of power, monitor, Extend-A-Gun RC and optional push button controls. A sensor shall be located on the waterway that signals a 12 volt indicator light installed in the cab to illuminate to indicate that the monitor is raised. The aluminum riser shall have a 4" waterway; hardcoat anodized finish and be furnished with a 4" Victaulic inlet coupling and a TFT Code RPM male connection for a TFT remote control monitor with TFT Code RPF female inlet. The unit shall be covered by a five-year warranty.

EXTEND-A-GUN BRACKET SET
Task Force Tips model # XGB-43 bracket set shall be installed. The set shall include a top plate and saddle brackets and is designed to securely mount the Extend-A-Gun RC4 telescoping waterway. The unit shall be covered by a five-year warranty.

2000 GPM REMOTE CONTROLLED MONITOR
Task Force Tips Monsoon RC, model # Y4-EP1A remote controlled monitor shall be installed. The monitor shall operate with 12 or 24 volt direct current and controlled by a monitor mounted switch panel with functions that control rotation, elevation, nozzle patterns, programmable park and oscillate, auxiliary 1 and auxiliary 2. The monitor shall be compatible with optional wired and wireless control stations and monitor position display.

The electrical components for the monitor shall be waterproof and utilize current limiting and position encoders to protect the drive train at the ends of travel. Monitor shall have thirty feet of ultra flex robotic power cable and include a unique cable guide for 450 degrees of monitor rotation. A six-pin electrical connection for a TFT remote control nozzle shall be provided. The monitor shall be compatible with optional wired and wireless control stations and monitor position display. The monitor shall be equipped with manual override knobs for use

in the event of power failure. The motors and knobs control stainless steel worm gears for rotation and elevation adjustment.

The monitor shall have the following capabilities:

- Full horizontal rotation with travel 225 degrees left and right of center;
- 135 degrees of vertical travel with stops at 90 degrees above horizontal and 45 ° below horizontal;
- Field changeable rotation stops at 45, 90 and 135 degrees left and/or right of center and 45 degrees above and/or 30 degrees below horizontal;
- Flow capability of 2000 GPM with friction loss no more than16 psi;
- Maximum operating pressure of 200 PSI

For resistance to corrosion the monitor shall be constructed from hardcoat anodized aluminum with a silver powder coat interior and exterior finish. A threaded port for an optional pressure gauge shall be provided. The unit shall have a unique serial number and be covered by a written five-year warranty.

The monitor shall be designed with a unique waterway that minimizes the path of travel, reduces friction loss and turbulence, and produces a far reaching water stream. The monitor shall be configured with a Task Force Tips code RPF threaded inlet to mate with Task Force Tips Extend-A-Gun RC4 telescoping waterway and 3-1/2" male NH outlet.

REMOTE ELECTRIC MASTER STREAM

Task Force Tips Master Stream 2000, model # M-ERP2000-NN automatic nozzle with electrically operated pattern control shall be provided. The nozzle design shall allow for straight stream through dense wide fog patterns. The nozzle shall have a flow capability of 300 to 2000 GPM at a user adjustable pressure rating of 80 PSI to 120 PSI. User shall have the ability to change nozzle operating pressure by means of an adjustment knob with pressure indicator on the front of the nozzle.

The electric drive unit shall develop over 400 pounds of torque, be enclosed in a waterproof cast aluminum housing and include a manual override device in the event the power source fails. The unit shall be compatible with 12 or 24 volt power systems and require no more than a 3 amp power draw and include a 24" connection cable. Nozzle stream shaper actuator shall have position encoder for smooth transition between straight stream and fog pattern with fine stream adjustment. For corrosion resistance and durability the nozzle and actuator shall be constructed from hardcoat anodized aluminum alloy, include a protective rubber bumper with fog teeth, laser engraved serial number, and reflective labeling.

The nozzle shall have a 3-1/2" female NH swivel rocker lug coupling and a flow range of 300-2000 GPM at a user adjustable pressure rating of 80 PSI to 120 PSI A waterproof six-pin electrical connection for use with TFT remote control monitors shall be included.

