

# Compressed air systems

Compressed air is practical and reliable. Leaks in the network often get unnoticed and are not perceived as a problem. In a hydraulic system leakage is noticed fast and requires quick repair. Compressed air is basically perceived as «just air».

What is often overlooked is that compressed air is a very expensive energy source that should be handled carefully. Air as such does not cost anything and is therefore compressed, cooled, filtered, oiled and boosted without concern – often around the clock. Every cubic metre of air goes through a series of processes before it meets the quantity, pressure and quality required for the compressed air network. The use of waste heat from the compressor increases the total efficiency of the compressed air system.

Energy costs account for some 60% of a compressed air system’s operating costs. Consequently, the proper dimensioning and configuration that meets operating needs have a decisive impact on operating costs throughout service life. In this respect, the use of efficient com-

ponents such as IE4 motors with frequency converters for load adaptation is just as important as proper pipe sizing, filters and design of the compressed air network and storage tanks. Every «bar» lower pressure that the compressor is feeding into the compressed air network saves around 10% in energy costs. Proper planning and the use of efficient components pay off with compressed air systems. The basis for decision-making should always be the life-cycle costs (the sum of all costs throughout service life), not procurement costs only. Systems that cost more when purchased but are more efficient may soon lead to lower operating costs compared to cheaper models, thereby generating cost savings.

### Leakages cost money

No matter how efficient an installation is, air that escapes through a leakage in the network or in the storage tanks and is not fully used is 100% wasted. Compressors and compressed air systems need maintenance to keep them in optimum operation at all times. Every hiss costs money, and should therefore be corrected rapidly.

Hole diameter of leak	Air consumption at 6 bar (over pressure) m <sup>3</sup> /min	Loss	
		kW	CHF/year
1 mm	0.065	0.46	604.–
2 mm	0.257	1.80	2364.–
4 mm	1.03	7.21	9474.–
6 mm	2.31	16.17	21247.–

**Table 1: Leakage cost for compressed air systems, source: KAESER Kompressoren (2018), price of electricity: 0.15 CHF/kWh; specific compressor performance: 7kW/(m<sup>3</sup>/min)**

