

# MIL 41000

## Heavy Duty Cage Guided Control Valves





# Table of Contents

|  |         |
|--|---------|
| Introduction   | 01      |
| Features   | 02 - 03 |
| Typical Applications   | 03      |
| Technical Information  | 04 - 12 |
| <ul style="list-style-type: none"> <li>• Model Decodification</li> <li>• Standard Sizes / Ratings</li> <li>• Standard End Connections</li> <li>• General Data</li> <li>• Seat Leakage Class / Temperature Range</li> <li>• Flow Coefficients (Rated Cv)</li> </ul> |         |
| Construction   | 13 - 16 |
| Dimensions and Weights   | 17 - 18 |



## Introduction

Hallmarks of exceptional service requirements of control valves are four fold: high pressure drop capability, high capacity, tight shut-off and high temperature capability. MIL 41000 series exhibits these characteristics in all valve sizes. The rugged cage guiding, optional pressure balancing and a host of custom-engineered trim designs make these valves suitable for higher pressure drops and other severe applications, where conventionally designed control valves fail to perform satisfactorily.



## Features

### Higher Allowable Pressure Drops

41000 series control valves provide exceptional and dependable performance over a wide range of pressure drops typical of severe services. Just as important, it handles a vast majority of all shut-off pressures with standard pneumatic spring-diaphragm actuators.

### Greater Capacity with Low Recovery

Rated capacity for each 41000 series valve is at top levels established for contemporary cage guided valves. These unusually high capacities are attained with minimum pressure recovery, as indicated by the high critical flow factors, which minimises possibility of cavitation in liquid service.

### Tight Shut-off

41000 series valves can provide single seat leak tightness of Class IV in accordance with FCI 70.2, or the exceptional leak tightness of Class V.

### Wide Temperature Range

Standard 41000 series valves handle temperatures from  $-30^{\circ}\text{C}$  to  $566^{\circ}\text{C}$ . Standard bonnet is designed with a moderately finned extension, so no bonnet change is necessary in this temperature range. Optional designs makes 41000 series control valves suitable for operations up to  $-196^{\circ}\text{C}$  and above  $566^{\circ}\text{C}$ .

### High Performance Material as Standard

Without exception, the material specified as standard for 41000 series valves have been tested and selected to provide trouble free operation in services with high pressures and extreme temperatures. The superior trim material employed ensures durability of the valve for any severe application.



### Simple, High Performance Trim Design

Every valve is available with standard and reduced Cv cages. For balanced design, common plug and seat result in reduced spare parts inventory. For applications where cavitation or high noise is anticipated, standard cage is replaced with multi-hole cage. Clamped seat and cage facilitate easy trim removal and valve maintenance.



## Variety of Specially Engineered Trim Packages Lo-dB / Anti-cavitation Single Stage Trim

Provides excellent noise attenuation for compressible fluids and cavitation protection for liquid service. Lo-dB / Anti-cavitation Multi-stage Trim is designed for noise control on gas or steam at high pressure drop ratios and high pressure drops for liquid service.

### Auxiliary Shut-off Pilot Plug

Used for tight shut-off requirements, with a pilot plug closing the balancing holes in shut-off condition.

## Typical Applications

MIL 41000 series heavy duty cage guided control valves are engineered for the most demanding applications in process industries, ranging from power generation to integrated petroleum and chemical processing plants and a host of other modern process industries. These valves provide complete solution for all application needs in core sectors. A few of the critical typical applications for which these valves are employed includes:

### Utility/Captive Power plants

- Feed water regulation
- Condensate pump recirculation
- Spray water control and block
- Deaerator pegging steam control
- Soot blower pressure reduction
- Heater drain etc.

### Hydrocarbon processing

- Compressor antisurge
- Separator letdown
- Gas gathering and metering stations
- Make-up hydrogen & hydrogen quench
- Cold & hot recycle gas control
- Reactor feed & stripping steam
- Reformed gas vent, hydrocarbons to flare, etc.

## Pressure Energized Dynamic Seal Ring

Tight shut off attained by arresting the leakage through the seal ring by means of a pressure energised polymeric seal ring located in the plug pressing against the walls of the cage.

## Static Seal Ring

Designed for high pressure tight shut-off and continuous throttling applications. The special seal ring with a longer heel located in the cage imparts excellent dynamic stability while throttling.

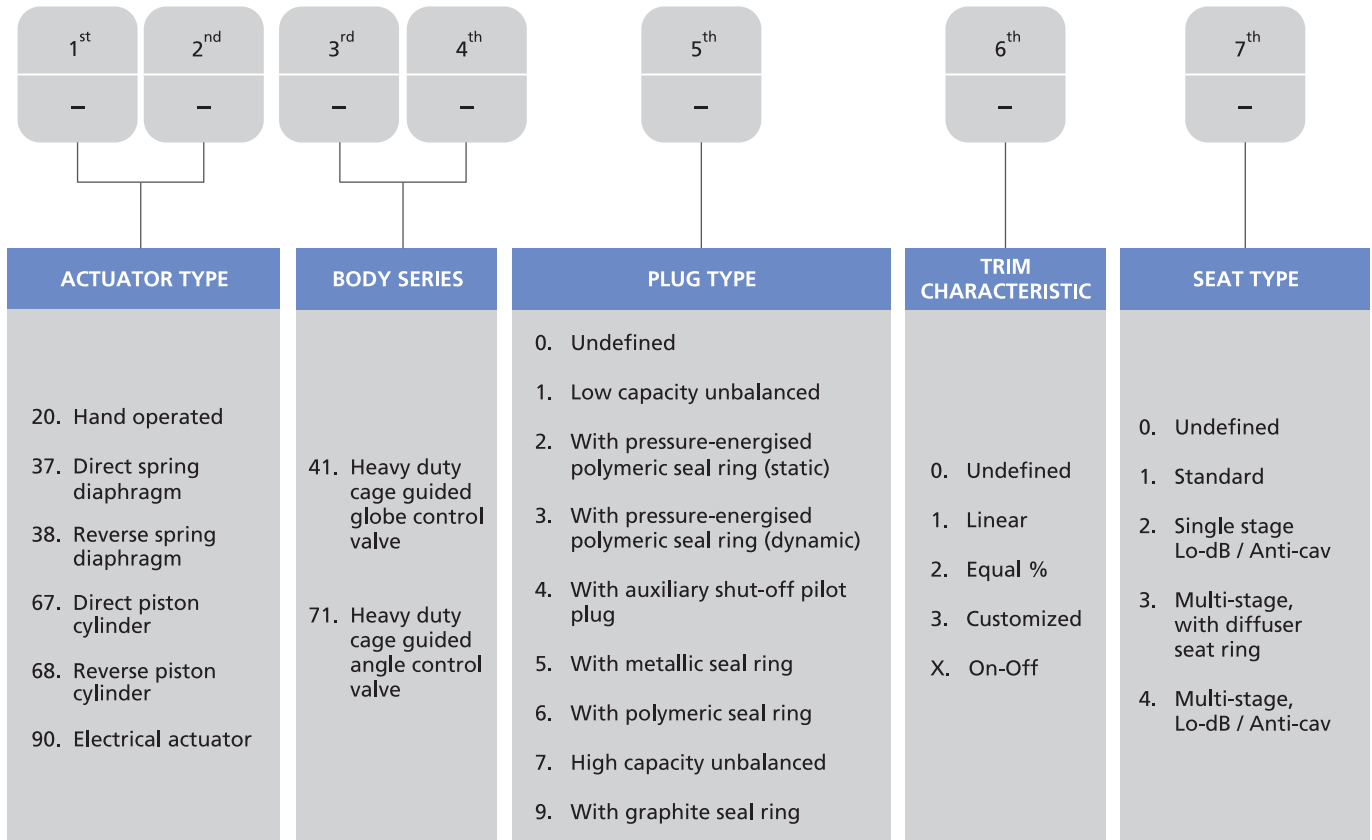


MIL 41000, 12" 300# ASME for Charge Gas Compressor Antisurge Valve for Petrochemical Complex, Panipat, Haryana



## Technical Information

### Model Decodification



### Standard Sizes / Ratings

| RATING <sup>(1)</sup><br>(ASME CLASS) | VALVE SIZE (inch) <sup>(1)</sup> |     |       |     |       |       |     |     |    |    |    |    |    |    |    |    |    |    |    |   |
|---------------------------------------|----------------------------------|-----|-------|-----|-------|-------|-----|-----|----|----|----|----|----|----|----|----|----|----|----|---|
|                                       | 0.75, 1                          | 1.5 | 2     | 2.5 | 3     | 4     | 6   | 8   | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 26 | 28 | 30 | 32 |   |
| 150# - 600#                           | U                                | U B | U B   | U   | U S B | U S B | U B | U B | B  | B  | B  | B  | B  | B  | B  | B  | B  | B  | B  | B |
| 900# - 1500#                          | U                                | U S | U S B | U S | S B   | S B   | S B | B   | B  | B  | B  | B  | B  | B  | -  | -  | -  | -  | -  | - |
| 2500# - 4500#                         | U                                | U S | U S B | U S | S B   | S B   | S B | B   | B  | B  | B  | B  | B  | -  | -  | -  | -  | -  | -  | - |

U : Unbalanced - 41100/41700

B: Balanced - 41300 / 41400 / 41500 / 41600 / 41900

S: Static Seal - 41200

<sup>(1)</sup> : Other sizes or rating can also be given, consult MIL.