PANEL MOUNT MONITOR CONTROL STATION

Task Force Tips model # Y4E-RP panel mount control station for Monsoon, Hurricane, Typhoon, and Tornado series remote control monitors shall be installed. The control station shall be designed for flush panel mounting and include switches to control horizontal rotation, vertical elevation and nozzle stream pattern, oscillate and park, auxiliary 1 and auxiliary 2. The control station shall be capable of connection of control circuits from other control devices. The interface accepts 12 or 24 volt DC positive signals, and is field changeable to accept ground inputs. The control station shall also include a circuit board to communicate with the Task Force Tips remote control monitor. Internally mounted switches shall be included for the ability to choose which control station shall be dominant. Relay connections for "At Park" indication shall be provided. The switch enclosure shall be weatherproof and utilize weatherproof components such as a membrane switch, silicone seal, hardware with o-rings and liquid tight electrical connections with strain relief fittings. A 10 foot long incoming power connection cable shall be supplied.

PENDANT REMOTE MONITOR CONTROL STATION

Task Force Tips model # Y4E-CT-10 pendant control station for Monsoon, Hurricane, Typhoon, and Tornado series remote control monitors shall be installed. The control station shall be tethered with a 10 foot long, four conductor cable with waterproof plug. The control includes membrane switches to control horizontal rotation, vertical elevation, nozzle stream pattern, park, oscillate, auxiliary 1 and auxiliary 2. The control station shall also include a circuit board to communicate with the Task Force Tips remote control monitor. Internally mounted switches shall be included for the ability to choose which control station shall be dominant. The control requires 12 or 24 volt DC power. The handheld control enclosure shall be weatherproof and have a protective silicone rubber casing. A storage bracket for the handheld control shall be included and shall comply with NFPA 1901

Section14.1.11. A 30 foot long, four conductor power and communications cable connected to a panel mount receptacle with protective cap shall be supplied. The switch enclosure shall be weatherproof and utilize weatherproof components such as a membrane switch, silicone seal, hardware with o-rings and liquid tight electrical connections with strain relief fittings. The unit shall be covered by a five-year warranty.

WIRELESS REMOTE MONITOR CONTROL SYSTEM
Task Force Tips model # YE-RF-900 wireless operator station for Monsoon, Hurricane, Typhoon, and Tornado series remote control monitors shall be installed. The 900 MHz wireless transmitter shall be designed for remote usage and operate up to 500 feet away from the monitor-mounted receiver. The remote control includes membrane switches to control horizontal rotation, vertical elevation, nozzle stream pattern, park, oscillate, auxiliary 1 and auxiliary 2. The handheld control enclosure shall be weatherproof, have a protective silicone rubber casing, a short, flexible antenna, four replaceable AA lithium batteries, a "Power" button with indicator LED, and low battery indication. The included radio receiver board is connected inside the monitor mounted control box. A storage bracket for the handheld control shall be included and shall comply with NFPA 1901 Section14.1.11. The unit shall be covered by a five-year warranty.

LEFT REAR DISCHARGE
One (1) 2-½" (6.35cm) discharge with a stainless steel valve shall be plumbed to the left side rear. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2-½"(6.35cm) valve outlet terminates with 2-½"(6.35cm) grooved connection. The valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge must be capable of flowing 500 GPM or greater.

JUMP LINE DISCHARGE
One (1) 2"(5.08cm) discharge with a stainless steel valve shall be plumbed to the right side hose tray. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2"(5.08cm) valve outlet terminates with 2"(5.08cm) grooved connection. The valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge shall be foam capable.

ADAPTER
Task Force Tips model # B-A adapter shall be provided. For corrosion resistance the lightweight tapered adapter shall have a hardcoat anodized finish and have a 900 PSI hydrostatic strength rating. The adapter shall be configured with 1-1/2" female NH and 1" male NH threads. The unit shall be covered by a five-year warranty.

