



AB2000

High Duty Single Seated Globe Valve for Ratings ANSI 150-600

AB2500

High Duty Single Seated Angle Valve for Ratings ANSI 150-600

ABB Control Valves

TAB2

Technical Bulletin

AB2000/AB2500 Features

General

The AB2000 range of valves combines high integrity features with a high capacity, economical design philosophy. The AB2000 is ideally suited to meet the various critical service process control requirements that are demanded from a wide range of related industries. The modular construction design is available with a range of end connections and styles, and a variety of trim designs.

The AB2500 angle valve has been centred on a modular construction, using similar trim details to the AB2000 globe valve. The AB2500 is compatible with many pipework configurations, and offers a cost effective solution to the 'final control element' used in modern plants.

Performance:

- High Cv to body size ratio.
- Streamlined flow passages to optimise capacity.
- High Cv to valve weight ratio.
- Excellent flow control rangeability.

Design Flexibility:

- Modular construction design available with a range of different end connections and styles.
- Large variation of trim designs from single stage ported cage to multiple stage low noise/anti-cavitation trim designs.
- Wide range of supplementary noise control options.
- Inherently characterised trim offered in Equal Percentage and Linear.
- Optional balanced or unbalanced plug designs.
- All trim components removable from the top for ease of maintenance.
- Multiple trim sizes available
- Developed using C.A.D. systems.
- Fully rationalized and interchangeable features.

Design Integrity:

- High integrity body/bonnet bolting system design to ASME VIII.
- Clamped cage guiding - accepted as the most positive guiding system on severe service applications.
- Screwed-in seat design incorporating high integrity sealing system.

Quality Manufacturing:

- Rigorously tested to ensure specified performance on site.
- Quality assurance systems in accordance with ISO 9001.
- Optional full N.A.C.E MR-01-75 certification.

ABB

Engineering Data - AB2000/AB2500 Range



Scope of Design

AB2000 End Connection Sizes:

1" to 36" (25mm to 900mm)
Nominal Bore.

AB2500 End Connection Sizes:

1" to 24" (25mm to 600mm)
Nominal Bore.

End Connection Styles:

ANSI, DIN, RF, FF.

Valve Body Ratings:

ANSI 150 to ANSI 600
JIS 10K - 40K
NP10 - NP100

Design Standards:

ANSI B16.34 and ASME
Section VIII (for body/bonnet
bolting).

Trim Design Options:

Full and reduced Ported
Cage, HF, HFD, and HFT
available as standard.

Inherent Characteristics:

Equal Percentage, Linear.

Material Combinations:

A range of body/bonnet and
trim materials are available.

Temperature Range:

-40°C to 427°C.
-40°F to 800°F

Plug Design Options:

Unbalanced with metal/metal
seating plus balanced with
metal/metal seating and
metallic or resilient piston
rings.

Bonnet Options:

Standard.

Actuation:

Various types of actuation are
available including:-

'G' Series spring opposed
pneumatic diaphragm.

'C' Series spring opposed
pneumatic piston.

'D' Series double acting
pneumatic piston.

'H' Series Multispring
Diaphragm. In addition, a
range of electric, electro-
hydraulic, hydraulic and
manually operated versions
are available.

Sizing/Noise Prediction

The procedures for
performing valve sizing,
velocity calculations and the
predicted sound pressure
level generated by the
AB2000 and AB2500 range of
control valves are detailed in
Sizing and Selection manual.

Modular Design

The AB2000 range has been designed around a modular manufacturing concept. Using this philosophy, a centre body module selected to most suit the specified flow conditions and operating data, is combined with an end connection size/rating, selected to support that module. This design feature allows not only the selection of full size ends, but gives the facility, where conditions permit, to offer oversize end connections to suit a particular requirement.

Severe Service

For Severe Service applications not covered by this product, ABB Control Valves supply the AB9012. In ratings ANSI 900-2500, the AB9012 also features a range of special duty trims which can be engineered to meet the requirements of specific applications.



Guide to Trim Options Available.

Standard Duty

The Ported Cage design is the standard trim option available, being suitable for modulating or on/off applications, satisfying a large percentage of process control requirements.

Trim Design Options:

Ported Cage - full and reduced capability

Characteristics Available:

Equal Percentage, Linear.

Plug Options:

Unbalanced with metal to metal seating face and balanced plug with metallic or resilient piston ring options.

Direction of Flow:

Recommended flow over the plug for liquids and under the plug for gas/vapour.

Arduous Duty

The High Friction HF family of trim designs has been developed for high pressure drop applications to prevent the onset of cavitation and reduce the noise level generated as a result of both liquid and gas vapour flow.

Trim Design Options:

HF - single stage High Friction

HFD - double stage High Friction

HFT - triple stage High Friction

Characteristics Available:

Equal Percent or Linear.

Plug Options:

Unbalanced with metal to metal seating face and balanced plug with metallic or resilient piston ring options.

Direction of Flow:

Recommended flow over the plug for liquids and under the plug for gas/vapour.

