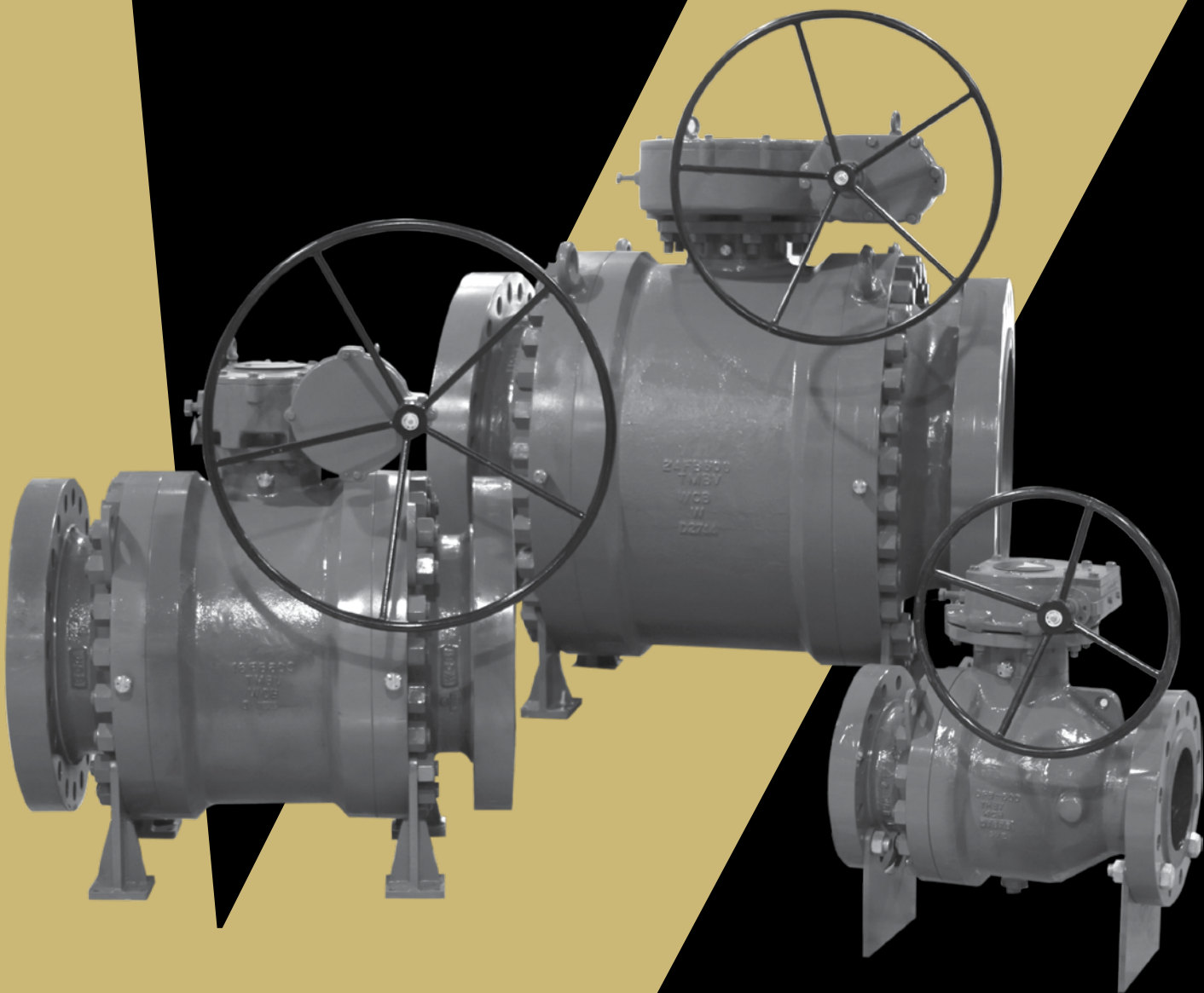


TRUNNION MOUNTED BALL VALVES



ViTrol, Inc.

PROVEN PERFORMANCE • WORLD CLASS PRODUCTS



Design & Testing Standards

- ViNtrol valves are designed and manufactured as per ASME B 16.34, API 6D & BS 5351/BS EN ISO 17292
These standards cover Pressure - Temperature ratings, minimum shell thickness, bore diameter for each size/class.
- Valve body and trim can be offered as per NACE MR 01-75 compliant.
- Castings inspection as per MSS-SP 53, 54, 55, 59, 93 & 94
- Actuator mounting pad on the valve as per ISO 5211
- Fugitive emission qualification as per ISO 15848, TA - Luft : VDI 2440 MESC 77/312 and EPA 40_CFR 60-F

- Valve Bore : API 6D, API 6A
- Face to Face : ASME B 16.10 / API 6D
- Flange dimensions : ASME B 16.5 / B 16.47 / MSS SP 44
- Butt weld valve ends : B 16.25 / 31.3 / 31.4 / 31.8
- Pressure tests : API 6D/API 598 / BS EN 12266-1&2
- Fire safe test : API 607/ API 6FA / BS 6755 Part II / BS EN ISO 10497
- Drain / Vent / Bypass : MSS SP 45 / API 6D

Quality Systems / Certification : ISO 9001-2000, API 6D - Q1, PED 97/23/EC, GOST, ATEX and OSHAS 18001

Technology in Full Flow

YOUR BEST CHOICE FOR FLOW CONTROL & SEALING SOLUTIONS

ViNtrol offers a complete solution for your flow control applications. ViNtrol products serve many of the leading Petroleum & Industrial companies and are the result of decades of innovation within the Oil & Gas industry. Our designs are proven performers in the harshest of environments. The ViNtrol brand means quality and reliability you can count on. Our state of the art manufacturing facilities have achieved ISO 9001-2000 and other certifications such as CE, API 6D & API 6A, GOST and Atex.

ViNtrol products are marketed and sold worldwide by an experienced team of domestic and international field representatives. Our sales force works closely with these representatives to ensure our customer's expectations are met or exceeded. A network of authorized distributors stock ViNtrol products for immediate delivery to the oil and gas and industrial marketplace.

Our complete product offering includes API 6A & API 6D trunnion mounted and floating ball valves, check valves, wellhead gate valves and production chokes. Available end connections include flanged, butt weld, threaded, and socket weld configurations. ViNtrol's extensive product line also includes: threaded end floating ball valves, threaded end and wafer check valves, needle valves, scotch yoke and pneumatic piston actuators. ViNtrol's extensive ball valve offering range in size from 1/4" FP thru 56" FP in class 150 to 2500 and 1 13/16" thru 7 1/16" API 2,000 to 10,000 psi. For additional product design, size and pressure information, please visit our website: www.vintrol.com. Contact ViNtrol today to discuss how one of our cost effective products can solve your production requirements.



Manufacturing Range

Size Range Available

Bore	ASME class	Size (Inch/mm)																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	40"	42"	48"	56"
		50	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1050	1200	1400
FULL	150#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	300#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	600#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	900#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	1500#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
	2500#	✓	✓	✓	✓	✓	✓	✓											
REDUCED	150#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	300#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	600#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	900#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	1500#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
	2500#	✓	✓	✓	✓	✓	✓	✓											

Valve sizes larger than 36" and sizes 22", 26", 28", 32" and 34" are also available on request

Valve Configurations Available

Design	Class/Size						API 6A
	150#	300#	600#	900#	1500#	2500#	2000 - 10,000
2-piece (T2)	2"~12"	2"~12"	2"~12"	2"~12"			1 13/16" - 7 1/16"
3-piece (T3)	2"~56"	2"~56"	2"~56"	2"~36"	2"~24"	2"~12"	1 13/16" - 7 1/16"

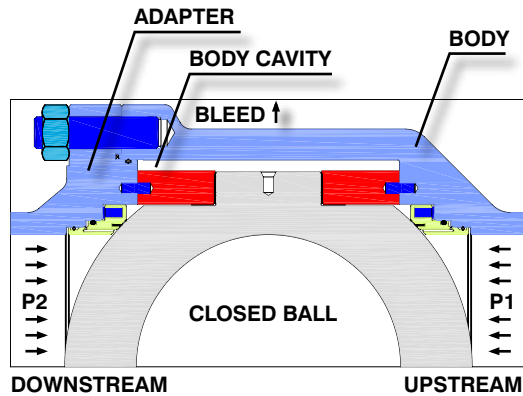
Top entry and all welded construction available upon request

SPECIAL TESTING CAPABILITIES

- Fugitive Emission testing
- Cryogenic testing
- High pressure Nitrogen/Gas testing
- Vacuum testing (Helium leak detection)
- Sulphide stress cracking (SSC) testing
- Hydrogen Induced Cracking (HIC) testing.

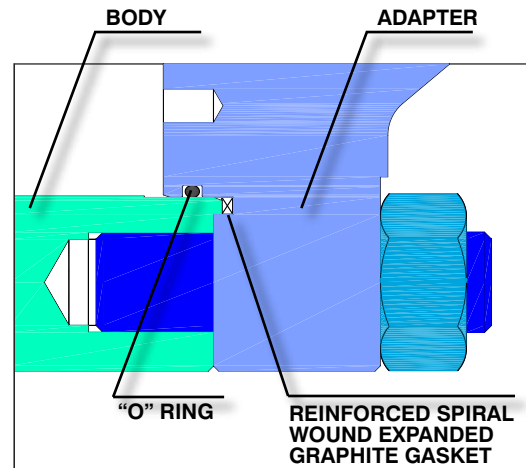
Design Features

Double Block and Bleed



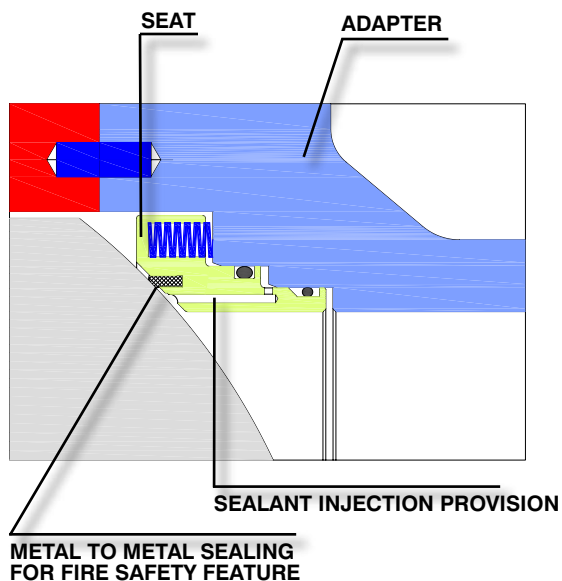
Spring loaded floating seats maintain contact with the ball and provide tight shut off even at low pressure differential. Independent sealing of upstream and downstream sides facilitates draining of fluid from the body cavity, and thus the double block and bleed operation.

