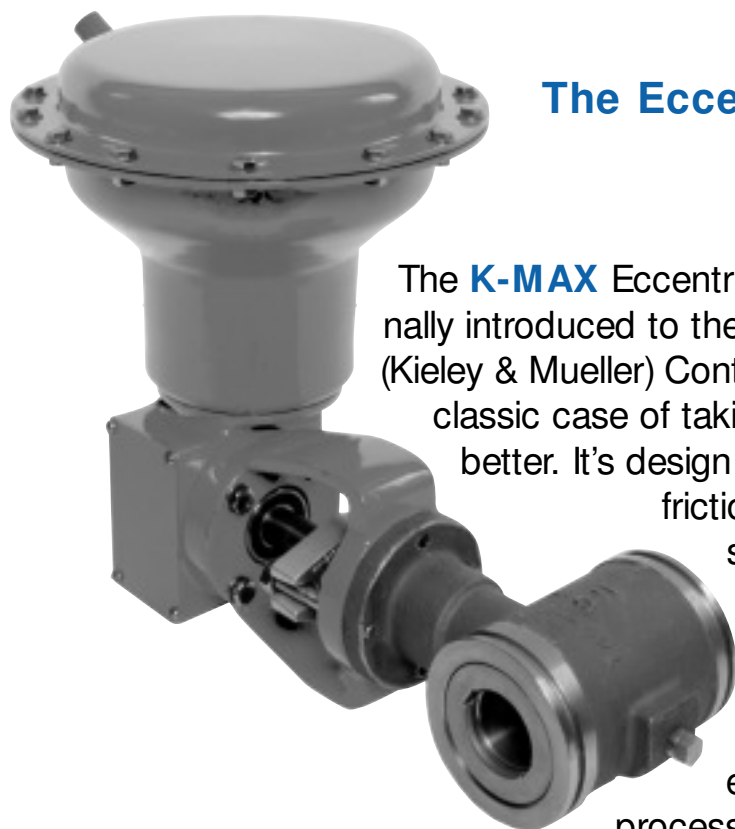


K-MAX CONTROL VALVE



The Eccentric Rotary Control Valve has *EVOLVED!*

The **K-MAX** Eccentric Plug Rotary Control Valve was originally introduced to the worldwide valve market by the K&M (Kieley & Mueller) Control Valve Company. The **K-MAX** is a classic case of taking a good idea and making it even better. It's design still incorporates the cam action, low friction plug operation that provides tight shutoff over long service life in a wide variety of flow control applications.

The **K-MAX** Rotary Control Valve is engineered to handle nearly all industrial process control requirements including:

■ Economical Design

The inherent versatility of the K-Max offers the advantage of using one valve style for many applications, allowing for plant standardization and minimal stocking requirements. In addition, the efficient straight-through flow design allows for a much lower cost per C, than conventional globe style control valves.

■ Eccentric Rotary Plug Action

The K-Max plug is offset to the shaft centerline. This allows the plug to break free of the seat ring immediately upon initial rotation of the shaft. Since there is no sliding contact between the plug and the seat ring throughout travel, seat ring life and shutoff integrity are greatly enhanced.

■ Self-aligning Orbital Seat

This innovative design allows orbital movement of the seat ring to provide self-alignment with the plug at assembly. Once seat ring to plug alignment is made, the seat is locked in place by the seat ring retainer. The seat ring and plug rigidly mate with every closure of the valve, maintaining excellent shutoff capability.

■ Rangeability

Rangeability of the K-Max valve is 100:1, allowing precise throttling over a wide range of flows.

■ Bi-directional Flow Capability

The normal flow direction for clean liquids, gases, and steam is flow to open (flow into the face of the plug). The recommended flow direction for erosive and slurry service is flow to close (flow into the backside of the plug). Shutoff class is maintained in either flow direction

K-MAX CONTROL VALVE

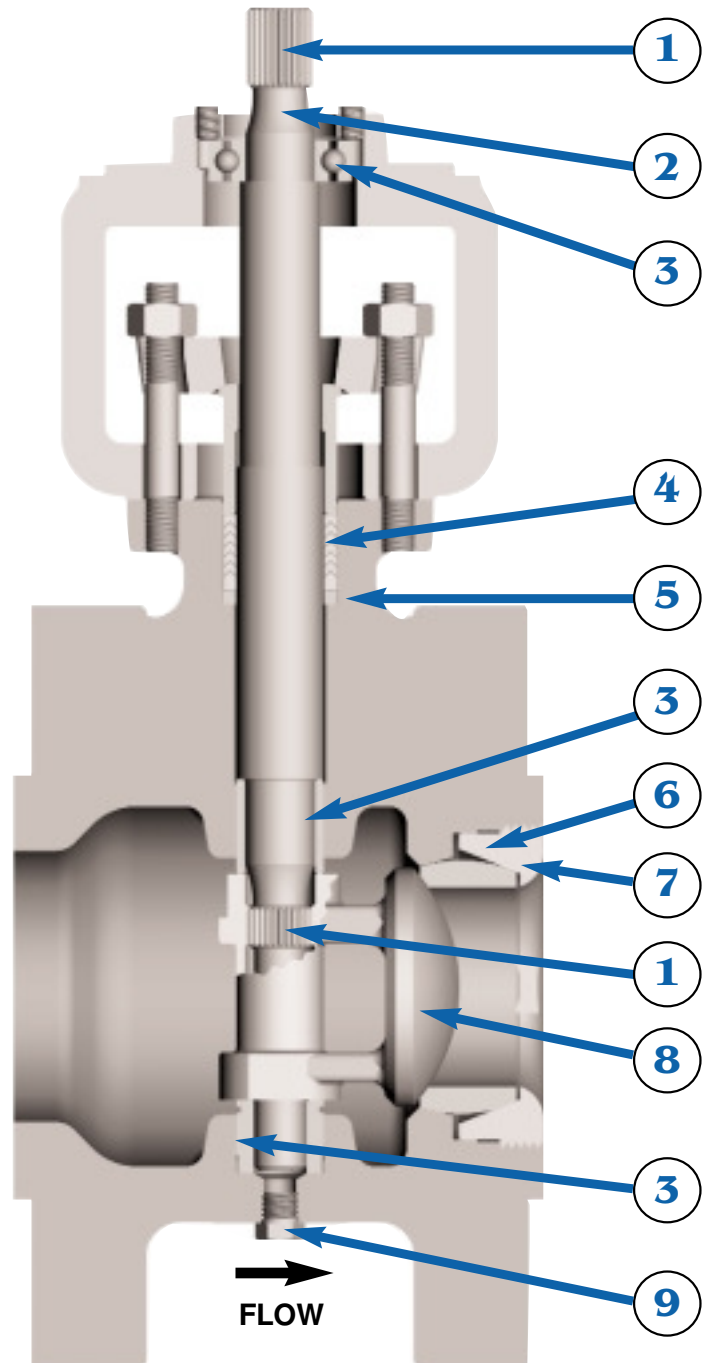
...with a Well-rounded Complement of Features

