



## Typical Specifications for Horizontal Fire Pumps

**GENERAL:** The pumps furnished for fire protection service shall be supplied with the specified drivers, controls and pump accessory items by the pump manufacturer. The pump, driver and control shall be

- ☐ Underwriters Laboratories (UL) Listed
- ☐ Factory Mutual Research Corporation (FM) Approved
- ☐ Underwriters Laboratories-Canada (ULC) Listed for fire protection service. The pumping equipment shall be installed as recommended in the National Fire Protection Association (NFPA) Pamphlet 20, Standard for the Installation of Centrifugal Fire Pumps. The fire pump shall be designed to deliver \_\_\_\_\_ U.S. gallons per minute (USGpm) at a total differential pressure of \_\_\_\_\_ psiG. The fire pump shall also be capable of delivering not less than 150% of rated flow at not less than 65% rated head. Peerless Pump model \_\_\_\_\_ shall be furnished with driver, controllers and accessories as detailed in this specification. Pump manufacturer shall have unit responsibility for the proper operation of the complete unit assembly as indicated by field acceptance tests.

**MANUFACTURER'S FACTORY TESTS:** Each individual pump shall be hydrostatically tested and run tested prior to shipment. The pump shall be hydrostatically tested at a pressure of not less than one and one-half times the no flow (shut off) head of the pump's maximum diameter impeller plus the maximum allowable suction head but in no case less than 250 psig.

**FIELD ACCEPTANCE TEST:** A field acceptance performance test shall be conducted upon completion of pump installation. The test shall be made by flowing water through calibrated nozzles, approved flow meters or other such accurate devices as may be selected by the authority having jurisdiction. The test shall be conducted as recommended in NFPA Pamphlet 20 by

- ☐ the installing contractor
  - ☐ the owner
  - ☐ the owner's representative
  - ☐ (other) \_\_\_\_\_
- in the presence of the authority having jurisdiction and with that authority's final approval and acceptance. Failure to submit documentation of factory and field tests will be just cause for equipment rejection.

**HORIZONTAL CENTRIFUGAL PUMPS:** The fire pump shall be of horizontal centrifugal (single stage) (multistage) construction specifically labeled for fire service and shall be a Peerless Pump model \_\_\_\_\_. The pump shall be connected to the (fire standpipe) (fire sprinkler) (underground fire main) system. The suction supply for the fire pump shall be from a (public service water main) (elevated storage tank) (ground storage tank) (underground reservoir) at a maximum pressure of \_\_\_\_\_ pounds per square inch (psig) and a minimum pressure of \_\_\_\_\_ psig. The pump casing shall be cast iron with \_\_\_\_\_ inch 125 pound ANSI rated suction and \_\_\_\_\_ inch(125)(250) pound ANSI rated

discharge flanges machined to American National Standards Institute (ANSI) dimensions.

**ELECTRIC MOTORS:** The pump driver shall be horizontal foot mounted ball bearing induction motor rated \_\_\_\_\_ horsepower, \_\_\_\_\_ 3 phase, (50)(60) Hertz with open drip-proof NEMA \_\_\_\_\_ enclosure for operation on \_\_\_\_\_ volt phase service. The motor locked rotor current shall not exceed the values stated in NFPA Pamphlet 20. The motor shall be mounted on a steel base common to the pump and shall be connected to the pump with a flexible coupling protected by a suitable guard. The fire pump manufacturer shall accurately align the pump and motor shafts prior to shipment. After field installation but prior to grouting the base, a millwright or similarly qualified person shall check and verify or correct the shaft alignment.

**ELECTRIC MOTOR CONTROLLERS:** The automatic electric motor controller shall be (UL listed)(FM approved) specifically for fire pump service. The controller shall be designed for

- ☐ full voltage
  - ☐ part winding
  - ☐ primary resistance reduced voltage
  - ☐ wye-delta open transition
  - ☐ wye-delta closed transition
  - ☐ auto-transformer
  - ☐ solid state (soft start)
- type starting. The controller shall be rated for the horsepower specified in this specification's electric motors section. The controller shall be capable of interrupting a short circuit current at least equal to the available short circuit current in the controller supply circuit. This fire pump controller installation requires an withstand rating of not less than \_\_\_\_\_ amps RMS symmetrical at an operating voltage of \_\_\_\_\_ volts. The controller shall be:
- ☐ floor or wall mounted for electrical connection to the motor by the equipment installer.
  - ☐ mounted on a common base with the fire pump and wired to the motor by the pump manufacturer.

