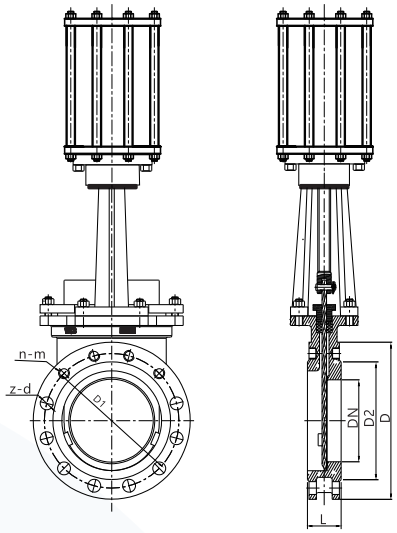
Penumatic Knife Gate Valve INSTRUCTION MANUAL

DELCO

Specialized Control Valve Manufacturer

Introduction

Pneumatic knife gate valve is a type of valve specifically designed for media containing particles, fibers, or high viscosity. It is opened and closed by controlling the vertical movement of the gate through a pneumatic actuator. Its core feature is the blade shaped design at the bottom of the gate, which can shear the medium and remove the residue on the sealing surface, suitable for harsh working conditions. Composed of pneumatic actuator, valve body, blade gate, valve stem, and sealing components. For clamp or flange connections, the gate is perpendicular to the direction of the fluid and relies on medium pressure (self sealing) or external force to force sealing when closed. Single acting (spring reset) or double acting (air on/off), the air source drives the actuator to push the valve stem and drive the gate to rise and fall.



Main Outline and Connecting （1.0MPa）

MODEL	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500
Size	2”	2-1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”	18”	20”
D	160	180	195	215	245	280	335	390	440	500	565	615	670
D1	125	145	160	180	210	240	295	350	400	460	515	565	620
D2	100	120	135	155	185	210	265	320	368	428	482	532	585
b	18	18	18	18	18	23	23	23	23	23	27	27	27
L	50	50	50	50	50	60	60	70	80	90	100	110	114
z-d	2-18	2-18	2-18	6-18	6-22	6-22	6-22	8-26	8-26	8-30	10-30	10-30	10-30
n-m	2-M16	2-M16	2-M16	2-M16	2-M20	2-M20	2-M20	4-M24	4-M24	4-M27	4-M27	6-M27	6-M27

Main Outline and Connecting （ANSI 150LB）

MODEL	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400
Size	2”	2-1/2”	3”	4”	5”	6”	8”	10”	12”	14”	16”
D	150	180	195	215	245	280	335	390	440	500	565
D1	120.7	139.7	152.4	190.5	215.9	241.3	298.5	362	431.8	476.3	539.8
D2	92.1	104.8	127	157.2	185.7	215.9	269.9	323.8	381	412.8	469.9
L	50	50	50	50	50	60	60	70	76	76	89
z-d	2-18	2-18	2-18	6-18	6-22	6-22	6-22	8-26	8-26	8-30	10-30
n-m	2-M16	2-M16	2-M16	2-M16	2-M20	2-M20	2-M20	4-M24	4-M24	4-M27	6-M27

Uses and Stuctural Features of Product

The pneumatic knife gate valve has the advantages of simple and compact structure, reasonable design, light-weight material, reliable sealing and easyoperation. The pneumatic knife gate valve is driven by compressed ai.Pneumatic knife gate valve uses pneumatic actuator to control the valve, so as torealize the opening and closing of the valve.lt has the advantages of flexibility, smallsize, smooth passage, small flow resistance, light weight, easyinstallation and disassembly, etc. lt can work normaly under the working pressure of 1.0MPa-2.5MPa and the operating temperature of-29~650*cThe gate of the knife gate valve has a shearing function, which can scrape of the adhesive on the sealing surface and automatically remove the sundries.The stainless steel gate can prevent the seal leakage caused by corrosion.

