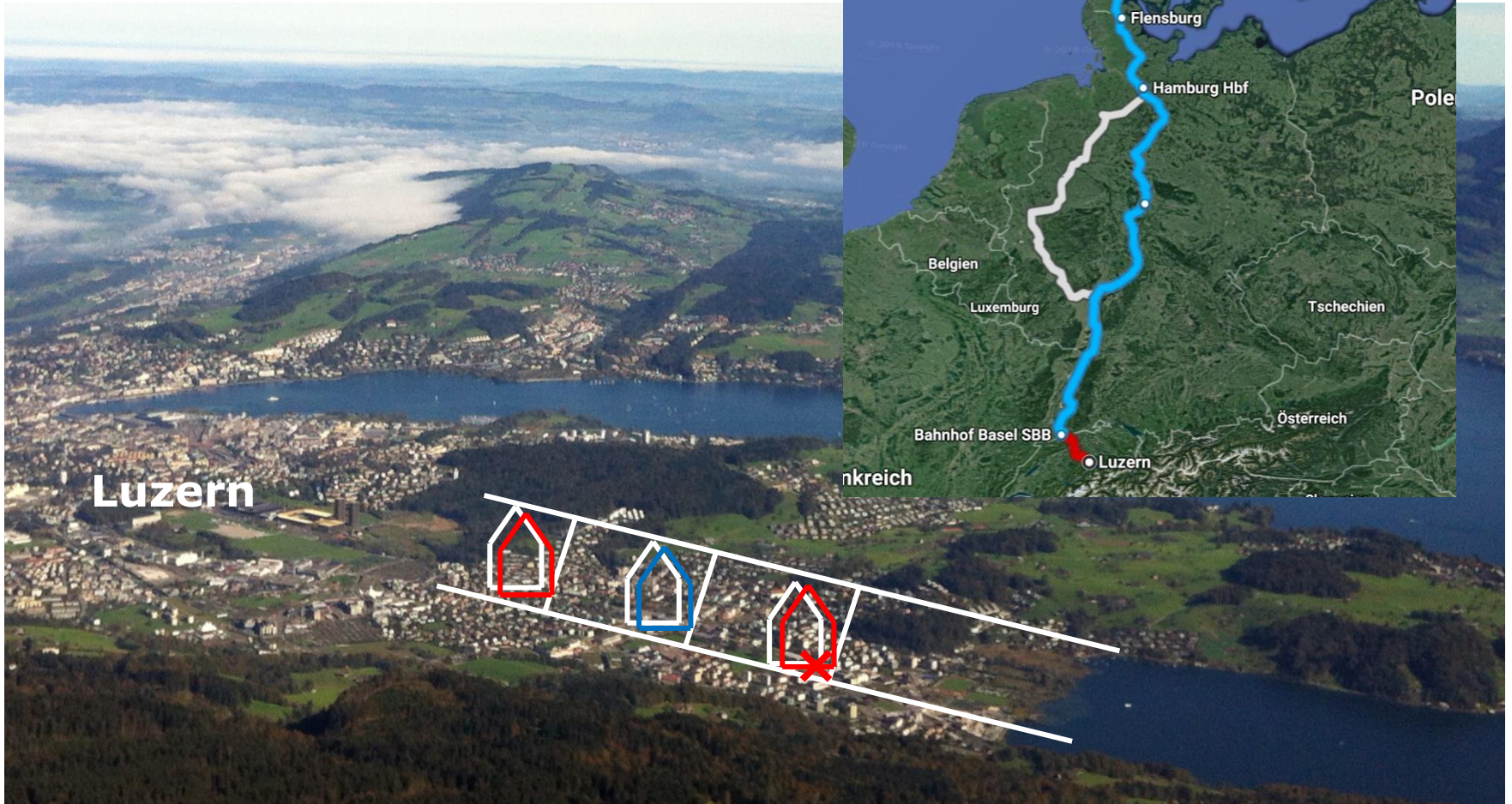
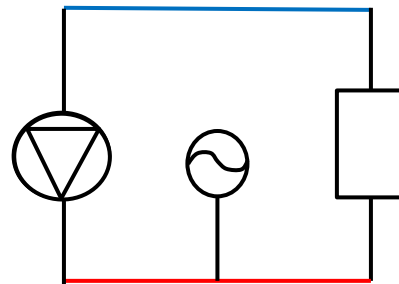
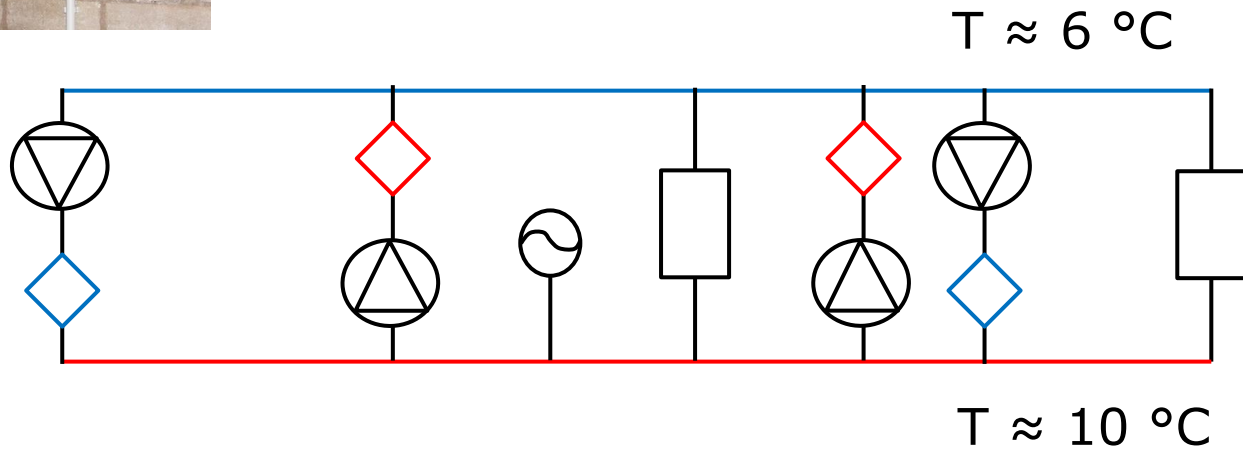


