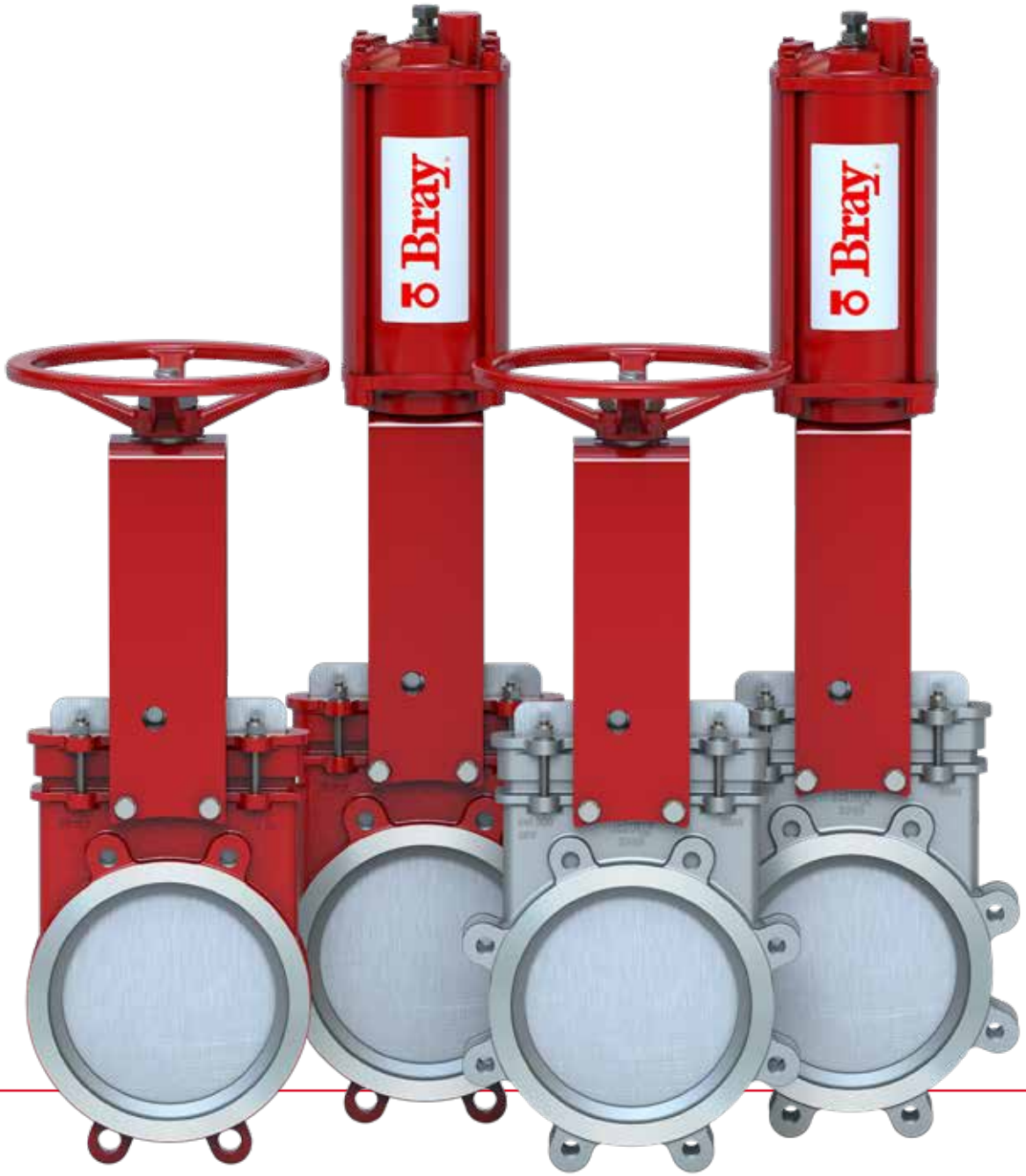
SERIES 943/953

UNIDIRECTIONAL KNIFE GATE VALVES

TECHNICAL SALES MANUAL



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CONTENTS

OVERVIEW

The Series 943 features a full lug and the Series 953 features a semi-lug, single piece cast body for demanding applications. The standard metal-to-metal seating is engineered for general purpose on/off service and isolation of clean, dirty, corrosive, abrasive, viscous, and high temperature media. Optional zero leakage resilient seats are available.

SPECIFICATIONS

Size Range	NPS 2 to 24 | DN 50 to 600	
	943	**953**
Pressure Rating	2-24 150psi | 50-600mm 10 bar	2-10 150psi | 50-250mm 10bar
		12-16 90psi | 300-400mm 6bar
		18 75psi | 450mm 5bar
		20-24 60psi | 500-600mm 4bar
Body Style	Single Piece | Lug	Single Piece | Semi Lug

DESIGN STANDARDS

Face-to-Face	MSS SP-81	
Flange Drilling	ASME B16.5 CL150	
Design Standard	**943** | MSS SP-81	**953** | Manufacturer Standard
Testing Standard	MSS SP-151	

STANDARD CONSTRUCTION

	943	**953**
Body	CF8M (316)	Cast Iron
Gate	316	304
Seat	Integral Metal	Integral Metal
Stem	304	304
Gland	CF8	Ductile Iron
Packing	PTFE Impregnated Synthetic Fiber + Quad Seal	PTFE Impregnated Synthetic Fiber + Quad Seal
Topworks	Carbon Steel	Carbon Steel

