

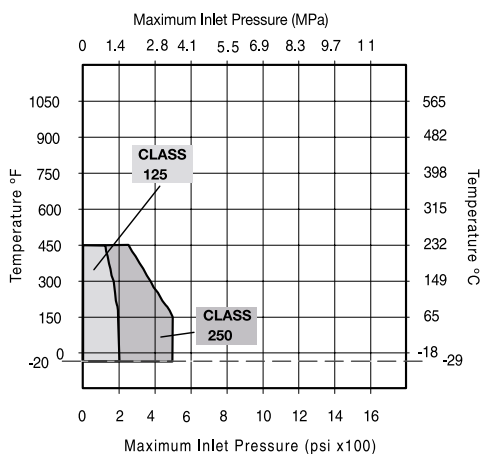


BOSS D SERIES PNEUMATIC CONTROL VALVE

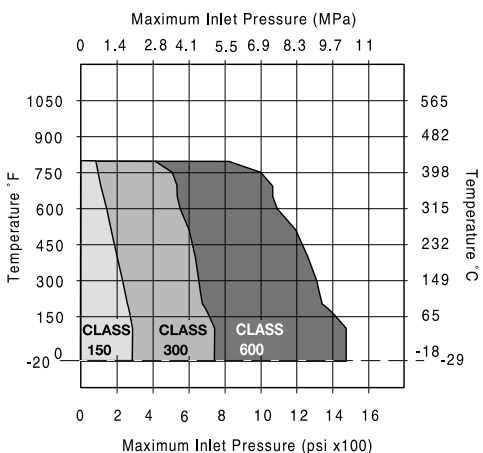
APPLICATION DATA

- Process control systems for food, pulp and paper, chemical, petrochemical & other industries
- HVAC systems
- Feed water and fuel system controls in boiler rooms
- Packaged systems (OEM) such as heat exchangers, water purification systems & vaporizer, metal cleaning and plating

CAST IRON A126 CLASS B



CARBON STEEL A216WCB



BOSS SERIES D CONTROL VALVE

SIZES 2" – 8"

ANSI CLASS 125/250, 250/300, 600

- **Available in Pneumatic & Electric Actuators** for modulating control and on/off applications.
- **Electric Actuator Accepts Analog Signals** 4-20 mA, 0-10 VDC or Profibus DP
- **High Flow Capacities** - Valve body flow areas 42% of pipe area, reducing velocities and pressure loss.
- **Controlled Seat Loading** maintains constant seat gasket load.
- **Hung Cage Design** eliminates problems associated with fixed cages.
- **Hardened/Stainless Steel Trim** provides twice the service life of 316 stainless trim.
- **Rugged Piston Seal** with three times the wear surface of competitive valves for long lasting leak tight seal.
- **Multiple Cage Options** for maximum versatility.
- **Balanced Plug Design** provides smooth high pressure control.
- **Tighter Shut Offs to Class VI** - Superior design provides exceptional performance up to Class VI.

MODELS

- D1 — Cast Iron Stainless Trim, Pneumatic or Electrically Actuated
- D2 — Cast Steel Stainless Trim, Pneumatic or Electrically Actuated

OPTIONS

- 35, 55, 85 or 135 sq. in. Actuator, Reverse or Direct
- Electric Actuator Accepts Analog Signals 4-20 mA, 0-10 VDC or Profibus DP
- Soft Seats
- Thread of Flange Connection
- Moore and PMV Accessories
- Noise and Cavitation Reducing Trim
- Reduced Flow Caging
- Alternate Packings for Severe Service
- High Temperature Trim

APPLICABLE CODES

- ANSI B16.0 Face-To-Face Dimensions and ISA S75.03 Uniform Face-To-Face Dimensions for Flanged Globe Style Control Valves
- ANSI B16.37 Hydrotesting of Control Valves
- ISA S75.02 Control Valve Capacity Test Procedure
- Canadian Registration # OC 0591.9C

BOSS SERIES D CONTROL VALVE SPECIFICATION

All cage-guided control valves shall be designed, built and tested in accordance with the latest revision of applicable industry standards (see previous page). Valve body materials and end connections shall be as specified on the valve data sheets, in accordance with ANSI B16.34 and B16.5. Bonnets shall be through bolted, of the same material as the valve body. Stem packing shall be adjustable and suitable for the intended service. Asbestos or asbestos filled packings are prohibited. If graphite packing is selected or specified, use alternating rings of braided and die-cut anti-extrusion rings. Live-loaded PTFE V-ring packing shall be used to 450°F. Packing gland, clamp, studs and nuts shall be of 300 Series stainless steel. Cage type guiding and throttling shall be used for 2" valves and larger. Valves shall be of a "quick change" trim design utilizing a hung cage in all pressure classes. Seat rings shall be non-threaded and retained by a load spring with laminated graphite seat/body gasket. Trim shall be of 400 Series

hardened stainless steel. Plugs shall be balanced unless otherwise noted. Where specified or required, valves shall be provided with stellite seating surfaces on 400 Series hardened stainless steel plug and seat ring. Seat stellite thickness shall be 3/32" minimum. Valve characteristic shall be modified linear or equal percent. Valve leakage shall be ANSI/ISA 70-2 Class IV unless otherwise specified. Valve stems shall be 316 stainless steel with a minimum 16 RMS finish. Plug/stem assemblies shall be of a two piece threaded and pinned design. Actuators shall be of the spring and diaphragm type or electrically driven. Pneumatic Actuators shall be capable of shutting off the valve without the use of line pressure assist. Pneumatic Actuator yokes shall be of cast iron unless otherwise specified and bolted or clamped to the valve bonnet. Locknut mounting is not preferred. Electric Actuators shall have integral handwheel permitting easy manual operation when power is lost. Top mounted handwheel manual overrides shall be provided where specified. Rim pull required to operate valve shall not exceed 40 pounds. Valve body size shall not be less than 1/2 the nominal inlet pipe size. Provide reduced window cages where required. Valves shall be sized to control within manufacturers published rangeability. Size valve to pass 110% of maximum stated flow. Valve generated noise shall not exceed 85 dBA when measured 3 feet downstream and 3 feet away from the pipe.