**FITTINGS:** The pump manufacturer shall furnish piping accessory items for the pump installation which will adapt the pump connections to the fire protection system and test connection as follows. Fittings subjected to pump discharge pressure shall be ANSI (125)(250) pound rating. Fittings subjected to suction pressure shall be ANSI 125 pound rating.

- ☐ eccentric tapered suction reducer
  - ☐ concentric tapered discharge increaser
  - ☐ hose valve test header
  - ☐ hose valves with caps and chains
  - ☐ pump casing relief valve
  - ☐ automatic air release valve
  - ☐ hose valve head drain valve
  - ☐ suction and discharge pressure gauges
- Additional accessories required when pump is engine or steam turbine driven:*
- ☐ main relief valve:
    - ☐ direct acting (spring actuated)
    - ☐ pilot operated (hydraulically actuated)
    - ☐ relief valve overflow cone, enclosed type

- ☐ discharge tee with elbow (for mounting relief valve)

**DIESEL ENGINES:** The pump driver shall be a horizontal shaft type internal combustion engine Model \_\_\_\_\_ manufactured by:

- \_\_\_\_\_ rated at \_\_\_\_\_ rpm, clockwise rotation viewed from the end opposite the pump. The engine shall be provided by the pump manufacturer with, at a minimum, the following accessories for automatic operation.
- ☒ cooling waterlines, pressure regulator, strainer, bypass lines and necessary fittings for engine cooling system, pre-piped and factory mounted.
- ☒ flexible exhaust connector
- ☒ residential exhaust silencer
- ☒ engine jacket water heater, factory installed.
- ☒ one set dual batteries, lead acid storage type.
- ☒ fuel system as recommended in NFPA Pamphlet 20
- ☒ fuel storage tank sized to provide a minimum supply of one gallon of fuel per engine maximum rated horsepower plus 5% for sump area plus 5% for expansion area. The tank shall be furnished (with)(without) legs for floor mounting and with a direct reading level gauge. Fuel tank shall (single wall)(dual wall) UL listed; single wall non-listed
- ☐ The engine shall be run tested with the pump by the pump manufacturer prior to shipment.

**ENGINE CONTROLLERS:** The automatic engine controller shall be (UL listed)(FM approved) specifically for fire pump service. The controller must be capable of performing or contain the following features:

- ☒ Built in battery charger
- ☐ time clock for weekly automatic test
- ☐ system pressure recorder
- ☐ timing relay for automatic stop
- ☐ power failure start
- ☐ low fuel level switch
- ☐ pump room alarm audible and visual signals
- ☐ The controller shall be wired to the corresponding engine function terminals and shall be mounted on a common base with the engine and pump. A complete running test of the base mounted controller, engine and pump shall be performed by the pump manufacturer prior to shipment.
- ☐ The engine controller shall be floor mounted for electrical connection to the engine by the equipment installer.

