

Kammer Multi-Z
Severe Service Valves





Kämmer Multi-Z

Introduction

Solids and cavitation completely under control

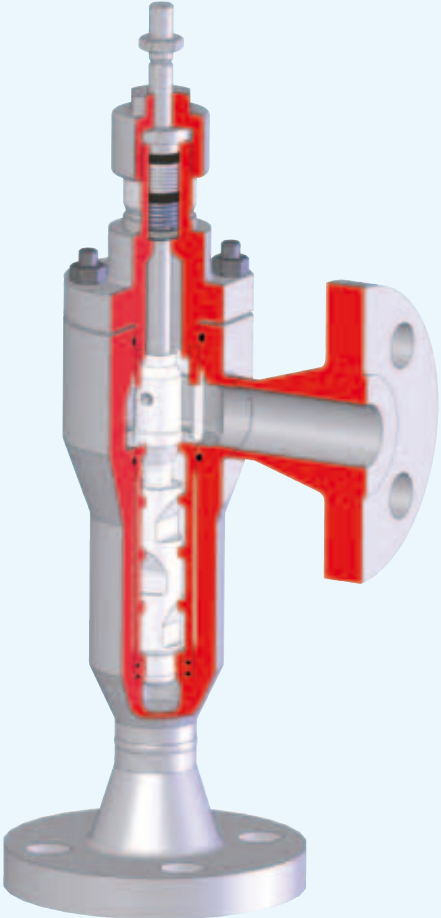
Users from the power generation, petrochemical and industrial chemicals industries are frequently confronted with extreme pressure differentials in their process systems - differentials of up to 400 bar are not rare. Nevertheless, or rather precisely for this reason these customers desire continuous, harmonious, steady-state curves with appropriate flow characteristics, long and uniform service life, as well as low maintenance costs. The valves to be implemented must satisfy certain prerequisites, such as accommodating solids in liquid media, and prerequisites relative to high sound levels, high temperatures, cavitation formation, and corrosion. Now Flowserve Essen GmbH offers solutions with an interesting technological new development.

Type Multi-Z valves are used if solids are entrained in the medium and if there is a possibility of cavitation forming. In addition this multiple stage valve is capable of reducing high-pressure differentials via a multiple stage relief process. Flowserve reduces pressure via division in partitions - a course which is different to that pursued by other suppliers. The major advantage is a noticeable reduction in wear combined with an extremely low-noise control valve. Likewise deviating from conventional procedures, in order to avoid cavitation a physically optimized technology has been implemented that achieves significantly better results.

The valves are configured on the basis of customer specification so that the valve is optimally tailored to the special operating conditions. In this regard we do not rely on standard values, rather specially matched seat-plug fittings are used in each case. The individual stages of the plug are configured in such a manner that cavitation is impossible. Through the appropriate design of transitions and passages in the plug, solids in the process can be safely managed without destroying the fittings or the valve. The design of the linear / equal percentage multi-stage plug results in a greater rangeability and outstanding control characteristics for the installed strokes.



Features



- Eliminates cavitation
- Reduces sound level
- Tolerates solids in the process
- High rangeability
- Custom characteristics possible
- Seat is protected from high velocity, cavitation or flashing
- Variety of actuators:
 - Pneumatic cylinder
 - Pneumatic diaphragm
 - Electric
 - Hydraulic
- Available as unbalanced or pressure balanced

Figure 1: Multi-Z Features

Kammer Multi-Z

Applications

Ideal for high-pressure drop applications in oil and gas, chemical, petrochemical and power.

The Multi-Z is specifically designed to handle high-pressure drops where entrained solids are a problem, and is tested and certified for pump compatibility.

Ideal for applications in chemical, petrochemical and power with pressure differentials of up to 5880 psi (400 bar), such as system start-up and boiler feed-water recirculation, the Multi-Z features a multistage trim design that eliminates cavitation and provides extended trim life. The addition of a unique venturi outlet nozzle provides further trim and seat protection from high velocity, cavitation and flashing.

The Multi-Z linear multistage plug design provides high rangeability and throttling resolution, and dramatically reduces noise. Trim designs are available as unbalanced or pressure-balanced, with the number of stages optimised for specific service conditions.

The Multi-Z is offered in nominal standard diameters of 1 to 4 inches (DN25 to DN100) - in special applications up to 16 inches (DN300) - and in pressure classes from ANSI 300 to ANSI 1500 (PN40 to PN250). These pressure classes enable the Multi-Z to operate within a maximum pressure drop of 5880 to 15 psi (400 to 1 bar).