Klick - klack

Lowering the pressure in district heating and cooling networks by alternating the connection of the expansion vessel

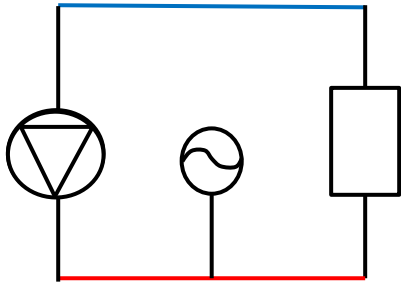
Low temperature network





NODES Lab

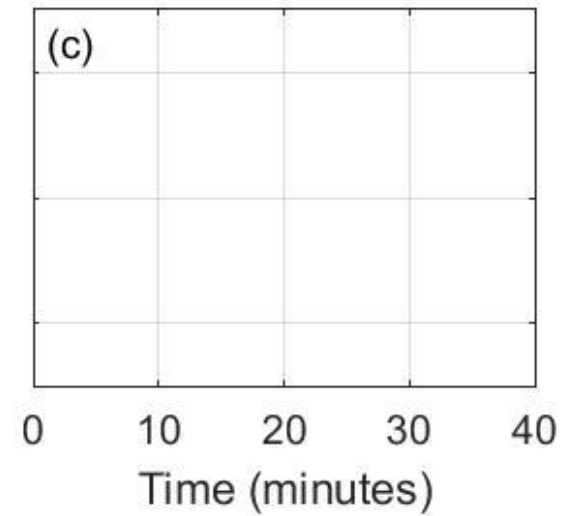
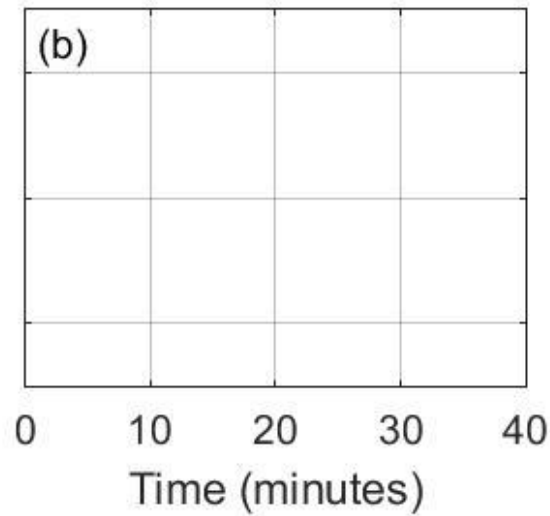
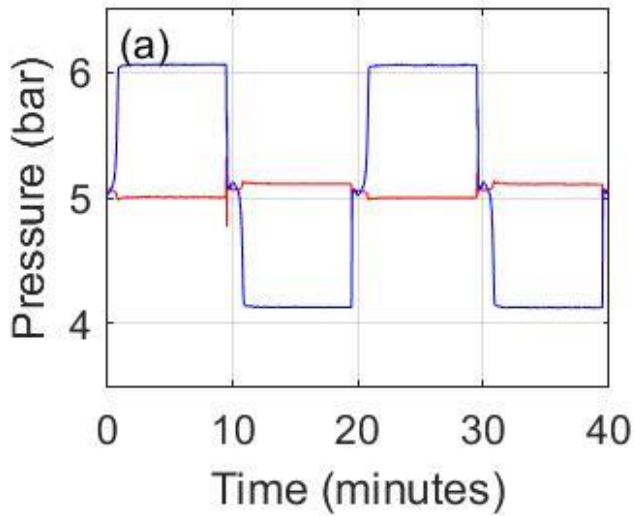


