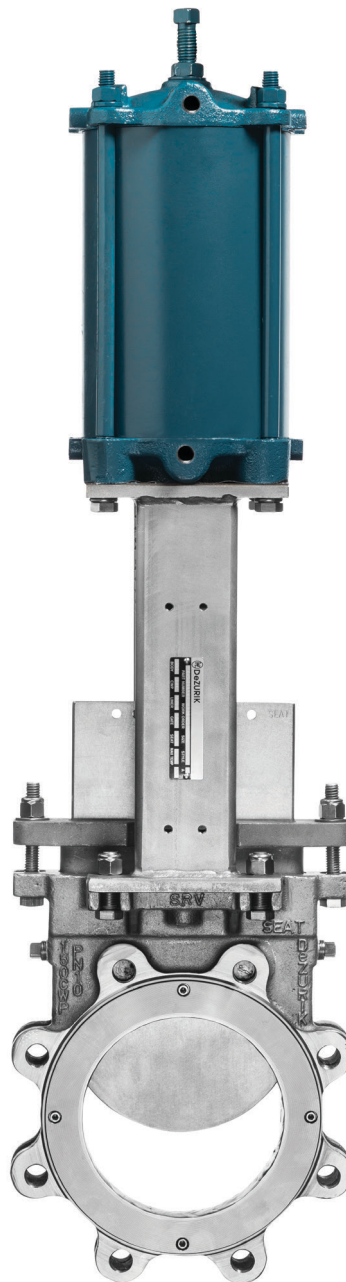# DeZURIK KGC-MD MAXIMUM DUTY CAST KNIFE GATE VALVES

Design and Construction

DeZURIK KGC-MD Maximum Duty Cast Knife Gate Valves are designed to provide long service life in highly abrasive applications including Pulp and Paper, Mining, Chemical, Petrochemical, Power, Steel and Food Processing industries. These Maximum Duty Knife Gate Valves are specifically designed to provide the capabilities needed in demanding services such as sand, medium slurry, pulp stock, mining tailings and corrosive media with grit.

The KGC-MD Knife Gate Valves are available in 3-24" (80-600mm) sizes with metal or dual metal and resilient seats. To withstand highly abrasive media, the valves are available with a replaceable hardened seat, hardened gate, full 100% port opening, high performance packing system with wire scraper rings, and heavy-duty superstructure. All these features combine to provide a longer service life, less downtime and less maintenance than other valves designed for these tough applications.

Heavy-Duty Cast Body

The cast body and packing gland are available in 304 and 316 Stainless Steel with ASME Class 150 flanges.The body features cast gate guides to provide support for the moving gate. Cast gate jams at the bottom of the body hold the gate securely against the seat to assure positive shutoff.The body has raised face end connections with drilled and tapped lugs. Additional body materials include 317, 254, 2205 duplex stainless steel or Hastelloy C.
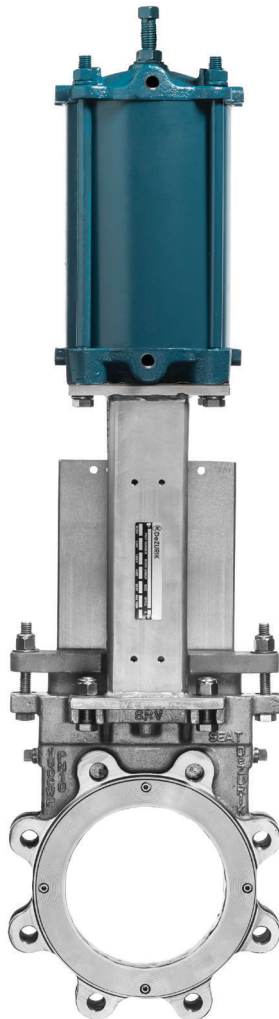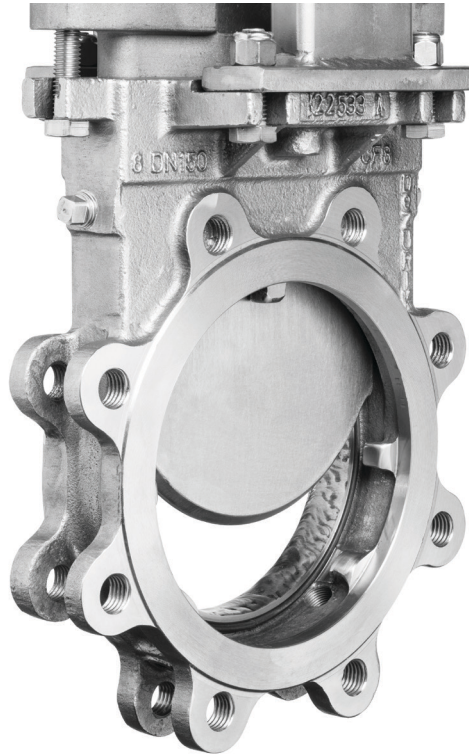
Full Port ID

The 100% area round port on the KGC-MD allows high flow capacity and minimum pressure drop. The seat ID is equal to the inside diameter of standard (ASME B36.10) pipe.