MATERIAL OPTIONS

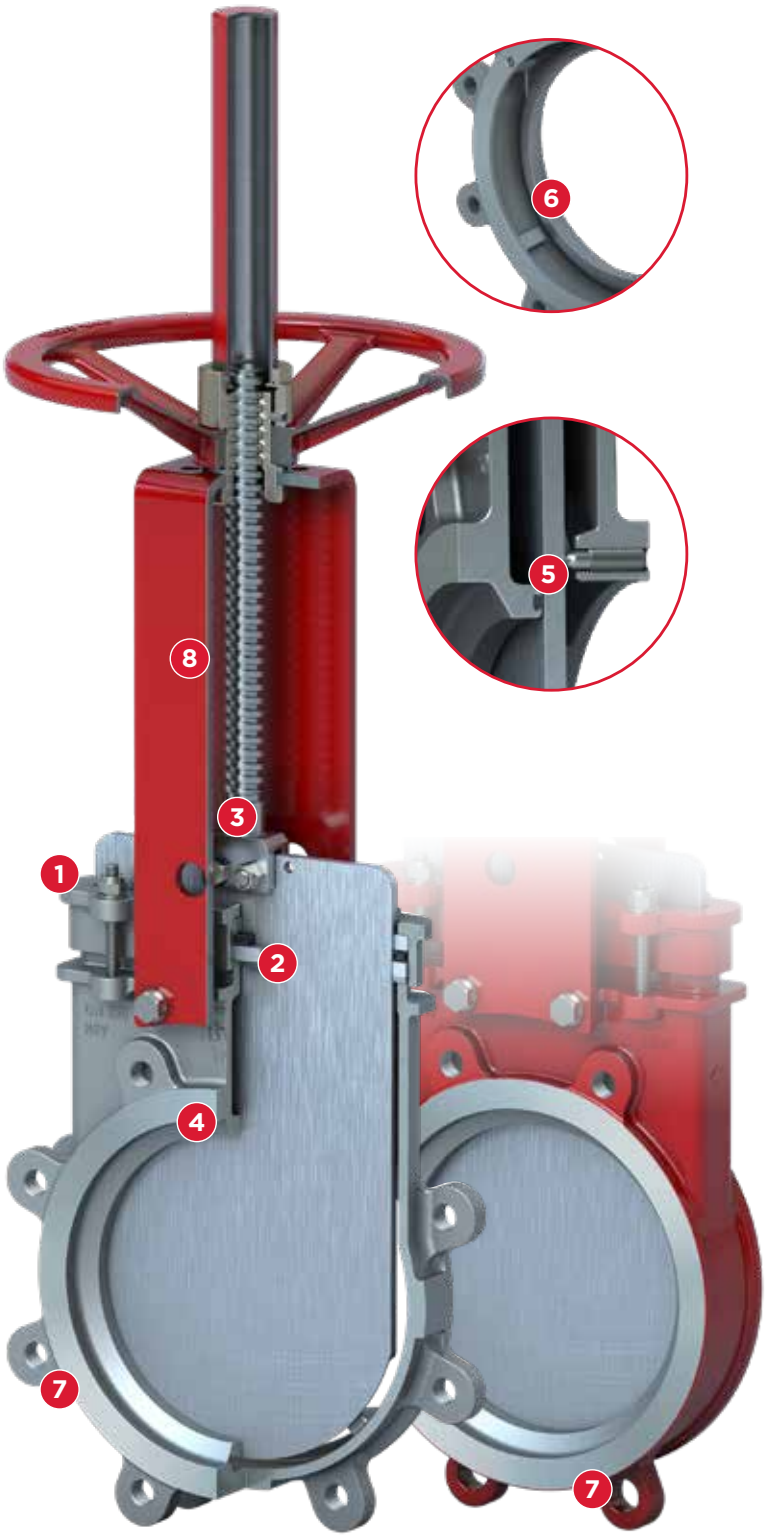
Body	**943 -** Carbon Steel (WCB) | CF8 Stainless Steel | CF3 Stainless Steel | CF3M Stainless Steel | CE3MN Duplex Steel (SS 2507) | CD3MN Duplex
Gate	304, 317 Stainless Steel | Hastelloy® C
	SAF 2507 Duplex | Monel®
	17-4PH Stainless Steel | Titanium
Stem	316
Packing	Pure PTFE | PTFE w/Nitrile Quad Seal
	PTFE w/EPDM Quad Seal | PTFE w/Copper Wiper
	Graphite
Seat	Nitrile | EPDM | Viton® | RPTFE | Aflas

Series 943
Lugged

Series 953
Semi Lug

FEATURES

1. Inverted packing gland extends packing life and simplifies replacement.
2. Standard energized quad seal packing provides exceptional gland sealing.
3. Clevis design and horizontal bolting stabilizes gate ensuring proper alignment.
4. Standard metal seated, also available with optional unique self-locking RPTFE seat or replaceable O-Ring soft seat for high performance unidirectional sealing.
5. Adjustable gate guides provided to fine tune the gate-to-seat contact and assist with back pressure.
6. Cast in gate guides eliminating welding in the body and precision machined wedging for ultimate sealing.
7. Optimized body design is offered in both lugged and semi lugged design to maximize performance without unnecessary weight. Lugged body suitable for all mounting orientations including dead-end service.
8. Carbon steel, stainless steel, or alloy superstructure ensures robustness in valve design for different operators/orientation.
9. Optional replaceable deflection cone, available in Chrome Iron and Polyurethane, can be provided to protect the seat from abrasive media.



Series 953
Semi Lug

APPLICATIONS

Water/Wastewater
- > Slurry/Sludge Lines

General Industrial
- > Pneumatic Conveyance
- > Raw & Treated Water
- > Water Conveyed Solids
- > Dry Media | Cement
- > Hot Gases
- > Carbon Black and Coking

Mining
- > Mineral Mining
- > Coal Washeries
- > Coal Preparation

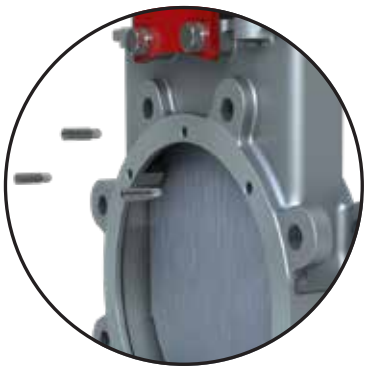
Pulp & Paper
- > Paper Stock
- > Liquor Services
- > Recycle Paper

Power
- > Fly Ash | Bottom Ash
- > Branch Lines

Chemical
- > Pellets
- > Process Fluids & Chemicals
- > Petroleum Products

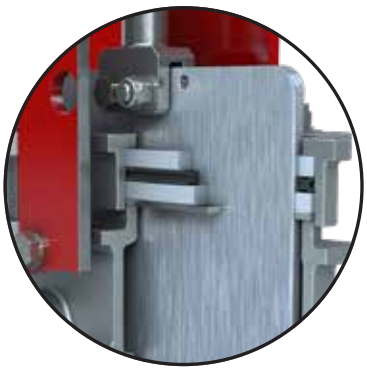
Food & Beverage
- > Winery
- > Dairy Processing
- > Brewery | Grain Storage Silo
- > Spent Grain

ADJUSTABLE GATE GUIDES



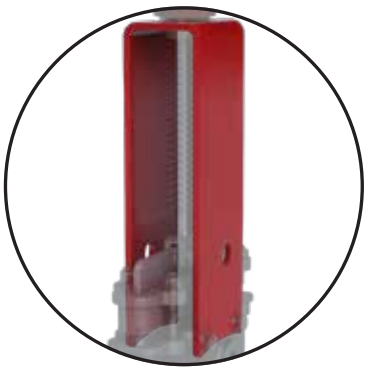
These soft-tipped screws are factory set for standard operation. Field adjustment can be made to fine tune the gate-to-seat dimension when low pressure applications require a better seal.