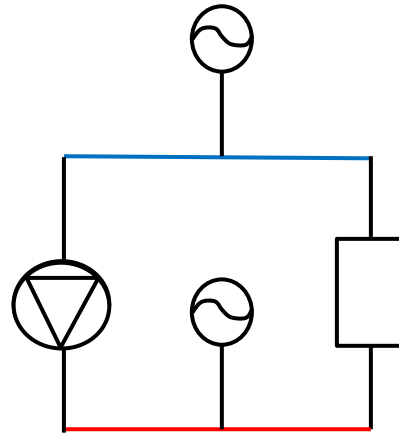


Expansion vessel in
warm line

Variable
connection of the
expansion vessel

Variable connection of the
expansion vessel after
pressure reduction

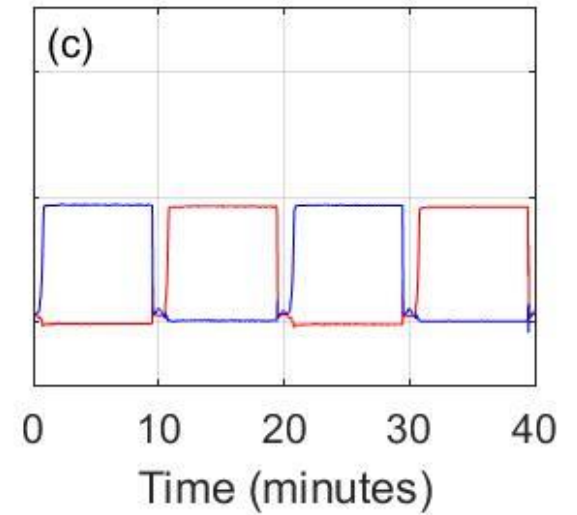
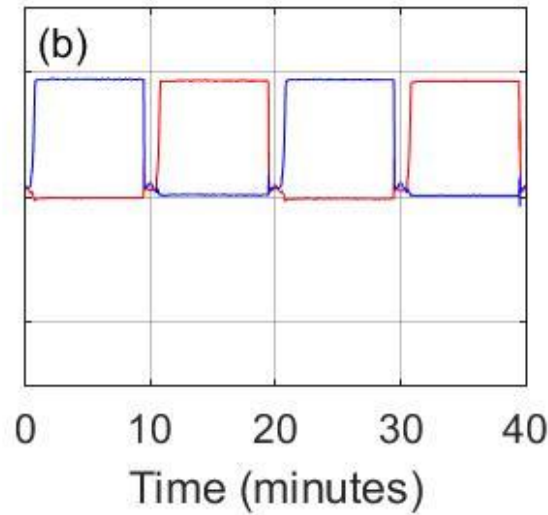
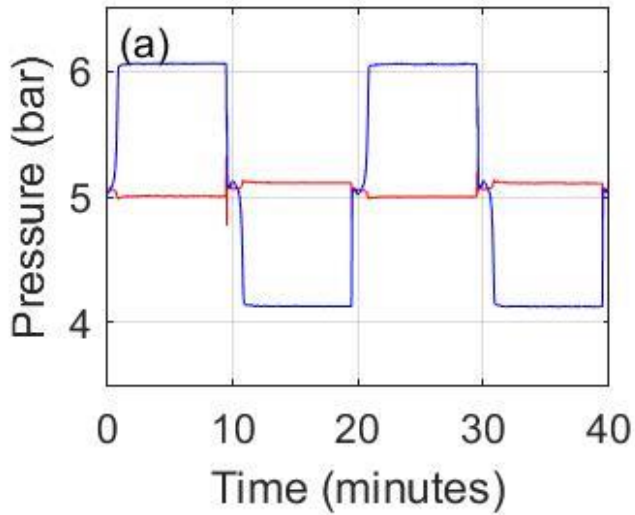


