

# Type D



## RUBBER SLEEVE KNIFE GATE VALVE

The **D** model knife gate is a wafer valve designed for a wide range of industrial applications. The double-seated design provides bi-directional shut off. The design of the valve body and the two rubber sleeves make the D valve suitable for handling abrasive slurries in industries such as:

- Mining
- Chemical plants
- etc.
- Power plants
- Wastewater treatment

**Sizes:** DN 50 to DN 900 (larger DN on request)

<b>Working pressure:</b>	DN 50 to DN 125:	9	kg/cm <sup>2</sup>
	DN 150:	6	kg/cm <sup>2</sup>
	DN 200 to DN 250:	5	kg/cm <sup>2</sup>
	DN 300:	4	kg/cm <sup>2</sup>
	DN 350 to DN 400:	3	kg/cm <sup>2</sup>
	DN 450 to DN 600:	2,5	kg/cm <sup>2</sup>
	DN 750 to DN900:	2	kg/cm <sup>2</sup>

Note: Gates are available in other materials or thickness to achieve higher working pressures. Please consult our technical department.

**Standard Flange connection:** DIN PN 10 and ANSI B16.5 (class 150)

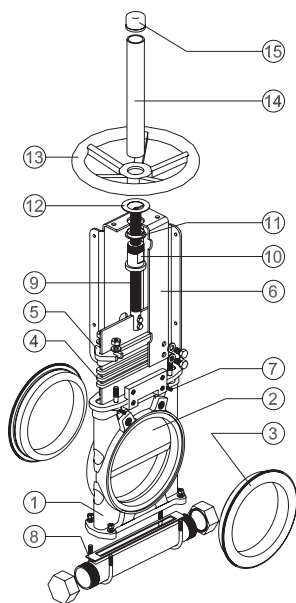
Other: (On request)

DIN PN 6	DIN PN 16	DIN PN 25
BS "D" and "E"	ANSI 125	

Standard face to face dimensions according to MSS SP-81

**Directives:** DIR 98/37/CE (MACHINES)  
 DIR 97/23/CE (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)  
 DIR 94/9/CE (ATEX) Group II, Cat. 3: zones 2 and 22

All valves are tested prior to shipping in accordance with the standard developed by the Quality Control Department.



### STANDARD PARTS LIST

Part:	Cast Iron:	Stainless Steel:
1- Body	DN < 300 Ductile Iron DN > 350 GJL 250 (GG25)	CF8M
2- Gate	AISI 304	AISI 316
3- Sleeves	Natural rubber	
4- Packing	PTFE Impreg. Synth. Fibre	
5- Gland Follower	Aluminium/ Carbon Steel	AISI 316 / CF8M
6- Yoke	Carbon Steel - Epoxy coated	
7- Grease Nipple	Acc. to DIN 3402	
8- Splash guard (optional)	See options	
9- Stem	AISI 303	
10- Stem nut	Brass	
11- Collar	Nylon	
12- Friction washer	Brass	
13- Handwheel	$\phi \leq 310$ : Ductile Iron / $\phi \geq 410$ : GJL 250 (GG25)	
14- Stem protector	Epoxy-coated Carbon Steel	
15- Cap	Plastic	

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## DESIGN FEATURES

### BODY

Wafer style cast **monoblock**, designed with reinforced ribs in larger diameters, providing the body with extra strength.

Internal body design allows the gate to be fully guided.

The grease nipples allow the gate to be lubricated, thus enhancing its capacity to slide between the sleeves.

The design allows draining through the lower part, where a cover or a bottom splash guard can be installed.

### GATE

The stainless steel gate is polished on both sides.

Bottom of the gate is machined to an edge for easier seat separation when closing the valve and longer wearing life of the rubber sleeves.

### SEAT / RUBBER SLEEVES

The seat is made of two highly resistant, long-lasting sleeves, made of elastomer with a stainless steel core.

The two sleeves are in permanent contact with each other when the valve is in the open position. There are no seat cavities to wear or that could produce build-up with solids.

While the valve is either in the open or closed position, the media does not come into contact with the internals of the body.

This design allows for easy sleeve replacement and avoids gasket installation between the flange and the valve.

### PACKING:

Long-life packing with several layers of braided fibre plus an EPDM o-ring, with an easy access packing gland ensuring a tight seal.

Long-life braided packing is available in a wide range of materials.

### STEM:

The standard stainless steel stem offers a long corrosion resistant life.

For rising stem handwheel actuators only, a stem protector is provided for additional protection against dust while the valve is in the open position.

### ACTUATORS:

All actuators supplied by AKO are interchangeable, and supplied with an standard mounting kit to allow for installation on site.

### YOKE or ACTUATOR SUPPORT:

Made of EPOXY coated steel (stainless steel available on request).