Purges in Chest and Seat Area

As an option, purges in both the chest and seat area are available to prevent process media buildup.

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DeZURIK Exclusive Premium Packing System

The KGC-MD High Performance Packing System includes a number of features that reduce external leakage, minimize friction, reduce actuator thrust, and allow field replacement of packing. The DeZURIK exclusive rounded gate edge, rounded cast packing chamber and packing, form a tight seal. The system includes various braided packing options sandwiched between a top and bottom wire scraper ring to wipe the gate and prevent process media from entering the packing chamber.

Packing | Metal Scraper
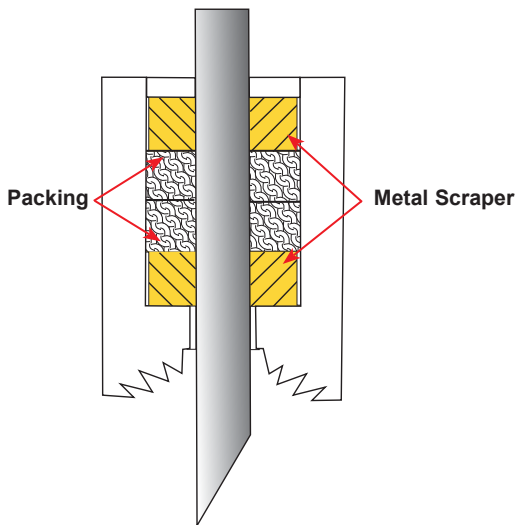
Replaceable, Wear Resistant Metal or Resilient Seat Options

Both metal and resilient seated valves are available in the 100% area round port design. Metal seats are available in either Carbon Steel or 316 Stainless Steel. They can also be ordered with a Chrome Carbide, Tungsten Carbide or Cobalt Chromium overlay for maximum endurance. Metal seated valves meet MSS SP-81. Dual metal and resilient seated valves are available with a variety of resilient seat seal options and provide leak tight/ drip tight shutoff. The removable seat ring mechanically retains the resilient seat to prevent it from becoming dislodged.
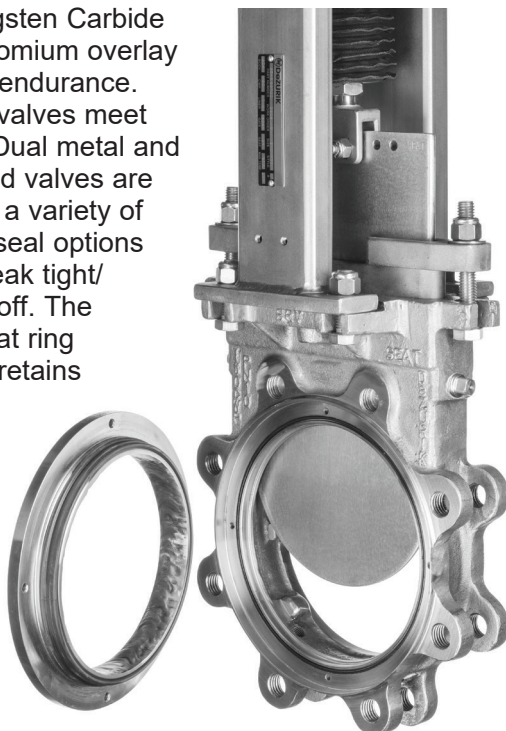
DeZURIK Exclusive Rounded Gate Edges

The standard 410 Stainless Steel gate has a rounded gate edge that is precision machined with a ground finish on both sides and edges. The rounded gate edge moves smoothly through the packing with minimal packing disturbance, thus requiring less adjustment and maintenance of the packing system.

Stem/Gate Clip

A strong, investment cast gate clip complements KGC-MD's robust construction. Gate clip and gate are drilled to match the shoulder screw diameter to provide a heavy-duty connection needed for high cycle applications.

