



Darley UHP-HV Diesel Specification¹

This dual pump is designed for either a powerhead type unit or a full module.

The module provides a “self-contained” diesel powered “slide-in” type ultra high pressure / high volume system (UHP- HV). The system shall be designed to fit into the back of a standard length and width pick-up truck or fire service body.

The powerhead is to be installed and plumbed by OEM/installer. The powerhead provides diesel driven volume and pressure pumps. The system is designed to be mounted and finished by installer.

The UHP-HV shall be designed to discharge low pressure water (foam solution option) from one discharge, or high pressure foam solution (option) from a hose reel (option) or both simultaneously.

Engine

The power to drive the system shall be provided by a *Kubota* model DH 902, liquid cooled, indirect injection, naturally aspirated diesel engine. The heavy duty rating for this engine is 24.8 hp @ 3600 rpm. Automotive engines or ratings will not be used. The power unit shall have re-borable crankcase of grey cast iron.. The pressure-lubricated engine shall have a 12VDC – 40 amp alternator, glow plugs. A remote oil drain shall be supplied.

High Volume Water Pump

The low pressure water pump shall be a *Darley 2BE* single-stage centrifugal pump with a vertically split aluminum case. It shall have replaceable bronze impeller and seal rings on a stainless steel shaft. The pump seal shall be of a mechanical design.

High Pressure Water Pump

The high pressure water pump shall be a CAT pump 7CP6170 belt driven plunger pump. The pump shall incorporate a forged brass head with FPM and EPDM elastomers offering compatibility with a wide range of foam liquids. It shall be of rugged continuous-duty triplex design capable of pressures exceeding 1400psi.

There shall be built in pressure relief valves to protect the system from over pressure. In addition, there will be integrated thermal relief valve designed to keep the pump at safe operating temperatures. All hp pressure lines shall be rated to a minimum of 2000 psi.

Drive System

The high volume water pump is directly driven in line with the engine crankshaft. The high pressure pump is belt driven from special bell housing sprocket drive. It shall be driven via a dry ²*Gates Poly-Chain*[®] drive system. The complete drive system shall have a 2,000 hour rated service life and shall be designed and rated for the imposed speed and load.

Electrical System

All electrical equipment installed by the manufacturer shall conform to current automotive electrical system standards and the requirements of the applicable NFPA apparatus standards. The wiring shall be individually and permanently color and function coded. The installation shall meet SAE Standard J1128 in its latest edition for GXL or SXL temperature rating.

All exposed wiring shall run in loom with a minimum of 280°F (137.8°C) rating. All wiring loom shall be properly supported and attached to frame members along the entire run. At any point where wire or looms must pass through metal, rubber grommets shall be installed to protect the wire from abrasion.

¹ Specifications are subject to change and improvements without notice

² [®] *Gates Poly-Chain* is a registered trademark of the Gates Corporation, dba The Gates Rubber Company



The main low voltage electrical terminal block and circuit breaker panel shall be provided behind the pump operator's panel in a location providing easy service access.

The electrical connections shall be made using heat shrink and/or weatherproof connectors. All electrical circuits shall be protected with ATO blade type fuses.

Priming System

A *Darley* 12 VDC electric, oil-less, rotary-vane priming system shall be utilized. The primer is capable of priming the water pump through 20' of hard suction hose with a 10' lift. Primer controls and instruction plate shall be mounted on the operator's panel.

Plumbing, Hoses and Lines

All piping shall be of galvanized or stainless steel. Uses of grooved end pipe couplings are required for flexibility and movement of system components on mobile equipment. Flexible piping may be used where applicable. Check valves are required throughout the system to maintain integrity and shall be placed so that water and foam solution do not inadvertently mix. Drain cocks shall be provided on the water pump and Cat Pump to prevent freeze damage.

Tank to Pump

There shall be a brass two piece 2½" tank to pump valve fitted in the module and controlled from the operator's panel.

Inlets

A 2½" NH male suction inlet with cap and lanyard shall be provided at the operator's panel.

Outlets

1. There shall be one 2½" NH water only discharge (optionally foam discharge) with a 2" valve provided on the operator's panel. The valve shall terminate in NST threads with cap and lanyard.
2. A high pressure discharge outlet will be provided for a hose reel which can be optionally mounted to either the top of the module or the tank.

Tank Refill

A 1½" tank refill line with a 1½" valve and flexible, reinforced wire-braid, hydraulic hose shall be provided, and controlled from the operator's panel.

