



KEYSTONE KNIFE GATE VALVES

FIGURE OS1700

Bi-directional zero leakage ASME Class 150 rated knife gate valve.
Designed for the rigors of high pressure slurry and oil sands applications



FEATURES

- Full round port and seat design offers low pressure drop across valve and longer service life in abrasive applications.
- True bi-directional flow and Zero leakage* shut-off, can be installed in either direction.
- Compliance to the face-to-face dimensions of MSS-SP135 (short).
- Suitable for dead end service up to full rated pressure.
- Designed as a repairable asset for a lower cost of ownership.
- 17-4 ph stainless steel hardened gate provides improved abrasion resistance against the rigors of abrasive applications.
- Heavy cross section precision molded elastomer seat, held in place by the bolted body to prevent pullout or shifting in the body. Simple to replace, no shimming or trimming.
- Seat is available in EPDM, NBR, HNBR, Natural Rubber, FKM or other elastomers with a maximum temperature rating up to 200°C (400°F) with proper elastomer selection.
- Superior all-around the gate packing assembly, no special tools or unique packing materials to maintain or replace. Optional live-loaded packing for high cycle applications provides continual load.
- Optional fluoropolymer or proprietary SSEC coating can be applied to gate or body. Formulated to minimize media adherence (anti-stick) and improve abrasion resistance; apply to gate to extend seat and packing life or use on the body, interior or exterior, for additional protection.

GENERAL APPLICATION

The OS1700 has many features to provide longer service life, lower maintenance and lower cost of ownership compared to other styles of knife gate valves.

TECHNICAL DATA

Size range:	DN 50 - 1200 (NPS 2 - 48)
Temperature rating:	Up to 200°C (400°F) with proper elastomer selection
Pressure rating:	ASME Class 150
Compliance to:	MSS-SP135 ASME B16.34 or B31.3
Face to face:	Matches MSS-SP135 short pattern