Double Body Sealing



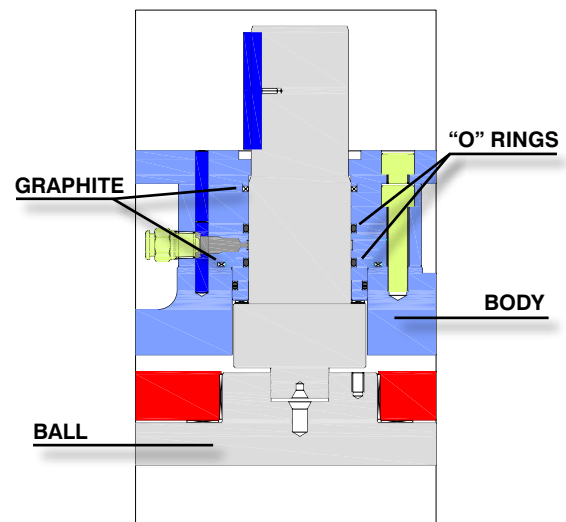
Double seal combination of O-ring and spiral wound gasket ensure perfect body joint sealing. ViTrol valves therefore meet or exceed the fugitive emission requirements across wide range of pressure and temperature applications. Valves are suitable for both above and underground installations.

Fire Safe Design



Secondary metal-to-metal sealing accomplishes Fire Safe requirements.

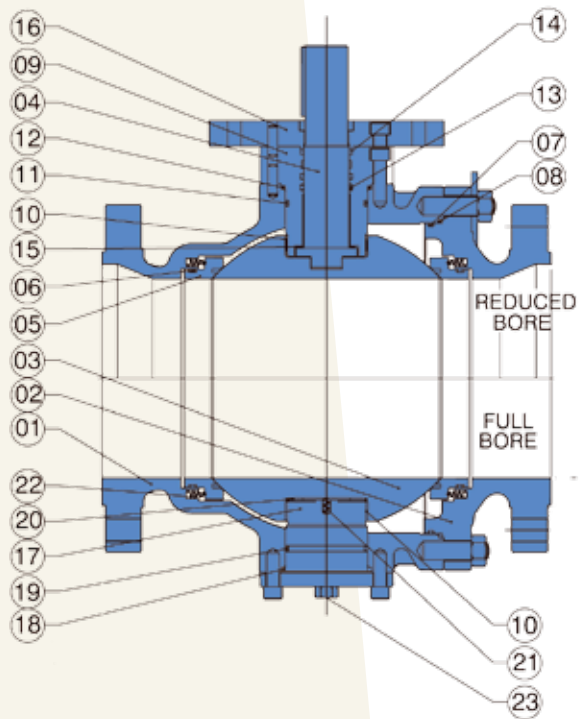
Multiple Stem Sealing



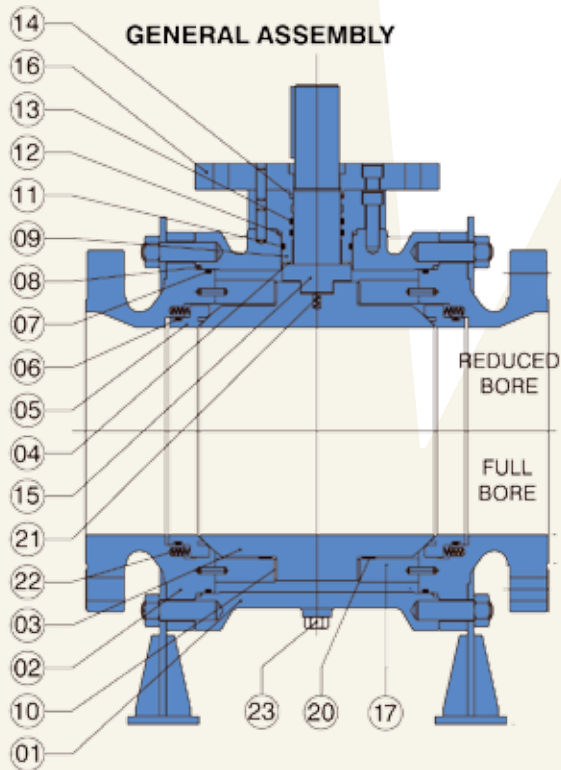
A triple sealing arrangement in stem area prevents leakage to atmosphere. It includes double sealing with O-rings and graphite seal at the top of stem housing. The blow out proof stem enables positive stem retention.

Corrosion Protection and Painting

All castings are shot blasted and are subjected to dewatering oil coats. Carbon Steel valves are Zinc phosphated and internally lacquered before final assembly. Valves are thoroughly cleaned and primer coated with Epoxy Zinc Phosphate primer, followed by a final coat of Epoxy Blue shade applied in semi-gloss finish. Valves are shipped in vapor corrosion inhibitor impregnated paper bags with desiccant pouches to prevent corrosion due to saline environment.

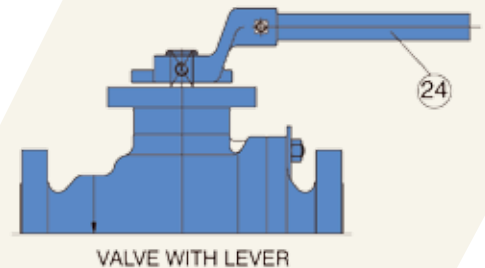


Series T2

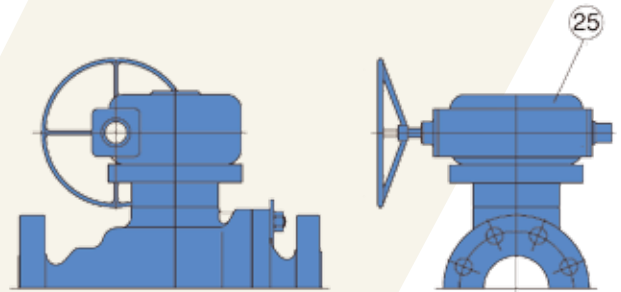


Series T3

Lever / Gear Box Details



VALVE WITH LEVER



VALVE WITH GEAR

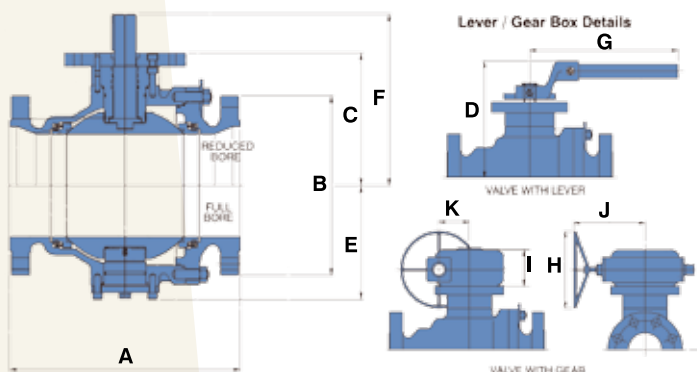
ITEM NO.	PART DESCRIPTION
01	BODY
02	BODY ADAPTER
03	BALL
04	STEM
05	SEAT + INSERT
06	O RING (SEAT)
07	O RING (BODY ADAPTER)
08	GASKET (BODY)
09	STEM HOUSING
10	BUSH BEARING
11	O RING (STEM HOUSING)
12	GASKET (STEM HOUSING)
13	O RING (STEM)
14	GASKET (STEM)
15	STEM THRUST WASHER
16	ISO MOUNTING FLANGE
17	TRUNNION/TRUNNION PLATE
18	GASKET (TRUNNION)
19	O RING (TRUNNION)
20	TRUNNION THRUST WASHER
21	ANTISTATIC SPRINGS
22	SEAT SPRINGS
23	DRAIN PLUG/BLEED VALVE
24	HAND LEVER
25	GEAR BOX

Materials of Construction

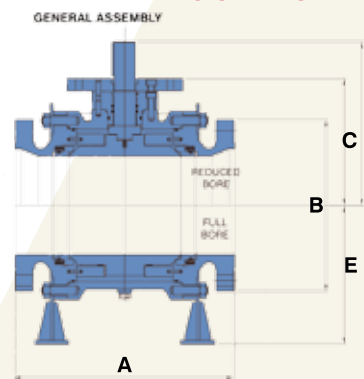
BODY	ASTM - A 216 WCB / A 351 CF8M / A 351 CF8M / A 351 CF3M / A 351 LCB / A 217 CA15
BODY ADAPTER	ASTM - A 216 WCB / A 351 CF8M / A 351 CF8M / A 351 CF3M / A 351 LCB / A 217 CA15
BALL	ASTM - A 216 WCB + ENP COATED / A 351 CF8M / A 351 CF8M / A 351 CF3M / A 217 CA 15
STEM HOUSING	ASTM - A 216 WCB / A351 CF8M / A 351 CF3M / A 352 LCB / A 217 CA 15
STEM	ASTM - A 479SS304 / A 479 SS 316 / A 479 SS 304L / A 479 SS 316L / A 182 F304 / A 182 F 410 / A 564 TYPE 630 / A 479 SS 410
SEAT	ASTM - A 105 + ENP / A 182 F316 / AISI 410 / A 479SS 410
SEAT INSERT	RPTFE / NYLON / PEEK / DEVLON / METAL TO METAL WITH VARIOUS OVERLAYS
STEM GASKET	GRAPHITE
BODY GASKET	GRAPHITE / REINFORCED SS 316 GRAPHITE
STEM H. GASKET	GRAPHITE
TRUNNION GASKET	GRAPHITE
O RING	VITON / HNBR / AFLAS / PC BUNA / EPDM / JAMES WALKER
TRUNNION	ASTM - A 479 SS 304 / A 479 SS 316L / A 479 SS 304L / A 479SS 316L / A 182 F 304 / A 182 F 304 F 316 / A 182 F 410 / A 564n TYPE 630 / A 105
SPRINGS	ASTM - A 313 SS 302 / ASTM B 637 (INCONEL 750)
THRUST WASHER	PHOSPHOR BRONZE / A 479 SS 316 + BRONZE + PTFE COATED / A 479 SS 316 + PTFE COATED
STUDS / BOLTS / CAP SCREW	ASTM - A 320 L7 / A 193 B8 / A 193 B8M / A 193 GR. B7M
NUT	ASTM - A 194 GR 7M / A 194 GR 8M / A 194 2H / A 194 B7 / A 193 GR. B7M
BEARING	A 479 SS 316 + PTFE COATED
COUPLING	STEEL + PLATING
SUPPORT STAND	STEEL
LIFTING HOOK	STEEL
BRACKET	STEEL
DRAIN PLUG	STANDARD



