



Important Pump Installation Notes

Suction Piping – Elevated Units Only

If the pump is not bolted onto the side of a floor-mounted unit (elevated tank above pump), always install a section of straight pipe (18" Minimum) between the suction of the pump and first elbow. The recommended suction piping size is shown below:

Pipe Size	Max. GPM. 210F or Less	Max. GPM Greater than 210F
2"	52	30
2-1/2"	75	43
3"	114	66
4"	200	116
5"	312	181
6"	450	261
8"	750	450
120	16728	180

If tank suction pipe size is larger or smaller than pump suction connection, a reducing elbow is required. Be sure to eliminate any pipe strain on the pump. Support the suction and discharge pipes independently by using pipe hangers near the pump. Line up the vertical and horizontal piping so that the bolt holes in the pump flanges match the bolt holes in the pipe flanges. Do not attempt to spring the suction or discharge lines into position.

The code for pressure piping (ASME Section 1) must be followed as well as any local codes. Where considerable temperature changes or seismic zone areas are anticipated, fittings for absorbing expansion should be installed in the system in a way strain on the pump.

Pump suction strainers are NOT to be placed ahead of a centrifugal pump in the suction piping. NPSHA can not be calculated. Strainers will shut off water supply or cause a restriction. This will result in pump and mechanicals. All strainers belong in return lines back to receiver tanks and also in make-up water lines.

Suction strainers are never used with NES centrifugal pumps. Strainers are placed in the inlets to the tanks and not in the suction piping. No one can predict the pressure drop through a strainer and once it gets clogged your pump will run dry and destroy itself. Besides, centrifugal pumps can handle some dirt and debris. If you are using turbine pumps it is the lesser of two evils. Turbines have close tolerances and a little dirt will destroy the pump; therefore, suction strainers are used even though they will clog and destroy the motor if they are not kept clean.

Discharge Piping: Install a union immediately beyond the pump discharge. A spring-loaded check valve should be installed in the discharge piping close to the pump to prevent backflow into the unit. A throttling valve (ball valve, globe valve or steam cock) must be installed after the check valve close to the pump. If pump is rated for 75 PSIG or greater the pump comes equipped with an automatic flow control valve that serves as the throttling valve. The throttling valve or automatic valve is used to set pump discharge at design conditions to prevent motor overload and cavitation. (See figure 2.1, 2.2).

Notes on Piping:

1. When installing the pump, suction and discharge gauge ports should be installed in the pipeline.
2. The piping should have isolation valves around the pump and have a drain valve in the suction.
3. When installing the suction and discharge connections to a threaded pump housing a Teflon tape sealer.



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Boiler Feed Sizing:

Selection is based on GPM, receiver size, and PSIG.

Determine GPM:

The evaporation rate of one boiler horsepower is .069 gallons per minute. Boiler feed pumps are sized at a rate of 1.5 to 2 times this evaporation rate. Boilers are usually rated in boiler horsepower. However, some may be rated in sq. ft. EDR or lbs/hr or a high quality thread sealant is recommended.

(Conversion Equivalents): One boiler horsepower equals .069 GPM or 33,475 BTU or 34.5 lbs/hr or 139.4 sq. ft. EDR.

Determine PSIG:

Generally low pressure boilers run at .5 to 15 PSIG. Therefore, a discharge pump pressure of 20 PSIG should be adequate. Boiler feed units are usually near the boilers they feed. To be safe you should determine the amount of vertical rise + friction loss in pipe + valve loss + feed valve loss (if any) + back pressure in line (boiler operating pressure) + a safety margin of approximately 5 PSIG. The amount of these values, or these values added together, are normally expressed in feet of head. To convert to pounds per square inch or PSIG, 2.31 feet of head = 1 PSIG.