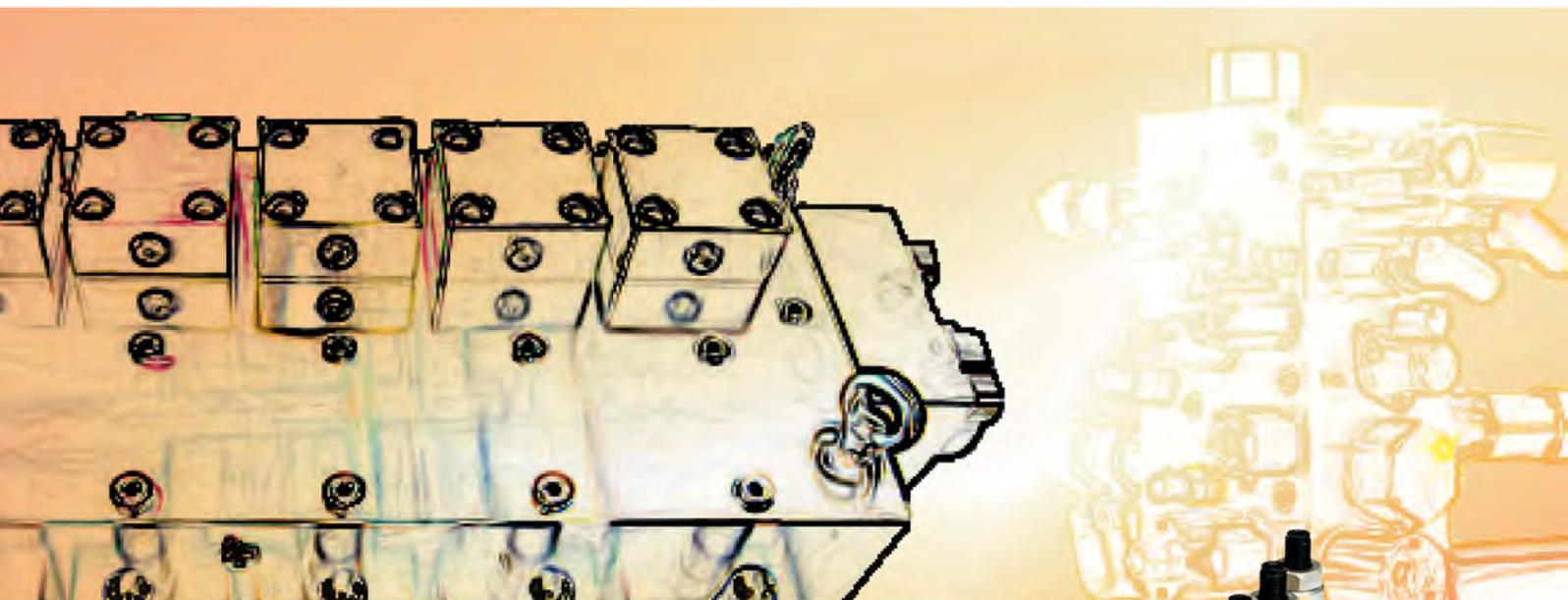




Cartridge Valves

– Hydraulic Screw-in



Cartridge Valve For Hydraulic Equipment

Saving space and cost, to replace modular type

In hydraulic power unit for mobile engineering

Fine raw materials & strictly tested

CARTRIDGE VALVES INTRODUCTION

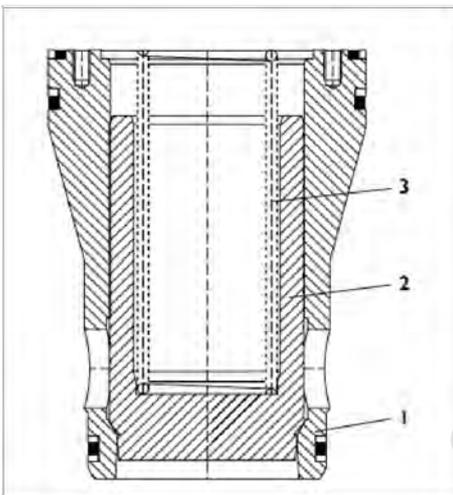
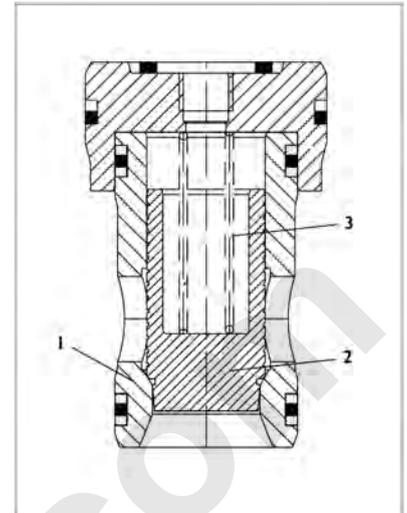
Cartridge valve has stood out in the fluid power industry with almost 30 years of successful use. It has become an important part of a lot of motion control and fluid power systems because of its size speed of switching as well as the cost elective design.