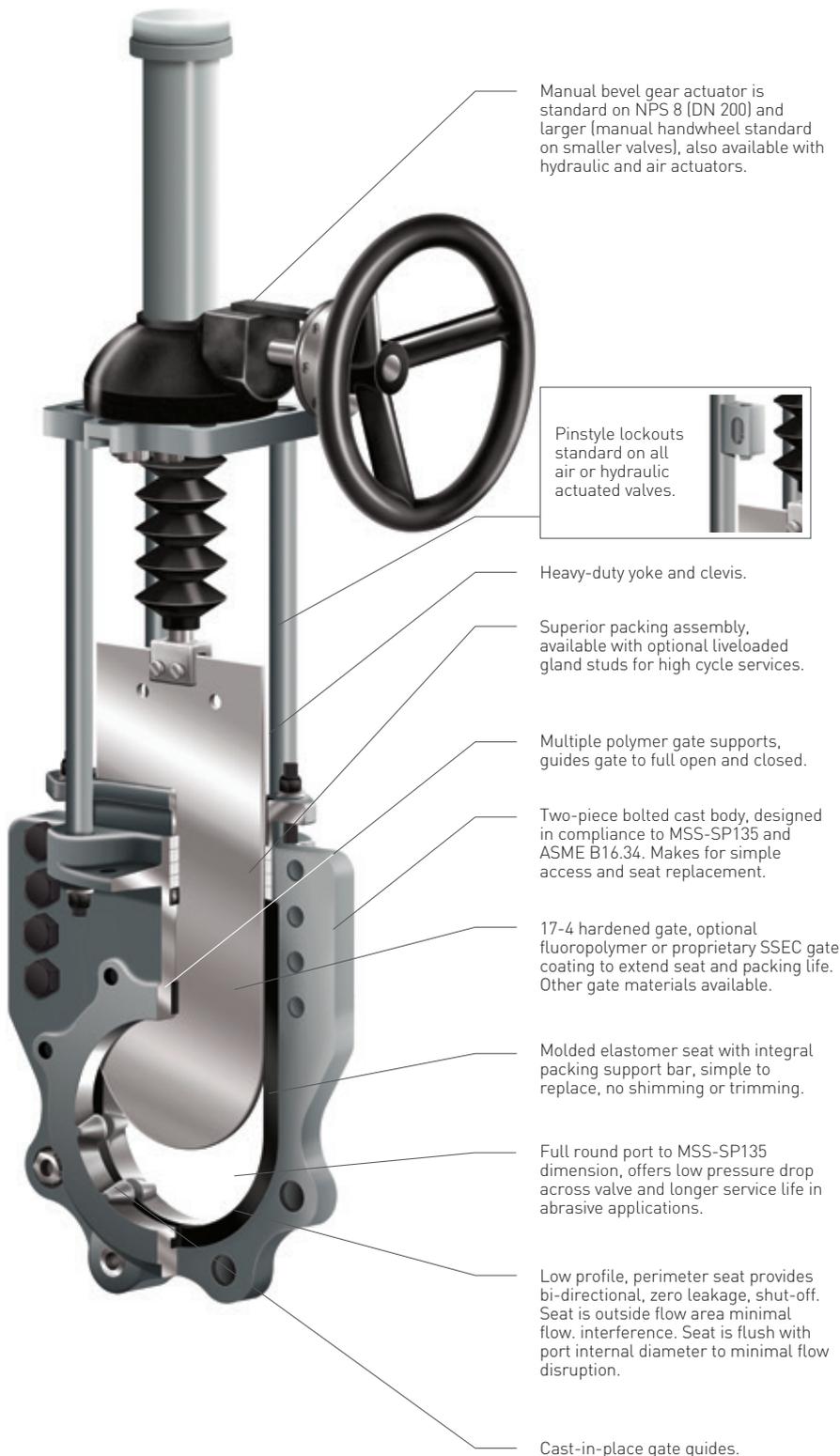
NOTES

1. WCB/LCB Carbon Steel body is 285 psi cold working pressure.
- * Zero leakage is defined as no visible leakage of water past the seat at any test pressure up to the fully rated pressure of the valve.

US Patent 7,815,170

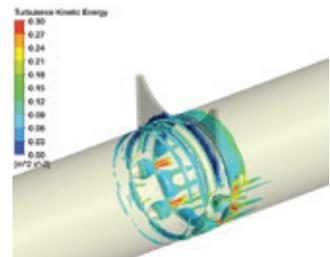
KEYSTONE KNIFE GATE VALVES

FIGURE OS1700

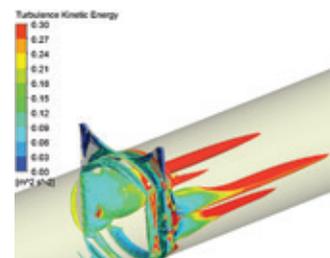


PORT / SEAT DESIGN

The OS1700 features a round port perimeter seat design with an I.D. to match ASME B16.34. With the seat outside the flow area, less disruption to pipeline flow is generated compared to valves with obstructions in the flow path, offering superior life for the valve with a lower cost-of-ownership. Additionally, the smoother flow minimizes wear on the downstream pipe and equipment. Disruptions in the port geometry (reduced port dimension non-round ports) can result in flow being accelerated and even directed into the pipe walls, generating turbulence and breaking down streamlined flow. This results in higher velocities and increased wall shear stresses downstream. Wall shear stress is dependent upon the magnitude of velocity and distance from wall, any turbulent behaviour can lead to disruptive flow conditions, increasing flow velocity near the wall. The greater magnitude of wall shear stress is proportional to abrasive wear.



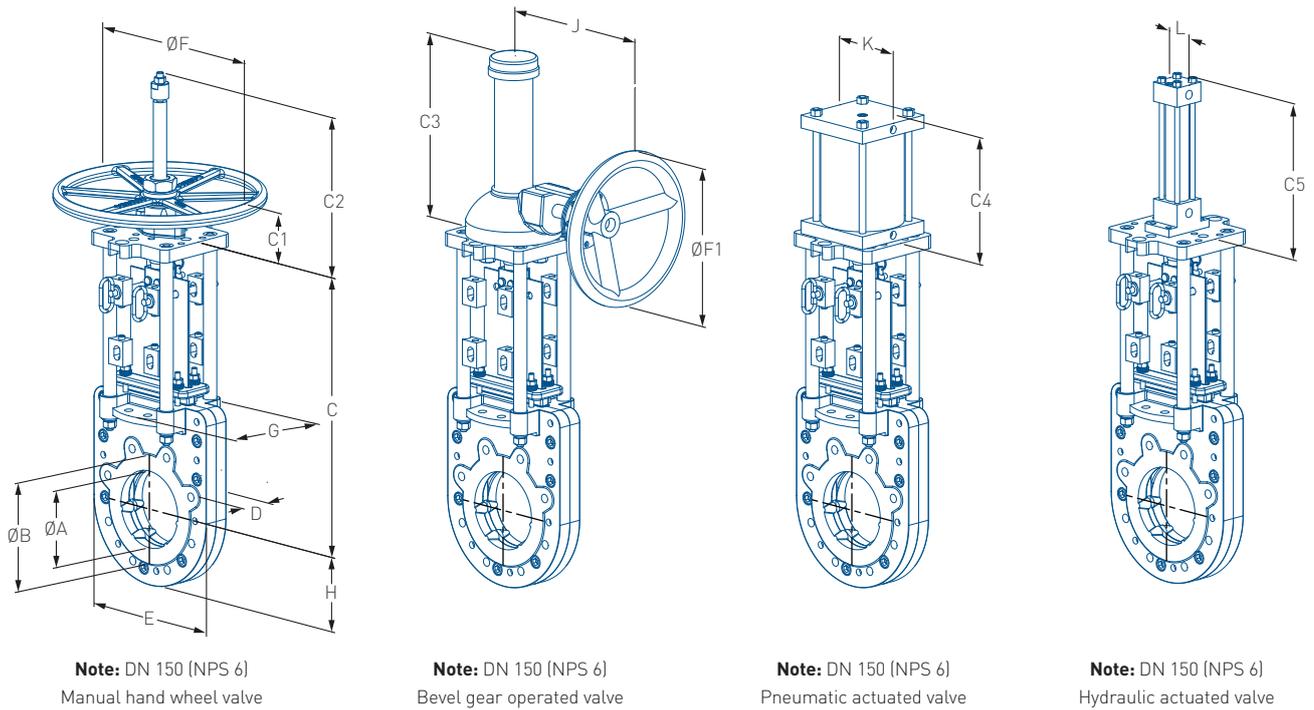
The full-round port with perimeter seat outside the flow minimizes any disruption, reducing wear on the valve and protecting the downstream components from wear.