Maximum Service Life assured by these standard features:

- 1 Dual Spline Driven Shaft**
- 2 Large Diameter 17-4PH Stem**
- 3 Triple Bearing Shaft Support**
- 4 Long Packing Life and Minimized Emissions Hazard**
provided by rotary valve operation.
- 5 Fewer Possible Leak Paths**
due to one piece, integral bonnet design.
- 6 Easy Trim Size Changes**
modify valve C_v by simply replacing seat ring.
- 7 Customized Trim Options**
include Stainless Steel, Stellite, Hastelloy, Titanium and other alloys for a variety of applications such as:
 - Slurry Service
 - Corrosive Chemicals
 - Erosive Conditions
 - Superheated Steam
- 8 Tight Shutoff over Extended Service Life**
provided by low friction, cam action offset plug mated with self-aligning orbital seat.
- 9 Easy Maintenance and Clean-out**
assured by standard shaft access plug.

Variety of End Connections

- Wafer Style
(150, 300, 600 ANSI Class)
- Separable Flanged
(150, 300 ANSI Class)
- Integral Flanged
(150, 300, 600 ANSI Class)



FLOW TO CLOSE

ROTARY

K-MAX TECHNICAL SPECIFICATIONS

Valve Style:

High performance eccentric rotary plug control valve.

Valve Size:

Sizes 1" through 8" (25mm-200mm) with full or reduced port trim.

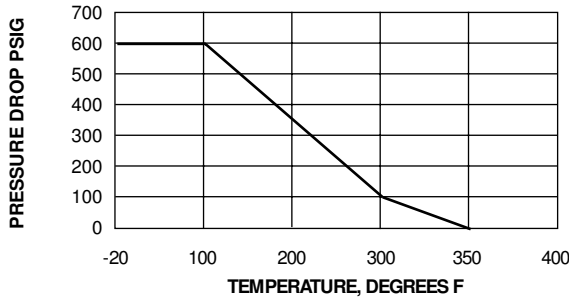
End Connection:

Flangeless ANSI class 150, 300 or 600, sizes 1" - 8".
 Separable flanged ANSI class 150 or 300, sizes 1" - 6".
 Integral flanged ANSI class 150, 300 or 600, sizes 1" - 8".
Note: Serrated raised face flanges are standard. Smooth raised face flanges, DIN and JIS flanges, available on application.

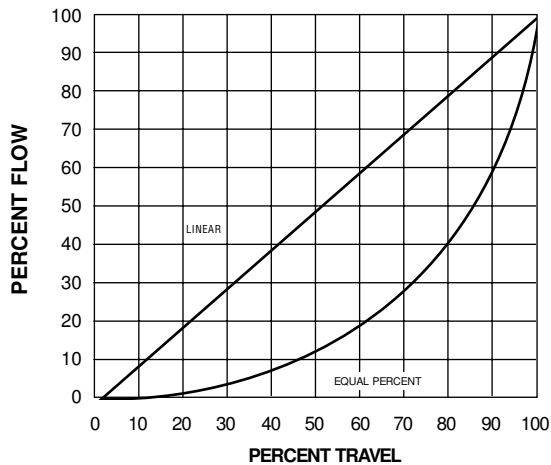
Seat Seal

Metal to metal seat (standard) - ANSI Class IV
 Metal to metal seat (optional) - ANSI Class V
 PTFE soft seat - ANSI Class VI

PTFE SOFT SEAT



FLOW CHARACTERISTIC



The inherent flow characteristic of the K-Max valve is linear. When required, the valve travel can be modified with a positioner cam adjustment to provide equal percent flow characteristic.

PRESSURE/TEMPERATURE ANSI RATINGS

Begin on page 204

Body Material:

Carbon steel, ASTM A216 grade WCB
 316 stainless steel, ASTM A351 grade CF8M
 Alloy 20 Cb3, ASTM A351 grade CN7M
 Hastelloy C22 ASTM A494 GR CX2MW*
 Titanium C3, ASTM B367 grade C-3

Packing:

| Packing Type | Temperature Range |
|---|-----------------------|
| Teflon Chevron | -40°F through +450°F |
| Laminated Graphite | -300°F through +800°F |
| Teflon Chevron with Viton Bearing Seals | -40°F through +450°F |

Trim Material:

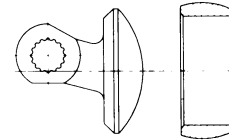
See K-Max valve material specifications.

Note: Other trim combinations available on application.

Trim Options:

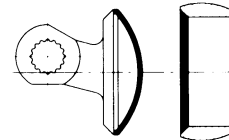
No Alloy 6 Trim

No Alloy 6 on seat ring or plug.



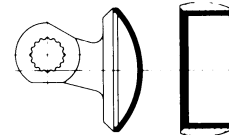
Partial Alloy 6 Trim

Alloy 6 on seat ring and plug seating surfaces.

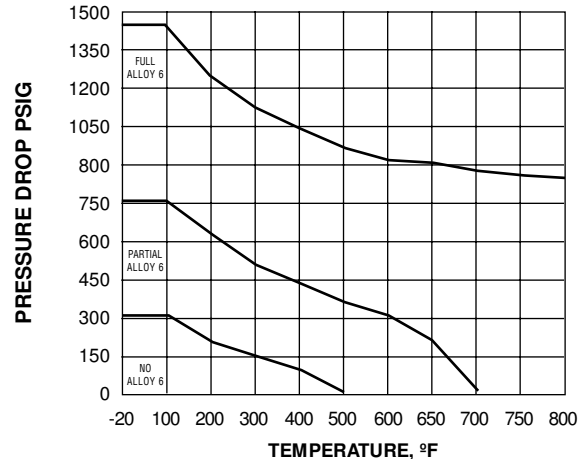


Full Alloy 6 Trim

Alloy 6 on seat ring bore in addition to seat ring and plug seating surfaces.



ALLOY 6 RECOMMENDED USAGE
(ANSI CLASS 600 RATING)



* Consult factory.

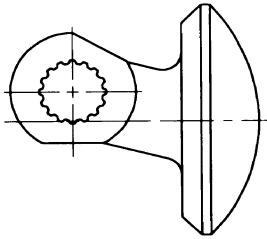
K-MAX TECHNICAL SPECIFICATIONS

Trim Size

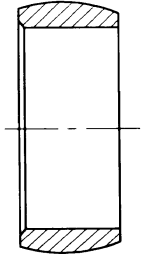
- Full size trim - 100% capacity
- .6 reduced trim - 60% of full capacity
- .4 reduced trim - 40% of full capacity
- .2 reduced trim - 20% of full capacity

Note: Other trim sizes available on application.