Compact design makes it extremely robust even under the most severe conditions. "U" type reinforced design is standard starting from DN 200.

### EPOXY COATING:

The epoxy coating on all cast iron and carbon steel valve bodies and components is electrostatically applied making the valves to be corrosion resistant with a high quality finished surface.

The standard colour is RAL-5015 blue.

### GATE SAFETY PROTECTION:

AKO automated valves are provided with gate guards in accordance with

**EU** Safety Standards.

The design feature prevents any objects from being caught accidentally while the gate is moving.



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## OTHER OPTIONS

### Bottom splash guard:

Developed to prevent any media from leaking to the atmosphere while valve cycles.

Media is easily flushed while valve is in operation.

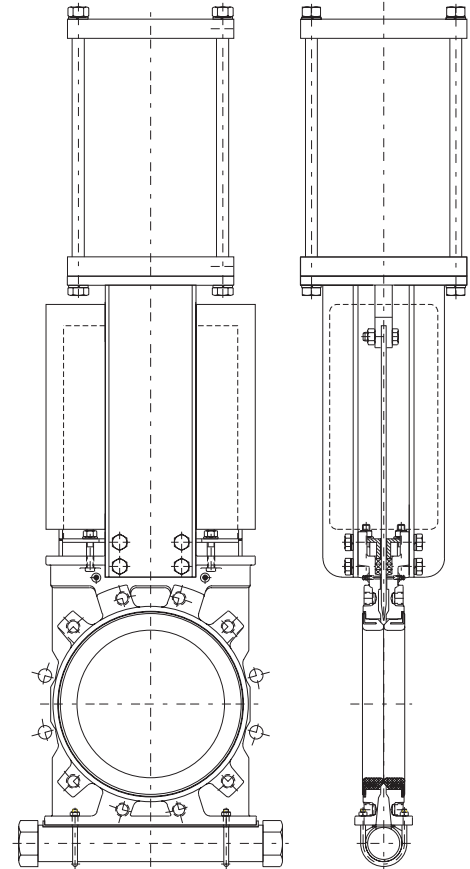
### Other materials of construction:

Special alloys such as AISI 317, 254SMO, Hastelloys, Titanium, etc.

### Fabricated valves:

AKO is equipped for in house fabrication of special valves.

Depending on the design, diameter, pressures, material of construction, etc.



We recommend consultation with our technical department.

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## ACTUATOR TYPES

### Manual:

Handwheel (rising & non-rising stem)  
Chainwheel  
Lever  
Bevel Gear  
Others (square nut...)

### Automatic:

Electric  
Double Acting Pneumatic  
Single Acting Pneumatic  
Hydraulic

All actuators supplied by AKO are interchangeable.

### FAIL SAFE SYSTEMS

Used on pneumatic actuated valves.

#### SINGLE ACTING / SPRING RETURN

Available from DN 50 to DN 200

Options:

- Fail open
- Fail closed

#### SINGLE ACTING / VOLUME TANK

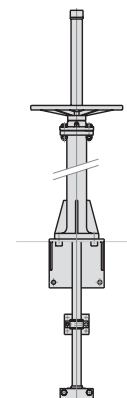
Available for all sizes (>DN200).

Options:

- Pneumatic Failsafe
- Pneumatic or Electric Failsafe

### ACCESSORIES

- Mechanical stops
- Locking device
- Manual override
- Solenoid valves
- Positioners
- Limit switches
- Proximity switches
- Floor stands
- Stem extensions



Wide range of valve extensions available.

*For further information about fail safe systems and valve extensions, please see A chapter.*

*We recommend consultation with our technical department.*

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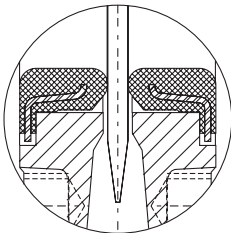


## TEMPERATURE CHART

<b>SEAT / SLEEVES</b>			<b>PACKINGS</b>		
<b>Material</b>	<b>Max. Temp(°C)</b>	<b>Applications</b>	<b>Material</b>	<b>Max. Temp. (°C)</b>	<b>pH</b>
Natural rubber	75	General	Cotton (A, H)	50	6 - 8
EPDM	120	Acids and non mineral oils	PTFE impregn. synth. fibre (F)	240	2 - 13
Neoprene	90	Oils and solvents.	Braided PTFE (G)	260	0 - 14
Chlorobutyl	125	High temperatures	NOTE: All types include an elastomere O-ring, except G.		

All of them are reinforced with a stainless steel core.

