



# Valve Information

## Ways

The (oil) ports on a valve.

A 3-way valve has 3 ports: pressure (P), tank (T), and cylinder (A).

A 4-way valve has 4 ports: pressure (P), tank (T), advance (A) and retract (B).

**Single-Acting** cylinders require at least a 3-way valve, and can, under certain instances, be operated with a 4-way valve.

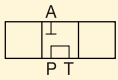
**Double-Acting** cylinders require a 4-way valve, providing control of the flow to each cylinder port.

## Positions

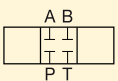
The number of control points a valve can provide. A 2-position valve has the ability to control only the advance or retraction of the cylinder. To be able to control the cylinder with a hold position, the valve requires a 3rd position.

## Centre Configuration

The centre position of a valve is the position at which there is no movement required of the hydraulic component, whether a tool or cylinder.



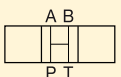
The most common is the **Tandem Centre**. This configuration provides for little to no movement of the cylinder and the unloading of the pump. This provides for minimum heat build-up.



The next most common is the **Closed Centre** configuration, which is used mostly for independent

control of multi-cylinder applications. This configuration again provides for little to no movement of the cylinder, but also dead-heads the pump, isolating it from the circuit. Use of this type of valve may require some means of unloading the pump to prevent heat build-up.

There are many more type of valves, such as Open Centre and Float Centre. These valves are used mostly in complex hydraulic circuits and require other special considerations.



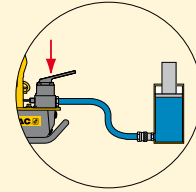
Open Centre



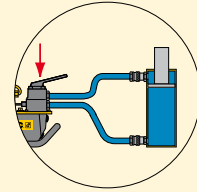
Float Centre

## Directional Control Valves

**3-Way Valves** are used with single-acting cylinders.

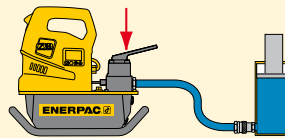


**4-Way Valves** are used with double-acting cylinders.

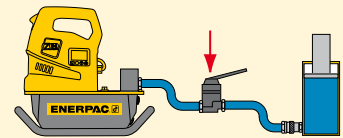


Valves may be either pump mounted or remote mounted.

### Pump Mounted

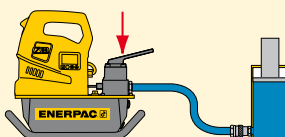


### Remote Mounted

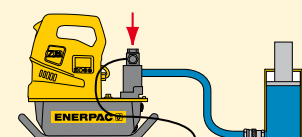


Valves may be either manually or solenoid operated.

### Manually Operated

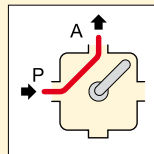


### Solenoid Operated



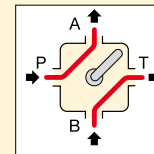
## Advance Hold Retract

**Single-acting cylinder** Controlled by a 3-way, 3-position valve.



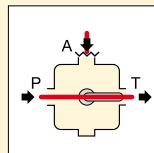
### Advance

The oil flows from the pump pressure port P to the cylinder port A: the cylinder plunger will extend.



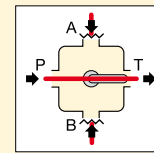
### Advance

The oil flows from the pump pressure port P to the cylinder port A and from cylinder port B to tank T.



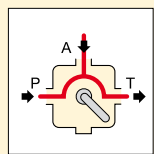
### Hold

The oil flows from the pump pressure port P to the tank T. The cylinder port A is closed: the cylinder plunger will maintain its position.



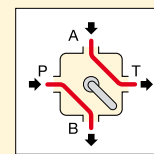
### Hold

The oil flows from the pump pressure port P to the tank T. The cylinder ports A and B are closed: the cylinder plunger will maintain position.



### Retract

The oil flows from the pump and cylinder port A to the tank T: the cylinder plunger will retract.



### Retract

The oil flows from the pump pressure port P to cylinder port B and from cylinder port A to tank T: the cylinder plunger will retract.