

# **Application & Reference Data Typical Specifications**

## **Section 914 Vertical Turbine Fire Pump**

---

Typical Specifications  
**Vertical Turbine**  
**Fire Pump**  
Motor Driven

---

## VERTICAL

Contractor shall furnish and install a quantity of \_\_\_\_\_ Aurora Pump \_\_\_\_\_ stage, \_\_\_\_\_ Model (Underwriters Laboratories Listed) (Underwriters Laboratories of Canada Listed) (Factory Mutual Approved) water lubricated vertical turbine fire pump(s). Each unit shall include a bowl assembly, strainer, column and shaft, surface discharge head, vertical hollow shaft electrical motor, automatic air release valve, discharge pressure gauge, and automatic motor controller.

## CONDITIONS OF SERVICE

The pump(s) shall be rated for \_\_\_\_\_ GPM at \_\_\_\_\_ PSI at the discharge head centerline. The maximum lift below (distance from the discharge head centerline to the minimum low water level) will not exceed \_\_\_\_\_ feet. The distance from the top of the pump mounting pad to the bottom of the sump or reservoir shall be \_\_\_\_\_ feet. The unit(s) will be installed at \_\_\_\_\_ feet elevation above sea level with a maximum ambient temperature of \_\_\_\_\_ degrees F.

## PUMP CONSTRUCTION

### DISCHARGE HEAD

The discharge head shall be Class 30 cast iron with a separate cast iron foundation plate, and shall be furnished with a grease lubricated packing box and ANSI (125 lb.) (250 lb.) standard discharge flange. To prevent damage to the shaft when installing or removing the motor, a separate motor shaft shall be furnished and shall be connected to the headshaft at a point above the packing box with a threaded coupling. The headshaft shall be furnished with a stainless steel sleeve where it passes through the packing box. The discharge head shall be provided with a \_\_\_\_\_" NPT tap for packing box drainage. The discharge head shall be hydrostatically tested 1-1/2 times the maximum working pressure but in no case less than 250 PSI

### COLUMN PIPE

Pump column pipe shall be furnished in sections not exceeding 10 feet in length with straight threads and sleeve type couplings. Pipe weights shall be not less than specified in NFPA #20.

### LINESHAFT

Open, water lubricated construction shall be used where the distance from the discharge head to the static water level does not exceed 50 feet. Lineshaft shall be furnished in sections not exceeding 10 feet in length. Lineshaft shall be SAE 1045 steel of adequate size to transmit the horsepower and thrust required and shall have renewable shaft sleeves. The lineshaft shall run in neoprene bearings housed in bronze bearing retainers.

### BOWL ASSEMBLY

The pump bowls shall be Class 30 cast iron with bronze bowl wearing rings, bronze enclosed impellers and steel impeller lock collets. The pump shaft shall be 416 stainless steel supported by bronze bowl bearings. The bowl assembly shall be hydrostatically tested to 1-1/2 times the maximum working pressure but in no case less than 250 PSI. The bowl assembly shall be performance tested and certified performance curves supplied.

### STRAINER

A bronze basket strainer with a free area of at least 4 times the suction area and with openings to restrict the passage of a 1/2" sphere shall also be supplied.

### ELECTRIC MOTOR

Electric motor(s) shall be of the weather protected Type 1, vertical hollow shaft design with non-reverse ratchet and 1.15 service factor, \_\_\_\_\_ RMP, and wound for \_\_\_\_\_ phase, \_\_\_\_\_ hertz, \_\_\_\_\_ volts. Motor(s) shall be of the (across-the-line) (part-winding) (wye-delta) (primary resistor) (auto-transformer) (soft start) type starting and sizing so as not to exceed the permissible loading limits of NFPA #20 (or Factory Mutual Loss Prevention Data Sheet 3-7N) at any point on the pump performance curve. Motor(s) shall be provided with thrust bearings having an average life of 5 years continuous operation and capable of sustaining the maximum pump downthrust. Maximum motor horsepower shall not exceed \_\_\_\_\_ HP.