The most complete line of cartridge valves which ranges from sizes 16 to 160 based on DIN standard 24342 for sizes 16-100, is made possible by the cartridge valve of high technology. In order to ensure focused and higher functioning fluid power systems, standard cartridge valves supply a total line of high flow and working cartridges.

These cartridge valves, when combined with cover plates and sometimes, pilot valves will bring about configurations which will replace the device functions of check, directional, pressure and flow control.

Cartridge Valve Structure

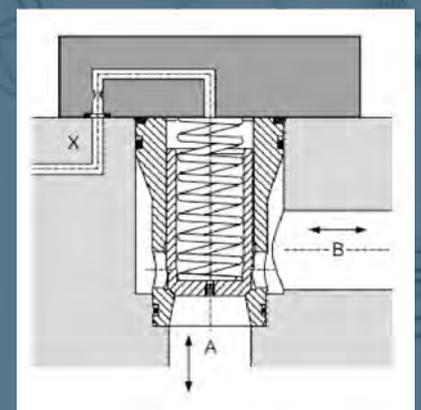
A sleeve (1), valve poppet(2) or cone and closing spring(3) is the basic make up of many cartridges valves. The cartridge assembly is made in such a way that it can enter into a cavity defined by DIN24342, and is secured with a cover. The manifold block functions as the valve housing and is made up of ports A and B alongside the pilot control lines.



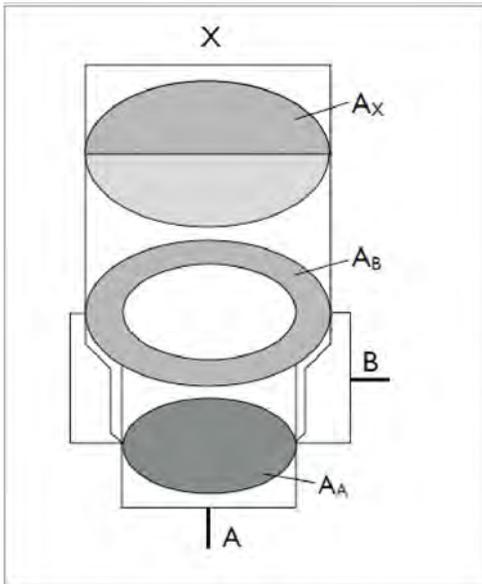
The control cover is made up of pilot control drillings thereby acting as the link between the pilot side of the cartridge valve also known as the spring side and the connection X. There are two functional cartridge valves (2/2-way or logic valves) known as A and B.

The flow path linking these two connections is hydraulically managed by a pilot pressure placed on X. A valve poppet sleeve is the main component of a cartridge valve and is usually held in place by a spring.

There is an almost non-leakage condition across the two ports, depending on pilot control, and this is made possible because the poppet valve has a seated cone. The closing spring is held in place by the control cover which surrounds the cartridge valve and gives pilot connections from the X-port. There are several forms of pilot control which can be set up on either the control cover or a manifold face adjacent it in order to give straight access to the cartridge valve.



Cartridge Valve Function



The A_A , A_B and A_X are the best areas of the basic element. Pilot oil can be gotten from either port A, B or even both ports using a shuttle valve brand outside source. The 2-way cartridge valve enables hydraulic fluid to flow from A to B or B to A.

Using a pilot valve, one can influence directly, the switch function of the cartridge valve. This can be done either in the middle of two extreme positions whether open or closed, or in other intermediate positions.

The precise location of the valve cone is determined by the ratio of control surface A_X to the pressures from the working connections A and B on the seating surface of A_A and the annular area of A_B .