Protective Stem Cover Bellows

KGC-MD valves are available with an optional Stem Actuator Cover Bellows to improve actuator cycle life in harsh environments where actuator stem protection from dirt and debris is required.
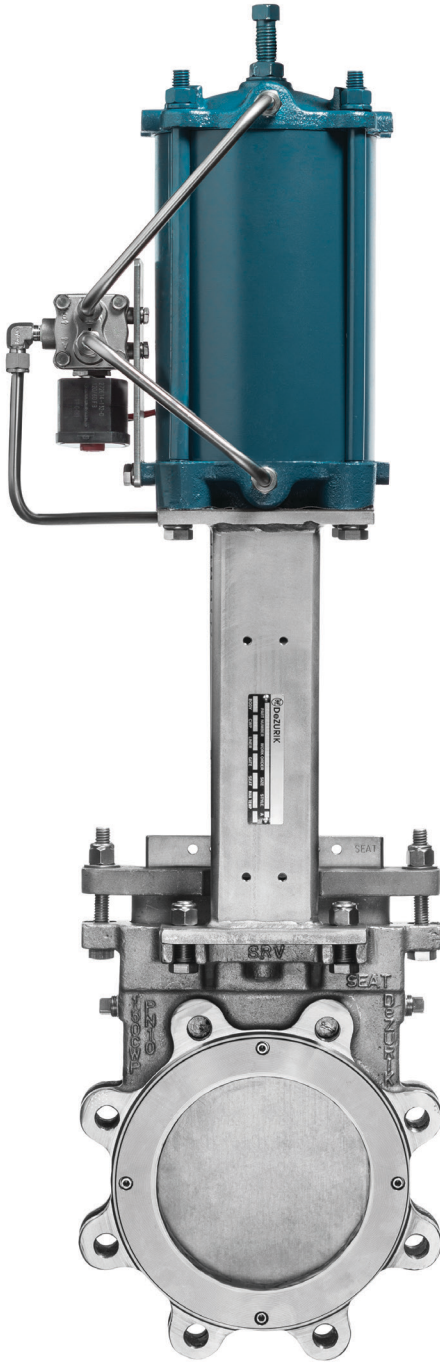
High Strength Actuator Legs

Optional High Strength Actuator Legs provide additional rigidity to withstand horizontal valve mounting, high cycle rates, and vibration common on cyclone applications, without external actuator supports. Available on valve sizes 3-12" (80-300mm).

Actuators and Accessories

DeZURIK pneumatic cylinder actuators are mounted on a sturdy, reinforced superstructure. A variety of cylinder actuator accessories for customizing the valve/actuator package are available to meet your specific requirements.

