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# CV40 and CV41 Control Valve

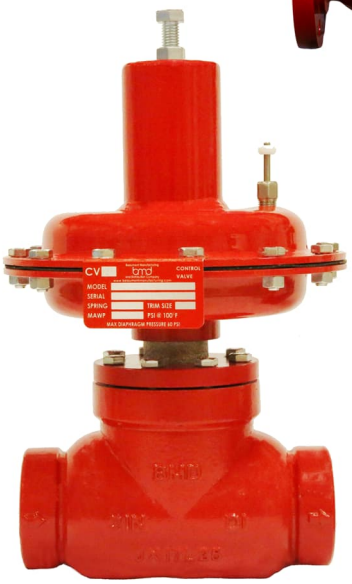
The CV40 is a low pressure, full port, dump valve. It features balanced plug control trim with a quick opening characteristic and an adjustable topworks. The CV40's full port allows for high flow rates, and its standard soft seat design gives a consistent leak free shut off when the valve closes. The CV41 offers the same great features, but with an open yoke design.

Both the CV40 and CV41 can be ordered with a metal to metal seat. The metal seat version comprises an unbalanced, hex-shaped plug that avoids debris build up for severe service conditions. Both the soft seat and metal seat trims are offered in full port and reduced port sizes to fit a variety of flow conditions while keeping the same valve body.

The CV40 and CV41 can be used for discharging liquid or gas from separators, treaters, knockouts or other vessels. It can also be used for back pressure regulation when paired with a PC48 pressure controller making it a great economical choice for a variety of low pressure applications.

CV40 Reverse Angled Body

CV41 with #120 Actuator



CV40 Reverse Globe Body

## Specifications

Sizes: 2", 3" and 4"
**Connections:** Female NPT, Flanged
Body Type: Globe, Angle
**Soft Seat Trim:**
**Trim Characteristic:** Quick Open
Trim Size:
2" Body Size: 2", 1 1/2", 1"
3" Body Size: 3", 2", 1"
4" Body Size: 4", 3", 2", 1"
Trim Type: Balanced
Metal Seat Trim:
**Trim Characteristic:** Modified Percent
Trim Size:
2" Body Size: 1.75" & 1.00"
3" Body Size: 2.75", 1.75", 1.00"
4" Body Size: 3.75", 2.75", 1.75", 1.00"
Trim Type: Unbalanced
**Pressure Rating:**
500 psi - 2", 3", 4" NPT
250 psi - 2", 3", 4" Flanged
Temperature Range: -20° F to 400° F
Actuator Sizes: #35, #70, #120
Input Signal Range: 3-15 or 6-30 psi
Materials:
Body: Ductile Iron
Bonnet and Plug: Stainless Steel
Bonnet Flange: Carbon Steel
Seat: 304 Stainless Steel
Stem: 304 Stainless Steel
Actuator Housing: Carbon Steel
Standard Materials are good for NACE

# CV Values

| Body Size | Trim Size (in.) | Balanced Soft Seat Trim Valve Opening (% Travel) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 2 Inch | 1” | 6.3 | 9.2 | 10.8 | 11.5 | 11.8 | 12.4 | 13.3 | 14.3 | 16.3 | 19.8 |
| | 1 1/2” | 7.7 | 15.0 | 21.4 | 25.9 | 28.6 | 30.2 | 31.3 | 32.2 | 32.8 | 33.2 |
| | 2” | 7.7 | 15.6 | 23.9 | 32.3 | 39.6 | 45.5 | 49.6 | 52.0 | 53.6 | 54.8 |
| 3 Inch | 1” | 10.0 | 12.5 | 14.0 | 14.8 | 15.3 | 15.4 | 16.9 | 18.1 | 19.6 | 19.6 |
| | 2” | 15.4 | 26.5 | 38.6 | 44.9 | 49.0 | 51.8 | 53.7 | 55.3 | 56.3 | 56.8 |
| | 3” | 28.4 | 28.6 | 40.9 | 54.6 | 67.0 | 88.6 | 91.4 | 100.6 | 106.4 | 110.8 |
| 4 Inch | 1” | 9.1 | 11.6 | 13.5 | 14.8 | 15.8 | 16.1 | 16.9 | 18.5 | 19.6 | 20.1 |
| | 2” | 16.7 | 23.7 | 29.5 | 34.3 | 36.9 | 39.8 | 41.4 | 44.6 | 46.5 | 49.9 |
| | 3” | 23.1 | 46.5 | 70.1 | 85.7 | 96.6 | 105.2 | 110.3 | 116.6 | 117.4 | 122.7 |
| | 4” | 23.6 | 47.5 | 74.2 | 93.2 | 114.2 | 135.0 | 149.5 | 165.0 | 174.2 | 179.4 |