AUTOMATIC NOZZLE
Task Force Tips Ultimatic 125, model # B-BGH automatic nozzle with shutoff shall be provided. The nozzle design shall allow for straight stream through dense wide fog patterns and be able to be flushed without shutting down. For corrosion resistance and durability the nozzle shall be constructed from hardcoat anodized aluminum alloy, have a six (6) position detent flow control stainless steel slide valve, a protective rubber bumper with fog teeth, stainless steel inlet debris screen, laser engraved serial number, and reflective labeling. An integral pistol grip handle shall be positioned directly below the valve handle. The nozzle shall have a 1" female NH inlet, which allows the nozzle to swivel when tightened, a flow range of 10-125 GPM at 100 PSI and be designed to accept the Task Force Tips FJ-U low expansion or FJ-UMX FoamJet multi expansion foam attachments. The unit shall have a unique serial number and be covered by a written five-year warranty.

TANK FILL
One (1) 2"(5.08cm) discharge with a stainless steel valve shall be plumbed to the tank. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2"(5.08cm) valve outlet terminates with 2"(5.08cm) grooved connection. Valve shall be controlled at the side panel with a chrome-plated push/pull locking "T" handle mounted on the pump panel.

CROSSLAY 1 ¾"
One double crosslay shall be installed on apparatus. Each section of the crosslay shall hold 200' of 1-3/4" double jacket fire hose. A 1-1/2" mechanical swivel hose connector shall be used in each crosslay to provide access of hose in either direction. Each crosslay shall have one (1) 2" (5.08cm) stainless steel valve. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The

2"(5.08cm) valve outlet terminates with 2"(5.08cm) grooved connection. Each valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near each control to indicate pressure. Each discharge shall also come equipped with a quarter-turn ¾" drain valve. Each discharge shall be foam capable. Eacg discharge must be capable of flowing 180 GPM or greater.

DUAL PRESSURE AUTOMATIC NOZZLE
Task Force Tips Mid-Force, model # HMD-VPGI dual pressure automatic nozzle with shutoff shall be provided. A knob located at the front of the nozzle shall allow for pressure rating adjustments of 100 or 55 PSI. The nozzle design shall allow for straight stream through dense wide fog patterns and be able to be flushed without shutting down. For corrosion resistance and durability the nozzle shall be constructed from hardcoat anodized aluminum alloy, have a six (6) position detent flow control stainless steel slide valve, a protective rubber bumper with fog teeth, stainless steel inlet debris screen, laser engraved serial number, reflective labeling and five year warranty. An integral pistol grip handle shall be positioned directly below the valve handle. The nozzle shall comply with the current NFPA 1964 standard. The nozzle shall have a 1-1/2" female NH inlet, which allows the nozzle to swivel when tightened, a flow range of 70-200 GPM at 100 PSI and be designed to accept the Task Force Tips FJ-LX-HM low expansion or FJ-MX-HM multi expansion FoamJet foam attachments.

CROSSLAY 2 ½"
One single crosslay shall be installed on apparatus. The section of the crosslay shall hold 200' of 2 ½"" double jacket fire hose. A 2-1/2" stainless steel mechanical swivel hose connector shall be used in the crosslay to provide access of hose in either direction. The crosslay shall have one (1) 2-½" (6.35cm) stainless steel valve. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2-½" (6.35cm) valve outlet terminates with 2-½" (6.35cm) grooved connection. The valve shall be electric controlled with a switch mounted on the pump panel. There shall be a Class 1 2 ½" pressure gauge mounted on the panel near the control to indicate pressure. The discharge shall also come equipped with a quarter-turn ¾" drain valve. The discharge shall be foam capable. The discharge must be capable of flowing 350 GPM or greater.

PORTABLE ATTACK MONITOR
Task Force Tips Blitzfire model # XX111A portable lightweight attack monitor shall be supplied.
The monitor shall include an integral safety shut off valve that will automatically shut down the water flow in the event control of the monitor is lost. The water flow is controlled by a six position detent, turbulence free slide valve. The detent flow control shall also function as the reset for the safety shut off valve to resume water flow. The water inlet shall pivot up and down to allow for stability on uneven surfaces. The discharge has vertical elevation travel between 10 and 50 degrees above horizontal with a ball and socket joint. The same ball and socket joint shall allow for horizontal adjustment of 20 degrees left and right of center. The discharge outlet shall have a removable stream straightener. The monitor shall have folding stabilization legs with carbide tips, which are concealed in the carry and stow positions. An integral carrying handle that also functions as an attachment point for the included anchor strap shall be provided. For corrosion resistance, the monitor shall be constructed from hardcoat anodized aluminum alloy and have a blue powder coat interior and exterior finish. The monitor shall be configured with a 2-1/2" female NH swivel rocker lug coupling and 2-1/2" male NH rigid outlet with a flow rating of 500 GPM. The unit shall be covered by a five-year warranty.