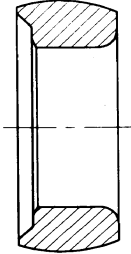
NOTE:
Other trim sizes available
on application.



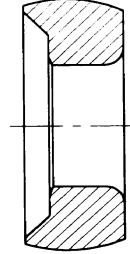
COMMON PLUG
FOR ALL
TRIM SIZES



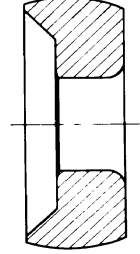
FULL
PORT SEAT
(100% CAPACITY)



.6 REDUCED
PORT SEAT
(60% CAPACITY)



.4 REDUCED
PORT SEAT
(40% CAPACITY)



.2 REDUCED
PORT SEAT
(20% CAPACITY)

ROTARY

Options

- Fluoroelastomer bearing seal for slurry service
- Kalrez bearing seal for slurry service
- 316 stainless steel separable flanges and retaining rings
- 316 stainless steel valve to actuator bolting

STANDARD CLASS

| Temp. °F | Working Pressure by Classes, psig | | |
|-------------|-----------------------------------|-----|------|
| | 150 | 300 | 600 |
| -20 to 100 | 285 | 740 | 1480 |
| 200 | 260 | 675 | 1350 |
| 300 | 230 | 655 | 1315 |
| 400 | 200 | 635 | 1270 |
| 500 | 170 | 600 | 1200 |
| 600 | 140 | 550 | 1095 |
| 650 | 125 | 535 | 1075 |
| 700 | 110 | 535 | 1065 |
| 750 | 95 | 505 | 1010 |
| 800 | 80 | 410 | 825 |
| 850 | 65 | 270 | 535 |
| 900 | 50 | 170 | 345 |
| 950 | 35 | 105 | 205 |
| 1000 | 20 | 50 | 105 |

Not recommended for prolonged usage above about 800°F

RECOVERY COEFFICIENTS F_L (ALL FLUIDS) & CAVITATION INDEX K_C (LIQUIDS)

| Valve Opening % | Flow to Open | | Flow to Close | |
|--------------------|--------------|-------|---------------|-------|
| | F_L | K_C | F_L | K_C |
| 100 | .88 | .60 | .75 | .56 |
| 90 | .89 | .61 | .74 | .49 |
| 80 | .89 | .62 | .73 | .49 |
| 70 | .90 | .63 | .73 | .49 |
| 60 | .89 | .62 | .75 | .50 |
| 50 | .89 | .61 | .78 | .51 |
| 40 | .88 | .61 | .80 | .52 |
| 30 | .88 | .60 | .82 | .53 |
| 20 | .87 | .59 | .84 | .55 |
| 10 | .87 | .59 | .85 | .55 |

Note: For calculating the pressure drop at which cavitation will begin, ΔP_c multiply K_c by the quantity $P_1 - P_v$, where P_1 = upstream pressure (PSIA), and P_v = vapor pressure (PSIA). $\Delta P_c = K_c (P_1 - P_v)$.

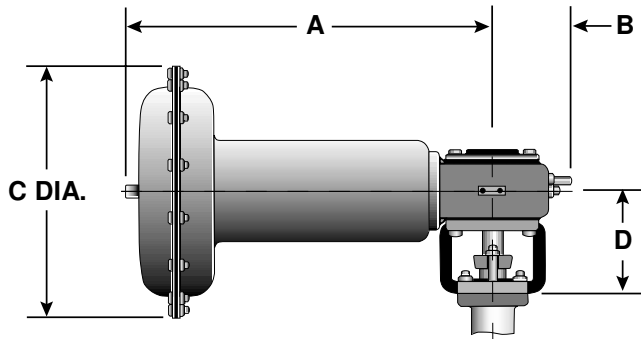
K-MAX SPECIFICATIONS

ROTARY

| Trim Material Code | Body Material | Plug Material | Seat Ring Material | | Shaft Material | Bearing Material |
|--------------------|---------------------------------------|---|---|--|---|--|
| | | | Size 2" - 8" full trim valves | Size 1" - 1.5" full trim valves and size 1" - 8" reduced trim valves | | |
| S | Carbon Steel ASTM A216 WCB | 316 Stainless Steel ASTM A351 CF8M w/hardened electroless nickel coating | 316 Stainless Steel ASTM A351 CF8M Hardness Brinell 150 | 316 Stainless Steel ASTM A479 316 Hardness Brinell 150 | 17-4 PH Stainless Steel ASTM A564 S17400 condition H900 Hardness Rockwell C 40 | 440C Stainless Steel ASTM A276 S44004 Hardness Rockwell C 58 |
| | 316 Stainless Steel ASTM A351 CF8M | 316 Stainless Steel ASTM A351 CF8M w/hardened electroless nickel coating | 316 Stainless Steel ASTM A351 CF8M Hardness Brinell 150 nickel coating | 316 Stainless Steel ASTM A479 316 Hardness Brinell 150 | 17-4 PH Stainless Steel ASTM A564 S17400 condition H900 Hardness Rockwell C 40 | Alloy 6 AMS 5387B Hardness Rockwell C 37-41 |
| P or F | Carbon Steel ASTM A216 WCB | 316 Stainless Steel ASTM A351 CF8M w/Alloy 6 hard overlay AWS A5.13 RCoCr - A Hardness Rockwell C 38 - 47 | Alloy 6 | 316 Stainless Steel ASTM A479 316 Alloy 6 Hardness Rockwell C 38 - 47 | 17-4 PH Stainless Steel ASTM A564 S17400 condition H900 Hardness Rockwell C 40 | 440C Stainless Steel ASTM A276 S44004 Hardness Rockwell C 58 |
| | 316 Stainless Steel ASTM A315 CF8M | 316 Stainless Steel ASTM A351 CF8M w/Alloy 6 hard overlay AWS A5.13 RCoCr - A Hardness Rockwell C 38 - 47 | Alloy 6 | 316 Stainless Steel ASTM A479 316 Alloy 6 Hardness Rockwell C 38 - 47 | 17-4 PH Stainless Steel ASTM A564 S17400 condition H900 Hardness Rockwell C 40 | Alloy 6 AMS 5387B Hardness Rockwell C 37-41 |
| A | Alloy 20 ASTM A315 CN7M | Alloy 20 ASTM A351 CN7M Hardness Brinell 130 | Alloy 20 ASTM A351 CN7M Hardness Brinell 130 | Alloy 20 Cb3 ASTM B473 N08020 Hardness Brinell 183 | Titanium 5 ASTM B348 Grade 5 Hardness Rockwell C 36 | Hastelloy C ASTM B574 N10276 Hardness Brinell 184 |
| H | Hastelloy C22 ASTM A494 CX2MW | Hastelloy C ASTM A494 CX2MW Hardness Brinell 200 | Hastelloy C ASTM A494 CX2MW Hardness Brinell 200 | Hastelloy C ASTM B574 N10276 Hardness Brinell 184 | Titanium 5 ASTM B348 Grade 5 Hardness Rockwell C 36 | Hastelloy C ASTM B574 N10276 Hardness Brinell 184 |
| T | Titanium C3 ASTM B367 C - 3 | Titanium C3 ASTM B367 C - 3 Hardness Brinell 235 maximum | Titanium C3 ASTM B367 C - 3 Hardness Brinell 235 maximum | Titanium 5 ASTM B348 Grade 5 Hardness Rockwell C 36 | Titanium 5 ASTM B348 Grade 5 Hardness Rockwell C 36 | Ceramic Partially stabilized zirconium Grade MS |

Note: Seat ring retainer material is the same as the base plug material.