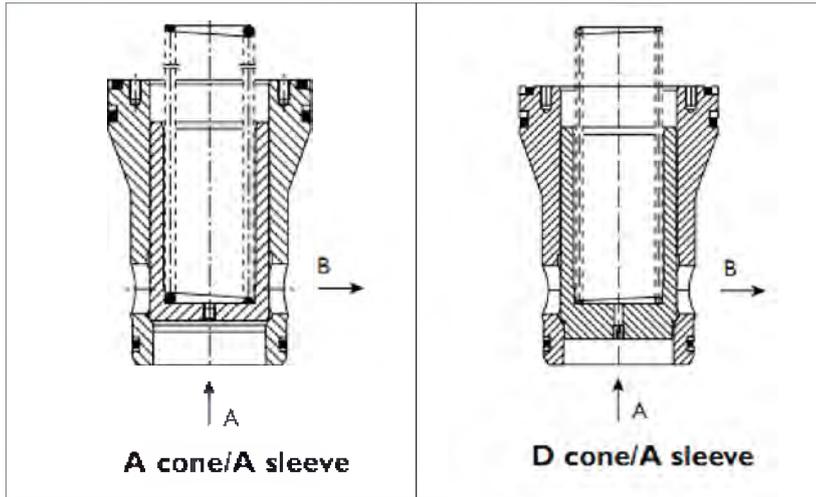
Reducing the pressure seen at X when the valve cone is open will lead to easy flow from A to B and vice-versa.

When a specific pressure is applied at X, the connections which are still functioning become closed while the valve cone is shut by the seat mounting.

Because of clearance tolerance, between the cone and sleeve, there will be a difference in pressure between connection B and pilot connection X. To avoid leakage, use a seat valve which is not susceptible to leaks and connecting the pilot connection X to the functioning connection B.

If the function you want does not allow an operation of this sort, you can make use of a cartridge valve with an extra sealing surface to separate connections A, B, and X from one another.

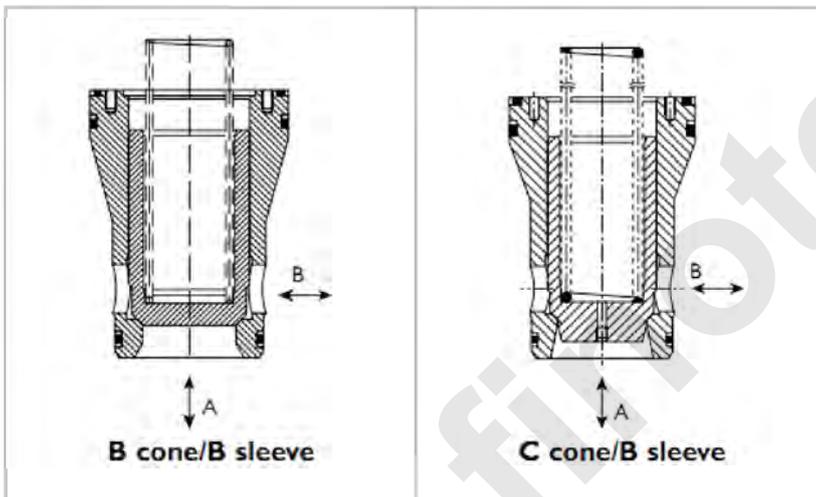
Cartridge Valve Functionality



Pressure Control Cartridge Valves:

A cartridge valve is used most times as a replacement for the pressure control valve because of the similarities in functions. For an optimal result, the control surface area A_x and the cone surface area A_a should have same ratio of 1:1. This is ensured by a cartridge valve that has cone A and a corresponding sleeve A. In this cartridge valve, note that the flow can only be from A to B.

A cartridge cone with a wet nose can be utilized to have a better control reaction in the same area. The cartridge valve is made up of one sleeve A and one cone D with a cone ratio of 1:1. In this case, the flow is only one-directional from A to B.

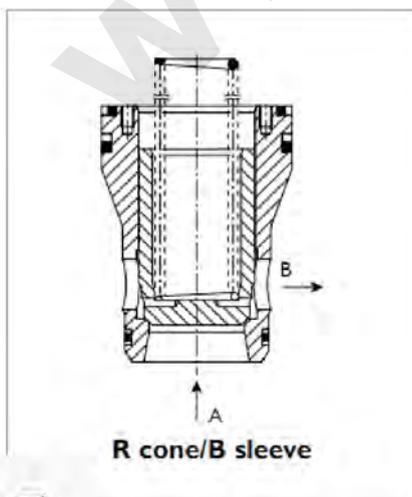


Directional Cartridge Valve, Flow Cartridge Valves:

A cartridge valve which allows multi directional flow between A and B is needed for directional control, check, and flow control valve applications. Cones with a control surface area of A_x which is bigger than the cone surface of A_a , illustrated as $A_x > A_a$, has to be utilized. In this case, therefore, the cone surface area A_b must not be 0.

A cartridge with a sleeve B and cone B must be specifically used for directional control, check, and flow control applications. The difference between control surface area A_x and cone surface A_a brings about soft switching operations.

A cone with a wet nose e.g. cone C can be used as a replacement for cone B to remove the possibility of the occurrence of pressure peaks in tank circuits. It can also be used to correct any issue in flow control valves.



