



## CLARKSON HEAVY DUTY KNIFE GATE VALVE

FIGURE KGA+

The new Clarkson KGA+ heavy duty slurry valve builds on the 35 years of in-service experience with the KGA and provides new features including an improved secondary seal and full face flanges



### FEATURES

- Improved secondary seal is capable of being lubricated without disassembly, simplifying valve maintenance.
- Full flange body design with available flange drilling including ASME B16.5, PN10 and PN16 (per DIN and BS standards), and Australian Table D and E (per AS 2129) among others.
- Simplified two-piece body design allows for easier rebuilds.
- Higher optional pressure rating possible with selected gate materials, many KGA+ valves can be rated up to 200 psi.
- Meets a wide range of abrasion, corrosion, temperature, and pressure requirements.
- Can be used in wet or dry services easily dealing with large, heavy particles and tramp material.
- 100% isolation; bubble tight shut-off results in absolutely zero downstream leakage.
- Heavy duty, field replaceable elastomer sleeves with internal stiffener.
- Double-seated design provides bi-directional flow and shut-off.
- Unobstructed flow eliminates turbulence, minimizes pressure drop across valve.
- No seat cavity where solids can collect and prevent full gate closure.
- No metal parts in contact with the flowing slurry.
- No gate or stem packing is required, eliminating packing leakage and maintenance.
- Adaptable frame (yoke) design featuring a top removal stem nut.

### GENERAL APPLICATION

- Mining
- Power
- Pulp and paper
- Alumina
- Chemical
- Cement

### TECHNICAL DATA

Size range:	NPS 3-60 (DN 80-1500)
Temperatures:	Standard sleeve rated to 180 °F, up to 400 °F with proper elastomer selection.
Pressure rating:	NPS 3 - 24 = 100 psi NPS 26 - 42 = 75 psi NPS 48 - 54 = 50 psi NPS 60 = 30 psi
Sleeve:	Natural rubber (standard)

### NOTES

1. 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.
2. Not all valves can be rated to 200 psi, contact local sales representative for complete information on optional gate materials and pressure ratings.
3. NPS 60 valves feature a bolt-on secondary seal

U.S. patent 8,056,882 and 5,890,700

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

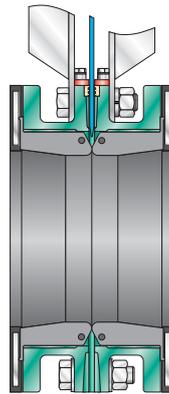
## FIGURE KGA+

### HOW THE KGA+ SLEEVES WORK

When the gate is open, matching elastomer sleeves seal against each other under a high compression load, creating the valve pressure vessel and provide an unobstructed port, protecting metal parts from the flowing slurry. As the gate strokes to close, the gate tip creates a gap between the facing sleeves, allowing any media that could potentially clog or jam the valve to be purged out from between the sleeves, and potentially expelled outside the valve housing to atmosphere. When closed, the sleeves seal against the gate face, isolating upstream from downstream providing positive sealing action. The sleeve has an integrally molded encapsulated internal stiffener ring designed to maintain the roundness of the sleeves, resisting the heavy shearing forces during actuation while retaining the internal line pressure.

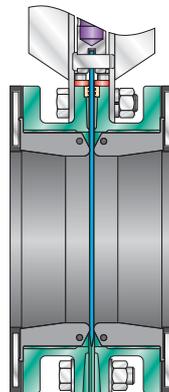
#### OPEN POSITION:

- Gate positioned above seals, out of flow
- Matching elastomer sleeves seal against each other under a high compression load
- Sleeves act as pressure vessel
- No metal parts in contact with slurry
- Unobstructed port area eliminates turbulence, minimizes pressure drop across valve
- No seat cavity where solids can collect and prevent full gate closure



#### CLOSED POSITION:

- Gate travels through sleeves to provide blind flange shut-off, allowing opportunity for media to expel to atmosphere
- 100% Isolation-bubble tight shut-off results in absolutely zero downstream leakage
- When properly installed and maintained, the KGA+ is designed to provide man-safe isolation
- Double-seated design provides bi-directional flow and shut-off
- Controlled stroke prevents gate from penetrating too far, minimizing stress on sleeve