Non-round ports with mismatched I.D.s. generate significant disruption, causing wear on valve and downstream components.

KEYSTONE KNIFE GATE VALVES

FIGURE OS1700



DIMENSIONS (inches)

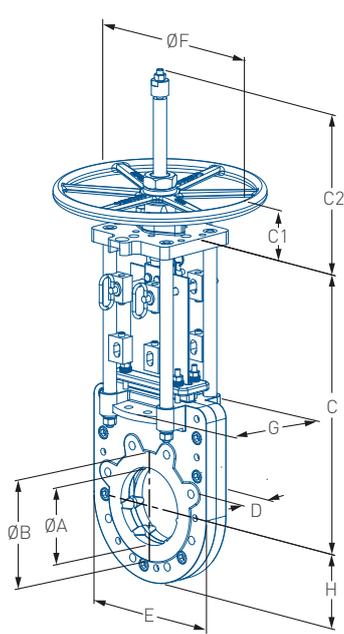
Valve size	H/W mass (lbs)	BG mass (lbs)	Hyd mass (lbs)	Pneu mass (lbs)	Bevel gear model
2	62	107	58	63	BG3
3	71	116	67	72	BG3
4	82	128	78	83	BG3
6	137	176	125	147	BG3
8	-	237	194	241	BG3
10	-	359	319	466	BG3
12	-	427	409	596	BG3
14	-	647	606	903	BG3
16	-	822	811	1234	BG4
18	-	1118	1043	1562	BG42
20	-	1418	1399	2023	BG42
24	-	1930	1954	CS	BG44
26	-	2963	2849	-	BG64
28	-	3709	3591	-	BG64
30	-	4246	4298	-	BG64
32	-	5162	5205	-	BG624
36	-	6842	7020	-	BG624
42	-	CS	CS	-	BG624
48	-	CS	CS	-	CS

NOTES

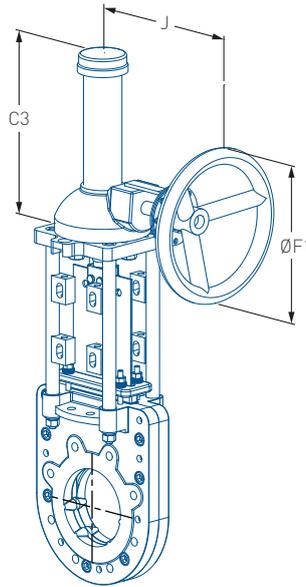
- ØA = Port I. D. dimension per B16.34 Appendix A
 - D = Face to Face dimensions per MSS-SP135- short pattern.
 - G = The maximum valve width clearance dimension for installation.
 - CS = Contact Sales for further information.
1. Pneumatic and hydraulic actuator sizes are based on differential pressure at MAWP.
 2. Hydraulic actuator mass includes weight of oil.
 3. Bevel gear size based on 150 psi differential pressure, contact Sales for BG size to suit full rated pressure differential.
 4. Number of holes is dependent upon flange drilling.
 5. Manual bevel gear actuator is standard NPS 8 and larger (manual handwheel is standard on smaller valves).