BOSS SERIES D
CONTROL VALVE

MATERIALS OF CONSTRUCTION

BODY ASSEMBLY:

Style: Single seated, top entry bolted bonnet, globe style body, cage guided balanced plug

BODY/BONNET MATERIALS:

Cast Iron, ASTM A126 Class B
Carbon Steel, ASTM A216 Gr WCB
Chrome Moly, ASTM A217 Gr WC-9
Note: See ANSI B16.1 (cast iron) or ANSI B16.34 (other materials) for pressure/temp. limits of body/bonnet assemblies.

SIZES: 2"-8" (50-200mm)

END CONNECTIONS:

ANSI Class 125/150 Integral Flanged, 2-8"
ANSI Class 250/300 Integral Flanged, 2-8"
ANSI Class 600 Integral Flanged, 2-8"
Threaded, NPT - 2" only, (ANSI 250 Cast Iron Bodies), (ANSI 600 Carbon Steel & Alloy)
Socketweld - 2" only, (ANSI 600 Class)
Buttweld Ends
DIN Flanges: ND-16, ND-25, ND-40, ND-64, ND-100

BONNET:

Bolted Bonnet, Standard

BODY/BONNET BOLTING:

ASTM A-193 GRB7 Studs
ASTM A-194 GR2H Nuts

STEM PACKING:

PTFE V-Rings, -40 to 460°F(-22 to 238°C)
PTFE/Graphite, -40 to 500°F(-22 to 260°C)
Laminated Graphite, -320 to 800°F (-195 to 426°C)

PACKING STUDS, NUTS & FOLLOWER:

300 Series Stainless Steel

GASKETS:

Body/Bonnet and Seat Ring/Body:
Filled 304 stainless steel 500°F (260°C) Max.
Inconel/Graphite: 800°F (426°C) Max.

TRIM SIZES:

Full Port and 40% reduced

PLUG (PISTON) SEAL MATERIALS:

Standard TFE/Graphite, max. temp. 500°
(Class IV shutoff)
Ni-Resist, max. temp. 800°F (Class III shutoff)

FLOW CHARACTERISTICS:

Modified Linear, Standard
Equal % (w/ CAM Characterized Positioner)

SHUTOFF CLASS (ANSI /ISA 70-2):

Standard trim, 0-500°F(-18 to 260°C) Max.
Class IV (.01% Cv).

Metal/PTFE seats - Class VI, bubble tight to 460°F (238°C).

High-temp trim, 0-800°F(-18 to 426°C),
Class III (.1% Cv).

For optional Class IV or V shutoff above
500°F, contact factory.

TRIM MATERIAL COMBINATIONS:

See Chart on page 172

ACTUATORS:

Standard: Spring & Diaphragm
Digi Electric
Optional: Piston Double Acting/Spring Return
Hydraulic

PRESSURE RECOVERY FACTOR:

Liquid: $F_L = 0.8$, Gas: $X_T = 0.7$

ANSI BODY RATINGS:

Class 125 & 250 Cast Iron
Class 150, 300, & 600 Steel and Alloy

BOSS SERIES D ORDERING CODE

Model	Orifice	Size	Connections	Trim	Packing	Actuator	Spring	Positioner	Posit. Set	Accessories	Inlet Pressure											
D	1	T	H	1	1	1	-	3	4	D	A	M	I	0	2	0	2	-	#	#	#	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			