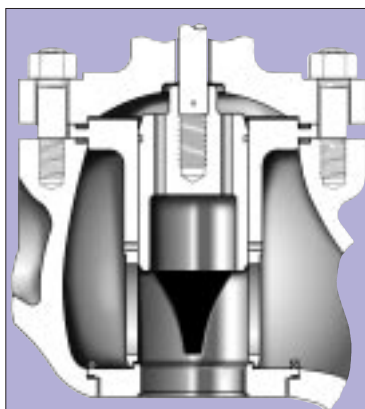


Fig 1. Ported Cage Design illustrated with Balanced Plug.

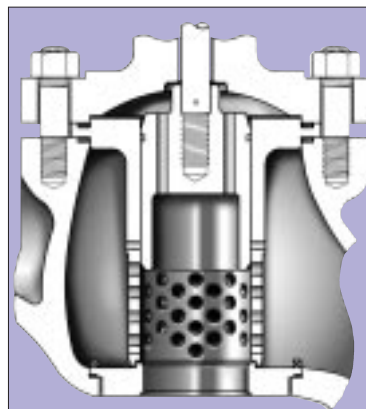


Fig 2. Low noise HF Design illustrated with Balanced Plug.

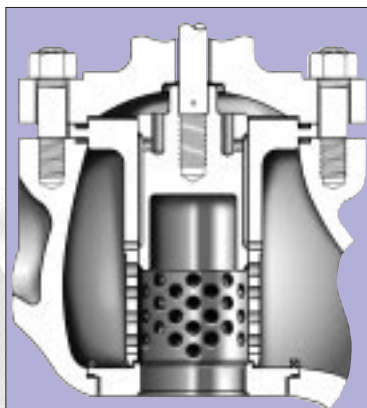


Fig 3. Low noise HF Design illustrated with Unbalanced Plug.

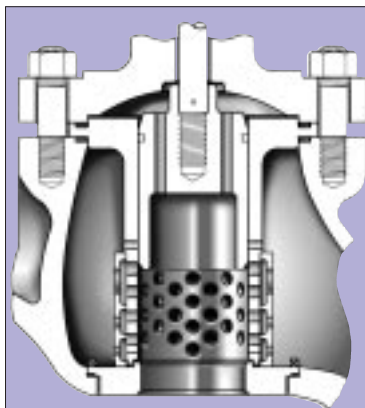


Fig 4. Low noise HFD Design illustrated with Balanced Plug.

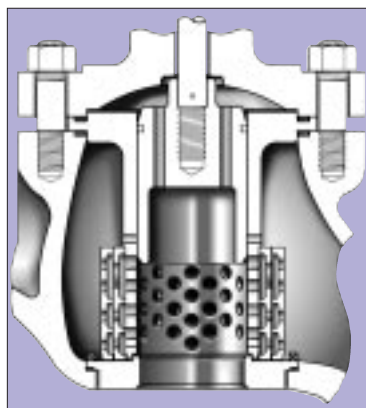


Fig 5. Low noise HFT Design illustrated with Balanced Plug.

Series AB2000 Design Cv Values

Flow Coefficient (Cv)

The values detailed in the tables are at the maximum rated travel and are stated in U.S. Units. The figures by definition are related to the flow of water (SG=1) through the valve at full lift in US Gallons per minute with a pressure drop of 1psi.

Table 1. AB2000 Design Cv Values, Single Stage.

| Single Stage Trims - Rating ANSI 150, 300, 600, JIS 10K-40K, NP10-NP100 | | | | | | | | | |
|---|--------------------------|------------------------------------|---------------|-------------|------|----------------|------|------|------|
| Nom. conn. ins | End size (mm) | Centre module actual bore ins (mm) | Trim Size ins | Full Ported | | Reduced Ported | | HF | |
| | | | | =% | LIN. | =% | LIN. | =% | LIN. |
| 1 1½ 2 | (25) (40) (50) | 1 (25) | 1 | 13 | 13 | 9 | 9 | 9 | 9 |
| 1½ 2 3 | (40) (50) (80) | 1½ (40) | 1½ | 30 | 30 | 20 | 20 | 20 | 20 |
| 2 3 4 | (50) (80) (100) | | 1 | 13 | 13 | 9 | 9 | 9 | 9 |
| 2 3 4 | (50) (80) (100) | 2 (50) | 2 | 50 | 50 | 39 | 39 | 39 | 39 |
| 3 4 6 | (80) (100) (150) | | 1 ½ | 30 | 30 | 20 | 20 | 20 | 20 |
| 3 4 6 | (80) (100) (150) | 3 (80) | 3 | 120 | 120 | 75 | 75 | 75 | 75 |
| 4 6 8 | (100) (150) (200) | | 2 | 50 | 50 | 39 | 39 | 39 | 39 |
| 4 6 8 | (100) (150) (200) | 4 (100) | 4 | 200 | 210 | 155 | 155 | 145 | 155 |
| 6 8 10 | (150) (200) (250) | | 3 | 120 | 120 | 75 | 75 | 75 | 75 |
| 6 8 10 | (150) (200) (250) | 6 (150) | 6 | 440 | 460 | 295 | 310 | 270 | 290 |
| 8 10 12 | (200) (250) (300) | | 4 | 200 | 210 | 155 | 155 | 145 | 155 |
| 8 10 12 | (200) (250) (300) | 8 (200) | 8 | 700 | 740 | 560 | 580 | 510 | 550 |
| 10 12 14 | (250) (300) (350) | | 6 | 440 | 460 | 295 | 310 | 270 | 290 |
| 10 12 14 | (250) (300) (350) | 10 (250) | 10 | 1090 | 1150 | 870 | 920 | 810 | 900 |
| 12 14 16 | (300) (350) (400) | | 8 | 700 | 740 | 560 | 580 | 510 | 550 |
| 12 14 16 | (300) (350) (400) | 12 (300) | 12 | 1580 | 1660 | 1310 | 1380 | 1220 | 1350 |
| 14 16 18 | (350) (400) (450) | | 10 | 1090 | 1150 | 870 | 920 | 810 | 900 |
| 14 16 18 | (350) (400) (450) | 14 (350) | 14 | 2030 | 2140 | 1790 | 1880 | 1690 | 1850 |
| 16 18 20 | (400) (450) (500) | | 12 | 1580 | 1660 | 1310 | 1380 | 1220 | 1350 |
| 16 18 20 | (400) (450) (500) | 16 (400) | 16 | 2680 | 2820 | 2330 | 2460 | 2230 | 2430 |
| 18 20 24 | (450)* (500) (600) | | 14 | 2030 | 2140 | 1790 | 1880 | 1690 | 1850 |
| 18 20 24 | (450)* (500) (600) | 18 (450) | 18 | 3410 | 3590 | 3020 | 3180 | 2850 | 3130 |
| 20 24 30 | (500)* (600) (750) | | 16 | 2680 | 2820 | 2330 | 2460 | 2230 | 2430 |
| 20 24 30 | (500)* (600) (750) | 20 (500) | 20 | 4230 | 4460 | 3800 | 4000 | 3540 | 3920 |
| 24 30 36 | (600)* (750) (900) | | 18 | 3410 | 3590 | 3020 | 3180 | 2850 | 3130 |
| 24 30 36 | (600)* (750) (900) | 24 (600) | 24 | 6140 | 6480 | 5100 | 5380 | 4760 | 5220 |
| | | | 20 | 4230 | 4460 | 3800 | 4000 | 3540 | 3920 |