Module Frame

The module frame shall be constructed of aluminum and designed for rigorous fire service use. Aluminum tubing shall be ¼" thick and be of 6061 or better specification. The entire frame will be powder coated black before assembly of all components.

Fuel Tank

A 3 gallon poly fuel tank with a mounting bracket for the fuel tank and shall be provided. The fuel system will be emission compliant for gasoline service.

Control Panel

The control panel shall be laser cut, 16 gauge, powder coated stainless steel. The instruments, indicators and controls that are located on the control panel / operators area shall be positioned in a logical manner and clearly marked to provide for simple and easy operation. The following items shall be mounted on the control panel:

1. Pump Panel Light Cluster
2. Foam or Dual Foam Solution Control Valve (option)
3. Water Only Discharge Valve(optionally foam discharge); 2½" NH Male Outlet



4. Tank Refill Valve
5. Tank to Pump Valve
6. 2½” NH Male Suction Inlet with Cap
7. Prime Valve Controls
8. 2½” Master Low Water Pressure Gauge
9. 2½” Master High Water Pressure Gauge
10. Engine Throttle
11. Engine Control
 - a. Hour Meter / Tachometer
 - b. Ignition Switch
 - c. Low Engine Oil PSI Light
 - d. Choke

Labels

All controls shall be clearly labeled. The labels shall comply with applicable NFPA standards.

Testing

The completed unit shall undergo a manufacturer’s run-in test prior to delivery. The engine, pump and CAT pump shall be operated for a minimum period of two (2) hours, during which time the test operator shall monitor and record the functions and performance of each system component.

This testing shall be performed to ensure proper system operation and performance prior to shipment. The manufacturer shall provide written certifications that the tested unit meets all performance criteria contained herein.

Manuals

One (1) copy of the *Operation and Maintenance Manual* and a CD copy shall be provided to the purchaser with each unit. This manual shall include detailed instructions in the operation and maintenance of the overall unit, engine, water pump and foam proportioner.

Dimensions

Length	TBD
Width	TBD
Height	TBD
Weight	TBD

Performance

Low Pressure Water Pump	140 gpm @ 110 psi 200 gpm @50
High Pressure pump	8 GPM @ 1400 psi
Simultaneous Flow	100gpm @100 psi 8gpm@ 1100psi
Engine Horsepower	24.8 hp @ 3600 rpm

Warranty³

Engine	1 year
HP pump	1 year
Water Pump	3year/3000 hours
Chemical Injector	1 year
Water Tank	Lifetime

³ Covered by the original manufacturer’s warranty.



All fabrication and materials are warranted for a period of two (2) years barring accidents, abuse or negligence. Excluding from warranty are all consumables and parts subject to routine replacement. We will repair or assist in the repair or replacement of the product in its entirety.

UHP-HV Options

The list of options, which follow, can be added to the standard UHP - HV module according to your specifications and needs of operation. These options are not included in the base price of the module.

Water Tank - 150 200 250 gallons

Specify size as needed -

The tank will be designed to mount within 8" of the rear of the module to promote good air circulation to the engine. It will be separate and shipped loose and mounted to the bed of the vehicle with separate mount hardware.

The water tank shall be rectangular in configuration and shall be constructed of ½" polypropylene sheet. All joints and seams are to be nitrogen welded.

The tank cover shall be constructed of ½" polypropylene and shall incorporate hold-downs to assist in keeping the cover rigid under fast filling conditions. The cover shall have a combination vent and manual fill tower. The tower shall have a hinged cover and a ¼" thick polypropylene screen.

There shall be two (2) standard tank outlets; one for the tank to pump suction line and one for the tank fill line. An anti-swirl plate shall be installed at the tank-to-pump outlet. A manufacturer's warranty shall be included for the tank.

The tank shall include all fittings, adapters, senders, switches and hoses necessary for tank to module connections.

Water Tank - 150 200 250 gallons and skid

Specify size as needed -

A plastic weldment sub-frame shall be provided to support the entire slide-in module. The sub frame shall be strong enough to support the weight of the booster tank and module / pumping equipment while in the apparatus and during loading and unloading and shall be utilized as a base mount for the engine and pumps. Provisions shall be incorporated in the sub frame to facilitate using a forklift for loading and unloading of the unit.

The water tank shall be rectangular in configuration and shall be constructed of ½" polypropylene sheet. All joints and seams are to be nitrogen welded.

The tank cover shall be constructed of ½" polypropylene and shall incorporate hold-downs to assist in keeping the cover rigid under fast filling conditions. The cover shall have a combination vent and manual fill tower. The tower shall have a hinged cover and a ¼" thick polypropylene screen.