NO.	Part Name	Part Material
01	Nominal Size	DN50~DN1000
02	Applicable medium	Mud,material, viscous, granular fluid
03	Connection Type	FlangedType,Plum blossom type,Wafer type
04	Pressure Rating	0-6 1-6 4.0 6.4(ANSI 150 300 600Lb)(JIS10 20 30 40K)
05	Operating Temperature	-30℃ ~300℃
06	Body Material	WCB、CF8、CF8M、Castlron,Carbon Steel(WcB),Stainless Steel(CF8,CF8M)
07	Disc Material	WCB、CF8、CF8M、WCB、Cast lron,Stainless Steel(CF8,CF8M)
08	Applicable medium	Stainless Steel(CF8,CF8M)

Flange type

Lug type

Wafer type

SC-Series Product Features

Non-lubrication

Use oil bearing to make the piston rod without refueling lubrication.

Buffering

In addition to the fixed buffer,the cylinder terminal is also adjustablebuffer to make the piston in place smoothly without impact

High Temperature Resistance

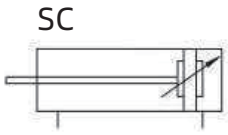
High temperature resistant sealing material can be used to make the cylinder work normally at a high temperature of 150 degrees Celsius (Need to be Customized)

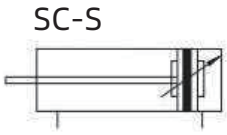
Installation Options

Multiple installation accessories are available for customers to choose

Magnetic Properties

The cylinder piston is equipped with a permanent magnet that triggersa magnetic switch mounted on the cylinder to sense the movingposition of the cylinder