---

Typical Specifications  
**Vertical Turbine  
Fire Pump**  
Motor Driven

---

Section **914** Page **103**

Date **June 1, 2001**

## CONTROLLER

The electric motor controller shall be arranged to start the fire pump motor automatically on loss of system pressure with (automatic stop) (manual stop). (For sprinkler or standpipe systems where an automatically controlled pumping unit constitutes the sole supply, the controller shall be wired for manual shutdown. Manual shutdown shall also be provided where required by the authority jurisdiction.) It shall be supplied with a circuit breaker rated not less than \_\_\_\_\_ AIC at \_\_\_\_\_ phase, \_\_\_\_\_ hertz, \_\_\_\_\_ volts.

The magnetic starting contactor shall be of the (choose one):

- |   |  |
|---|--|
| 1. Across-the-line type.                    | 5. Wye-Delta open transition reduced voltage type.   |
| 2. Primary resistor reduced voltage type.   | 6. Wye-Delta closed transition reduced voltage type. |
| 3. Primary reactor reduced voltage type.    | 7. Auto transformer reduced voltage type.            |
| 4. Part winding reduced voltage start type. | 8. Solid state soft start reduced voltage type.      |

## ACCESSORIES

Furnish each pump with the following fittings or accessories:

1. 3-1/2" dial discharge pressure gauge.
2. Minimum 1-1/2" automatic air and vacuum release valve.
3. Pressure recorder as required by Factory Mutual and NFPA #20, common to all pumps.
4. Hose valve manifold with a set of 2-1/2" hose valves, caps and chains, or flowmeter common to all pumps.
5. Water level testing device common to all pumps.

## STANDARDS

All equipment furnished and the complete installation shall be in accordance with NFPA #20 and/or (UL448) (ULC 448) (Factory Mutual Approved Standard #1312). Pump(s) and controller(s) shall bear the (UL) (ULC) (FM) mark.

---

Typical Specifications  
**Vertical Turbine  
Fire Pump  
Engine Driven**

---

## GENERAL

Contractor shall furnish and install a quantity of \_\_\_\_\_ Aurora Pump \_\_\_\_\_ stage, \_\_\_\_\_ Model (Underwriters Laboratories Listed) (Underwriters Laboratories of Canada Listed) (Factory Mutual Approved) water lubricated vertical turbine fire pump(s). Each unit shall include a bowl assembly, strainer, column and shaft, surface discharge head, vertical hollow shaft right angle gear, gear to engine flexible shaft with guard, automatic air release valve, discharge pressure gauge, and diesel engine with fuel and starting systems and automatic engine controller.

## CONDITIONS OF SERVICE

The pump(s) shall be rated for \_\_\_\_\_ GPM at \_\_\_\_\_ PSI at the discharge head centerline. The maximum lift below (distance from the discharge head centerline to the minimum low water level) will not exceed \_\_\_\_\_ feet. The distance from the top of the pump mounting pad to the bottom of the sump or reservoir shall be \_\_\_\_\_ feet. The unit(s) will be installed at \_\_\_\_\_ feet elevation above sea level with a maximum ambient temperature of \_\_\_\_\_ degrees F.

## PUMP CONSTRUCTION

### DISCHARGE HEAD

The discharge head shall be Class 30 cast iron with a separate cast iron foundation plate, and shall be furnished with a grease lubricated packing box and ANSI (125 lb.) (250 lb.) standard discharge flange. To prevent damage to the shaft when installing or removing the motor, a separate motor shaft shall be furnished and shall be connected to the headshaft at a point above the packing box with a threaded coupling. The headshaft shall be furnished with a stainless steel sleeve where it passes through the packing box. The discharge head shall be provided with a \_\_\_\_\_" NPT tap for packing box drainage. The discharge head shall be hydrostatically tested 1-1/2 times the maximum working pressure but in no case less than 250 PSI

### COLUMN PIPE

Pump column pipe shall be furnished in sections not exceeding 10 feet in length with straight threads and sleeve type couplings. Pipe weights shall be not less than specified in NFPA #20.

