

SECTION 2

FOAM CONCENTRATE PROPORTIONING



I. Premix

The simplest method of proportioning foam concentrate is the premix method. This is accomplished by mixing pre-measured amounts of water and foam concentrate in a common container. Typically the storage container is a pressure rated tank using inert gas to pressurize the system. However, the premix can be stored in an atmospheric tank and a pump used to supply the premix solution under pressure to the discharge devices. Be-

cause the storage vessel must contain the water as well as the foam concentrate, this type of proportioning is usually limited to small systems. Although this is the simplest method, it has many drawbacks. Size of storage container limits the size of system, not all foam concentrates can be pre-mixed And storage life of premix solutions is unknown.

II. Venturi Type (Vacuum Inducing)

Line Proportioners are venturi devices that introduce Foam Concentrate into a flowing stream of water at a controlled proportioning rate. The line proportioner (also known as an inductor or eductor) is a simple, inexpensive method of proportioning when the water supply pressure is reasonably high. It has no moving parts and requires minimal maintenance.

The line proportioner is ideally suited to any proportioning application requiring a single fixed discharge flow and relatively high, consistent water pressure. They can operate with pressures as low as 75 PSI (5.2 Bar) or as high as 200 PSI (13.8 Bar), however, optimum performance is achieved with pressures above 125 PSI (8.6 Bar). They are not suitable for use in applications requiring operation over a range of flows or pressures. They are not recommended for applications using sprinklers or other multiple small orifice discharge devices, where blockage of a portion of the discharge devices could increase the allowable back pressure sufficiently to cause proportioning failure.

As water flows through the venturi (water orifice) at a high velocity, a negative pressure area develops at the discharge of the venturi. This negative pressure creates a pressure differential across the foam concentrate-metering orifice, thereby allowing atmospheric pressure to push foam concentrate in to the proportioner at the correct percentage. As the water pressure at the inlet to the proportioner increases or decreases the solution flow from the device will increase or decrease correspondingly. Because the amount of foam concentrate to be injected into the water stream is controlled by the relationship between the negative pressure area and atmospheric pressure the range over which proper injection occurs is limited. Therefore, each model of line proportioner has an operating pressure range and to achieve optimum performance, the water inlet pressure must be maintained within this range. Higher than design pressure will result in a leaner (lower percentage) mixture; lower than design pressure will result in a richer (higher percentage) mixture.

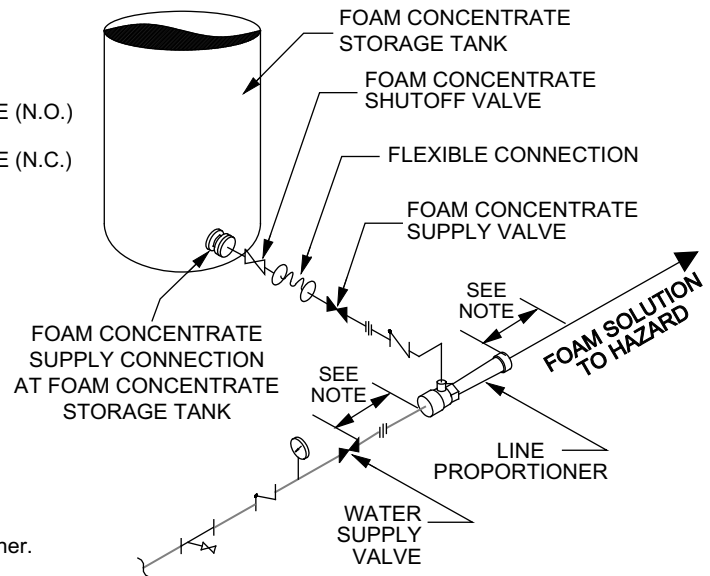
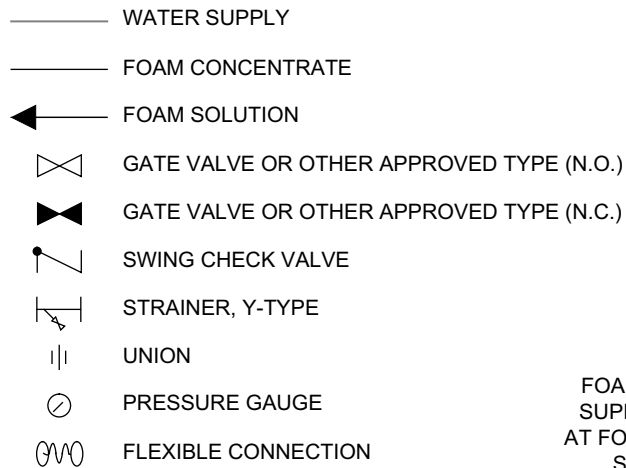
In addition to water pressure, LP's are sensitive to back pressure. Back pressure is the amount of pressure required down stream of the proportioner to discharge the total foam solution flow. This will include the pressure required at the inlet to the discharge device(s), elevation head and line losses. The total allowable back pressure on the discharge side of the LP can not exceed 65% of the water inlet pressure. If back pressure exceeds 65%, the LP may not pick-up foam concentrate or the solution may be lean.