Model - Position 1 & 2 D1 - Cast Iron D2 - Cast Steel Orifice - Position 3 T = STD P = 40% Q = Seco-Sonic R = Seco-Cav Size - Position 4 H = 2 J = 2½ K = 3 M = 4 P = 6 Q = 8	Connections - Position 5 1 = 150 RF Flg 2 = 125# 3 = 300RF Flg 4 = 250# 6 = 600 RF Flg 9 = Threaded Trim - Position 6 1 = Metal 2 = Soft 3 = Hi-Temp 4 = Stellite Packing - Position 7 1 = V-ring 2 = Graphite 3 = Hi-Temp	Actuator - Position 8 & 9 01 = None 02 = ST5112-34 03 = ST5113-07 04 = ST5114-17 34 = 35 35 = 35R 52 = 55 53 = 55R 54 = 55A 55 = 55AR 82 = 85 83 = 85R 84 = 85A 85 = 85AR 86 = 135 87 = 135R	Spring - Position 10 & 11 AA = None TA - 38422 TB - 41968 TC - 23239 TD - 35014 TE - 24296 TF - 24297 TG - 24299 TH - 24301 TJ - 42489 TK - 23996 TL - 61264 TM - 42489/ 25390	Positioner - Position 12 & 13 AA = None MI = Moore I/P MP = Moore P 4P = PMV P4 P 5I = PMV P5 I/P Positioner Set - Position 14 & 15 01 = None 02 = Std 3-15 03 = S.R. 3-9 04 = S.R. 9-15 Accessories - Position 16 & 17 01 = None 02 = Limit Switch, Mechanical 03 = Limit Switch, Proximity Switch 04 = Feedback Potentiometer 1K 05 = Feedback 4-20mA Posit. Trans Inlet Pressure - Position 18, 19 & 20 ___ = Actual Setting
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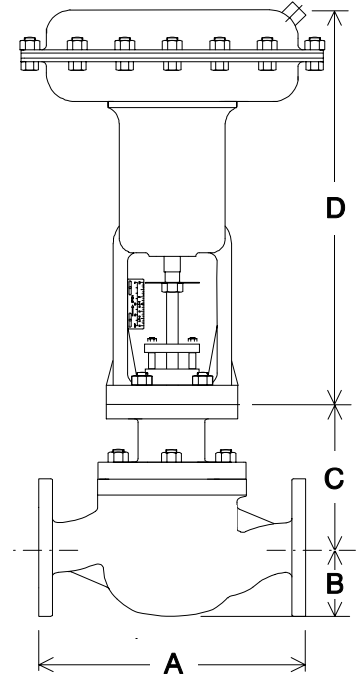
BOSS SERIES D CONTROL VALVE

DIMENSIONS

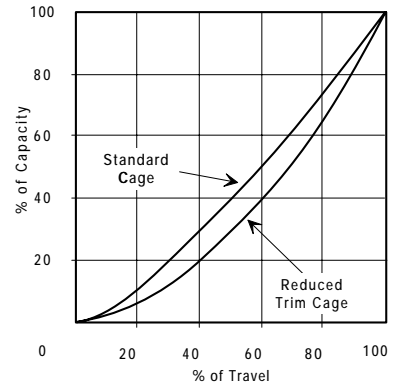
PNEUMATIC ACTUATOR

BOSS
DIMENSIONS

CONTROL VALVE - CAST IRON DIMENSIONS IN INCHES						CONTROL VALVE - CAST STEEL DIMENSIONS IN INCHES					
SIZE	A	B	C	D*	WGT.*	SIZE	A	B	C	D*	WGT.*
THREADED						THREADED					
2	9 ¹ / ₄	3 ³ / ₈	7 ¹ / ₄	12 ³ / ₈	80 lb.	2	9 ¹ / ₄	3	7 ¹ / ₈	12 ³ / ₈	45 lb.
125 LB. ANSI FLANGE STANDARD						150 LB. ANSI FLANGE STANDARD					
2	10	3 ³ / ₈	7 ¹ / ₄	12 ³ / ₈	85 lb.	2	10	3	7 ¹ / ₈	12 ³ / ₈	85 lb.
2½	10 ⁷ / ₈	4 ³ / ₈	6 ⁵ / ₈	15 ¹ / ₄	125 lb.	2½	10 ⁷ / ₈	3½	6 ⁵ / ₈	15 ¹ / ₄	125 lb.
3	11 ³ / ₄	4½	6 ¹ / ₈	15 ¹ / ₄	145 lb.	3	11 ³ / ₄	3 ³ / ₄	6 ¹ / ₈	15 ¹ / ₄	145 lb.
4	13 ³ / ₈	5½	8 ¹ / ₈	15 ¹ / ₄	190 lb.	4	13 ³ / ₈	4½	8 ⁵ / ₈	15 ¹ / ₄	190 lb.
6	17 ³ / ₄	5 ⁵ / ₈	9 ³ / ₄	19 ⁵ / ₈	460 lb.	6	17 ³ / ₄	5½	9 ³ / ₄	19 ⁵ / ₈	450 lb.
8	21 ³ / ₈	7 ⁵ / ₈	12 ¹ / ₄	27 ³ / ₈	625 lb.	8	21 ³ / ₈	6 ³ / ₄	12 ¹ / ₄	27 ³ / ₈	600 lb.
250 LB. ANSI FLANGE STANDARD						300 LB. ANSI FLANGE STANDARD					
2	10½	3¾	7¼	12¾	88 lb.	2	10½	3¼	7⅞	12¾	88 lb.
2½	11½	4¾	6⅞	15¼	130 lb.	2½	11½	3¾	6⅞	15¼	130 lb.
3	12½	4½	6⅞	15¼	152 lb.	3	12½	4⅞	6⅞	15¼	152 lb.
4	14½	5½	8½	15¼	198 lb.	4	14½	5	8⅞	15¼	198 lb.
6	18 ⁵ / ₈	5 ⁵ / ₈	9 ³ / ₄	19 ⁵ / ₈	480 lb.	6	18 ⁵ / ₈	6¼	9 ³ / ₄	19 ⁵ / ₈	470 lb.
8	22 ³ / ₈	7 ⁵ / ₈	12¼	27 ³ / ₈	640 lb.	8	22 ³ / ₈	7½	12¼	27 ³ / ₈	635 lb.
600 LB. ANSI FLANGE STANDARD						600 LB. ANSI FLANGE STANDARD					
—	—	—	—	—	—	2	11¼	3¼	7⅞	12¾	90 lb.
—	—	—	—	—	—	2½	12¼	3¾	6⅞	15¼	135 lb.
—	—	—	—	—	—	3	13¼	4⅞	6⅞	15¼	158 lb.
—	—	—	—	—	—	4	15½	5 ⁵ / ₈	8⅞	15¼	205 lb.
—	—	—	—	—	—	6	20	7	9 ³ / ₄	19 ⁵ / ₈	485 lb.
—	—	—	—	—	—	8	24	8¼	12¼	27 ³ / ₈	660 lb.
DIMENSIONS IN MILLIMETERS						DIMENSIONS IN MILLIMETERS					
SIZE	A	B	C	D*	WGT.*	SIZE	A	B	C	D	WGT.*
THREADED						THREADED					
50	235	95	184	314	36.3 kg	50	235	76	181	314	20.4 kg
DIN 2533 FLANGE STANDARD (ND-16)						DIN 2543 FLANGE STANDARD (ND-16)					
50	254	95	184	314	39 kg	50	254	76	181	314	39 kg
65	276	111	168	387	57 kg	65	276	89	168	387	57 kg
80	299	114	175	387	66 kg	80	299	95	175	387	66 kg
100	352	140	206	387	86 kg	100	352	114	219	387	86 kg
160	451	149	248	499	209 kg	160	451	140	248	499	204 kg
200	543	194	311	695	284 kg	200	543	172	311	695	272 kg
DIN 2534 FLANGE STANDARD (ND-25)						DIN 2545 FLANGE STANDARD (ND-40)					
50	267	95	184	314	40 kg	50	267	83	181	314	40 kg
65	292	111	168	387	59 kg	65	292	95	168	387	59 kg
80	318	114	175	387	69 kg	80	318	105	175	387	69 kg
100	368	140	206	387	90 kg	100	368	127	219	387	90 kg
160	473	149	248	499	218 kg	160	473	159	248	499	213 kg
200	568	194	311	695	290 kg	200	568	191	311	695	288 kg
DIN 2547 FLANGE STANDARD (ND-100)						DIN 2547 FLANGE STANDARD (ND-100)					
—	—	—	—	—	—	50	286	83	181	314	41 kg
—	—	—	—	—	—	65	311	95	168	387	61 kg
—	—	—	—	—	—	80	337	105	175	387	72 kg
—	—	—	—	—	—	100	394	137	219	387	93 kg
—	—	—	—	—	—	160	508	178	248	499	220 kg
—	—	—	—	—	—	200	610	210	311	695	299 kg