INVERTED PACKING GLAND



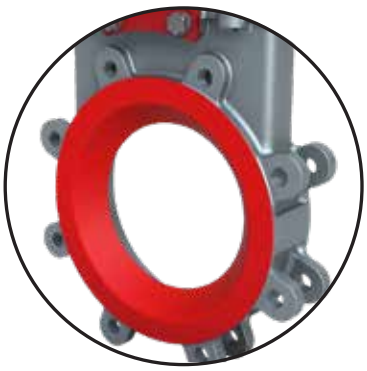
This feature allows for easier packing installation. Because the packing and gland are external to the valve body, they adjust with the gate, providing an improved, longer lasting seal.

RIGID U-SHAPED FRAME



Available in a variety of materials, this heavy duty single-piece frame is designed to provide full-force lockout capability and is easily adaptable for any type of actuation.

DEFLECTION CONE



Recommended for abrasive flow applications to direct the flow away from the seat.

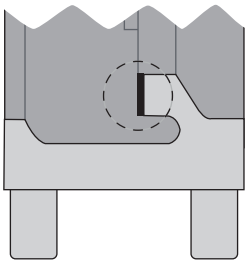
SEAT DESIGN OPTIONS

METAL SEAT
For applications with:
• High temperature
• High density media

SOFT SEAT
For applications with:
Zero Leakage

Nitrile	-34 to 194°F
	-36 to 90°C
EPDM	-65 to 248°F
	-54 to 120°C
Viton®	-15 to 392°F
	-26 to 200°C
Aflas®	-15 to 392°F
	-26 to 200°C

RPTFE	-235 to 500°F
	-148 to 260°C



STELLITED SEAT
For applications with:
Abrasive media

SPECIAL OPTIONS

PURGE CONNECTIONS
Purge ports are recommended when valves are installed in applications where product tends to dewater, solidify, or build up in the seat area. It is recommended that purging media be it air or fluid be one barg pressure greater than operating pressure.

BODY PURGES
Standard purge positions at 2, 4, 8 and 10 o'clock on the perimeter of the valve body.

CHEST PURGE
Standard purge positions located on both front and back side of the chest area.

Flush ports are also available fully piped for ease of operation minimizing the need for multiple piping connections. They can be supplied in either stainless or carbon steel piping depending on material construction of the body.

V PORT
A V Port is used to control flow in clean media applications

AVAILABLE ACCESSORIES | SHOWN IN RED

DEFLECTION CONE

HANDWHEEL LOCK OUT

NON-RISING STEM

PNEUMATIC FAILSAFE

GATE GUARD

CHAIN WHEEL

PROXIMITY SENSOR

MANUAL OVERRIDE

MECHANICAL LIMIT SWITCH

ELECTRO PNEUMATIC POSITIONER

ACTUATOR OPTIONS | SHOWN IN RED

DIRECT MOUNTED HANDWHEEL

BEVEL GEAR OPERATOR

DOUBLE ACTING PNEUMATIC ACTUATOR

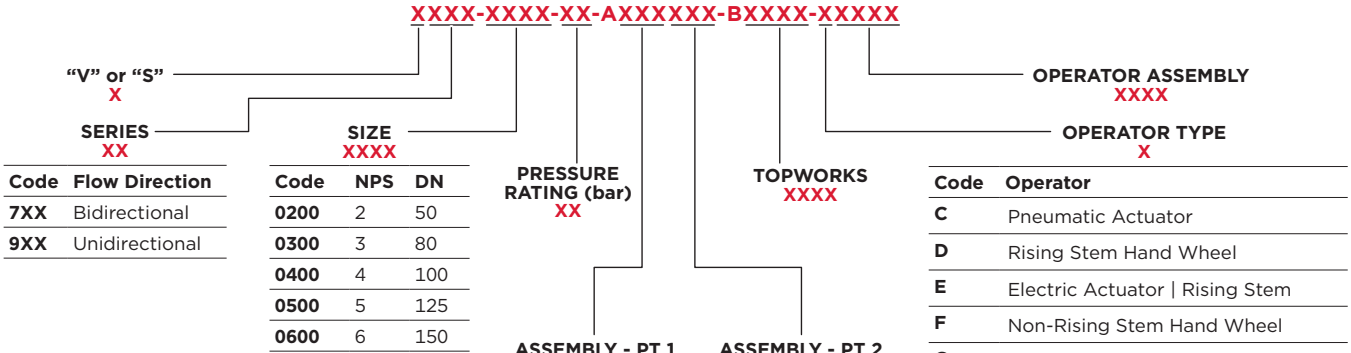
HYDRAULIC ACTUATOR

LEVER

ELECTRIC ACTUATOR

VALVE PART NUMBERING SYSTEM

Select one code from each category to build a complete valve order number.



Code	Flow Direction
7XX	Bidirectional
9XX	Unidirectional

Code	NPS	DN
0200	2	50
0300	3	80
0400	4	100
0500	5	125
0600	6	150
0800	8	200
1000	10	250
1200	12	300
1400	14	350
1600	16	400
1800	18	450
2000	20	500
2400	24	600

Part
Body
Seat
Gate
Gland
Fasteners
Packing

Part
Drilling
End Style
Body Options
Gate Options
Other Options

Code	Operator
C	Pneumatic Actuator
D	Rising Stem Hand Wheel
E	Electric Actuator | Rising Stem
F	Non-Rising Stem Hand Wheel
G	Chain Wheel
H	Bevel Gear | Rising Stem
L	Lever
M	Hydraulic Actuator
N	Bare Stem
P	Bevel Gear | Non-Rising Stem
Q	Electric Actuator | Non-Rising Stem

NOTES:

1 For a complete list of standard materials and descriptions, refer to MATERIALS OF CONSTRUCTION. Other materials are available, please contact Bray for additional information.
2 No assigned code, ASSEMBLY NUMBER is generated by Engineering configurator..

