



Types of valve



Designed by:

عبيدة السيد السيد متولي
فرقة أولى - 230132

WHAT IS A CHECK VALVE?

- A check valve, also known as a non-return valve or one-way valve, is a simple yet crucial component that allows fluid (liquid or gas) to flow in one direction only.
- It prevents backflow, ensuring that the fluid moves in the intended direction within a system.

HOW DOES A CHECK VALVE WORK?

- A check valve has a movable element (like a disc or ball) that blocks reverse flow.
- When the fluid flows in the correct direction, it pushes the element open.
- If the pressure drops or reverses, the element closes, preventing backflow.

COMMON TYPES OF CHECK VALVES:

- 1. Swing Check Valve
- 2. Ball Check Valve
- 3. Lift Check Valve
- 4. Butterfly Check Valve
- 5. Tilting Disc Check Valve



Made by :

ندى السيد الشحات
فرقة تالته - 2021-349

WHAT IS A GATE VALVE?

- Gate valves are devices used to control the flow of liquids or gases in pipelines by raising or lowering a flat or wedge-shaped gate

ADVANTAGES :

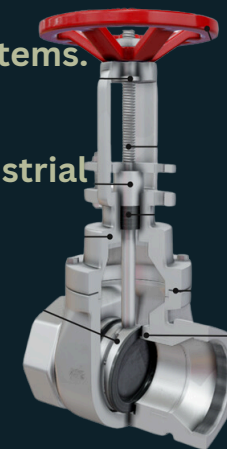
- 1. Low resistance to flow.
- 2. Durable and reliable for high-pressure applications.
- 3. Suitable for a wide range of media such as water, oil, gas, and steam.

DISADVANTAGES:

- 1. Slow to operate due to the rising and lowering mechanism.
- 2. Not ideal for throttling or regulating flow.

COMMON USES:

- 1. Water distribution systems.
- 2. Oil and gas pipelines.
- 3. Power plants and industrial applications.



Made by :

عبدالرحمن محمد عوف
فرقة تالته - 2021-251

THE DIAPHRAGM VALVE :

- The diaphragm valve is a crucial component in the process industry and is used to regulate the flow of gases and liquids. To ensure the best possible performance and long service life, it is important to choose the right diaphragm valve for your specific application.

KEY FEATURES :

- Design: The valve consists of a body, a diaphragm, and a seat. The diaphragm is usually made of rubber or another flexible material.
- Operation: When the actuator is engaged (manually or automatically), the diaphragm moves up or down, either opening or closing the flow path.
- Sealing: The diaphragm provides an excellent seal, preventing leakage and contamination.

KEY FEATURES :

- 1. Stem
- 2. Compressor
- 3. Bonnet
- 4. Actuator
- 5. Valve Body



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منال محمد فتحي
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LIQUID RELIEF VALVE :

- Liquid relief valve: a pressure-actuated valve closed by a spring or other means, designed to automatically relieve liquid pressure in excess of its setting.
- Intended for use with ASME [rated] pressure vessels or other stamped equipment.
- Certified by the National Board and rated in U.S. gallons per minute of 60°F [16°C] water flow at 110% of its setting



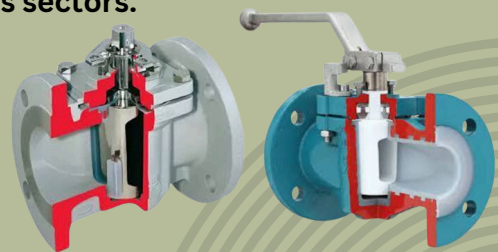
- FIG. UG-1241 SYMBOL DENOTE THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS STANDARD FOR PRESSURE RELIEF VALVES

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مريم خالد نافع
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PLUG VALVE :

- A plug valve is a quarter-turn valve with a cylindrical or conical plug that fits into the flow stream, featuring holes to allow or block flow. When rotated 90 degrees, these holes either align with the flow or block it. Plug valves are often used in applications requiring quick shutoff, tight sealing, and low-pressure drops. They are compact, easy to operate, and highly reliable due to their simple construction, which involves minimal moving parts.
- Made from materials such as brass, bronze, cast iron, or stainless steel, plug valves are versatile and can be manually or automatically actuated. Some models include indicators to show whether the valve is open or closed. They are commonly used in industries like oil and gas, chemical processing, power plants, and water treatment for tasks like regulating flow, isolating pipelines, preventing backflow, and controlling wastewater discharge. Additionally, plug valves have medical applications, such as managing irrigation fluids during surgeries and controlling water systems in dialysis treatments. Their functionality includes flow regulation, diversion, and measurement, making them a reliable choice in various sectors.