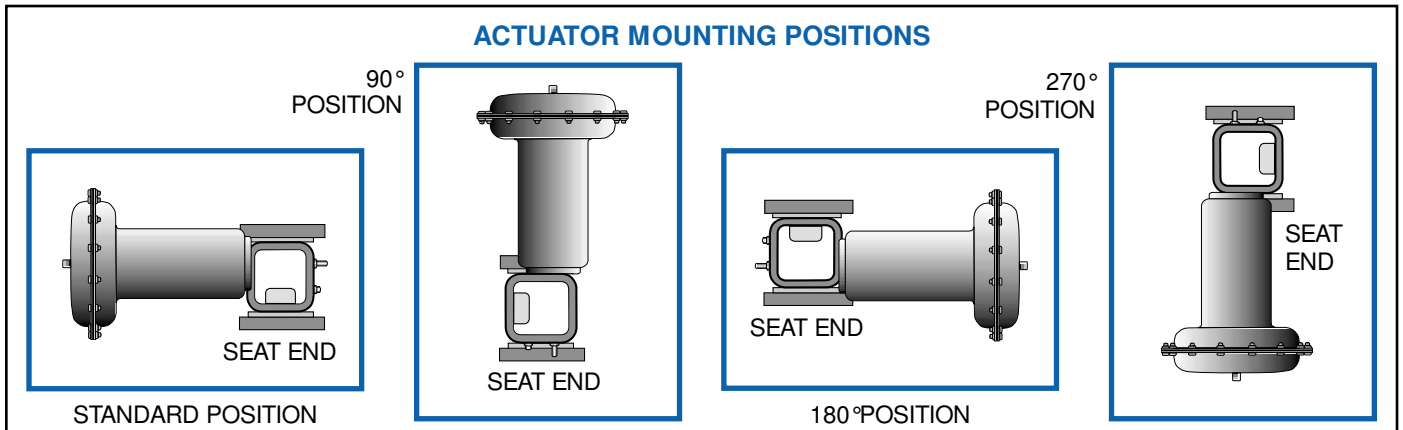
K-MAX ACTUATOR DIMENSIONS



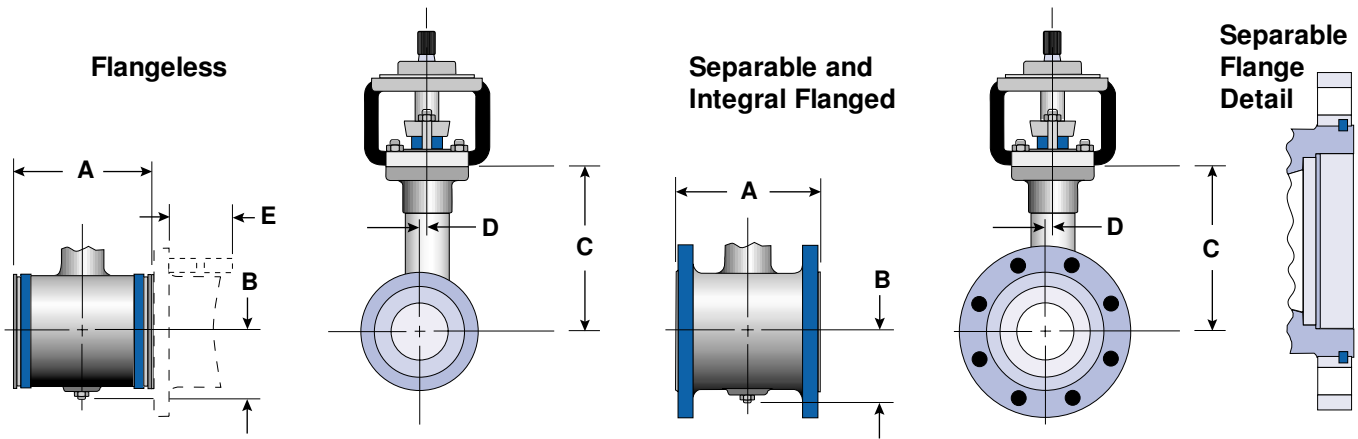
ACTUATOR DIMENSIONS inches (mm)
AND WEIGHTS pounds (kg)

| Actuator Size | Dimensions | | | | Weights |
|---------------|----------------|----------------|----------------|---------------|-------------|
| | A | B | C | D | |
| 40 | 11.25 (286) | 3.50 (88.9) | 10.12 (257) | 6.50 (165) | 29 (13) |
| 55 | 18.50 (470) | 5.25 (133) | 12.00 (305) | 6.56 (167) | 80 (36) |
| 85 | 19.88 (505) | 5.25 (133) | 14.75 (375) | 7.44 (189) | 110 (50) |