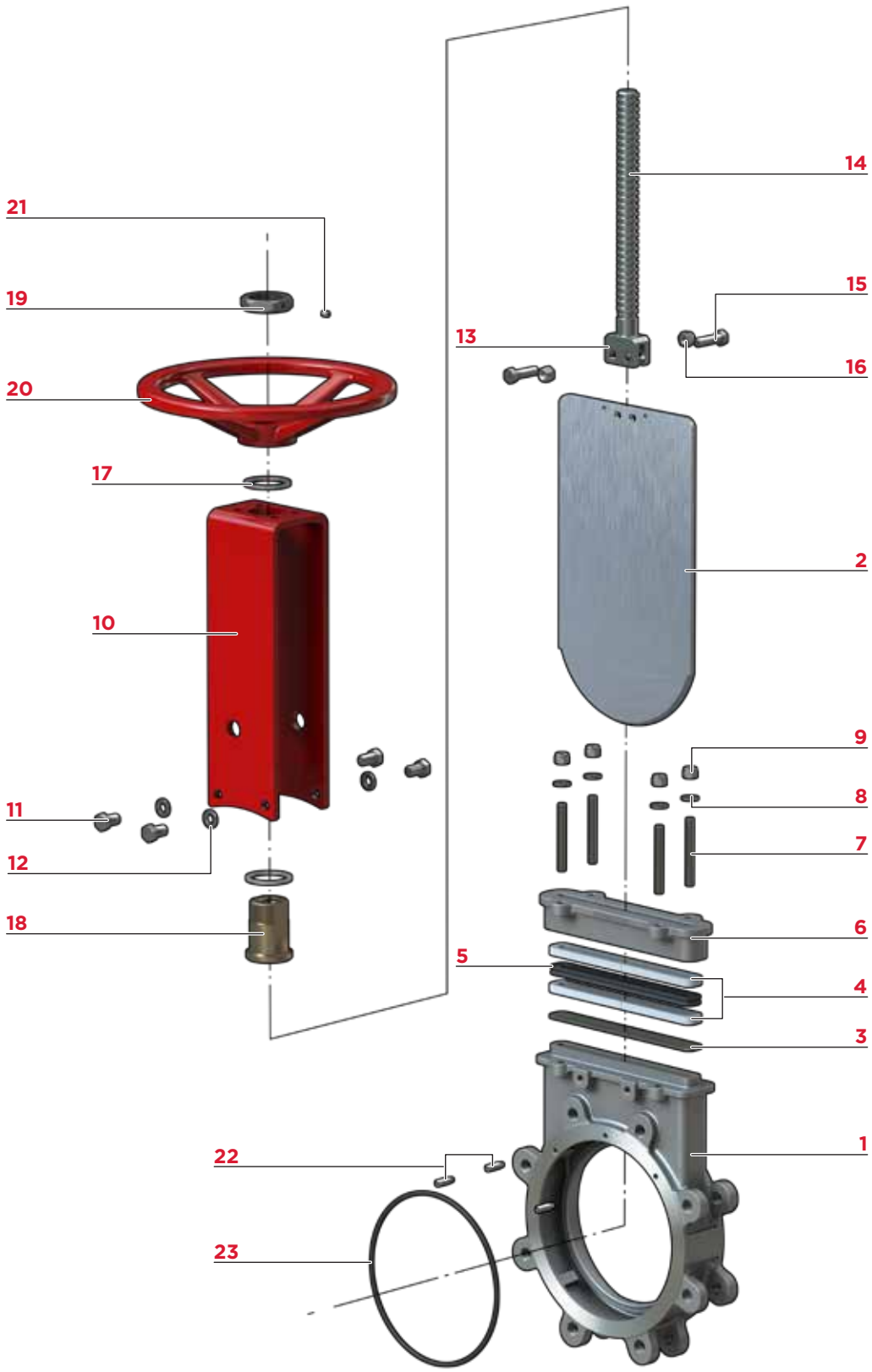
EXAMPLE

S-943-0800-10-A610610-B0610-D6110

- Unidirectional, Lugged
- 8 inch (200 mm)
- 150 psi (10 bar) rated valve
- Standard build assembly
- Rising Stem Hand Wheel

