Carbon Steel Cage Design, Two-Port Control Valves

Description
The CE43 series is a range of carbon steel two-port, cage trim, control valves conforming to ASME B 16.34, ASME VIII standards in sizes 1" to 4" (DN25 to DN100) available with ASME and PN flange connections. When used in conjunction with a pneumatic linear actuator 'C' series valves will provide characterised modulating or on/off control.

Compatible actuators and positioners:
- Pneumatic actuators: PN1000 series, spring-to-close
- PN2000 series, spring-to-open
- Positioners: EPS (electropneumatic), SP2 (smart electropneumatic)

Refer to the relevant Technical Information Sheet for further details.

Sizes and pipe connections
1", 1½", 2", 2½", 3" and 4" (DN25, DN40, DN50, DN65, DN80 and DN100) Flanged to ASME (ANSI) 150, 300 or 600 (Raised face or ring type joint), PN16, PN25, PN40, PN63 and PN100 (Raised face with ASME (ANSI) face-to-face dimension). 1", 1½" and 2" socket weld.

Options
- Trim: Equal %, linear, fast opening (on/off) characteristics, soft seat, hard faced, low noise and anti-cavitation (single and multi-cage).
- Stem seal: PTFE chevron, graphite packing and bellows.
- Plug: Balanced or unbalanced to: ASME (ANSI) Class IV, V or VI shut-off.

See 'C' series valve options Technical Information Sheet TI-F12-23.

Technical data
- Plug design: Unbalanced plug
- Balanced plug
- PTFE sealed balanced plug
- Graphite sealed balanced plug
- Trim design: Cage trim with equal percentage, linear and fast opening flow characteristics.
- Leakage: IEC 534-4
- CE valves: Equal percentage
- CF valves: Fast opening
- CM valves: Modified characteristic (special)
- Rangeability: 50:1 Equal percentage
- 30:1 Linear
- Travel: 1" and 1½" (DN25 and DN40) ¾" (20 mm)
- 2" (DN50) 1½" (30 mm)
- 2½" and 3" (DN65 and DN80) 1½" (38 mm)
- 4" (DN100) 2" (50 mm)

Materials

<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Carbon steel ASTM A216 WCB</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet</td>
<td>Carbon steel ASTM A216 WCB</td>
</tr>
<tr>
<td>3</td>
<td>Valve plug</td>
<td>Stainless steel AISI 431 hardened</td>
</tr>
<tr>
<td>4</td>
<td>Valve cage</td>
<td>Stainless steel AISI 316 ENC</td>
</tr>
<tr>
<td>5</td>
<td>Valve seat</td>
<td>Stainless steel AISI 431</td>
</tr>
<tr>
<td>6</td>
<td>Valve stem</td>
<td>Stainless steel AISI 316</td>
</tr>
<tr>
<td>7</td>
<td>Valve plug sealing rings</td>
<td>PTFE and graphite or graphite</td>
</tr>
<tr>
<td>8</td>
<td>Lock-nut</td>
<td>Stainless steel AISI 316</td>
</tr>
<tr>
<td>9</td>
<td>Mounting nut</td>
<td>Zinc plated carbon steel AISI 302</td>
</tr>
<tr>
<td>10</td>
<td>Gland spring</td>
<td>Stainless steel AISI 316</td>
</tr>
<tr>
<td>11</td>
<td>Gland seal</td>
<td>PTFE chevron or graphite</td>
</tr>
<tr>
<td>12</td>
<td>Bonnet gasket</td>
<td>Reinforced exfoliated graphite</td>
</tr>
<tr>
<td>13</td>
<td>Bonnet studs</td>
<td>Carbon steel ASTM A 193 B7</td>
</tr>
<tr>
<td>14</td>
<td>Bonnet nuts</td>
<td>Carbon steel ASTM A 193 B7</td>
</tr>
<tr>
<td>15</td>
<td>Stuffing box studs</td>
<td>Carbon steel ASTM A 193 B7</td>
</tr>
<tr>
<td>16</td>
<td>Stuffing box nuts</td>
<td>Carbon steel ASTM A 193 B7</td>
</tr>
<tr>
<td>17</td>
<td>Stem scraper</td>
<td>Glass filled PTFE</td>
</tr>
<tr>
<td>18</td>
<td>Stuffing box bush</td>
<td>Stainless steel AISI 316</td>
</tr>
<tr>
<td>19</td>
<td>Stuffing box ring</td>
<td>Stainless steel AISI 316</td>
</tr>
<tr>
<td>20</td>
<td>Valve stem wiper</td>
<td>Fluoroelastomer</td>
</tr>
<tr>
<td>21</td>
<td>'O' ring</td>
<td>Fluoroelastomer</td>
</tr>
</tbody>
</table>