Materials of Construction

Item	Description	Material
A1	Body	304 Stainless Steel, ASTM A351 Type CF-8
		316 Stainless Steel, ASTM A351 Type CF-8M
A2	Scraper	Braided Copper Wire Scraper
A3	Gate	410 Stainless Steel, ASTM A240 Type 410
A4	Gland	Same as body material
A5	Screw	18-8 Stainless Steel
A6	Washer	18-8 Stainless Steel
A7	Nut	18-8 Stainless Steel
A8	Packing	Braided PTFE to 500°F (260°C)
A9	Screw	316 Stainless Steel
A10	Seat Ring (Base Material)	316 Stainless Steel, ASTM A240 Type 316
		Carbon Steel, ASTM A36
	Seat Ring (Coating Material)	No Coating
		Chrome Carbide, AWS A5.13
A11	Resilient Seat	NBR = Acrylonitrile-Butadiene to 180°F (83°C)
A12	O-Ring	NBR = Acrylonitrile-Butadiene to 180°F (83°C)
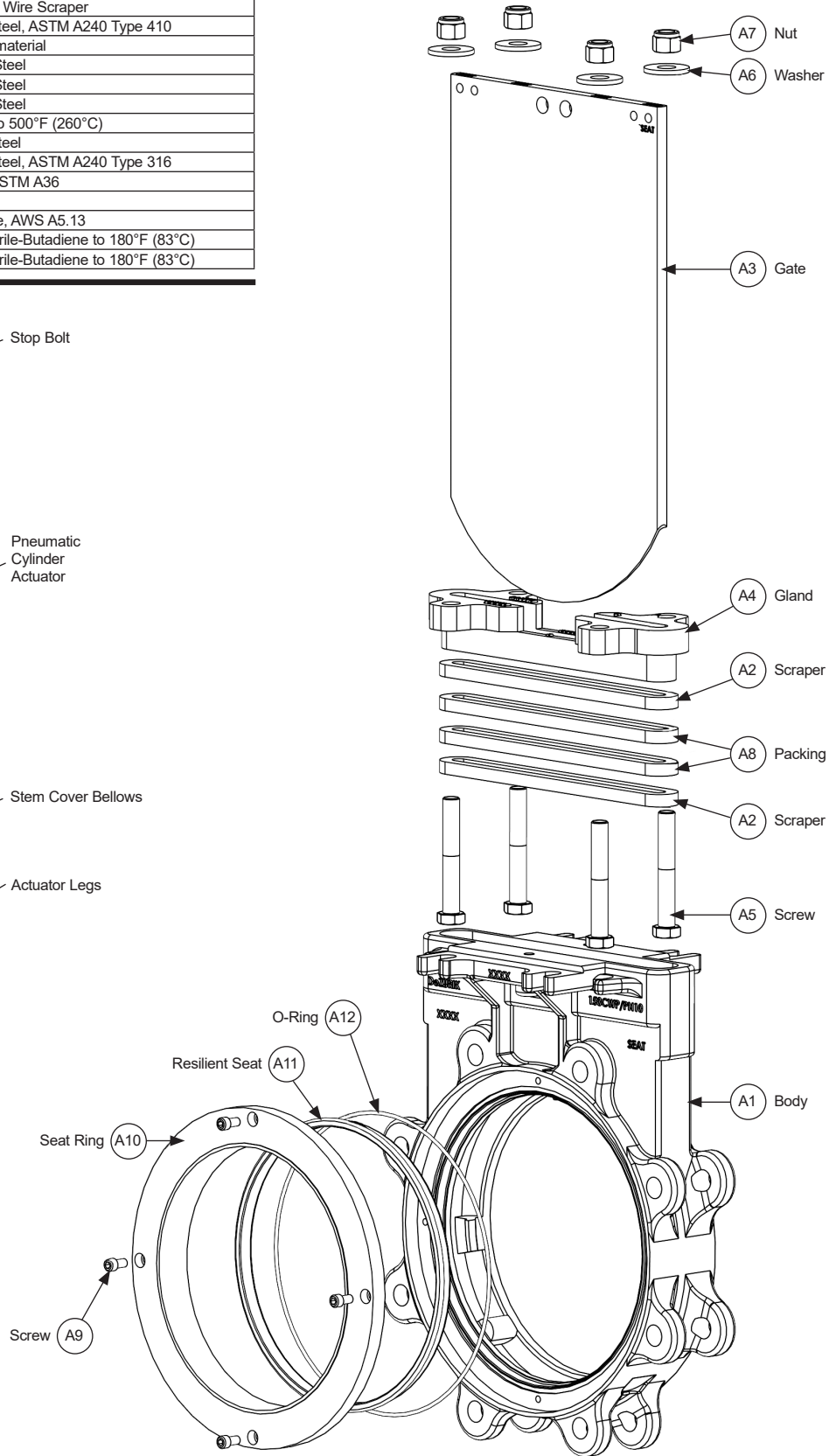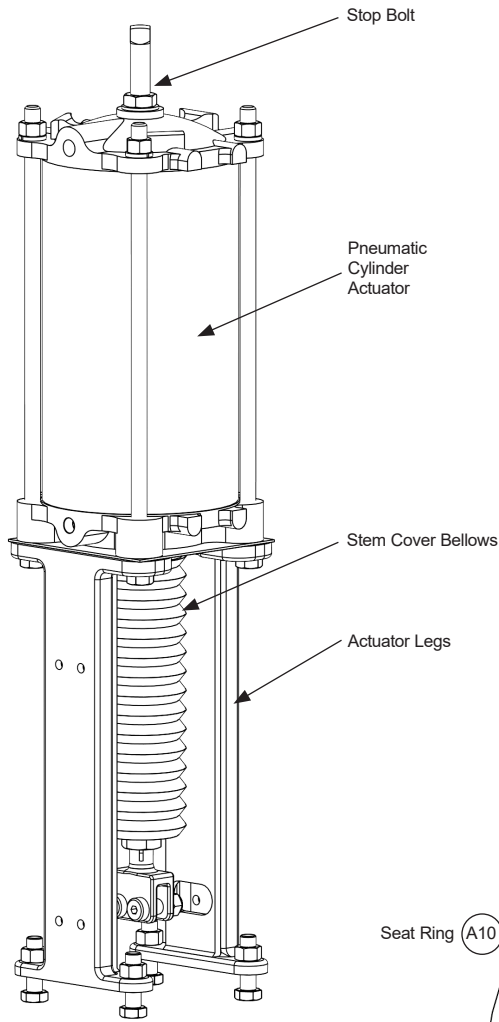
Valve Selection
Shut-Off Capabilities

Resilient Seats	Leak tight/drip tight
Metal Seats	Meet MSS SP-81 and TAPPI TIS 405-8

Pressure Ratings (100°F (38°C))

3-24" (80-600mm)	150 psi C.W.P. (1030 kPa)

Note: Valve can withstand Full Reverse Pressure without damage.