PARTS CALLOUT SERIES 943

NPS 2 to 24 | DN50 to DN600



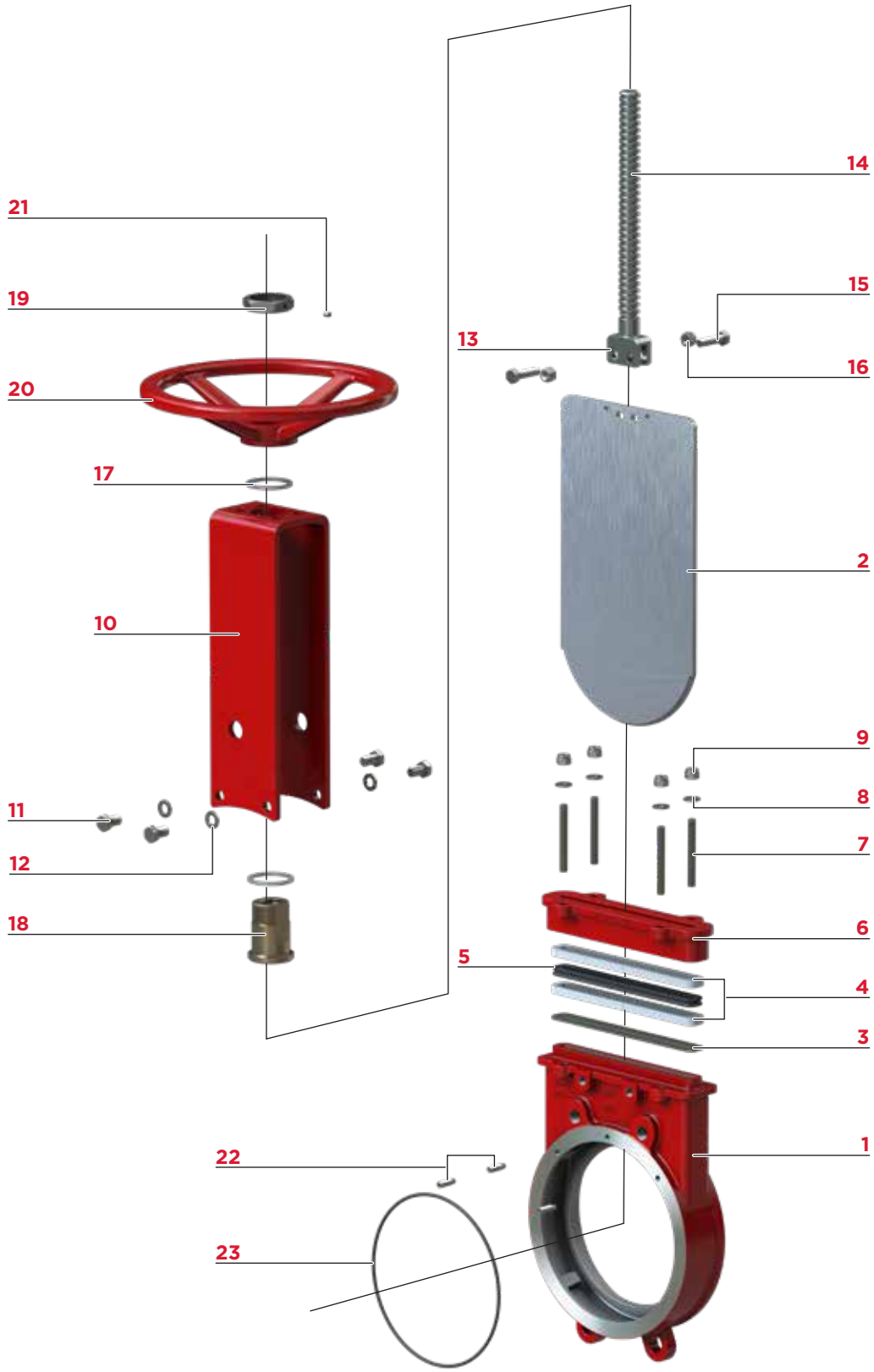
PARTS LIST AND MATERIAL SPECIFICATIONS

ITEM	DESCRIPTION	MATERIAL
1	Body	CF8M
2	Gate	316SS
3	Anti-Extrusion Ring	RPTFE
4	Packing Set	PTFE Impregnated Synthetic Fiber
5	Quad Seal	Viton®
6	Gland	CF8
7	Gland Stud	304SS
8	Gland Washer	304SS
9	Gland Nut	304SS
10	Yoke/U-Plate	Carbon Steel Painted
11	Yoke Mounting Bolt	304SS
12	Yoke Spring Washer	304SS
13	Clevis	304SS
14	Stem	304SS
15	Clevis Bolt	304SS
16	Clevis Nut	304SS
17	Thrust Washer	Brass
18	Yoke Sleeve	Brass
19	Lock Nut	Zinc Plated Carbon Steel
20	Hand Wheel	Ductile Iron (Painted)
21	Grub Screw	Zinc Plated Carbon Steel
22	Gate Guides	PTFE Tipped 316SS Screw
23	Seat	Metal/EPDM/Nitrile®/Viton®/RPTFE

NOTES
1 Material specifications provided for reference only, and are subject to change without notice.
2 Additional materials available upon request.

PARTS CALLOUT SERIES 953

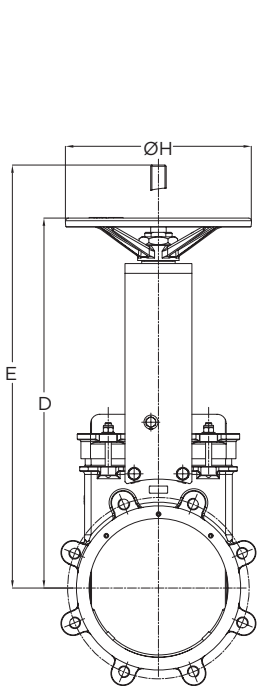
NPS 2 to 24 | DN50 to DN600



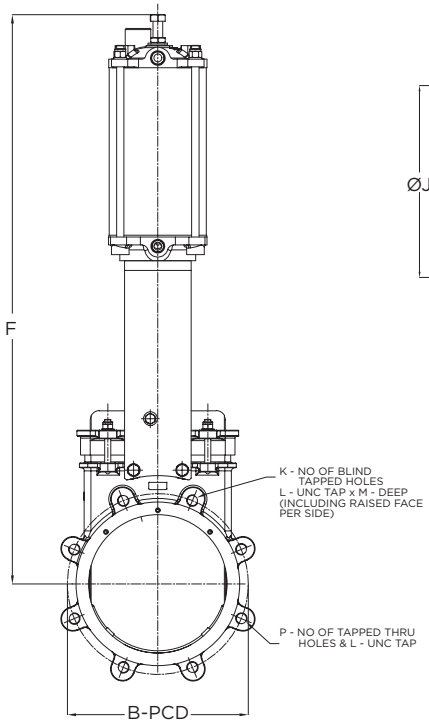
PARTS LIST AND MATERIAL SPECIFICATIONS

ITEM	DESCRIPTION	MATERIAL
1	Body	Cast Iron GG25 (Painted)
2	Gate	304SS
3	Anti-Extrusion Ring	RPTFE
4	Packing Set	PTFE Impregnated Synthetic Fiber
5	Quad Seal	Viton®
6	Gland	Ductile Iron GGG40 (Painted)
7	Gland Stud	Zinc Plated Carbon Steel
8	Gland Washer	Zinc Plated Carbon Steel
9	Gland Nut	Zinc Plated Carbon Steel
10	Yoke/U-Plate	Carbon Steel (Painted)
11	Yoke Mounting Bolt	Zinc Plated Carbon Steel
12	Yoke Spring Washer	Zinc Plated Carbon Steel
13	Clevis	304SS
14	Stem	304SS
15	Clevis Bolt	304SS
16	Clevis Nut	304SS
17	Thrust Washer	Brass
18	Yoke Sleeve	Brass
19	Lock Nut	Zinc Plated Carbon Steel
20	Hand Wheel	Ductile Iron (Painted)
21	Grub Screw	Zinc Plated Carbon Steel
22	Gate Guides	PTFE Tipped 316SS Screw
23	Seat	Metal/EPDM/Nitrile®/Viton®/RPTFE

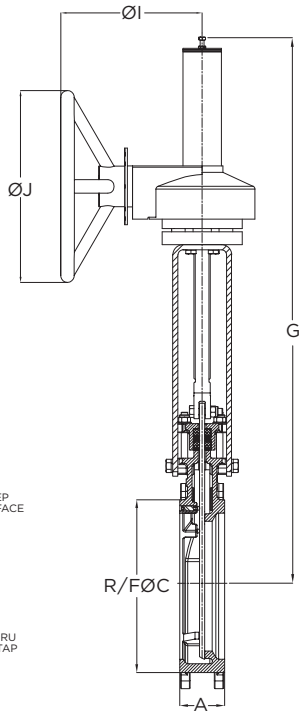
NOTES
1 Material specifications provided for reference only, and are subject to change without notice.
2 Additional materials available upon request.
3 Stainless Steel/TFE available.