The Multi-Z body is available in globe cast and angle forged configurations, and in a choice of carbon steel, stainless steel and other materials upon request. Custom options and configurations are also available. Two main pneumatic actuator alternatives as the standard choice — the first, a stainless steel diaphragm actuator type KP for air pressure up to 88 psi (6 bar), and the second, an aluminium double-acting piston actuator type VL for pressure up to 176 psi (12 bar).

Solids can be up to 0,4 inch (10 mm) in size, depending upon the specific design.



Figure 2: Multi-Z at Work

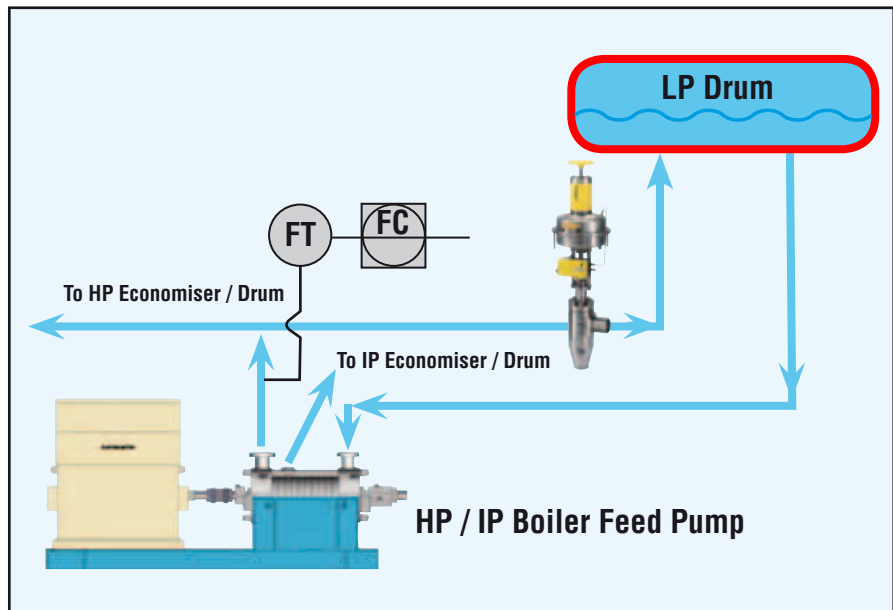


Figure 3: HP Feed Pump Recirculation System

Kämmer Multi-Z

xF / Sigma Table

The table shows standard values. For an engineered valve the values depend on the service conditions.

Stages	3	4	5	6
xF	0,957	0,985	0,995	0,998
Sigma	1,045	1,015	1,005	1,002

Specifications

Size	1 - 4 inch; DN25 - 100, other sizes upon request
Pressure Class	Class 300 - 1500; PN 40 - 250
Body Materials	Carbon Steel (WCB) Stainless Steel (CF8M) Others upon request
Body Type	Globe cast Angle forged
End Connections	Weld ends Flanged Screwed NPT Others upon request
Trim Type	Balanced or Unbalanced
Trim Design	Linear Multistage Trim 3 to 6 stages
Plug Material	1.4112 (440B) or as required by application
Liner Material	1.4112 (440B) or as required by application
Seat Material	1.4112 (440B) or as required by application
Solids	Depending on Cv value and size up to 0,4 inch (10 mm)
Actuator	Diaphragm Actuator Type KP (Stainless Steel) Piston Actuator Type VL Electric Actuator Hydraulic Actuator

Ceramic plug option

For special highly erosive and corrosive applications a ceramic plug could be the solution.