### LINESHAFT

Open, water lubricated construction shall be used where the distance from the discharge head to the static water level does not exceed 50 feet. Lineshaft shall be furnished in sections not exceeding 10 feet in length. Lineshaft shall be SAE 1045 steel of adequate size to transmit the horsepower and thrust required and shall have renewable shaft sleeves. The lineshaft shall run in neoprene bearings housed in bronze bearing retainers.

### BOWL ASSEMBLY

The pump bowls shall be Class 30 cast iron with bronze bowl wearing rings, bronze enclosed impellers and steel impeller lock collets. The pump shaft shall be 416 stainless steel supported by bronze bowl bearings. The bowl assembly shall be hydrostatically tested to 1-1/2 times the maximum working pressure but in no case less than 250 PSI. The bowl assembly shall be performance tested and certified performance curves supplied.

### STRAINER

A bronze basket strainer with a free area of at least 4 times the suction area and with openings to restrict the passage of a 1/2" sphere shall also be supplied.

### GEAR

A vertical hollow shaft right angle gear with a non-reverse ratchet shall be furnished to match the mounting dimensions of the discharge head. The gear shall have adequate thrust and horsepower ratings to transmit the maximum thrust and horsepower required by the pump.

---

Typical Specifications  
**Vertical Turbine  
Fire Pump**  
Engine Driven

---

## ENGINE

Diesel engine(s) shall be equal to \_\_\_\_\_ Model \_\_\_\_\_ rated \_\_\_\_\_ HP at \_\_\_\_\_ RPM at 300 feet above sea level and 77 degrees F and shall be (Underwriters Laboratories Listed) (Factory Mutual Approved). Each engine shall be provided with electric starting equipment and a charging alternator. The factory supplied heat exchanger piping loop complete with required strainers, a pressure gauge, a pressure reducing valve, and a bypass line shall be installed between the pump discharge head and the engine heat exchanger by the installing contractor. Each engine shall be furnished with lead-acid starting batteries, battery rack and cables, a flexible exhaust connector and industrial type silencer. Furnish each engine with a jacket water heater.

## FLEXIBLE SHAFT

A flexible shaft, with engine and gear flanges, shall be furnished to connect the engine to the gear. The shaft shall be adequately sized to transmit the maximum pump brake horsepower at the engine speed with a minimum bearing life of 2500 hours. The shaft shall be protected by a shaft guard.

## CONTROLLER

The diesel engine controller shall be arranged to start the fire pump motor automatically on loss of system pressure with (automatic stop) (manual stop). (For sprinkler or standpipe systems where an automatically controlled pumping unit constitutes the sole supply, the controller shall be wired for manual shutdown. Manual shutdown shall also be provided where required by the authority jurisdiction.) An automatic weekly test timer shall also be standard. The controller shall be furnished with a built-in battery charger capable of restoring the batteries from a fully discharged condition to a fully charged condition within twenty-four (24) hours.

## FUEL SYSTEM

Furnish an above ground fuel tank with a capacity equal to one gallon per horsepower plus 5% volume for expansion and 5% volume for sump. Furnish the tank with an indicating fuel level gauge. Provide flexible fuel line connectors at the engine and fuel line connections at the fuel tank. (Fuel lines to be provided by the installing contractor.)

## ACCESSORIES

Furnish each pump with the following fittings or accessories:

1. 3-1/2" dial discharge pressure gauge.
2. Minimum 1-1/2" automatic air and vacuum release valve.
3. Main relief valve with closed waste cone.
4. Discharge tee with relief valve elbow.
5. Pressure recorder as required by Factory Mutual and NFPA #20, common to all pumps.
6. Hose valve manifold with a set of 2-1/2" hose valves, caps and chains, or flowmeter common to all pumps.
7. Water level testing device common to all pumps.

## STANDARDS

All equipment furnished and the complete installation shall be in accordance with NFPA #20 and/or (UL448) (ULC 448) (Factory Mutual Approved Standard #1312). Pump(s) and controller(s) shall bear the (UL) (ULC) (FM) mark.