Direct Mounted Handwheel



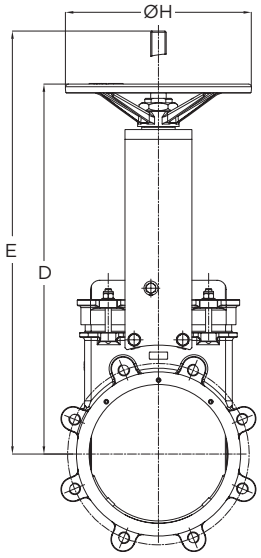
Pneumatic Actuator



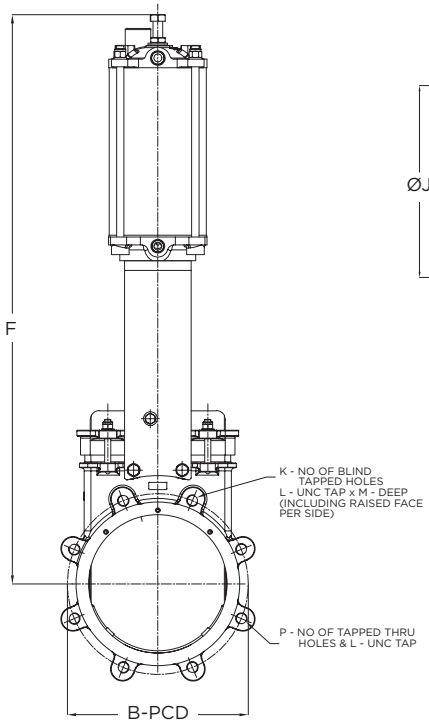
Bevel Gear

DIMENSIONS (inch)															WEIGHT (lbs)		
NPS	A	B-PCD	R/FØC	D	E	F	G	ØH	ØI	ØJ	K	L	M	P	HAND WHEEL	PNEUMATIC ACTUATOR	GEAR OPERATOR
2	1.88	4.75	3.62	14.37	15.94	20.67	--	8	--	--	2	5/8"-11	.35	2	20	29	--
3	2.00	6.00	5.00	15.94	18.50	23.03	--	8	--	--	2	5/8"-11	.35	2	24	31	--
4	2.00	7.50	6.20	17.91	21.42	25.79	--	8	--	--	2	5/8"-11	.35	6	31	42	--
5	2.25	8.50	7.32	19.88	24.21	29.53	--	10	--	--	2	3/4"-10	.43	6	42	62	--
6	2.25	9.50	8.50	20.87	26.61	31.89	--	10	--	--	2	3/4"-10	.43	6	46	66	--
8	2.75	11.75	10.63	24.02	32.13	37.20	34.06	12	11.81	20	2	3/4"-10	.43	6	68	88	90
10	2.75	14.25	12.76	27.56	37.13	43.11	38.98	16	11.81	20	4	7/8"-9	.43	8	108	152	130
12	3.00	17.00	15.00	31.69	43.39	49.21	45.28	16	11.81	20	4	7/8"-9	.43	8	132	183	161
14	3.00	18.75	16.26	34.84	48.27	54.13	50.00	20	11.81	20	4	1"-8	.55	8	196	260	223
16	3.50	21.25	18.50	38.70	53.94	61.26	55.71	20	11.81	20	6	1"-8	.71	10	282	357	311
18	3.50	22.76	20.98	42.05	59.45	65.47	61.42	20	12.20	20	6	1-1/8"-7	.71	10	357	425	386
20	4.50	25.00	23.03	46.57	65.55	73.86	67.52	20	12.20	20	6	1-1/8"-7	.75	14	474	606	503
24	4.50	29.50	27.24	52.95	75.79	86.42	77.76	20	12.20	20	6	1-1/8"-7	.75	14	633	776	661

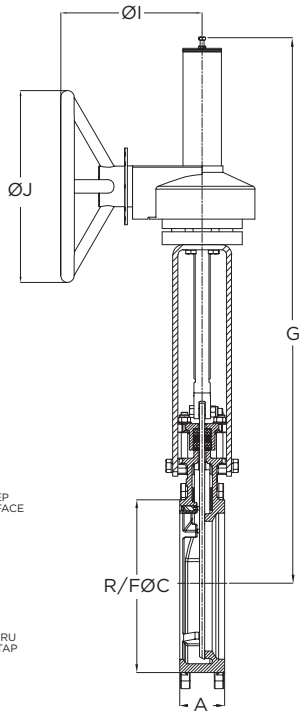
NOTES
1 Consult factory for hydraulic and electric actuator dimensions.
2 Dimensions are approximate and subject to change. Consult factory for certified drawings.
3 Drilling In conformance with ASME B16.5, Class 150 for sizes NPS 2 (DN50) through NPS 24 (DN600.)



Direct Mounted Handwheel



Pneumatic Actuator



Bevel Gear

DIMENSIONS (mm)															WEIGHT (kg)		
DN	A	B-PCD	R/FØC	D	E	F	G	ØH	ØI	ØJ	K	L	M	P	HAND WHEEL	PNEUMATIC ACTUATOR	GEAR OPERATOR
50	48	120.7	92	365	405	525	--	203	--	--	2	5/8"-11	9	2	9	13	--
80	51	152.4	127	405	470	585	--	203	--	--	2	5/8"-11	9	2	11	14	--
100	51	190.5	158	455	544	655	--	203	--	--	2	5/8"-11	9	6	14	19	--
125	57	215.9	186	505	615	750	--	254	--	--	2	3/4"-10	11	6	19	28	--
150	57	241.3	216	530	675	810	--	254	--	--	2	3/4"-10	11	6	21	30	--
200	70	298.5	270	610	816	945	865	305	300	500	2	3/4"-10	11	6	31	40	39
250	70	362.0	324	700	943	1095	990	406	300	500	4	7/8"-9	11	8	49	69	54
300	76	431.8	381	805	1102	1250	1150	406	300	500	4	7/8"-9	11	8	60	83	60
350	76	476.3	413	885	1226	1375	1270	508	300	500	4	1"-8	14	8	89	118	91
400	89	539.8	470	983	1370	1556	1415	508	300	500	6	1"-8	18	10	128	162	141
450	89	577.9	533	1068	1510	1663	1560	508	310	500	6	1-1/8"-7	18	10	162	193	175
500	114	635.0	585	1183	1665	1876	1715	508	310	500	6	1-1/8"-7	19	14	215	275	228
600	114	749.3	692	1345	1925	2195	1975	508	310	500	6	1-1/8"-7	19	14	287	352	300

NOTES
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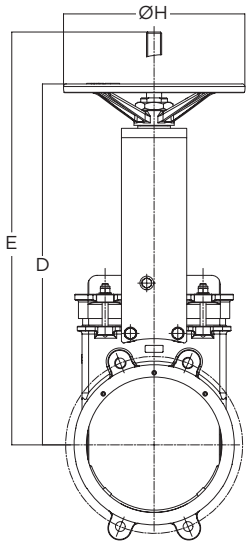
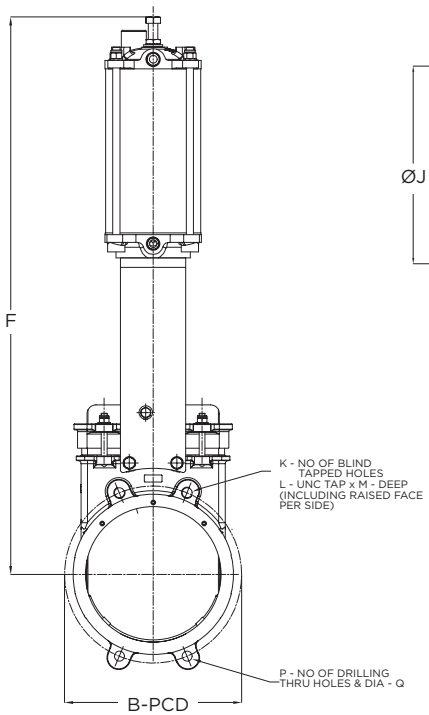
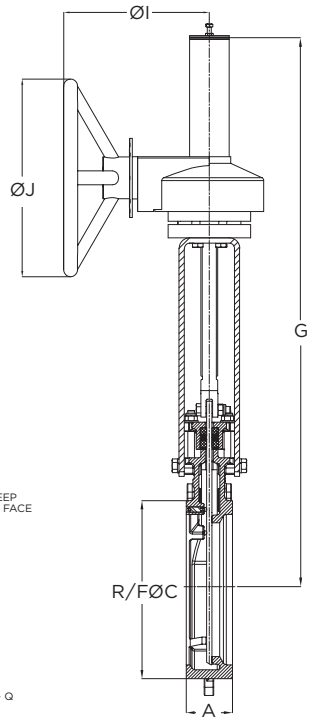