ATTACK MONITOR STORAGE BRACKET
Task Force Tips model # XX-B storage bracket shall be installed. The bracket shall be constructed from stainless steel and hardcoat aluminum and be designed for horizontal or vertical installation. The bracket shall include an adjustable strap assembly for elimination of nozzle movement. The bracket is designed for storage of the Blitzfire and Blitzfire OSC series portable monitors. The unit shall be covered by a five-year warranty.

DUAL PRESSURE NOZZLE TIP
Task Force Tips Max-Force, model # MD12A dual pressure automatic nozzle tip shall be provided. A knob located at the front of the nozzle shall allow for pressure rating adjustments of 100 or 55 PSI. The nozzle design shall allow for straight stream through dense wide fog patterns and be able to be flushed without shutting down. The ribbed rubber bumper shall allow for stream shape adjustment. For corrosion resistance and durability the nozzle shall be constructed from hardcoat anodized aluminum alloy, a protective rubber bumper with fog teeth, laser engraved serial number, reflective labeling and five year warranty. The nozzle shall comply with the current NFPA 1964 standard. The nozzle shall be suitable for foam solution application and designed to accept

the Task Force Tips FJ-LX-MD low expansion air aspirating attachment. The nozzle shall have a 2-1/2" female NH swivel rocker lug coupling and a flow range of 100-500 GPM at 100 or 55 PSI.

TANK TO PUMP

One (1) 4"(10.16cm) valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type. The valve shall be electric controlled with a switch at the side pump panel.

TOTAL PRESSURE GOVERNOR PLUS (TPG+)

Apparatus shall be equipped with a Class1 “Total Pressure Governor Plus” (TPG+) that is connected to the Engine Control Module (ECM) mounted on the engine. The “TPG+” will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine’s J1939 data for optimal resolution and response when supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the “TPG+”. The “TPG+” shall function as a Master Pump Discharge and Intake Gauge.

The TPG+ shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations. The “TPG+” shall be backwards compatible to any 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 “TPG+” shall have the ability to use either a 300 PSI or a 600 PSI discharge pressure transducer and a 300 PSI intake pressure transducer. PSG system diagnostics shall be built in and accessible by technicians. Programmable presets for RPM and Pressure settings shall be easily configurable. The straightforward menu structure shall allow the “TPG+” configuration to match existing apparatus operation as closely as possible.

The “TPG+” shall also include indication of engine RPM, system voltage, engine oil pressure and engine/transmission temperature with audible alarm output for all. The “TPG+” uses the J1939 data bus for engine information, requiring no additional sensors to be installed. The TPG+ shall monitor and display pump and engine hours. The “TPG+” shall use J1939 broadcast warnings for the alarm as a standard and allow the “user” to select warning values if “SOP’s” dictate.

ITL-40 TANK LEVEL GAUGE

The apparatus shall be equipped with a Class1 “ITL-40” Tank Level Gauge for indicating water or foam level. The Tank Level Gauge shall indicate the liquid level or volume on an easy to read LED display and show increments of 1/8 of a tank.

Each tank level gauge system shall include:

1) A pressure transducer that is mounted on the outside of the tank in an easily accessible area. Sealed foam tanks will require zero pressure vacuum vents.

2) A super bright LED display viewable from 180 degrees with a visual indication at nine accurate levels.

3) A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power. Additional (slave) displays (if requested) are to be easily integrated and will receive data from the same source as the Master Display. No additional transducers shall be required.

4) The system shall include the ability to display “text messages”

5) The system shall include built-in diagnostic capabilities.