There shall be two (2) standard tank outlets; one for the tank to pump suction line and one for the tank fill line. An anti-swirl plate shall be installed at the tank-to-pump outlet. A manufacturer's warranty shall be included for the tank.

The tank shall include all fittings, adapters, senders, switches and hoses necessary for tank to module connections.



Foam Tank

A 10 to 15 –gallon polypropylene foam reservoir shall be provided as an integral part of the booster tank and may contain a level sender for gauge in the bottom of the tank to signal level of the foam reservoir (option sender hole). The tank shall be plumbed to supply the foam proportioner with a minimum 1/2” hose (size varies per customer specifications).

Hose Reel

The hose reel shall be of painted steel construction with fairleads and electric rewind, installed with 200’ of 1/2” *high pressure* hose. The hose reel shall be mounted on top of the module and shall have a straight swivel inlet. The system will be provided with a rewind button on the front of the operator’s area. A variable pressure single flow discharge wand with pistol grip hand valve and straight discharge tip will be provided with the reel.

Dual Flow Nozzle Gun

An all aluminum dual flow “Dual Strike” nozzle gun shall be capable of two different flows –

1. Straight stream delivers penetrating spray with fine cooling mist 30 to 50 ft.
 2. Fog stream delivers high expansion foam up to 45 ft. with expansion ratios up to 10:1 for maximum coverage. The Fog stream shall be compatible and effective with Class A & Class B foams
- The Nozzle also incorporates an auto shut-off feature for firefighter safety.

Foam Concentrate Proportioner

The automatic foam proportioner shall be the CAT precision foam control system. It shall be provided and installed to inject foam concentrate into the high pressure discharge hose. The proportioner shall automatically meter the correct percentage of foam concentrate, based on current flow, into the water stream. A check valve shall be provided ahead of the foam injection point to prevent foam solution back-flow. The concentrate pump shall be an around the pump type system. The system shall be capable of flowing either type A or B fire fighting foams (flush required for both). The proportioner knob pointer shall allow injection rates to 6% capabilities.

Dual Foam Flurry Concentrate Proportioner

The Dual Foam Flurry is an “around the pump/eduction” foam injection system designed for the UHP-HV. It is capable of injecting Class A foam into the suction side of the high volume pump as well as the suction side of the ultra-high pressure pump without needs for electrical power. It will be capable of proportionally higher injection rates automatically as flow increases. When flow ceases in the discharge piping, the Dual Foam Flurry will automatically stop injection. The high volume side can inject up to .65 gallon a minute of Class A chemical under full flow. It requires a minimum discharge pressure of 80 to optimum 100 psi or above to inject. There shall be little or no pressure allowed into the suction head of the fire pump (hydrant use) when operating the Dual Foam Flurry. The high pressure side can inject up to .65 gallon a minute of Class A chemical under full flow, which is around 6% chemical percentage. The intake pressure should be between 20-35 psi into the UHP side (pre-set).

Suction Valve

The suction valve shall be a 2½” hydrant type valve mounted on the control panel suction inlet.

Water Level Gauge

One (1) electronic water level gauge shall be provided on the control panel.

Foam Level Gauge

One (1) electronic foam level gauge shall be provided on the control panel.



<i>Odin® UHP-HV diesel</i>	
Standard Equipment	
<ul style="list-style-type: none"> • Engine – Kubota 24.8 HP, water Cooled, 3 cylinder, Diesel Powered, 12 VDC Electric Start • Control Panel – Illuminated, Laser Cut, Brushed Stainless Steel Panel with all Engine, Water Pump controls. 	<ul style="list-style-type: none"> • LP Pump System – Darley Model “2BE” with 2½” Water Discharge, 2½” NPT Suction Inlet, Muffler Primer, 2½” Water Pressure Gauges • HP Pump System – CAT model 7CP, belt driven 8gpm@1200 PSI • Frame – Lightweight Aluminum tubing. 1/4” wall, black powder coated. • Fuel tank – a emission compliant fuel tank – 3 gallons capacity
Options	
Water tank and skid to 150 gallons	
Water tank and skid to 300 gallons	
Foam Cell for tanks	
Level Gauge – Water or Foam <i>(price each)</i>	
Hose Reel – Installed with 200’ of 1/2” HP Hose, pistol grip valve and Tip	
Dual Foam Gun	
2.5” Suction valve – hydrant type	
CAT UHP Foam system	
Dual Foam Flurry	