*Note: Full size trim not available with ANSI 600 LB Flange Connection.

Table 2. AB2000 Design Cv Values, Multi-Stage

| Multi Stage Trims - Rating ANSI 150, 300, 600, JIS 10K-40K, NP10-NP100 | | | | | | | | | | | | |
|--|-------------------------|------------------------------------|---------------|--------|------|------|------|------------|------|------|------|----|
| Nom. conn. ins | End size (mm) | Centre module actual bore ins (mm) | Trim Size ins | Liquid | | | | Gas/Vapour | | | | |
| | | | | HFD | | HFT | | HFD | | HFT | | |
| | | | | =% | LIN. | =% | LIN. | =% | LIN. | =% | LIN. | |
| 1½ 2 3 | (40) (50) (80) | 1½ (40) | 1 | 7 | 7 | 6 | 6 | 8 | 8 | 7 | 7 | |
| 2 3 4 | 2 (50) | | | 1½ | 15 | 15 | 12 | 12 | 16 | 16 | 15 | 15 |
| 1 | | | | 7 | 7 | 6 | 6 | 8 | 8 | 7 | 7 | |
| 3 4 6 | (80) (100) (150) | 3 (80) | 2 | 30 | 30 | 25 | 25 | 32 | 32 | 30 | 30 | |
| 1½ | 15 | | 15 | 12 | 12 | 16 | 16 | 15 | 15 | | | |
| 4 6 8 | (100) (150) (200) | 4 (100) | 3 | 55 | 55 | 45 | 45 | 60 | 60 | 55 | 55 | |
| 2 | 30 | | 30 | 25 | 25 | 32 | 32 | 30 | 30 | | | |
| 6 8 10 | (150) (200) (250) | 6 (150) | 4 | 110 | 115 | 90 | 95 | 120 | 125 | 110 | 115 | |
| 3 | 55 | | 55 | 45 | 45 | 60 | 60 | 55 | 55 | | | |
| 8 10 12 | (200) (250) (300) | 8 (200) | 6 | 205 | 215 | 170 | 180 | 225 | 235 | 205 | 215 | |
| 4 | 110 | | 115 | 90 | 95 | 120 | 125 | 110 | 115 | | | |
| 10 12 14 | (250) (300) (350) | 10 (250) | 8 | 395 | 415 | 330 | 345 | 435 | 455 | 395 | 415 | |
| 6 | 205 | | 215 | 170 | 180 | 225 | 235 | 205 | 215 | | | |
| 12 14 16 | (300) (350) (400) | 12 (300) | 10 | 630 | 690 | 525 | 570 | 695 | 750 | 630 | 690 | |
| 8 | 395 | | 415 | 330 | 345 | 435 | 455 | 395 | 415 | | | |
| 14 16 18 | (350) (400) (450) | 14 (350) | 12 | 960 | 1030 | 800 | 870 | 1055 | 1120 | 960 | 1030 | |
| 10 | 630 | | 690 | 525 | 570 | 695 | 750 | 630 | 690 | | | |
| 16 18 20 | (400) (450) (500) | 16 (400) | 14 | 1340 | 1450 | 1125 | 1230 | 1470 | 1570 | 1340 | 1450 | |
| 12 | 960 | | 1030 | 800 | 870 | 1055 | 1120 | 960 | 1030 | | | |
| 18 20 24 | (450) (500) (600) | 18 (450) | 16 | 1780 | 1910 | 1500 | 1630 | 1940 | 2070 | 1780 | 1910 | |
| 14 | 1340 | | 1450 | 1125 | 1230 | 1470 | 1570 | 1340 | 1450 | | | |
| 20 24 30 | (500) (600) (750) | 20 (500) | 18 | 2260 | 2480 | 1900 | 2110 | 2460 | 2680 | 2260 | 2480 | |
| 16 | 1780 | | 1910 | 1500 | 1630 | 1940 | 2070 | 1780 | 1910 | | | |
| 24 30 36 | (600) (750) (900) | 24 (600) | 20 | 2800 | 3030 | 2340 | 2560 | 3060 | 3290 | 2800 | 3030 | |
| 18 | 2260 | | 2480 | 1900 | 2110 | 2460 | 2680 | 2260 | 2480 | | | |