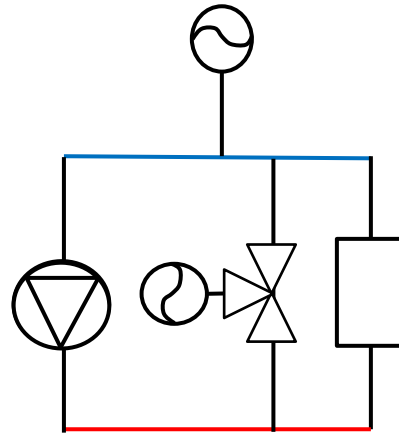


Expansion vessel in
warm line

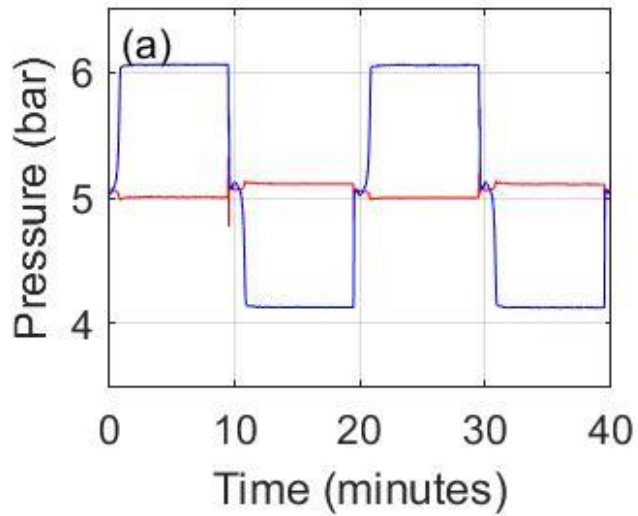
Variable
connection of the
expansion vessel