## Standard End Connections <sup>(2)</sup>

| VALVE SIZE<br>(inch) | RATING (ASME CLASS) <sup>(2)</sup> |              |       |         |
|----------------------|------------------------------------|--------------|-------|---------|
|                      | 150# - 600#                        | 900# - 1500# | 2500# | > 2500# |
| 0.75 - 2             | F S B                              | F S B        | F S B | B       |
| 2.5 - 18             | F B                                | F B          | F B   | B       |
| 20 - 24              | F B                                | F B          | B     | B       |
| 26 - 32              | F B                                | -            | -     | -       |

F: Flanged (RF, RTJ, T&G, FF)      S: Socket Weld      B: Butt Weld

<sup>(2)</sup>: DIN, JIS, BS or other rating and end connection can be usually supplied. Consult MIL.

## General Data

| BODY   |  |
|--|--|
| Type   | : High Capacity Globe or Angle   |
| Recommended Flow Directions:   |  |
| Unbalanced valves (411/41700)  | : FTO <sup>(3)</sup> / FTC <sup>(4)</sup>  |
| Pressure-energised seal rings (412/300)  | : FTO  |
| Auxiliary shut-off pilot plug (41400)  | : FTC  |
| Balanced valves (415/6/900) (Liquid)   | : FTC  |
| Balanced valves (415/6/900) (Gas/Steam)  | : FTO  |
| Single stage low noise valves (41002)  | : FTO  |
| Single stage anti-cavitation valves (41002)  | : FTC  |
| Anti-cav/lo-dB valves with diffuser (41003)  | : FTC  |
| Multi-stage Lo-dB valves (41004)   | : FTO  |
| Note: Special Engineered options available with different flow directions, consult MIL |  |
| GLAND SEAL   |  |
| Type   | : Adjustable double sealed packing box with PTFE or Graphite moulded split rings |
| Option   | : Eco lock (varying density for low emission, PTFE or Graphite) or PTFE V rings  |
| Temperature range  | : ≤ 180°C PTFE,<br>> 180°C Graphite  |

| TRIMS                |   |
|----------------------|---|
| Type                 | : Single stage / Multi-stage (Anti-cav / Lo-dB)   |
| Plug type            | : Balanced or Unbalanced  |
|                      | <ul style="list-style-type: none"> <li>• Pressure balanced with spring-energised, Metallic, Polymeric or Graphite seal rings.</li> <li>• Pressure balanced with auxiliary shut-off pilot plug</li> <li>• Unbalanced without seal rings</li> </ul> |
| Seat type            | : Clamped (quick change)  |
| Guiding              | : Cage guiding  |
| Rangeability         | : 100 : 1 for standard trims<br>50 : 1 for Lo-dB/ Anti-cav trims  |
| Characteristic       | : Standard - Linear, Equal % or On-off<br>Anti-cav / Lo-dB - Linear, Mod. Equal% (on request)   |
| BONNET               |   |
| Type                 | : Stud bolted with moderately finned extension  |
| Temperature Range    | :   |
| Standard bonnet      | : -29°C to 566°C  |
| Extension bonnet(AB) | : -30°C to -100°C   |
| Cryogenic bonnet(CB) | : -101°C to -196°C  |

<sup>(3)</sup>: Flow to open

<sup>(4)</sup>: Flow to close



## Seat Leakage Class / Temperature Range

| MODEL                | TEMPERATURE RANGE (°C) <sup>(5)</sup> |      | VALVE SIZE (inch) | SEAT LEAKAGE CLASS (FCI 70.2) |                       |
|----------------------|---------------------------------------|------|-------------------|-------------------------------|-----------------------|
|                      | MIN.                                  | MAX. |                   | STANDARD                      | OPTIONAL              |
| 41100                | -196                                  | 566  | 0.75 - 3          | IV                            | V <sup>(9)</sup>      |
| 41200 <sup>(6)</sup> | -46                                   | 315  | 1.5 - 6           | IV                            | V <sup>(9)</sup>      |
| 41300 <sup>(7)</sup> | -46                                   | 315  | 1.5 - 32          | IV                            | V <sup>(9)</sup>      |
| 41400                | -196                                  | 566  | 3 - 32            | IV                            | V <sup>(9)</sup>      |
| 41500                | -196                                  | 566  | 1.5 - 4           | II                            | -                     |
|                      |                                       |      | 6 - 32            | III                           |                       |
| 41600 <sup>(8)</sup> | -30                                   | 150  | 1.5 - 32          | IV                            |                       |
| 41700                | -27                                   | 427  | 0.75 - 8          | IV                            | V <sup>(9)</sup> , VI |
| 41900                | -196                                  | 566  | 1.5 - 4           | III                           | -                     |
|                      |                                       |      | 6 - 32            | IV                            |                       |

Class II : 0.5% of maximum rated capacity at 50 psig to atmosphere  
 Class III : 0.1% of maximum rated capacity at 50 psig to atmosphere  
 Class IV : 0.01% of maximum rated capacity at 50 psig to atmosphere  
 Class V : 5 x 10<sup>-4</sup> ml per minute of water per inch of orifice diameter per psi differential

<sup>(5)</sup> : Special designs available for applications outside the given temperature range, consult MIL.

<sup>(6)</sup> : For 41200, max. working pressure : 400 bar

<sup>(7)</sup> : For 41300, max. working pressure: 200 bar

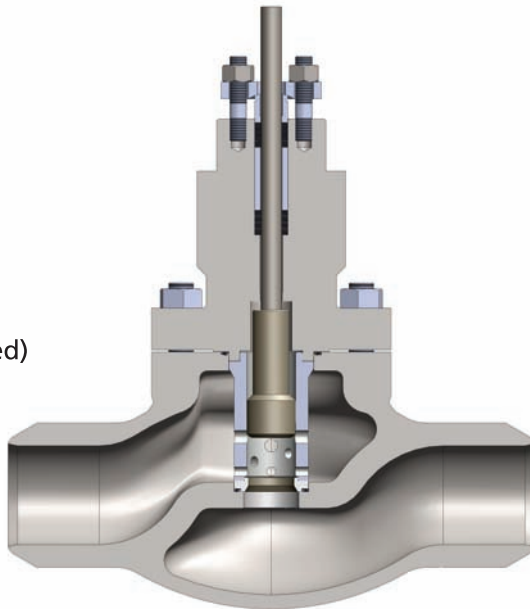
<sup>(8)</sup> : Special designs available upto 305 °C and ≤ 4" valve size, consult MIL.

<sup>(9)</sup> : This class is usually specified for critical applications where the control valve may be required to be closed for long periods of time with high differential pressure across the seating surfaces.



## Flow Coefficients (Rated Cv)

MIL 41100 Design  
(Low Capacity, Unbalanced)



### MIL 41100 Single Stage Low Capacity Unbalanced Valves (Linear / Equal % / On-off)

Critical Flow Factor (C<sub>c</sub> or F<sub>c</sub>) at full open position : 0.90

| VALVE SIZE (inch) | STROKE (inch)        | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |     |       |       |        |                    |   |
|-------------------|----------------------|---------------------|-------------------------------------|-----|-------|-------|--------|--------------------|---|
|                   |                      |                     | 0.375                               | 0.5 | 0.625 | 0.812 | 1      | 1.25               | 1.375                                   |
| 0.75 & 1          | 0.75                 | 150# - 2500#        | 1.7, 2.5                            | 3.8 | 6, 8  | 10    | -      | -                  | -                                       |
| 1.5               | 0.75 <sup>(10)</sup> | 150# - 2500#        | 1.7, 2.5                            | 3.8 | 6, 8  | 10    | 12, 16 | 20 <sup>(10)</sup> | -                                       |
| 2                 | 0.75 <sup>(10)</sup> | 150# - 2500#        | 1.7, 2.5                            | 3.8 | 6, 8  | 10    | 12, 16 | 20 <sup>(10)</sup> | 25 <sup>(10)</sup> , 30 <sup>(10)</sup> |
| 2.5               | 0.75 <sup>(10)</sup> | 150# - 2500#        | -                                   | -   | 8     | 10    | 12, 16 | 20 <sup>(10)</sup> | 25 <sup>(10)</sup> , 30 <sup>(10)</sup> |
| 3                 | 1.5                  | 150# - 600#         | -                                   | -   | -     | -     | -      | -                  | 25, 30                                  |

<sup>(10)</sup> : Cv 20, 25, 30 with 1.5" stroke

Other Cv's on request

### MIL 41102 Single Stage Low Capacity Lo-dB / Anti-cavitation Valves

Critical Flow Factor (C<sub>c</sub> or F<sub>c</sub>) at full open position : 0.94

| VALVE SIZE (inch) | STROKE (inch)        | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |       |       |    |        |                    |   |
|-------------------|----------------------|---------------------|-------------------------------------|-------|-------|----|--------|--------------------|---|
|                   |                      |                     | 0.5                                 | 0.625 | 0.812 | 1  | 1.25   | 1.375              | 1.625                                   |
| 0.75 & 1          | 0.75                 | 150# - 2500#        | 1.7, 2.5, 3.8                       | 6     | 8     | 10 | -      | -                  | -                                       |
| 1.5               | 0.75 <sup>(11)</sup> | 150# - 2500#        | 1.7, 2.5, 3.8                       | 6     | 8     | 10 | 12, 16 | 20 <sup>(11)</sup> | -                                       |
| 2                 | 0.75 <sup>(11)</sup> | 150# - 2500#        | 1.7, 2.5, 3.8                       | 6     | 8     | 10 | 12, 16 | 20 <sup>(11)</sup> | 25 <sup>(11)</sup> , 30 <sup>(11)</sup> |
| 2.5               | 0.75 <sup>(11)</sup> | 150# - 2500#        | -                                   | 6     | 8     | 10 | 12, 16 | 20 <sup>(11)</sup> | 25 <sup>(11)</sup> , 30 <sup>(11)</sup> |
| 3                 | 1.5                  | 150# - 600#         | -                                   | -     | -     | -  | -      | -                  | 25, 30                                  |