## HORIZONTAL OR INLINE FIRE PUMPS PUMP DATA



**Peerless Pump Company**  
Indianapolis, IN 46207-7026

Fire Pump Model	Commercial Model Pump	Shaft Dia. At Coupling . Inches	Suction Flange Size x ANSI Lb. Standard	Discharge Flange Size x ANSI Lb. Standard	Maximum Working Pressure Psi	
					Std. ②	H ③
2.5PVF8	None	-	2.5 x 125	2.5 x 125	175	-
2.5PVF8M	25PV8A	-	2.5 x 125	2.5 x 125	175	-
3PVF8	None	-	3 x 125	3 x 125	175	-
3PVF8M	3PV8A	-	3 x 125	3 x 125	175	-
3PVF11	None	-	3 x 125	3 x 250 ④	175	250
3PVF11M	3PV11	-	3 x 125	3 x 250 ④	175	250
4PVF8G	None	-	4 x 125	4 x 125	175	-
4PVF8GM	4PV8G	-	4 x 125	4 x 125	175	-
5PVF7	None	-	5 x 125	5 x 125	175	-
5PVF7M	5PV7	-	5 x 125	5 x 125	175	-
5PVF11	None	-	5 x 125	5 x 250 ④	175	250
5PVF11M	5PV11	-	5 x 125	5 x 250 ④	175	250
6PVF10	None	-	6 x 125	6 x 250 ④	175	300
6PVF10M	6PV10	-	6 x 125	6 x 250 ④	175	300
2ADF8	2AD8	0.937	3 x 125	2 x 125	175	275
3AEF9	3AE9	1.375	4 x 250 ④	3 x 250 ④	300	425
3AEF9G	3AE9G	1.375	4 x 250 ④	3 x 250 ④	300	425
4AEF10	4AE10	1.375	5 x 250 ④	4 x 250 ④	275	450
4AEF10G	4AE10G	1.375	5 x 250 ④	4 x 250 ④	275	450
4AEF11	4AE11	1.125	5 x 250 ④	4 x 250 ④	250	250
4AEF11G	4AE11 G	1.125	5 x 250 ④	4 x 250 ④	250	250
4AEF12	4AE12 Double Volute	1.375	5 x 250 ⑥	4 x 250 ④	300	510
5AEF8	5AE8	1.375	6 x 125	5 x 125 ④	300	375
5AEF8G	None	1.375	6 x 125	5 x 125 ④	300	300
5AEF8N	5AEF8N	1.375	6 x 125	5 x 125 ④	300	300
5AEF11	5AE11	1.562	6 x 250 ④	5 x 250 ④	300	510
5AEF11G	5AE11 G	1.562	6 x 250 ④	5 x 250 ④	300	510
5AEF12	5AE12 Double Volute	1.562	6 x 250 ④	5 x 250 ④	250	510
5AEF14	5AE14	1.375	6 x 250 ④	5 x 250 ④	250	250
5AEF14N	5AE14N	1.375	6 x 250 ④	5 x 250 ④	250	250
6AEF10	None	1.562	8 x 125	6 x 250 ④	300	300
6AEF12	6AE12 Double Volute	1.875	8 x 250 ④	6 x 250 ④	350	500
6AEF14	6AE14	1.562	8 x 250 ④	6 x 250 ④	250	250
6AEF14G	6AE14G	1.562	8 x 250 ④	6 x 250 ④	250	250
6AEF14Q ⑤	None	1.562	8 x 250 ④	6 x 250 ④	250	250
6AEF16	6AE16	1.562	8 x 125	6 x 250 ④	250	250
6AEF16G	6AE16G	1.562	8 x 125	6 x 250 ④	250	250
6AEF16N	6AE16N	1.562	8 x 125	6 x 250 ④	250	250
6AEF18	6AE18	1.875	8 x 125	6 x 250 ④	300	300
8AEF13	8AE13	1.562	10 x 250 ④	8 x 250 ④	250	250
8AEF15A ⑤	8AE15	1.875	10 x 250 ④	8 x 250 ④	250	250
8AEF15G	8AE15G	1.875	10 x 250 ④	8 x 250 ④	250	250
8AEF17A	8AE17A Double Volute	1.875	10 x 250 ④	8 x 250 ④	262	262
8AEF17Q	8AE17Q Double Volute	1.875	10 x 250 ④	8 x 250 ④	262	262
8AEF17W	8AE17W Double Volute	1.875	10 x 250 ④	8 x 250 ④	262	262
8AEF20	8AE20	2.250	10 x 125	8 x 250 ④	300	300
8AEF20G	8AE20G	2.250	10 x 125	8 x 250 ④	300	300
8AHF26	8AH26	69 mm	10 x 125	8 x 250	275	-
10AEF16	10AE16 Double Volute	2.250	12 x 125	10 x 125	175	175
10AEF20	10AE20 Double Volute	2.500	12 x 125	10 x 250 ④	250	250
10AHF22	10AH22	69 mm	12 x 125	10 x 250	300	-
10AHF26	10AH26	79 mm	12 x 125	10 x 250	325	-
12AF19G	12A19G	3.000	14 x 125	12 x 125	175	253
12AHF26	12AH26	89 mm	14 x 125	12 x 250	325	-
4TUF5	4TU14	1.875	5 x 125	4 x 250	400	428
4TUF11	4TU11	1.750	6 x 125	4 x 400	550	550
5TUF7	5TU15	2.000	6 x 125	5 x 250	400	420
6TUF10B	6TU16B	2.250	8 x 125	6 x 250	300	500
6TUHF13A2	6TUHF13A2	R.F.	8 x 125	6 x 250	510	-
8TUF15	8TU16F	2.750	10 x 125	8 x 250	335	335
4TUTF14	4TUT14	1.750	5 x 125	4 x 250	428	428
5TUTF16B	5TUT16B	2.250	6 x 125	5 x 250	400	510