### IMPROVED SECONDARY SEAL

The KGA+ features the improved secondary seal with the ability to lubricate the gate without need to disassemble the valve. Silicon-based lubricant is introduced into the seal, all the way to the gate, through external lubrication fittings. The lubrication is held inside a series of rib cavities built into the seal, each time the gate passes through the seal, a small amount of the long lasting lubricant is released, providing smoother gate movement and longer seal life, as well as reducing the force required to actuate the gate. The one-piece, molded elastomer seal is dynamically self-adjusting, eliminating the need for continual adjustment required with conventional style packing. It eliminates any leakage between the knife gate and top of the valve body in any orientation and prevents any outside contaminants from getting inside the valve. The seal is replaceable and can be changed while the gate is in the fully open position.

### STANDARD CONFIGURATION

- Cast ductile iron or carbon steel housings.
- 316 stainless steel gate rated for:
  - 100 psi (NPS 3 thru 24) [6.9 bar (DN 80-600)]
  - 75 psi (NPS 26 thru 42) [5.2 bar (DN 650-1050)]
  - 50 psi (NPS 48 thru 54) [3.4 bar (DN 1200-1350)]
  - 30 psi (NPS 60) [2 bar (DN 1500)]
- Carbon steel actuator support frames.
- Flat-faced body flanges to match ASME B16.5 Class 150 (NPS 3 thru 24 (DN 80-600)) or MSS SP44 (NPS 26 thru 60 (DN 650-1500)) companion flange dimensions
- High tear strength natural rubber sleeves with encapsulated stiffener ring
- Sizes NPS 10 thru 60 (DN 250-1500) include natural rubber covered carbon steel sleeve retainer flanges

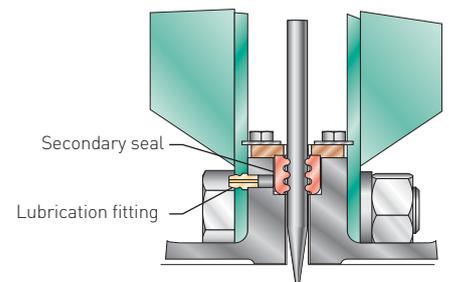
### OPTIONS

**Note:** some optional gate materials allow higher pressure ratings, contact Emerson for additional information.

- 316L S/S
- 317L S/S
- 17-4 PH™
- 2507
- 317L S/S
- Alloy 20
- Alloy C-276
- 2205

#### Others

- Natural rubber-covered carbon steel sleeve retainer flanges are (NPS 3 thru 8 (DN 80-200))
- Sleeve elastomers (see page 3)
- Stem covers
- Splash guard devices (see page 4)
- Actuators (see page 4)
- Control accessories



# CLARKSON HEAVY DUTY KNIFE GATE VALVE

## FIGURE KGA+

### AVAILABLE SLEEVE MATERIALS

**Natural rubber (standard):** This category includes all natural gum elastomers, both filled and unfilled and synthetic polyisoprene. Has high tensile strength, superior resistance to tear and abrasion and good resistance to heat build-up. Maximum continuous operating temperature 180 °F (82 °C).

**EPDM-HTP:** Advantages - excellent resistance to heat, ozone and sunlight, very good flexibility at low temperature, good resistance to alkalis, acids, and oxygenated solvents and superior resistance to water and steam. Limitations - poor resistance to oil, gasoline, and hydrocarbon based solvents. Maximum continuous operating temperature 300 °F (150 °C).

#### Optional available sleeve materials:

Emerson offers optional elastomers. These may be available upon request and review of application. Contact Emerson for additional information.

**NBR (Nitrile):** Advantages - very good resistance to petroleum based greases/oils, silicone greases/oils and nonoxidizing chemicals. Good resistance hydrocarbon based fuels. Limitations - Inferior resistance to ozone and oxygenated solvents. Maximum continuous operating temperature 275 °F (135 °C).

**HNBR (Nitrile-HTP):** Same as above except maximum continuous operating temperature 325 °F (163 °C).

**Chlorobutyl:** Advantages - Outstanding impermeability to gases and vapor, very good resistance to heat, oxygen, ozone and sunlight. Excellent energy absorption and resistance to alkalis and oxygenated solvents, superior resistance to water and steam. Limitations - Poor resistance to oil, gasoline and hydrocarbon based solvents, poor resilience. Maximum continuous operating temperature, 230 °F (110 °C).