Variable connection of the
expansion vessel after
pressure reduction

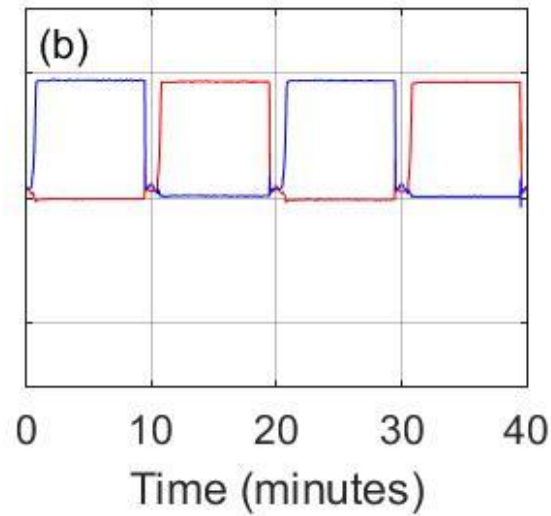




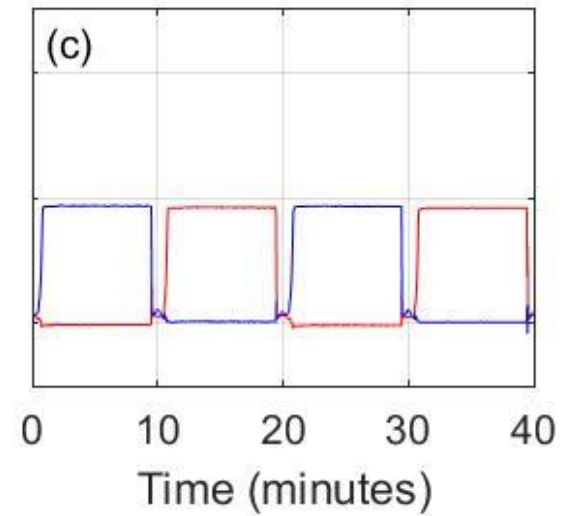
Expansion vessel in
warm line

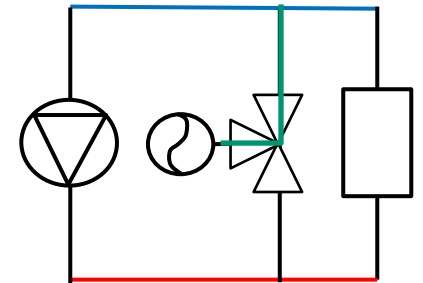
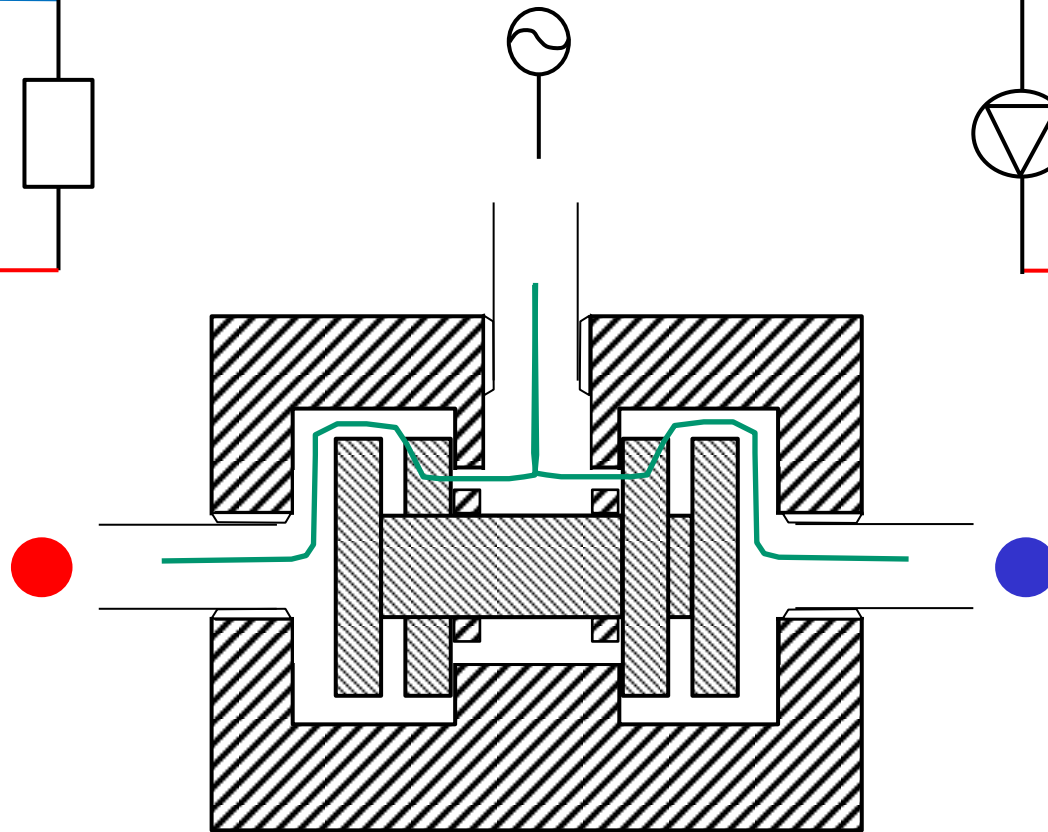
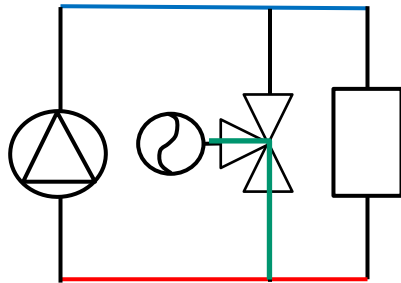


Variable
connection of the
expansion vessel



Variable connection of the
expansion vessel after
pressure reduction





Pressure reduction

Pressure in the low temperature network of ETH Zurich can be lowered by 0.5 bar.