See following page 2.1 for footnotes

Subject to change without notice

**NOTES: (for page 2 of Section 1520)**

- ① (*General*) The fire pump dimensions are the same as the commercial pump shown. The fire pump's hydraulic performance is not the same as the commercial pump's due to internal changes and on some fire pump models the internal parts are not interchangeable with the commercial model. Refer to Section 1550 for further details on ordering repair parts (pump serial number and model number from nameplate is required).
- ② The **Std.** (standard) constructed pump is limited to a suction pressure no greater than 75 psi and/or a maximum working pressure (pump shut-off pressure psi plus suction pressure psi) no greater than value indicated in the **Std.** column. The fire pump model number built to standard construction will be as indicated in the first column of table. UL listed pumps constructed without waterseal piping and lantern rings, may use standard shaft sleeves and packing when the suction pressure is at least 30 psi but no greater than 150 psi.
- ③ The **H** (heavy) constructed pump is limited to a suction pressure no greater than 250 psi and/or a maximum working pressure (pump shut-off pressure psi plus suction pressure psi) no greater than value shown in **H** column. All **H** column pumps **are not constructed** to be applied at the maximum limit shown in **H** column. The maximum working pressure of a pump beyond the **Std.** value depends on the modifications used to meet the job's specifications. For example a 3AEF9 specified to meet 325 psi maximum working pressure will have only the modifications necessary for 325 psi maximum working pressure and would not be suitable for 400 psi maximum working pressure. The pump model number having heavy construction for 325 psi mwp will include an "H" suffix (example: 3AEF9H). Refer to the factory for the available "H" pump modifications.
- ④ The flange will be drilled for either 125 Lb ANSI for 175 psi maximum working pressure or 250 Lb. ANSI for a maximum working pressure shown in the **Std.** column.
- ⑤ The 6AEF14Q and 8AEF15A pump models have double row outboard bearing design.



European product liability and safety requirements have made sales to Europe increasingly difficult in recent years. The requirement that every product sold in Europe bear the CE Marking has resulted in the need for considerable extra effort. US made product that does not bear CE Marking must be sent to a third party to be certified as being in compliance. Failure to take this step could result in significant risk of fines, confiscation of equipment, and even criminal liability!

The US may have led the way with product safety and liability laws, but other nations have followed suit. The relatively recent creation of the European Union, and the desire to standardize liability laws and to promote free trade across the EU has resulted in the CE Marking requirements. While these laws do offer the opportunity for the free movement of goods within and into the EU and eliminate national differences, they also place some stricter requirements on those manufacturing for or selling in the EU. In many cases, the EU requirements are stricter than, and certainly always different to the US requirements.

There are a multitude of product safety and liability laws that apply to product being marketed in Europe. Those most relevant to pumps are the Directives generally known as the Machinery Directive, the Low Voltage Directive, and the Electromagnetic Compatibility Directive. These directives apply to virtually all pump systems. Other directives may apply to pumps intended for specific uses. The accepted means to show compliance with the directives is to comply with European "harmonized standards". There may be hundreds of standards relating to each of the directives. The manufacturer or seller of a product is responsible for determining which Directives and standards apply to his product. The scope of this effort has resulted in low volume manufacturers, such as pump manufacturers, being slow to take the challenge of CE Marking their product.

Without factory CE Marking, it was necessary to sell the product first to a third party, often a European pump manufacturer, who would make any required changes to the product or its' documentation and re-sell it with their own compliant instructions. This obviously adds cost and delay into the sales equation. Clearly, factory CE Marking is the answer.