#### OEM replacement sleeves and parts:

To maintain the expected performance always use genuine Clarkson OEM sleeves and other replacement parts from Emerson. Genuine sleeves are easily recognized by the laser etched identification marks; allowing traceability. The use of copycat parts may invalidate any remaining warranty.

### FEATURES



Heavy-duty frame (yoke) designed to accept top removal stem nut, bevel gear or cylinder actuator.

The stainless steel gate is completely withdrawn from the process flow in the open position and can be inspected or replaced without taking the valve out of service.

316 stainless steel gate is standard

Full flanged body housing to suit ASME B16.5/150 through 24", sizes 26" and larger suit MSS-SP44

Improved secondary seal allows lubrication without disassembly

Double sleeved configuration is designed to provide a "blind flange" shut-off when the gate is closed. Any potential leakage should be to atmosphere and not downstream.

Elastomer sleeve molded with an integral stiffener ring to properly center the sleeve in the valve body housing and resist the high shearing forces present when the gate cycles.

Elastomer sleeves provide unobstructed flow area, no metal-to-metal contact, no guides or wedges.

Elastomer covered retainer flanges eliminates need for gaskets (optional on sizes NPS 3 to 8, standard on NPS 10 and larger).

Discharge, clean-out area. Any discharge purged from valve can be controlled with optional bottom splash guard device.

### SPLASH CONTROL

It is normal for the KGA+ to discharge media during opening and closing cycles. This helps prevent any solids from building up between the sleeves that would prevent a tight seal when the valve is fully open or closed. The KGA+ discharge can be controlled (not contained) with the use of an optional splash guard device such as a splash bucket or splash plate.

The splash bucket (illustrated above) bolts to the bottom of the housing with the use of an adapter plate; no need to remove the KGA+ body bolts. It has a large NPT drain port and an integral NPT flush inlet to facilitate flushing. Standard in WCB, it is also available in corrosion resistant materials.

The splash plate is provided with ports to flush and or drain away accumulated solids that may prevent full gate closure. Flush water can both enter and exit the clean-out area through the drain plate ports.

These splash guard devices can be connected to a customer supplied piping system to provide a means of carrying the discharge away, to a permanent drain or other collection point. [Any additional piping system must not be capped or otherwise prevented to flow freely as this may cause eventual clogging of valve.]

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

FIGURE KGA+

## SPECIFICATION CLARKSON KGA+ SLURRY KNIFE GATE VALVE

Heavy duty, slurry knife gate valve shall be flat-face flanged, packingless, rubber-lined, bidirectional valve suitable for a wide range of industrial applications. The valve sleeves seal against each other under a high compression load when the valve is open, creating the valve pressure vessel. Isolation shall be provided by the gate passing through the elastomer sleeves, isolating upstream from downstream in such a manner that media in the line which could potentially clog or jam the valve is purged out from between the sleeves to atmosphere, through the bottom of the valve housing. The full port design shall have no internal obstructions and will provide a "blind flange" shut-off when the gate is closed.

The valve's sealing surface is to be between two thick, rubber sleeves that are compressed into the valve housings. The sleeve will be molded with an internal stiffener ring that locates the sleeve in the valve housing and helps the sleeves resist the high shearing forces present when the gate is driven between them. Valve shall have a one-piece molded elastomer secondary seal to eliminate any leakage between the knife gate and top of the valve body in any orientation, prevent any outside contaminants from getting inside the valve housing and lubricate the gate as it cycles through the seal, providing smoother gate movement and longer seal life, as well as reducing the force required to actuate the gate.

The secondary seal shall be dynamically self-adjusting eliminating the need for continual adjustment and shall include the capability of adding Silicon based lubricant to the internal chambers through provided fittings as needed without removing seal. The stainless steel gate shall be completely withdrawn from the process flow when in the open position, and can be inspected and replaced, if necessary, without taking the valve out of service. The valve body housing to be full flanged, bolt pattern to suit ASME B16.5/150 through NPS 24 and MSS-SP44 above NPS 24. (Other bolt patterns available.).

Valve is equipped with a heavy steel fabricated handwheel frame (yoke) which can be converted to bevel gear in the field, complete with a 304 stainless steel rising stem (except cylinder actuated valves).