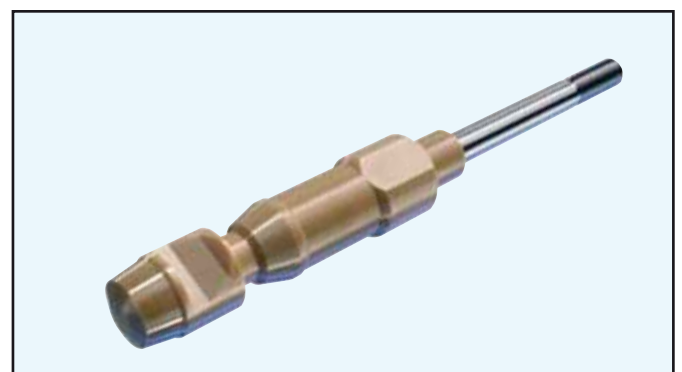


Figure 4: Ceramic Plug Option

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Exploded view

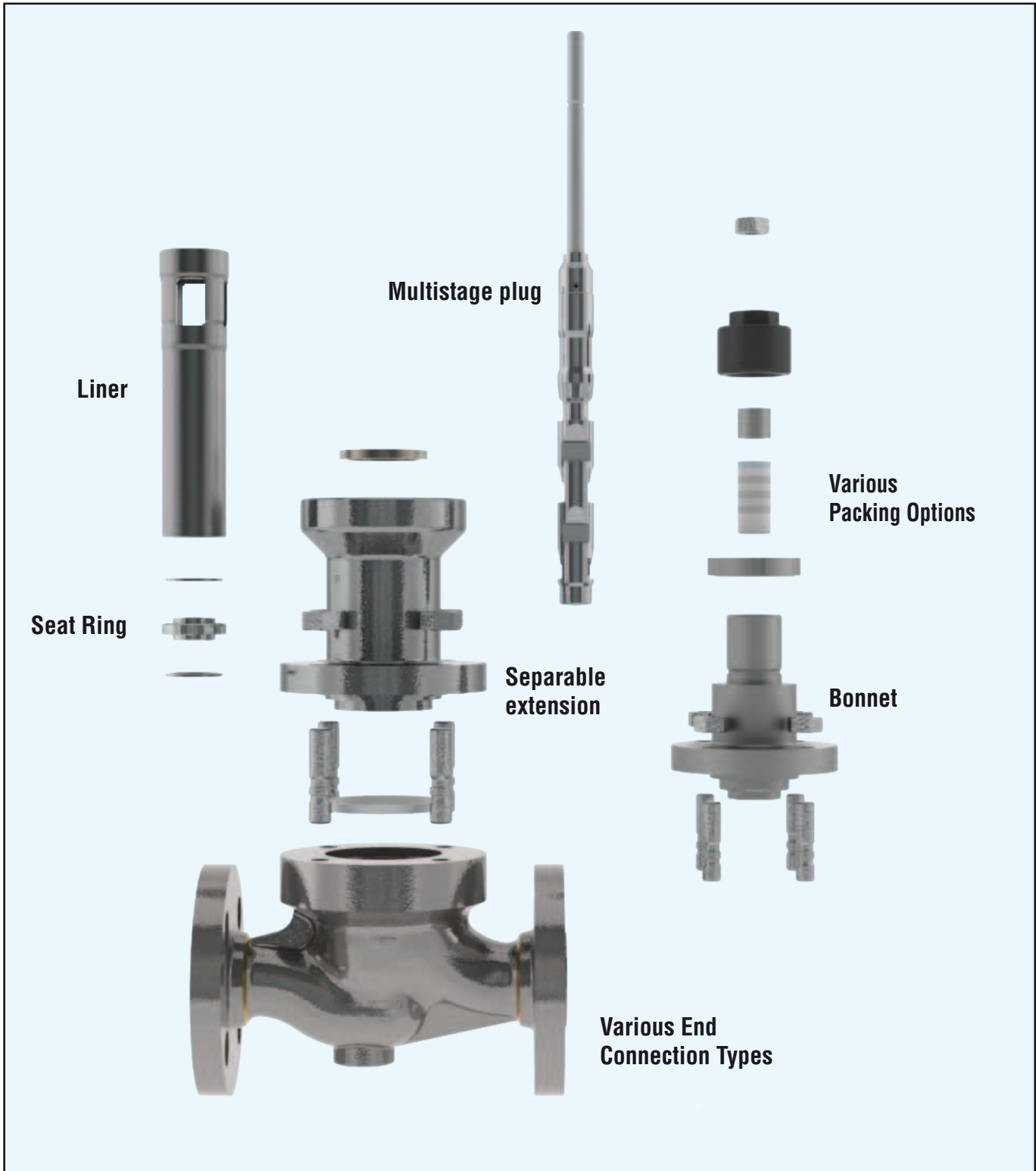


Figure 5: Exploded View

Kämmer Multi-Z Actuator Options

Pneumatic actuators

The Multi-Z Severe Service Valve can be equipped with two high performance pneumatic actuator options:

- The single acting diaphragm actuator Series KP made of stainless steel
- The double acting cylinder actuator Series VL for high duty applications and high air supply.

Both actuator series are widely used in different applications for almost all Valtek and Kämmer valve series around the world. The Multi-Z accommodates the different market demands by adapting the actuator individually to the valve.

Precise actuator accuracy in combination with Flowserve positioners gives high performance and optimised processes back to the user.



Figure 6: Pneumatic Actuator



Figure 7: Electric Actuators

Electric actuators

Most types of electric actuator can be adapted to operate the Multi-Z Severe Service Valve. Based on this flexible design in combination with linear motion units, Flowserve is able to provide the electric actuator the customer is familiar with. This helps to reduce maintenance cost and reduces spare part inventory. Electric actuators are used environments where compressed air is not available.



Figure 8: Manual Operators

Manual operators

A variation of option manual operators can be selected. Based on modular bonnet and yoke design almost any actuator type is possible.



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