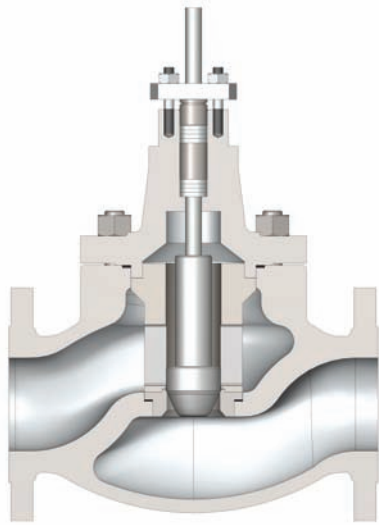
<sup>(11)</sup> : Cv 20, 25, 30 with 1.5" stroke

Other Cv's on request





# MIL 41000



MIL 41700 Design  
(High Capacity, Unbalanced)

## MIL 41700 Single Stage High Capacity Unbalanced Valves (Linear / Equal % / On - Off)

Critical Flow Factor ( C, or F, ) at full open position : 0.90

| VALVE SIZE (inch) | STROKE (inch) | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |          |                         |                           |                    |        |    |              |      |     |                                     |      |
|-------------------|---------------|---------------------|-------------------------------------|----------|-------------------------|---------------------------|--------------------|--------|----|--------------|------|-----|-------------------------------------|------|
|                   |               |                     | 0.25 (min.)                         | 0.375    | 0.5                     | 0.812                     | 1.25               | 1.625  | 2  | 2.625        | 2.95 | 3.5 | 5                                   | 6.25 |
| 0.75, 1           | 0.75          | 150# - 600#         | 1.7                                 | 2.5, 3.8 | 5.2 <sup>(12)</sup> , 6 | 9, 10, 12 <sup>(12)</sup> | 16 <sup>(12)</sup> | -      | -  | -            | -    | -   | -                                   | -    |
| 1.5               | 0.75          | 150# - 600#         | 1.7                                 | 2.5, 3.8 | 6                       | 10, 13                    | 20, 25             | 35     | -  | -            | -    | -   | -                                   | -    |
| 2                 | 0.75          | 150# - 600#         | 1.7                                 | 2.5, 3.8 | 6                       | 10, 11, 12, 15            | 21, 26             | 35, 46 | -  | -            | -    | -   | -                                   | -    |
| 3                 | 1.5           | 150# - 600#         | -                                   | -        | -                       | -                         | 31                 | 47     | 65 | 75, 80, 110  | -    | -   | -                                   | -    |
| 4                 | 1.5           | 150# - 600#         | -                                   | -        | -                       | -                         | -                  | 49     | 66 | 95, 110, 113 | 140  | 195 | -                                   | -    |
| 6                 | 2             | 150# - 600#         | -                                   | -        | -                       | -                         | -                  | -      | 68 | 126          | -    | 208 | 275 <sup>(13)</sup> , 300, 320, 400 | -    |
| 8                 | 2             | 150# - 600#         | -                                   | -        | -                       | -                         | -                  | -      | -  | -            | -    | 224 | 415                                 | 640  |

<sup>(12)</sup> : Cv available for 1" valve only

<sup>(13)</sup> : Cv 275 with 4" orifice diameter

Other Cv's on request

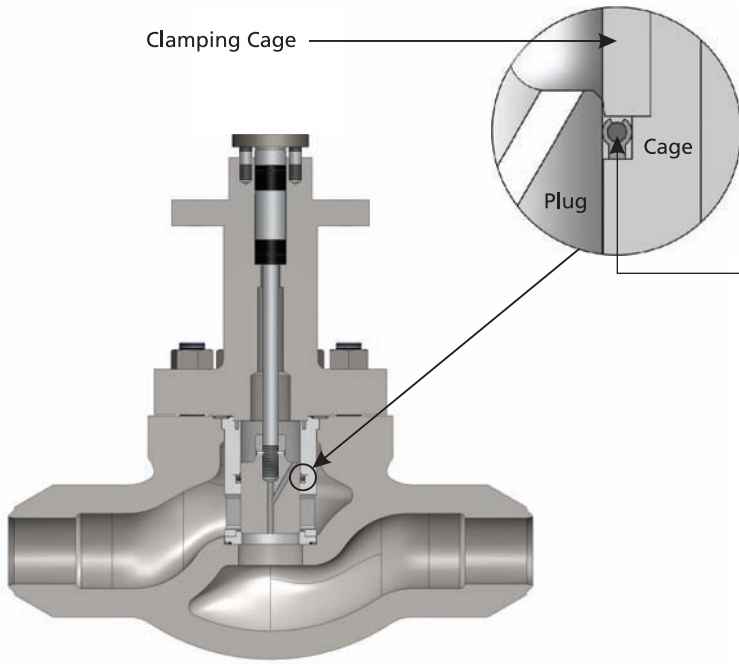
## MIL 41700 Single Stage High Capacity Lo-dB / Anti-cavitation Valves

Critical Flow Factor ( C, or F, ) at full open position : 0.94

| VALVE SIZE (inch) | STROKE (inch) | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |            |    |        |                |     |               |      |          |   |
|-------------------|---------------|---------------------|-------------------------------------|------------|----|--------|----------------|-----|---------------|------|----------|---|
|                   |               |                     | 1.25                                | 1.625      | 2  | 2.25   | 2.625          | 3.5 | 5             | 6.25 |          |   |
| 0.75, 1           | 0.75          | 150# - 600#         | 1.7 <sup>(12)</sup> , 2.5, 4, 6, 8  | -          | -  | -      | -              | -   | -             | -    | -        | - |
| 1.5               | 0.75          | 150# - 600#         | 1.7, 2.5, 4, 6, 8, 15               | 20, 25     | -  | -      | -              | -   | -             | -    | -        | - |
| 2                 | 0.75          | 150# - 600#         | 1.7, 2.5, 4, 6, 8, 15               | 20, 25, 30 | -  | -      | -              | -   | -             | -    | -        | - |
| 3                 | 1.5           | 150# - 600#         | -                                   | 10, 15, 25 | 30 | 45, 35 | 40, 50, 60, 75 | -   | -             | -    | -        | - |
| 4                 | 1.5           | 150# - 600#         | -                                   | -          | 30 | 45     | 40, 65, 75     | 100 | -             | -    | -        | - |
| 6                 | 2             | 150# - 600#         | -                                   | -          | -  | -      | -              | 100 | 200, 225, 240 | -    | -        | - |
| 8                 | 2             | 150# - 600#         | -                                   | -          | -  | -      | -              | -   | -             | -    | 300, 415 | - |

<sup>(12)</sup> : Cv available for 1" valve only

Other Cv's on request



MIL 41200 Design  
(Tight Shut-off, with Static Seal Ring)

Static Seal Ring <sup>(14)</sup>

<sup>(14)</sup> **Seal Ring (Static)** : The special seal ring with a longer heel located in the cage imparts excellent dynamic stability during throttling, while proceeding FCI 70.2 Class V leak tightness in the closed position

## MIL 41200 Static Seal Ring Valves ( Linear / Equal % / On-off)

Critical Flow Factor ( C<sub>f</sub> or F<sub>c</sub>) at full open position : 0.90

| VALVE SIZE (inch) | STROKE (inch) | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |                                    |   |                                    |   |                   |                                   |      |
|-------------------|---------------|---------------------|-------------------------------------|------------------------------------|---|------------------------------------|---|-------------------|-----------------------------------|------|
|                   |               |                     | 1.25                                | 1.375                              | 2.24  | 2.68                               | 2.28  | 3.62              | 2.75                              | 4.93 |
| 1.5               | 0.75          | 900# - 2500#        | 20                                  | -                                  | -   | -                                  | -   | -                 | -                                 | -    |
| 2                 | 0.75          | 900# - 1500#        | -                                   | 16, 20, 25, 30, 40 <sup>(15)</sup> | -   | -                                  | -   | -                 | -                                 | -    |
|                   | 1.5           | 2500#               | -                                   |                                    | -   | -                                  | -   | -                 | -                                 | -    |
| 2.5               | 1.5           | 900# - 2500#        | -                                   | -                                  | 20, 25, 30, 35, 40 <sup>(15)</sup> , 54 <sup>(15)</sup> | -                                  | -   | -                 | -                                 | -    |
| 3                 | 1.5           | 150# - 600#         | -                                   | -                                  | -   | 30, 47, 65, 75 <sup>(15)</sup>     | -   | -                 | -                                 | -    |
|                   |               |                     | -                                   | -                                  | -   | 120                                | -   | -                 | -                                 | -    |
|                   | 2             | 900# - 1500#        | -                                   | -                                  | -   | 25, 30, 47, 65, 75 <sup>(15)</sup> | -   | -                 | -                                 | -    |
|                   |               |                     | -                                   | -                                  | -   | 95                                 | -   | -                 | -                                 | -    |
|                   | 0.75          | 2500#               | -                                   | -                                  | -   | -                                  | 25, 50 <sup>(15)</sup> , 60 <sup>(15)</sup> | -                 | -                                 | -    |
|                   |               |                     | -                                   | -                                  | -   | -                                  | 30, 75 <sup>(15)</sup>                      | -                 | -                                 | -    |
| 4                 | 2             | 150# - 600#         | -                                   | -                                  | -   | -                                  | -   | 95, 120, 140, 170 | -                                 | -    |
|                   |               | 900# - 1500#        | -                                   | -                                  | -   | -                                  | -   | -                 | -                                 | -    |
|                   |               | 2500#               | -                                   | -                                  | -   | -                                  | -   | -                 | 90, 120, 140, 155 <sup>(15)</sup> | -    |
| 6                 | 2             | 900# - 1500#        | -                                   | -                                  | -   | -                                  | -   | -                 | -                                 | 225  |