Direct Mounted Handwheel



Pneumatic Actuator



Bevel Gear

DIMENSIONS (inch)																WEIGHT (lbs)		
NPS	A	B-PCD	R/FØC	D	E	F	G	ØH	ØI	ØJ	K	L	M	P	Q	HAND WHEEL	PNEUMATIC ACTUATOR	GEAR OPERATOR
2	1.88	4.75	3.62	14.37	15.94	20.67	--	8	--	--	2	5/8"-11	.35	2	18	**20**	27	--
3	2.00	6.00	5.00	15.94	18.50	23.03	--	8	--	--	2	5/8"-11	.35	2	18	**24**	31	--
4	2.00	7.50	6.19	17.91	21.42	25.79	--	8	--	--	2	5/8"-11	.35	2	18	**28**	38	--
5	2.25	8.50	7.31	19.88	24.21	29.53	--	10	--	--	2	3/4"-10	.43	2	22	**36**	56	--
6	2.25	9.50	8.50	20.87	26.61	31.89	--	10	--	--	2	3/4"-10	.43	2	22	**41**	62	--
8	2.75	11.75	10.62	24.02	32.13	37.20	34.06	12	11.81	20	2	3/4"-10	.43	2	22	**65**	84	87
10	2.75	14.25	12.75	27.56	37.13	43.11	38.98	16	11.81	20	4	7/8"-9	.43	2	25	**98**	140	119
12	3.00	17.00	15.00	31.69	43.39	49.21	45.28	16	11.81	20	4	7/8"-9	.43	2	25	**118**	161	138
14	3.00	18.75	16.25	34.84	48.27	54.13	50.00	20	11.81	20	4	1"-8	.55	4	28	**181**	246	207
16	3.50	21.25	18.50	38.70	53.94	61.26	55.71	20	11.81	20	6	1"-8	.83	4	28.4	**244**	311	270
18	3.50	22.75	21.00	42.05	59.45	65.47	61.42	20	12.20	20	6	1-1/8"-7	.83	4	32.5	**312**	381	332
20	4.50	25.00	23.00	46.57	65.55	73.86	67.52	20	12.20	20	8	1-1/8"-7	.86	6	32.5	**474**	550	439
24	4.50	29.50	27.25	52.95	75.79	86.42	77.76	20	12.20	20	8	1-1/4"-7	.86	6	32.5	**545**	683	565

NOTES
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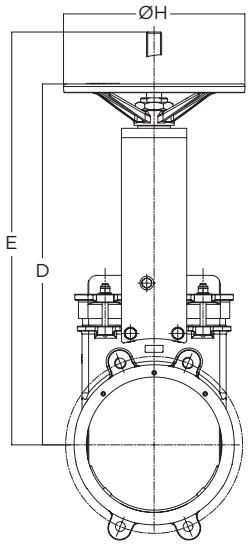
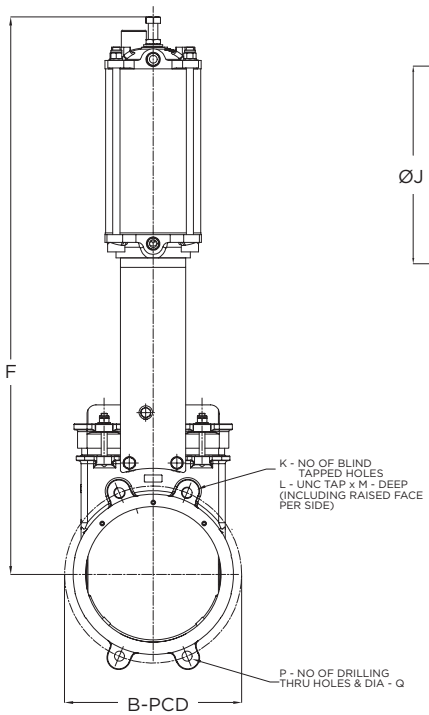
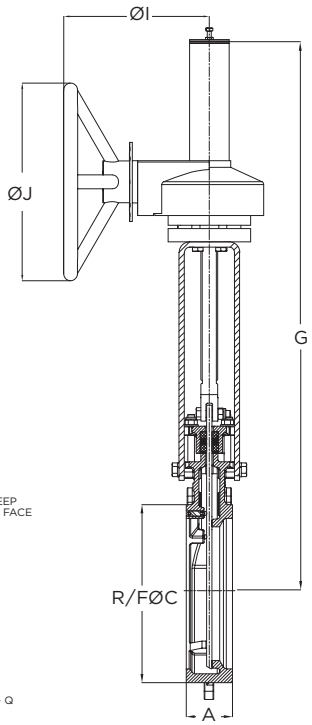
2 Dimensions are approximate and subject to change. Consult factory for certified drawings.
3 Drilling In conformance with ASME B16.5, Class 150 for sizes NPS 2 (DN50) through NPS 24 (DN600.)



Direct Mounted Handwheel



Pneumatic Actuator



Bevel Gear

DIMENSIONS (mm)																WEIGHT (kg)		
DN	**A**	**B-PCD**	**R/FØC**	**D**	**E**	**F**	**G**	**ØH**	**ØI**	**ØJ**	**K**	**L**	**M**	**P**	**Q**	**HAND WHEEL**	**PNEUMATIC ACTUATOR**	**GEAR OPERATOR**
50	48	120.7	92	365	405	525	--	203	--	--	2	5/8"-11	9	2	18	**9**	12	--
80	51	152.4	127	405	470	585	--	203	--	--	2	5/8"-11	9	2	18	**11**	14	--
100	51	190.5	158	455	544	655	--	203	--	--	2	5/8"-11	9	2	18	**13**	17	--
125	57	215.9	186	505	615	750	--	254	--	--	2	3/4"-10	11	2	22	**16**	26	--
150	57	241.3	216	530	675	810	--	254	--	--	2	3/4"-10	11	2	22	**19**	28	--
200	70	298.5	270	610	816	945	865	305	300	500	2	3/4"-10	11	2	22	**29**	38	39
250	70	362.0	324	700	943	1095	990	406	300	500	4	7/8"-9	11	2	25	**45**	63	54
300	76	431.8	381	805	1102	1250	1150	406	300	500	4	7/8"-9	11	2	25	**53**	73	60
350	76	476.3	413	885	1226	1375	1270	508	300	500	4	1"-8	14	4	28	**82**	111	94
400	89	539.8	470	983	1370	1556	1415	508	300	500	6	1"-8	21	4	28.4	**110**	141	122
450	89	577.9	533	1068	1510	1663	1560	508	310	500	6	1-1/8"-7	21	4	32.5	**162**	173	150
500	114	635.0	585	1183	1665	1876	1715	508	310	500	8	1-1/8"-7	22	6	32.5	**215**	249	199
600	114	749.3	692	1345	1925	2195	1975	508	310	500	8	1-1/4"-7	22	6	32.5	**247**	310	256