All nonferrous exterior surfaces shall be painted to factory standard. Specify Clarkson KGA+ slurry knife gate valve from Emerson.

## ACTUATION OPTIONS



MH Manual handwheel



BG Manual bevel gear



AC Air cylinder



HC Hydraulic cylinder

Optional Open-Closed lockout brackets are designed to resist the normal MH or BG operating thrust with suitable lockout pin. In order to assure complete lockout compliance, any AC, HC or EM actuated valve must be placed in a ZERO ENERGY STATE by isolating all potential energy sources including electricity, operator supply air or hydraulic fluids.

Please contact factory for complete details



EM Electro-mechanical



Hydra-helper

**Note:** not all actuators shown are available on all valve sizes.

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

FIGURE KGA+

## SPECIAL COATINGS TO ENHANCE SERVICE LIFE

Emerson is a leader in coating technology with broad experience using special coatings in various industries and applications on a worldwide basis. The coatings below offer advantages in service life and operation, improving performance and adding value.

### SSEC: Synergistic surface enhancement coating

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.

### SSEC+: Synergistic surface enhancement coating plus

Select SSEC+ for additional corrosion resistance, about 3 times better than the base SSEC coating (based on ASTM B117 salt spray testing). Abrasion resistance, lubricity, corrosion resistance are similar to the base SSEC. SSEC+ is not recommended for strong acids.

### TBSEC: Tungsten-based surface enhancement coating

For applications where maximum wear resistance on ferrous and nonferrous metals is needed over a broad temperature range, Emerson offers TBSEC - Tungsten-based surface enhancement coating. TBSEC is a specific combination of ceramics, metals and proprietary polymers that produces a moisture proof and nonporous structural integrity matrix. Adding TBSEC improves the base metal surface properties and is ideal for applications where galling or sticky media and scaling/plating is a problem. Applied by a thermal spray process, this coating will work on most all metal surfaces and has excellent release (non-stick) properties, protects against wear and chemical attack as well as it features excellent abrasion and galling resistance, and provides permanent lubricity and a superior resistance to static buildup of material. TBSEC has excellent abrasion resistance as well as various chemical and acid resistances. Used on steel, stainless, copper, brass, bronze, titanium, and aluminum.

### PBSEC: Polymer-based surface enhancement coating

PBSEC is a polymer-based impregnated surface enhancement coating ideal for applications where maximum corrosion resistance on ferrous and nonferrous metals is needed over a broad temperature range. Like SSEC, PBSEC exhibits a very low coefficient of friction, providing improved lubricity and reducing friction as the gate slides through the sleeves thus increasing the sleeve life. It is ideal for applications where galling or sticky media and scaling/ plating is a problem. It will work on most all metal surfaces and has excellent release (non-stick) properties. PBSEC features excellent abrasion and galling resistance and a superior resistance to static buildup of material. It has excellent chemical and abrasion resistance as well as high oxidative stability. Can be applied to steel, stainless, copper, brass, bronze, titanium, and aluminum.

### PBSEC-80: Polymer-based surface enhancement coating

PBSEC-80 takes all the great qualities of the PBSEC coating and amplifies them. Those qualities include; release (non-stick) properties, protection against wear, chemical attack, corrosion, galling and abrasion resistance. PBSEC-80 also provides permanent lubricity and a superior resistance to static buildup of material. PBSEC-80 is a proprietary blend of engineered polymers that exhibit a very low coefficient of friction. This is placed on top of an inert ceramic base coating that becomes infused with the PBSEC coating. Used on steel, stainless, brass, copper, titanium, bronze and aluminum.

### NOTE

Emerson does not recommend coatings be used as an attempt to reduce metallurgy of the base material required for the application. Coatings from Emerson are used on all our knife gate and slurry valve products.