Check Cartridge Valves:

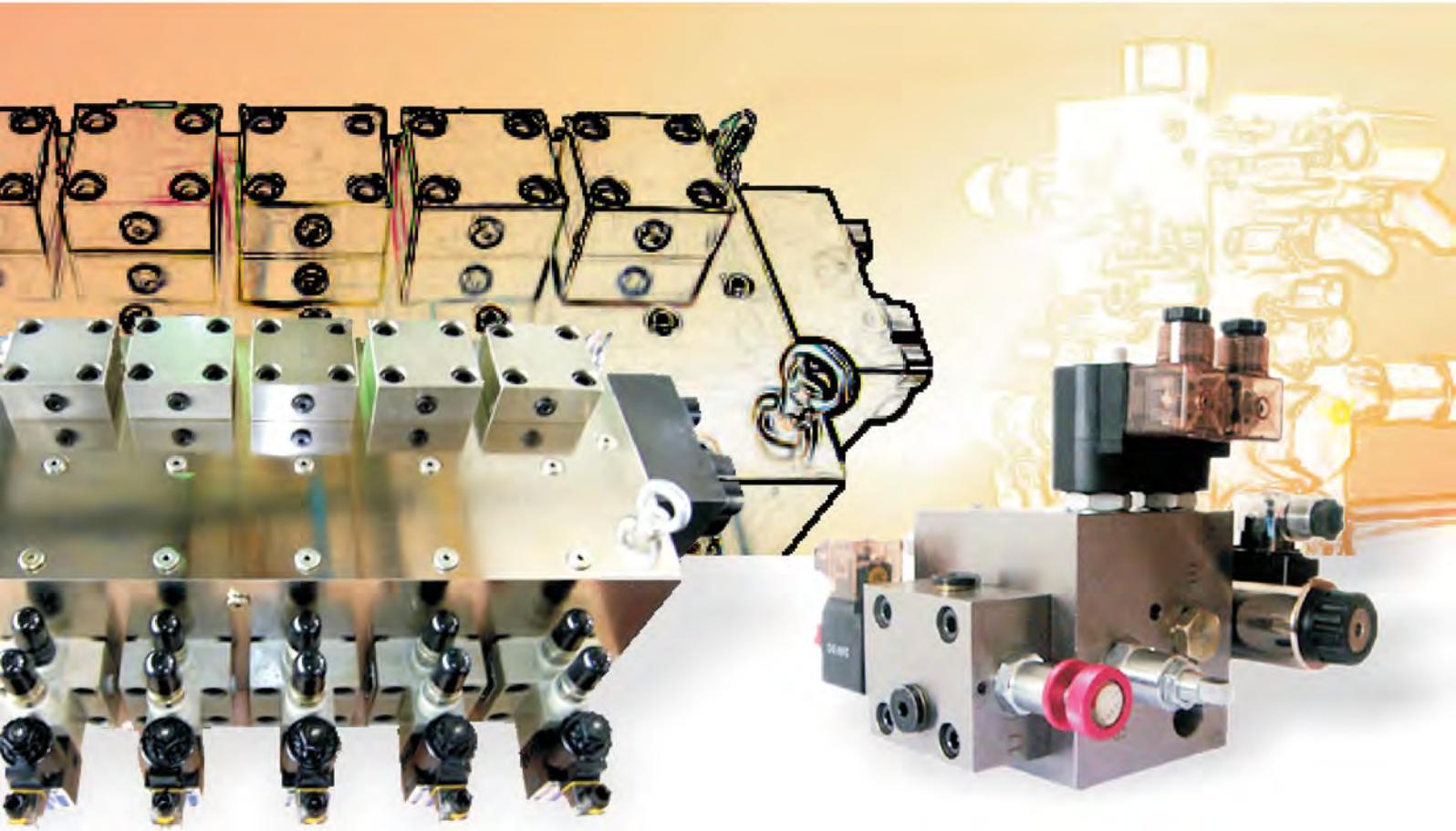
For a cartridge valve to act as a replacement for a check valve, the control surface area must be larger than the cone surface area A_a .

To reduce the work involved in fixing in the check valve function in the control unit, a unique cone R can be used. It works by taking out the necessity for added control drillings and unique cartridge covers. A cartridge valve made up of sleeve B and cone R moves easily between A and B but closes off total flow from B to A.

Cartridge valves are unique item lines which have their foundation on standard valve but with better and higher control levels. Cartridges were made to overcome the challenges of of normal cartridges including time used for opening and closing, tightness, prefill valve function, preside control, closing time while overloaded, as well as response time.

The Primary Benefits of Finotek Cartridge Valves:

- Different pressure, flow range optional
- Quick response to pressure single
- High performance and heavy duty in hydraulic circuit



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