

Pneumatics System

(Uses of Pressurized Air)

Aim: How can we learn about the pneumatics system in a robot?

Do Now: Describe specific movements a robot can make other than moving left to right.

What is Pneumatics?

Pneumatics is the study of pressurized gas used to move parts of the robot

How has pneumatics been used in past robots?

Used for but not limited to...

- *Used to open and close arms*
- *Shooters*



Pneumatics Components

Air Compressor: Compresses
air from the atmosphere



Air Can: Holds air



Pneumatics Components

Pressure Gauge: Measures the pressure of a gas in psi (pounds per sq. in)



Pressure Switch:



Detects pressure change and when pressure reaches a set level, capable of opening or closing electrical contact

Pneumatics Components

Pressure Relief Valve: A valve that automatically opens when pressure reaches a dangerous level

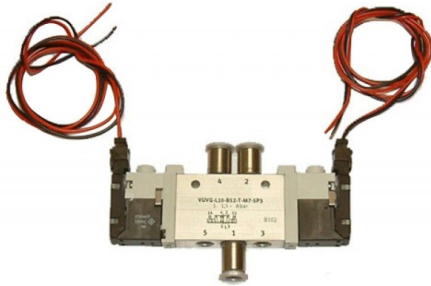


Pressure Regulator:

A valve that automatically cuts off the flow of a liquid or gas at a certain pressure

Pneumatics Components

Solenoid Valve



Air moves in and out (controls the air pressure going into the pistons)

Piston



A short cylinder which is fitted closely within a tube and is pushed out when air is released and contracted when air is sucked back in.

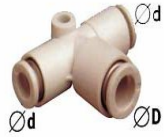
Tubing



What the air flows through the system

Pneumatics Components

T-Connectors:



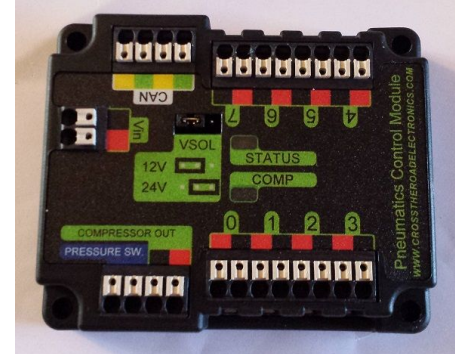
Helps make additional connections with tubes

Teflon Tape



Used to wrap around brass fittings to prevent air leakage

PCM

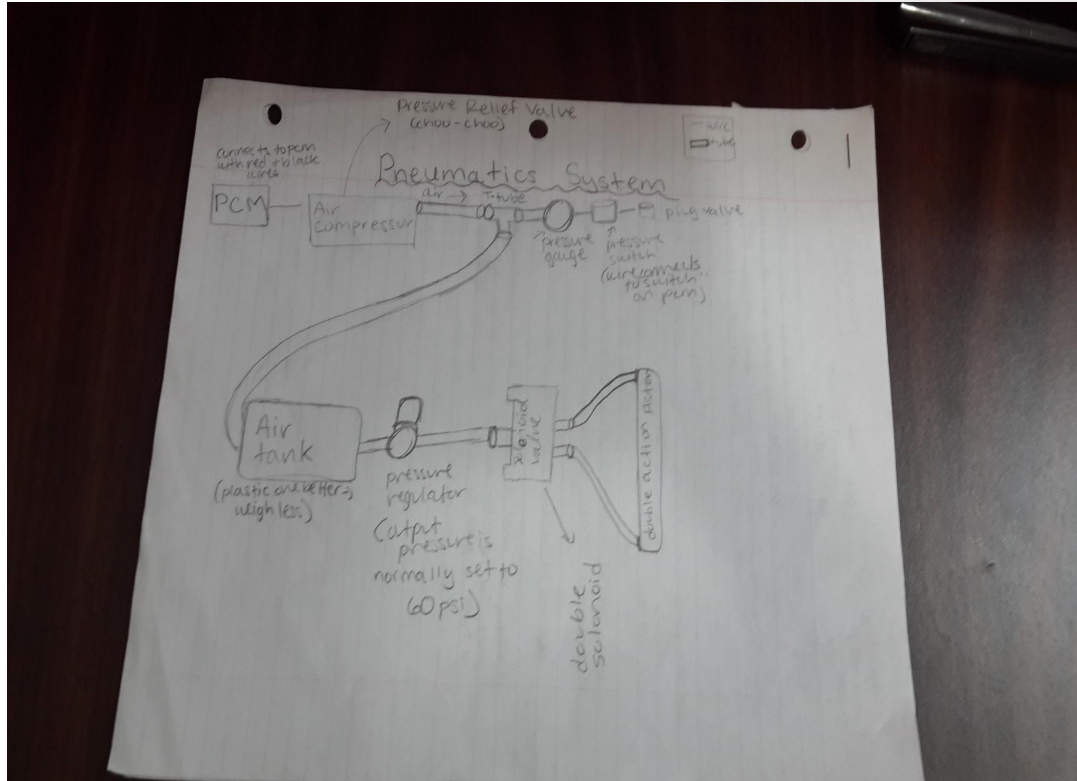


Pneumatics Control Module

Pneumatics Components

- **Air Compressor:** Compresses air from the atmosphere
- **Air Cans/Cylinders:** Holds air
- **Pressure Gauge:** Measures the pressure of a gas in psi
- **Pressure Switch:** Detects pressure change and when pressure reaches a set level, capable of opening or closing electrical contact
- **Pressure Relief Valve:** A valve that automatically opens when pressure reaches a dangerous level. Type of **valve** used to control or limit the **pressure** in a system
- **Pressure Regulator:** a valve that automatically cuts off the flow of a liquid or gas at a certain pressure
- **Solenoid Valve:** air moves in and out (controls the air pressure going into the pistons)
- **Piston:** A short cylinder which is fitted closely within a tube and is pushed out when air is released and contracted when air is sucked back in.
- **Tubes:** What the air flows through the system
- **T-Connectors:** Helps make additional connections with tubes
- **Teflon Tape:** used to wrap around brass fittings to prevent air leakage
- **PCM:** Pneumatics Control Module

System Connections



Pneumatic System Connections

- PCM connects to air compressor with red and black wires
- Air compressor connects with t-tube to pressure gauge, pressure switch and pressure relief valve. The other side of the t-tube connects to the air tank
- The air tank connects to the pressure regulator
- The pressure regulator connects to the solenoid valve
- The solenoid valve connects to the piston

Let's Review!

1. What is pneumatics?

It is the study of pressurized air used to move parts of the robot

2. What does the air compressor do?

It compresses air from the surroundings

3. The air compressor is connected to which other components?

It connects to the PCM. It also connects to the air tank with one side of the tube. The other side is connected to the pressure gauge, pressure switch and pressure relief valve