Series AB2500 Design Cv Values

Flow Coefficient (Cv)

The values detailed in the tables are at the maximum rated travel and are stated in U.S. Units. The figures by definition are related to the flow of water (SG=1) through the valve at full lift in US Gallons per minute with a pressure drop of 1psi.

Table 3. AB2500 Design Cv Values, Single Stage

| Single Stage Trims - Rating ANSI 150, 300, 600, JIS 10K-40K, NP10-NP100 | | | | | | | | | |
|---|------------------|--|---------------------|-------------|------|----------------|------|------|------|
| Nom. conn. ins | End size (mm) | Centre module actual bore ins (mm) | Trim Size ins | Full Ported | | Reduced Ported | | HF | |
| | | | | =% | LIN. | =% | LIN. | =% | LIN. |
| 1 | (25) | 1 (25) | 1 | 13 | 13 | 9 | 9 | 9 | 9 |
| 1½ | (40) | 1½ (40) | 1½ | 30 | 30 | 20 | 20 | 20 | 20 |
| 2 | (50) | | 1 | 13 | 13 | 9 | 9 | 9 | 9 |
| 2 | (50) | 2 (50) | 2 | 50 | 50 | 40 | 40 | 40 | 40 |
| 3 | (80) | | 1½ | 30 | 30 | 20 | 20 | 20 | 20 |
| 4 | (100) | 3 (80) | 3 | 125 | 125 | 75 | 75 | 75 | 75 |
| 6 | (150) | | 2 | 50 | 50 | 40 | 40 | 40 | 40 |
| 4 | (100) | 4 (100) | 4 | 220 | 230 | 165 | 165 | 150 | 165 |
| 6 | (150) | | 3 | 125 | 125 | 75 | 75 | 75 | 75 |
| 8 | (200) | 6 (150) | 6 | 500 | 530 | 310 | 330 | 285 | 305 |
| 10 | (250) | | 4 | 205 | 215 | 155 | 155 | 145 | 155 |
| 8 | (200) | 8 (200) | 8 | 820 | 885 | 615 | 640 | 550 | 600 |
| 10 | (250) | | 6 | 465 | 490 | 300 | 320 | 275 | 295 |
| 12 | (300) | 10 (250) | 10 | 1275 | 1370 | 955 | 1025 | 875 | 995 |
| 14 | (350) | | 8 | 740 | 790 | 580 | 605 | 525 | 570 |
| 12 | (300) | 12 (300) | 12 | 1850 | 1985 | 1450 | 1550 | 1330 | 1505 |
| 14 | (350) | | 10 | 1170 | 1245 | 910 | 965 | 840 | 940 |
| 16 | (400) | 14 (350) | 14 | 2330 | 2500 | 1985 | 2110 | 1850 | 2070 |
| 18 | (450) | | 12 | 1710 | 1815 | 1380 | 1465 | 1275 | 1430 |
| 16 | (400) | 16 (400) | 16 | 3090 | 3310 | 2585 | 2765 | 2450 | 2722 |
| 18 | (450) | | 14 | 2190 | 2330 | 1895 | 2005 | 1780 | 1970 |
| 20 | (500) | 18 (450) | 18 | 3935 | 4220 | 3365 | 3595 | 3135 | 3520 |
| 24 | (600) | | 16 | 2915 | 3095 | 2480 | 2635 | 2360 | 2600 |
| 20 | (500)* | 20 (500) | 20 | 4890 | 5255 | 4255 | 4545 | 3900 | 4430 |
| 24 | (600) | | 18 | 3730 | 3970 | 3235 | 3435 | 3030 | 3370 |
| 30 | (750) | 24 (600) | 24 | 7120 | 7665 | 5620 | 6000 | 5175 | 5780 |
| 24 | (600)* | | 20 | 4515 | 4795 | 4000 | 4235 | 3700 | 4140 |
| 30 | (750) | | | | | | | | |
| 36 | (900) | | | | | | | | |

*Note: Full size trim not available with ANSI 600 LB Flange Connection.

For design Cv values for higher ratings consult factory.