NOTES
1 Consult factory for hydraulic and electric actuator dimensions.
2 Dimensions are approximate and subject to change. Consult factory for certified drawings.
3 Drilling In conformance with ASME B16.5, Class 150 for sizes NPS 2 (DN50) through NPS 24 (DN600.)

STEM DATA					
SIZE		STROKE	STEM DIA	THRUST	TPI
inch	mm	mm	inch	lbf	
02	**50**	63	0.75	141	6
03	**80**	88	0.75	335	6
04	**100**	114	0.75	698	6
05	**125**	140	0.75	680	6
06	**150**	166	0.75	1469	6
08	**200**	216	1.00	2096	5
10	**250**	255	1.00	2938	5
12	**300**	307	1.00	3765	5
14	**350**	345	1.50	5027	4
16	**400**	387	1.50	5858	4
18	**450**	440	1.50	6845	4
20	**500**	489	1.50	7759	4
24	**600**	589	1.50	9184	4

AS2129 TABLE D AUSTRALIAN FLANGE STANDARD						
SIZE (mm)	RAISED FACE DIAMETER	BOLT CIRCLE DIAMETER	NUMBER OF TAPPED THRU HOLES	NUMBER OF BLIND TAPPED HOLES	THREAD	DEPTH OF BLIND TAPPED HOLES
50	90	114	4	4	M16	9
80	122	146	4	4	M16	9
100	154	178	4	4	M16	9
125	186	210	12	4	M16	11
150	211	235	12	4	M16	11
200	268	292	12	4	M16	11
250	328	356	12	4	M20	11
300	378	406	16	8	M20	11
350	438	470	16	8	M24	14
400	489	521	16	8	M24	18
450	552	584	16	8	M24	18
500	609	641	20	12	M24	19
600	720	756	20	12	M27	19

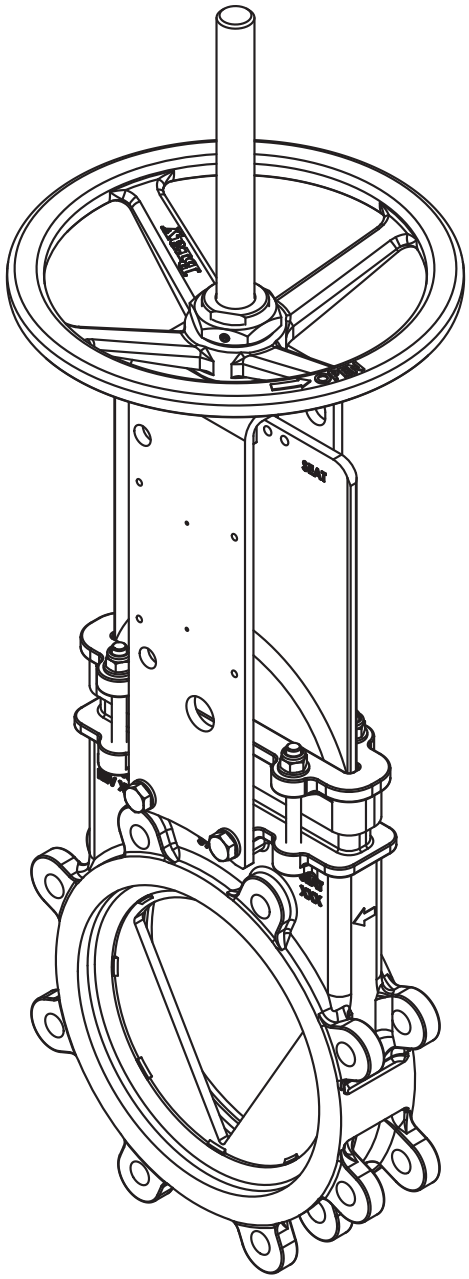
AS2129 TABLE E AUSTRALIAN FLANGE STANDARD						
SIZE (mm)	RAISED FACE DIAMETER	BOLT CIRCLE DIAMETER	NUMBER OF TAPPED THRU HOLES	NUMBER OF BLIND TAPPED HOLES	THREAD	DEPTH OF BLIND TAPPED HOLES
50	90	114	4	4	M16	9
80	122	146	4	4	M16	9
100	154	178	12	4	M16	9
125	186	210	12	4	M16	11
150	207	235	12	4	M20	11
200	264	292	12	4	M20	11
250	328	356	16	8	M20	11
300	374	406	16	8	M24	11
350	438	470	16	8	M24	14
400	489	521	20	12	M24	18
450	552	584	20	12	M24	18
500	609	641	20	12	M24	19
600	717	756	20	12	M30	19

OPTIONAL V-PORT FOR MODULATING APPLICATIONS

The Series 943 can be provided with an optional V-Port for modulating applications. Our standard V-Port is 60° available in NPS 4 to 12 (DN80 to 300). Other angles or orifice designs may be available, please contact your local Bray representative.

% OF VALVE STROKE	60 DEG. V-PORT (Cv)				
	NPS 4	NPS 6	NPS 8	NPS 10	NPS 12
10	6	11	2	3	3
20	17	35	27	38	47
30	34	73	84	104	144
40	60	131	189	215	303
50	98	220	281	388	550
60	147	332	426	641	923
70	198	451	613	931	1346
80	247	575	871	1214	1765
90	293	673	1117	1482	2173
100	305	699	1201	1612	2383

% OF VALVE STROKE	% OF MAX. FLOW				
	NPS 4	NPS 6	NPS 8	NPS 10	NPS 12
0	0	0	0	0	0
10	2.0	1.6	0.2	0.2	0.1
20	5.4	5.0	2.2	2.3	2.0
30	11.1	10.4	7.0	6.4	6.0
40	19.5	18.7	15.7	13.4	12.7
50	32.2	31.5	23.4	24.0	23.1
60	48.1	47.5	35.4	39.8	38.7
70	65.0	64.5	51.0	57.7	56.5
80	80.9	82.3	72.5	75.3	74.1
90	95.8	96.4	93.0	91.9	91.2
100	100	100	100	100	100



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