T2 SERIES



T3 SERIES



DIMENSIONAL DETAILS FOR 2 PIECE DESIGN - T2 SERIES ANSI 150

Dimensions in "inches" ANSI 150

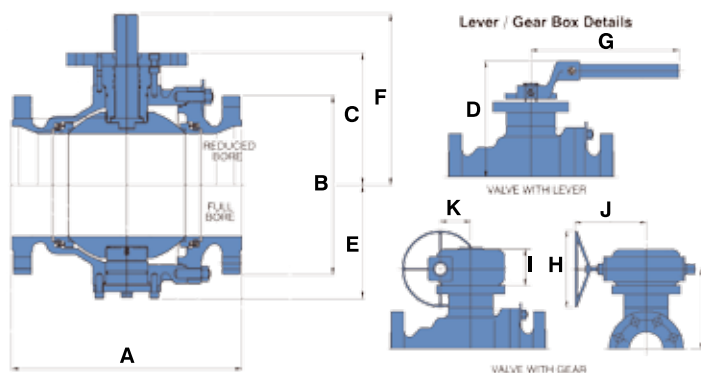
SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	7.00	7.50	6.00	2.93	5.20	2.99	4.11	11.42	-	-	-	-	21	1	-
3" x 2"	8.00	8.50	7.50	2.93	5.20	2.99	4.11	11.42	-	-	-	-	35	1	-
3"	8.00	8.50	7.50	3.98	7.20	4.72	5.62	15.74	-	-	-	-	50	4	-
4" x 3	9.00	9.50	9.00	3.98	7.20	4.72	5.62	15.74	-	-	-	-	85	4	-
4"	9.00	9.50	9.00	4.80	8.00	5.50	6.50	17.72	-	-	-	-	80	5	-
6" x 4"	15.50	16.00	11.00	4.80	8.00	5.50	6.50	17.72	-	-	-	-	140	5	-
6"	15.50	16.00	11.00	9.13	10.67	7.36	11.96	-	15.75	4.72	13.00	3.43	287	-	55
8" x 6"	18.00	18.50	13.50	9.13	10.67	7.36	11.96	-	15.75	4.72	13.00	3.43	375	-	55
8"	18.00	18.50	13.50	10.41	13.24	8.68	13.25	-	17.72	4.25	14.00	3.62	441	-	55
10" x 8"	21.00	21.50	16.00	10.41	13.24	8.68	13.25	-	17.72	4.25	13.00	3.62	550	-	55
10"	21.00	21.50	16.00	12.17	15.00	10.15	15.51	-	19.69	5.12	13.00	5.20	617	-	95
12" x 10"	24.00	24.50	19.00	12.17	15.00	10.15	15.51	-	19.69	5.12	13.80	5.20	730	-	95
12"	24.00	24.50	19.00	16.46	20.50	12.80	19.51	-	23.62	6.18	13.80	5.20	810	-	135

DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 150

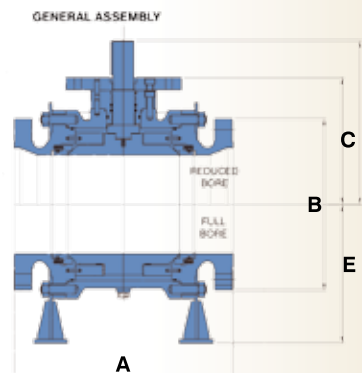
Dimensions in "inches" ANSI 150

SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
6" x 4"	15.5	16.0	11.00	8.43	12.60	6.70	10.80	-	9.84	2.95	9.84	2.66	235.4	-	55.0
6"	15.5	16.0	11.00	9.50	12.60	12.60	12.30	-	15.75	4.72	12.99	3.45	330	-	55.0
8" x 6"	18.0	18.5	13.50	9.50	12.60	12.60	12.30	-	15.75	4.72	12.99	3.45	389.4	-	55.0
8"	18.0	18.5	13.50	10.60	13.75	8.90	13.40	-	15.75	4.72	12.99	3.46	528	-	55.0
10" x 8"	21.0	21.5	16.00	10.60	13.75	8.90	13.40	-	19.69	4.72	12.99	3.46	645	-	55.0
10"	21.0	21.5	16.00	12.09	15.25	12.64	14.92	-	19.69	5.12	12.99	3.46	759	-	55.0
12" x 10"	24.0	24.5	19.00	12.09	15.25	12.64	14.92	-	23.62	5.12	12.99	3.46	880	-	55.0
12"	24.0	24.5	19.00	14.06	17.20	14.61	17.05	-	19.69	5.12	12.99	3.46	1034	-	55.0
14" x 12"	27.0	27.5	21.00	14.06	17.20	14.61	17.05	-	19.69	5.12	12.99	3.46	1137	-	55.0
14"	27.0	27.5	21.00	15.70	25.00	16.22	20.30	-	19.69	4.84	18.43	5.83	1672	-	125.4
16" x 14"	30.0	30.5	23.50	15.70	25.00	16.22	20.30	-	19.69	4.84	18.43	5.83	1868	-	125.4
16"	30.0	30.5	23.50	18.10	28.00	16.93	22.70	-	19.69	7.40	13.78	11.06	2200	-	250.8
18" x 16"	34.0	34.5	25.00	19.57	28.00	18.82	26.65	-	19.69	6.69	23.78	8.90	2534	-	250.8
18"	34.0	34.5	25.00	19.60	32.00	18.82	27.40	-	19.69	7.09	23.86	13.43	3421	-	301.4
20" x 18"	36.0	36.5	27.50	19.60	32.00	18.82	27.40	-	19.69	7.28	23.86	13.43	3498	-	301.4
20"	36.0	36.5	27.50	20.40	32.00	20.67	27.50	-	29.53	13.58	28.78	15.06	3703	-	484.0
24" x 20"	42.0	42.5	32.00	20.40	32.00	20.67	27.50	-	29.53	13.58	28.78	15.06	3923	-	484.0
24"	42.0	42.5	32.00	23.23	33.00	25.59	28.74	-	29.53	9.06	23.62	21.65	4119	-	653.4
30" x 24"	51.0	-	38.75	23.23	33.00	25.59	28.74	-	29.53	9.06	23.62	21.65	4538	-	653.4
30"	51.0	-	38.75	27.05	30.59	32.48	34.78	-	*	*	*	*	5370	-	*
36" x 30"	60.0	-	46.00	27.05	30.59	32.48	34.78	-	*	*	*	*	6713	-	*
36"	60.0	-	46.00	32.09	38.82	36.93	39.17	-	*	*	*	*	8950	-	*

T2 SERIES



T3 SERIES



DIMENSIONAL DETAILS FOR 2 PIECE DESIGN - T2 SERIES ANSI 300

Dimensions in "inches" ANSI 300

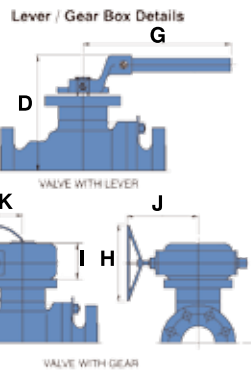
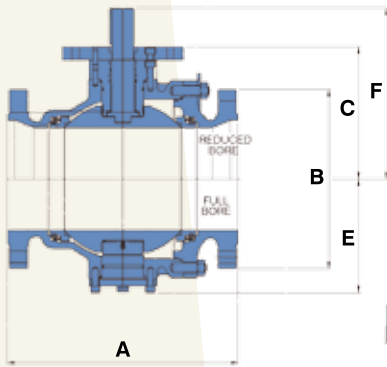
SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	8.50	9.12	6.50	2.93	5.20	2.99	4.11	11.42	-	-	-	-	29	1	-
3" x 2"	11.12	11.74	8.25	2.93	5.20	2.99	4.11	11.42	-	-	-	-	62	1	-
3"	11.12	11.74	8.25	3.98	7.20	4.72	5.62	21.65	-	-	-	-	82	4	-
4" x 3	12.00	12.62	10.00	3.98	7.20	4.72	5.62	21.65	-	-	-	-	113	4	-
4"	12.00	12.62	10.00	4.80	8.00	5.50	6.50	23.62	-	-	-	-	115	5	-
6" x 4"	15.88	16.50	12.50	4.80	8.00	5.50	6.50	23.62	-	-	-	-	200	5	-
6"	15.88	16.50	12.50	9.13	10.67	7.36	11.96	-	15.75	5.12	13.80	5.20	320	-	95
8" x 6"	19.75	20.37	15.00	9.13	10.67	7.36	11.96	-	15.75	5.12	13.80	5.20	400	-	95
8"	19.75	20.37	15.00	10.41	14.43	8.68	13.25	-	19.69	4.45	23.80	5.20	529	-	198
10" x 8"	22.38	23.00	17.50	10.41	14.43	8.68	13.25	-	19.69	4.45	23.80	5.20	640	-	198
10"	22.38	23.00	17.50	12.17	16.18	10.15	15.51	-	21.65	6.69	23.80	8.90	794	-	198
12" x 10"	25.50	26.12	20.50	12.17	16.18	10.15	15.51	-	21.65	6.69	23.80	8.90	950	-	198
12"	25.50	26.12	20.50	16.46	20.50	12.80	19.51	-	19.69	7.68	23.80	9.65	970	-	198

DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 300

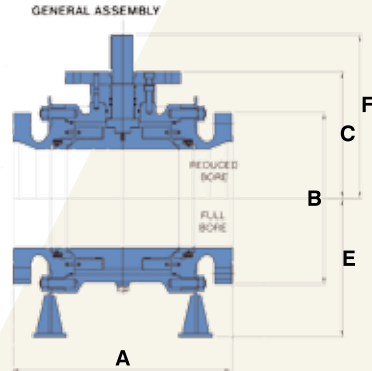
Dimensions in "inches" ANSI 300

SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	8.5	9.13	6.5	4.33	5.15	3.6	5.63	15.7	-	-	-	-	51	1	-
3" x 2"	11.1	11.7	8.25	5.85	6.91	4.33	7.55	15.7	-	-	-	-	88	1	-
3"	11.1	11.7	8.25	7.83	9.7	5.91	10.2	-	9.84	3.11	12.2	3.07	136	-	31.9
4" x 3"	12	12.6	10	7.83	9.7	5.91	10.2	-	9.84	3.11	12.2	3.07	172	-	31.9
4"	12	12.6	10	8.43	10.3	7.09	10.8	-	11.8	3.74	12.6	3.07	218	-	31.9
6" x 4"	15.9	16.5	12.5	8.43	10.3	7.09	10.8	-	11.8	3.74	12.6	3.07	275	-	31.9
6"	15.9	16.5	12.5	9.5	12.6	9.61	12.3	-	15.7	5.12	13.8	5.18	352	-	96.8
8" x 6"	19.8	20.4	15	9.5	12.6	9.61	12.3	-	19.7	5.12	14.5	5.18	682	-	96.8
8"	19.8	20.4	15	10.6	13.7	11.6	13.4	-	19.7	4.45	13	5.18	757	-	72.6
10" x 8"	22.4	23	17.5	10.6	13.7	11.6	13.4	-	21.7	5.12	13.4	5.18	860	-	72.6
10"	22.4	23	17.5	13	17	12.6	16.7	-	21.7	6.69	23.8	8.9	990	-	198
12" x 10"	25.5	26.1	20.5	13	17	12.6	16.7	-	23.6	6.69	23.8	8.9	1236	-	198
12"	25.5	26.1	20.5	15	18.8	14.6	18.8	-	19.7	6.69	23.8	8.9	1441	-	198
14" x 12"	30	30.6	23	15	18.8	14.6	18.8	-	19.7	6.69	23.8	8.9	1712	-	198
14"	30	30.6	23	15.7	25.5	16.2	20.3	-	19.7	6.69	23.8	8.9	2178	-	251
16" x 14"	33	33.6	25.5	15.7	25.5	16.2	20.3	-	19.7	6.69	23.8	8.9	2200	-	251
16"	33	33.6	25.5	18.1	27.1	18.4	22.8	-	29.5	7.87	28.8	13.4	2204	-	484
18" x 16"	36	36.6	28	18.1	27.1	18.4	22.8	-	29.5	7.87	28.8	13.4	3080	-	484
18"	36	36.6	28	19.6	31.4	18.7	26.7	-	29.5	13.6	28.8	13.9	3421	-	484
20" x 18"	39	39.8	30.5	19.6	31.4	18.7	26.7	-	29.5	13.6	28.8	13.9	4484	-	484
20"	39	39.8	30.5	20.4	32.2	19.9	27.5	-	29.5	13.6	28.8	13.9	5084	-	653
24" x 20"	45	45.9	36	20.4	32.2	19.9	27.5	-	29.5	13.6	28.8	13.9	6158	-	653
24"	45	45.9	36	25.5	32.2	29.3	32.6	-	39.6	10.4	29.9	12	7958	-	968
30" x 24"	55	56	43	25.5	32.2	29.3	32.6	-	39.6	10.4	29.9	12	9948	-	968
30"	55	56	43	28	34.1	33	34.4	-	*	*	*	*	15852	-	*
36" x 30"	68	69.1	50	28	34.1	33	34.4	-	*	*	*	*	19815	-	*
36"	68	69.1	50	31.5	37.6	36.9	38.5	-	*	*	*	*	23662	-	*

T2 SERIES



T3 SERIES



DIMENSIONAL DETAILS FOR 2 PIECE DESIGN - T2 SERIES ANSI 600

Dimensions in "inches" ANSI 600

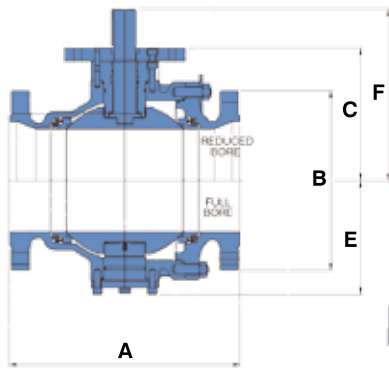
SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	11.50	11.62	6.50	4.92	6.87	3.74	6.63	19.70	-	-	-	-	55	5	-
3" x 2"	14.00	14.12	8.25	4.92	6.87	3.74	6.63	19.70	-	-	-	-	95	5	-
3"	14.00	14.12	8.25	6.50	10.80	5.39	8.86	39.37	13.78	3.74	13.00	3.07	143	10	37
4" x 3	17.00	17.12	10.75	6.50	10.80	5.39	8.86	39.37	13.78	3.74	13.00	3.07	195	10	37
4"	17.00	17.12	10.75	7.76	12.12	5.94	10.16	39.37	13.78	3.74	13.00	3.07	214	15	37
6" x 4"	22.00	22.12	14.00	7.76	12.12	5.94	10.16	39.37	13.78	3.74	13.00	3.07	293	15	37
6"	22.00	22.12	14.00	9.37	13.31	7.40	12.30	-	19.70	6.18	13.80	5.20	463	-	198
8" x 6"	26.00	26.12	16.50	9.37	13.31	7.40	12.30	-	19.70	6.18	13.80	5.20	670	-	198
8"	26.00	26.12	16.50	11.10	15.10	15.60	14.10	-	19.70	6.69	23.86	8.90	1014	-	198
10" x 8"	31.00	31.12	20.00	11.10	15.10	15.60	14.10	-	19.70	6.69	23.86	8.90	1322	-	198
10"	31.00	31.12	20.00	12.95	17.44	13.10	16.75	-	19.70	7.40	23.86	11.06	1720	-	251
12" x 10"	33.00	33.12	22.00	12.95	17.44	13.10	16.75	-	19.70	7.40	23.86	11.06	2160	-	251
12"	33.00	33.00	22.00	14.37	19.13	19.17	18.17	-	19.70	8.50	23.86	11.06	1852	-	251

DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 600

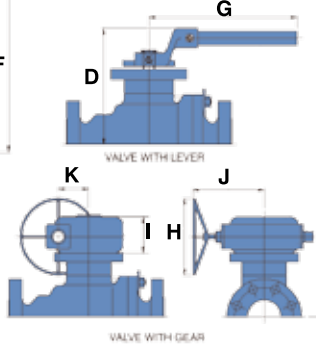
Dimensions in "inches" ANSI 600

SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	11.5	11.61	6.5	5.85	6.91	4.53	7.55	19.7	-	-	-	-	75	5.1	-
3" x 2"	14.0	14.13	8.25	5.85	6.91	4.53	7.55	19.7	-	-	-	-	119	5.1	-
3"	14.0	14.13	8.25	7.83	11.5	5.91	10.20	39.4	13.8	3.74	12.99	3.07	169	6.7	37
4" x 3"	17.0	17.13	10.75	7.83	11.5	5.91	10.20	39.4	13.8	3.74	12.99	3.07	182	6.7	37
4"	17.0	17.13	10.75	8.43	11.5	7.09	10.83	39.4	13.8	3.74	12.99	3.07	264	6.7	37
6" x 4"	22.0	22.13	14	8.43	11.5	7.09	10.83	39.4	13.8	3.74	12.99	3.07	354	6.7	37
6"	22.0	22.13	14	9.49	12	8.86	12.3	-	21.7	6.18	13.39	5.18	528	-	119
8" x 6"	26.0	26.14	16.5	9.49	12.5	8.86	12.3	-	21.7	6.18	13.39	5.18	724	-	119
8"	26.0	26.14	16.5	11.10	15	10.67	16.73	-	19.7	6.69	23.78	8.90	1023	-	198
10" x 8"	31.0	31.14	20	11.10	15	15.59	14.90	-	19.7	6.69	23.78	8.90	1232	-	198
10"	31.0	31.14	20	12.95	17.25	13.03	16.75	-	19.7	7.40	23.86	11.06	1320	-	198
12" x 10"	33.0	33.11	22	12.95	17.25	13.03	16.75	-	19.7	7.40	23.86	11.06	1430	-	198
12"	33.0	33.11	22	15	19.76	14.53	18.8	-	19.7	8.50	23.86	11.06	1833	-	251
14" x 12"	35.0	35.12	23.75	15	19.76	14.53	18.8	-	19.7	8.50	23.86	11.06	2015	-	251
14"	35.0	35.12	23.75	15.75	24.67	17.05	20.33	-	29.5	13.58	28.78	15.06	3058	-	484
16" x 14"	39.0	39.13	27	15.75	24.67	17.05	20.33	-	29.5	13.58	28.78	15.06	3120	-	484
16"	39.0	39.13	27	18.1	26.92	17.32	22.70	-	29.5	13.58	27.72	15.06	4070	-	301
18" x 16"	43.0	43.11	29.25	18.1	26.92	17.32	22.70	-	29.5	13.58	27.72	15.06	4697	-	301
18"	43.0	43.11	29.25	20.63	32.2	20.47	27.52	-	29.5	13.58	21.65	18.07	6032	-	651
20" x 18"	47.0	47.24	32	20.63	32.2	20.47	27.52	-	29.5	13.58	21.65	18.07	6483	-	651
20"	47.0	47.24	32	20.4	32.16	19.88	27.52	-	29.5	13.58	21.65	18.07	7409	-	651
24" x 20"	55.0	55.39	37	20.4	32.16	19.88	27.52	-	29.5	13.58	21.65	18.07	7557	-	651
24"	55.0	55.39	37	25.67	33.16	29.61	32.76	-	39.4	10.43	29.92	12.01	8774	-	968
30" x 24"	65.0	65.51	44.5	25.11	31.22	30.27	32.6	-	39.4	10.43	29.92	12.01	11738	-	968
30"	65.0	65.51	44.5	27.05	32.91	31.73	37.17	-	*	*	*	*	18230	-	*
36" x 30"	82.0	82.64	51.75	28.62	34.92	33.31	41.2	-	*	*	*	*	23580	-	*
36"	82.0	82.64	51.75	32.75	38.86	37.72	41.2	-	*	*	*	*	27685	-	*

T2 SERIES

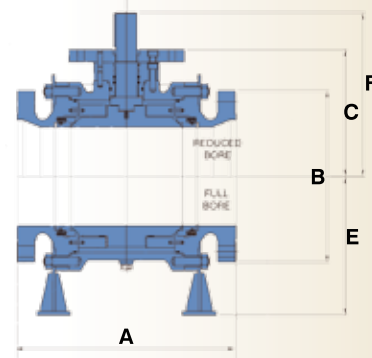


Lever / Gear Box Details



T3 SERIES

GENERAL ASSEMBLY



DIMENSIONAL DETAILS FOR 2 PIECE DESIGN - T2 SERIES ANSI 900

Dimensions in "inches" ANSI 900

SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	14.49	14.61	8.50	5.85	7.99	4.72	7.56	27.56	-	-	-	-	117	5	-
3" x 2"	15.00	15.12	9.50	5.85	7.99	4.72	7.56	27.56	-	-	-	-	131	5	-
3"	15.00	15.12	9.50	6.50	10.06	5.91	8.82	39.37	13.78	3.74	12.99	3.07	187	10	37
4" x 3	17.99	18.11	11.50	6.50	10.06	5.91	8.82	39.37	13.78	3.74	12.99	3.07	254	10	37
4"	17.99	18.11	11.50	7.76	11.69	7.09	10.16	39.37	17.72	4.25	14.37	3.31	281	15	50.6
6" x 4"	24.02	24.13	15.00	7.76	11.69	7.09	10.16	39.37	17.72	4.25	14.37	3.31	374	15	50.6
6"	24.02	24.13	15.00	10.08	14.00	8.43	13.07	-	23.62	6.69	23.78	8.90	626	-	198
8" x 6"	29.02	29.13	18.50	10.08	14.00	8.43	13.07	-	27.56	6.69	23.78	8.90	767	-	198
8"	29.13	29.13	18.50	11.81	15.60	9.92	15.59	-	19.69	6.69	23.78	8.90	879	-	202
10" x 8"	32.99	33.11	21.50	11.81	15.60	9.92	15.59	-	19.69	6.69	23.78	8.90	1726	-	202
10"	32.99	33.11	21.50	13.70	18.10	11.54	19.07	-	23.62	8.50	23.86	11.06	1866	-	266
12" x 10"	37.99	38.11	24.00	13.70	18.10	11.54	19.07	-	23.62	8.50	23.86	11.06	2169	-	266
12"	37.99	38.11	24.00	15.47	20.00	13.86	20.91	-	29.53	7.28	23.86	13.43	2450	-	266