Table 4. AB2500 Design Cv Values, Multi Stage

| Multi Stage Trims - Rating ANSI 150, 300, 600, JIS 10K-40K, NP10-NP100 | | | | | | | | | | |
|--|--|---------------------|--------|------|------|------|------------|------|------|------|
| Nom. End conn. size ins (mm) | Centre module actual bore ins (mm) | Trim Size ins | Liquid | | | | Gas/Vapour | | | |
| | | | HFD | | HFT | | HFD | | HFT | |
| | | | =% | LIN. | =% | LIN. | =% | LIN. | =% | LIN. |
| 1½ (40) 2 (50) 3 (80) | 1½ (40) | 1 | 7 | 7 | 6 | 6 | 6 | 6 | 4 | 4 |
| 2 (50) 3 (80) 4 (100) | 2 (50) | 1½ | 15 | 15 | 12 | 12 | 13 | 13 | 9 | 9 |
| | | 1 | 7 | 7 | 6 | 6 | 6 | 6 | 4 | 4 |
| 3 (80) 4 (100) 6 (150) | 3 (80) | 2 | 30 | 30 | 25 | 25 | 26 | 26 | 18 | 18 |
| | | 1½ | 15 | 15 | 12 | 12 | 13 | 13 | 9 | 9 |
| 4 (100) 6 (150) 8 (200) | 4 (100) | 3 | 55 | 55 | 45 | 45 | 50 | 50 | 35 | 35 |
| | | 2 | 30 | 30 | 25 | 25 | 26 | 26 | 18 | 18 |
| 6 (150) 8 (200) 10 (250) | 6 (150) | 4 | 110 | 115 | 90 | 90 | 95 | 100 | 70 | 75 |
| | | 3 | 55 | 55 | 45 | 45 | 50 | 50 | 35 | 35 |
| 8 (200) 10 (250) 12 (300) | 8 (200) | 6 | 200 | 215 | 165 | 180 | 180 | 190 | 125 | 140 |
| | | 4 | 110 | 115 | 90 | 95 | 95 | 100 | 70 | 75 |
| 10 (250) 12 (300) 14 (350) | 10 (250) | 8 | 380 | 420 | 320 | 350 | 340 | 370 | 240 | 270 |
| | | 6 | 200 | 215 | 170 | 180 | 180 | 190 | 130 | 135 |
| 12 (300) 14 (350) 16 (400) | 12 (300) | 10 | 620 | 700 | 510 | 580 | 545 | 620 | 390 | 450 |
| | | 8 | 400 | 420 | 330 | 350 | 350 | 370 | 250 | 265 |
| 14 (350) 16 (400) 18 (450) | 14 (350) | 12 | 960 | 1095 | 800 | 915 | 850 | 970 | 615 | 710 |
| | | 10 | 640 | 700 | 530 | 580 | 565 | 620 | 405 | 450 |
| 16 (400) 18 (450) 20 (500) | 16 (400) | 14 | 1340 | 1510 | 1120 | 1270 | 1190 | 1350 | 860 | 980 |
| | | 12 | 980 | 1050 | 810 | 880 | 870 | 930 | 620 | 670 |
| 18 (450) 20 (500) 24 (600) | 18 (450) | 16 | 1800 | 2020 | 1500 | 1690 | 1000 | 1800 | 1160 | 1320 |
| | | 14 | 1375 | 1490 | 1140 | 1240 | 1220 | 1330 | 880 | 960 |
| 20 (500) 24 (600) 30 (750) | 20 (500) | 18 | 2310 | 2630 | 1930 | 2210 | 2060 | 2350 | 1500 | 1720 |
| | | 16 | 1830 | 1975 | 1520 | 1650 | 1620 | 1750 | 1170 | 1270 |
| 24 (600) 30 (750) 36 (900) | 24 (600) | 20 | 2780 | 3160 | 2310 | 2640 | 2460 | 2810 | 1780 | 2045 |
| | | 18 | 2310 | 2550 | 1920 | 2120 | 2040 | 2260 | 1470 | 1640 |

For design Cv values for higher ratings consult factory

General Selection Information

The information detailed is intended to act as a general guide, to assist in the selection of AB2000 and AB2500 control valves.

Trim Cv Calculation

A full description of the procedures used for calculating the Cv on various fluids is detailed in the Sizing and Selection manual.

Body Selection

Generally, the valve body must be capable of supporting the selected trim design without producing excessive velocity. The following tables can be used as a guide for determining the maximum recommended body velocities for liquid and gas/vapour applications.

Liquid Service

The velocity guidelines detailed in Tables 5&6, reflect the normal inlet and outlet maximum velocities recommended to eliminate body erosion and prevent trim instability. Other factors may reduce the following figures further. Refer to Sizing and Selection manual.

Table 5. Recommended maximum Inlet and Outlet Velocities Liquid Service AB2000

| Maximum Recommended Velocity | | | | | |
|------------------------------|-----------|----------------------|-------------|-------------|-------------|
| Valve Size | | Valve Body Materials | | | |
| | | Carbon Steel | | Alloy Steel | |
| in | mm | ft/s | m/s | ft/s | m/s |
| 1 - 12 | 25 - 300 | 43 (60) | 13.1 (18.3) | 52 (70) | 15.8 (21.3) |
| 14 - 20 | 350 - 500 | 35 (50) | 10.7 (15.2) | 43 (60) | 13.1 (18.3) |
| >24 | >600 | 25 (35) | 7.6 (10.7) | 35 (50) | 10.7 (15.2) |

Note: Values in brackets refer to center module limits.

