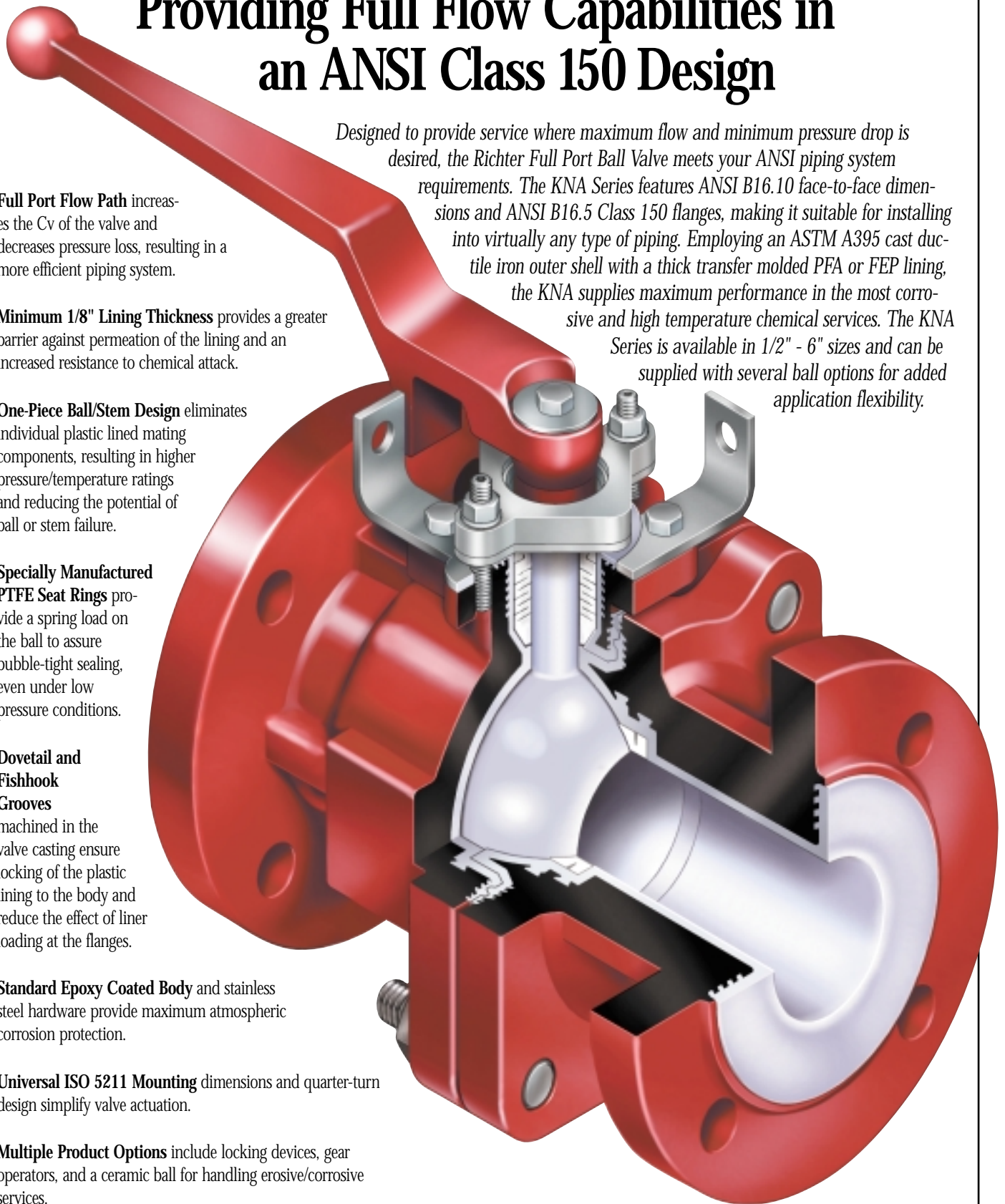


## Providing Full Flow Capabilities in an ANSI Class 150 Design

*Designed to provide service where maximum flow and minimum pressure drop is desired, the Richter Full Port Ball Valve meets your ANSI piping system requirements. The KNA Series features ANSI B16.10 face-to-face dimensions and ANSI B16.5 Class 150 flanges, making it suitable for installing into virtually any type of piping. Employing an ASTM A395 cast ductile iron outer shell with a thick transfer molded PFA or FEP lining, the KNA supplies maximum performance in the most corrosive and high temperature chemical services. The KNA Series is available in 1/2" - 6" sizes and can be supplied with several ball options for added application flexibility.*