KEYSTONE KNIFE GATE VALVES

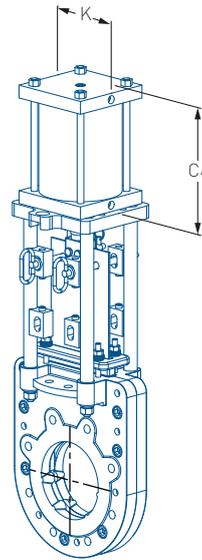
FIGURE OS1700



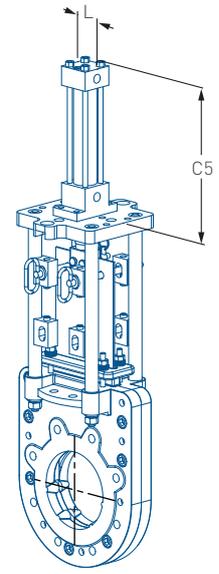
Note: DN 150 (NPS 6)
Manual hand wheel valve



Note: DN 150 (NPS 6)
Bevel gear operated valve



Note: DN 150 (NPS 6)
Pneumatic actuated valve



Note: DN 150 (NPS 6)
Hydraulic actuated valve

DIMENSIONS (mm)

Valve size		H/W mass (kg)	BG mass (kg)	Hyd mass (kg)	Pneu mass (kg)	Bevel gear model																
DN	ØA	ØB	C	C1	C2	C3	C4	C5	D	E	ØF	ØF1	G	H	J	K	L					
50	51	92	348	67	194	229	143	200	52	173	300	300	241	87	317	114	64	28	49	26	29	BG3
80	76	127	399	67	219	279	168	225	52	205	300	300	241	102	317	114	64	32	53	30	33	BG3
100	102	157	447	67	245	281	194	251	51	243	300	300	241	121	317	114	64	37	58	35	38	BG3
150	152	216	545	86	318	356	248	302	57	302	350	300	241	151	317	165	64	62	80	57	67	BG3
200	203	270	691	-	-	383	322	365	70	464	-	450	241	170	317	216	76	-	108	88	109	BG3
250	254	324	825	-	-	457	400	416	73	440	-	450	305	216	317	270	89	-	163	145	211	BG3
300	305	381	911	-	-	533	452	494	76	591	-	450	305	243	355	324	114	-	194	186	270	BG3
350	337	413	1004	-	-	533	508	524	80	581	-	600	325	278	421	375	114	-	293	275	410	BG3
400	387	470	1113	-	-	584	566	588	161	649	-	600	324	310	421	432	127	-	373	368	560	BG4
450	438	533	1290	-	-	674	623	639	92	717	-	450	406	333	438	483	127	-	507	473	709	BG42
500	489	584	1415	-	-	737	689	710	114	788	-	600	406	362	488	533	165	-	643	635	918	BG42
600	591	692	1618	-	-	814	840	812	114	936	-	600	468	425	489	635	165	-	875	886	CS	BG44
650	641	749	1754	-	-	904	-	899	171	1004	-	600	635	454	657	-	191	-	1344	1292	-	BG64
700	692	800	1852	-	-	955	-	950	181	1073	-	600	559	483	658	-	191	-	1682	1629	-	BG64
750	743	857	1953	-	-	1031	-	1039	187	1149	-	600	575	508	658	-	216	-	1926	1950	-	BG64
800	794	914	2055	-	-	1096	-	1082	206	1217	-	600	609	549	658	-	216	-	2341	2361	-	BG624
900	895	1022	2289	-	-	1207	-	1227	226	1410	-	600	705	603	658	-	241	-	3103	3184	-	BG624
1050	1048	1194	2749	-	-	CS	-	1456	248	1566	-	600	880	689	CS	-	321	-	CS	CS	-	BG624
1200	1200	1359	3026	-	-	CS	-	CS	292	1813	-	CS	907	772	CS	-	CS	-	CS	CS	-	CS

NOTES

ØA = Port I. D. dimension per B16.34 Appendix A

D = Face to Face dimensions per MSS-SP135- short pattern.

G = The maximum valve width clearance dimension for installation.

CS = Contact Sales for further information.

1. Pneumatic and hydraulic actuator sizes are based on differential pressure at MAWP.
2. Hydraulic actuator mass includes weight of oil.
3. Bevel gear size based on 1000 kPa differential pressure, contact Sales for BG size to suit full rated pressure differential.
4. Number of holes is dependent upon flange drilling.
5. Manual bevel gear actuator is standard DN 200 and larger (manual handwheel is standard on smaller valves).