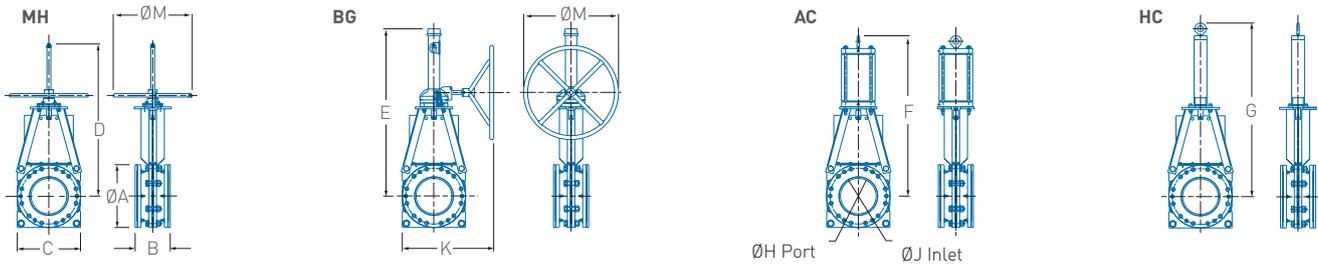
## COATING SELECTIONS

	Coefficient of friction	Temperatures <sup>[1]</sup>	Thickness (Mils)	pH range	Abrasion	Anti-stick (lubricity)	Chemical resistance
SSEC	As low as 0.09	-250 °F to 550 °F <sup>[2]</sup> (-157 °C to 288 °C)	0.2 to 3	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
TBSEC	As low as 0.06	-200 °F to 550 °F (-129 °C to 288 °C)	2 to 10	4 to 10	Excellent	Fair	Fair
PBSEC	Static as low as 0.4 Dynamic as low as 0.3	Cryogenic to 275 °F <sup>[3]</sup> (135 °C)	3 to 5	Below 0 to 14	Fair	Not Recommended	Excellent
PBSEC-80	0.19	Cryogenic to 300 °F (149 °C)	10 to 20	0 to 14	Excellent	Fair	Excellent

1. Stated temperatures are above normal operating temperature of the valve and are not to be considered as the rated temperature of the valve.
2. SSEC will survive temperatures of 1400 °F (760 °C), but all lubricant will dissipate above+ 800 °F (427 °C).
3. Short term exposure up to 350 °F (177 °C)

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

FIGURE KGA+



**DIMENSIONS (inches) AND WEIGHTS (lbs)**

Valve size NPS	ØA*	B**	C	Centerline to top				ØH	ØJ	K	Handwheel		Weight (lbs)			
				MH D	BG E	AC F	HC G				MH ØM	BG ØM	MH	BG	AC	HC
3	7.50	6.88	8.88	18.93	21.38	21.38	24.56	2.41	2.81	15.81	12	12	50	127	85	50
4	9.00	6.88	11.00	22.00	23.33	23.94	27.63	3.33	3.88	16.88	12	12	64	141	130	70
6	11.00	7.00	13.00	28.00	31.82	30.18	34.00	5.38	5.81	17.88	16	12	98	175	180	98
8	13.50	7.25	15.25	32.90	34.00	35.00	38.31	6.88	7.75	19.00	20	12	135	212	210	135
10	16.00	8.88	16.56	38.75	42.63	40.50	44.25	9.06	9.81	23.40	20	24	198	275	310	175
12	19.00	10.13	21.00	-	47.45	45.50	53.13	10.75	11.50	25.50	-	24	-	427	669	360
14	21.00	10.13	22.75	-	53.31	53.43	57.80	12.50	13.25	26.38	-	24	-	448	720	414
16	23.50	11.00	24.25	-	57.20	60.19	64.06	14.00	14.75	27.62	-	24	-	573	1125	550
18	25.00	12.25	26.50	-	66.75	67.62	68.75	14.88	16.75	30.35	-	24	-	875	1330	950
20	27.50	14.13	28.38	-	71.94	73.50	74.44	16.56	18.50	31.29	-	24	-	1054	1680	1200
24	32.00	14.63	33.80	-	86.19	88.00	89.63	21.19	23.00	34.75	-	24	-	-	2200	1400
26	34.25	14.38	36.75	-	-	-	93.63	23.50	25.00	-	-	-	-	-	-	1700
28	36.50	14.88	36.75	-	-	-	93.63	23.50	25.00	-	-	-	-	-	-	1800
30	38.75	15.57	41.50	-	-	-	106.19	26.75	29.00	-	-	-	-	-	-	2400
32	41.75	16.19	41.50	-	-	-	106.19	26.75	29.00	-	-	-	-	-	-	2900
36	46.25	18.50	48.25	-	-	-	119.25	31.88	35.00	-	-	-	-	-	-	3800
42	53.00	21.13	56.50	-	-	-	145.68	38.25	41.00	-	-	-	-	-	-	5700
48	59.50	21.13	60.35	-	-	-	158.25	43.98	46.75	-	-	-	-	-	-	6970
54	66.19	21.13	67.25	-	-	-	172.88	48.98	51.75	-	-	-	-	-	-	8275
60	73.00	21.13	77.00	-	-	-	188.25	57.13	59.50	-	-	-	-	-	-	9500

