Valve Basic Interview Questions & Answers

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Are you getting ready for an interview? Look over these Valve Basic Interview Questions and Answers. Let's go over the fundamentals of control valves.

What exactly is a valve?

A valve is a piece of equipment that regulates the flow of a fluid or gas. Today's valves can control not only the flow of liquids, gases, or slurries through a pipeline, but also the rate, volume, pressure, and direction.

What exactly is a 2-way valve?

The on/off function is provided by a 2-way directional control valve. When the valve is opened, air flows through the input port and out the output port. View a cross section of a 2-way normally closed valve.

What exactly is a 3-way valve?

A three-way directional control valve is used to pressurize and exhaust a port. Air flows through the input port and out the output port when a 3-way normally closed valve is actuated.

When not actuated, air flows from the output port through the exhaust port. View a cross section of a three-way valve.

What exactly is a 4-way valve?

Two ports are pressurized and exhausted by a four-way directional control valve (the valve body consists of 5 ports).

A four-way valve contains four distinct flow paths and is commonly used to cause reversible motion of a cylinder or motor. When the valve is opened, flow is directed from input port 1 to output port 4, while output port 2 exhausts through port 3.

Air flow is directed through input port 1 to output port 2 in the unactuated position, while output port 4 exhausts through port 5. View a cross section of a four-way valve.

What is normally available? (At the Valve Point)

In the unactuated position, air flows from the input port to the output port, which is referred to as normally passing.

What is normally shut? (At the Valve Point)

In the unactuated position, air flow is blocked at the input port, which is referred to as normally not passing.

What exactly is a shuttle valve?

When a signal must be selected from two or more different sources, shuttle valves are used.

They, too, are known as "OR" valves because they allow a signal to pass through from either input A or B (or both), as well as the reverse flow of system exhaust through these same inputs.

A shuttle valve selects the higher of two pressures, which is an important function to consider when designing circuitry. View a cross section of a shuttle valve.

What exactly is a "AND" valve?

"AND" valves are used in circuit control applications where multiple inputs must be combined to produce a single output. When a signal is fed into both input ports 1 and 2, the output is fed into port 2.

The lower of the two pressures will always be the output flow. To receive an output signal from the valve, both input pressures must be present (loss of input will cancel the output signal). View a cross section of an AND valve.

What exactly is a "OR" valve?

Shuttle valves are another name for "OR" valves.

What exactly is the distinction between a flow control and a needle valve?

Although the basic function is flow restriction, the needle valve controls flow in both directions (bi-directional), whereas the flow control valve controls flow in only one direction, allowing free flow in the opposite direction.

What is the function of meter?

Free flow is from port 1 to port 2, whereas controlled flow is from port 2 to port 1.

What exactly is meter out?

Free flow is from port 2 to port 1, whereas controlled flow is from port 1 to port 2.

A directional control valve is what it sounds like.

A pneumatic valve is a mechanical device that connects or disconnects passages within the body. It consists of a body and a moving part (poppet or stem). Directional control valves are 2-way, 3-way, and 4-way valves.

A circuit control valve is what it sounds like.

Circuit control valves are used to regulate system flow volumes and pressures.

Circuit control valves include shuttle valves, check valves, flow controls, needle valves, quick exhausts, and pressure regulators.

What exactly is a quick exhaust valve?

Air quick exhaust valves are commonly used to allow for quick cylinder return while preventing air from returning through the pneumatic system.

When pressure is applied to the input port, an internal mechanism shifts, allowing flow through the output port while blocking the exhaust port.

Back flow at the output port unseats the internal mechanism and allows flow through the exhaust port when pressure is removed from the input port.

What exactly is closed cross-over, and why is it advantageous?

A closed cross-over valve has a stem and a poppet that work together to ensure that the poppet seals the exhaust port before the valve opens to allow flow.

There is no transitional state between functions, giving the operator precise control between positions.

What exactly is a control valve?

In the process control industry, the final control element is the control valve. It works with flowing fluids such as steam, gas, water, and liquids to correct process errors and regulate the process to the desired set point.

Where should a control valve be used?

Isolation is used for

To regulate the flow rate

Flow diverting and mixing

Preventing backflow, controlling pressure, and regulating temperature

What exactly is a CV?

Maximum flow rate in US GPM through CV at 20 degrees Celsius and 1 psi DeltaP across it.

What are the most critical components of a control valve?

Stuffing Box, Body, Bonnet, Trim (Seat Ring, Plug, and Spindle),

What is the purpose of each of these vital components?

The body of a control valve is the main component that contains internal components such as trim, seals, and helps the flow to create a proper flow path.

Bonnet: The part that connects the body to the actuator.

Trim: The heart of the control valve helps to control the fluid according to the set point.

Stuffing Box: Helps to prevent fluid from leaking through the bonnet area, thereby eliminating any unwanted leaks.

What exactly is an actuator?

Allows the valve to operate using various energy inputs such as pneumatic, electric hydraulic, and so on.

How does an actuator function?

Depending on the positioner signal, the actuator causes the valve spindle to move up and down.

What are the different types of actuators?

Pneumatic (single acting/dual acting), pneumatic piston actuators, electric actuators, and hydraulic actuators

What are the different types of control valves?

Butterfly valves, Segmented V notch Ball Valves, Self-Actuated diaphragm valves, Eccentric Plug valves, Angle valves, and 3-Way valves are examples of globe control valves.

What exactly is a positioner?

A positioner is a component that generates input signals to cause the valve to open or close in order to eliminate process error and achieve the set point.

What exactly does a positioner do?

Positioner measures the actual position of the valve and receives the command from the controller, comparing both signals and causing the valve to move in either an open or closed direction to correct the process error.

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