

Danfoss Industrial Controls:

Mathematical analysis of the dynamic flow characteristic in a damping nozzle for a pressure transmitter.

Purpose:

To set up

1. an approximate but in practice usable method to calculate the band-width in stationary operation and
2. a description of stages in possible start-up situations.

Background:

The "Puls-Snubber" (see figure 1) consists of a hole about $\varnothing 0.3 \times 0.5$. At the input side is the media pressure and the output side looks into the "dead volume" about 1500 mm^3 . The media can be gas or liquid, for instance air or hydraulic oil (32 cSt by 20C). The pressure in the dead volume is measured by an incompressible pressure sensor with infinite band-width. The housing can be considered incompressible compared to the bulk-modulus of the media. The media in the dead volume can by start-up be anything between air, a mixture or liquid. The air in stationary operation will partly be dissolved in and partly removed by the initial liquid transport through the nozzle.

Function:

The function of the nozzle is to prevent cavitations in the dead volume which can damage the thin sealing diaphragm. The band-width by the pressure measurement should be reduced as little as possible.

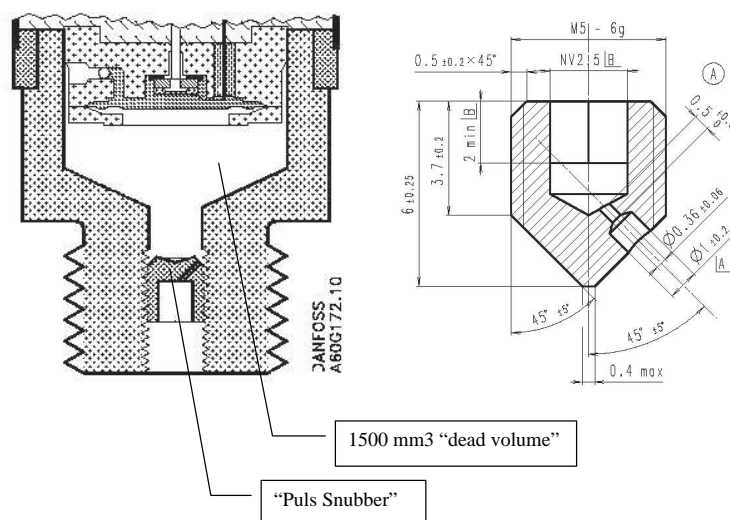
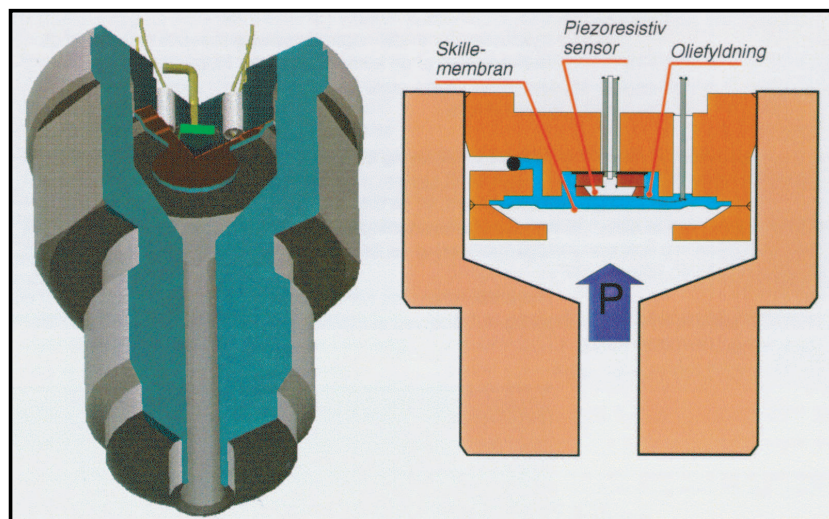


Figure 1: MBS3250 with puls snubber