## SEAT



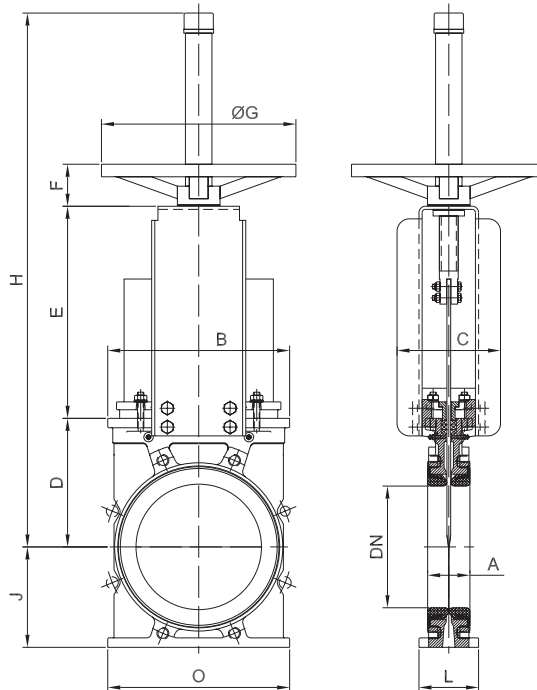
### RUBBER SLEEVES

Double-seated design, bi-directional. The easily replaceable moulded elastomer sleeves form a tight seal against each other when the valve is open (providing free port and protecting metal parts) and seal against the gate when the valve is closed.

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## HANDWHEEL (rising stem)

- Standard handwheel actuator
- Consists on:
  - Handwheel: Epoxy coated Cast Iron
  - Stem
  - Stem nut
  - Stem protector
- Available from DN 50 to DN 600
  - Higher DN on request
- Options (on request):
  - Locking Device
  - Extensions and floor stand



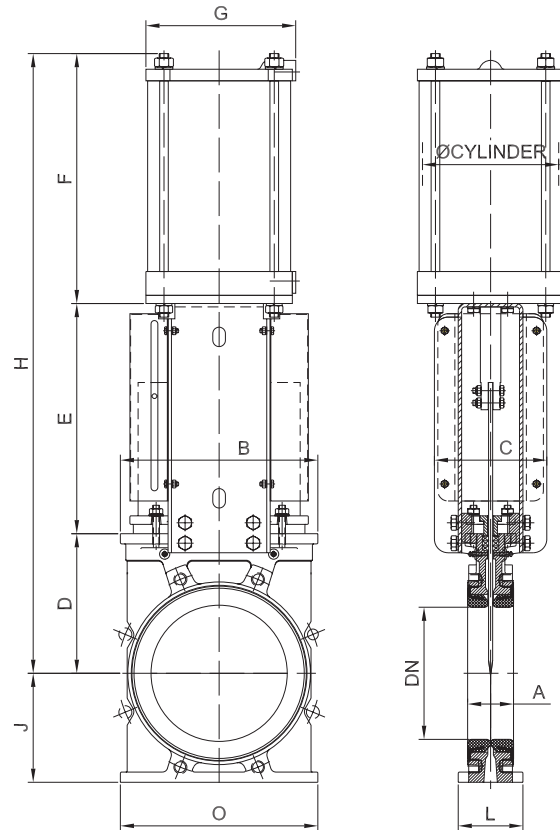
DN	A	B	C	D	E	F	ØG	H	J	L	O	Weight (kg.)
50	48	139	100	105	162	47	225	456	63	69	180	10
65	48	154	100	115	187	47	225	495	70	69	195	13
80	51	174	100	124	211	47	225	575	90	82	195	14,5
100	51	178	100	140	255	67	310	670	100	82	225	22
125	57	206	100	150	278	67	310	733	123	82	215	24
150	57	231	100	175	309	67	310	789	130	82	245	26
200	70	290	270	205	363	68	410	971	160	95	290	39,5
250	70	346	270	245	439	70	410	1103	200	95	350	63
300	76	398	270	280	492	70	410	1271	232	95	405	72
350	76	447	290	325	548	70	550	1372	258	118	460	96
400	89	503	290	350	628	97	800	1617	292	118	510	188
450	89	556	290	420	681	97	800	1795	318	118	570	216
500	114	618	290	462	755	97	800	1951	345	130	630	274
600	114	724	290	510	866	97	800	2220	400	130	740	318

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## PNEUMATIC CYLINDER

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
  - Aluminium jacket and covers
  - Stainless Steel (AISI 304) piston rod
  - Nitrile coated steel piston
- Available from DN 50 to DN 600
- Supply Pressure: minimum 3.5 kg/cm<sup>2</sup> - maximum 10 kg/cm<sup>2</sup>
- Reinforced design of support plates (U-type) is standard starting from DN 200.
- Options (on request):
  - Hard anodized jacket and covers
  - Over / Undersized cylinder
  - Stainless Steel jacket and covers
  - Manual override
  - Fail safe system
  - Travel stops
- Instrumentation (on request):
  - Positioners
  - Flow regulators
  - Solenoid valves
  - Air preparation units