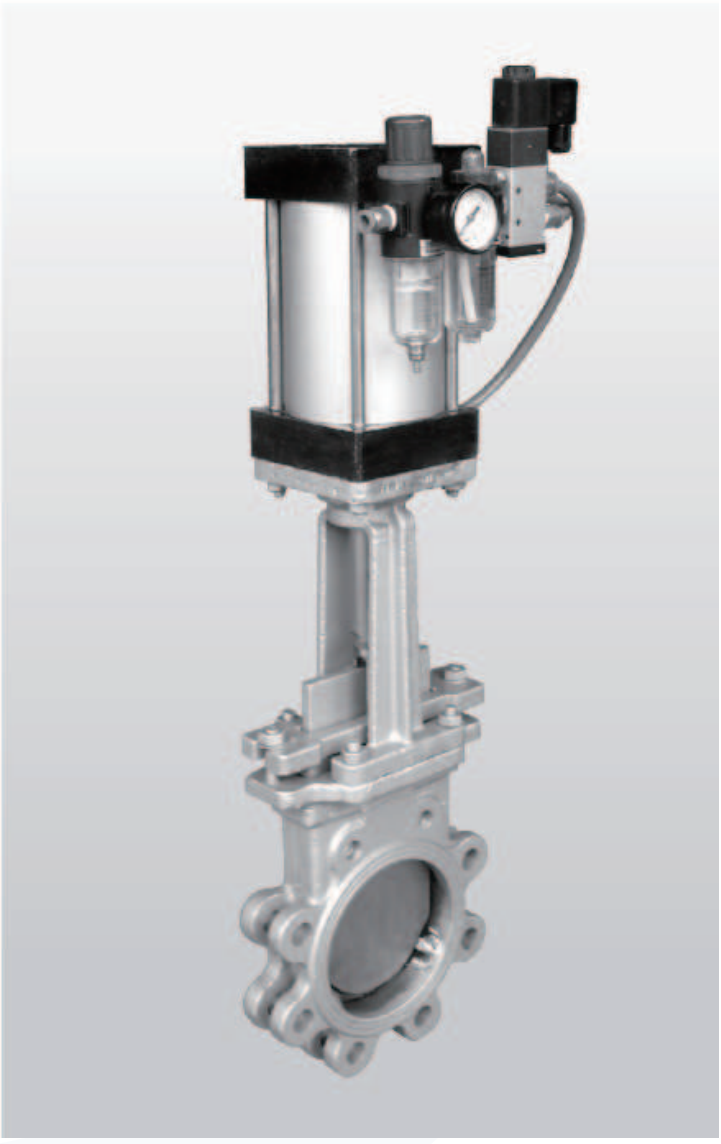


Specifications

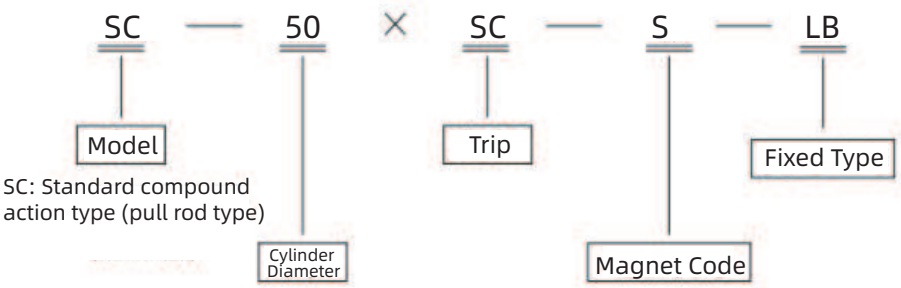
DN	32	40	50	63	80	100	125	160	200	250
Acting Type	Complex-action type (math.)									
Working Media	Atmosphere									
Structure Type	Basic Type Type FA Type FB Type CA Type CB Type LB Type TC Type TV-M									
Working Pressure	1~9.0									
Pressure Resistance	13.5									
Working Temperature	-5~70									
Speed Range	50~800									
Buffer Type	Adjustable buffer									
Buffer Stroke	24			32			35			42
Pipe Size	PT1/8		PT1/4		PT3/8		PT1/2		PT3/4	

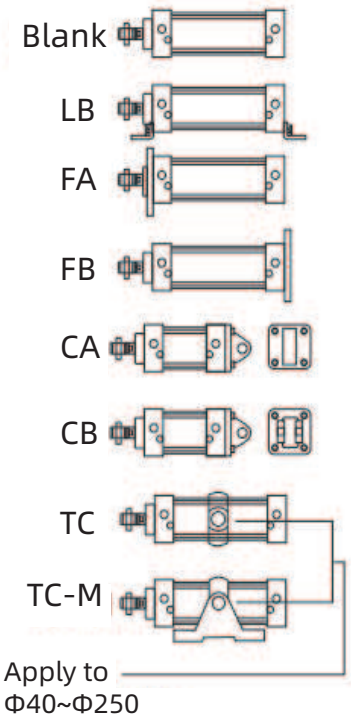
Stoke Range Table

DN	Standard Journey	Maximum Stroke	Allowable Trips
32	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500	1000	2000
40	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800	1200	
50	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000	1200	
63	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000	1500	
80	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		
100	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		
125	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		
160	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		
200	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		
250	25 50 75 80 100 125 150 160 175 200 250 300 350 400 450 500 600 700 800 900 1000		



Order Code

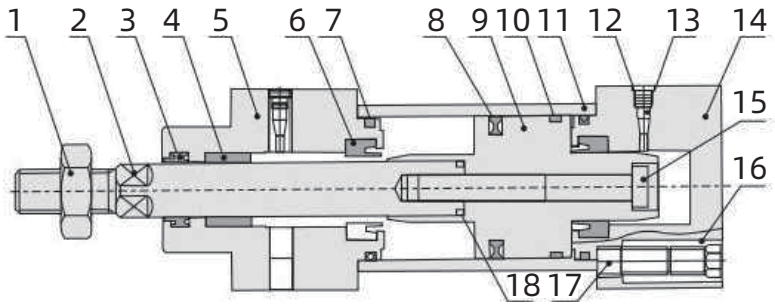




give an example
To order a standard reciprocating (pull rod) cylinder with a cylinder diameter of 50mm, stroke of 50mm, magnetic attachment, and TC fixed type, the correct ordering c ode is:
SC-50x50-S-TC