Flow Parameters
Round Port

Valve Size	Cv* Kv* 100% Open	K** (resistance)	Port Area (in²/cm²)
3" 80mm	675 584	0.16	7.1 46
4" 100mm	1200 1040	0.16	12.6 81
5" 125mm	1900 1640	0.16	19.6 126
6" 150mm	2700 2340	0.16	28.3 183
8" 200mm	4800 4200	0.16	50.3 325
10" 250mm	7500 6500	0.16	78.5 506
12" 300mm	10800 9300	0.16	113 729
14" 350mm	13200 11400	0.16	138 890
16" 400mm	17400 15100	0.16	183 1180
18" 450mm	22300 19300	0.16	234 1510
20" 500mm	27800 24000	0.16	291 1880
24" 600mm	40500 35000	0.16	425 2740

*Cv = Flow in GPM of water at 1 psi pressure drop.
  Kv = Flow in m3/hr. of water at 100 kPa pressure drop.
** K = The resistance coefficient of the valve. The constant (K)
  can be used to determine the equivalent length of pipe.

$$L = \frac{KxD}{f}$$

Where
- L = Equivalent length of pipe in feet
- K = Resistance coefficient
- D = Pipe diameter in feet
- f = Friction factor, related to type of pipe

Applicable Standards

DeZURIK KGC-MD Knife Gate Valves are designed and/or tested to meet the following standards:	
MSS SP-81	Metal Seated Valves, Stainless Steel, Bonnetless, Flanged Knife Gate Valves
MSS SP-151	Pressure testing of knife gate valves
ASME B16.5	Flanges and Flanged Fittings, ANSI 150 Conforms to related drilling dimensions
International Standards	Conforms to flanged bolt guides — DIN 10 and DIN 16; ISO 7005-1/PN10 and 7005-2/PN16; BS 4504/PN10 and BS 4504/PN16; and AS 2129 Tables D and E; SANS 1123-1000 and SANS 1123-1600
TAPPI TIS 405-8	Recommendations for Stainless Steel, Bonnetless, Flanged, Wafer Knife Gate Valves. Revoked by TAPPI, Same as MSS SP-81

Valve and Actuator Weights

Valve Size	Basic Valve lbs. Kg.	With Cylinder Order Code	lbs. Kg.
3" 80mm	16 7	CY-PC4	37 17
4" 100mm	24 11	CY-PC4	45 20
		CY-PC6	63 29
5" 125mm	32 15	CY-PC4	58 26
		CY-PC6	76 35
		CY-PC8	88 40
6" 150mm	38 17	CY-PC4	63 29
		CY-PC6	81 37
		CY-PC8	93 42
8" 200mm	65 30	CY-PC6	112 51
		CY-PC8	124 56
10" 250mm	103 47	CY-PC8	174 79
		CY-PC10	220 100
		CY-PC12	257 117
12" 300mm	148 67	CY-PC8	225 102
		CY-PC10	270 122
		CY-PC12	309 140
14" 350mm	199 90	CY-PC10	332 151
		CY-PC12	372 169
16" 400mm	272 123	CY-PC10	409 186
		CY-PC12	449 204
		CY-PC14	495 225
18" 450mm	361 164	CY-PC12	551 250
		CY-PC14	602 273
		CY-PC16	813 369
20" 500mm	518 235	CY-PC12	712 323
		CY-PC14	760 345
		CY-PC16	982 445
24" 600mm	725 329	CY-PC12	947 430
		CY-PC14	1001 454
		CY-PC16	1219 553
		CY-PC18	1262 572

Note: Weights are approximate and do not include crating.

Ordering

To order, simply complete the valve order code from information shown.
An ordering example is shown for your reference.

Valve Style
Give valve style code as follows:

KGC = Cast Knife Gate Valve

Valve Size
Give valve size code as follows:

3	=	3"	(80mm)	12	=	12"	(300mm)
4	=	4"	(100mm)	14	=	14"	(350mm)
5	=	5"	(125mm)	16	=	16"	(400mm)
6	=	6"	(150mm)	18	=	18"	(450mm)
8	=	8"	(200mm)	20	=	20"	(500mm)
10	=	10"	(250mm)	24	=	24"	(600mm)

Body Style
Give body style code as follows:

MD = Maximum Duty

End Connection
Give end connection code as follows:

F1 = ANSI 150 UNC Tapping for Threads

On Application
Other end connections available on application.