DN	A	B	C	D	E	F	G	H	J	L	O	Weight(kg.)	Standard Cyl.	Connect.
50	48	139	100	105	162	203	115	476	63	69	180	12	C100/95	1/4" G
65	48	154	100	115	187	222	115	530	70	69	195	15	C100/110	1/4" G
80	51	174	100	124	211	249	140	590	90	82	195	17	C125/125	1/4" G
100	51	178	100	140	255	283	175	678	100	82	225	25	C160/150	1/4" G
125	57	206	100	150	278	308	175	736	123	82	215	28	C160/175	1/4" G
150	57	231	100	175	309	338	175	822	130	82	245	31	C160/205	1/4" G
200	70	290	270	205	363	408	220	976	160	95	290	50	C200/260	3/8" G
250	70	346	270	245	445	490	277	1180	200	95	350	78	C250/320	3/8" G
300	76	398	270	280	497	565	382	1342	232	95	405	88	C300/365	1/2" G
350	76	447	270	325	553	610	382	1488	258	118	460	132	C300/415	1/2" G
400	89	503	290	350	613	704	444	1667	292	118	510	232	C350/475	3/4" G
450	89	556	290	420	666	754	444	1840	318	118	570	268	C350/525	3/4" G
500	114	618	290	462	742	823	515	2027	345	130	630	340	C400/575	3/4" G
600	114	724	290	510	853	933	515	2296	400	130	740	396	C400/685	3/4" G
750	152	980	430	650	1190	1062	483	2902	535	140	965	340	C450/880	3/4" G
900	203	1176	320	700	1400	1190	535	3290	635	170	1176	396	C500/1000	3/4" G

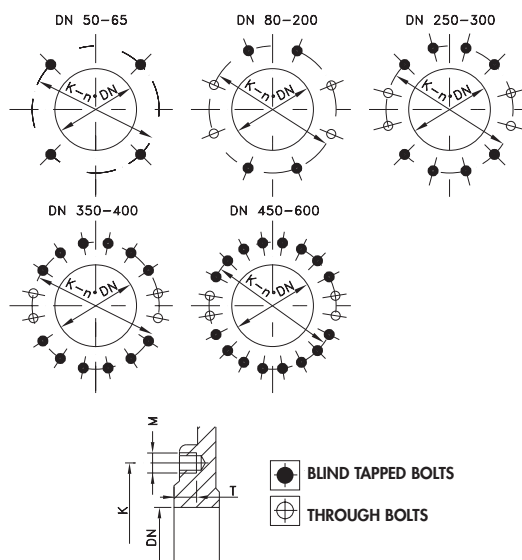
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## FLANGE AND BOLTING DETAILS

### DIN PN10

DN	K	n°	M	T	
50	125	4	M-16	10	4 - -
65	145	4	M-16	10	4 - -
80	160	8	M-16	12	4 - 4
100	180	8	M-16	12	4 - 4
125	210	8	M-16	14	4 - 4
150	240	8	M-20	14	4 - 4
200	295	8	M-20	16	4 - 4
250	350	12	M-20	16	8 - 4
300	400	12	M-20	20	8 - 4
350	460	16	M-20	15	12 - 4
400	515	16	M-24	20	12 - 4
450	565	20	M-24	20	16 - 4
500	620	20	M-24	25	16 - 4
600	725	20	M-27	24	16 - 4



### ANSI B16.5, class 150

DN	K	n°	M	T	
2"	4 3/4"	4	5/8" UNC	3/8"	4 - -
2 1/2"	5 1/2"	4	5/8" UNC	3/8"	4 - -
3"	6"	4	5/8" UNC	1/2"	4 - -
4"	7 1/2"	8	5/8" UNC	1/2"	4 - 4
5"	8 1/2"	8	3/4" UNC	9/16"	4 - 4
6"	9 1/2"	8	3/4" UNC	9/16"	4 - 4
8"	11 3/4"	8	3/4" UNC	5/8"	4 - 4
10"	14 1/4"	12	7/8" UNC	5/8"	8 - 4
12"	17"	12	7/8" UNC	3/4"	8 - 4
14"	18 3/4"	12	1" UNC	19/32"	8 - 4
16"	21 1/4"	16	1" UNC	3/4"	12 - 4
18"	22 3/4"	16	1 1/8" UNC	3/4"	12 - 4
20"	25"	20	1 1/8" UNC	15/16"	16 - 4
24"	29 1/2"	20	1 1/4" UNC	15/16"	16 - 4