Table 6. Recommended maximum Inlet and Outlet Velocities Liquid Service AB2500

| Maximum Recommended Velocity | | | | | |
|------------------------------|-----------|----------------------|-------------|-------------|-------------|
| Valve Size | | Valve Body Materials | | | |
| | | Carbon Steel | | Alloy Steel | |
| in | mm | ft/s | m/s | ft/s | m/s |
| 1 - 12 | 25 - 300 | 48 (65) | 14.6 (19.8) | 57 (75) | 17.4 (22.9) |
| 14 - 20 | 350 - 500 | 40 (55) | 12.2 (16.8) | 48 (65) | 14.6 (19.8) |
| >24 | >600 | 30 (42) | 9.1 (12.8) | 40 (55) | 12.2 (16.8) |

Note: Values in brackets refer to center module limits.

Gas/Vapour Service

The velocity guidelines detailed in Table 7, reflect the normal inlet and outlet maximum velocities relative to the allowable noise levels.

Table 7. Recommended maximum Inlet and Outlet Velocities Gas/Vapour Service

| Maximum Recommended Velocity | | | | Allowable Noise Level dBA | Mach Number |
|------------------------------|-----------|------------|-----------|------------------------------|-------------|
| Inlet | | Outlet | | | |
| ft/s | m/s | ft/s | m/s | | |
| 475 (670) | 144 (204) | 830 (1150) | 253 (350) | >95 | 0.65 (0.9) |
| | | | | <95 | 0.5 (0.7) |
| | | | | <85 | 0.3 (0.45) |

Note: Values in brackets refer to center module limits.

Trim Inherent Rangeability

The inherent rangeability of a valve trim is dependant on a number of factors including size and style. The values detailed in Table 8 provide a general guideline to the maximum achievable values.

Table 8. Maximum Inherent Rangeability.

| Trim Size ins | Standard Rangeability |
|---------------|-----------------------|
| Up to 8" | 50:1 |
| 10" to 16" | 60:1 |
| 18" to 24" | 70:1 |

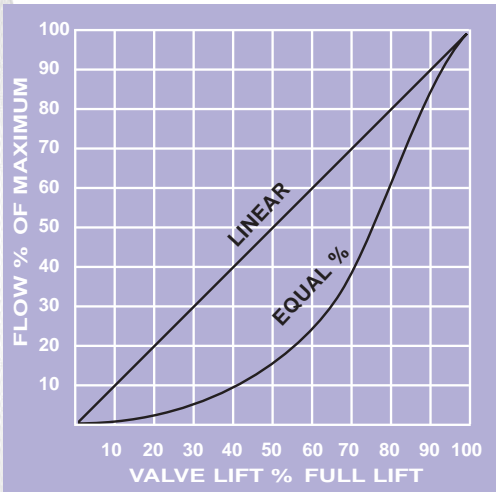


Figure 6. Inherent Flow Characteristic Curves.

Inherent Flow Characteristics

The inherent flow characteristic of a control valve is the relationship between the flow and the valve travel at constant pressure drop. As with all caged multihole trims the actual characteristic may vary slightly from the true curve.

Definitions

Linear:

Flow is directly proportional to valve lift.

Equal %:

Flow changes by a constant percentage of its instantaneous value for each unit of valve lift.

Maximum Leakage Rates

Leakage rates are normally measured in accordance with the ANSI/FCI 70-2-1976 specification using the class designation. The following Table 9. defines the achievable leakage class for each available plug design.

Table 9. Achievable Leakage Class.

| Plug Design | Seating Style | Piston Ring | Achievable Leakage Class |
|-------------|-------------------|-------------|--------------------------|
| Unbalanced | Metal/Metal (STD) | None | IV |
| Unbalanced | Metal/Metal (SPL) | None | V |
| Balanced | Metal/Metal (STD) | Alloy 25 | III |
| Balanced | Metal/Metal (SPL) | Alloy 25 | IV |
| Balanced | Metal/Metal (STD) | Resilient | IV |
| Balanced | Metal/Metal (SPL) | Resilient | V |

Note: (STD) or (SPL) refer to the amount of seat/plug lapping carried out at final assembly.

Dimensions AB2000

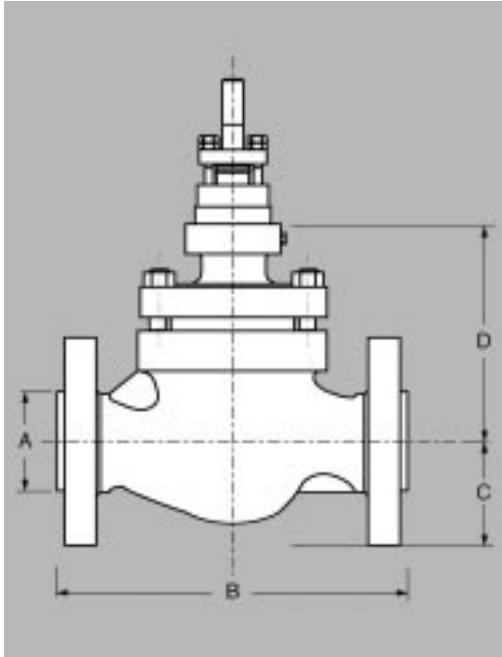


Table 10. Face to Face Dimensions.