Inherent Flow Characteristics



* With standard actuator

Dimensions are subject to change without notice.
Request certified drawings for installation purposes

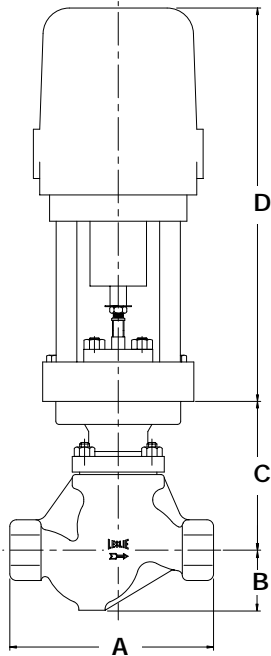
C_v TABLE

Valve Size	Full Port		40% Red.		Seco-Sonic		Seco-Cav		Stroke (in.)	Seat Dia.	Unbalanced Area (in ²)
	Cv	Range	Cv	Range	Cv	Range	Cv	Range			
2	65	30:1	26	20:1	48	30:1	32	14:1	0.750	2.3	0.14
2½	90	40:1	36	25:1	70	40:1	40	17:1	0.875	2.9	0.18
3	125	40:1	50	25:1	97	40:1	63	20:1	1.00	3.5	0.21
4	205	50:1	82	30:1	156	50:1	103	25:1	1.25	4.6	0.28
6	435	50:1	174	30:1	349	50:1	217	25:1	2.00	6.9	0.42
8	760	50:1	304	30:1	579	50:1	304	25:1	2.75	9.2	0.56

BOSS SERIES D CONTROL VALVE

DIMENSIONS

ELECTRIC ACTUATOR



ELECTRIC ACTUATORS SPECIFICATIONS, DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

Model	Std. Stroke (in)	Max Thrust (lb/f)	Stroke Time (sec)	Sec./Inch	Rating	Power Supply	Power Consumption	Ambient Temp. Limits	D	Wgt.
ST5112-34	1.57	674	39	25	IP-65	24V(DC), 115V, 230V, 50/60 Hz	18VA	-68°F to 158°F	16 ¹ / ₁₆ (424)	12 (5.5)
ST5113-07	2.36	1348	38	16	IP-55	24V(DC), 115V, 230V, 50/60 Hz	72VA	-68°F to 140°F	21 ¹ / ₁₆ (541)	23 (10.5)
ST5114-17	3.14	2248	91	29	IP-55	24V(DC), 115V, 230V, 50/60 Hz	66VA	-68°F to 140°F	21 ¹ / ₁₆ (558)	23 (10.5)

CARBON STEEL AND CHROME MOLY VALVE BODY ASSEMBLY

DIMENSIONS[†] inches (mm) AND WEIGHTS pounds (kg)