Limiting conditions
Body design conditions: ASME (ANSI) 600
- Standard PTFE chevron stem seals: 14°F to +482°F (-10°C to +250°C)
- Graphite packing stem seals: 14°F to +572°F (-10°C to +300°C)
- Extended bonnet: 14°F to +797°F (-10°C to +425°C)
- Graphite sealed balanced plug: Class IV 797°F (425°C)
- PTFE sealed balanced plug: Class VI 356°F (180°C)

Designed for a maximum cold hydraulic test pressure of: ASME (ANSI) 600 2220 psi g (153 bar g)

Maximum differential pressure: See relevant actuator T1

Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification without notice.

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Valve flow coefficients at 100% lift

Cv (US) for single stage trims (K vs shown in brackets).

<table>
<thead>
<tr>
<th>Size</th>
<th>Equal % Cv (K vs)</th>
<th>F,</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; (DN25)</td>
<td>18.00 (15.00)</td>
<td>0.94</td>
</tr>
<tr>
<td>1½&quot; (DN40)</td>
<td>36.00 (31.00)</td>
<td>0.94</td>
</tr>
<tr>
<td>2&quot; (DN50)</td>
<td>60.00 (51.00)</td>
<td>0.94</td>
</tr>
<tr>
<td>2½&quot; (DN65)</td>
<td>99.00 (85.00)</td>
<td>0.94</td>
</tr>
<tr>
<td>3&quot; (DN80)</td>
<td>136.00 (116.00)</td>
<td>0.90</td>
</tr>
<tr>
<td>4&quot; (DN100)</td>
<td>223.00 (191.00)</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Three reduced Cv are available for equal percentage and linear trims, for further details see TI-F12-23 ‘C’ series control valve options.

For conversion Cv (UK) = Cv (US) x 0.833   K vs = Cv (US) x 0.865

Sizing

Please consult Spirax Sarco.

Installation

The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve name-plate. The actuator position will depend on the type fitted to the valve. Full instructions are supplied with the product.

Valve size

1", 1½", 2", 2½", 3" and 4"

DN25, 40, 50, 65, 80 and 100

Valve series

C = Cage trim
L  =  Linear
E  =  Equal percentage
equal characteristic
F  =  Fast opening
M = Modified equal percentage

4  =  Carbon steel
Body material

Connections

3  =  Flanged
4 = Socket weld (1", 1½" and 2")

Stem sealing

P  =  PTFE chevron
H  =  Graphite
B  =  Bellows

Seating options

G  =  PTFE soft seat
W = Hard face AISI 316

Type of trim

C = Standard cage
P = Noise reducing perforated cage
A = Anti-cavitation cage

Number of stages

1 = One
2 = Two
3 = Three
Other = To be specified

Trim balancing

B = Balanced
U = Unbalanced

Bonnet type

S = Standard
H = Extended for high temperature
L = Extended for low temperature

Reduced trim

0 = No reduction
1 = 1 reduction
2 = 2 reductions
3 = 3 reductions

Cv

To be specified

Cv 35

Connection type

To be specified

ASME300

2" C E 4 3 P T C 1 U S 1 Cv 35 ASME300

How to order

Example: 1 off Spirax Sarco 2" CE43 PTC1US1 Cv 35 control valve having flanged ASME 300 connections.

Spare parts

See TI-F12-22.