- **Full Port Flow Path** increases the Cv of the valve and decreases pressure loss, resulting in a more efficient piping system.
- **Minimum 1/8" Lining Thickness** provides a greater barrier against permeation of the lining and an increased resistance to chemical attack.
- **One-Piece Ball/Stem Design** eliminates individual plastic lined mating components, resulting in higher pressure/temperature ratings and reducing the potential of ball or stem failure.
- **Specially Manufactured PTFE Seat Rings** provide a spring load on the ball to assure bubble-tight sealing, even under low pressure conditions.
- **Dovetail and Fishhook Grooves** machined in the valve casting ensure locking of the plastic lining to the body and reduce the effect of liner loading at the flanges.
- **Standard Epoxy Coated Body** and stainless steel hardware provide maximum atmospheric corrosion protection.
- **Universal ISO 5211 Mounting** dimensions and quarter-turn design simplify valve actuation.
- **Multiple Product Options** include locking devices, gear operators, and a ceramic ball for handling erosive/corrosive services.

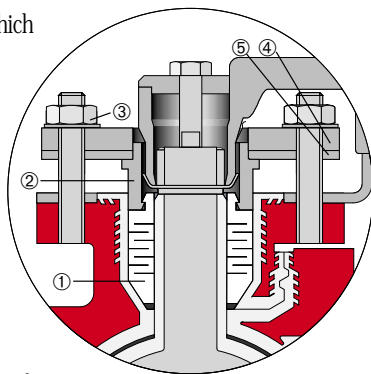


## Innovative Stem Seal Design

Since its initial introduction, the Richter Series KNA Full Port Ball Valve has gained a reputation for outstanding stem seal performance under the most challenging conditions of thermal cycling, high pressures and corrosive chemicals. As illustrated, the KNA stem seal utilizes a

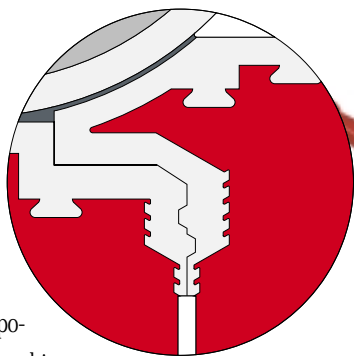
machined PTFE packing insert ① which is permanently fixed to a thrust ring ②. By tightening the two adjusting nuts ③, the packing gland follower ④ and the spring gland follower ⑤ transmit a compressive load through the thrust ring to the insert, activating the stem seal.

With this patented design, dynamic loading of the stem seal to compensate for temperature and pressure variables is created by the spring gland follower. An added benefit is the ability to monitor the live loaded condition of the stem seal simply by inspecting the “gap” between the packing followers, thus lending this design to the user’s preventative maintenance program.



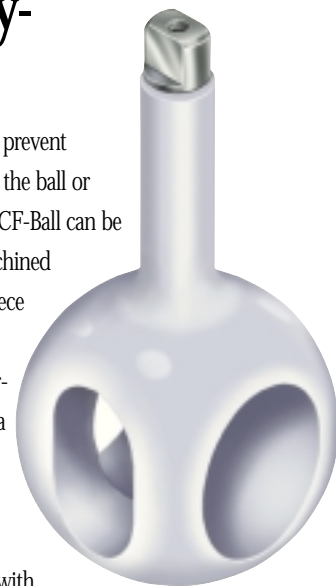
## Permanent Body Flange Sealing

Concerning to all plastic lined ball valve manufacturers is the means of obtaining a tight seal between the two lined body components. The Richter KNA Ball Valve achieves permanent body flange sealing even under the most frequent thermal cycling conditions. The body sealing zone is characterized by full lining thickness and a labyrinth-like flow path which maximizes the surface contact between the mating components. The body pieces position themselves properly by means of the cup and cone shapes of each piece. The effects of temperature variations are controlled by the almost metal-to-metal flange contact in the circumference area close to the flange bolting. With this unique design, neither retightening of the body bolts nor the use of spring washers is required.