Body Material
Give body material code as follows:

S1 = 304 Stainless Steel
S2 = 316 Stainless Steel

On Application
Other body materials available on application

Packing Material
Give packing material code as follows:

CW2 = PTFE Braided Packing with Top and Bottom Copper Wire Scraper to 500º (260ºC) pH Range 4-10

On Application
Other packing materials available on application.

Gate Material
Give gate material code as follows:

S8 = 410 Stainless Steel

On Application
Other gate materials available on application

Seat Material
Give seat material code as follows:

All Metal

S2 = 316 Stainless Steel
CSCC3 = Carbon Steel Seat with Chrome Carbide 0.1" (3mm) Overlay
S2CC3 = 316 Stainless Steel Seat with Chrome Carbide 0.1" (3mm) Overlay

Combination Metal with Resilient Seat Seal

S2NBR = 316 Stainless Steel Seat with Acrylonitrile-Butadiene Seat Seal to 180°F (83°C)
CSCC3NBR = Carbon Steel Seat with Chrome Carbide 0.1" (3mm) Overlay and Acrylonitrile-Butadiene Seat Seal to 180°F (83°C)
S2CC3NBR = 316 Stainless Steel Seat with Chrome Carbide 0.1" (3mm) Overlay and Acrylonitrile-Butadiene Seat Seal to 180°F (83°C)

On Application
Other resilient seat and overlay materials available on application

Note:
The limiting factor in valve selection is the lowest temperature of the packing or seat.

Standard Options
Give option code as follows:

PSC = Purge Ports in Seat and Chest Area

Ordering Example:
KGC,8,MD,F1,S2,CW2,S8-S2NBR,PSC*Actuator

Cylinder Actuators

DeZURIK cylinder actuators are available with double-acting pneumatic cylinders for on/off or positioning services. Supply pressure is 60 or 80 psi (410 or 550 kPa). To order, add the proper code from the table to the valve order code.

Actuator Sizing
60 psi (410 kPa) Air Supply

Valve Size	Order Code Carbon Steel (CS) Yoke	Order Code 304 SST (S1) Yoke	Maximum Pressure Differential psi/kPa On/Off Dry Solids, Slurries, Paper Stock	Liquids & Gases
3" 80mm	CY-PC4-CS	CY-PC4-S1	150 1030	150 1030
4" 100mm	CY-PC4-CS	CY-PC4-S1	100 690	150 1030
	CY-PC6-CS	CY-PC6-S1	150 1030	N/R
5 & 6" 125 & 150mm	CY-PC4-CS	CY-PC4-S1	N/A	50 340
	CY-PC6-CS	CY-PC6-S1	125 860	150 1030
	CY-PC8-CS	CY-PC8-S1	150 1030	N/R
8" 200mm	CY-PC6-CS	CY-PC6-S1	75 515	125 860
	CY-PC8-CS	CY-PC8-S1	150 1030	150 1030
10" 250mm	CY-PC8-CS	CY-PC8-S1	100 690	150 1030
	CY-PC10-CS	CY-PC10-S1	150 1030	N/R
	CY-PC12-CS	CY-PC12-S1	N/R	N/R
12" 300mm	CY-PC8-CS	CY-PC8-S1	75 515	125 860
	CY-PC10-CS	CY-PC10-S1	125 860	150 1030
	CY-PC12-CS	CY-PC12-S1	150 1030	N/R
14" 350mm	CY-PC8-CS	CY-PC8-S1	50 340	75 515
	CY-PC10-CS	CY-PC10-S1	100 690	150 1030
	CY-PC12-CS	CY-PC12-S1	150 1030	N/R
16" 400mm	CY-PC10-CS	CY-PC10-S1	75 515	125 860
	CY-PC12-CS	CY-PC12-S1	125 860	150 1030
	CY-PC14-CS	CY-PC14-S1	150 1030	N/R
18" 450mm	CY-PC12-CS	CY-PC12-S1	100 690	150 1030
	CY-PC14-CS	CY-PC14-S1	150 1030	N/R
	CY-PC16-CS	CY-PC16-S1	N/R	N/R
20" 500mm	CY-PC12-CS	CY-PC12-S1	50 340	125 860
	CY-PC14-CS	CY-PC14-S1	125 860	150 1030
	CY-PC16-CS	CY-PC16-S1	150 1030	N/R
24" 600mm	CY-PC12-CS	CY-PC12-S1	25 170	75 515
	CY-PC14-CS	CY-PC14-S1	75 515	150 1030
	CY-PC16-CS	CY-PC16-S1	150 1030	N/R
	CY-PC18-CS	CY-PC18-S1	N/R	N/R

N/R = Not required. Use next smaller actuator.
N/A = Not available. Use larger actuator or contact DeZURIK.