SIZE	A				B	C	WEIGHT	
	THD	150	300	600			THD	FLG
2 (50)	9 ¹ / ₄ (235)	10 (254)	10 ¹ / ₂ (267)	11 ¹ / ₂ (286)	2 ¹ / ₂ (67)	7 ¹ / ₈ (181)	85 (39)	90 (41)
2 ¹ / ₂ (65)	—	10 ³ / ₈ (276)	11 ¹ / ₂ (292)	12 ¹ / ₄ (311)	3 ¹ / ₄ (83)	6 ³ / ₈ (172)	—	135 (61)
3 (80)	—	11 ¹ / ₄ (299)	12 ¹ / ₂ (318)	13 ¹ / ₄ (337)	3 ³ / ₈ (92)	6 ¹ / ₂ (175)	—	158 (72)
4 (100)	—	13 ¹ / ₈ (352)	14 ¹ / ₂ (368)	15 ¹ / ₂ (394)	4 ¹ / ₈ (105)	8 ¹ / ₈ (206)	—	205 (93)
6 (160)	—	17 ¹ / ₈ (451)	18 ³ / ₈ (473)	20 (508)	5 ¹ / ₂ (140)	9 ¹ / ₈ (248)	—	485 (220)
8 (200)	—	21 ¹ / ₈ (543)	22 ³ / ₈ (568)	24 (610)	7 ¹ / ₄ (184)	12 ¹ / ₄ (311)	—	660 (299)

[†] Threaded Carbon Steel & Chrome Moly available in 2" only.
Flanged (150, 300 & 600#) Carbon Steel & Chrome Moly available in 2" to 8".

CLASS IV SHUTOFF

VALVE SIZE	VALVE STROKE (IN)	MAXIMUM DELTA P (PSI)		
		ST5112-34	ST5113-07	ST5114-17
2	3/4	750	—	—
2 ¹ / ₂	7/8	600	—	—
3	1	600	750	—
4	1 ¹ / ₄	—	750	—
6	2	—	350	500
8	2 ³ / ₄	—	—	300

DIGI ACTUATOR OPTIONS

Model	Prod. Ref. No.
Heater, 12 volt	E68717
Heater, 115 volt	E68718
Heater, 230 volt	E68719
Limit Switch Set	E68720
Field Bus	*

* Consult factory.

DIGI MOUNTING KITS

Actuator Code**	Model	Valve Size	Prod. Ref. No.
02	ST5112-34	1/2 to 1 ¹ / ₂ 2 to 4	U009005096 U009005097
03	ST5113-07	1/2 to 1 ¹ / ₂ 2 to 4	U009005096 U009005097
04	ST5114-17	1/2 to 1 ¹ / ₂ 2 to 4	U009005096 U009005097

** Use Actuator Code for ordering.

CAST IRON VALVE BODY ASSEMBLY

DIMENSIONS[†] inches (mm) AND WEIGHTS pounds (kg)

SIZE	A			B	C	WEIGHT	
	THD	125	250			THD	FLG
2 (50)	9 ¹ / ₄ (235)	10 (254)	10 ¹ / ₂ (267)	3 ³ / ₈ (95)	7 ¹ / ₈ (181)	85 (39)	90 (41)
2 ¹ / ₂ (65)	—	10 ³ / ₈ (276)	11 ¹ / ₂ (292)	4 ³ / ₈ (111)	6 ³ / ₈ (172)	—	135 (61)
3 (80)	—	11 ¹ / ₄ (299)	12 ¹ / ₂ (318)	4 ¹ / ₂ (114)	6 ¹ / ₂ (175)	—	158 (72)
4 (100)	—	13 ¹ / ₈ (352)	14 ¹ / ₂ (368)	5 ¹ / ₂ (140)	8 ¹ / ₈ (206)	—	205 (93)
6 (160)	—	17 ¹ / ₈ (451)	18 ³ / ₈ (473)	5 ³ / ₈ (149)	9 ¹ / ₈ (245)	—	485 (220)
8 (200)	—	21 ¹ / ₈ (543)	22 ³ / ₈ (568)	7 ¹ / ₄ (194)	12 ¹ / ₄ (311)	—	660 (299)

[†] Threaded Cast Iron available in 2" only.
Flanged (125 and 250#) Cast Iron available in 2" to 8".

BOSS SATURATED STEAM CAPACITY TABLE

(Modified Equal Percent Contour Plug) (Lb/Hr)