**DIMENSIONS (mm) AND WEIGHTS (kgs)**

Valve size DN	ØA*	B**	C	Centerline to top				ØH	ØJ	K	Handwheel		Weight (kgs)			
				MH D	BG E	AC F	HC G				MH ØM	BG ØM	MH	BG	AC	HC
80	190.50	174.75	225.55	480.82	543.05	543.05	623.82	61.21	71.37	401.57	305	305	22.7	57.6	38.6	22.7
100	228.60	174.75	279.40	558.80	592.58	608.08	701.80	84.58	98.55	428.75	305	305	29.0	64.0	59.0	31.8
150	279.40	177.80	330.20	711.20	864.00	766.57	863.60	136.65	147.57	454.15	406	305	44.5	79.4	81.6	44.5
200	342.90	184.15	387.35	835.66	378.21	889.00	973.07	174.75	196.85	482.60	610	305	61.2	96.2	95.3	61.2
250	406.40	225.55	420.62	984.25	1082.80	1028.70	1123.95	230.12	249.17	594.36	610	610	89.8	124.7	140.6	79.4
300	482.60	257.30	533.40	-	1205.23	1155.70	1349.50	273.05	292.10	647.70	-	610	-	193.7	303.5	163.3
350	533.40	257.30	577.85	-	1354.07	1357.12	1468.12	317.50	336.55	670.05	-	610	-	203.2	326.6	187.8
400	596.90	279.40	615.95	-	1452.88	1528.83	1627.12	355.60	374.65	701.55	-	610	-	259.9	510.3	249.5
450	635.00	311.15	673.10	-	1695.45	1717.55	1746.25	377.95	425.45	770.89	-	610	-	396.9	603.3	430.9
500	698.50	358.90	720.85	-	1827.28	1866.90	1890.78	420.62	469.90	794.77	-	610	-	478.1	762.0	544.3
600	812.80	371.60	858.52	-	2189.23	2235.20	2276.60	538.23	584.20	882.65	-	610	-	-	997.9	635.0
650	869.95	365.25	933.45	-	-	-	2378.20	596.90	635.00	-	-	-	-	-	-	771.1
700	927.10	378.00	933.45	-	-	-	2378.20	596.90	635.00	-	-	-	-	-	-	816.5
750	984.25	395.48	1054.10	-	-	-	2697.23	679.45	736.60	-	-	-	-	-	-	975.2
800	1060.45	411.23	1054.10	-	-	-	2697.23	679.45	736.60	-	-	-	-	-	-	1089.0
900	1174.75	469.90	1225.55	-	-	-	3028.95	809.75	889.00	-	-	-	-	-	-	1724.0
1050	1346.20	536.60	1435.10	-	-	-	3700.27	971.55	1041.40	-	-	-	-	-	-	2585.5
1200	1511.30	536.60	1532.89	4019.55	1117.09	-	-	-	1187.45	-	-	-	-	-	-	3161.5
1350	1681.23	536.60	1708.15	-	-	-	4391.15	1244.09	1314.45	-	-	-	-	-	-	3754.8
1500	1854.20	536.60	1955.80	-	-	-	4781.55	1451.10	1511.30	-	-	-	-	-	-	4309.1

\* Flange diameter: Designed to match ASME B16.5/150 through NPS 24, MSS-SP44 above NPS 24

\*\* Face-to-face includes the retainer flanges, all sizes. Retainer flanges are standard sizes NPS 10 and larger, optional on NPS 8 and smaller.

Add ¼ to ½ an inch for ease of installation

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

## FIGURE KGA+

### WELL SUITED FOR AGGRESSIVE APPLICATIONS

The Clarkson KGA heavy duty slurry valve has been performing in the most difficult slurry applications worldwide for over 35 years. First introduced in 1978, the KGA was designed to meet a wide range of abrasive, viscous, corrosive and scaling applications in a wide range of temperature and pressure requirements. Now, with a range of improvements, the Clarkson KGA+ is even better suited to the most difficult services.