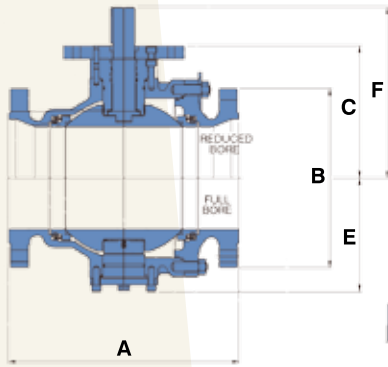
DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 900

Dimensions in "inches" ANSI 900

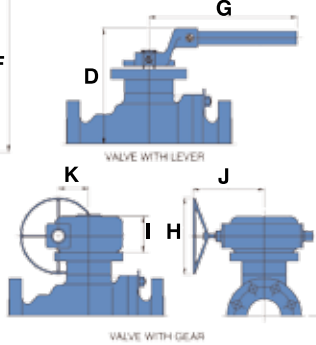
SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	14.5	14.61	8.5	5.85	6.9	4.7	7.6	27.6	-	-	-	-	139	5	-
3" x 2"	15.0	15.12	9.5	5.85	6.9	4.7	7.6	27.6	-	-	-	-	154	5	-
3"	15.0	15.12	9.5	7.82	9.7	5.9	10.2	39.4	13.8	3.74	12.99	3.1	220	-	37
4" x 3"	18.0	18.11	11.5	7.82	9.7	5.9	10.2	39.4	13.8	3.74	12.99	3.1	299	-	37
4"	18.0	18.11	11.5	8.43	10.3	7.1	10.8	39.4	17.7	4.25	14.37	3.3	330	-	51
6" x 4"	24.0	24.13	15	8.43	10.3	7.1	10.8	39.4	17.7	4.25	14.37	3.3	440	-	51
6"	24.0	24.13	15	9.49	14.0	9.6	13.1	-	23.6	6.69	23.78	8.9	737	-	198
8" x 6"	29.0	29.13	18.5	9.49	14.0	9.6	13.1	-	27.6	6.69	23.78	8.9	902	-	198
8"	29.0	29.13	18.5	11.10	15.6	10.9	15.6	-	19.7	6.69	23.78	8.9	1034	-	202
10" x 8"	33.0	33.11	21.5	11.10	15.6	10.9	15.6	-	19.7	6.69	23.78	8.9	2031	-	202
10"	33.0	33.11	21.5	12.95	18.1	13.2	19.1	-	23.6	8.50	23.86	11.1	2196	-	266
12" x 10"	38.0	38.11	24	12.95	18.1	13.2	19.1	-	23.6	8.50	23.86	11.1	2552	-	266
12"	38.0	38.11	24	15.00	20.0	14.4	20.9	-	29.5	7.28	23.86	13.4	2959	-	301
14" x 12"	40.5	40.87	25.25	15.00	20.0	14.4	20.9	-	29.5	7.28	23.86	13.4	3014	-	301
14"	40.5	40.87	25.25	18.31	21.4	22.2	25.2	-	29.5	13.58	20.67	15.1	4563	-	484
16" x 14"	44.5	44.88	27.75	18.31	21.4	22.2	25.2	-	29.5	13.58	20.67	15.1	4971	-	484
16"	44.5	44.88	27.75	19.02	22.44	20.87	24.61	-	*	*	*	*	5247	*	*
18" x 16"	48.0	48.50	31	19.02	22.44	20.87	24.61	-	*	*	*	*	5765	*	*
18"	48.0	48.50	31	23.78	30.5	28.7	31.3	-	*	*	*	*	6773	*	*
20" x 18"	52.0	52.52	33.75	23.78	30.5	28.7	31.3	-	*	*	*	*	7919	*	*
20"	52.01	52.52	33.75	21.9	28.0	26.9	29.5	*	*	*	*	*	9848	*	*
24" x 20"	60.98	61.73	41	21.9	28.0	26.9	29.5	*	*	*	*	*	12555	*	*
24"	60.98	61.73	41	25.2	31.3	30.3	33.9	*	*	*	*	*	16133	*	*
30" x 24"	74.02	74.88	48.5	25.2	31.3	30.3	33.9	*	*	*	*	*	20684	*	*
30"	74.02	74.88	48.5	31.3	*	34.65	38.98	*	*	*	*	*	28420	*	*
36" x 30"	90.00	91.14	57.5	31.3	*	34.65	38.98	*	*	*	*	*	35236	*	*

* Consult factory for dimensional details

T2 SERIES

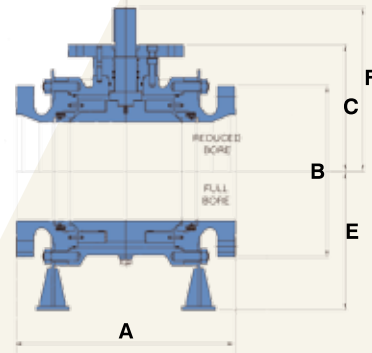


Lever / Gear Box Details



T3 SERIES

GENERAL ASSEMBLY



DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 1500

Dimensions in "inches" ANSI 1500

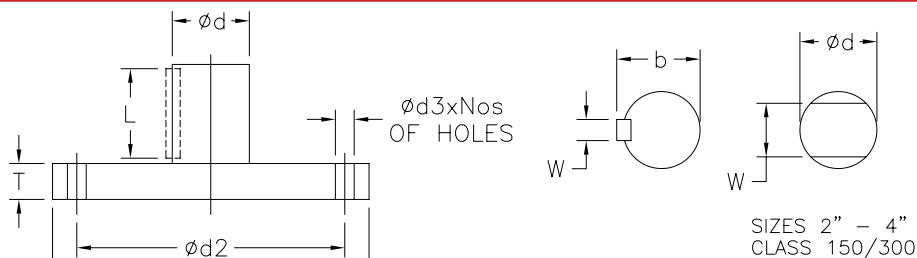
SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	14.5	14.61	8.5	5.85	6.91	4.72	7.56	27.56	-	-	-	-	158.4	5	-
3"x 2"	18.5	18.62	10.5	5.85	6.91	4.72	7.56	27.56	-	-	-	-	198	5	-
3"	18.5	18.62	10.5	7.83	9.7	5.91	10.20	-	17.72	4.25	14.37	3.31	242	-	50.6
4"x 3"	21.5	21.61	12.25	7.83	9.7	5.91	10.20	-	17.72	4.25	14.37	3.31	338.8	-	50.6
4"	21.5	21.61	12.25	8.43	12.6	7.09	10.83	-	17.72	4.76	15.51	4.02	371.8	-	66
6"x 4"	27.8	27.99	15.5	8.43	12.6	7.09	10.83	-	17.72	4.76	15.51	4.02	638	-	66
6"	27.8	27.99	15.5	12.36	15.31	17.80	15.96	-	19.69	6.69	23.78	8.90	1254	-	202
8"x 6"	32.8	33.11	19	12.36	15.31	17.80	15.96	-	19.69	6.69	23.78	8.90	1375	-	202
8"	32.8	33.11	19	15.55	18.23	21.06	20.28	-	23.62	8.50	23.86	11.06	2222	-	251
10"x 8"	39.0	39.37	23	15.55	18.23	21.06	20.28	-	23.62	8.5	23.9	11	2890	-	251
10"	39.0	39.37	23	18.43	21.57	23.82	25.31	-	23.62	8.5	17.13	13.43	3505	-	495
12"x 10"	44.5	45.12	26.5	18.43	21.57	23.82	25.31	-	23.62	8.5	17.13	13.43	3877	-	495
12"	44.5	45.12	26.5	18.78	21.85	23.90	25.67	-	29.53	13.58	28.78	15.08	5510	-	495
14"x 12"	49.5	50.24	29.5	18.78	21.85	23.90	25.67	-	29.53	13.58	28.78	15.08	6068	-	495
14"	49.5	50.24	29.5	20.28	-	18.74	26.18	-	*	*	*	*	7308.3	-	*
16"x 14"	54.5	55.35	32.5	20.28	-	18.74	26.18	-	*	*	*	*	8038	-	*
16"	54.5	55.35	32.5	22.44	-	21.57	28.35	-	*	*	*	*	10117	-	*
18"x 16"	60.5	61.38	36	22.44	-	21.57	28.35	-	*	*	*	*	11129	-	*
18"	60.5	61.38	36	25.39	-	26.50	32.09	-	*	*	*	*	14842	-	*
20"x 18"	65.5	66.38	38.75	25.39	-	26.50	32.09	-	*	*	*	*	16325	-	*
20"	65.5	66.38	38.75	28.82	-	27.20	36.50	-	*	*	*	*	21447	-	*
24"x 20"	80.43	81.54	46	28.82	-	27.20	36.50	-	*	*	*	*	23583	-	*
24"	80.43	81.54	46	31.42	-	30.87	39.09	-	*	*	*	*	32966	-	*