ACTUATOR MOUNTING POSITIONS



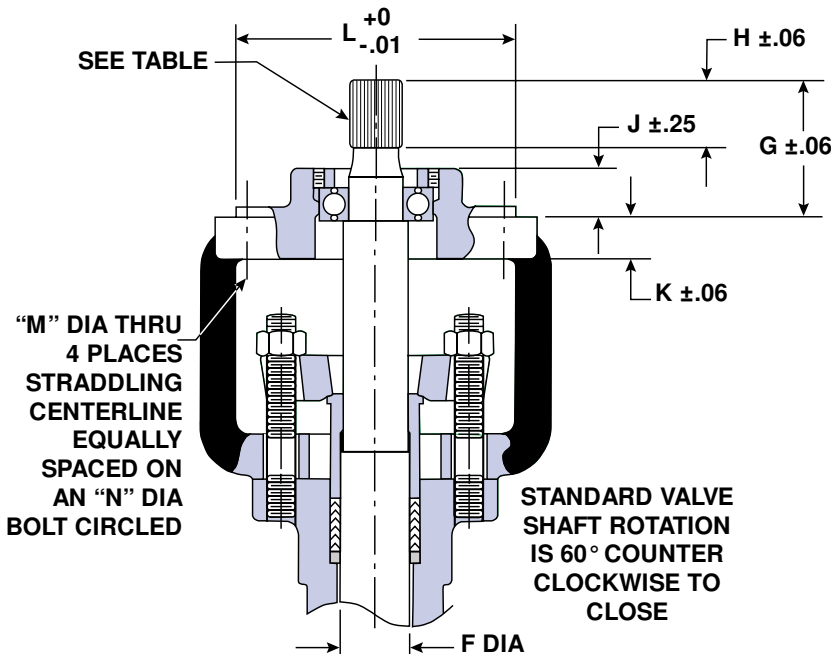
K-MAX Body Dimensions



BODY DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

| Size | DIMENSIONS | | | | | | | | | | | | | WEIGHTS | | | |
|---------------------------------------|---|---|---|--|--|---|--|--|--|--|------------|--|---|-------------|-------------|--------------|--------------|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | Flgless | FL150 | FL300 | FL600 |
| 1 (25) | 4 (102) | 2 ⁷ / ₁₆ (62) | 4 ⁷ / ₁₆ (113) | 5 ¹ / ₂ (4.06) | 7 ¹ / ₂ (194) | 1 (25) | 1 ¹ / ₂ (38.1) | 1 ¹ / ₆ (17.5) | — | 1 ⁵ / ₁₆ (23.9) | — | 7 ¹ / ₁₆ (11.2) | 3 ³ / ₄ (82.6) | 9 (4.1) | 12 (5.4) | 14 (6.4) | 17 (7.7) |
| 1 ¹ / ₂ (40) | 4 ¹ / ₂ (114) | 2 ³ / ₄ (69.8) | 5 ¹ / ₂ (130) | 8 ³ / ₄ (6.35) | 222 (222) | 1 (25) | 1 ¹ / ₂ (38.1) | 1 ¹ / ₆ (17.5) | — | 1 ⁵ / ₁₆ (23.9) | — | 7 ¹ / ₁₆ (11.2) | 3 ³ / ₄ (82.6) | 13 (5.9) | 18 (8.2) | 23 (10) | 27 (12) |
| 2 (50) | 4 ⁷ / ₈ (124) | 2 ¹³ / ₁₆ (71.4) | 4 ⁷ / ₈ (124) | 9 ¹ / ₂ (5.59) | 232 (232) | 1 (25) | 1 ¹ / ₂ (38.1) | 1 ¹ / ₆ (17.5) | — | 1 ⁵ / ₁₆ (23.9) | — | 7 ¹ / ₁₆ (11.2) | 3 ³ / ₄ (82.6) | 14 (6.4) | 21 (9.5) | 25 (11) | 30 (14) |
| 3 (80) | 6 ¹ / ₂ (165) | 3 ³ / ₁₆ (90.4) | 5 ¹ / ₄ (146) | 11 ¹ / ₂ (7.87) | 292 (292) | 1 ¹ / ₄ (32) | 2 ⁷ / ₁₆ (62) | 1 ¹ / ₆ (20.6) | 7 ¹ / ₈ (22.4) | 3 ¹ / ₄ (19) | 5 (125) | 9 ¹ / ₁₆ (14.2) | 6 ¹ / ₂ (165) | 31 (14) | 43 (20) | 52 (24) | 58 (26) |
| 4 (100) | 7 ¹ / ₈ (194) | 4 (100) | 7 (178) | 13 ³ / ₈ (11.2) | 340 (340) | 1 ¹ / ₂ (32) | 2 ⁷ / ₁₆ (62) | 1 ¹ / ₆ (20.6) | 7 ¹ / ₈ (22.4) | 3 ¹ / ₄ (19) | 5 (125) | 9 ¹ / ₁₆ (14.2) | 6 ¹ / ₂ (165) | 42 (19) | 60 (27) | 76 (34) | 100 (45) |
| 6 (150) | 9 (229) | 5 ¹ / ₁₆ (129) | 9 ¹ / ₁₆ (244) | 15 ³ / ₄ (16.8) | 400 (400) | 1 ³ / ₄ (44.4) | 2 ⁵ / ₁₆ (58.7) | 1 ⁵ / ₁₆ (23.9) | 7 ¹ / ₁₆ (11.2) | 1 ¹ / ₆ (16.8) | 5 (125) | 9 ¹ / ₁₆ (14.2) | 6 ¹ / ₂ (165) | 97 (44) | 119 (54) | 152 (69) | 207 (94) |
| 8 (200) | 9 ¹ / ₁₆ (243) | 6 (150) | 11 (279) | 17 ³ / ₄ (22.4) | 438 (438) | 1 ³ / ₄ (44.4) | 2 ⁵ / ₁₆ (58.7) | 1 ⁵ / ₁₆ (23.9) | 7 ¹ / ₁₆ (11.2) | 1 ¹ / ₆ (16.8) | 5 (125) | 9 ¹ / ₁₆ (14.2) | 6 ¹ / ₂ (165) | 144 (65) | 180 (82) | 222 (101) | 304 (138) |

- Note:** 1. All dimensions are subject to change without notice. Request certified drawings for use in preparing piping layouts.
 2. Flange dimensions conform to ANSI B16.5.
 3. Face-to-face dimensions conform to ISA S75.04.
 4. Weights shown do not include crating.



External Involute Spline Data Table (Inches)

| Feature | Valve Size | | |
|---------------------------------|------------|-----------|-------------|
| | 1, 1.5, 2 | 3, 4 | 6, 8 |
| Fillet Root Side Fit | | | |
| Number of teeth | 28 | 28 | 52 |
| Pitch | 40/80 | 32/64 | 40/80 |
| Pressure angle | 30° | 30° | 30° |
| Base diameter | .6062 | .7578 | 1.1258 |
| Pitch diameter | .7 | .875 | 1.3 |
| Major diameter | .725/.722 | .906/.903 | 1.325/1.322 |
| Form diameter | .671 | .839 | 1.271 |
| Minor diameter | .638 | .8 | 1.236 |
| Circular Tooth Thickness | | | |
| Max. effective | .0390 | .0491 | .0393 |
| Min. actual | .0366 | .0464 | .0361 |