### **Peerless Pump announces CE Marking on model AEF fire pumpsets**

Peerless Pump can now offer model AEF fire pumpsets with factory CE Marking. This offering includes the entire line of model AEF pumps, however there are some limitations on drivers and controls. (See the table below for detail of availability of drivers and controls.) This offering will make Peerless Pumps more competitive by reducing cost and lead-time. Peerless fire pumpsets bearing the CE Marking are compliant with the Machinery, Low Voltage, and Electromagnetic Compatibility Directives. These pumpsets should move quickly through customs and on to the customer.

**Model AEF Fire Pumpsets -- Now Available**

Type	Pump Models	Drivers	Controls
Diesel Engine Driven Fire Pumpsets	All model AE pumps	Clarke US built engines of JU, JW, and VM series  Clarke UK built engines IK6R-UF11/15/19	Master Controls with Modification 8E Models: DCF or DCM
			Firetrol Controls: Mark II controls available by June 2003
Electric Motor Driven Fire Pumpsets	All model AE pumps	U.S. Electrical Motors 50Hz, 3 phase, AC Squirrel-Cage Induction Motors with one of the following type designations: A, C, CE, CT, D, H, J, R, S, T, or UT (there may be other prefix and/or suffix letters or numbers)	Master Controls MC & EC Series Controls with Modification 8E Models: ECA, ECP, ECR, ECO, ECY, ECS, ECT, MCA, MCP, MCR, MCO, MCY, MCS, or MCT
			Metron Controls -- Full Service Electric Controllers
			Firetrol Controls: Mark II controls will be available with CE Marking early to mid 2003

Contact a sales or applications engineering professional at Peerless Pump for more details and for pricing.

### CALCULATION OF TOTAL HEAD (H)

To duplicate factory test curves during field tests, the pump must be credited with the velocity head difference at each test point. Correct Total Head (H) calculations are made as follows:

$$H = h_D - h_S + h_V + C$$

$h_D$  = Discharge pressure gage reading in psi multiplied by 2.31 for fresh cool water. Gage on pump discharge flange.

$h_S$  = Suction pressure gage reading in psi multiplied by 2.31 for fresh cool water. (If suction lift exists, suction lift shown by gage must be converted to feet and then considered as +  $h_S$  rather than -  $h_S$  in above formula.) Gage on pump suction flange.

$h_V$  = Velocity head difference. From curves on page 14 for pump size and test gpm point.

$C$  = Gage correction. Normally not used unless vertical distance in feet between center of suction and discharge gages is over 1 foot. Add if discharge gage is above suction gage, subtract if below suction gage.

#### EXAMPLE #1

5" discharge  $\times$  6" suction pump with positive suction pressure, fresh cool water. Discharge gage reading = 115 psi, suction gage reading = 30 psi test point capacity = 1000 gpm. Difference in elevation of suction and discharge gage centers 2.5 ft., discharge gage above suction gage.

$$h_D = 115 \times 2.31 = 266 \text{ ft.} \quad h_S = 30 \times 2.31 = 69.5 \text{ ft.}$$

$$h_V = 2.15 \text{ ft.} \quad C = 2.5 \text{ ft.}$$

$$H = 266 - 69.5 + 2.15 + 2.5 = 201.15 \text{ ft.}$$

#### EXAMPLE #2

3" discharge  $\times$  4" suction pump with suction lift, fresh cool water. Discharge gage reading = 61 psi, suction gage reading = -4 psi (vacuum). Test point capacity = 500 gpm. Difference in elevation of suction and discharge gage centers 3/8 inch, discharge gage below suction gage.

$$h_D = 61 \times 2.31 = 141 \text{ ft.} \quad h_S = 4 \times 2.31 = 9.25 \text{ ft.}$$