## Optional Cavity-Free CF-Ball

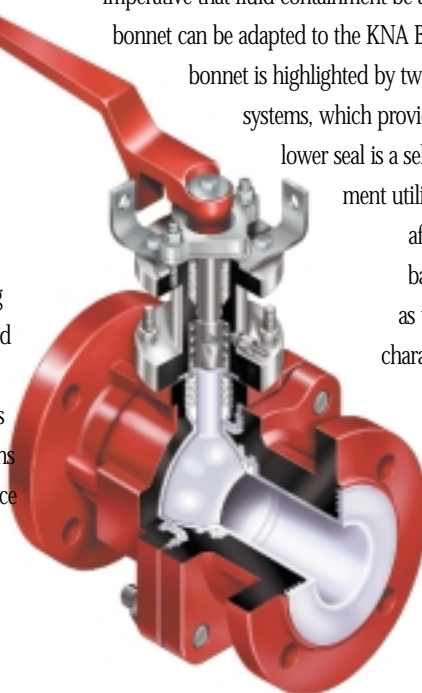
In applications where it is imperative to prevent process fluid from becoming trapped in the ball or within the body cavity of the valve, the CF-Ball can be specified. Utilizing a large vent port machined through one side of the ball, this one-piece ball/stem design prevents media with a high rate of expansion from overpressurizing the valve body. When installed in a vertical position, this optional ball also functions to drain the valve cavity, reducing the potential entrapment of contaminating media. When equipped with this unidirectional ball, an arrow to indicate the pressure tight seat and to aid in installation of the valve is attached to the body.



## Double Packing Bonnet for Emissions Control

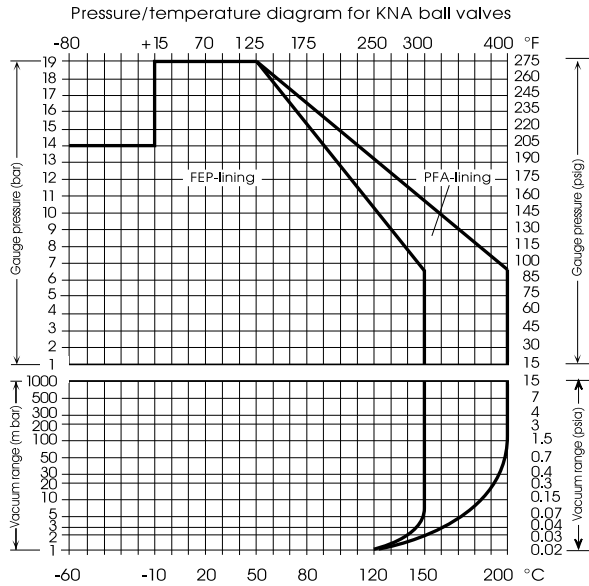
Today’s concern for the containment of fugitive emissions has brought forth in the industry a wide variety of stem sealing concepts and designs aimed at eliminating unwanted stem leaks. To address applications where it is imperative that fluid containment be assured, the optional double packing bonnet can be adapted to the KNA Ball Valve. The KNA double packing bonnet is highlighted by two independently operating packing systems, which provide dual stem seal protection. The

lower seal is a self-adjusting, spring loaded arrangement utilizing a machined PTFE packing insert affixed to the gland ring. The upper, back-up seal features the same design as used in the standard KNA Ball Valve, characterized by a live loaded, adjustable gland follower system. As a further option, a monitoring port can be placed between the two stem seals to allow for detection of fugitive emissions past the primary seal. The results are unmatched stem seal performance and safety.