ANODE PRO

The Fire Pump shall be equipped with replaceable anodes. These anodes shall be constructed with alloy meeting MIL-A-24779 (no exceptions). The pump shall have one anode on each intake section and one anode on the discharge section of the Fire Pump. The anodes shall have a central stainless steel core to prevent anode breakage that can lead to clogged nozzles (no exceptions).

Each anode shall have an internal probe that detects when the anode has worn to the point where the anode no longer provides adequate protection for the pump. The internal probe shall be connected to a monitoring box via a single wire and a sealed weatherpak connection. Each anode shall have an NPT thread to allow replacement and proper sealing and removal for replacement.

A monitor box shall be provided and mounted in a protected space such as the engineers’ compartment or behind the pump panel to indicate the status of the anodes. The monitor box itself shall have three individual LEDs that monitor the anodes every 4-5 seconds and indicates the status on the box panel. A clearly labeled monitor panel shall have a separate indicator LED for each anode. The LEDs shall indicate green when the anode is still working and shall flash red when the individual anode needs replacement. The monitor box housing shall be constructed of a non-metallic material and shall utilize a sealed pass-thru connector to prevent leakage contaminants into the anode monitor box. The circuit board for the monitor box shall be conformal coated to resist corrosion.

The monitor box (AnodePro) shall operate on 12VDC and shall be wired to battery on or ignition switches. The power connection shall be a two pin weatherpak sealed connector. The AnodePro shall be grounded directly to the Fire Pump body. The anode connections shall be color coded and all wiring shall conform to NFPA 1901 requirements.

TRV-L
A thermal protection device shall be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump. The thermal protection device shall be set to relieve water when the temperature of the pump water exceeds 120o F (49 C). The components of the thermal protection device shall be manufactured of brass and stainless steel and be compatible with most foam concentrates. The thermal protection device shall have 1-1/4 inch NPT threads for easy adaptability to existing pump discharge openings. The discharge line shall be 3/8 inch diameter tubing vented to atmosphere or back to the booster tank. The thermal protection device shall have a hydrostatic test rating of 600 PSIG.

MASTER PUMP DRAIN
The pump shall be equipped with a Class 1 Master Pump drain to allow draining of the lower pump cavities, volute and selected water carrying lines and accessories. The drain shall have an all brass body with a stainless steel return spring.

U.L. TEST POINTS
Two (2) U.L. test points shall be mounted on the pump panel for testing of the vacuum and pressures. The test points shall be a single piece with individual ports for suction and discharge.

VALVE CONTROLS
Class 1 locking push pull control rods shall be provided for valve actuation. The chrome plated zinc handles shall have a recessed area for 1” x 3” (2.54 x 12.70cm) identification tags. The controls shall be locked in any position.

DISCHARGE GAUGES
Individual Class 1 2-½(6.35 cm) line gauges for each 2” (5.08 cm) or larger discharge shall be provided and mounted adjacent to the discharge valve control handle. The gauges shall be Interlube filled pressure gauges and handle pressures from 0 to 400 PSI. The pressure gauge shall be fully filled with pulse and vibration dampening Interlube® to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation to minus 40 degrees F. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature material and be sealed from the water system using an insolating Sub Z diaphragm located in the stem. A colored bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage.

INDIVIDUAL DRAINS
All 2” (5.08cm) or larger discharge outlets shall be equipped with a ¾” ball valve drain valve or larger.

WIRING HARNESS
The Class 1 electrical wiring harness shall be manufactured using GXL wire as SAE- J1128 rated performance requirements. The electrical wiring harness shall be covered by a black split convoluted loom, rated at a minimum of 275º F. All terminals shall meet the minimum pull test as required by the manufacturers pull test and crimp measurement data. All splices shall be manufactured using the ultra sonic splice process. The harness shall be 100% connected to a Dynalab® circuit tester to insure continuity and correct assembly.

FOAMLOGIX MODEL 5.0 DUAL AGENT ADT
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 5.0 GPM (19 LPM) foam concentrate flow rate with maximum operating pressure of 250 PSIG (17 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 bar graph foam concentrate is being injected and the foam system capacity.

• Indicate on LED bar graph 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.

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.

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.

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.