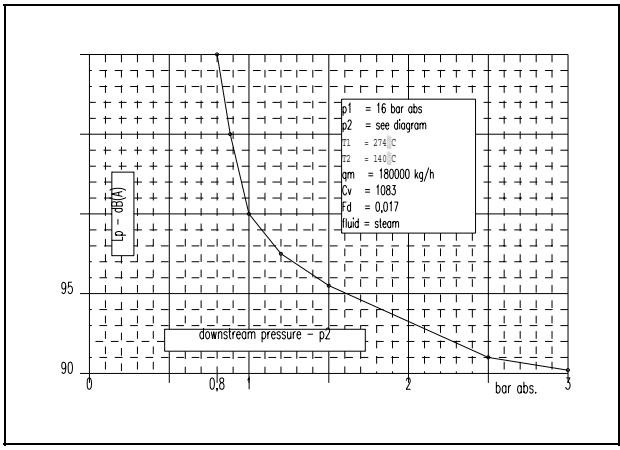
Condensate draining is greatly necessary in turbine by-pass lines, as they are kept normally closed. When valve opens (very fast in case of load rejection or turbine trip), the condensate accumulated upstream the valve may be carried at high velocity through the valve body and, in addition, flashing may occur. Also condensate can be corrosive due to trace amounts of carbon dioxide introduced to feed water when it is treated. To prevent erosion and corrosion problems, it is mandatory to drain the piping upstream the Limiphon valve both through steam traps and by designing the piping path so to collect the condensate in the direction of the trap.
Also the valve body design helps condensate to drain; here it is the models list in order of decreasing efficiency:

- 1-9400 – intrinsically draining - just necessary to avoid siphons in upstream piping
- 1-9800 – necessary just a slope of upstream piping toward traps
- 1-9600 – upstream slope grants the complete self-drainage, except the possible pockets in big bodies
- 1-9100 – straight- way model requires the lower body section to be drained through an appropriate connection

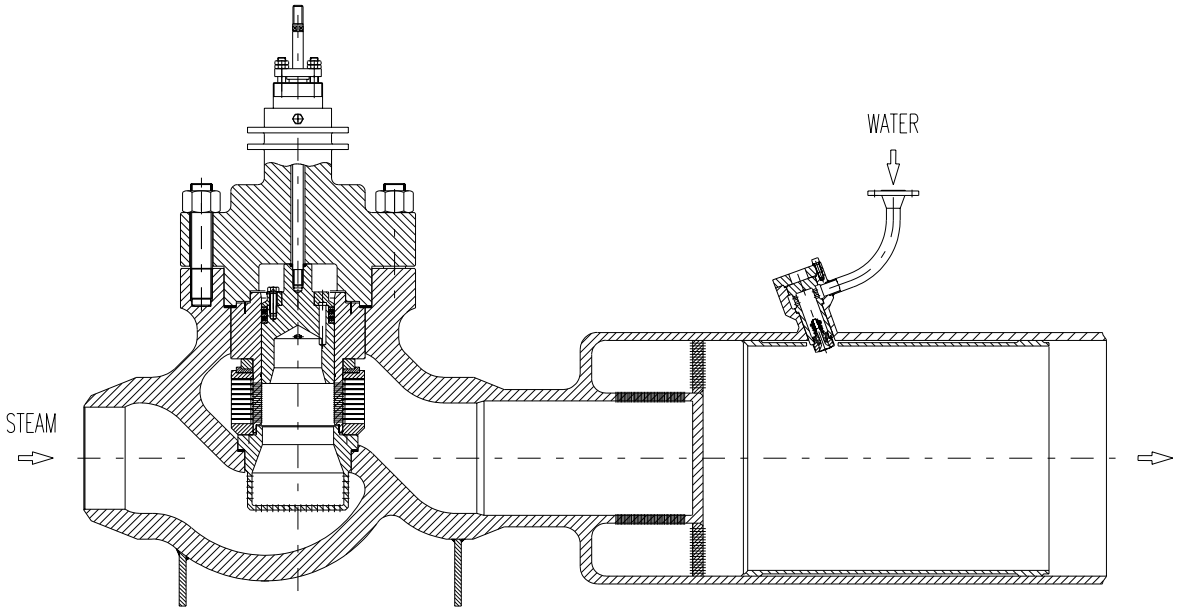
The ***fluid action*** is normally flow-to-open, since the flow direction is always oriented inward the Limiphon stack - When the fail-safe action is required the fluid action may be replaced by the one of single acting actuators which is provided by accumulators of mechanical energy (springs) or pressure energy (air or oil).
Anyway the fluid action may be obtained by partial plug balancing (about 80%). When such action tends to close the valve, actuators (and mainly their stiffness) must be selected by taking into account the forces to be faced near to the closed position.

Sizing

Limiphon valves are sized according to Parcol proprietary method, which includes the noise prediction according to IEC 60534-8-3.
The trim is designed for specific operation conditions on the basis of the standard port list here below included. Limiphon stacks may be very quickly machined by using CAD/CAE/CAM advanced technologies; by this way it is useless to standardize them and to keep stores.
When the desuperheater is supplied together with the pressure reducing valve the acoustic sizing takes into account the particular configuration of valve+desuperheater assembly by attributing to the water injection an acoustic benefit, which is a function, besides the injector type, also of the ratio w between water and steam flow rate. The best acoustic benefit is obtained by using LVM type multiple spring-nozzles; it may be calculated by the equation: $\Delta L_w = 38 \bullet w^{1.5}$.
Limiphon applications on by-pass to condenser require careful analysis and accurate data concerning the pressure downstream the pressure reducing/desuperheating unit, especially when pressure drop is generated by the fixed area dumper usually installed on valve discharge. Inaccuracies in p_2 evaluation may significantly affect the line noise, due to the possible change of Limiphon noise level as shown here below in the diagram. The similar effect of p_2 reduction due to flow rate change is taken instead into account in Limiphon sizing.



Effect of pressure p_2 on noise pressure level generated by a 14" x 28" Limiphon discharging to condenser



1-9154 - Limiphon reducing/desuperheating valve
straight-way cast body - bottom inlet- filtering basket under the seat - balanced plug with inserts - V leakage class - HAS silencer on the outlet downstream chamber with spring-nozzle LVL single type - Suitable for moderate flow rates , turn-down and p1/p2 ratios - high pressure differentials - very low noise level

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