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FIGURE OS1700

OPTIONAL SSEC: SYNERGISTIC SURFACE ENHANCEMENT COATING (SEE NOTE 1)

Well suited for use in applications where corrosive media or abrasion is a problem, SSEC is ideal for applications with sticky, viscous media, scaling/plating or where galling is a problem. The low coefficient of friction eliminates “stick-slip” problems, reduces drag and increases sleeve life. Often improves micro finish of a gate or body. SSEC is a synergistic coating that combines the advantages of anodizing, plating or thermal spraying with the controlled infusion of polymers, dry lubricants and other materials to provide an entirely new composite with improved properties to the base metal. This coating will work on most metal surfaces and creates a harder-than- steel surface, excellent release (non-stick) properties, protects against wear, corrosion and chemical attack and provides permanent lubricity and a superior resistance to static buildup of material. SSEC has a hardness/wear and abrasion rating of up to rc 68 equilibrium Wear rate (eWr) using Taber abrasion testing methods (CS-10 wheel): 2.0 - 4.0 mg per 1000 cycles. SSEC is also very corrosion resistant and will survive 500 hours in ASTM B-117 salt spray. (coating thickness will affect corrosion resistance.) Suitable for use on steel, stainless, copper, brass, bronze, titanium, and aluminum.

	Coefficient of friction	Temperatures (a)	Thickness (mils)	pH range	Abrasion	Anti-stick (lubricity)	Chemical resistance
SSEC	As low as 0.09	-250°F to 550°F (b) (-157°C to 288°C)	0.2 to 3 excellent	5 to 8.5	Good	Excellent	Fair
SSEC+	Static as low as 0.10 Dynamic as low as 0.09	-250°F to 500°F (-157°C to 260°C)	0.5 to 2.0	5 to 8.5	Good	Excellent	Good

NOTES

1. Other fluoropolymer coatings available, contact factory for details.
2. Stated temperatures are above normal operating temperature of the valve and are not to be considered as the rated temperature of the valve.
3. SSEC will survive temperatures of 760°C [1400°F], but all lubricant will dissipate above +427°C [800°F]
4. Short term exposure up to 177°C [350°F]

RECOMMENDED SPECIFICATIONS

Bi-directional high pressure knife gate valve, ASME Class 150 to MSS-SP135 with flush molded HNBR seat (or other elastomer as required for the application) with round port , I.D. to match MSS-SP135 pipe size requirements, 17-4 ph stainless steel hardened gate with polymer gate support discs to support gate through the full length of the stroke. To prevent atmospheric leakage, valves shall be equipped with a packing assembly compressed by an adjustable gland follower. Valve shall be seat leak tested with an allowable leak rate to ZERO* leakage with gate in the fully closed position up to fully rated pressure of valve. Valve shall be repairable with seat, packing, gate, gate supports and body replaceable.

KEYSTONE KNIFE GATE VALVES

FIGURE OS1700

SELECTION GUIDE

Example	150	OS1700	170	AN150
Valve size:	DN 50 - 1200 (NPS 2 - 48)			
Figure no:	Bi-directional resilient seated, OS1700 Class 150 rated			
Trim	See table			
End connections (to suit):	Class 150 UNC threads (Note 5) ASME B16.5			

NOTES

5. Threaded holes for flange bolting shall be tapped in accordance with ASME B 1.1 Coarse thread series Class 2B for bolts 1 inch and smaller, and shall be tapped to the 8-Thread series Class 2B for bolts 1½ inches or larger.
6. To minimize risk to personnel, Emerson recommend the use of purpose built guards and shrouds, consult factory for details.

Trim code	Body	Gate	Seat	Yoke	Stem	Packing
300	WCB/LCB	17.4 PH	EPDM	A36	304S/S	AFPL
301	WCB/LCB	17.4 PH	Natural rubber	A36	304S/S	AFPL
302	WCB/LCB	17.4 PH	NBR	A36	304S/S	AFPL
303	WCB/LCB	17.4 PH	HNBR	A36	304S/S	AFPL
304	WCB/LCB	17.4 PH	FKM	A36	304S/S	AFPL
305	CF8M	17.4 PH	EPDM	A36	304S/S	AFPL
306	CF8M	17.4 PH	Natural rubber	A36	304S/S	AFPL
307	CF8M	17.4 PH	NBR	A36	304S/S	AFPL
308	CF8M	17.4 PH	HNBR	A36	304S/S	AFPL
309	CF8M	17.4 PH	FKM	A36	304S/S	AFPL

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