| A End Connection nom. size ins (mm) | B Face to Face (RF Flanges) ins (mm) | | |
|---|---------------------------------------|---------------------------------------|---------------------------------------|
| | Up to ANSI 150 NP 16 | Up to ANSI 300 NP 40 | Up to ANSI 600 NP 100 |
| 1 (25) | 7 ¹ / ₄ (184) | 7 ³ / ₄ (197) | 8 ¹ / ₄ (210) |
| 1 ¹ / ₂ (40) | 8 ³ / ₄ (222) | 9 ¹ / ₄ (235) | 9 ⁷ / ₈ (251) |
| 2 (50) | 10 (254) | 10 ¹ / ₂ (267) | 11 ¹ / ₄ (286) |
| 3 (80) | 11 ³ / ₄ (298) | 12 ¹ / ₂ (318) | 13 ¹ / ₄ (337) |
| 4 (100) | 13 ⁷ / ₈ (352) | 14 ¹ / ₂ (368) | 15 ¹ / ₂ (394) |
| 6 (150) | 17 ³ / ₄ (451) | 18 ⁵ / ₈ (473) | 20 (508) |
| 8 (200) | 21 ³ / ₈ (543) | 22 ³ / ₈ (568) | 24 (610) |
| 10 (250) | 26 ¹ / ₂ (673) | 27 ⁷ / ₈ (708) | 29 ⁵ / ₈ (752) |
| 12 (300) | 29 (737) | 30 ¹ / ₂ (775) | 32 ¹ / ₄ (819) |
| 14 (350) | 35 (889) | 36 ¹ / ₂ (927) | 38 ¹ / ₄ (972) |
| 16 (400) | 40 (1016) | 41 ⁵ / ₈ (1057) | 43 ⁵ / ₈ (1108) |
| 18 (450) | 45 ³ / ₈ (1153) | 47 (1194) | 49 ¹ / ₄ (1251) |
| 20 (500) | 52 ¹ / ₂ (1334) | 54 (1372) | 56 (1422) |
| 24 (600) | 58 ¹ / ₄ (1480) | 60 (1524) | 63 (1600) |

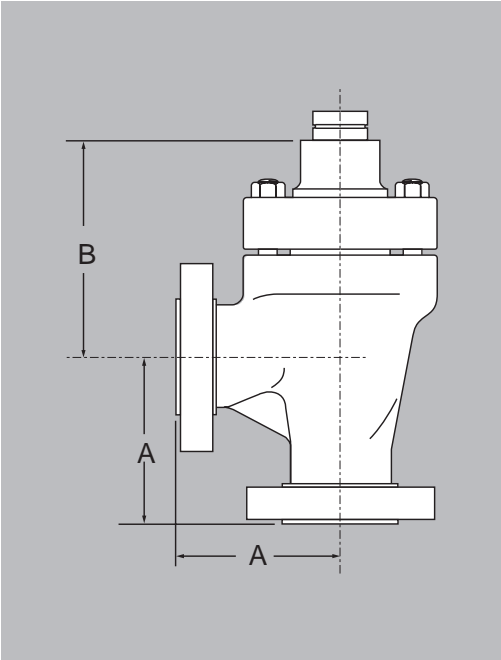
Notes:

- For other ratings consult the factory.
- Face to face dimensions comply with ANSI/ISA S75.03 1984.
- Face to face dimensions exclude RTJ flanges.
- ABB Control Valves reserve the right to confirm dimensions on certified drawings
- Table 10 only applicable when inlet and outlet flanges are identical.
- Full dimensional and weight schedule available on request.
- In certain cases the centreline to flange outside diameter dimension could exceed the centreline to base dimension.

Table 11.

