

Pyrolance, LLC

**SPECIFICATIONS FOR**

***DIESEL ENGINE DRIVEN***

***ULTRA HIGH PRESSURE FIRE FIGHTING SYSTEM***

***B2000 M-D***

# Pyrolance, LLC

## **HIGH PRESSURE FIRE FIGHTING SPECIFICATIONS**

### **Scope and General Design Requirements**

A fire fighting system shall be provided for offensively attacking a fire. The high pressure fire-fighting system shall allow the operator to attack fire from a safe position. The system shall be extremely effective in fire attack operations with limited water supplies.

### **Components and Base Plate Design**

The fire-fighting system shall consist of:

- Engine: Diesel driven engine
- Water pump: High pressure positive displacement piston pump
- Hose Reel: Ultra-high pressure hose reel and attack hose
- Nozzle: Manually operated ultra-high pressure pistol grip style fog nozzle

The major components shall be assembled on a removable assembly with integral engine. The entire system shall be designed to be a quickly installed or removable “plug-and-play” module.

### **Performance Capabilities**

The fire-fighting system shall be tested and proven to be highly effective in the following scenarios:

- Wildland, grass, and brush fire applications
- Automobile and truck fires
- Limited structural fires
- Confined or concealed space fires
- Limited industrial fires
- Shipboard and marine firefighting
- Military fire-fighting applications
- Container fires

## **BASE PLATE MOUNTING FOR DIESEL ENGINE**

The fire-fighting system shall be mounted on a 1/2" (12 mm) aluminum base plate assembly. The mounting assembly shall be powder coated and shall be designed to contain the specified major components of the system.

## **ULTRA HIGH PRESSURE FIRE PUMP SPECIFICATIONS**

The fire-fighting system shall be equipped with a heavy duty ultra-high pressure three plunger type positive displacement fire pump.

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The pump shall have the following features:

- Pump rating: 20 GPM @ 2,200 PSI (80 LPM @ 150 bar)
- Operational rating: 20 GPM @ 1,400 PSI (80 LPM @ 100 bar)
- Brass Manifold
- Stainless Steel Check Valve
- Stainless Steel Plunger Guides
- Bronze Connecting Rods
- Tapered Roller Bearings
- Solid Ceramic Plungers
- Heavy Duty Flat Base
- High Pressure Seals
- Heat Treated Crankshaft.

## **POLY DRIVE SYSTEM SPECIFICATIONS**

The ultra-high pressure fire pump shall be equipped with a tooth-type Poly Belt drive system between the engine and the fire pump. The pulley ratio shall be appropriate for the engine type to produce the specified fire pump performance.

## **ENGINE INSTALLATION**

The fire-fighting system shall be powered by a Hatz air cooled diesel engine. The engine installation shall be designed with adequate cooling and ventilation air in the mounting area.

The engine shall have the following specifications:

- Model: 2-4M41
- Type: Air cooled in-line, four stroke
- Cylinders: Two
- Rating: 34 HP (25.3 kw)
- RPM: 2,900
- Weight: 447 lbs. (303 kg)
- Oil filter and cooler
- Electric engine start with on-off control
- High Coolant Temperature Light
- Low Pressure Light
- High Oil Temperature Light
- Oil alert system and shut down system

## **EXHAUST SYSTEM**

The fire pump engine shall have a muffler, rain cap, heat guard, and exhaust pipe installed on the engine assembly. The exhaust pipe shall be directed vertically and away from the pump operator panel.

## **DIESEL FUEL TANK**

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A plastic fuel tank shall be installed for the specified diesel engine. The fuel tank shall have a capacity of approximately 4 gallons (15 L). A shut/off valve and flexible fuel line shall be furnished.

## **ELECTRIC SUPPLY CABLE AND CONNECTION**

The unit shall be powered by the chassis power system. There shall be a 12V+ power stud, and a ground stud provided for the OEM / installer to power the system. The OEM / installer shall be responsible for supplying the power to the unit with a circuit breaker.

## **INSTRUCTIONS AND LABELING**

A fire-fighting pump instruction nameplate and necessary warning labels shall be installed on the assembly. (English language)

## **HOUR METER AND TACHOMETER**

The fire pump engine shall be equipped with an hour meter and tachometer installed on the control panel.

## **OIL DRAIN HOSE**

The fire pump engine shall be equipped with an engine oil drain extension equipped with a valve, plug, and identification label.

## **PANEL LIGHT**

The pump control panel shall be provided with an LED 12 volt light with switch.

## **PUMP CONTROL PANEL**

The control panel shall be ergonomically designed and operator friendly. The panel shall be labeled and installed to be easily visible from the operator's position. The following instruments and controls shall be installed:

- Master electrical switch
- Emergency stop (red) switch
- Momentary contact two-position start-stop ignition switch
- Reel discharge control valve
- Control panel light and switch
- One (1) UHP pressure gauge

## **PLUMBING**

The fire-fighting system shall be plumbed with high pressure hydraulic type hose, plumbing and fittings. This shall include double wire braided high pressure hoses of various sizes, zinc plated steel hose ends, and plated steel hydraulic fittings. The threads shall be male and female NPT, JIC and SAE O-ring style in various sizes. Rigid plumbing shall be in zinc plated steel piping with pipe fittings of zinc plated steel.