The Clarkson slurry valve literally grew up in the mining industry. The original KGA slurry valve was developed in 1978 and was immediately successful, gaining worldwide recognition as a problem-solving, innovative isolation valve in extremely difficult applications. Building upon that success, the KGD, KLB, KGL, KGF, KGF-HP, C-valve and now the new KGA+ followed, bringing the most comprehensive line of slurry valve products to the mining industry.

While mining methods around the world vary depending on the material being extracted, many similar processes exist, all of which are well suited for the Clarkson slurry valve.

- Tailings collection
- SAG mill thickener underflow
- Process water
- Cyclone isolation
- Ball mill isolation and diversion
- Tailings discharge
- Isolation feed valve
- Secondary cyclone manifold

Coal fired power plants are another process where you find thousands of Clarkson valves installed. The undisputed leader in wet flue-gas desulfurisation, the Clarkson valve is also well suited for many other power plant applications.

- Scrubber isolation
- Slurry diversion
- Bottom ash slurry
- Fly ash
- Bottom ash
- Pyrite separation
- Pump discharge isolation
- Bottom ash isolation
- Sluice line
- Lime slurry isolation
- Reaction slurry
- Pump isolation
- Lime storage diversion
- Absorber tower isolation

Clarkson valves are also found in many other industries installed in aggressive, abrasive applications that require the positive action and 100% shutoff found in the Clarkson slurry valve. In some cases, an application specific trim can be developed for optimum performance, such as the below example for Alumina processing.

### ALUMINA TRIM PACKAGE

The KGA+ is primarily used as a process isolation valve or as a maintenance isolation valve to prevent media from flooding a pump during an outage or prevent a tank draining during a maintenance shutdown.

#### Specify:

KGA+ [SIZE] AC - B6 - D13 - H2H20 - L2 - R10

B6 = Stem and rod cover

H2 = 17-4 ph SS gate rated up to 200 psi

L2 = Gate lockout

= EPDM -HTP Coated retainer flanges

D13 = EPDM-HTP Encapsulated sleeves

H20 = SSEC Gate treatment to Lower oxidation and prevent media from R10 sticking to or abrading the gate

An alloy 2205 gate (H12) is suitable in many cases, some installations would use HNBR sleeves suitable for 325 °F (163 °C).



Other industries where Clarkson valves may be found:

- Pulp and paper
- Phosphates
- Steel/Metals
- Chemical
- Cement

# CLARKSON HEAVY DUTY KNIFE GATE VALVE

## FIGURE KGA+

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### GLOBAL LEADER IN SLURRY VALVE TECHNOLOGY

Field proven, heavy duty, trouble-free slurry valves for abrasive, corrosive and coarse slurries. The Clarkson slurry valves from Emerson feature elastomer sleeves offering the ultimate in protection against heavy slurries. They provide both high performance and long life in the toughest of environments.

### KGF AND HGF-HP HIGH PRESSURE SLURRY VALVE

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For high pressure slurry application, the only choice is the KGF slurry knife gate valve. It offers the same features and performance of the KGA or KGD but in a 300, 450, 740 psi design.

- KGF: 300 and 450 psi
  - Sizes NPS 3 to 36 (DN 80 to 900)
- KGF-HP: Up to 740 psi CWP
  - Sizes NPS 3 to 36 (DN 80 to 900)



### KGD WAFER SLURRY KNIFE GATE VALVE

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- MSS face-to-face dimension
- 100% full port
- Double-seated, bi-directional shutoff design
- Exclusive, dynamic self-adjusting sleeve design
- Standard operating pressures up to 150 psi; higher pressures available
- Sizes NPS 2 to 24 (DN 50 to 600)



### KLB AND KGL LINEAR LINE BLINDS

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The KLB is based on the KGD and the KGL is derived from the KGA. Both provide man-safe isolation in a blanking application.

- Man-safe line blind
- No downstream leakage even with sleeve failure
- KLB: Sizes NPS 2 to 24 (DN 50 to 600)
- KGL: Sizes NPS 3 to 60 (DN 80 to 1500)



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