K-MAX C_v TABLES

Flow coefficients (C_v), Linear Characteristic

ROTARY

| Flow to Open | | Percent Travel (60° Rotation) | | | | | | | | | |
|--------------|------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Valve Size | Trim Size | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |
| 1 | Full | 1.3 | 2.8 | 4.2 | 5.9 | 7.8 | 9.1 | 11 | 12 | 13 | 14 |
| | .6 reduced | .76 | 1.6 | 2.5 | 3.5 | 4.8 | 5.5 | 6.4 | 7.4 | 7.9 | 8.4 |
| | .4 reduced | .50 | 1.1 | 1.7 | 2.4 | 3.2 | 3.7 | 4.3 | 4.9 | 5.3 | 5.6 |
| | .2 reduced | .25 | .53 | .84 | 1.2 | 1.6 | 1.8 | 2.1 | 2.5 | 2.6 | 2.8 |
| 1.5 | Full | 2.9 | 6.1 | 9.6 | 13 | 18 | 21 | 24 | 28 | 30 | 32 |
| | .6 reduced | 2.7 | 5.7 | 9.0 | 11 | 12 | 13 | 15 | 17 | 18 | 20 |
| | .4 reduced | 1.2 | 2.5 | 3.9 | 5.5 | 7.4 | 8.6 | 9.8 | 11 | 12 | 13 |
| | .2 reduced | .59 | 1.2 | 2.0 | 2.8 | 3.7 | 4.3 | 4.9 | 5.7 | 6.1 | 6.5 |
| 2 | Full | 4.6 | 9.7 | 15 | 21 | 29 | 34 | 39 | 45 | 48 | 51 |
| | .6 reduced | 2.7 | 5.7 | 9.0 | 13 | 17 | 20 | 23 | 26 | 28 | 30 |
| | .4 reduced | 1.8 | 3.8 | 6.0 | 8.4 | 11 | 13 | 15 | 18 | 19 | 20 |
| | .2 reduced | .90 | 1.9 | 3.0 | 4.2 | 5.7 | 6.6 | 7.6 | 8.8 | 9.4 | 10 |
| 3 | Full | 14 | 29 | 45 | 63 | 86 | 99 | 114 | 132 | 141 | 150 |
| | .6 reduced | 8.1 | 17 | 27 | 38 | 51 | 59 | 68 | 79 | 85 | 90 |
| | .4 reduced | 5.4 | 11 | 18 | 25 | 34 | 40 | 46 | 53 | 56 | 60 |
| | .2 reduced | 2.7 | 5.7 | 9.0 | 13 | 17 | 20 | 23 | 26 | 28 | 30 |
| 4 | Full | 22 | 47 | 74 | 104 | 141 | 163 | 187 | 217 | 232 | 247 |
| | .6 reduced | 13 | 28 | 44 | 62 | 84 | 97 | 112 | 129 | 138 | 147 |
| | .4 reduced | 8.8 | 19 | 29 | 41 | 56 | 65 | 75 | 86 | 92 | 98 |
| | .2 reduced | 4.4 | 9.3 | 15 | 21 | 28 | 32 | 37 | 43 | 46 | 49 |
| 6 | Full | 47 | 99 | 156 | 218 | 296 | 343 | 395 | 458 | 489 | 520 |
| | .6 reduced | 28 | 59 | 89 | 125 | 170 | 206 | 225 | 275 | 294 | 312 |
| | .4 reduced | 19 | 40 | 59 | 83 | 113 | 137 | 150 | 183 | 196 | 208 |
| | .2 reduced | 9.4 | 20 | 30 | 42 | 57 | 69 | 75 | 92 | 98 | 104 |
| 8 | Full | 78 | 165 | 261 | 365 | 496 | 574 | 661 | 766 | 818 | 870 |
| | .6 reduced | 47 | 99 | 156 | 219 | 297 | 345 | 396 | 459 | 491 | 522 |
| | .4 reduced | 31 | 66 | 104 | 146 | 198 | 230 | 264 | 306 | 327 | 348 |
| | .2 reduced | 16 | 33 | 52 | 73 | 99 | 115 | 132 | 153 | 164 | 174 |

| Flow to Close | | Percent Travel (60° Rotation) | | | | | | | | | |
|---------------|------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Valve Size | Trim Size | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |
| 1 | Full | 1.4 | 2.9 | 4.5 | 6.3 | 8.6 | 9.9 | 11 | 13 | 14 | 15 |
| | .6 reduced | .81 | 1.7 | 2.7 | 3.8 | 5.1 | 5.9 | 6.8 | 7.9 | 8.5 | 9.0 |
| | .4 reduced | .54 | 1.1 | 1.8 | 2.5 | 3.4 | 4.0 | 4.6 | 5.3 | 5.6 | 6.0 |
| | .2 reduced | .27 | .57 | .90 | 1.3 | 1.7 | 2.0 | 2.3 | 2.6 | 2.8 | 3.0 |
| 1.5 | Full | 3.1 | 6.5 | 10 | 14 | 19 | 22 | 26 | 30 | 32 | 34 |
| | .6 reduced | 1.9 | 4.0 | 6.3 | 8.8 | 12 | 14 | 16 | 19 | 20 | 21 |
| | .4 reduced | 1.3 | 2.7 | 4.2 | 5.9 | 8.0 | 9.2 | 11 | 12 | 13 | 14 |
| | .2 reduced | .63 | 1.3 | 2.1 | 2.9 | 4.0 | 4.6 | 5.3 | 6.2 | 6.6 | 7.0 |
| 2 | Full | 5.0 | 11 | 17 | 23 | 31 | 36 | 42 | 48 | 52 | 55 |
| | .6 reduced | 2.7 | 5.7 | 9.0 | 13 | 17 | 20 | 24 | 29 | 30 | 33 |
| | .4 reduced | 1.8 | 3.8 | 6.0 | 8.4 | 11 | 13 | 16 | 19 | 20 | 22 |
| | .2 reduced | .90 | 1.9 | 3.0 | 4.2 | 5.7 | 6.5 | 8.0 | 9.0 | 10 | 11 |
| 3 | Full | 14 | 30 | 47 | 65 | 88 | 102 | 118 | 136 | 146 | 155 |
| | .6 reduced | 8.4 | 18 | 28 | 39 | 53 | 61 | 71 | 81 | 87 | 93 |
| | .4 reduced | 5.6 | 12 | 19 | 26 | 35 | 41 | 47 | 54 | 58 | 62 |
| | .2 reduced | 2.8 | 5.9 | 9.3 | 13 | 15 | 21 | 24 | 27 | 29 | 31 |
| 4 | Full | 24 | 51 | 80 | 112 | 152 | 176 | 202 | 234 | 250 | 266 |
| | .6 reduced | 14 | 30 | 48 | 67 | 90 | 95 | 120 | 140 | 149 | 159 |
| | .4 reduced | 9.5 | 20 | 32 | 45 | 60 | 63 | 80 | 93 | 99 | 106 |
| | .2 reduced | 4.8 | 10 | 16 | 22 | 30 | 32 | 40 | 47 | 50 | 53 |
| 6 | Full | 43 | 91 | 144 | 202 | 273 | 316 | 364 | 422 | 451 | 480 |
| | .6 reduced | 26 | 55 | 86 | 120 | 164 | 189 | 219 | 254 | 270 | 288 |
| | .4 reduced | 17 | 37 | 58 | 80 | 109 | 126 | 146 | 169 | 180 | 192 |
| | .2 reduced | 8.6 | 18 | 29 | 40 | 55 | 63 | 73 | 85 | 90 | 96 |
| 8 | Full | 72 | 152 | 240 | 336 | 456 | 528 | 608 | 704 | 752 | 800 |
| | .6 reduced | 43 | 90 | 144 | 201 | 273 | 317 | 365 | 422 | 450 | 480 |
| | .4 reduced | 29 | 60 | 96 | 134 | 182 | 211 | 243 | 281 | 300 | 320 |
| | .2 reduced | 14 | 30 | 48 | 67 | 91 | 106 | 122 | 141 | 150 | 160 |