## **BYPASS UNLOADER VALVE**

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The ultra-high pressure plumbing system shall include a bronze adjustable by-pass unloading valve set for the proper working pressure of the system. The valve shall unload the excess pressure to the intake side of the pump.

## **PRESSURE SAFETY, EASY START, THERMAL RELIEF VALVE**

The ultra-high pressure plumbing system shall include the following devices:

- a.) One (1) pressure safety relief valve which shall relieve water pressure to atmosphere; set at a slightly higher pressure than the unloading valve.
- b.) One (1) thermal relief valve which shall open if water temperatures exceed 145 F (62 C) degrees; designed to protect the pump from high temperature conditions and relieve the water to atmosphere.
- c.) One (1) EZ start valve.

## **INTAKE FILTER**

A 1-1/4" (31 mm) water filter with 32 mesh stainless steel screen shall be installed in the water supply line to the fire pump. The filter shall be accessible for cleaning the screen.

## **ELECTRICAL WIRING**

Necessary low voltage automatic circuit breaker protection shall be provide where required. Wiring shall be stranded copper automotive type, sized for the appropriate electrical load. Exposed wiring shall be protected with convoluted split plastic loom; such looms shall be mechanically secured. Wiring shall be run in protected areas or enclosed in metal panels where subject to mechanical injury. Electrical connections and termination of wiring shall be within weather proof plastic enclosures with waterproof strain reliefs and connectors.

## **WATER TANK SUPPLY LINE**

A 1.25" (31 mm) water tank to fire pump line shall be installed as follows:

- a) From the fire pump to the water filter shall be a 1.25" (31.75mm) flexible transparent hose.
- b) One (1) 1.25" (31.75mm) manually operated valve with control handle.
- c) 15' (5 meters) of 1.25" (31 mm) flexible water hose with removable connections and clamping devices to connect to a (non-drafting) water supply / source.

## **DISCHARGE PRESSURE GAUGE**

One (1) 2.5" (62 mm) liquid filled pressure gauge shall be installed from the discharge side of the ultra-high pressure fire pump, with the gauge mounted on the pump panel.

## **THROTTLE CONTROL**

The engine speed control shall be an electrically controlled mechanical throttle which shall automatically increase engine RPM speed when actuated and when released shall return the engine speed to idle.

## **ELECTRIC REWIND HOSE REEL – ULTRA-HIGH PRESSURE**

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One (1) ultra-high pressure steel hose reel shall be installed with a maximum capacity of 200' of 3/4" hose per reel. The reel shall have a leak proof ball bearing swing joint, electric 12 volt rewind provisions. The reel system shall be designed for a 2,000 PSI (135 bar) working pressure. The reel shall be painted red.

Each reel shall be equipped with a locking pin assembly.

The high pressure hose reel shall be supplied by a 1/2" (12 mm) hydraulic type wire braided flexible hose line. One (1) push button electric rewind control shall be installed near the reel. The wiring from the hose reel electric box shall be protected with conduit or loom.

The hose reel shall be equipped with a electrical wiring junction box of plastic construction with a sealed cover assembly. The box shall house the reel solenoid, circuit breaker, and electrical wiring for the rewind control circuit and electric rewind motor power supply. The electrical supply shall be sized for the reel motor for both positive and neutral cables. The electrical supply wiring shall be supplied from the main electrical supply box for high pressure pump skid or module. The supply line to the reel shall have a quick disconnect connection at the main electrical supply box.

One (1) stainless steel hose roller assembly shall be supplied with reel for protection of the hose during hose removal and rewind operations.

## **REEL MOUNTED ULTRA-HIGH PRESSURE HOSE**

150 foot (45 m) length x 3/4" (19 mm) hose shall be installed with threaded couplings. The hose shall have a working pressure of 3,125 psi (215 bar).

The hose reel(s) shall be installed by the OEM.

## **NOZZLE -- ULTRA-HIGH PRESSURE**

One (1) 20 GPM (80 LPM) ultra-high pressure pistol grip fog nozzle shall be provided for the high pressure fog reel.

## **FACTORY TESTING PRIOR TO SHIPMENT**

The entire pump and the plumbing system shall undergo a complete factory test. These test results shall be provided with shipment.

## **CRATING**

The equipment shall be properly crated, sealed, and protected for shipment. The crate shall be approximately: 48" (1219 mm) wide x 48" (1219 mm) long x 36" (914 mm) high in size and less than 500 lbs. (227 kg) in weight.

## **WARRANTY**

The PyroLance ultra-high pressure type firefighting system components shall be covered by a one (1) year parts and labor warranty. The installation portion of the warranty shall be covered by the final stage assembler.

## **TECHNICAL MANUAL**

The ultra-high pressure firefighting system shall be covered by a detailed technical manual covering installation, testing, operation, maintenance, and parts. This manual shall have various levels of warnings and caution notices provided. Paper and electronic portions will be supplied with the apparatus.

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