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ريم محمد هلاي
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VALVES :

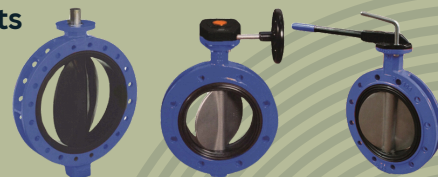
- A ball valve is one of a family of quarter-turn valves; butterfly valves are in the same family. (It should not be confused with a “ball-check valve,” which is a type of check valve.)
- Internally this type of valve has a perforated, pivoting ball. Generally the size of the hole in the ball is equal to the diameter of the pipe in which it is installed. The valve is open when the ball’s hole is in line with the flow and closed when it is pivoted through 90°. Like a gate valve a ball valve is usually operated in either the fully open or fully closed position. It also has a low pressure drop but, unlike a gate valve, it can be opened and closed quickly, leading to the potential for hydraulic hammer



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روضة عمرو حجازي
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BUTTERFLY VALVE :

- A butterfly valve is a type of flow control device used in pipelines to regulate, start, or stop the flow of a fluid or gas. It consists of a circular disc or "butterfly" that rotates on a shaft within the valve body. When the valve is opened, the disc rotates 90 degrees, allowing the fluid to flow through with minimal resistance. Butterfly valves are known for their compact design, lightweight construction, and cost-effectiveness, making them suitable for a wide range of applications, including water treatment, HVAC systems, and industrial processes. They are often preferred in large-diameter pipelines where space is limited, as they provide a quick and reliable means of flow control. Depending on the design, butterfly valves can be operated manually, pneumatically, or electrically, and are available in various materials such as cast iron, stainless steel, and plastic, making them versatile for different operating environments



Made by :
ندى العراقي
فرقة تانيه - 2022-2

GLOBE VALVES

- Globe valves are control valves commonly used in industrial piping systems, characterized by their design that allows precise control of the flow of fluids or gases. They are characterized by an internal barrier that separates the body into two parts and contains an opening that can be closed or opened gradually using a disc that moves in a straight line. These valves are used in applications that require precise adjustment of flow or control of fluid pressure. Globe valves are used in a wide range of industries, including petrochemical industries, power plants, water treatment industries, heating and cooling systems (HVAC): to control the flow of hot or cold water.



TYPES OF GLOBE VALVES :

- T-type globe valve: it has a horizontal seat, suitable for controlling flow.
- Y-type globe valve: it has an inclined design that reduces pressure loss, suitable for high flow.
- Angle globe valve: allows flow at a 90-degree angle, ideal for reducing vibrations in systems.

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أحمد ياسر عيسى
فرقة رابعه - 2020-335

SAFETY VALVES:

- A safety valve is a valve that acts as a fail-safe. An example of safety valve is a pressure relief valve (PRV), which automatically releases a substance from a boiler, pressure vessel, or other system, when the pressure or temperature exceeds preset limits.
- is normally used on compressible fluids, primarily steam. These devices are typically certified to protect the system within 3% overpressure, which is the rise in pressure above the maximum allowable working pressure (MAWP) of the equipment being protected
- safety valves will have the following components.
- Nozzle -- This is a pressure containing element which constitutes the inlet flow passage.
- Seat -- This also is a pressure containing component which makes contact between the fixed and moving portions of a valve.
- Guide -- This provides a guiding surface for the disk to insure proper alignment of the seating surfaces.



Made by :
عائشة مجدي
فرقة رابعه - 2020-158