| Centre Module Size ins (mm) | Travel ins (mm) | C Centreline to yoke mounting | | D Centreline to Base | |
|--------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|
| | | Standard Bonnet | | Up to ANSI 300 NP 40 | ANSI 600 NP 100 |
| | | Up to ANSI 300 NP 40 | ANSI 600 NP 100 | | |
| 1 (25) | 1 ¹ / ₈ (28) | 5 ¹ / ₂ (141) | 5 ¹ / ₂ (141) | 2 ⁵ / ₈ (67) | 2 ⁵ / ₈ (67) |
| 1 ¹ / ₂ (40) | 1 ¹ / ₈ (28) | 8 ¹ / ₈ (206) | 8 ¹ / ₈ (206) | 4 (103) | 4 (103) |
| 2 (50) | 1 ¹ / ₂ (38) | 7 ³ / ₈ (187) | 7 ³ / ₈ (187) | 4 ⁵ / ₈ (117) | 4 ⁵ / ₈ (117) |
| 3 (80) | 2 ¹ / ₄ (57) | 9 ⁷ / ₈ (251) | 9 ⁷ / ₈ (251) | 4 ⁷ / ₈ (124) | 5 ¹ / ₈ (130) |
| 4 (100) | 2 ¹ / ₄ (57) | 11 (281) | 11 (281) | 5 ⁷ / ₈ (149) | 6 (152) |
| 6 (150) | 3 ¹ / ₂ (89) | 13 ¹ / ₈ (333) | 13 ¹ / ₈ (333) | 9 (229) | 9 (229) |
| 8 (200) | 4 (102) | 15 ³ / ₄ (400) | 15 ³ / ₄ (400) | 9 ⁷ / ₈ (251) | 10 ³ / ₄ (273) |
| 10 (250) | 5 (127) | 17 ⁷ / ₈ (454) | 19 (483) | 11 ⁷ / ₈ (302) | 12 ³ / ₈ (314) |
| 12 (300) | 6 (152) | 20 ¹ / ₂ (521) | 22 (559) | 12 ¹ / ₂ (318) | 13 ¹ / ₈ (333) |
| 14 (350) | 7 (178) | 24 ³ / ₄ (628) | 26 ¹ / ₂ (673) | 12 ⁷ / ₈ (327) | 13 ³ / ₄ (349) |
| 16 (400) | 8 (203) | 28 ³ / ₈ (721) | 29 ³ / ₄ (756) | 15 ³ / ₄ (400) | 15 ³ / ₄ (400) |
| 18 (450) | 9 (229) | 28 ¹ / ₈ (846) | 33 ¹ / ₄ (846) | 18 ¹ / ₄ (464) | 18 ¹ / ₄ (464) |
| 20 (500) | 10 (254) | 35 ¹ / ₂ (902) | 35 ¹ / ₂ (902) | 19 ¹ / ₄ (489) | 19 ¹ / ₄ (489) |
| 24 (600) | 12 (305) | 40 ⁵ / ₈ (1032) | 43 ⁷ / ₈ (1114) | 22 (558) | 24 ¹ / ₂ (622) |

Dimensions AB2500



- Notes:**
1. For other ratings consult the factory.
 2. Face to face dimensions comply with ANSI B 16.10.
 3. Face to face dimensions exclude RTJ flanges.
 4. ABB Control Valves reserve the right to confirm dimensions on certified drawings
 5. Table 12 only applicable when inlet and outlet flanges are identical.
 6. Full dimensional and weight schedule available on request.

Table 12.

| End Conn. Nom.Size ins (mm) | Centre Module Size ins (mm) | Travel ins (mm) | A Face to Centerline | | | B Centreline to yoke mount | |
|-----------------------------------|-----------------------------------|--------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|
| | | | NP 16 ANSI 150 ins (mm) | NP 40 ANSI 300 ins (mm) | NP 100 ANSI 600 ins (mm) | Up to ANSI 300 ins (mm) | Up to ANSI 600 ins (mm) |
| 1 1/2 (40) | 1 1/2 (40) | 1 1/8 (28) | 4 3/8 (111) | 4 5/8 (117) | 4 15/16 (125) | 8 1/8 (206) | 8 1/8 (206) |
| 2 (50) | 2 (50) | 1 1/2 (38) | 5 (127) | 5 1/4 (133) | 5 5/8 (143) | 7 3/8 (187) | 7 3/8 (187) |
| 3 (80) | 3 (80) | 2 1/4 (57) | 5 7/8 (149) | 6 1/4 (159) | 6 5/8 (168) | 9 7/8 (251) | 9 7/8 (251) |
| 4 (100) | 4 (100) | 2 1/4 (57) | 6 15/16 (176) | 7 1/4 (184) | 7 3/4 (197) | 11 1/8 (281) | 11 1/8 (281) |
| 6 (150) | 6 (150) | 3 1/2 (89) | 8 7/8 (225) | 9 5/16 (237) | 10 (254) | 13 1/8 (333) | 13 1/8 (333) |
| 8 (200) | 8 (200) | 4 (102) | 10 11/18 (271) | 11 3/16 (284) | 12 (305) | 15 3/4 (400) | 15 3/4 (400) |
| 10 (250) | 10 (250) | 5 (127) | 13 1/4 (337) | 13 15/16 (354) | 14 13/16 (376) | 17 1/8 (454) | 19 (483) |
| 12 (300) | 12 (300) | 6 (152) | 14 1/2 (368) | 15 1/4 (387) | 16 1/8 (410) | 20 1/2 (521) | 22 (559) |
| 14 (350) | 14 (350) | 7 (178) | 17 1/2 (445) | 18 1/4 (464) | 19 1/8 (486) | 24 3/4 (628) | 26 1/2 (673) |
| 16 (400) | 16 (400) | 8 (203) | 20 (508) | 20 13/16 (529) | 21 13/16 (554) | 28 3/8 (721) | 29 3/4 (756) |
| 18 (450) | 18 (450) | 9 (229) | 22 11/16 (576) | 23 1/2 (597) | 24 5/8 (625) | 33 5/16 (846) | 33 5/16 (846) |
| 20 (500) | 20 (500) | 10 (254) | 26 1/4 (667) | 27 (686) | 28 1/2 (724) | 35 1/2 (902) | 35 1/2 (902) |
| 24 (600) | 24 (600) | 12 (305) | 29 1/8 (740) | 30 (762) | 31 1/2 (800) | 40 5/8 (1032) | 43 7/8 (1114) |



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