

COMPONENTS OF PNEUMATIC DEVICES

CONCEPT Pneumatic devices use compressed air to power various types of equipment and machinery. They consist of several key components. The various components of a pneumatic system work together to create a reliable and efficient source of power for a wide range of applications, from industrial machinery to automotive tools.

TERMINOLOGY

COMPRESSOR - This is the device that compresses and stores air in a tank or receiver, which can then be used to power other pneumatic components.

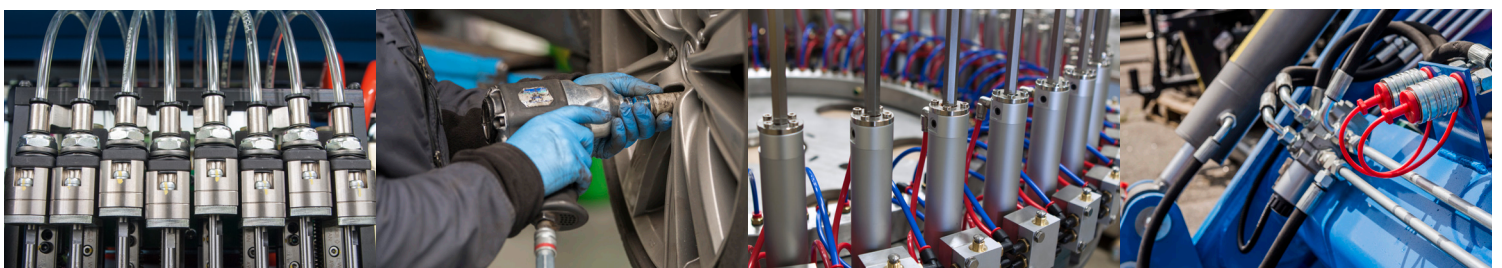
ACTUATORS - These are the components that convert compressed air into mechanical motion or force, allowing pneumatic devices to perform work. Examples include cylinders, motors and grippers.

VALVES - Valves are used to control the flow of compressed air within a pneumatic system. They can be manually or automatically operated and can control the direction, pressure, and volume of air flow. Some common types of valves include directional control valves, pressure control valves, flow control valves, and check valves.

FITTINGS AND TUBING - Fittings are used to connect various components of the pneumatic system and include couplings, adapters, elbows, and tees. Tubing is used to transport compressed air between components and is available in different materials such as plastic, metal, and rubber.

AIR TREATMENT COMPONENTS - These components are used to ensure that the compressed air used in a pneumatic system is clean, dry and free of contaminants. They can include filters, regulators, dryers and lubricators.

PNEUMATIC CIRCUITS - These are the different arrangements of pneumatic components such as compressors, actuators, valves and air treatment components that work together to perform a specific function.



BACKGROUND

The history of pneumatic devices can be traced back to ancient Greece, where Heron of Alexandria developed the first known steam turbine, which used steam to cause a sphere to rotate. In the 17th century, the concept of a vacuum was developed by Evangelista Torricelli, which led to the creation of the vacuum pump. The first practical pneumatic device was the air pump, invented by Otto von Guericke in 1650. Later, in the 19th century, advancements in manufacturing technology led to the development of more sophisticated pneumatic devices, including air compressors, pneumatic cylinders, and control valves. Today, pneumatic devices are widely used in a variety of applications, including manufacturing, transportation and construction.



Make sure it measures up

REAL WORLD CONNECTIONS

Ever been driving in a car when road workers or construction workers are busting up concrete? Some large pneumatic drills, also known as jackhammers, are powered by compressed air and are commonly used in road construction, demolition and excavation projects. These tools are frequently used for drilling and breaking up concrete and asphalt surfaces. Pneumatic drills consist of several key components, including a compressor to provide compressed air, an actuator (the drill itself) to perform the work and control valves to regulate the flow and pressure of the compressed air.

APPLICATION

Pneumatic devices are heavily used in the automotive industry, where compressed air is used to power various tools and machinery. For example, pneumatic impact wrenches are used to remove and tighten lug nuts on wheels, as they provide a high torque output with minimal effort from the operator.

Additionally, pneumatic actuators are used in vehicle braking systems to apply pressure and “squeeze” the brake pads on the rotor to slow down the vehicle. Pneumatic cylinders are also used in some suspension systems to adjust the height of the vehicle and provide a smoother ride.

The use of pneumatic tools in the automotive and construction industry has greatly improved efficiency and productivity, while also allowing mechanics and technicians to reduce repetitive motions which can lead to injuries and increased fatigue.