<sup>(15)</sup> : Cv available for On-Off Valves only

Other Cv's on request



# MIL 41000

## MIL 41300/41400/41500/41600/41900 Single Stage Valves

Critical Flow Factor (C<sub>v</sub> or F<sub>L</sub>) for Linear / Equal % at full open position : 0.90  
 Critical Flow Factor (C<sub>v</sub> or F<sub>L</sub>) for Lo-dB / Anti-cav at full open position : 0.94

| VALVE SIZE (inch) |            |       | ORIFICE DIAMETER (inch) | STROKE (inch) | RATED Cv                       |                              |                                     |
|-------------------|------------|-------|-------------------------|---------------|--------------------------------|------------------------------|-------------------------------------|
| 150#-600#         | 900#-1500# | 2500# |                         |               | LINEAR / ON - OFF              | EQUAL %                      | Lo-dB / ANTI-CAV                    |
| 1.5               | 2          | -     | 1.84                    | 0.75          | 12,16,30,40                    | 14 ,35                       | 8,12,16,25,30                       |
| -                 | -          | 2     | 1.84                    | 1.5           | 12,16,40                       | 14 ,35                       | 12,25,30                            |
| 2                 | -          | -     | 2.5                     | 1.5           | 26,30,35,65,75                 | 16,26,35,50,65               | 15,25,50,65                         |
| 3x2               | -          | -     | 2.5                     | 1.5           | 30,35,75                       | 16,26,30,35,50,65,90         | 15,25,30,35,50,65                   |
| -                 | -          | 3     | 2.5                     | 1.5           | 26,30,65                       | 16,26,35,50,65               | 15,25,50,65,75                      |
| -                 | 3          | -     | 3.25                    | 2             | 30, 45, 60,75,95,130           | 35,56,90,110,120             | 30,45,95,120                        |
| 3                 | -          | -     | 3.25                    | 2             | 30, 45, 60,75,95,130,140,155   | 35,56,90,110,140             | 30,45,70,95,120                     |
| 4x3               | 4x3        | -     | 3.25                    | 2             | 30, 45, 60,75,95,155           | 35,56,90,110,140             | 30,45,95,120                        |
| -                 | -          | 4     | 3.25                    | 2             | 30, 45, 60,75,95,155           | 35,56,90,110,140             | 30,45,65,95,120                     |
| -                 | 6x3        | 6x4   | 3.25                    | 2             | 30, 45, 60,75,95,155,190       | 35,56,90,110,140             | 30,45,95,120                        |
| -                 | 4          | -     | 4.375                   | 2             | 95, 160, 205                   | 45, 90,140,170               | 45,70,95,120,145,180                |
| 4                 | -          | -     | 4.375                   | 2             | 30,45,60,95,160, 205,240       | 45, 90,140,170,200,225       | 45,55,70,95,120,145,195             |
| 6x4               | 6x4        | -     | 4.375                   | 2             | 60, 70,95,155,160,205,240      | 45, 56, 90,110, 140, 170,225 | 45,70,95,110,120, 145,195           |
| -                 | -          | 6     | 4.475                   | 2.5           | 205, 240,260 <sup>(16)</sup>   | 155, 170,225                 | 145,195                             |
| -                 | 6          | -     | 5.125                   | 2             | 160, 205, 250, 300, 360        | 144,255,300,360              | 130, 145                            |
| -                 | -          | -     | -                       | 2.5           | -                              | -                            | 105, 210, 255, 300                  |
| 6                 | -          | -     | 5.125                   | 2             | 160, 205,300,350, 400          | 144,170,175,205,255,300,360  | 70,125,130,145                      |
| -                 | -          | -     | -                       | 2.5           | -                              | 400                          | 105, 210, 255, 300                  |
| -                 | -          | 8     | 6.5                     | 2             | 160, 204, 300, 350, 400        | 144,255,360                  | 130,145                             |
| -                 | -          | -     | -                       | 2.5           | 425                            | 300,400, 425                 | 105,210,255,300,425 <sup>(17)</sup> |
| -                 | 8          | -     | 6.5                     | 2.5           | 260, 380, 500,575              | 230,300,400                  | 105,210,255,300                     |
| -                 | -          | -     | -                       | 3             | -                              | 575                          | 155, 175, 315, 400,450              |
| 8                 | -          | -     | 6.5                     | 2.5           | 260,380,500,640                | 230,300,400                  | 105,210,255,300                     |
| -                 | -          | -     | -                       | 3             | -                              | 575,640                      | 155,175,315,400,500, 550            |
| 10x8              | -          | -     | 6.5                     | 2.5           | 260,380,500,640                | 230,300,400                  | 105,210,255,300                     |
| -                 | -          | -     | -                       | 3             | -                              | 575,640                      | 155,175,315,400,500                 |
| -                 | -          | 12x8  | 6.5                     | 2.5           | 260,380,500,640                | 230,300,400                  | 105,210,255,300                     |
| -                 | -          | -     | -                       | 3             | -                              | 575,640                      | 155,175,315,400,500                 |
| -                 | -          | 10    | 6.9                     | 3             | 400,750                        | 360,650                      | 300,650                             |
| -                 | -          | -     | -                       | 3.5           | -                              | 750                          | 250,500,750                         |
| -                 | 10         | -     | 8                       | 3             | 400,750                        | 360,650                      | 300,650                             |
| -                 | -          | -     | -                       | 3.5           | 900                            | 800,900                      | 250, 500, 750, 900                  |
| 10                | -          | -     | 8                       | 3             | 400,750                        | 360,650                      | 250,300, 500, 650                   |
| -                 | -          | -     | -                       | 3.5           | 900, 1000                      | 800, 900, 1000               | 750, 850, 900, 1000                 |
| -                 | -          | 12x10 | 6.9                     | 3             | 400,750                        | 360,650                      | 300,650                             |
| -                 | -          | -     | -                       | 3.5           | -                              | 750                          | 250,500,750                         |
| -                 | -          | 14x10 | 8                       | 3             | 400,750                        | 360,650,900                  | 250, 500, 650                       |
| -                 | -          | -     | -                       | 3.5           | 900, 1000                      | 800, 1000                    | 750, 1000                           |
| -                 | -          | 12    | 8                       | 3.5           | 860                            | 820                          | 820                                 |
| -                 | 12         | -     | 9.75                    | 4             | 700, 1050, 1260                | 500, 750, 900, 1150          | 580, 725, 1100, 1260                |
| 12                | -          | -     | 9.75                    | 4             | 700, 900, 1050, 1260, 1400     | 500, 750, 900, 1250          | 315,580,625,725,1100,1400           |
| -                 | -          | 14    | 9.75                    | 4             | 1100                           | 1000                         | 1050                                |
| -                 | 14         | -     | 12                      | 4             | 1950                           | 1760                         | 1600                                |
| 14                | -          | -     | 12                      | 4             | 1600,1830,2150                 | 1600,1960                    | 725,1400, 1800                      |
| 16                | -          | -     | 13                      | 4             | 1800, 2000                     | -                            | 1800                                |
| -                 | -          | -     | -                       | 6             | 2500                           | 2250                         | 2000,2200                           |
| 18x16             | -          | -     | 13                      | 4             | 2600,2750 <sup>(16)</sup>      | 1600, 2450                   | 1800,2100                           |
| -                 | -          | -     | -                       | 6             | 2750                           | 2250                         | 2200                                |
| 20                | -          | -     | 17                      | 4             | 2500,3100,3400 <sup>(16)</sup> | 1960, 2750                   | 2100                                |
| -                 | -          | -     | -                       | 6             | 3500, 3800 <sup>(16)</sup>     | 3100                         | 3500                                |
| 24                | -          | -     | 22                      | 8             | 5000, 6000 <sup>(16)</sup>     | 2300, 4500                   | 4500                                |
| 32                | -          | -     | 31                      | 12            | -                              | 9000                         | -                                   |

<sup>(16)</sup> : Cv available for On-Off Valves only

<sup>(17)</sup> : Cv 425 with 3" stroke

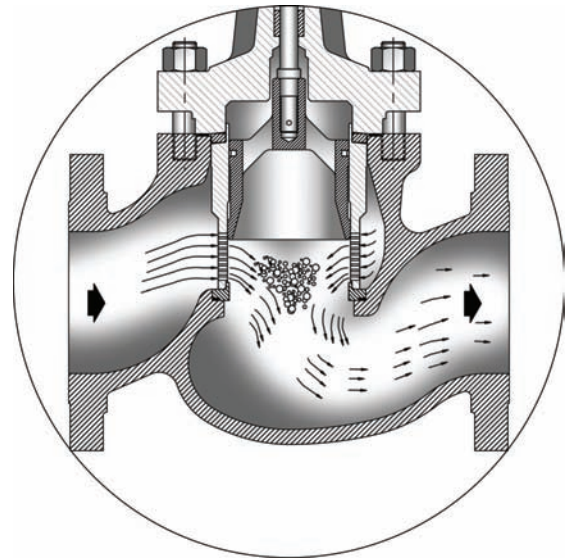
Other Cv's on request



## Multi-hole Trims for Noise / Cavitation Attenuation

In compressible fluid flow, Multi-hole trim attenuates noise, by shifting the peak frequency outside the audible range. Also the fluid acoustic energy is lowered by reduction in size of fluid jets.

For cavitation control in incompressible flow, multi-hole trim design is used in flow to close direction where flow is divided into small jets which allows cavitation to occur at the center of cage, away from all metal surfaces, avoiding damages to trim parts.