K-MAX TORQUE SPECIFICATIONS

Torque Requirements to achieve ANSI Class IV, V OR VI shut off
(Foot Pounds)

| Valve Size | Shut off Pressure Drop (PSIG) | | | | | | | | | | | | | |
|------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 30 | 50 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 | 1440 |
| 1 | 10.8 | 11.0 | 11.5 | 12.2 | 12.9 | 13.8 | 14.6 | 15.4 | 16.2 | 16.9 | 17.8 | 18.6 | 20.2 | 21.8 |
| 1.5 | 19.5 | 19.9 | 21.2 | 23.4 | 25.8 | 28.0 | 30.3 | 32.7 | 34.9 | 37.3 | 39.6 | 42.4 | 46.5 | 51.1 |
| 2 | 28.7 | 29.5 | 31.4 | 35.3 | 39.3 | 43.3 | 47.3 | 51.3 | 55.2 | 59.2 | 63.1 | 67.4 | 74.9 | 78.8 |
| 3 | 61.3 | 63.7 | 69.7 | 81.7 | 93.6 | 106 | 117 | 129 | 142 | 153 | 165 | 177 | 193 | 210 |
| 4 | 110 | 116 | 130 | 160 | 189 | 218 | 248 | 277 | 306 | 336 | 365 | 394 | - | - |
| 6 | 229 | 252 | 299 | 393 | 487 | 582 | 676 | 770 | - | - | - | - | - | - |
| 8 | 397 | 442 | 552 | 773 | 994 | - | - | - | - | - | - | - | - | - |

Maximum Allowable Differential Pressure (PSIG)
based on Torsional Shear Strength of Shaft

| Valve Size | Shaft Material | | | |
|------------|----------------|----------|---------|-------------|
| | 17-4 SST | Titanium | 317 SST | Hastelloy C |
| 1 | 1440 | 1440 | 1440 | 1440 |
| 1.5 | 1440 | 1440 | 1440 | 1440 |
| 2 | 1440 | 1440 | 700 | 1440 |
| 3 | 1440 | 1440 | 350 | 800 |
| 4 | 1000 | 1000 | 30 | 175 |
| 6 | 1000 | 1000 | 200 | 400 |
| 8 | 550 | 550 | 30 | 100 |

Note: Hastelloy C shaft material on application

Maximum Allowable Shaft Torques
(Foot Pounds)

| Valve Size | Shaft Material | | | |
|------------|----------------|----------|---------|-------------|
| | 17-4 SST | Titanium | 317 SST | Hastelloy C |
| 1 | 210 | 210 | 55 | 80 |
| 1.5 | 210 | 210 | 55 | 80 |
| 2 | 210 | 210 | 55 | 80 |
| 3 | 390 | 390 | 100 | 150 |
| 4 | 390 | 390 | 100 | 150 |
| 6 | 1550 | 1550 | 405 | 550 |
| 8 | 1550 | 1550 | 405 | 550 |

Note: Hastelloy C shaft material on application

Diaphragm Actuator Output Torques

| Actuator Size | Actuator Action | Actuator Spring | Output Torque(Ft-lbs) |
|---------------|-----------------|-----------------|-----------------------|
| 40 | Air to Open | 20 psi | 31 |
| | Air to Close | 20 psi | 19 |
| | Air to Open | 35 psi | 58 |
| | Air to Close | 35 psi | 58 |
| | Air to Open | 60 psi | 95 |
| | Air to Close | 60 psi | 102 |
| 55 | Air to Open | 20 psi | 88 |
| | Air to Close | 20 psi | 76 |
| | Air to Open | 35 psi | 152 |
| | Air to Close | 35 psi | 124 |
| | Air to Open | 60 psi | 263 |
| | Air to Close | 60 psi | 224 |

| Actuator Size | Actuator Action | Actuator Spring | Output Torque(Ft-lbs) |
|---------------|-----------------|-----------------|-----------------------|
| 85 | Air to Open | 20 psi | 130 |
| | Air to Close | 20 psi | 130 |
| | Air to Open | 35 psi | 220 |
| | Air to Close | 35 psi | 221 |
| | Air to Open | 60 psi | 389 |
| | Air to Close | 60 psi | 389 |

K-MAX ACTUATOR SIZING

Full Port, Air to Open Flow-to-Open & Flow-to-Close

| Valve Size (Inches) | Actuator Code | Maximum Shutoff Pressure Differential | | |
|------------------------|-------------------------|---------------------------------------|------|------|
| | | Air Supply PSIG | | |
| | | 20 | 35 | 60 |
| 1 | DR-40-R-60 | - | - | 1440 |
| | DR-40-R-35 | - | 1440 | - |
| | DR-40-R-20 | 1440 | - | - |
| 1.5 | DR-40-R-60 | - | - | 1440 |
| | DR-40-R-35 | - | 1440 | - |
| | DR-40-R-20 | 500 | - | - |
| 2 | DR-40-R-60 | - | - | 1440 |
| | DR-40-R-35 | - | 800 | - |
| | DR-40-R-20 | 100 | - | - |
| 3 | DR-55-R-60 ¹ | - | - | 1440 |
| | DR-55-R-35 | - | 775 | - |
| | DR-55-R-20 | 250 | - | - |
| | DR-85-R-35 ¹ | - | 1440 | - |
| | DR-85-R-20 | 600 | - | - |
| 4 | DR-55-R-60 ¹ | - | - | 540 |
| | DR-55-R-35 | - | 100 | - |
| | DR-55-R-20 | 25 | - | - |
| | DR-85-R-35 ¹ | - | 400 | - |
| | DR-85-R-20 | 100 | - | - |
| 6 ² | DR-85-R-60 | - | - | 200 |
| | DR-85-R-35 | - | 25 | - |
| 8 ² | DR-85-R-60 | - | - | 25 |