DIMENSIONAL DETAILS FOR 3 PIECE DESIGN - T3 SERIES ANSI 2500

Dimensions in "inches" ANSI 2500

SIZE	A - RF	A - RTJ	B	C	D	E	F	G	H	I	J	K	Approximate Weights (lb)		
													Bare Stem	Lever	Operator Gear
2"	17.8	17.9	9.25	6.02	8.11	-	8.19	39.37	11.81	*	*	*	226	5.06	*
3"x 2"	22.8	23.0	12.00	6.02	8.11	-	8.19	39.37	11.81	*	*	*	400	5.06	*
3"	22.8	23.0	12.00	7.64	9.92	-	9.80	-	19.69	*	*	*	521	-	*
4"x 3"	26.5	26.9	14.00	7.64	9.92	-	9.80	-	19.69	*	*	*	679	-	*
4"	26.5	26.9	14.00	9.13	11.34	12.20	11.30	-	19.69	*	*	*	976	-	*
6"x 4"	36.0	36.5	19.00	9.13	11.34	12.20	11.30	-	19.69	*	*	*	1369	-	*
6"	36.0	36.5	19.00	12.36	15.35	15.16	14.53	-	27.56	*	*	*	2013	-	*
8"x 6"	40.2	40.9	21.75	12.36	15.35	15.16	14.53	-	27.56	*	*	*	2738	-	*
8"	40.2	40.9	21.75	16.46	19.41	18.50	18.62	-	27.56	*	*	*	3543	-	*
10"x 8"	50.0	50.9	26.50	16.46	19.41	18.50	18.62	-	27.56	*	*	*	4147	-	*
10"	50.0	50.9	26.50	19.17	22.72	21.46	21.34	-	27.56	*	*	*	5139	-	*
12"x 10"	56.0	56.9	30.00	19.17	22.72	21.46	21.34	-	27.56	*	*	*	6047	-	*
12"	56.0	56.9	30.00	22.01	28.03	24.41	24.17	-	27.56	*	*	*	7976	-	*

* Consult factory for dimensional details



OPERATOR MOUNTING DETAILS FOR SERIES T2-TWO PIECE

SIZE			ISO PAD DETAILS						STEM DETAILS			
FP	RP	CLASS	ϕd	ISO 5211	$\phi d1$	$\phi d2$	$\phi d3$	T	Nos OF HOLES	W	b	L
2	3	150-300	0.787	F07	2.83 SQ	2.76	M8X1.25P	0.43	4	0.551	—	0.866
2	3	600	0.984	F10	4.92	4.02	M10X1.5P	0.87	4	0.315	1.102	1.614
3	4	150-300	1.102	F10	3.70 SQ	4.02	M10X1.5P	0.71	4	0.787	—	1.260
3	4	600	1.575	F16	8.27	6.50	0.87	0.79	4	0.472	1.693	1.969
4	6	150-300	1.102	F10	3.70 SQ	4.02	M10X1.5P	0.71	4	0.787	—	1.260
4	6	600	1.575	F16	8.27	6.50	0.87	0.91	4	0.472	1.693	1.969
6	8	150-300	1.772	F16	8.27	6.50	0.87	0.79	4	0.551	1.909	2.559
6	8	600	1.772	F16	8.27	6.50	0.87	0.79	4	0.551	1.909	2.559
8	10	150-300	2.362	F25	11.81	10.00	0.71	0.98	8	0.709	2.520	2.953
8	10	600	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.189	3.543
10	12	150-300	2.362	F25	11.81	10.00	0.71	0.98	8	0.709	2.520	2.953
10	12	600	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.189	3.543
12	—	150-300	2.362	F25	11.81	10.00	0.71	0.98	8	0.709	2.520	2.953
12	—	600	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.189	3.543

OPERATOR MOUNTING DETAILS FOR SERIES T3-THREE PIECE

SIZE			ISO PAD DETAILS						STEM DETAILS			
FP	RP	CLASS	ϕd	ISO 5211	$\phi d1$	$\phi d2$	$\phi d3$	T	Nos OF HOLES	W	b	L
2	3	600-1500	0.984	F12	5.91	4.92	0.55	0.79	4	0.315	1.102	1.575
2	3	2500	1.181	F12	5.91	4.92	0.55	0.98	4	0.315	1.299	1.969
3	4	1500	1.575	F16	8.27	6.50	0.87	0.98	4	0.394	1.693	1.969
3	4	2500	1.575	F16	8.27	6.50	0.87	1.06	4	0.472	1.693	2.362
4	6	900-1500	1.575	F16	8.27	6.50	0.87	0.98	4	0.472	1.693	1.969
4	6	2500	1.772	F16	8.27	6.50	0.87	1.06	4	0.551	1.909	2.953
6	8	600	1.772	F16	8.27	6.50	0.87	0.79	4	0.551	1.909	2.559
6	8	900	2.165	F25	11.81	10.00	0.71	0.98	8	0.630	2.323	2.756
6	8	1500	2.165	F25	11.81	10.00	0.71	0.98	8	0.630	2.323	3.543
6	8	2500	2.283	F25	11.81	10.00	0.71	1.18	8	0.630	2.441	3.228
8	10	600	2.165	F25	11.81	10.00	0.71	0.98	8	0.630	2.323	2.756
8	10	900	2.165	F25	11.81	10.00	0.71	0.98	8	0.630	2.323	3.228
8	10	1500	2.953	F25	11.81	10.00	0.71	1.18	8	0.866	3.110	3.543
8	10	2500	2.953	F25	11.81	10.00	0.71	1.18	8	0.866	3.110	3.543
10	12	150-300	2.362	F25	11.81	10.00	0.71	0.98	8	0.709	2.520	2.953
10	12	600	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.189	3.543
10	12	900	2.953	F25	11.81	10.00	0.71	1.06	8	0.787	3.130	3.543
10	12	1500	2.953	F25	11.81	10.00	0.71	1.18	8	0.787	3.130	3.543
12	14	150-300	2.362	F25	11.81	10.00	0.71	0.98	8	0.709	2.520	2.953
12	14	600	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.189	3.543
12	14	900	2.953	F25	11.81	10.00	0.71	1.06	8	0.787	3.130	4.921
12	14	1500	3.543	F30	13.78	11.73	0.87	1.50	8	0.984	3.740	5.118
16	18	150	2.953	F25	11.81	10.00	0.71	0.98	8	0.866	3.169	3.543
16	18	300	3.346	F25	11.81	10.00	0.71	0.98	8	0.984	3.543	5.118
16	18	600	3.543	F25	11.81	10.00	0.71	0.98	8	0.984	3.740	5.118
16	18	900	4.528	F30	13.78	11.73	0.87	1.18	8	1.260	4.803	5.512
20	24	150	3.543	F25	11.81	10.00	0.71	0.98	8	0.984	3.740	5.118
20	24	300	4.134	F30	13.78	11.73	0.87	1.18	8	1.102	4.370	5.118
20	24	600	4.528	F30	13.78	11.73	0.87	0.98	8	1.260	4.803	5.512
24	—	150	4.134	F30	13.78	11.73	0.87	1.18	8	1.102	4.370	5.118
24	—	300	4.528	F30	13.78	11.73	0.87	1.18	8	1.260	4.803	5.512
24	—	600	5.118	F35	16.34	14.02	1.30	1.18	8	1.417	5.433	5.906

Operator Mounting Details for valve sizes larger than 24" and sizes 14" and 18" are available on request

CV FLOW COEFFICIENTS

API 6D

BORE (INCHES)	CLASSES					
	150	300	600	900	1500	2500
2	420	420	400	330	330	250
2.5	690	690	610	520	510	320
3 X 2	200	200	200	190	180	200
3	1200	1050	1000	910	180	200
4 X 3	600	600	600	590	550	560
4	2200	2100	1850	1800	1700	1100
6 X 4	800	800	790	790	780	745
6	5150	5100	4600	4380	3800	2500
8 X 6	2150	2150	2150	2150	2150	2150
8	9500	9400	9000	8500	7400	5300
10 X 8	4300	4300	4300	4300	3800	2500
10	15000	15000	14700	14500	11500	8300
12 X 10	7550	7550	7550	8000	9000	7550
14 X 10	6000	6000	6000	6100	6100	-
12	23000	23000	22500	21100	18000	13000
14 X 12	14000	14000	14000	12800	12800	-
16 X 12	9100	9100	9100	8900	8900	-
14	28000	28000	28000	25000	21000	-
16 X 14	15000	15000	15000	14200	14100	-
16	37200	37200	37200	34500	27500	-
18 X 16	21000	21000	21000	19200	19000	-
20 X 16	15300	15300	15300	13800	12000	-
18	49000	49000	49000	45000	37000	-
20 X 18	28400	28400	28400	25000	25000	-
20	59000	59000	59000	55200	47800	-
24 X 20	28200	28200	28000	25100	20600	-
22	68200	68200	68200	62000	54000	-
24	92000	92000	92000	83800	70000	-
30 X 24	36000	36000	36000	32900	-	-
26	110000	110000	110000	98500	-	-
28	121000	121000	121000	113000	-	-
30	145000	144000	144000	130000	-	-
36 X 30	64000	64000	64000	61500	-	-
32	170000	170000	170000	151000	-	-
36 X 32	87000	87000	87000	69500	-	-
36	210000	210000	210000	198200	-	-
40	267500	267500	267500	-	-	-
42 X 36	96700	96700	96000	-	-	-
42	280000	280000	280000	-	-	-
48	384000	384000	384000	-	-	-
56 X 42	89000	89000	89000	-	-	-
56	521000	521000	521000	-	-	-

API 6A

BORE (INCHES)	CLASSES		
	3000	5000	10000
1 13/16	270	270	230
2 1/16	350	350	300
3 1/8	1000	940	890
4 1/16	1750	1700	1600
5 1/8	2900	2700	2450
7 1/16	5930	5400	5220

DATA FOR CALCULATION OF FLOW

The coefficient of flow C_v express the rate of flow in gallons per minute at 60°F water with a pressure drop of 1 psig across the valve. The C_v coefficients for the various types and sizes, shown in the tables, have been determined from actual flow tests.

NOTE: K_v is the metric equivalent of C_v .

$$K_v = C_v \times 0.85$$

FOR LIQUIDS:

$$(1) Q_L = C_v \sqrt{\frac{\Delta P}{G_L}}$$

$$(2) \Delta P = G_L \left(\frac{Q_L}{C_v} \right)^2$$

WHERE: Q_L = Flow in U.S. Gallons per minute.