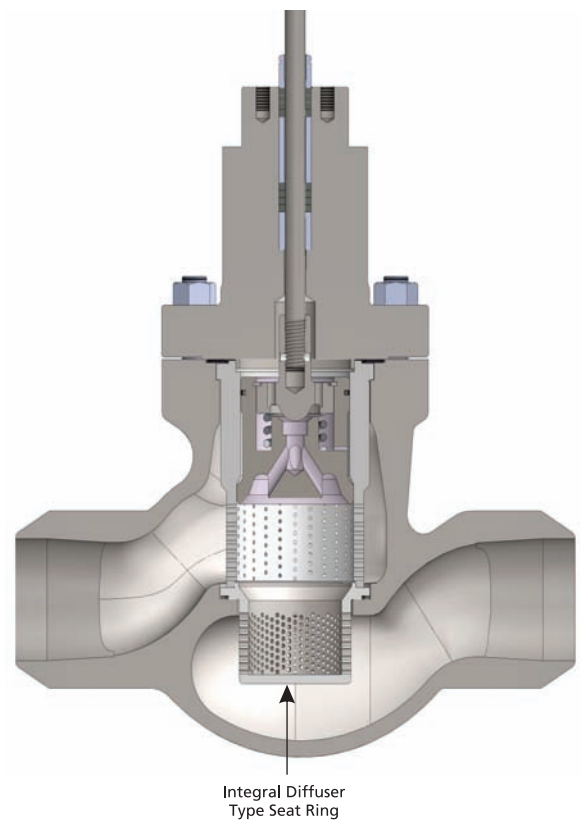


## MIL 41003 - Multi Stage Lo-dB / Anti-cavitation Valves with Diffuser Seat

Critical Flow Factor ( $C_v$  or  $F_L$ ) at full open position : 0.95

| VALVE SIZE (inch) | RATING (ASME CLASS) | STROKE (inch) | RATED $C_v$                      |
|-------------------|---------------------|---------------|----------------------------------|
| 3                 | 150# - 600#         | 2             | 35, 45, 65, 75                   |
|                   | 900# - 1500#        | 2             | 35, 40, 45, 65, 75, 100          |
| 4                 | 150# - 600#         | 2             | 30, 42, 55, 70, 85, 100, 120     |
|                   | 900# - 1500#        | 2             | 30, 42, 45, 55, 65, 70, 100, 120 |
|                   | 2500#               | 2             | 45, 60, 75, 80, 90, 95           |
| 4x3               | 150# - 600#         | 2             | 45                               |
|                   | 900# - 1500#        | 2             | 42, 95                           |
| 6                 | 150# - 1500#        | 2             | 55, 80, 95, 105, 145, 195        |
|                   | 2500#               | 2             | 95                               |
| 6x4               | 150# - 1500#        | 2.5           | 120                              |
|                   |                     | 2             | 45, 75                           |
|                   | 2500#               | 2             | 45, 65, 70, 95                   |
| 8                 | 150# - 600#         | 3             | 155, 195, 290                    |
|                   |                     | 2.5           | 155, 195, 300                    |
|                   | 2500#               | 2.5           | 155                              |
|                   |                     | 3             | 215, 300                         |
| 10                | 150# - 600#         | 3.5           | 250, 430, 500                    |
|                   | 900# - 1500#        | 3             | 250, 430, 500                    |
| 10x8              | 900# - 1500#        | 3             | 400                              |
| 12                | 150# - 600#         | 4             | 650, 725                         |
| 20                | 150# - 600#         | 4             | 2000                             |

Other  $C_v$ 's on request



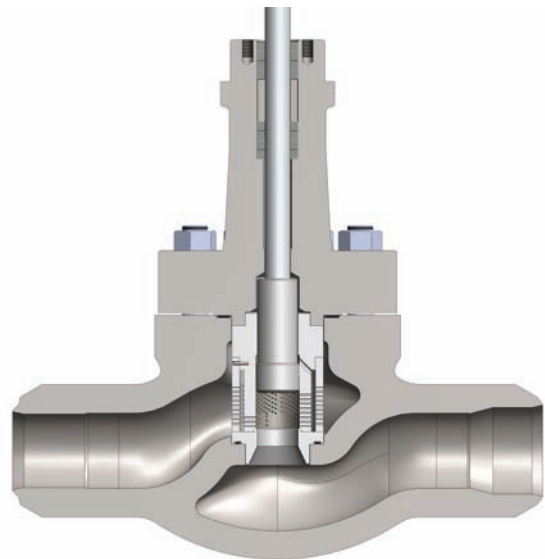
Lo-dB / Anti-cavitation Multi-stage Trim with Diffuser : Designed to provide additional noise and cavitation attenuation properties in "Flow to close" applications.



# MIL 41000

## MIL 41004 Design (Multi-stage Low Noise Valves)

Multi-stage Lo-dB Trim: Designed to provide noise attenuation for gas or steam applications at high pressure drop ratios.



## MIL 41104 Unbalanced Multi-stage Lo-dB Valves

Critical Flow Factor (C<sub>c</sub> or F<sub>c</sub>) at full open position : 0.95

| VALVE SIZE (inch) | STROKE (inch)       | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) Vs RATED Cv |   |                   |    |        |       |        |
|-------------------|---------------------|---------------------|-------------------------------------|---|-------------------|----|--------|-------|--------|
|                   |                     |                     | 0.5                                 | 0.625   | 0.812             | 1  | 1.25   | 1.375 | 1.625  |
| 1                 | 0.75                | 150# - 600#         | 2.5                                 | 3.8   | -                 | -  | -      | -     | -      |
| 1                 | 0.75                | 900# - 2500#        | 1, 1.7, 2                           | 3.8   | -                 | -  | -      | -     | -      |
| 1.5               | 1.5 <sup>(18)</sup> | 900# - 2500#        | -                                   | 1.7 <sup>(18)</sup> , 2 <sup>(18)</sup> , 3.8 <sup>(18)</sup> , 6 <sup>(18)</sup> | 8 <sup>(18)</sup> | 10 | 12, 16 | 20    | -      |
| 2.0               | 1.5 <sup>(18)</sup> | 900# - 2500#        | -                                   | 2 <sup>(18)</sup> , 3.8 <sup>(18)</sup> , 6 <sup>(18)</sup>                       | 8 <sup>(18)</sup> | 10 | 12, 16 | 20    | 25     |
| 2.5               | 1.5 <sup>(18)</sup> | 900# - 2500#        | -                                   | -   | 8 <sup>(18)</sup> | 10 | 12, 16 | 20    | 25     |
| 3.0               | 1.5                 | 900# - 2500#        | -                                   | -   | -                 | 10 | 16     | 20    | 25, 30 |

<sup>(18)</sup>: Cv 1.7, 2, 3.8, 6, 8 with 0.75" stroke

Other Cv's on request

## MIL 41004 Balanced Multi-stage Lo-dB Valves

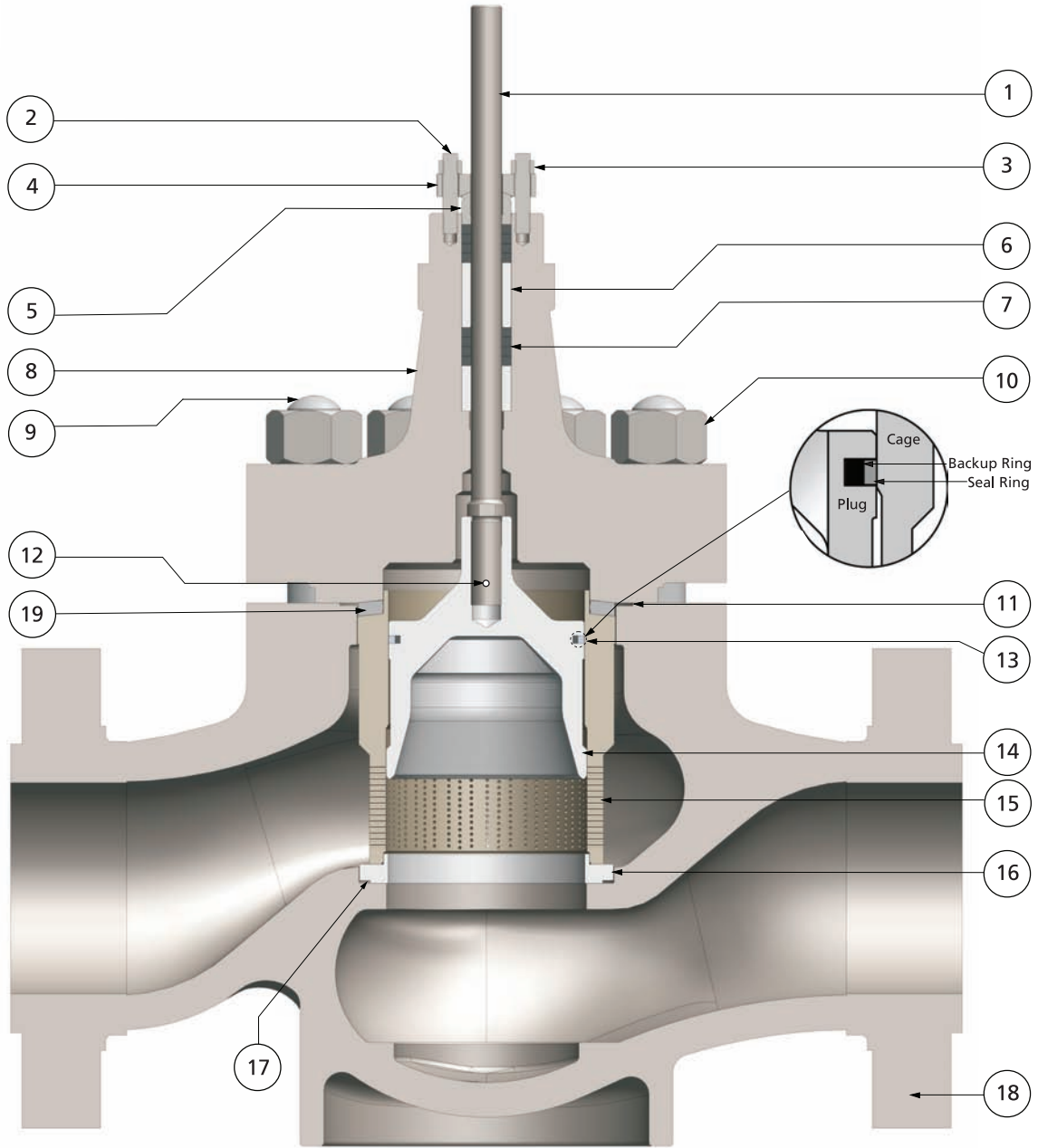
Critical Flow Factor (C<sub>c</sub> or F<sub>c</sub>) at full open position : 0.95