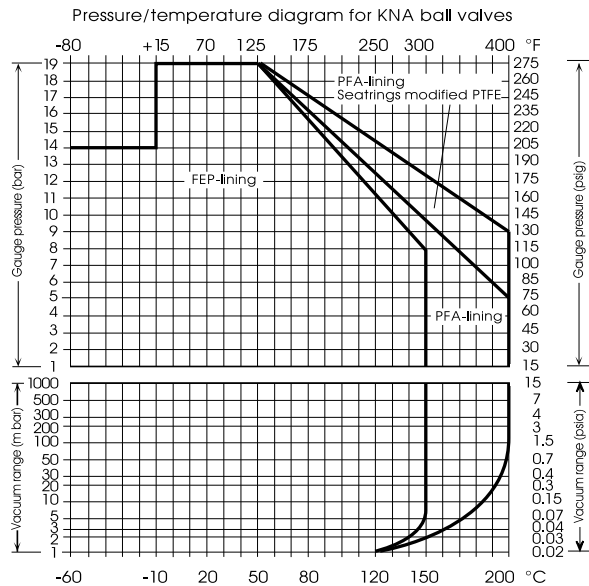


# Ball Valves Series KNA Full Port

## P/T Curves



1-Piece Plastic Lined Ball/Stem



2-Piece Ceramic [Al<sub>2</sub>O<sub>3</sub>] Ball with Lined Stem

## Dimensions/Weights

Valve Size	1/2"		3/4"		1"		1 1/2"		2"		3"		4"		6"	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A	5.1	130	5.9	150	5	127	6.5	165	7	178	8	203	9	229	10.5	267
B1	4.29	109	4.29	109	4.29	109	5.43	138	5.83	148						
B2											9.45	240	11.81	300	14.96	380
C	6.69	170	6.69	170	6.69	170	9.84	250	9.84	250	11.81	300	11.81	300	19.68	500
D	0.59	15	0.79	20	0.96	24.5	1.50	38	1.87	47.5	2.99	76	3.78	96	5.71	145
D1	1.65	42	1.97	50	2	51	2.87	73	3.62	92	5	127	6.19	157	8.5	216
E	2.05	52	2.05	52	2.05	52	2.72	69	2.91	74	4.41	112	5.12	130	7.09	180
F	3.5	89	3.87	99	4.25	108	5	127	6	153	7.5	191	9	229	11	280
G	2.375	60.3	2.75	69.8	3.13	79.4	3.88	98.4	4.75	120.6	6	152.4	7.5	190.5	9.5	241.3
H1	1.97	50	1.97	50	1.97	50	3.03	77	3.15	80	4.64	118	5.27	134	7.24	184
H2	2.36	60	2.36	60	2.36	60	3.70	94	3.82	97	5.51	140	6.14	156	8.46	215
H3	5.12	130	5.12	130	5.12	130	6.10	155	6.10	155	7.09	180	7.68	195	10.43	265
H4	0.315	8	0.315	8	0.31	8	0.47	12	0.47	12	0.63	16	0.63	16	0.79	20
H5	3.00	76	3.00	76	3.00	76	3.00	76	3.00	76	4.00	102	4.00	102	4.00	102
J	0.625	15.9	0.625	15.9	0.63	15.9	0.63	15.9	0.75	19	0.75	19	0.75	19	0.88	22.2
K	4		4		4		4		4		4		8		8	
Stem Dimensions																
M	0.67	17	0.67	17	0.67	17	0.87	22	0.87	22	1.18	30	1.18	30	1.65	42
N	0.35	9	0.35	9	0.35	9	0.47	12	0.47	12	0.55	14	0.55	14	1.02	26
P	0.87	22	0.87	22	0.87	22	1.24	31.5	1.24	31.5	1.69	43	1.69	43	2.17	55
Actuator Mounting Dimensions (to ISO 5211)																
ISO	F05	F05	F05	F05	F07	F07	F10	F10	F10	F10	F12	F12	F12	F12	F12	F12
R	1.38	35	1.38	35	1.38	35	2.17	55	2.17	55	2.76	70	2.76	70	3.35	85
S	1.97	50	1.97	50	1.97	50	2.76	70	2.76	70	4.02	102	4.02	102	4.92	125
T	M6	M6	M6	M6	M8	M8	M10	M10	M10	M12	M12	M12	M12	M12	M12	M12
# of Holes	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
U	2.17	55	2.17	55	2.17	55	2.76	70	2.76	70	3.74	95	3.74	95	4.72	120
Weight w/handle*	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg
	12.3	5.6	13.2	6	12.3	5.6	26.4	12	31.9	14.5	73.7	33.5	110	50	200	91

\* Weights shown are applicable to all 1-piece ball/stem options. Consult factory for weights of 2-piece ceramic ball with plastic lined stem.

## Operating Torques\*

Diff Press	1/2"-1"		1 1/2"		2"		3"		4"		6"		
	psi	Bar	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	
30	2	71	8	133	15	177	20	443	50	708	80	1770	200
45	3	71	8	133	15	177	20	443	50	708	80	1770	200
60	4	71	8	133	15	177	20	443	50	708	80	1859	210
75	5	71	8	133	15	177	20	443	50	708	80	1947	220
85	6	71	8	133	15	177	20	443	50	708	80	2036	230
100	7	71	8	133	15	177	20	470	53	735	83	2124	240
115	8	71	8	133	15	177	20	496	56	761	86	2213	250
130	9	71	8	133	15	177	20	522	59	788	89	2301	260
145	10	71	8	133	15	177	20	549	62	814	92	2390	270
160	11	71	8	133	15	177	20	575	65	841	95	2478	280
175	12	71	8	142	16	186	21	602	68	867	98	2567	290
190	13	80	9	151	17	195	22	628	71	894	101	2611	295
205	14	80	9	160	18	204	23	655	74	920	104	2655	300
220	15	80	9	168	19	212	24	682	77	947	107	2699	305
235	16	89	10	177	20	221	25	708	80	974	110	2744	310
245	17	89	10	177	20	221	25	735	83	1062	120	2788	315
260	18	89	10	177	20	221	25	761	86	1151	130	2832	320
275	19	89	10	177	20	221	25	797	90	1239	140	2876	325
Max allowable stalled torque		248	28	708	80	885	100	2212	250	3097	350	10620	1200

Nm = Newton Meters

Operating torques apply to all plastic lined balls.