Inner Stucture

No Magnetic



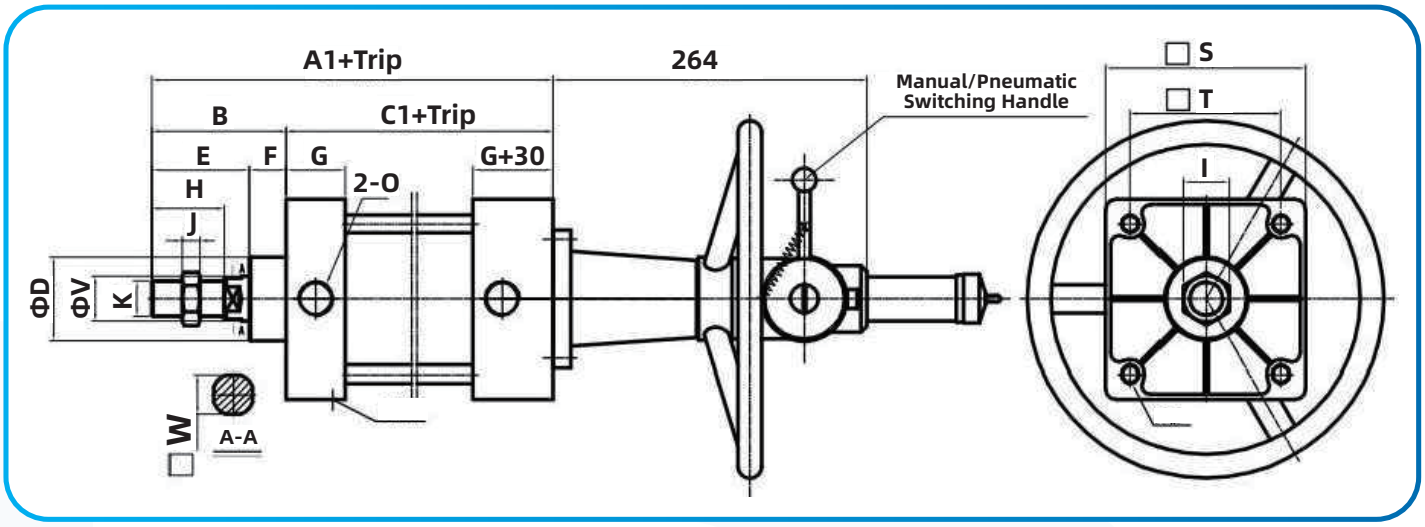
Order Number	Name	Order Number	Name
1	nut	2	piston rod
3	Front cover sealing ring	4	oil-impregnated bearing
5	protegulum	6	buffer.molding ring
7	Pipe wall 0 ring	8	Piston Type 0 Circle
9	plunger	10	wearing ring
11	cylinder block	12	Buffer leakage prevention.molding
13	Buffer adjustment screw	14	rear cover
15	inside hexagonal bolt	16	Pull rod screw cap
17	bar	18	piston rod.molding ring

Main Part Smaterial

Bore size	32/40/50/63/80/100/125/160/250	Bore size	32/40/50/63/80/100/125/160/250
Cylinder	Aluminium Alloy	LB Bracket	Low Carbon Steel
Plunger	Aluminium Alloy	FA Bracket	Ironcasting
Piston Rod	Medium Carbonsteel	FB Bracket	
Front Cover Seali	NBR	CA Bracket	
Piston O-Ring	NBR	CB Bracket	
Pipe O-Ring	NBR	TC Bracket	
Ger Rod O-Ring	NBR	TC Bracket	
Air leakage O-Ring	NBR	Inside	Medium Carbon Steel
Oil Bearing	Bronze Powder Metal Lurgy	Pillar	Low-Carbonsteel
Front Cover	Aluminium Alloy	Pillar	Low-Carbonsteel
Back Cover	Aluminium Alloy	Wearing	Nylon 6+M0S2
Magnet	Plastic Cement	Buffer Screws	Copper

