

## Pneumatic Information

### Some history

For thousands of years, man has used air as an aid in doing various tasks, e.g. a bellows for lighting fires.

In the year 260 BC, a Greek called Ctesibios built the first air gun. In addition to a tight seal, he used air compressed in a cylinder to increase the range of projectiles. So it is not surprising that "pneuma", the Greek word for "air", has given its name to the technology known as pneumatics.

During the industrialisation process in the 19<sup>th</sup> century, machines powered by compressed air were used for mining and building roads. Pneumatic technology has become indispensable in modern industry. Pneumatically powered machines and robots are to be found in numerous industrial processes such as assembling or arranging components, or packing finished goods.

### "Pneumatic Robots" from fischertechnik

As fischertechnik is capable of modelling (almost) anything on a small scale, small pneumatic drive units are also to be found in its program. These consist of pneumatic cylinders, manual valves and a mini compressor.

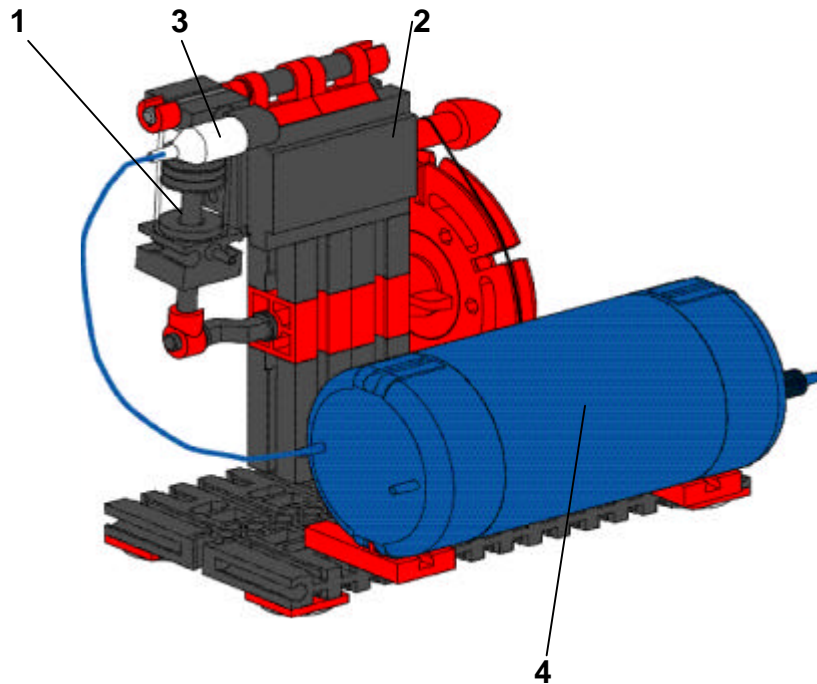
And this is not all. It is even possible to program and control these machines with a computer. Electromagnetic valves, which are connected to the fischertechnik interface now make it possible to control pneumatic cylinders using a computer program written with a special software package LLWin.

Thus, "Pneumatic Robots" combines two fascinating areas of technology, pneumatics and computing in one single kit. Pneumatically controlled fischertechnik models - the possibilities are virtually unlimited.

## The pneumatic components and their functions

### The compressor

The compressor is constructed using fischertechnik components. It supplies the compressed air required to move the cylinders in and out. The compressor is the same for every model and therefore only has to be constructed once, as described in the instructions provided.



#### Method of function:

The compressor cylinder (1) is powered by a fischertechnik motor (2). When the piston rises, air is sucked in from outside through the non-return valve (3). When the piston moves downwards, the air is compressed and forced into the air chamber (4). The non-return valve now ensures that the compressed air cannot flow back. The air chamber always contains enough compressed air to operate the pneumatic cylinder. The pressure generated by the compressor is around 0.5 bars. The piston of the compressor cylinder must always be able to move freely. If necessary it can be lubricated slightly with a small drop of acid-free oil (e.g. silicon oil).

If the compressor is not being used for some length of time, it is advisable to remove the drive belt as it may stretch and then slip when the machine is started again.

### The electromagnetic valve

In pneumatics, the purpose of a valve is to control the current of air to the pneumatic cylinder in such a way that the cylinder moves either inwards or outwards. Such a valve can either be operated by hand, pneumatically, or (in the case of the fischertechnik valve) electromagnetically.

Technical data:

3/2-way valve

9V DC/130mA

When connecting to power source, it is **not** necessary to ensure correct polarity.