\*Testing based on water at 68° F. Torques may increase depending on media, namely gases, viscous liquids, crystallizing liquids, etc. Consult factory for specific recommendations on these services and for operating torques with aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) ceramic ball.

## Cv Values

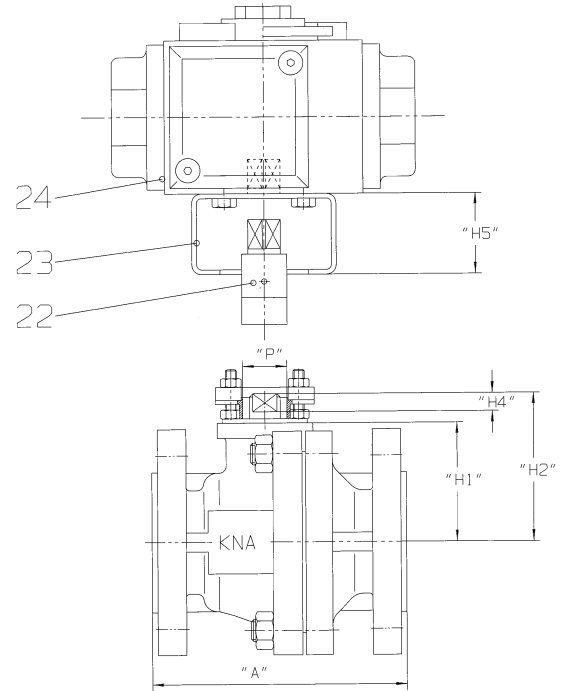
Valve Size	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"
Cv	20	36	70	221	326	685	1456	3262

Cv values have been determined based on water (Sg=1) flowing at 68° F at a pressure drop of 1 psi.

# Line Cutaways

Series KNA Ball Valve — Base Product:  
Ductile iron body, PFA/FEP lined, 1-piece ball/stem, lever operator.

Item No.	Part Description	Material	Qty.
1	Body	Ductile Iron ASTM A395; PFA, FEP lined <sup>1,2</sup>	1
2	End Piece	Ductile Iron ASTM A395; PFA, FEP lined <sup>1,2</sup>	1
3	Seat Rings	PTFE <sup>3</sup>	2
4	Ball/Stem (sizes 1/2" - 2")	Metal core stainless steel; PFA, FEP lined <sup>1,2,4</sup>	1
	Ball/Stem (sizes 3" - 6")	Stem SS w/integral steel ball; PFA, FEP lined <sup>1,2,4</sup>	1
6	Packing Insert	PTFE <sup>5</sup>	1
7	Handle	Malleable Cast Iron ASTM A220	1
9	Studs and Hex Nuts	Stainless Steel AISI 304 Sizes 1/2" - 2"	4
		Sizes 3", 4"	6
		Size 6"	8
14	Grounding Spring Washer	Stainless Steel AISI 301	1
15	Thrust Ring	Stainless Steel AISI 303	1
16.1	Spring Gland Follower	Stainless Steel AISI 304 Sizes 1/2" - 2"	1
		Sizes 3" - 6"	2
16.2	Packing Gland Follower	Stainless Steel AISI 304	1
17	Washer	Stainless Steel AISI 303	1
18	Handle Stop	Stainless Steel AISI 304	1
19	Set Screws and Nuts	Stainless Steel AISI 304	2
20	Hex Screw	Stainless Steel AISI 304	1
21	Valve Tag	Stainless Steel AISI 304	1
22	Coupling	Customer to specify	1
23	Bracket	Customer to specify	1
24	Actuator	Compact - Anodized Aluminum	1



- 1 PVDF lining available upon request.
- 2 Conductive lining available upon request in PFA or PVDF.
- 3 Modified PTFE seat rings supplied with ceramic ball for high temperature services.
- 4 Two-piece aluminum oxide ball/PFA lined stem available upon request.
- 5 Consult factory for optional double packing bonnet materials/dimensions.

