APS Side Kick 500
121064 Rev.B

APS Power Take-Off (PTO) Pump

DETAILED SPECIFICATIONS

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

Pump Assembly
1. The pump shall be of a size and design to mount on commercial and custom truck chassis, and have the capacity of _____ gallons per minute (U.S. GPM), NFPA 1901 rated performance.
2. The entire pump shall be manufactured and tested at the pump manufacturer's factory.
3. The pump shall be driven by a transmission mounted or split drive line power take-off (PTO). The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance within the torque rating of the PTO, truck transmission gears and drive line components.
4. The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Standard 1901. Pump shall be free from objectionable pulsation and vibration.
5. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.
6. Pump body shall be vertically split, on a single plane, for easy removal of impeller assembly, including clearance rings.
7. Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.
8. The pump shaft shall have only one mechanical seal. The mechanical seal shall be spring loaded, maintenance free and self-adjusting. (No exceptions.)
9. Pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined, hand-ground and individually balanced. The vanes of the impeller intake eye shall be hand-ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.
10. Impeller clearance rings shall be bronze, easily renewable without replacing impellers or pump volute body.
11. The pump shaft shall be electric furnace heat-treated and corrosion resistant with a positive impeller lock. Pump shaft must be sealed with double lip oil seal to keep road dirt and water out of gearbox.

Gearbox
1. The gearbox shall be manufactured and tested at the pump manufacturer's factory.
2. Pump gearbox shall be of sufficient size to withstand the torque of the engine in pump operating conditions. The gearbox shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.
3. The gearbox drive shaft shall be of heat-treated chromium steel and shall withstand the torque of the engine in pump operating conditions.
4. All gears shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut helical design shall be provided. (No exceptions.)
5. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine, transmission and power take-off selected.

CERTIFICATION
The pump will perform and meet the following tests:
100% of rated capacity @150 PSI net pump pressure.
100% of rated capacity @ 165 PSI net pumps pressure.
70% of rated capacity @ 200 PSI net pump pressure.

50% of rated capacity @ 250 PSI net pump pressure.
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.

5" STEAMER INLETS
One 5" (12.70cm) steamer inlet will be provided on the left side. The inlet shall have long handle chrome vented cap and a screen.

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

PUMP MODULE PANELS
The pump module panel shall be 14 gauge brushed stainless steel.

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. 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 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: 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" multi-turn valve installed thru the instrument panel and labeled.

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 plugs shall be mounted on the pump panel for testing of the vacuum and pressures.

VALVE CONTROLS
Class 1 locking push pull control rods shall be provided for appropriate valves. 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.

Class 1 valve lift handles shall be provided on appropriate valves. The lift handles shall have a recessed area for 1" x 3" (2.54 x 12.70cm) identification tags. The lift handles require a self locking valve.

DISCHARGE GAUGES
Individual Class 1 2-½(6.35cm) line gauges for each 2" (5.08cm) or larger discharge shall be provided and mounted adjacent to the discharge valve control handle. The gauges shall indicate pressure 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 isolating Sub Z diaphragm located in the stem.

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.

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 straight 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 lift 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 500 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 straight 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 lift 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 500 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 lift 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.

OPTIONS:

LEFT SIDE 2" DISCHARGE
One (1) 2" (5.08cm) discharge with a stainless steel valve shall be plumbed to _____. 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.

-or-

LEFT SIDE 2 ½" DISCHARGE
One (1) 2-½" (6.35cm) discharge with a stainless steel valve shall be plumbed to _____. 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 700 GPM or greater.

TANK FILL
One (1) 1 1/2"(3.81cm) 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 1 1/2"(3.81cm) valve outlet terminates with 1 1/2"(3.81cm) grooved connection. Valve shall be controlled at the side panel with a chrome-plated push/pull locking "T" handle mounted on the pump panel.

-or-

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
One (1) 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 must be capable of flowing 180 GPM or greater.

CROSSLAY 2
One (1) 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 must be capable of flowing 180 GPM or greater.

HOSE REEL
One (1) 2"(5.08cm) discharge with a stainless steel valve shall be plumbed to the hose reel. 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 1 1/2"(3.81cm) grooved connection. The valve shall be actuated with an air cylinder. The valve shall be controlled with a switch at the pump panel.

TANK TO PUMP
One (1) 3" (7.62cm) valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type. The valve shall be actuated with an air cylinder. The valve shall be controlled with a switch at the pump panel.

-or-

TANK TO PUMP

One (1) 3"(7.62cm) valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type. The valve shall be actuated with an electric motor. The valve shall be controlled with a switch at the pump panel.

-or-

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 actuated with an air cylinder. The valve shall be controlled with a switch at the pump panel.

-or-

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 actuated with an electric motor. The valve shall be controlled with a switch at the pump panel.

MASTER GAUGES
Class 1 3-½(8.89cm) gauges shall be provided. The master discharge gauge shall indicate pressure from 0 to 600 PSI. The master intake gauge shall indicate pressure from -30hg to 600 PSI. The gauges shall be Interlube filled pressure gauges and handle pressures from 0 to 600 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 isolating Sub Z diaphragm located in the stem.

TOTAL PRESSURE GOVERNOR (TPG)
Apparatus shall be equipped with a Class 1 “Total Pressure Governor” (TPG) that is connected to the Electronic Control Module (ECM) mounted on the engine. The “TPG” will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine’s J1939 datalink for optimal resolution and response provided that J1939 is supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the TPG, subject to J1939 RPM data availability.
The TPG shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations and display operational status messages to the operator under certain circumstances. The TPG shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain consistent fleet fire-fighting capability.
TPG shall incorporate the ability to use either a 300 PSI or a 600 PSI transducer for best operation. PSG system diagnostics shall be built in and accessible by service technicians.
Programmable presets for RPM and Pressure settings shall be easily configurable. The TPG shall incorporate configurable parameters in the menu structure accessed through a diagnostic password.
The “TPG” shall also include indication of engine RPM, system voltage, engine oil pressure and engine 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 use J1939 broadcast warnings for the alarm points as a standard.

-or-

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 TANK LEVEL GAUGE
The apparatus shall be equipped with a Class1 "Intelli-Tank" Tank Level Gauge for indicating water or foam level. The Tank Level Gauge shall indicate the liquid level 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 4-light display 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.

-or-

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.

FOAMLOGIX 2.1-A FOAM CONCENTRATE PROPORTIONING SYSTEM
The apparatus shall be equipped with a FoamLogix automatic electronically controlled, direct injection, 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.

A DC powered variable-speed electronic direct-injection foam-concentrate proportioning system with a 2.1-gpm-foam concentrate pump shall be integrated into the apparatus to provide foam proportioning. The pump shall be capable of handling Class A foam concentrate only and be operated by a full-function panel mounted digital display.

-or-

FOAMLOGIX MODEL 3.3 SINGLE AGENT
The apparatus shall be equipped with a FoamLogix single agent 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.

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. 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 direct current with a ¾ Hp (0.5 Kw) power rating at a maximum current draw of 60 AMPS.

-or-

FOAMLOGIX MODEL 5.0 SINGLE AGENT

The apparatus shall be equipped with a FoamLogix single agent 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.

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 direct current with a ¾ Hp (0.5 Kw) power rating at a maximum current draw of 60 AMPS.