The line proportioner can be designed for use in portable applications or installed in fixed piping systems. For portable applications the proportioner is equipped with hose connections to allow installation in a hose line. Foam concentrate is normally supplied from 5-gallon pails through a pickup tube. As noted above these proportioners are sensitive to the back pressure. Therefore, care must be used in matching the discharge nozzle to the proportioner as well as the amount of hose between the line proportioner and the nozzle. Line proportioners can be equipped with a metering valve to allow the desired percentage to be field set.

When line proportioners are used in a fixed piping systems, the foam concentrate is usually stored in a permanently installed storage tank with permanent piping between the tank and foam concentrate connection of the line proportioner. The line proportioner may be mounted up to a maximum height of 6-ft (1.8m) above the tank bottom. A minimum of 24 inches (610 mm) of straight unobstructed pipe should be installed upstream and downstream of the line proportioner. In fixed installations using Alcohol Resistant AFFF foam concentrates, the line proportioner should be installed at the bottom of the foam concentrate storage tank in order to provide a flooded suction at all times. A normally closed shutoff valve in the foam concentrate supply line will prevent possible siphoning of the foam concentrate.

See data sheets for physical dimensions of equipment and performance characteristics.

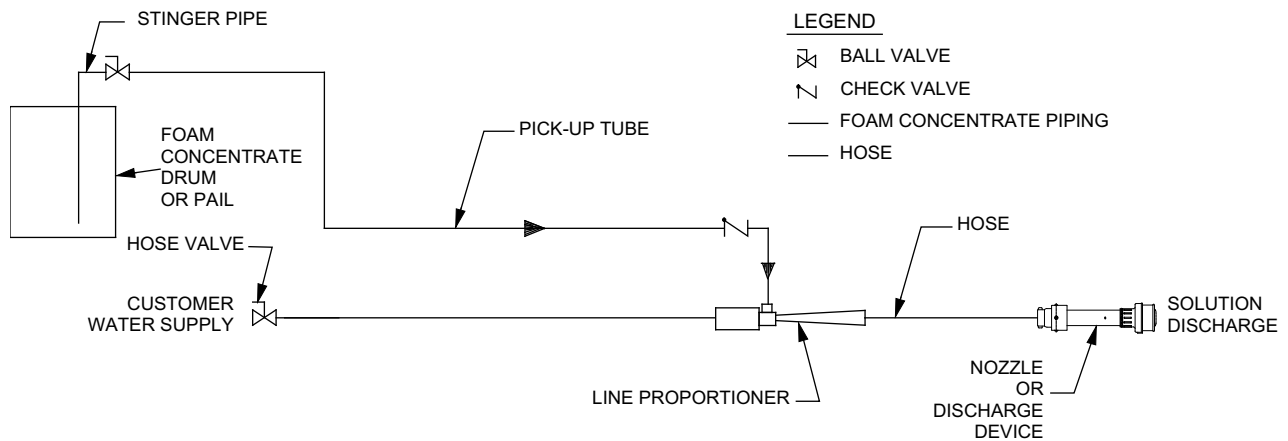
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NOTE:

A minimum 24" (610mm) of straight and unobstructed pipe is required upstream and downstream of line proportioner.

FIGURE 2-1
Line Proportioning - Fixed Installation



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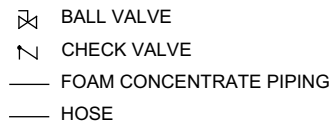


FIGURE 2-2
Portable Line Proportioning