

Direct Inject

How to select an electronic foam proportioner



Story & Photos by
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Electronic direct-injection proportioners are the most accurate systems on the market today. As the name implies, they're electronically controlled and inject foam concentrate directly into the foam manifold. These systems sense various parameters to determine how much concentrate to inject into the water to create the correct percentage of foam solution.

All systems sense water-flow volume by using a paddle wheel flow meter. The more water that's flowing, the faster the wheel spins. As the paddle wheel spins, it creates an electronic signal. Some proportioners also sense water temperature. Temperature is a factor because it's easier to mix foam concentrate with warm water than cold water.

Other proportioners also sense conductivity, which is an accurate way to check solution percentage. It can also help control the variables inherent in both water and foam concentrates that affect the foam solution produced. Conductivity-measuring systems first measure the conductivity of the water entering

the proportioner, then the conductivity of the foam solution exiting the proportioner. They then compare the values to ensure that the percentage is correct. The proportioner sensors feed their information to a computer, which calculates the volume in foam concentrate to inject. The computer then controls the speed of the injection pump. The faster the pump spins, the more concentrate will be injected. The system is a closed loop, which is constantly sensing and adjusting, keeping the percentage accurate as lines are opened or closed.

MAKING THE SELECTION

When selecting an electronic direct-injection proportioner for your apparatus, keep in mind the following information to ensure you get the system that best fits your department's needs.

Proportioners come in a variety of sizes measured in foam concentrate gallons per minute (gpm) flow capacity. They range from 1.5 gpm to more than 12 gpm. *Remember:* Bigger is not always better; size the system to fit your needs. ▶

Right: Foam capability dramatically increases the apparatus potential and gives us many more options on the fireground.

Inset: Proportioners come in a variety of sizes measured in foam concentrate gpm flow capacity.



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There are two factors that will help you determine your needs. The first is the volume of foam solution needed. A brush truck that typically flows low volumes will only require a low-gpm proportioner. Over-sizing

the proportioner in this application causes problems because large systems have decreased low-flow accuracy and at times intermittent low-flow operation. A structural pumper that may be called upon to flow foam master streams will require much higher concentrate flow capability. This will require a large-capacity proportioner to keep up with the concentrate demand of high water flows.

The second factor is the type of concentrate to be used. Class A concentrates are used at percentages up to 1 percent, while Class B concentrates may be used at 3 or 6 percent. The higher the percentage, the more volume of concentrate will be required to treat a specific volume of water. For example, when using Class A

foam at 0.3 percent, 3 gallons of concentrate will treat 1,000 gallons of water. Using Class B foam at 3.0 percent, 3 gallons of concentrate will treat only 100 gallons of water.

Additionally, there are some options to consider when selecting your proportioner. The first is a dual tank selector. If you're going to use more than one type of concentrate, they will need to be stored in separate tanks, and you'll need a selector switch to switch between them. Tank selector switches are available in both manual and electric versions.

A dual tank selector switch can also be used with a single tank and an overboard pick-up. The overboard pick-up provides the ability to either switch to a concentrate not normally carried or draw from a large supply on a big incident. If specifying an overboard pick-up, be certain that the proportioner you're using is capable of drafting from the outside source.

The second option to consider is a foam refill system. This system consists of a pick-up tube, pump and plumbing to refill the onboard foam tank from ground level. This is highly recommended for firefighter safety as it eliminates the slip, trip and fall hazards of climbing on top of the apparatus with foam buckets.

IN SUM

Do your research before selecting an electronic direct-injection proportioner. This will help ensure that your department monies are well spent and provides a system that meets your department's needs and expectations. ☺

Keith Klassen is a career captain with the Summit Fire District, a rural combination department bordering Flagstaff, Ariz. He has 33 years of volunteer and career experience in both structural and wildland firefighting, and a background in mechanical and vocational education. Klassen is also an international fire service instructor.



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