Actuator Sizing
80 psi (550 kPa) Air Supply

Valve Size	Order Code Carbon Steel (CS) Yoke	Order Code 304 SST (S1) Yoke	Maximum Pressure Differential psi/kPa On/Off Dry Solids, Slurries, Paper Stock	Liquids & Gases
3" 80mm	CY-PC4-CS	CY-PC4-S1	150 1030	150 1030
4" 100mm	CY-PC4-CS	CY-PC4-S1	150 1030	150 1030
	CY-PC6-CS	CY-PC6-S1	N/R	N/R
5 & 6" 125 & 150mm	CY-PC4-CS	CY-PC4-S1	50 340	75 515
	CY-PC6-CS	CY-PC6-S1	150 1030	150 1030
	CY-PC8-CS	CY-PC8-S1	N/R	N/R
8" 200mm	CY-PC6-CS	CY-PC6-S1	100 690	150 1030
	CY-PC8-CS	CY-PC8-S1	150 1030	N/R
10" 250mm	CY-PC8-CS	CY-PC8-S1	150 1030	150 1030
	CY-PC10-CS	CY-PC10-S1	N/R	N/R
12" 300mm	CY-PC8-CS	CY-PC8-S1	100 690	150 1030
	CY-PC10-CS	CY-PC10-S1	150 1030	N/R
14" 350mm	CY-PC10-CS	CY-PC10-S1	125 860	150 1030
	CY-PC12-CS	CY-PC12-S1	150 1030	N/R
16" 400mm	CY-PC10-CS	CY-PC10-S1	100 690	150 1030
	CY-PC12-CS	CY-PC12-S1	150 1030	N/R
	CY-PC14-CS	CY-PC14-S1	N/R	N/R
18" 450mm	CY-PC12-CS	CY-PC12-S1	150 1030	150 1030
	CY-PC14-CS	CY-PC14-S1	N/R	N/R
20" 500mm	CY-PC12-CS	CY-PC12-S1	125 860	150 1030
	CY-PC14-CS	CY-PC14-S1	150 1030	N/R
	CY-PC16-CS	CY-PC16-S1	N/R	N/R
24" 600mm	CY-PC12-CS	CY-PC12-S1	75 515	150 1030
	CY-PC14-CS	CY-PC14-S1	150 1030	N/R
	CY-PC16-CS	CY-PC16-S1	N/R	N/R

N/R = Not required. Use next smaller actuator.
N/A = Not available. Use larger actuator or contact DeZURIK.

Cylinder Actuator Accessories

Positioners

DeZURIK cylinder actuators are available with pneumatic, electro-pneumatic or digital positioners for throttling control. Positioners are available in various NEMA ratings and mounted to the actuator legs.

Air Filter Regulator

The DeZURIK Air Filter Regulator is designed to provide clean, accurate air pressure to actuators and positioners.

Four-Way Solenoid Valves

Solenoid valves may be ordered mounted and piped as part of a complete valve/actuator assembly or as a separate item.

Speed Control Valves

Speed Control Valves are available for controlling valve opening or closing speed with pneumatic actuators. The speed of operation is adjustable.

Position Indicating Switches

Mechanical or Proximity Position Indicating Switches are available for use on double-acting cylinder actuators. One switch can be set to indicate open or closed position. Two switches will automatically be set to indicate full open and full closed positions.

High-Strength Actuator Legs

For unsupported horizontal mounting of 3-12" (80-300mm) valve sizes, High-Strength Actuator Legs are available as part of a complete valve and actuator assembly. To order, add the SAL code after the actuator code.

