

Specification

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|----------------------|--|
| Trim Size | 15 to 600 mm (1/2" to 24") |
| Rating | ANSI 150 to 2500 or equivalents to DIN, BS10, JIS etc |
| Trim Types | Single cage, Multi-cage, Multi step, Multi-Stage, Special |
| Trim Material | Stainless steel, Duplex stainless steel, 13% Chrome steel, Monel |

| | |
|----------------------------|---|
| Flow Characteristic | Linear, Bi-linear, Tri-linear, Special |
| Hard Facings | Stellited seating areas, stellited full contours, hard chrome plating |
| Hard Metal | Tungsten Carbide, PSZ Ceramics, Advanced coatings |

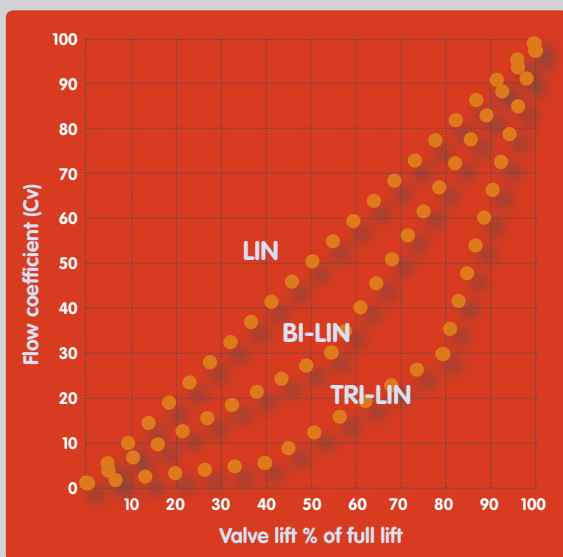
Design Features

- Wide variety of trim design options based on extensive operational experience.
- Special trims designed to suit specific applications.
- Designed to eliminate cavitation and reduce associated noise and premature damage on liquid applications
- Designed for low noise gas / vapour applications.
- Designed to minimise energy dissipation to within acceptable levels.
- Hard metal options including tungsten carbide and ceramics for superior erosion resistance.

Quality and Performance Guarantee

- Produced with Quality Systems accredited to ISO 9001:2008
- CE marked in accordance with European Pressure Equipment Directive 97/23/EC and ATEX compliant with European directive 94/9/EC.
- Full material certification available for all major component parts.
- Full guarantee on design and performance.
- All testing performed to the requirements of ANSI B16.34.

Characteristic Curves



The Inherent flow characteristic of a control valve is the relationship between the flow and the lift of the plug at a constant pressure drop.

The characteristics provided for severe service control valve designs are shown.

Linear - Flow is directly proportional to valve lift.

Bi-Linear - Flow is directly proportional to valve lift in two stages.

Tri-Linear - Flow is directly proportional to valve lift in three stages.

Rangeability

| Trim style | Trim size | | Standard rangeability |
|----------------------|-----------|------------|-----------------------|
| | ins | mm | Severe service |
| Multi Step | All sizes | All sizes | Up to 150:1 |
| | <4 | <100 | 50 : 1 |
| Single or Multi Cage | 4 to 12 | 100 to 300 | 70:1 |
| | >12 | >300 | 85:1 |
| Multi Stage | All sizes | All sizes | 35:1 |

Multi Step Trim Designs



Multi Step Trim Design

- Suitable for low capacity high pressure drop applications.
- Up to 5 stages of pressure let down.
- Uses a large number of changes of direction to achieve pressure reduction.
- Pressure staging designs available.
- Hard metal material options available.
- High rangeability capability.

Cage Trim Design



Single and Multi Cage Trim Design

- Used for medium to high pressure drop applications.
- Designs up to 4 cages available as standard.
- Uses principle of splitting the total flow into a large number of small streams together with changes of direction to achieve pressure reduction.
- Single stage cage trim design for 'flashing applications'.
- Can be designed for new or retrofit valve applications.
- Provides anti cavitation characteristics for liquid applications.
- Provides low noise characteristics for gas and vapour fluids.
- Hard metal material options available.
- Balanced plug designs available.

ED Multi Stage Trim

- Several mechanisms are utilised in the ED trim design to assist with the conversion of potential energy (pressure) into heat without problems of cavitation in liquids and the problems of high noise levels, with gases caused by high velocities.
- Splitting the flow within the ED trim into a large number of small streams reduces the energy levels in each stream.
- Large trim surface area maximises friction against the fluid within the trim design.
- Large number of changes of direction assist the pressure reduction.
- Repeated compression and expansion optimises the design.
- The pressure drop is taken in a geometric progression across each of the restrictions, resulting in the smallest number of stages for the process conditions.
- The disk stack consists of a multiple set of tortuous paths in parallel to each other, with each pathway being a series of restrictions in series with each other.
- In a modulating service, the flow experiences the same pressure drop conditions at low flow rates as it does with high flows.
- In liquid applications the expansion chambers cause swirling of the fluid increasing the pressure reduction achieved.
- The disks are clamped in position by means of the bonnet bolting. This ensures the stack can be easily extracted and separated for cleaning.
- Disks are of substantial thickness and so do not suffer from distortion.
- The clamping forces are applied through solid material with a large area of contact, eliminating the chance of collapse of the discs.
- Trim options include Linear Flow Characteristic, Bi-linear and Tri-linear.
- Other multi Stage trim designs are available on request.