| Body Size | Trim Size (in.) | Unbalanced Metal Seat Trim Valve Opening (% Travel) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 2 Inch | 1.00 | 2.3 | 3.3 | 5.5 | 8.3 | 12.8 | 17.4 | 19.5 | 21.1 | 21.9 | 22.4 |
| | 1.75 | 3.5 | 5.5 | 9.4 | 15.4 | 22.7 | 25.8 | 28.6 | 32 | 35.9 | 36.7 |
| 3 Inch | 1.00 | 2.3 | 3.3 | 5.5 | 8 | 14.4 | 19.8 | 22.1 | 23.4 | 24.4 | 25.3 |
| | 1.75 | 8.1 | 11.6 | 15.4 | 21.3 | 29.5 | 36.5 | 42.6 | 47.4 | 51.6 | 54.4 |
| | 2.75 | 12.4 | 17.7 | 28.6 | 41.4 | 54.9 | 67.9 | 77.8 | 85.2 | 91.2 | 95.8 |
| 4 Inch | 1 | 3.1 | 4.6 | 8.2 | 15.5 | 20.2 | 22.9 | 24.1 | 24.6 | 24.7 | 24.8 |
| | 1.75 | 5.4 | 9.7 | 19.9 | 29.3 | 37.3 | 44.5 | 50.5 | 54.5 | 56.6 | 58.6 |
| | 2.75 | 8.9 | 14.4 | 28.9 | 45.8 | 60.4 | 76.1 | 87.7 | 96.9 | 103.5 | 104 |
| | 3.75 | 11.7 | 19.1 | 37.3 | 61 | 82.1 | 103.3 | 119.5 | 130 | 144.6 | 150.6 |

# Dimensions

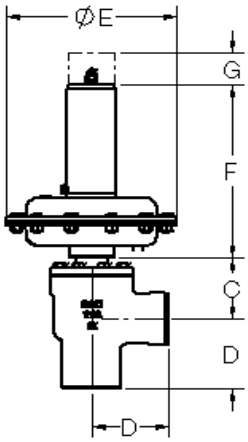
| End Connection | Body Dimension | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2" | | | | | 3" | | | | | 4" | | | | |
| | Globe | | | Angle | | Globe | | | Angle | | Globe | | | Angle | |
| | A | B | C | C | D | A | B | C | C | D | A | B | C | C | D |
| NPT | 8.50 | 2.13 | 4.72 | 3.77 | 4.38 | 12.00 | 3.00 | 6.51 | 3.88 | 5.50 | 15.00 | 3.75 | 7.16 | 4.96 | 6.50 |
| 150RFF | 9.00 | 2.13 | 4.72 | 3.77 | 4.25 | 12.19 | 3.00 | 6.50 | 3.88 | 5.50 | 15.13 | 3.75 | 7.16 | 4.96 | 6.50 |

| Acutator Size | Actuator Dimensions (in) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Direct | | | | Reverse | | | | |
| | E | F (CV40) | F (CV41) | G | E | F (CV40) | F (CV41) | H (CV40) | H (CV41) |
| No. 35, 3-15 | 9.50 | 10.50 | 16.04 | 5.50 | 9.50 | 7.75 | 13.38 | 9.70 | 15.33 |
| No. 35, 6-30 | 9.50 | 12.12 | 17.66 | 7.00 | 9.50 | 9.62 | 15.25 | 10.70 | 16.33 |
| No. 70, 3-15 | 12.50 | 12.09 | 15.00 | 7.00 | 12.50 | 9.62 | 15.25 | 12.57 | 18.20 |
| No. 70, 6-30 | 12.50 | 15.41 | 20.95 | 10.00 | 12.50 | 11.37 | 17.00 | 14.33 | 19.96 |
| No. 120 | 16.00 | — | 22.10 | 8.90 | 16.00 | — | 17.10 | — | 20.47 |

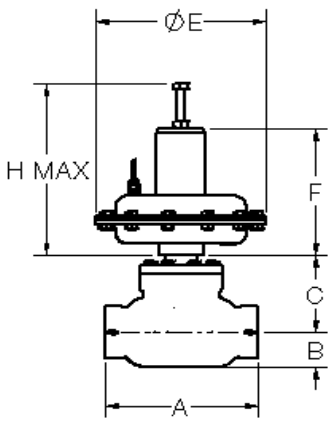
G = Clearance needed for spring cover removal.