| VALVE SIZE (inch) | RATING (ASME CLASS) | ORIFICE DIAMETER (inch) | STROKE (inch) | STANDARD RATED Cv's |
|-------------------|---------------------|-------------------------|---------------|---------------------|
| 2                 | 150# - 1500#        | 2.5                     | 1.5           | 12, 16              |
| 3                 | 150# - 1500#        | 3.25                    | 2             | 12, 16, 20, 70      |
| 4                 | 150# - 1500#        | 4.375                   | 2             | 25, 45, 95, 105     |
|                   | 2500#               | 3.25                    | 2             | 45, 80              |
| 6                 | 150# - 1500#        | 5.125                   | 2             | 105                 |
|                   | 2500#               | 4.375                   | 2.5           | 120, 160            |
| 8                 | 150# - 1500#        | 6.46                    | 2.5           | 120, 160            |
|                   |                     |                         | 3             | 210, 290, 300       |
| 10                | 150# - 1500#        | 8                       | 3             | 300, 375, 500       |
| 12                | 150# - 1500#        | 9.75                    | 4             | 520, 625            |
| 14                | 150# - 1500#        | 12                      | 4             | 720                 |

Other Cv's on request



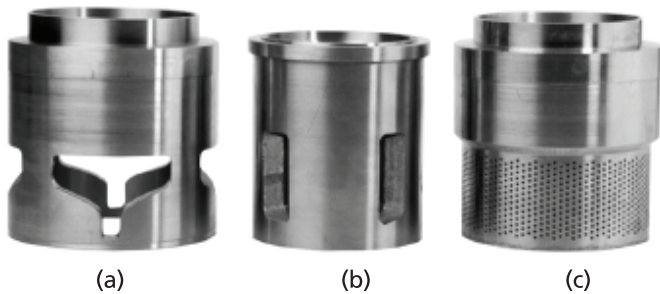
## Construction



MIL 41500 / 41600 / 41900  
Balanced Construction

### Typical Cage Designs

- (a) Equal %
- (b) Linear
- (c) Lo-dB/Anti-cav Linear







## Material of Construction

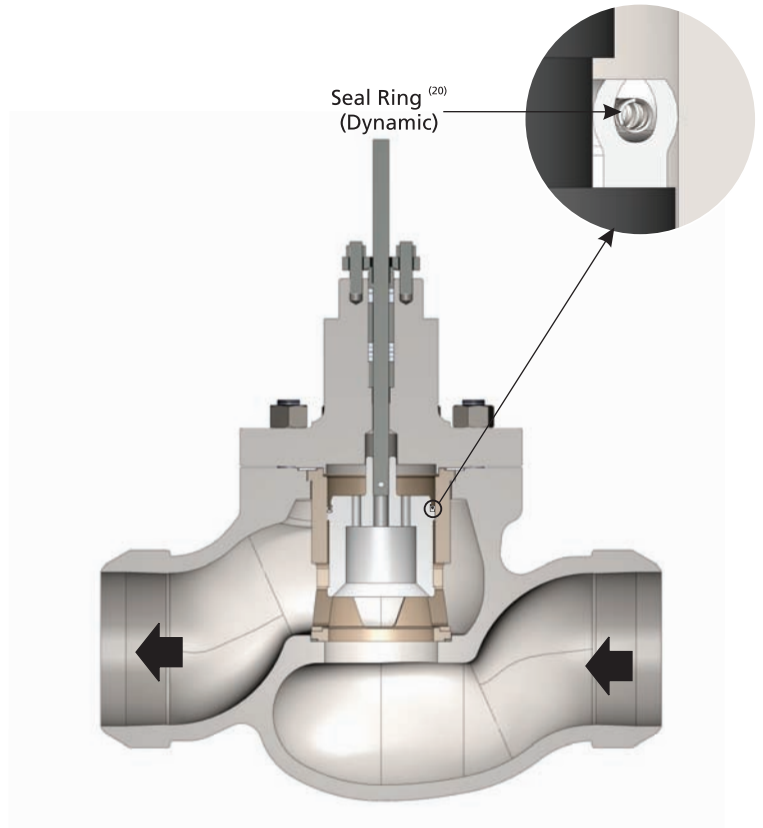
| REF. NO. | PART NAME   | STANDARD MATERIAL <sup>(19)</sup>                      |
|----------|---|--|
| 1        | Valve Plug Stem   | 17.4 PH SST H 1075 (< 343 °C)                          |
|          |   | SUPER ALLOY (ASTM A 638 Gr 660) (>343 °C)              |
| 2        | Packing Flange Stud                                     | ASTM A 193 Gr B8                                       |
| 3        | Packing Flange Nut                                      | ASTM A 194 Gr 8  |
| 4        | Packing Flange  | ASTM A 105   |
| 5        | Packing Follower  | 304 SST  |
| 6        | Packing Spacer/Lantern Ring                             | 304 SST  |
| 7        | Gland Packing   | PTFE ≤ 180 °C  |
|          |   | GRAPHITE > 180 °C                                      |
| 8, 18    | Bonnet, Body  | Carbon Steel : ASTM A 216 Gr WCC                       |
|          |   | Alloy Steel : ASTM A 217 Gr WC6                        |
|          |   | Alloy Steel : ASTM A 217 Gr WC9                        |
|          |   | Alloy Steel : ASTM A 217 Gr C5/C12/C12A                |
|          |   | Stainless Steel : ASTM A 351 Gr CF8/CF8M/CF8C/CF3/CF3M |
| 9        | Body Stud   | ASTM A 193 Gr B7 (< 454 °C)                            |
|          |   | ASTM A 193 Gr B16 (454°C - 538 °C)                     |
|          |   | ASTM A 453 Gr 660 (> 538 °C)                           |
| 10       | Body Nut  | ASTM A 194 Gr 2H (<454 °C)                             |
|          |   | ASTM A 194 Gr 7 (454°C - 538 °C)                       |
|          |   | ASTM A 194 Gr 8C (> 538 °C)                            |
| 11       | Body Gasket   | 316L SST + Graphite (spiral wound)                     |
| 12       | Plug Pin  | 316 SST  |
| 13       | Seal Ring   | 41200  |
|          |   | 41300  |
|          |   | 414 / 500  |
|          |   | 41600  |
|          |   | 41900  |
|          |   | Spring energised Ekonol+PTFE                           |
|          |   | Spring energised Ekonol+PTFE                           |
|          |   | Ni Resist D3   |
|          |   | PTFE   |
|          |   | Graphite   |
| 14       | Valve Plug  | 17.4 PH SST H 1075 (< 343 °C)                          |
|          |   | CA6NM, Nitrided (> 343 °C)                             |
| 15       | Cage  | CF8M Chrome plated (<343 °C)                           |
|          |   | CA6NM Nitrided (> 343 °C)                              |
| 16       | Seat Ring<br>Diffuser Seat Ring                         | 410 SST (< 343 °C)                                     |
|          |   | 316 SST + Stellite (> 343 °C)                          |
| 17       | Seat Ring Gasket  | 316L SST + Graphite (spiral wound)                     |
| 19       | Flat Spring <sup>(22)</sup>                             | 17.4 PH SST H 1075 (< 343 °C)                          |
|          |   | Inconel X 750 (> 343 °C)                               |
| 20       | Pilot Plug<br>(For MIL 41400, ref. page 15)             | CA6NM+Stellite No.6, Chrome plated (< 343°C)           |
|          |   | CA6NM+Stellite No.6, Nitrided                          |
| 21, 22   | Circlip / Pilot Spring<br>(For MIL 41400, ref. page 15) | Spring Steel (< 343 °C)                                |
|          |   | Inconel X 750 (> 343 °C)                               |

<sup>(19)</sup>: Material indicated above are for reference only. MIL reserves the right to supply alternate material / forms due to constant product upgradation. Other specific material are available on request.

