

Intelligently, compactly and correctly dimensioned: Pneumatics increases energy efficiency

Constructional changes for more energy efficiency



In order to ensure a certain level of machine performance, pneumatic components with oversized dimensions have often been chosen when constructing pneumatic systems. But with the continuous rise of energy prices, highly-efficient use of compressed air is becoming more and more critical. In most pneumatic systems substantial energy savings are possible.

Rexroth supports you with comprehensive pneumatic system Know-How ensuring the efficient design of your machines. Rexroth uses three crucial steps to achieve compressed air savings: Optimal dimensioning of components, reduction of tube lengths and intelligent pressure regulation. Through these measures Rexroth offers pneumatic applications with the highest reliability and up to 55% reduction of energy costs.

Oversizing = Wasting

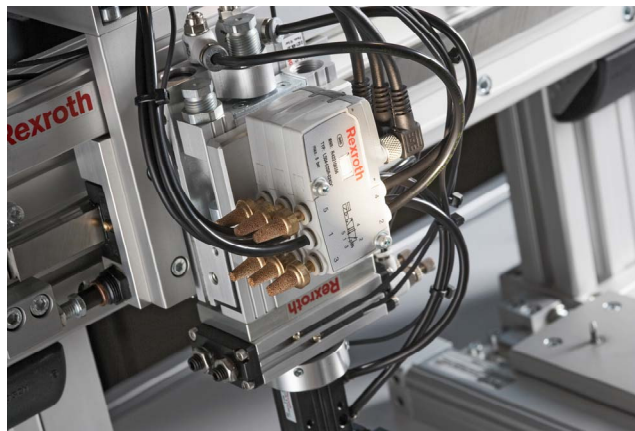
The first way to increase energy efficiency is optimal dimensioning of the components used, in order to avoid unnecessarily high air consumption due to oversizing.

Old habits die hard: Oversizing is still considered to be a legitimate means of securing machine performance. But oversized actuators consume

unnecessary energy and therefore increase the operating cost. When viewed over the entire life cycle of a machine, this adds up to a significant amount of money. Pneumatic components are available in a wide array of sizes, which provide the optimal conditions for precise application dimensioning. A cylinder with an application optimized diameter can reduce the air consumption by at least 15%, when compared to that with a commonly oversized diameter. Rexroth simplifies the dimensioning with modern, On-line, calculation and optimization programs. Through a few clicks and some basic inputs, the practical result is clearly presented including technical data and recommended components. With the new On-line air consumption calculator from Rexroth technical designers can calculate and compare the resulting energy costs from the basis of compressor capacity, operating hours and the technical parameters of the actual application.

Furthermore, compact components with smaller installation envelopes permit an economical machine design.

For example the valve series LS04 can, thanks to its compact dimensions and the low weight, be installed directly onto moving parts, for example in small handling applications.



Decentralized units = Short Paths

Technical designers can achieve a substantial machine efficiency increase through the reduction of the tube lengths. Thus dead volumes are reduced and pressure losses are avoided through shorter tube lengths.

Innovative pneumatics modules with high energy density, such as valve series LS04 from Rexroth, offer the cycle time advantages of decentralized automation structures and also lower air consumption up to 35%. These very compact components are so small and lightweight that they can be integrated directly on the actuators. Another example is the Rexroth valve terminal system CL03, which is the only valve system available that fulfils IP69K requirements. This enables a significant reduction in tube lengths by allowing it to be placed directly around the actuators in the food and beverage industry, something that is not normally possible due to high-pressure cleaning requirements.

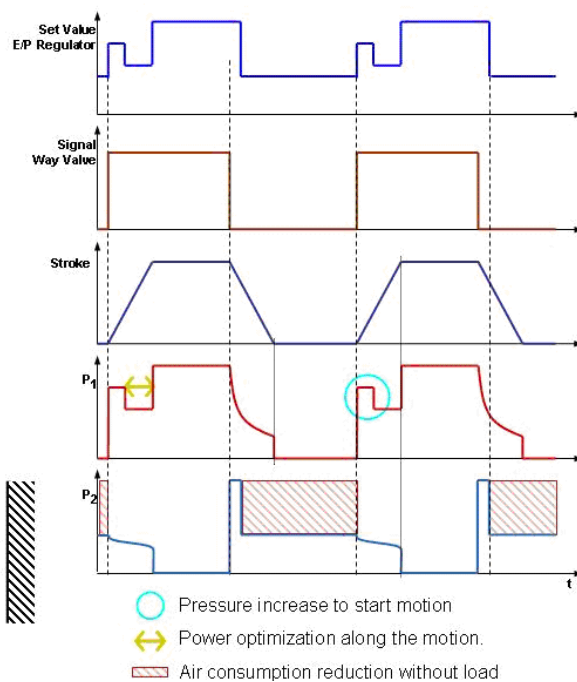
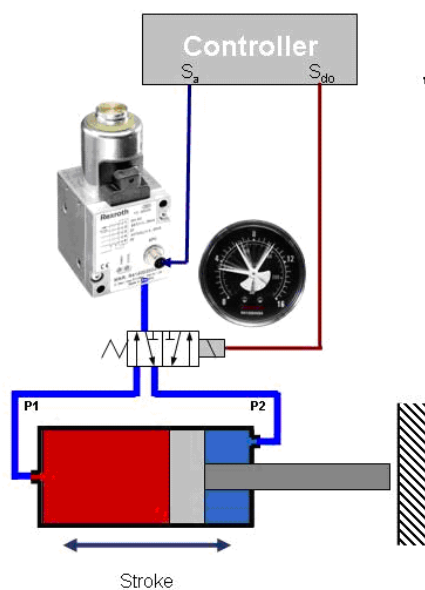


With integrated cylinder/valve units from Rexroth, tube lengths are reduced to almost zero. The concentration of the pneumatic functions within one unit prevents pressure losses, which can occur with long tube lengths from valve to the actuator.

Intelligent pressure regulation = Energy on demand

In the new ED series pressure control valves, Rexroth uses decentralized intelligence to adapt the pressure individually to every need, and thus raising the energy efficiency. The pressure profile of an actuator's movement is divided into different phases: Start, movement, end and return stroke. Start and end phases usually require high energy, while movement and return stroke phases can be performed with a significantly lower pressure.

Intelligent energy use for pneumatic actuators.



Even if the reduced pressure usage distance appears short, it is sufficient enough to optimize the motion and to minimize hard end position stops. When many thousand repetitions of the movement are performed, the incremental savings accumulate to a noticeable efficiency increase of the entire process.

Since each application has individual characteristics, energy-efficient procedures need extremely precise and intelligent pneumatic valves. The highly dynamic ED series from Rexroth combines innovative proportional valve technology with digital electronic control. Each unit consists of a direct control valve, including proportional magnet, a pressure sensor as well as an integrated electronic control.



By the intelligent linkage of different measurements, considerable savings can be obtained. Higher efficiency lowers the energy expenditures, allowing initial investments to amortize within a short time. Those who take energy consumption seriously do not have to wait until completely new components are invented. The necessary products and modules to increase energy efficiency already exist. Now it is time to apply these optimization technologies in the design of new machines and pneumatic systems, and as a result achieving high machine performance and high energy efficiency.
