

**VENTURI BALANCE PRESSURE PROPORTIONERS FOR VARIABLE FLOWRATE  
VZ TYPE WITH CALIBRATED ORIFICE FOR FIXED ADMIXING PERCENTAGE  
AND VZ-R TYPE WITH ADMIXING PERCENTAGE REGULATING VALVE**

**OPERATING AND MAINTENANCE HANDBOOK**

On foam installations with a central foam compound induction it is necessary to induct always the same percentage of foam compound to the extinguishing water as its water rate of flow can vary a lot. By that a foam compound-water mixture of the same concentration is always guaranteed.

This problem is solved with the venturi-inductor with constant pressure regulator, irrespective of the fact wheter the smallest or biggest group of foam producers inside a unit (for instance foaming of tanks or tank pits) shall be supplied with the mixture.

Venturi-inductors for fixed foam installations are manufactured as type DN 100 to DN 350.

The water delivered from the pump enters the venturi nozzle (1) from the left hand side. Due to the increase of flow speed at the narrowest part (1a) in the nozzle the pressure is reduced at this point compared to the primary water pressure (effective pressure).

The pressure reduction is proportional to the square of flow. Is for instance the flow starts off with a given pressure and then increases 6 times, the effective pressure will imcrease by the 36 times.

The foam compound supplied by a foam compound pump runs through the dirt collector with a pressure at least 2 bar higher than the pressure of the water, and enters the double seat valve (9). After passing the two throttle points between the valve seats and the valve cone (16) the foam compound enters the chamber (9b) in front of the proportioning plate (10). The pressure of the foam compound is transferred into the chamber (11) under the diaphragm (12). As long as this pressure is lower than the primary waer pressure in chamber (17) the diaphragm (12) operates the double seat valve to open position. As soon as the pressure above and below the diaphragm (12) is balanced this operation is stopped. In this state of balanced pressures the foam compund in the chamber (9b) in front of the proportioning plate (10) has the same pressure as the water in front of the venturi nozzle (1). The water runs with the same pressure drop through the venturi nozzle (1) as the foam compound through the proportioning plate (10). As the opening in the proportioning plate (10) is in a certain relation to the narrowest part of the venturi nozzle a set induction rate of both media is reached.

This rate is constant for the whole range of regulation.

If the effective pressure on the venturi nozzle is small (small water rate of flow) the differential pressure on the proportioning plate will be small (small flow of foam compound).

If the effective pressure on the venturi nozzle is great (great water rate of flow) the differential pressure on the proportioning plate will increase proportionally (great flow of foam compound).

The regulation of foam compound induction is effected by the proportioning valve and ensures the induction of a certain quantity of foam compound.

The constant pressure regulator works very exactly as the position of the double seat valve is not dependent on the foam compound pressure on the flange nor is it influenced by the limited friction caused by the foam compound flow.

Due to the diaphragm size even the smallest pressure variations are acting on the double seat valve immediately with relatively great force.

Due to this layout the effective pressure may be kept to a minimum at maximum throughput, without lacking precise induction rates at minimum throughput.

The lay-out of favourable flow of the venturi nozzle and the diffusor was chosen to avoid big pressure losses.

But the installation of larger pump's capacity is sometimes necessary loss of proportioner DN 250 mm. is at 6% admixing rate and 11.500 l/min. discharge about 2 bar.

To check the correct working of the constant pressure regulator two pressure gauges are installed. Correct working is ensured if both gauges indicate equal pressure.

It has shown up that a full sealing against the water system is not guaranteed by means of the double seat valve of the venturi inductor; i.e. during a stand-still of the fire extinguishing unit the foam compound must not be under pressure on the inductor.

After finishing the supply of foam compound the venturi inductor must be flushed throughly.

After being used with seawater flushing with potable water has to be done.

Pressure of foam compound at proportioner shall be about 2 bar over water pressure.

As fire main pump may generates a higher pressure in case of small discharge than in case of nominal discharge you have to provide an overflow safety valve if necessary.

Venturi admixer with admixing cock can adjust foam compound from 0 to 6%.

Admixes with built-in diaphragm are prepared for an admixing rate of 3% or 6% normal.

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