The following is the relevant information about the multi-functional hydraulic control valve:

Product Introduction

The multi-functional hydraulic control valve is an intelligent valve installed at the outlet of the water pump in a large-diameter water supply pipeline system, used to prevent the backflow of the medium, water hammer, and water shock phenomena. It is composed of a main valve, a regulating valve, and a connecting pipe system. The valve body adopts a direct-flow valve body, and the main valve control chamber has a double-control chamber structure of a diaphragm type or a piston type, which increases the control function of the main valve and can realize multiple control functions such as slow opening, full opening, slow closing, and cut-off at the outlet of the water pump. The working principle is to use the internal pressure of the pipeline to control the opening and closing of the main valve disc through the pressure difference in the upper and lower control chambers. After the water pump is started, the water pressure makes the main valve open, and the water in the upper chamber of the control chamber is slowly discharged to the outlet end through the regulating valve, and the main valve opens slowly; after the water pump stops working, the water pressure at the inlet end drops rapidly, and the main valve quickly closes most of its opening under the action of its own weight and spring pressure to prevent the backflow of water. The remaining opening is slowly closed under the combined action of the water pressure in the upper and lower chambers of the control chamber, forming a buffer to prevent a sharp increase in pressure.

Typical Installation Schematic Diagram

The multi-functional hydraulic control valve is usually installed at the outlet end of the water pump. Its typical installation schematic diagram generally includes components such as the main valve, the regulating valve, and the filter. The main valve is connected to the outlet pipeline of the water pump. The regulating valve is used to control the opening and closing speed of the main valve, and the filter is installed on the pipeline to filter the impurities in the medium and prevent the impurities from entering the valve and affecting its normal operation. In addition, some auxiliary devices such as pressure gauges and check valves may also be included to monitor and control the pressure and water flow direction in the pipeline. It should be noted that during installation, the installation direction of the valve should be correct, consistent with the water flow direction, and enough space should be reserved for the operation and maintenance of the valve. Since the structure and size of multi-functional hydraulic control valves of different models and manufacturers may vary, the specific installation schematic diagram should be subject to the product instruction manual or the information provided by the manufacturer.

Maintenance and Troubleshooting

- **Maintenance**
    - **Regular Inspection**: Regularly check all components of the valve, including the valve body, valve seat, valve core, diaphragm, and gasket, etc., to check for signs of wear, corrosion, aging, or damage. For valves used in high-pressure difference and corrosive medium occasions, focus on checking the pressure resistance and corrosion resistance.
    - **Cleaning Components**: Regularly clean the inside of the valve, remove impurities, dirt, and rust to prevent them from affecting the normal operation of the valve. Especially, pay attention to cleaning key parts such as the valve

core and valve seat to ensure the cleanliness and smoothness of the sealing surface.
    - **Lubrication Maintenance**: Check whether the packing seals and lubricating grease are aged or dry. If necessary, replace the PTFE packing in a timely manner and replenish the sealing lubricating grease to ensure the sealing performance and operation flexibility of the valve.
    - **Inspect Connection Parts**: Check the connection parts of the valve, such as flanges and bolts, to ensure that the connection is firm and there is no looseness or leakage. If it is loose, tighten the bolts in a timely manner; if damage to the flange sealing surface is found, repair or replace the gasket in a timely manner.
- **Troubleshooting**
    - **The Valve Cannot Open or Close Normally**: Possible reasons include blockage of the control pipeline, malfunction of the regulating valve, damage to the diaphragm or piston, and failure of the spring. The solution is to check the control pipeline and clear the blockage; repair or replace the regulating valve; check the diaphragm or piston and replace it if it is damaged; check the spring and replace the failed spring.
    - **Valve Leakage**: It may be caused by damage to the valve seat sealing surface, wear of the valve core, rupture of the diaphragm, aging of the gasket, etc. The solutions are to repair or replace the damaged valve seat sealing surface; replace the worn valve core; replace the ruptured diaphragm; and replace the aged gasket.
    - **Serious Water Hammer Phenomenon**: It may be caused by unreasonable opening settings of the regulating valve, too fast closing speed of the valve, etc. Adjust the opening of the regulating valve and optimize the opening and closing speed of the valve to reduce the water hammer phenomenon.

Performance Characteristics

- **Diverse Functions**: It combines the functions of an electric valve, a check valve, and a water hammer eliminator. It can achieve functions such as slow opening, full opening, rapid closing, and slow closing, effectively preventing the damage of the water supply pipeline and the water pump caused by the water hammer during pump start-up and the backflow and water hammer during pump stop.
- **Simple Operation**: There is no need to equip the valve with an additional electrical control system. The valve automatically and sequentially completes the control function with the start and stop of the water pump. Appropriate control parameters can be obtained by setting the opening of the regulating valve.
- **Small Fluid Resistance**: The valve body adopts a full-channel and streamlined design, with small hydraulic loss, large flow rate, and good energy-saving effect.
- **Corrosion Resistance**: The inside and outside of the valve body and valve cover are coated with epoxy resin powder to prevent the corrosion of the valve body and valve cover. At the same time, corrosion-resistant materials such as a full stainless steel piston cylinder, an integral piston, and a NBR sealing ring are used, which extends the service life of the valve.

- **Flexible Installation**: It can be installed vertically or horizontally arbitrarily in the pipeline without changing its reliability.
- **Convenient Maintenance**: It adopts the advanced technology of a detachable valve seat from abroad. The structure is ingenious, and the maintenance and replacement are convenient without the need to remove the whole valve.