ΔP = (P1-P2) Pressure drop in psi

G_L = Specific gravity of liquid (water = 1 at 60°F)

FOR GASES:

$$(3) Q_G = 1360 C_v \sqrt{\frac{\Delta P}{G_g T}} \cdot \sqrt{\frac{P_1 + P_2}{G_g T}}$$

$$(4) \Delta P = P_1 - \sqrt{P_1^2 - 2 G_g T \left(\frac{Q_g}{1360 C_v} \right)^2}$$

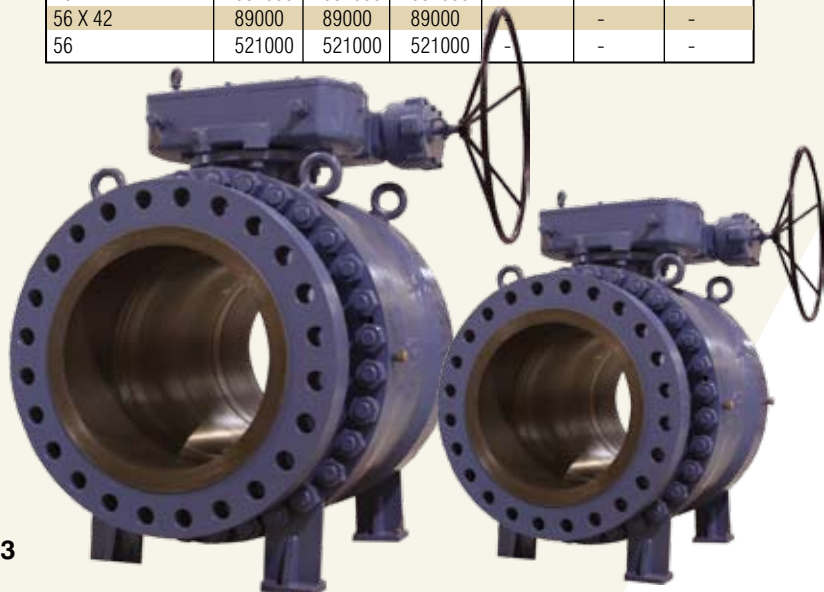
WHERE: Q_g = Volumetric flow of gas (SCFH)

G_g = Specific gravity of gas at standard conditions

T = Absolute temperature of gas (°F + 460)

NOTE: For gas, max. $A_p = 1/2 P_1$, and min.

$P_2 = 1/2 P_1$, and P_2 are absolute pressures (psia)



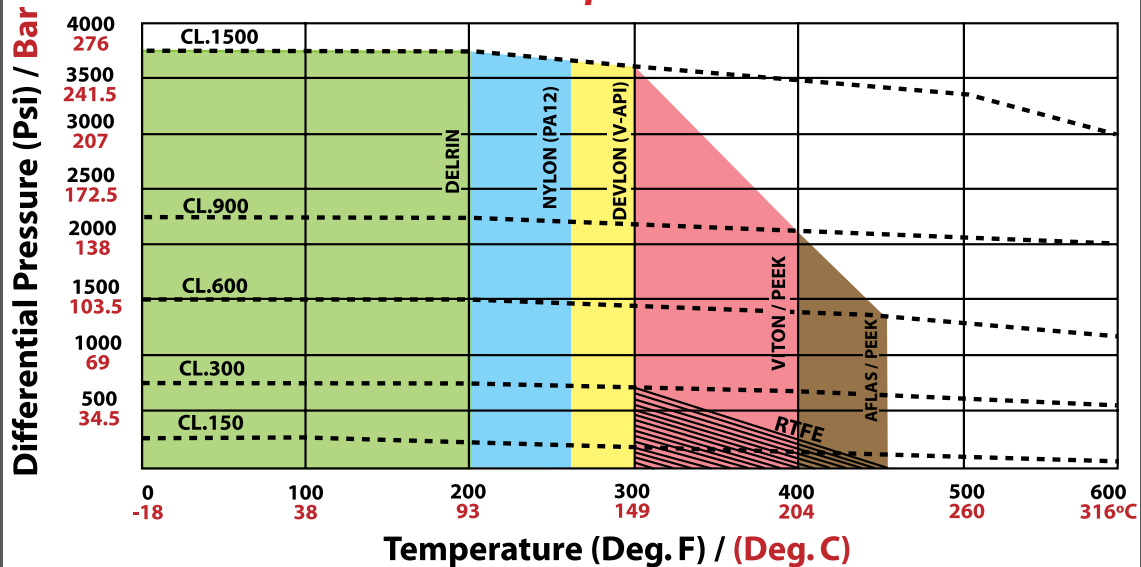
Technical Brief



How to Avoid Problems

- Ball Valves shall be transported and stored with the ball in the fully open position.
- Flanged ends and welded ends shall be protected.
- End protection shall be removed only when the valve is installed in the line
- Valves shall be handled using the proper lifting lugs.
- Valves shall be stored according to Vintrol storage procedures. Long term storage shall be avoided.
- For welded-end valves, advise Vintrol if there will be a post-weld heat treatment (transition pups may be necessary to avoid damages to seals).
- Flush and clean the line before operating the valve.
- Make sure no line-testing fluid is left in the line and/or the valve body.
- Avoid leaving the valve body filled with salt water to prevent corrosion
- During line-testing, valves shall be left in the partially open position for the minimum possible amount of time
- Standard ball valves shall be used for on-off service only. Throttling service (use of the valve with the ball partially open) can damage the seats
- Make sure to take into consideration the actual service conditions when selecting materials for O-rings and seat inserts.
- Always specify anti-explosive decompression material for valves to be used in high pressure gas service
- Make sure the selected actuator has been properly sized (an oversized actuator can be as dangerous as an undersized one).
- Advise Vintrol of cycle frequency to ensure proper sizing of actuator.
- Do not use the actuator to lift the valve.

Pressure/Temperature Chart



Torque Values in Nm/in-lbs.

SIZE DN (NPS)	TORQUE TYPE	PRESSURE CLASS									
		150		300		600		900		1500	
		Nm	In-lbs	Nm	In-lbs	Nm	In-lbs	Nm	In-lbs	Nm	In-lbs
1.5" (40)	BTO	54	478	81	717	99	876	111	982	162	1434
	ETC	43	381	65	575	79	699	89	788	130	1151
2" (50)	BTO	69	611	85	752	110	974	135	1195	285	2522
	ETC	55	487	68	602	88	779	108	956	228	2018
3" (80)	BTO	172	1522	239	2115	323	2859	436	3859	605	5354
	ETC	138	1221	191	1690	258	2283	349	3089	484	4283
4" (100)	BTO	275	2434	363	3213	465	4115	605	5354	931	8239
	ETC	220	1947	290	2567	372	3292	484	4283	744	6584
6" (150)	BTO	475	4204	756	6691	1211	10717	1664	14726	2580	22833
	ETC	380	3363	605	5354	968	8567	1331	11779	2064	18266
8" (200)	BTO	889	7869	1410	12479	2441	21606	3357	29706	5401	47802
	ETC	712	6298	1128	9983	1954	17292	2686	23769	4320	38232
10" (250)	BTO	1189	10524	1842	16302	3136	27750	4277	37851	6835	60490
	ETC	952	8422	1474	13041	2509	22205	3422	30281	5468	48387
12" (300)	BTO	1489	13179	2242	19838	3743	33123	5525	48896	12488	110515
	ETC	1192	10546	1793	15866	2994	26496	4420	39117	9900	88412
14" (350)	BTO	2668	23608	3931	34791	7064	62518	13247	117236	-	-
	ETC	2134	18882	3145	27835	5651	50012	10660	94341	-	-
16" (400)	BTO	3581	31690	5359	47429	8940	79120	19058	168663	-	-
	ETC	2864	25350	4288	37945	7153	63301	15275	135184	-	-
18" (450)	BTO	4980	44073	7835	69338	13737	121573	23215	205456	-	-
	ETC	3984	35258	6268	55468	10989	97252	18572	164360	-	-
20" (500)	BTO	6090	53897	10478	92734	20098	177867	-	-	-	-
	ETC	4872	43117	8383	74191	16078	142294	-	-	-	-
24" (600)	BTO	11688	103439	18437	163166	31941	282678	-	-	-	-
	ETC	9350	82751	14749	130530	25553	226142	-	-	-	-

BTO = Break to open torque (under rated pressure)

ETC = End to close torque (Reseating Torque)

1) Torque Values are in Nm/In-lbs and are for Primary Soft Seated TMBV's with Seat Insert material as Nylon PA - 12 /Devlon V (API)

2) Torque Values with PEEK seat insert are 100% higher than the corresponding above mentioned values

3) Torque Values are at Ambient temperature, media being clear water

4) Use a 1.3 multiplier for dry gas service

5) Consult factory for class 2500 details

6) For Reduced Bore Valves, take torque values corresponding to the lower size (Ball Bore size) e.g.: for 14"x10" Reduced Bore Valve, take torque values corresponding to 10"

Oilfield Elastomer Chart

	No.	# Temp Range (F)	Material	H ² S	E D R	Compound	Comments
Explosion Decompression Resistant (EDR)	1	-40° to +350°	HNBR 80 Duro	B	B	TA1280	Superior mechanical properties and ED resistant with higher temperature range than Nitrile. Generally resistant to oils, fuels and greases, amines, H ² S and dilute acids at low temperture, water and steam up to 300° F. Exceptionally good resistance to sunlight and weather.
	2	-13° to +350°	HNBR 90 Duro	B	A	James Walker Elast-O-lion® 101	
	3	-50° to +350°	HNBR Low Temp 85 Duro	B	A	James Walker Elast-O-Lion® 985	
	4	+10° to +410°	Fluorocarbon (Viton® B) 90 Duro	C	A	James Walker FR58/90	Excellent ED resistance with improved capabilities in sweet hydrocarbons, steam and acids when compared to Viton® A.
	5	+32° to +450°	AFLAS® 80 Duro	A	A	Seals Eastern 7182D	ED resistant and compatible with a wide range of aggressive media. Bases, phosphate esters, amines, H ² S, high temperature water or steam under certain conditions.
	6	+32° to +450°	AFLAS® 90 Duro	A	A	Seals Eastern 7182B	
General Purpose Compounds	7	-30° to +250°	Nitrile 70 Duro	D	D	4700-70	Generally resistant to Aliphatic Hydrocarbons, vegetable and mineral oils and greases, dilute acids at low temp, water up to 150° F (sulfur cured).
	8	-30° to +250°	Nitrile 90 Duro	D	D	4700-90	
	9	-65° to +225°	Nitrile Low Temp 70 Duro	D	D	4100-70	Same general resistance as standard Nitrile (sulphur cured)
	10	-65° to +250°	Nitrile Low Temp 90 Duro	D	C	4100-90	
	11	-20° to +275°	Nitrile Peroxide Cured 90 Duro	D	C	4300-90	Peroxide Cured- higher temperature, slightly better resistance in H ² S and CO ² service when compared to standard Nitrile.
	12	-15° to +400°	Fluorocarbon (Viton® A) 75 Duro	C	D	9700-75	Generally resistant to aliphatic, aromatic and chlorinated hydrocarbons, mineral acids, oils, fuels and greases, dilute acids at low temperture, many organic chemicals.
	13	-15° to +400°	Fluorocarbon (Viton® A) 90 Duro	C	D	9700-90	
	14	-50° to +450°	EPDM 90 Duro	A	B	Parker E962-90 Seals Eastern 7204	L' Garde cured- resistant to hot water, steam, many organic and inorganic acids, many polar solvents (No Hydrocarbons)

The temperature range shown above depends on the media and time at temperature

H ² S	Percentage*
A	35% max
B	5-10% max
C	<2000 ppm
D	<10 ppm

* Temperature dependent

Explosive Decompression Resistant (EDR)	
A	Excellent **
B	Good
C	Moderate
D	Not recommended

** As certified by the manufacturer

It is ultimately the responsibility of the user to determine the suitability of materials for their intended use. Vintrol does not accept any responsibility for any direct, compensatory or consequential damages arising from or related to the misapplication of any of these materials.

