

# Valves Explained



## There are two types of cylinders, Single and Double Acting:

Single acting cylinder uses the same port for the air intake and air exhaust. (Single acting cylinders typically have a spring inside used to return the piston back to the starting position)

Double acting cylinder features 2 ports at either end, and the ports alternate as inputs and exhaust to drive the cylinder back and fourth.

## What does "Way" mean, and what should I choose?

"Way" refers to the number of ways the air can flow through the valve

2 way valves features an input and output port (there is no exhaust), this is commonly used to allow air to flow through in one direction only.

3 way valves features an input, output, and exhaust. 3 way valves are generally used in single acting cylinders.

4 way valves features an input, two outputs, and two exhausts. 4 way valves are generally used in double acting cylinders, or when there is a need to switch the flow between the two outlet ports. There are a few variations in 4 way valves as you will learn later in the positions portion.

## What does "Positions" mean?

The term "Positions" is used to describe the number of states/actions available in the valve.

A 2 position valve means that there are 2 choices/states/actions the valve is capable of performing.

A 3 position valve means that there are 3 choices/states/actions that the valve is capable of performing.

## What is Normally Open, Normally Closed, Center Closed, Pressure Center, Center Exhaust?

Normally Closed, which means that the valve's pressure/input port is blocked when it is in the neutral/starting/1st position and the valve is ready to exhaust (if applicable).

Normally Open means that the valve's default/starting/1st position allows the air to flow from the input to the primary output port and the exhaust port is blocked (if applicable).

Center Closed valves features 3 positions. The center position blocks the air from flowing in or out of the valve, this is commonly used to stop a cylinder in intermediate positions.

Center Exhaust valves features 3 positions. The center position blocks the air from flowing into the valve, and all the air is exhausted, this is commonly used to prevent air from remaining in the system in the neutral/inactive state.

Pressure Center valves features 3 positions. The center position allows air to flow to both ports at the same time, this is commonly used to stop a cylinder in intermediate positions.

## What should I choose?

99% of the time you just need to choose either a 4 way 2 position, 4 way 3 position center closed, or 3 way 2 position valve.

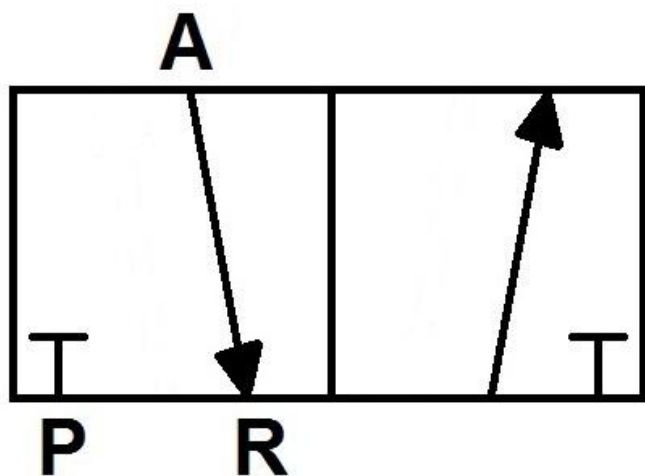
4 way 2 position valves are good for double acting cylinders. (if you want the cylinder to extend all the way out or all the way in).

4 way 3 position center closed valves are good for double acting cylinders (if you want to be able to extend, retract, and stop in intermediate positions)

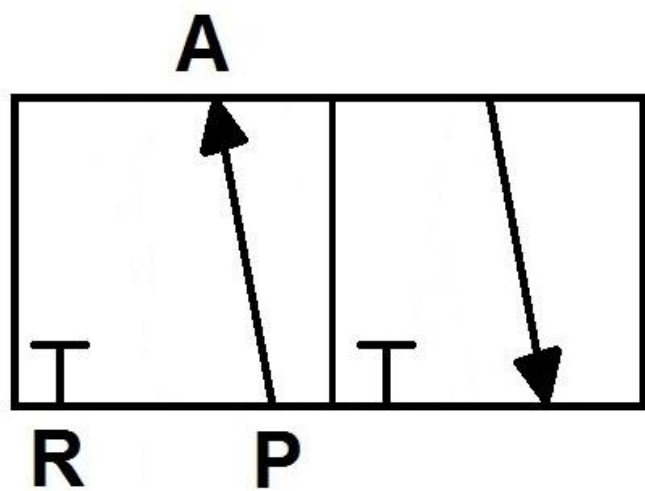
3 way 2 position valves are good for single acting cylinders. (if you want the cylinder to extend all the way out or all the way in).

2 way 2 position valves are also known as direct acting valves, they can only open and close, and do not have exhaust ports.

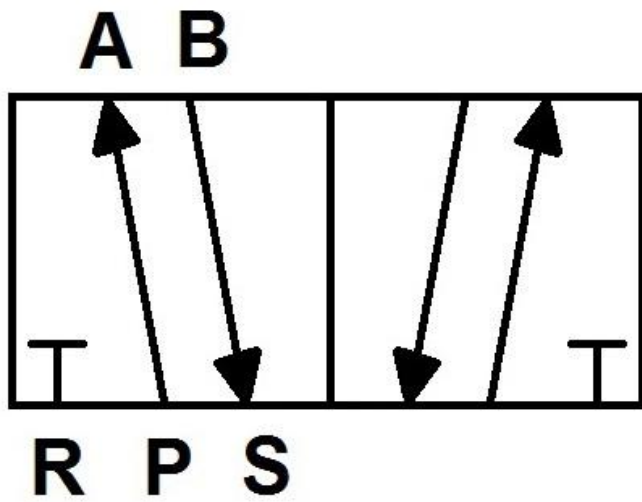
## 3 Way 2 Position Normally Closed



3 Way 2 Position Normally Open



4 Way 2 Position



4 Way 2 Position Center Closed