BOSS STEAM CAPACITY TABLE

Pressure (PSI)		Valve Port and Trim											
		2		2-1/2		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
10	5	2022	1483	2800	2162	3888	2996	6377	4819	13531	10781	23641	17885
	0	2531	1840	3505	2683	4867	3718	7982	5979	16938	13376	29594	22191
15	10	2244	1648	3107	2403	4315	3330	7077	5355	15018	11980	26238	19876
	5	2876	2097	3982	3059	5531	4238	9071	6816	19248	15249	33629	25299
20	0	3158	2283	4373	3330	6074	4614	9961	7421	21137	16603	36929	27544
	15	2443	1795	3382	2618	4698	3628	7705	5835	16349	13054	28563	21656
	10	3181	2325	4405	3390	6118	4698	10034	7556	21291	16904	37198	28044
30	0	3726	2682	5159	3912	7165	5420	11751	8717	24935	19502	43565	32355
	25	2793	2055	3867	2997	5371	4152	8808	6678	18690	14940	32654	24786
	15	4253	3102	5889	4523	8179	6268	13414	10080	28464	22552	49730	37414
40	0	4780	3427	6618	4998	9192	6926	15074	11139	31987	24919	55886	41342
	25	4839	3539	6701	5161	9307	7151	15263	11501	32387	25729	56585	42685
	15	5572	4039	7715	5891	10716	8163	17574	13128	37291	29369	65152	48724
50	3-0	5798	4157	8028	6063	11150	8401	18286	13512	38801	30228	67791	50148
	35	5356	3923	7416	5721	10300	7928	16892	12750	35844	28524	62623	47322
	30	5909	4314	8181	6291	11363	8718	18635	14021	39543	31366	69087	52038
	25	6298	4582	8720	6682	12111	9259	19863	14891	42147	33313	73637	55267
60	7-0	6808	4882	9426	7119	13092	9865	21471	15865	45560	35493	79600	58884
	45	5824	4271	8063	6228	11199	8631	18367	13880	38973	31052	68091	51517
	40	6469	4732	8958	6900	12441	9562	20403	15378	43295	34403	75642	57076
	35	6948	5067	9620	7389	13361	10239	21912	16467	46496	36840	81235	61118
75	11-0	7814	5603	10819	8171	15027	11323	24644	18210	52293	40738	91362	67586
	55	7215	5287	9990	7710	13876	10684	22756	17182	48287	38440	84363	63773
	50	7809	5709	10812	8325	15017	11536	24628	18553	52259	41507	91303	68862
	45	8271	6032	11453	8797	15906	12190	26087	19605	55355	43859	96711	72763
100	16-0	9304	6672	12883	9730	17893	13482	29345	21683	62268	48509	108790	80478
	75	9045	6629	12523	9667	17393	13395	28525	21543	60529	48195	105752	79957
	60	10584	7714	14655	11249	20354	15588	33381	25070	70832	56086	123753	93048
125	25-0	11757	8434	16279	12300	22609	17045	37079	27412	78680	61325	137463	101740
	100	10110	7420	13998	10822	19442	14996	31885	24117	67659	53953	118209	89509
	75	12865	9372	17813	13668	24741	18939	40574	30459	86097	68143	150422	113051
150	33-0	14194	10178	19653	14842	27295	20567	44765	33077	94988	74000	165956	122767
	125	11056	8123	15309	11846	21262	16416	34870	26400	73992	59062	129273	97986
	100	14327	10463	19837	15258	27552	21143	45185	34004	95880	76073	167515	126207
175	42-0	16601	11904	22987	17360	31926	24056	52358	38688	111102	86553	194109	143593
	150	11918	8762	16501	12778	22918	17707	37586	28478	79756	63709	139344	105695
	125	15642	11443	21659	16687	30081	23124	49334	37189	104684	83199	182895	138029
	100	17674	12852	24472	18743	33988	25972	55741	41770	118280	93447	206650	155031
200	51-0	18986	13621	26288	19863	36511	27525	59878	44267	127059	99034	221988	164299
	150	16831	12328	23305	17978	32368	24913	53083	40066	112639	89634	196795	148705
	125	19228	14013	26624	20436	36977	28318	60642	45543	128680	101887	224821	169034
225	59-0	21359	15315	29574	22335	41075	30950	67362	49775	142940	111356	249734	184742
	175	17939	13152	24838	19179	34497	26577	56575	42743	120050	95623	209743	158641
	150	20666	15086	28614	22000	39741	30485	65176	49028	138300	109684	241628	181969
250	67-0	23720	17009	32844	24804	45616	34372	74810	55278	158744	123667	277345	205167
	200	18963	13913	26256	20290	36467	28116	59806	45218	126906	101160	221721	167827
	175	21990	16073	30447	23439	42288	32480	69352	52237	147162	116862	257111	193878
	150	23966	17442	33183	25437	46088	35248	75584	56688	160385	126820	280212	210398
250	76-0	26058	18685	36080	27249	50111	37759	82182	60726	174387	135854	304676	225385

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.

BOSS SATURATED STEAM CAPACITY TABLE

(Modified Equal Percent Contour Plug) (Kg/Hr)

