

Hedging yes, but the right way!

Today, hydraulic accumulators, regardless of their design and functionality, are mainly protected against overpressure on the gas side with a burst disc or a safety valve. From a technical point of view, this doesn't really make sense. If we consider the function and design of an accumulator, it becomes clear why they should be protected against temperature as well as pressure.

Regardless of the technical function of the accumulator within the system, whether it is energy reserve, surge damping or expansion, the nitrogen pre-charge pressure must be set below the minimum working pressure. Otherwise, the gas cushion cannot be compressed and thus the accumulator cannot perform its intended function.

Accordingly, the working pressure in the system is always higher than the nitrogen pre-charge pressure. In addition, the design pressure of the shell of the accumulator is selected to be even higher. And most of the cases, the safety element is chosen to be set at the design pressure of the shell.

Furthermore, the systems are always, or at least should be, protected with a pressure safety valve on the fluid side. This pressure safety device has to be set below the pressure of any safety element on the gas side, taking into account the hysteresis of both devices. Otherwise a premature opening of the gas side element could occur, and thus generates a gas loss. As a result, the accumulator can no longer perform its intended task and the bladder may be damaged. In other words, the trigger pressure of a pressure safety element on the gas side can never be reached under operating conditions.

However, the reason for such protection on the gas side shouldn't be the operating condition, but external heat generation from fire. This is to prevent the gas-filled accumulator from becoming an explosion hazard and thus endangering people.

From the above explanations, we see that in case of fire, the hydraulic side is relieved first, which correspondingly causes the gas to experience a pressure drop. At least until the accumulator is completely free of liquid. By the time the gas pressure has risen, due to the heat of the fire in order to activate the pressure safety element on the gas-side, the pressure vessel may already be so weakened by the heat that it may burst before the trigger point is reached, and thus becomes an explosion hazard anyway.

For this reason, a change in thinking has to take place, and the accumulators must be protected against temperature and no longer against pressure. Therefore, we have developed our new temperature safety valve BSV. This valve protects your accumulator or other gas filled pressure equipment against overpressure due to high temperature at a defined temperature. Our standard models are set at 79 °C or +93 °C ± 3.5%. This response accuracy is unbeaten and guarantees the timely blow-off of the gas.

For any further questions please contact:

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