CV40

Direct

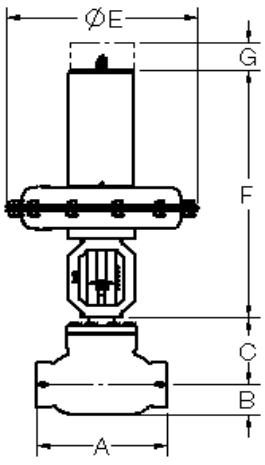



Reverse

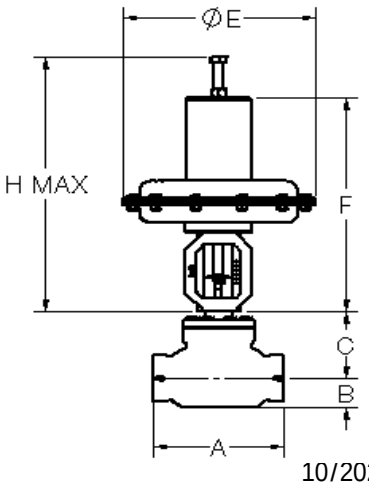



CV41

Direct




Reverse



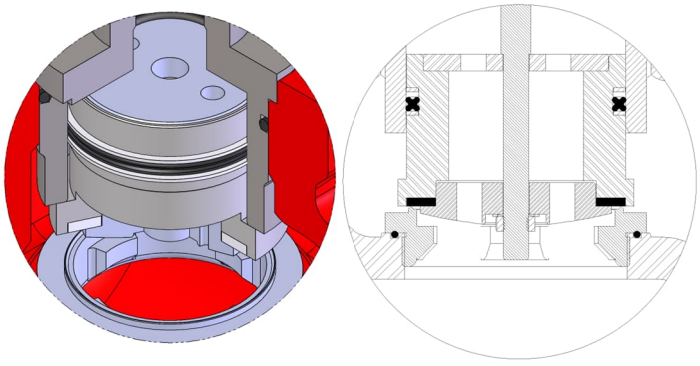
# Shut Off Values

| Trim Size | Flow Direction | Signal to No. 35 Actuator | | Signal to No. 35 Actuator | | Signal to No. 70 Actuator | | Signal to No. 70 Actuator | | Signal to No. 120 Actuator | | Signal to No. 120 Actuator | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 - 15 Spring | | 6 - 30 Spring | | 3 - 15 Spring | | 6 - 30 Spring | | 3 - 15 Spring | | 6 - 30 Spring | |
| | | 15 psi | 25 psi | 30 psi | 40 psi | 15 psi | 25 psi | 30 psi | 40 psi | 15 psi | 25 psi | 30 psi | 40 psi |
| 1 | Under Seat | | 435 | 56 | 500 | 56 | 500 | 477 | 500 | 500 | 500 | 500 | 500 |
| 1.75 | | | 103 | | 125 | | 270 | 116 | 407 | 341 | 500 | 500 | 500 |
| 2.75 | | | | | | | 51 | | 77 | 77 | 85 | 194 | 396 |
| 3.75 | | | | | | | 8 | | 15 | 27 | 136 | 78 | 187 |
| 1 | Over Seat | 173 | 500 | 252 | 500 | 252 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 1.75 | | 51 | 203 | 74 | 227 | 74 | 379 | 500 | 500 | 500 | 500 | 500 | 500 |
| 2.75 | | | 63 | | 51 | | 112 | 172 | 292 | 500 | 500 | 500 | 500 |
| 3.75 | | | 30 | | 19 | | 51 | 83 | 147 | 500 | 500 | 500 | 500 |

* Greyed out cells are not recommended.

# Trim Comparison

## Balanced Soft Seat Trim



Balanced trim allows the upstream pressure to act on the top of the plug. This equalizes the forces acting on the bottom of the plug to balance the trim. With balanced trim high shut off pressure can be achieved with relatively low actuation force. The CV40 balanced trim option also features a Teflon soft seat giving the valve a class VI shutoff.

Advantages:

- Higher shut off even with large trim
- Smaller actuator and spring needed
- Class VI shut off

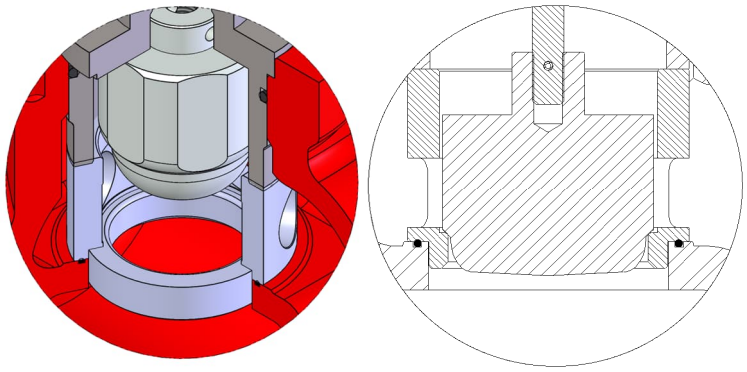
Disadvantages:

- Sand can build up on top side of plug
- Soft seat more susceptible to erosion in dirty conditions

Recommended for:

- Low pressure dump applications where flow rates may decrease over time

## Unbalanced Metal Seat Trim



Unbalanced trim does not allow the upstream pressure to act on the back side of the plug. It uses a solid one piece plug with hex flats. This design prevents sand buildup on the plug's backside. The metal to metal seat is also resistant to sand erosion.