Viton® is a Du Pont registered trademark. Afas® is a Asahi Glass registered trademark. Elast-O-Lion® is a James Walker registered trademark.

Trim Option Part Numbers



Coatings and Overlay

A wide variety of coatings are available for increased life span and corrosion protection you can count on. Enduro-Bond Plus coatings are a cross-linked barrier, fused by a strong mechanical bond to provide superior protection over traditional plastic coatings. A complete line of spray-on and weld overlay metals are also available.

Series 21 Scotch Yoke Actuator

ViTrol, Inc. is pleased to offer top-of-the-line products in flow control automation. The ViTrol Series 21 are pneumatically operated, quarter turn rotary, Scotch Yoke actuators. These actuators are built with several of the latest features that enhance safety and performance. The actuators are manufactured with state-of-the-art machinery and under a robust quality assurance system complying with ISO 9001: 2000. Sizes range from 4500 to 177,000 in-lbs.

Base No.	Suffix codes							
XXXX	X	X	X	X	X	X	X	XX
								Options
								99 None
								C1 Coated
								C2 Plated
								Pipe Size
								99 Standard
								XX See Schedule
								Actuation
								1 Locking Handle
								2 Square Nut
								3 Gear Operator
								4 Gear Operator w/ Locking Device
								8 Bare Stem w/ Locking Device
								9 Bare Stem
								Seals
								1 Buna-N
								2 Viton
								3 LT Buna-N
								4 HNBR
								5 AFLAS
								7 James Walker
								8 PC Buna-N
								9 EPDM
								Seat Material
								1 Devlon
								2 RTFE
								3 Delrin
								4 PEEK
								5 TFM
								6 Metal to Metal
								End Connections
								6 Flanged RF
								7 Flanged RTJ
								5 Buttweld x Buttweld
								8 Buttweld x RF
								9 Buttweld x RTJ
								Trim Material (Ball/Stem)
								1 Carbon Steel 1 mil ENP Nace Fire Safe
								2 316 SS / 316 SS Nace Fire Safe
								3 Low Temp CS 1mil ENP Nace Fire Safe
								4 Carbon Steel 3mil ENP Nace Fire Safe
								5 Low Temp CS 3mil ENP Nace Fire Safe
								Body / Adapter Material
								1 Two Piece Carbon Steel
								2 Two Piece Stainless Steel
								3 Two Piece Low Temp CS
								4 Three Piece Carbon Steel
								5 Three Piece Stainless Steel
								6 Three Piece Low Temp CS
								7 Alloy Steel

Size/Class	2"FP	3"RP	3"FP	4"RP	4"FP	6"RP	6"FP	8"RP	8"FP	10"RP	10"FP	12"RP	12"FP
150	5103	5105	5106	5107	5108	5109	5110	5111	5112	5113	5114	5115	5116
300	5303	5305	5306	5307	5308	5309	5310	5311	5312	5313	5314	5315	5316
600	5603	5605	5606	5607	5608	5609	5610	5611	5612	5613	5614	5615	5616
900	5903	5905	5906	5907	5908	5909	5910	5911	5912	5913	5914	5915	5916
1500	5703	5705	5706	5707	5708	5709	5710	5711	5712	5713	5714	5715	5716

Size/Class	14"RP	14"FP	16"RP	16"FP	18"RP	18"FP	20"RP	20"FP	24"RP	24"FP	30"RP	30"FP	36"FP
150	5117	5118	5119	5120	5121	5122	5123	5124	5125	5126	5127	5128	5130
300	5317	5318	5319	5320	5321	5322	5323	5324	5325	5326	5327	5328	5330
600	5617	5618	5619	5620	5621	5622	5623	5624	5625	5626	5627	5628	5630
900	5917	5918	5919	5920	5921	5922	5923	5924	5925	5926	5927	5928	5930
1500	5717	5718	5719	5720	5721	5722	5723	5724	5725	5726	5727	5728	5730

Consult factory for valve sizes larger than 36" and Class 2500

Trim Compatibility Guide

This guide is provided to assist Vintrol customers in selection of trim materials for common media applications. It is the responsibility of the user to determine the suitability of materials for a particular service condition. This information is believed to be reliable and is intended to be used by experienced personnel at their discretion. Compatibilities may be temperature dependant. Consult Vintrol for specific recommendations.

	BODY & TRIM		SEATS & SEALS						BODY & TRIM		SEATS & SEALS				
E = EXCELLENT G = GOOD F = FAIR U = UNSATISFACTORY	CARBON STEEL	CF8M STAINLESS STEEL	DEVCON / DELFIN	TEFLON	HNBR	VITON	EPDM		CARBON STEEL	CF8M STAINLESS STEEL	DEVCON / DELFIN	TEFLON	HNBR	VITON	EPDM
ACETONE	G	E	E	E	U	U	E	HEPTANE	E	E	E	E	E	E	U
ACETYLENE (DRY)	G	E	E	E	E	E	E	HEXANE	E	E	E	E	E	E	U
AIR	E	E	E	E	E	E	E	HYDRAULIC OILS	E	E	E	E	E	E	U
ALCOHOL, ISOPROPYL	E	E	G	E	E	E	E	HYDROGEN SULFIDE (DRY)	G	E	E	E	E	G	E
ALCOHOL, METHYL	G	E	G	E	E	U	E	HYDROGEN SULFIDE (WET)	G	E	G	E	E	F	E
ALUMINUM CHLORIDE	G	E	U	E	E	E	E	ISO-OCTANE	E	E	E	E	E	E	U
AMINES, PRIMARY	G	G	G	E	G	U	E	ISOPROPYL ETHER	E	E	G	E	F	U	G
AMMONIA, ANHYDROUS	G	E	G	E	G	U	E	JET FUEL	E	E	E	E	E	E	U
AMMONIA, (AQUEOUS)	E	E	G	E	G	U	E	KEROSENE	E	E	E	E	E	E	U
AMMONIA SOLUTIONS	G	E	G	E	E	U	E	LIQUIFIED PET. GAS	E	E	E	E	E	E	U
AMMONIUM CARBONATE	G	G	E	E	G	U	E	LUBRICATING OIL	E	E	E	E	E	E	U
AMMONIUM HYDROXIDE	G	G	E	E	G	U	E	MAGNESIUM HYDROXIDE	G	E	G	E	E	E	E
ASPHALT, EMULSION	E	E	G	E	E	E	U	MERCAPTAN	G	E	G	E	U	G	G
AROMATIC HYDROCARBONS	E	E	G	E	U	E	U	METHANE	E	E	E	E	E	E	U
BARIUM CARBONATE	G	G	G	E	E	E	E	METHYL ETHYL KETONE	G	E	G	E	U	U	E
BET SUGAR LIQUORS	G	E	E	E	E	E	E	MINERAL OIL	G	E	E	E	E	E	U
BENZALDHYDE	U	G	G	E	F	U	E	NAPHTHA	E	E	E	E	E	E	U
BENZENE	G	G	E	E	U	E	U	NAPHTHALENE	E	E	E	E	F	E	U
BUNKER "C" FUEL OIL	E	E	E	E	E	E	U	NATURAL GAS	G	E	E	E	E	E	U
BUTADIENE	G	G	E	E	U	E	U	NITRIC ACID	U	G	U	E	U	E	G
BUTANE	E	E	E	E	E	E	U	NITROGEN	E	E	E	E	E	E	E
BUTYLENE	G	G	E	E	G	E	U	OIL WATER MIXTURES	E	E	E	E	E	E	U
CARBOLIC ACID	U	G	U	E	U	E	G	OZONE (DRY)	F	G	U	E	E	E	E
CARBON DISULFIDE	G	G	G	E	U	E	U	PAINTS AND SOLVENTS	E	E	F	E	G	E	U
CARBON DIOXIDE	E	E	G	E	E	G	G	PARAFFIN	E	E	E	E	E	E	U
CARBONIC ACID	U	G	E	E	E	E	E	PENTANE	G	G	E	E	E	E	U
CARBON TETRACHLORIDE	F	E	E	E	G	E	G	PHENOL	G	E	U	E	U	E	E
CHLOROBENZENE (DRY)	G	G	G	E	U	E	U	PRODUCER GAS	G	G	E	E	E	E	U
CRUDE OIL (SWEET)	E	E	E	E	E	E	U	PROPANE	E	E	E	E	E	E	U
CRUDE OIL (SOUR)	G	E	G	E	E	G	U	PROPYLENE GLYCOL	E	E	G	E	E	E	E
CYCLOHEXANE	G	G	E	E	E	E	U	SEA WATER	U	E	E	E	E	E	E
DIESEL FUELS	E	E	E	E	E	E	U	SODIUM ACETATE	G	G	G	E	G	U	E
DIETHYLAMINE	E	E	E	E	U	U	E	SODIUM HYDROXIDE	G	E	E	E	E	E	E
DOWTHERM OIL A AND E	G	E	E	E	U	E	U	STEAM	E	E	F	E	E	U	E
DRILLING MUD	G	E	E	E	E	E	E	STODDARD SOLVENT	G	G	G	E	E	E	U
ETHANE	E	E	E	E	E	E	U	SULPHUR DIOXIDE	E	G	F	E	U	U	E
ETHYL ALCOHOL	G	G	E	E	E	F	E	SULPHURIC ACID	U	G	U	E	U	E	F
ETHYLENE	E	E	E	E	E	E	U	TALL OIL	G	G	G	E	E	E	U
ETHYLENE GLYCOL	G	G	G	E	E	E	E	TOLUENE / TOLUOL	E	E	E	E	U	E	U
ETHYLENE OXIDE	G	G	G	E	U	U	E	TERPENTINE	G	E	G	E	E	E	U
FISH OILS	G	E	G	E	E	E	U	WATER, FRESH	F	E	E	E	E	E	E
FORMALDEHYDE	U	E	G	E	G	F	G	WAX EMULSIONS	E	E	E	E	E	E	U
FREON	G	E	E	E	E	G	U	WAXES	E	E	E	E	E	E	U
FUEL OIL	E	E	E	E	E	E	U	XYLENE	E	E	G	E	E	E	U
GASOLINE, LEADED	E	E	E	E	E	E	U	ZINC CHLORIDE	U	G	U	E	E	G	U
GASOLINE, UNLEADED	E	E	E	E	E	E	U								
GASOLINE, AVIATION	E	E	E	E	E	E	U								
GLUE	E	E	E	E	E	E	E								
GLYCERIN (GLYCEROL)	G	E	G	E	E	E	E								
GLYCOLS	G	G	G	E	E	E	E								