O-Ring Type Table

	Front Cover Seal	Plunger O-Ring	Tube O-Ring	Piston O-Ring	Buffer O-Ring	Leak-Proof Seal
Internal Size	1	1	2	1	2	2
32	PDU-12	APA-32	27.5×2	1.3×9.2	CTU-15	1.5×5.5
40	PDU-16	APA-40	34.5×2	1.5×12.7	CTU-20	‘, 0×0, 0
50	PDU-20	APA-50	45.5×2	1.5×16.7	CTU-28	‘, 0×0, 0
63	PDU-20	APA-63	55.5×2	1.5×16.7	CTU-28	
80	PDU-25	APA-80	74.5×2	2.4×19.8	CTU-35	
100	PDU-25	APA-100	94.5×2	2.4×19.8	CTU-35	‘, 0×0, 0
125	PDU-32	APA-125	110.7×3.52	2.0×27.5	CTU-40	1.5×5.5
160	PDU-40	APA-160	152.0×3.53	2.0×35.5	CTU-50	1.5×9.5
200	PDU-40	APA-200	190.1×3.53	2.0×35.5	CTU-50	1.5×9.5
250	PDU-50	APA-250	240.1×3.53	2.0M5.5	CTU-63	1.5×9.5



Note:

1.When use manual operation,slowly turn the handwheel and operate the pneumatic/ manual switch handle,switch to the manual position;
2.Be sure to turn the switch handle to the pneumatic gear after the manual operation.

Inner Diameter/Symbol	A	B	C	D	E	F	G	H	I	J	K	L
32	140	47	93	28	32	15	27.5	22	17	6	M10×1.25	M6×1
40	142	49	93	32	34	15	27.5	24	17	7	M12×1.25	M6×1
50	150	57	93	38	42	15	27.5	32	23	8	M16×1.5	M6×1
63	153	57	96	38	42	15	27.5	32	23	8	M16×1.5	M8×1.25
80	182	75	107	47	54	21	33	40	26	10	M20×1.5	M10×1.5
100	188	75	113	47	54	21	33	40	26	10	M20×1.5	M10×1.5
125	254	104	150	60	72	32	41	54	41	13.5	M27×2	M12×1.75
160	315	129	186	65	94	35	50	72	55	18	M36×2	M16×2
200	361	165	196	80	100	65	50	72	55	18	M36×2	M16×2
250	383	187	196	100	112	76	50	84	65	23	M36×2	M20×2

Inner Diameter/Symbol	M	N	O	P	Q	R	S	T	V	W
32	9.5	13.7	PT1/8	3.5	7.5	7	45	33	12	10
40	9.5	13.5	PT/4	6	8.2	9	50	37	16	14
50	9.5	13.5	PT/4	8.5	8.2	9	62	47	20	17
63	9.5	13.5	PT3/	7	8.2	8.5	75	56	20	17
80	11.5	16.5	PT3/	10	9.5	14	94	70	25	22
100	11.5	16.5	PT/2	11	9.5	14	112	84	25	22
125	13	20.5	PT	11	9.5	14	140	110	32	27
160	15	25	PT	11	9.5	14	180	140	40	36
200	15	25	PT3/4	11	9.5	14	220	175	40	36
250	15	25	PT3/4	11	9.5	14	280	225	50	42

Description of Cylinder Use

1、Working medium:Dry clean air filtered with water removal and containing oil mist.

2、Medium and ambient temperature -5-70°C

3、Relative temperature of W85%

4、Common working pressure range:1-9.0kg/cm3

5、Referencespeed:50-800mm/s

6、Storage:The cylinder should be placed in a ventilated and dry warehouse to prevent moisture drust.

7、It should be a trial run under no-load conditions before installation. Can be installed after normal operation.

8、Select the installation form according to the use conditions, installation should pay attention to.

A) Ear ring installation, intermediate shaft pin installation, the force should be in the same plane.

B) Flange installation, the force and support centre in the same axis, flange The connection with the support seat should make the flange surface bear the force, and not make its fixed screw bear Pulling force.

C)the cylinder piston rod is not allowed to bear bias or lateral load. Extra long stroke cylinder should Plus support or guide configuration.

9、The cylinder into the pipeline before, to remove the pipe dirt, to prevent debris, dust into the cylinder cavity.

10、 If necessary, you can adjust the buffer spool to adjust the effect of the buffer, to avoid the piston and cylinder head collision, damage the machine parts, the use of the process should often check the fasteners to prevent Loose buckle phenomenon.