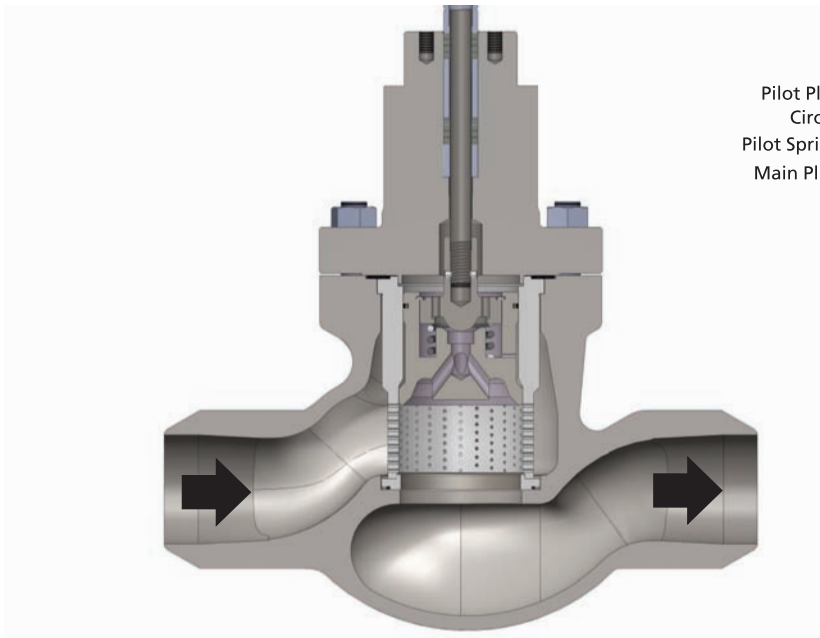


## MIL 41300 Construction (Tight Shut-off, with Dynamic Seal Ring)

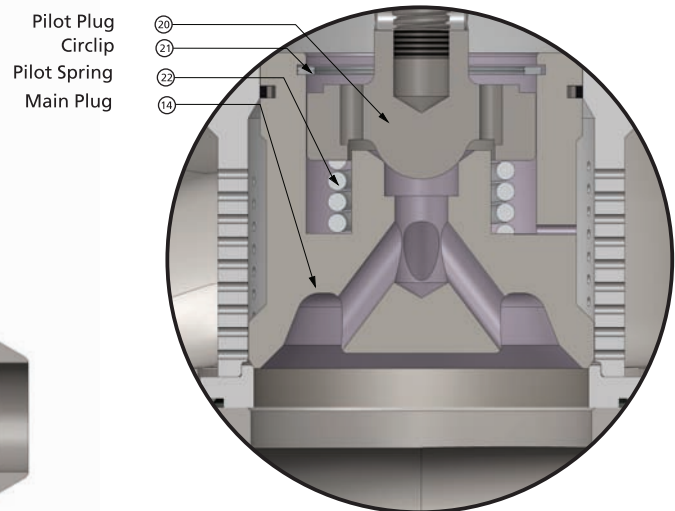
<sup>(20)</sup> **Seal Ring (Dynamic)** : Tight shut-off achieved by arresting the seal ring leakage to FCI 70.2, Class V limits, by using a special pressure energised polymeric seal ring.



## MIL 41400 Construction (Tight Shut-off, With Auxiliary Shut-off Pilot Plug)<sup>(21)</sup>



Valve in Open Position



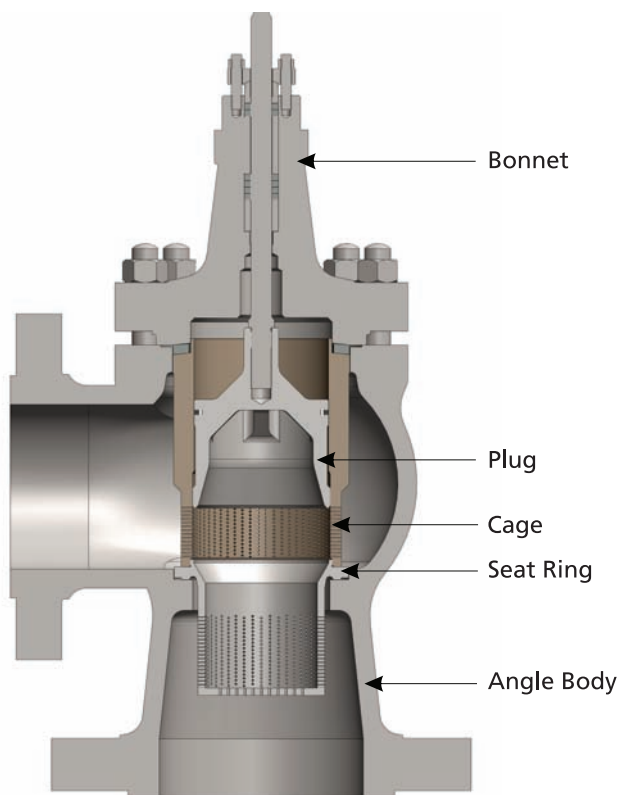
Valve in Closed Position

<sup>(21)</sup> **Auxiliary Shut-off Pilot Plug:** Used for applications, where tight shut-off is required in the high temperature service, beyond capabilities of seal rings. The pilot plug closes the balancing holes in shut-off condition. No 'Soft' parts are used for sealing and FCI 70.2, Class V tight shut-off can be ensured even beyond 566 °C.

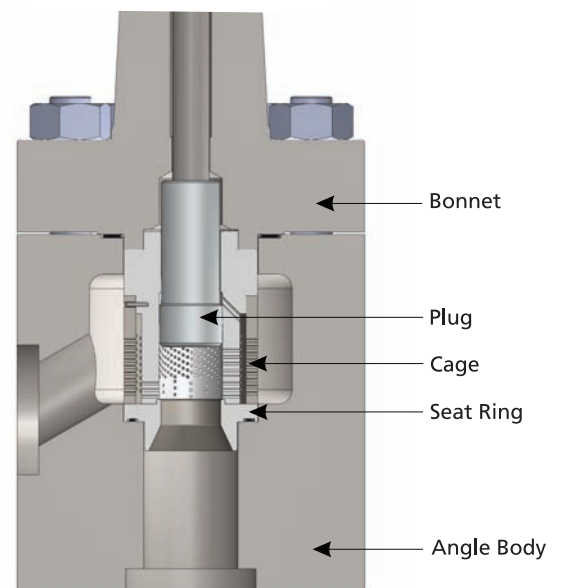


## MIL 71000 Angle body valves are tailored for the following applications

- Hydrocarbons to Flare
- Gas gathering and metering stations
- Compressor recycle
- Compressor bypass or antisurge
- Other applications where piping configuration requires an angle body



MIL 71600 Construction  
(Angle Valve with Polymeric Seal Ring - Cast Design)



MIL 71104 Construction  
(Multi-stage Angle Valve - Forged Design)

Note: MIL 71000 being a custom engineered control valve, the data furnished here is representative rather than inclusive of complete product offering. MIL can specifically design 71000 series to meet any specific application requirements with all possible combinations of inlet and outlet sizes. For compressible fluids, generally angle valves have expanding outlets. The trim variants available in 41000 series described hitherto can be provided for 71000 series also.



## Dimensions and Weights

Dimensions (mm) & Shipping Weights (W in kg) for MIL 41000 Body Subassembly<sup>(22)</sup>

| VALVE SIZE (Inch) | ASME 150# FLANGED (RF) |     |     |      | ASME 300# FLANGED (RF) |     |     |      | ASME 600# FLANGED (RF) |     |     |      |
|-------------------|------------------------|-----|-----|------|------------------------|-----|-----|------|------------------------|-----|-----|------|
|                   | A                      | B   | H   | W    | A                      | B   | H   | W    | A                      | B   | H   | W    |
| 1.5               | 222                    | 63  | 216 | 38   | 235                    | 78  | 216 | 39   | 251                    | 78  | 216 | 39   |
| 2                 | 266.5                  | 92  | 254 | 43   | 266.5                  | 92  | 254 | 45   | 285.5                  | 92  | 254 | 45   |
| 3x2               | 298                    | 115 | 288 | 98   | 318                    | 115 | 288 | 98   | 337                    | 130 | 288 | 98   |
| 3                 | 298                    | 115 | 300 | 100  | 318                    | 115 | 300 | 100  | 336.5                  | 130 | 300 | 100  |
| 4x3               | 352                    | 137 | 322 | 162  | 368.5                  | 137 | 322 | 162  | 394                    | 150 | 322 | 162  |
| 4                 | 352                    | 137 | 330 | 165  | 368.5                  | 137 | 330 | 165  | 393.5                  | 150 | 330 | 165  |
| 6x4               | 451                    | 174 | 330 | 240  | 473                    | 174 | 330 | 240  | 508                    | 193 | 330 | 255  |
| 6                 | 451                    | 162 | 390 | 245  | 473                    | 174 | 390 | 245  | 508                    | 193 | 390 | 260  |
| 8                 | 543                    | 206 | 496 | 418  | 569                    | 206 | 496 | 418  | 609.5                  | 230 | 496 | 439  |
| 10x8              | 752                    | 217 | 534 | 617  | 752                    | 237 | 534 | 617  | 752                    | 269 | 534 | 650  |
| 10                | 673                    | 225 | 567 | 629  | 708                    | 225 | 567 | 629  | 752                    | 269 | 564 | 677  |
| 12                | 737                    | 333 | 620 | 980  | 775                    | 333 | 620 | 980  | 819                    | 342 | 617 | 1015 |
| 14                | 889                    | 386 | 600 | 1170 | 927                    | 386 | 600 | 1170 | 972                    | 397 | 656 | 1490 |
| 16                | 1016                   | 441 | 705 | 1455 | 1057                   | 459 | 705 | 1455 | 1108                   | 459 | 718 | 1506 |
| 20                | 1420                   | 534 | 782 | 2765 | 1420                   | 534 | 782 | 2765 | 1484                   | 547 | 823 | 3100 |
| 18x16             | 1120                   | 445 | 765 | 1590 | 1160                   | 445 | 765 | -    | 1220                   | 465 | 765 | 1740 |
| 24                | 1500                   | 561 | 867 | -    | 1500                   | 561 | 867 | -    | -                      | -   | -   | -    |