Advantages:

- More erosion resistant than soft seat trim
- Prevents sand build up

Disadvantages:

- Lower shut off pressure due to unbalanced trim
- Requires a larger actuator and spring

Recommended for:

- Flow back
- Abrasive media

# Weights

| End Connection | Valve Weights with No. 35 Actuator | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2" | | | | 3" | | | | 4" | | | |
| | Globe | | Angle | | Globe | | Angle | | Globe | | Angle | |
| | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg |
| CV40 NPT | 48 | 22 | 51 | 23 | 69 | 31 | 56 | 25 | 111 | 50 | 85 | 39 |
| CV40 ANSI 150 | 58 | 26 | 54 | 24 | 85 | 39 | 74 | 34 | 113 | 51 | 103 | 47 |
| CV41 NPT | 55.5 | 29.5 | 58.5 | 30.5 | 76.5 | 38.5 | 63.5 | 32.5 | 118.5 | 57.5 | 92.5 | 46.5 |
| CV41 ANSI 150 | 65.5 | 33.5 | 61.5 | 31.5 | 92.5 | 46.5 | 81.5 | 41.5 | 120.5 | 58.5 | 110.5 | 54.5 |

| End Connection | Valve Weights with No. 70 Actuator | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2" | | | | 3" | | | | 4" | | | |
| | Globe | | Angle | | Globe | | Angle | | Globe | | Angle | |
| | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg |
| CV40 NPT | 63 | 28.8 | 66 | 29.8 | 84 | 37.8 | 71 | 31.8 | 126 | 56.8 | 100 | 45.8 |
| CV40 ANSI 150 | 73 | 32.8 | 69 | 30.8 | 100 | 45.8 | 89 | 40.8 | 128 | 57.8 | 118 | 53.8 |
| CV41 NPT | 70.5 | 36.3 | 73.5 | 37.3 | 91.5 | 45.3 | 78.5 | 39.3 | 133.5 | 64.3 | 107.5 | 53.3 |
| CV41 ANSI 150 | 80.5 | 40.3 | 76.5 | 38.3 | 107.5 | 53.3 | 96.5 | 48.3 | 135.5 | 65.3 | 125.5 | 61.3 |

# How to Order

Example Model No. CV40-2NGR33-TR-T
CV40 Series Dump Valve, 2" Globe Body, Threaded Ends, No. 35 Reverse Actuator, 3-15 psi Spring, Teflon Seat, Reduced Port, 1/4" Tapped Body.

CV40 - 2 N G R 3 3 - T R - T

**Style**
CV40 - Close Coupled
CV41 - Open Yoke
CV40U - Unbalanced Metal Seat, Close Coupled
CV41U - Unbalanced Metal Seat, Open Yoke

**Body Size**
2 - 2"
3 - 3"
4 - 4"

**Connection**
N - NPT
F - RFF

**Body Type**
G - Globe Body
A - Angle Body

**Actuator**
D - Direct (Fail Open)
R - Reverse (Fail Close)

**Actuator Size**
3 - #35
7 - #70
2 - #120 (CV41 Only)

**Spring**
3 - 3-15 psi
6 - 6-30 psi

**Seat Material**
T - Teflon
M - Metal (Unbalanced only)

**Trim Size**

Balanced/ **Soft Seat**
F - Full Port
R - Reduced Port
RR* - Reduced 2 Sizes
RRR*- Reduced 3 Sizes

Unbalanced/ Metal Seat

| | | | | |
|---|---|---|---|---|
| 2" Valve | 8 - 1.00" | 14 - 1.75" | | |
| 3" Valve | 22 - 2.75" | 14 - 1.75" | 8-1.00" | |
| 4" Valve | 30 - 3.75" | 22 - 2.75" | 14 - 1.75" | 8 - 1.00" |

**Tapped Body**
T - 1/4" NPT Tapped Body
Blank - Standard Body

*Example: A 3" Soft Seat Valve with RR trim would be reduced two sizes to 1"

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10/2023