Factsheet

Optimising system pressure

An operating pressure that is too high by as little as 1 bar can already lead to a huge increase in operating costs:

- The compressor's power consumption increases by 6 to 10%.
- Leakage rises by 13 to 14%.
- Backflow loss in rotary compressors and the effect of the dead spaces in piston compressors increase, leading to a reduction in delivery of 10%. If the compressor has sufficient reserve power, its load cycles are increased by 10%.
  Otherwise, the pressure at the point of consumption drops.
- Due to the additional thermal load, the oil ages more quickly, so that it needs to be changed twice as often, resulting in much higher costs for new oil and the disposal of the spent oil.

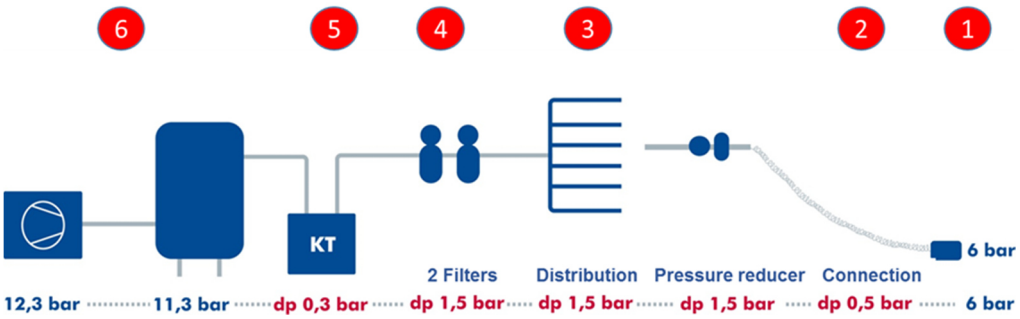
As the energy consumption increases, the compression temperature rises, which has a deteriorating effect on the quality of the compressed air.

- A temperature increase of the compressed air of as little as approx. 5 K results already in a much higher water load. In order to dehumidify the air, operators need larger dryers, which of course consume more energy.
- The increased compression temperature further results in a mineral oil load in the compressed air system that is around 50% higher than normal, so that the maintenance intervals of activated carbon filters and activated carbon adsorbers become significantly shorter.

Recommendations

The system pressure downstream of the compressor can be calculated based on the operating pressure required by the consumer. For new plants, this pressure is specified in the operating instructions. For existing systems, we recommend measuring the pressure using a plug-in gauge. The key factor is thereby the dynamic pressure in the running system, and not the static pressure during machine standstill.

Example of old plant before optimisation



Recommended guide values (plant diagram):

(1)	6.0 bar	Required operating pressure at consumer
(2)	+ 0.2 bar	Pressure loss caused by fittings (couplings, hoses, etc.)
(3)	+ 0.1 bar	Pressure loss occurring in system network
(4)	+ 0.4 bar	Pressure loss at each filter
(5)	+ 0.1 bar	Pressure loss at each dryer
(6)	6.8 bar	System pressure downstream of compressor