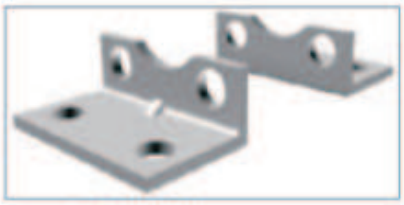
11、Gas red into, exhaust pipe joints of the general diameter should be adapted to the cylinder bore, the user according to the use of the inlet and exhaust pipe joints in the Users according to the use of inlet and exhaust port piping installed in the one-way throttle valve to regulate cylinder piston rod movement speed.

Install Accessoroes


TC Type Accessories


TC-M Type Accessories


CA Type Attachment


LB Type Attachment


FA(FB) Type Accessories


CB Type Attachment

Joint


I Connector


Y Connector


Floating Joint


Fish Eye Joint


Triple Components For Gas Source Treatment


Solenoid Valve


Travel Switch


Proximity Switch

Calculation of Theoretical Cylinder Air Output

$$F = P \times A$$

- A — 活塞受压面积 (cm^2)
- P — 工作压力 (Kg/cm^2)
- F — 气缸理论出力 (Kgf)

Cylinder Bore	Outer Diameter of Piston Rod	Action type		Compression Area(cm^2)	Air Pressure (Kgf/cm^2)								
					1	2	3	4	5	6	7	8	9
32	12	Double Lift	Pressure Side	8.04	8.04	16.08	24.12	32.16	40.20	48.24	56.28	64.32	72.39
			Pull Side	6.90	6.90	13.80	20.70	27.60	34.50	41.40	48.30	55.20	62.10
40	16			12.56	12.56	25.12	37.68	50.24	62.80	75.36	87.92	100.24	113.04
				10.55	10.55	21.10	31.65	42.20	52.75	63.30	73.85	84.40	94.95
50	20			19.63	19.63	39.26	58.98	78.52	98.15	117.78	137.41	157.04	176.67
				16.49	16.49	32.98	49.47	65.96	82.45	98.94	115.43	139.92	148.41
63	20			31.17	31.17	62.34	93.51	124.68	155.85	187.02	218.19	249.36	280.53
				28.03	28.03	56.06	84.09	112.12	140.15	168.18	196.21	224.24	252.27
80	25			50.26	50.26	100.52	150.78	201.04	251.30	301.56	351.82	402.08	452.34
				45.36	45.36	90.72	136.08	181.44	226.80	272.16	317.52	362.88	408.24
100	25			78.53	78.53	157.06	235.59	314.12	392.65	471.18	428.82	628.24	706.77
				71.47	71.47	142.94	214.41	285.88	357.35	428.82	500.29	571.76	643.23
125	32			122.72	122.72	245.44	368.16	490.88	613.6	736.32	859.04	981.74	1104.48
				114.68	114.68	229.36	344.04	458.72	573.40	688.08	802.76	917.44	1032.12
160	40			201.06	201.06	402.12	603.18	804.24	1005.30	1206.36	1407.42	1608.48	1809.54
				188.49	188.49	376.98	565.47	753.96	942.45	1130.94	1319.43	1507.92	1696.41
200	40			314.16	314.16	628.32	942.48	1256.64	1570.80	1884.96	2199.12	2513.28	2827.44
				301.57	301.57	603.14	904.71	1206.28	1507.85	1809.42	2110.99	2412.56	2714.13
250	50			490.86	490.86	981.72	1407.58	1963.44	2454.3	2945.16	3436.02	3769.84	4417.74
				471.23	471.23	942.46	1413.69	1884.92	2356.15	2827.38	3296.61	4241.07	3926.88

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Specialized Control Valve Manufacturer

DELCO VALVE CO.LTD

Phone: +86-159 8960 2972

Website:www.delcofluid.com/www.delcovalves.com / www.delcovalve.ru

E-mail:sales@delcofluid.com

Address:Building 8A#, Tiansheng Industrial Park, Wanjiang Street, Dongguan,China