$$h_V = 5.6 \text{ ft.} \quad C = \text{neglect, under 1 ft.}$$

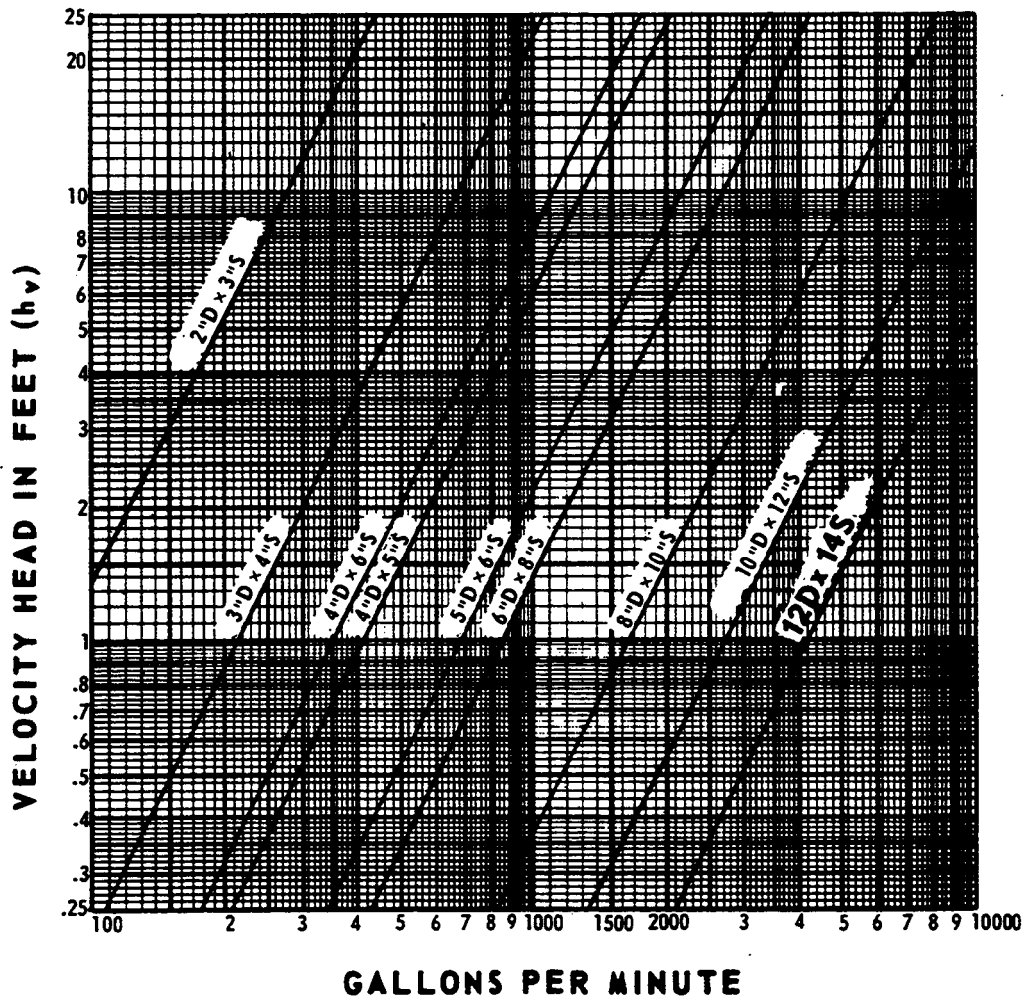
$$H = 141 + 9.25 + 5.6 + 0 = 155.85 \text{ ft.}$$

Should gages read in other than psi, readings must be converted to feet head using proper constants. For other than simple, fresh water calculations described above, refer to Hydraulic Institute Standards or other proper hydraulic references.

**HORIZONTAL FIRE PUMPS**  
**Electric Motor or Diesel Engine Driven**

**Peerless Pump Company**  
Indianapolis, IN 46207-7026

**VELOCITY HEAD DIFFERENCE CURVES**  
**HORIZONTAL FIRE PUMPS**



**LEGEND**  
D = Discharge Size  
S = Suction Size

**EXAMPLE**  
3" Discharge x 4" Suction Pump  
(3" D x 4" S) at 750 GPM,  
Vel. Hd. is 12.3 ft.

**TO DETERMINE PUMP  
TOTAL HEAD SEE  
OPPOSITE SIDE OF  
THIS SHEET.**

2873855  
Rev. 8-76



For fire pump engine data sheets refer to the following websites for current downloadable information

Cummins Fire Power Fire Pump Diesel Engines .....[cumminsfirepower.com](http://cumminsfirepower.com)

Clarke Fire Pump Diesel Engines .....[clarkefire.com](http://clarkefire.com)

Caterpillar Fire Pump Diesel Engines..... (Currently no data is available as engines  
are in the process of being re-designed)

Blank