| VALVE SIZE (inch) | ANSI 900# FLANGED (RTJ) |     |     |     | ANSI 1500# FLANGED (RTJ) |      |     |     | ANSI 2500# WELD END (BW) |      |     |      |
|-------------------|-------------------------|-----|-----|-----|--------------------------|------|-----|-----|--------------------------|------|-----|------|
|                   | A                       | B   | H   | W   | A                        | B    | H   | W   | A                        | B    | H   | W    |
| 1.5               | 333.5                   | 89  | 194 | 45  | 333                      | 88.9 | 194 | 45  | 292                      | 50.5 | 196 | 45   |
| 2                 | 378                     | 123 | 223 | 55  | 378                      | 123  | 223 | 55  | 394                      | 96   | 215 | 70   |
| 2.5               | -                       | -   | -   | -   | 315                      | 135  | 198 | -   | 394                      | 96   | 219 | 125  |
| 3x2               | 394                     | 120 | 251 | 105 | 406                      | 148  | 251 | 105 | -                        | -    | -   | -    |
| 3                 | 444                     | 131 | 283 | 114 | 463.5                    | 148  | 300 | 114 | 530                      | 120  | 294 | 140  |
| 4x3               | 514                     | 161 | 322 | 175 | 532.5                    | 171  | 322 | 175 | -                        | -    | -   | -    |
| 4                 | 514                     | 161 | 330 | 185 | 532.5                    | 171  | 330 | 185 | 575                      | 131  | 410 | 250  |
| 6x3               |                         |     |     |     | 774                      | 212  | 330 |     |                          |      |     |      |
| 6x4               | 717                     | 205 | 330 | 380 | 774                      | 212  | 330 | 380 | 760                      | 170  | 411 | 455  |
| 6                 | 717                     | 205 | 390 | 395 | 774                      | 212  | 390 | 395 | 760                      | 182  | 434 | 473  |
| 8                 | 917                     | 258 | 521 | 703 | 981                      | 258  | 521 | 703 | 1022                     | 232  | 640 | 848  |
| 10                | 1095                    | 291 | 570 | 800 | 1179                     | 310  | 615 | 805 | -                        | -    | -   | -    |
| 12x8              | -                       | -   | -   | -   | -                        | -    | -   | -   | 1022                     | 283  | 646 | 1800 |
| 12                | 1133                    | 350 | 626 | -   | 1235                     | 373  | 628 | -   | -                        | -    | -   | -    |
| 14x10             | -                       | -   | -   | -   | -                        | -    | -   | -   | 1200                     | 316  | 690 | 2300 |

<sup>(22)</sup> : Approximate dimensions and weights furnished are for reference only.

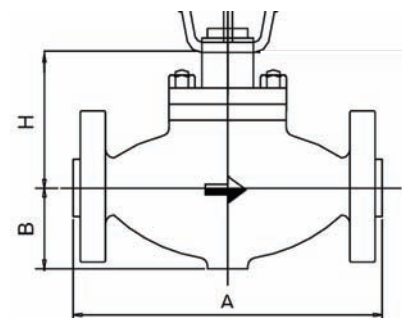


# MIL 41000

## Dimensions (mm) & Shipping Weights (W in kg) for MIL 41000 Body Subassembly<sup>(22)</sup>

| VALVE SIZE (Inch) | ANSI 150/300# WELD END (BW) |     |     |      | ANSI 600# WELD END (BW) |     |     |      | ANSI 900/1500# WELD END (BW) |     |     |     |
|-------------------|-----------------------------|-----|-----|------|-------------------------|-----|-----|------|------------------------------|-----|-----|-----|
|                   | A                           | B   | H   | W    | A                       | B   | H   | W    | A                            | B   | H   | W   |
| 1.5               | 251                         | 44  | 216 | 30   | 251                     | 44  | 216 | 30   | -                            | -   | -   | -   |
| 2                 | 285                         | 67  | 254 | 36   | 285                     | 67  | 254 | 36   | 375                          | 80  | 223 | 40  |
| 3x2               | 440                         | 115 | 288 | 80   | 440                     | 115 | 288 | 80   | 406                          | 108 | 251 | 105 |
| 3                 | 440                         | 115 | 300 | 85   | 440                     | 115 | 300 | 85   | 460                          | 131 | 300 | 114 |
| 4x3               | 444                         | 137 | 322 | 115  | 444                     | 137 | 322 | 115  | 530                          | 129 | 322 | 175 |
| 4                 | 444                         | 137 | 331 | 128  | 444                     | 137 | 330 | 128  | 530                          | 129 | 330 | 185 |
| 6x3               |                             |     |     |      |                         |     |     |      | 680                          | 177 | 330 |     |
| 6x4               | 560                         | 162 | 330 | 215  | 560                     | 165 | 330 | 215  | 680                          | 177 | 330 | 380 |
| 6                 | 560                         | 162 | 390 | 235  | 560                     | 165 | 390 | 235  | 680                          | 177 | 390 | 395 |
| 8                 | 656                         | 206 | 496 | 355  | 656                     | 201 | 496 | 355  | 860                          | 215 | 521 | 703 |
| 10                | 802                         | 225 | 567 | 550  | 802                     | 242 | 564 | 550  | 892                          | 249 | 582 | 595 |
| 12                | 822                         | 333 | 620 | 950  | 822                     | 342 | 617 | 956  | 1130                         | 350 | 626 | -   |
| 14                | 1029                        | 386 | 600 | -    | -                       | -   | -   | -    | -                            | -   | -   | -   |
| 16                | 1108                        | 459 | 705 | 1415 | 1108                    | 459 | 718 | 1415 | -                            | -   | -   | -   |
| 20                | 1484                        | 534 | 782 | -    | -                       | -   | -   | -    | -                            | -   | -   | -   |

<sup>(22)</sup> : Approximate dimensions and weights furnished are for reference only.



### Sales & Service offices

**New Delhi:** MIL Controls Ltd., KSB House, A-96, Sector-4, Gautam Budh Nagar, Noida-201 301, India. Tel: +91 (120) 2541091-93, 2541501-03, Fax: +91 (120) 2550567 E-mail: salesnoida.mil@ksb.com **Mumbai:** MIL Controls Ltd., KSB Pumps Ltd., 126, Maker Chamber III, Nariman Point, Mumbai 400 021, India. Tel: +91 (22) 66588787, 66588757-59, 66588761, Fax: +91 (22) 66588788. E-mail: salesmumbai.mil@ksb.com **Kolkata:** MIL Controls Ltd., KSB Pumps Ltd., 2nd Floor, 30 Circus Avenue, Kolkata 700 017, India. Tel: +91 (33) 22809847, 22809848, 22870473, Fax: +91 (33) 22870588, 22809847. E-mail: saleskolkata.mil@ksb.com **Chennai:** MIL Controls Ltd., KSB Pumps Ltd., Guindy House, 2nd Floor, No: 95, Anna Salai, Chennai 600 032, India. Tel: +91 (44) 22352571 -72, 22300629, Fax: +91 (44) 22352749 E-mail: saleschennai.mil@ksb.com **Vadodara:** MIL Controls Ltd., KSB Pumps Ltd., 4-B, Ramakrishna Chambers, Productivity Road, Vadodara 390 005, India. Tel: +91 (265) 2330532, 2333226, Fax: +91 (265) 2350002 E-mail: salesbaroda.mil@ksb.com **Pune:** MIL Controls Ltd., KSB Pumps Ltd., Plot No - 28/21, D-II Block, MIDC, Chinchwad, Pune 411 019, India. Tel: +91 (20) 27409100, Fax: +91 (20) 27470890 E-mail: salespune.mil@ksb.com

### Middle East & Asia Pacific

**China:** KSB Valves (Shanghai) Co.Ltd 29 F. Xing-Yuan Technology Building, 418 Guiping Road, Shanghai, China, Post Code: 200233, Tel: +86-21-6485 1778, Fax: +86-21-6485 9115. **Dubai:** KSB Middle East FZE, P.O.Box: 18315, Jebel Ali, Dubai, U.A.E. Tel: +971-4-883 0455, Fax: +971-4-883 0456 **Indonesia:** PT KSB Indonesia, Jalan Timor Blok D2-1, Kawasan Industri MM 2100 Cibitung, Jawa Barat, Indonesia. Tel: +62 21 89983570, Fax: +62 21 89983571 **Korea:** KSB Korea Ltd, Soo Young Building, 64-1, Hannam-Dong, Yongsan-Ku, Seoul 140-210, Korea. Tel: +82-2-790 4351, Fax: +82-2-790 4350 **Malaysia:** KSB Malaysia Pumps & Valves SDN BHD 29, Jalan PJU 3/47, Sunway Damansara, 47810 Petaling Jaya, Selangor Darul Ehsan, Malaysia., Tel: +60-03-7805 3397, Fax: +60-03-7805 1373 **Singapore:** KSB Singapore (Asia Pacific) PTE Ltd., 4 Woodlands Walk, Singapore 738248. Tel: 6757 7200, Fax: 6482 3005 **Taiwan:** KSB Taiwan Co.Ltd, No: 154-6 Sec 1, Datong Rd, Xizhi Dist, 10635, New Taipei City, Tel: +886-2-2649 2255, Fax: +886-2-2649 8833 **Thailand:** KSB Pumps Co Ltd., Bangkok 10530, Thailand. Tel: +66-2-988 2324, Fax: +66-2-988 2213

**MIL Controls Limited**  
Meladoor, Annamanada, Pin 680 741,  
Thrissur Dist., Kerala, India  
Tel : +91 (480) 2695700  
Fax : + 91 (480) 2890952  
Email : sales.mil@ksb.com  
Web : www.milcontrols.com