Ordering Example (complete valve):
KGC,6,MD,F1,S1,CW2,S8-S2*CY-PC6-S1,SAL

Stem Cover Bellows

To protect valve stem from environmental debris, the Stem Cover Bellows may be ordered as part of a complete valve and actuator assembly. To order, add the SCB code to the valve and actuator code.
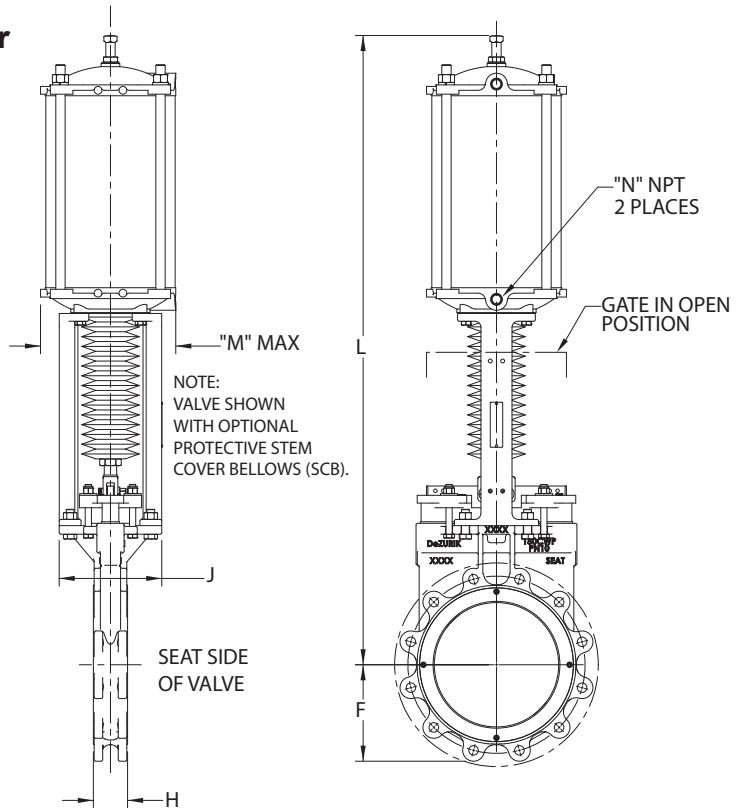
Ordering Example (complete valve):
KGC,6,MD,F1,S1,CW2,S8-S2*CY-PC6-S1,SCB

Dimensions
Basic Valve with Cylinder Actuator

Valve Size	Dimensions		
	F	H	J
3" 80mm	3.75 95	2.00 51	4.75 121
4" 100mm	4.50 114	2.00 51	5.00 127
5" 125mm	5.00 127	2.25 57	5.75 146
6" 150mm	5.50 140	2.25 57	5.75 146
8" 200mm	6.75 171	2.75 70	6.38 162
10" 250mm	8.00 203	2.75 70	8.25 210
12" 300mm	9.50 241	3.00 76	8.25 210
14" 350mm	10.50 267	3.00 76	8.25 210
16" 400mm	11.75 298	3.50 89	8.69 221
18" 450mm	12.50 318	3.50 89	9.31 236
20" 500mm	13.75 349	4.50 114	9.42 239
24" 600mm	16.00 406	4.50 114	9.42 239

Inches
Millimeters

"M" MAX

NOTE:
VALVE SHOWN
WITH OPTIONAL
PROTECTIVE STEM
COVER BELLOWS (SCB).

J

SEAT SIDE
OF VALVE

H

"N" NPT
2 PLACES

GATE IN OPEN
POSITION

L

F

3-24" (80-600mm) Valves

Inches
Millimeters

Actuator Order Code	Dimensions												M	N
	L													
	3" 80mm	4" 100mm	5" 125mm	6" 150mm	8" 200mm	10" 250mm	12" 300mm	14" 350mm	16" 400mm	18" 450mm	20" 500mm	24" 600mm		
CY-PC4	23.98 609	26.26 667	30.64 778	32.18 817	—	—	—	—	—	—	—	—	5.38 137	1/4
CY-PC6	—	27.61 701	32.00 813	33.56 852	39.11 993	47.13 1197	—	—	—	—	—	—	7.88 200	1/4
CY-PC8	—	—	32.38 822	33.94 862	39.49 1003	49.57 1259	53.19 1351	59.06 1500	62.74 1594	—	—	—	10.50 267	1/2
CY-PC10	—	—	—	—	—	50.97 1295	54.59 1387	60.35 1533	64.03 1626	73.59 1869	77.16 1960	—	13.00 330	1/2
CY-PC12	—	—	—	—	—	50.94 1294	54.56 1386	60.70 1542	64.38 1635	73.94 1878	77.50 1968	89.48 2273	15.00 381	1/2
CY-PC14	—	—	—	—	—	—	—	—	63.68 1617	73.24 1860	76.81 1951	88.78 2255	17.00 432	1/2
CY-PC16	—	—	—	—	—	—	—	—	—	70.25 1784	75.94 1929	87.91 2233	17.00 432	1/2
CY-PC18	—	—	—	—	—	—	—	—	—	—	—	88.16 2239	19.00 483	3/4

Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:
Web Site: DeZURIK.com   E-Mail: info@DeZURIK.com