Savings

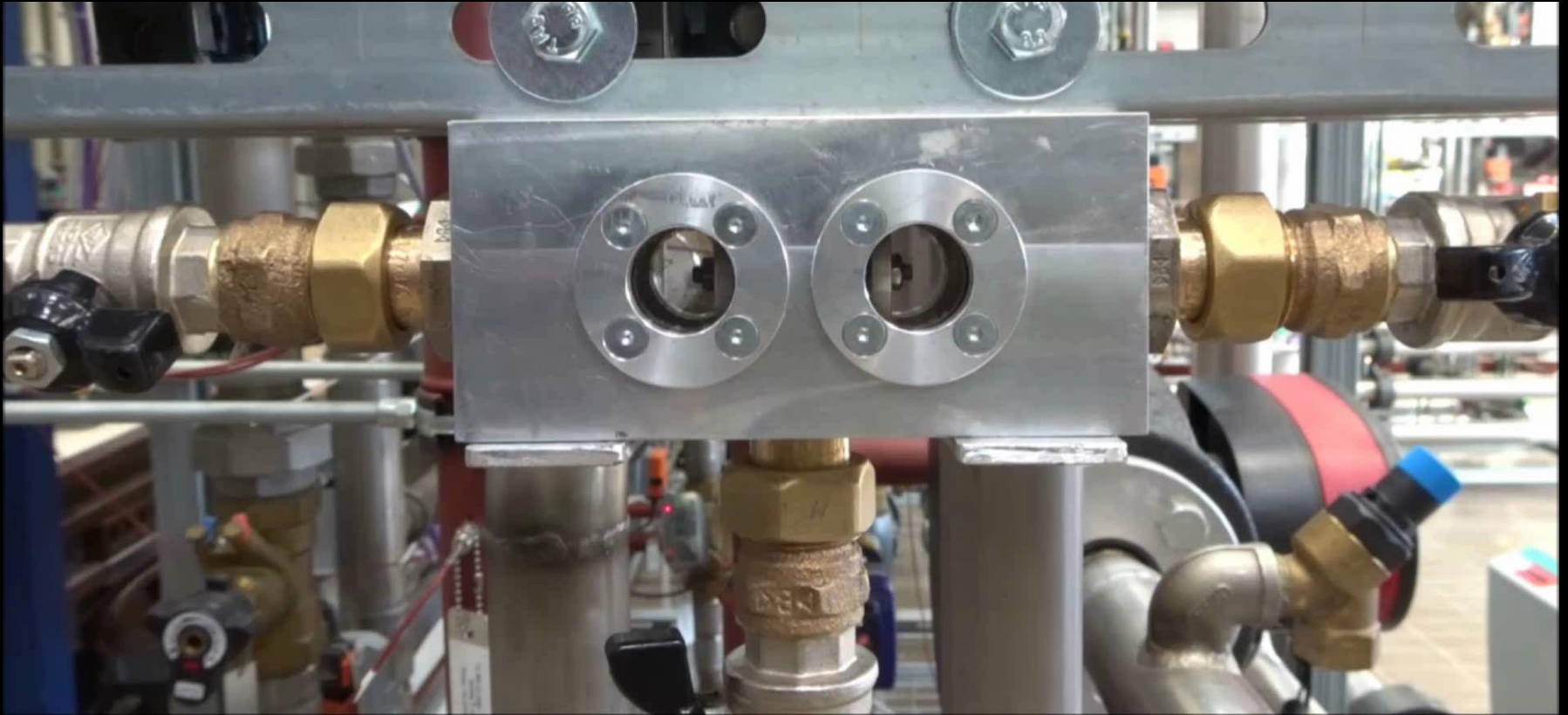
PN10 pipe is 30 % cheaper than a PN16 pipe.

Operation

Cavitation free operation without previous knowledge of pump activities.

Simple realisation

Work arounds are all more complicated (adjustable system pressure, motor driven three way valve)



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