Pressure (bar)		Valve Port and Trim											
		2		2-1/2		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
0.7	0.3	973	713	1348	1039	1872	1440	3069	2317	6513	5183	11379	8598
	0.2	1051	768	1456	1120	2022	1552	3316	2497	7036	5586	12293	9267
1	0.7	951	699	1317	1019	1830	1413	3001	2272	6367	5083	11124	8432
	0.5	1161	850	1608	1239	2233	1717	3662	2762	7770	6179	13575	10252
	0.3	1294	943	1792	1376	2489	1906	4082	3066	8662	6859	15133	11379
1.5	1	1326	973	1836	1418	2550	1966	4182	3161	8875	7072	15506	11732
	0.7	1564	1142	2166	1665	3008	2307	4933	3710	10468	8300	18288	13769
	0.5	1664	1210	2304	1765	3200	2445	5249	3933	11138	8798	19459	14596
2	1.5	1464	1075	2027	1568	2815	2173	4617	3494	9798	7817	17118	12968
	1.2	1749	1280	2422	1866	3364	2586	5517	4159	11707	9304	20454	15435
	1	1879	1371	2602	1999	3614	2770	5928	4455	12578	9967	21976	16536
3	2	2259	1653	3128	2411	4344	3341	7124	5374	15117	12022	26411	19944
	1.5	2566	1868	3552	2724	4934	3774	8092	6070	17170	13580	29999	22529
	3-0	2798	2006	3874	2926	5380	4054	8823	6520	18723	14586	32711	24198
3.5	3.0	1817	1337	2516	1950	3494	2702	5731	4345	12161	9721	21246	16128
	2.0	2771	2021	3837	2948	5329	4085	8740	6569	18546	14696	32402	24381
	1.0	3092	2229	4282	3251	5947	4505	9752	7245	20694	16208	36155	26889
	4-0	3123	2240	4325	3266	6006	4526	9850	7279	20902	16283	36518	27015
4	3.0	2564	1880	3550	2742	4930	3800	8085	6111	17157	13671	29975	22680
	2.0	3216	2338	4453	3410	6185	4725	10143	7599	21522	17001	37602	28205
	1.0	3437	2471	4759	3603	6610	4993	10840	8030	23002	17965	40188	29805
	6-0	3449	2473	4775	3606	6632	4997	10877	8037	23081	17981	40325	29830
5	4.0	2836	2083	3927	3038	5455	4209	8946	6769	18983	15144	33165	25125
	3.0	3641	2655	5041	3872	7001	5366	11482	8629	24364	19306	42567	32029
	2.0	4005	2896	5545	4224	7701	5853	12630	9413	26800	21058	46823	34936
	9-0	4102	2941	5680	4290	7889	5944	12937	9560	27452	21386	47963	35481
7	5.0	4366	3196	6045	4661	8396	6458	13770	10386	29220	23236	51050	38549
	3.0	5276	3816	7306	5565	10147	7711	16641	12402	35311	27745	61693	46030
	1.6-0	5404	3875	7483	5651	10393	7831	17044	12594	36167	28176	63189	46744
9	7.0	4976	3649	6890	5322	9569	7375	15693	11860	33300	26534	58180	44020
	5.0	6241	4537	8641	6617	12002	9169	19683	14746	41766	32990	72970	54732
	2.1-0	6690	4797	9264	6996	12866	9695	21101	15592	44775	34881	78227	57869
10	8.0	5230	3839	7242	5598	10059	7757	16496	12476	35004	27910	61156	46304
	5.0	7007	5080	9702	7409	13475	10266	22099	16510	46893	36937	81927	61279
	2.5-0	7300	5235	10108	7634	14039	10579	23024	17013	48857	38061	85359	63145
12	10.0	5736	4214	7943	6146	11032	8516	18092	13697	38390	30642	67072	50836
	7.0	7916	5759	10960	8399	15223	11639	24965	18718	52975	41875	92553	69472
	5.0	8455	6101	11708	8898	16261	12330	26667	19830	56587	44362	98864	73598
	3.2-0	8569	6145	11865	8961	16479	12417	27026	19970	57348	44676	100194	74119
14	10.0	8118	5938	11240	8659	15612	12000	25603	19298	54329	43174	94920	71626
	7.0	9476	6866	13121	10012	18223	13874	29886	22313	63416	49919	110796	82817
	3.8-0	9822	7043	13600	10271	18888	14232	30977	22889	65731	51207	114840	84954
15	12.0	7559	5546	10466	8088	14536	11208	23840	18026	50587	40326	88381	66902
	10.0	9073	6623	12563	9659	17448	13385	28615	21526	60719	48157	106083	79893
	4.2-0	10421	7472	14429	10897	20040	15100	32866	24285	69740	54330	121845	90135
17	15.0	6791	4997	9403	7287	13060	10098	21419	16240	45450	36332	79406	60276
	12.0	9773	7145	13532	10420	18795	14440	30824	23222	65407	51953	114274	86191
	10.0	10803	7859	14958	11460	20775	15881	34072	25540	72299	57139	126315	94794
	4.8-0	11661	8362	16146	12194	22426	16898	36778	27176	78041	60797	136348	100864

BOSS STEAM CAPACITY TABLE

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.



BOSS AIR CAPACITY TABLE

(Modified Equal Percent Contour Plug) (SCFH)