Full Port, Air to Close Flow-to-Open & Flow-to-Close

| Valve Size (Inches) | Actuator Code | Maximum Shutoff Pressure Differential | | |
|------------------------|-------------------------|---------------------------------------|------|------|
| | | Air Supply PSIG | | |
| | | 20 | 35 | 60 |
| 1 | DR-40-D-60 | - | - | 1440 |
| | DR-40-D-35 | - | 1440 | - |
| | DR-40-D-20 | 1200 | - | - |
| 1.5 | DR-40-D-60 | - | - | 1440 |
| | DR-40-D-35 | - | 1440 | - |
| | DR-40-D-20 | 75 | - | - |
| 2 | DR-40-D-60 | - | - | 1440 |
| | DR-40-D-35 | - | 800 | - |
| | DR-40-D-20 | 20 | - | - |
| 3 | DR-55-D-60 ¹ | - | - | 1440 |
| | DR-55-D-35 | - | 560 | - |
| | DR-55-D-20 | 150 | - | - |
| | DR-85-D-35 ¹ | - | 1440 | - |
| | DR-85-D-20 | 600 | - | - |
| 4 | DR-55-D-60 ¹ | - | - | 425 |
| | DR-55-D-35 | - | 100 | - |
| | DR-55-D-20 | 20 | - | - |
| | DR-85-D-35 ¹ | - | 400 | - |
| | DR-85-D-20 | 100 | - | - |
| 6 ² | DR-85-D-60 | - | - | 200 |
| | DR-85-D-35 | - | 25 | - |
| 8 ² | DR-85-D-60 | - | - | 25 |

.6, .4 & Reduced Port, Air to Open Flow-to-Open & Flow-to-Close

| | | | | |
|----------------|-------------------------|------|------|------|
| 1 & 1.5 | DR-40-R-60 | - | - | 1440 |
| | DR-40-R-35 | - | 1440 | - |
| | DR-40-R-20 | 1440 | - | - |
| 2 | DR-40-R-60 | - | - | 1440 |
| | DR-40-R-35 | - | 1440 | - |
| | DR-40-R-20 | 860 | - | - |
| 3 | DR-55-R-60 ¹ | - | - | 1440 |
| | DR-55-R-35 | - | 1440 | - |
| | DR-55-R-20 | 400 | - | - |
| | DR-85-R-20 | 960 | - | - |
| 4 | DR-55-R-60 ¹ | - | - | 1440 |
| | DR-55-R-35 | - | 200 | - |
| | DR-55-R-20 | 40 | - | - |
| | DR-85-R-35 ¹ | - | 640 | - |
| | DR-85-R-20 | 160 | - | - |
| 6 ² | DR-85-R-60 | - | - | 690 |
| | DR-85-R-35 | - | 120 | - |
| 8 ² | DR-85-R-60 | - | - | 295 |

.6, .4 & Reduced Port, Air to Close Flow-to-Open & Flow-to-Close

| | | | | |
|----------------|-------------------------|------|------|------|
| 1 & 1.5 | DR-40-D-60 | - | - | 1440 |
| | DR-40-D-35 | - | 1440 | - |
| | DR-40-D-20 | 1440 | - | - |
| 2 | DR-40-D-60 | - | - | 1440 |
| | DR-40-D-35 | - | 1440 | - |
| | DR-40-D-20 | 860 | - | - |
| 3 | DR-55-D-60 ¹ | - | - | 1440 |
| | DR-55-D-35 | - | 1440 | - |
| | DR-55-D-20 | 240 | - | - |
| | DR-85-D-20 | 960 | - | - |
| 4 | DR-55-D-60 ¹ | - | - | 1440 |
| | DR-55-D-35 | - | 200 | - |
| | DR-55-D-20 | 30 | - | - |
| | DR-85-D-35 ¹ | - | 640 | - |
| | DR-85-R-20 | 160 | - | - |
| 6 ² | DR-85-D-60 | - | - | 690 |
| | DR-85-D-35 | - | 120 | - |
| 8 ² | DR-85-D-60 | - | - | 295 |

1. Not for use with trim material S3.
2. For higher differential pressures, consult factory.

ROTARY

K-MAX ORDERING CODE

| Class | Material | Valve Size | End Conn. | Valve Rating | Trim Material | Trim Factor | Shutoff Class | Packing | Flow Direction | Actuator | Spring | H.O.D. Orientation | # of Accessories | | |
|----------|----------|------------|-----------|--------------|---------------|-------------|---------------|----------|----------------|----------|----------|--------------------|------------------|----------|----------|
| K | R | C | 2 | W | 1 | S | 1 | 4 | T | C | B | 6 | N | A | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| |
|---|
| Class - Position 1 & 2 KR |
| Material - Position 3 C = WCB (Carbon Steel) S = CF8M (SST) A = CN7M (Alloy 20) H = CX2MW (Hastelloy C22) T = Grade C-3 (Titanium Grade 3) X = Other |
| Valve Size - Position 4 0 = 1" 1 = 1½" 2 = 2" 3 = 3" 4 = 4" 6 = 6" 8 = 8" X = Other |
| End Connection - Position 5 W = Wafer L ² = CS separable flanges S ¹ = SS separable flanges F = Integral flanges X = Other |

| |
|---|
| Valve Rating - Position 6 1 = ANSI 150 2 = ANSI 300 3 = ANSI 600 4 = ANSI 150 Special Class 5 = ANSI 300 Special Class 6 = ANSI 600 Special Class X = Other |
| Trim Material - Position 7 S = Std 316 SS P = Partial Stellite F = Full Stellite A = Alloy 20 ³ H = Hast C ³ T = Titanium R = 316/TFE ⁴ X = Other |
| Trim Factor - Position 8 1 = Full 6 = 0.6 4 = 0.4 2 = 0.2 X = Other |
| Shutoff - Position 9 4 = Class IV, Standard 5 = Class V, Optional 6 = Class VI, soft seat only |
| Packing - Position 10 G = Laminated Graphite T = Teflon-Chevron V = Teflon-Chevron ⁵ X = Other |

| |
|--|
| Flow Direction - Position 11 O = Flow to Open C = Flow to Close |
| Actuator - Position 12 A = DR-40-D B = DR-40-R C = DR-55-D D = DR-55-R E = DR-85-D F = DR-85-R N = None/bare stem ⁶ |
| Spring - Position 13 2 = 20 3 = 35 6 = 60 (Standard) |
| H.O.D. - Position 14 N = None H = Handwheel J = HandJack |
| Actuator Orientation - Position 15 A = Standard B = 90° C = 180° D = 270° |
| # of Accessories - Position 16 1 = 1 accessory 2 = 2 accessories 3 = 3 accessories 4 = 4 accessories 5 = 5 accessories 6 = 6 accessories 7 = 7 accessories 8 = 8 accessories 9 = 9 accessories 0 = No accessories |

ROTARY

NOTE: Consult factory for configurations not listed above.
Add accessories and other options as separate line items.

1. Separable flanges available in 1" - 6", ANSI 150-300 only.
2. Carbon steel separable flanges only good to 800° F service.
3. Optional in 316 & CS valves.
4. Use position 9 Option 6 for shutoff classification. TFE seats 1" - 2" Full Cv only.
5. For Slurry Service includes Kalrez O-ring Bearing Seals.
6. Includes Yoke Kit.