BOSS AIR CAPACITY TABLE

Pressure (PSI)		Valve Port and Trim											
		2		2-1/2		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
10	5	38908	28546	53872	41630	74823	57687	122709	92775	260383	207554	454921	344337
	0	49154	35773	68059	52169	94527	72291	155024	116262	328954	260099	574724	431511
15	10	43431	31902	60135	46524	83520	64470	136974	103683	290651	231957	507804	384823
	5	56067	40924	77631	59681	107822	82701	176827	133004	375219	297554	655555	493650
	0	62112	44987	86001	65606	119446	90911	195892	146208	415672	327093	726232	542656
20	15	47534	34945	65816	50962	91411	70618	149914	113572	318111	254080	555780	421526
	10	62271	45541	86221	66414	119751	92031	196392	148009	416734	331122	728087	549340
	0	74057	53434	102540	77925	142417	107982	233563	173661	495610	388511	865893	644550
30	25	54839	40359	75931	58856	105460	81558	172954	131165	367001	293440	641196	486825
	15	84296	61532	116718	89734	162108	124346	265857	199979	564136	447389	985618	742230
	0	96540	69304	133671	101068	185654	140051	304473	225237	646077	503896	1128778	835977
40	25	96492	70607	133604	102969	185562	142685	304321	229473	645754	513372	1128215	851697
	15	112097	81384	155212	118685	215572	164464	353538	264498	750190	591730	1310677	981695
	2-0	118211	84808	163677	123678	227330	171383	372821	275626	791107	616625	1382164	1022996
50	35	107378	78698	148678	114768	206497	159036	338655	255770	718609	572203	1255500	949299
	30	118861	86856	164576	126665	228578	175521	374868	282282	795452	631514	1389756	1047699
	25	127156	92616	176062	135066	244531	187162	401030	301004	850966	673399	1486745	1117186
	5-0	139823	100312	193601	146289	268891	202714	440981	326015	935740	729353	1634855	1210016
60	45	117295	86063	162409	125509	225568	173919	369931	279705	784976	625750	1371452	1038135
	40	130667	95638	180924	139473	251284	193269	412105	310825	874467	695370	1527804	1153638
	35	140754	102747	194890	149839	270680	207635	443916	333928	941968	747056	1645737	1239386
	8-0	161435	115816	223525	168899	310452	234046	509140	376403	1080371	842082	1887545	1397035
75	55	146686	107542	203103	156832	282088	217324	462624	349511	981666	781920	1715095	1297225
	50	159129	116421	220333	169781	306018	235268	501870	378369	1064943	846479	1860591	1404330
	45	168983	123354	233976	179892	324966	249279	532945	400902	1130883	896890	1975796	1487963
	12-0	193951	139073	268547	202814	372982	281043	611690	451986	1297977	1011174	2267730	1677564
100	75	185945	136350	257463	198843	357587	275540	586443	443136	1244403	991375	2174129	1644717
	60	218861	159670	303038	232852	420886	322666	690253	518926	1464683	1160932	2558987	1926016
	20-0	247881	177833	343220	259340	476694	359371	781778	577958	1658894	1292996	2898298	2145113
125	100	209464	153808	290028	224304	402816	310821	660619	499876	1401800	1118313	2449122	1855310
	75	268632	195905	371952	285694	516601	395891	847225	636690	1797770	1424390	3140932	2363099
	27-0	302061	216594	418239	315866	580887	437700	952655	703930	2021487	1574817	3531793	2612662
150	125	230652	169523	319364	247221	443561	342578	727440	550950	1543593	1232575	2696851	2044873
	100	300776	219837	416459	320595	578416	444254	948602	714470	2012888	1598397	3516769	2651782
	35-0	355938	255354	492837	372392	684496	516028	1122573	829901	2382045	1856638	4161734	3080210
	150	250081	183926	346266	268225	480924	371683	788716	597758	1673617	1337292	2924021	2218602
175	125	329987	241563	456905	352279	634590	488158	1040728	785079	2208373	1756363	3858307	2913852
	100	375147	273137	519434	398325	721436	551965	1183155	887696	2510597	1985936	4386331	3294719
	42-0	410172	294115	567930	428917	788792	594357	1293619	955873	2744997	2138459	4795857	3547759
	150	356925	261583	494204	381475	686394	528616	1125687	850145	2388652	1901926	4173277	3155344
200	125	409880	299020	567526	436071	788231	604270	1292699	971816	2743043	2174127	4792443	3606932
	50-0	463995	332875	642454	485443	892297	672685	1463368	1081845	3105195	2420280	5425168	4015308
	175	382039	280236	528978	408677	734691	566310	1204894	910766	2556726	2037548	4466923	3380344
225	150	442100	323009	612138	471055	850192	652748	1394314	1049780	2958667	2348547	5169165	3896300
	57-0	518283	371636	717622	541969	996697	751014	1634584	1207816	3468507	2702102	6059920	4482856
	200	405650	297762	561669	434237	780096	601728	1279358	967728	2714734	2164981	4742984	3591760
250	175	472265	345453	653905	503786	908202	698103	1489451	1122722	3160543	2511731	5521868	4167027
	150	516974	376690	715810	549339	994180	761227	1630456	1224242	3459748	2738849	6044616	4543821
	65-0	572051	410396	792071	598495	1100099	829342	1804162	1333788	3828344	2983923	6688601	4950405

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.

BOSS AIR CAPACITY TABLE

(Modified Equal Percent Contour Plug) (M3/Hr.)

Pressure (bar)		Valve Port and Trim											
		2		2-1/2		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
0.7	0.3	1171	847	1621	1235	2252	1712	3692	2753	7835	6158	13689	10216
	0.2	1268	915	1756	1335	2439	1850	3999	2975	8486	6655	14827	11040
1	0.7	1149	834	1591	1216	2209	1684	3623	2709	7688	6060	13432	10054
	0.5	1408	1018	1949	1484	2707	2057	4439	3307	9420	7399	16458	12276
	0.3	1576	1135	2182	1655	3031	2294	4971	3689	10548	8253	18429	13692
1.5	1	1615	1169	2236	1705	3105	2363	5092	3801	10806	8503	18879	14107
	0.7	1914	1380	2650	2013	3681	2789	6037	4485	12810	10035	22381	16648
	0.5	2045	1469	2831	2143	3932	2969	6448	4775	13683	10682	23905	17722
2	1.5	1799	1304	2490	1902	3459	2636	5673	4239	12037	9483	21030	15732
	1.2	2158	1559	2988	2274	4150	3151	6806	5067	14442	11337	25232	18808
	1	2325	1676	3220	2444	4472	3386	7334	5446	15563	12184	27190	20214
3	2	2809	2031	3890	2962	5402	4104	8859	6600	18799	14766	32845	24497
	1.5	3209	2308	4443	3366	6171	4665	10120	7502	21475	16783	37519	27844
	.2-0	3562	2522	4931	3678	6849	5097	11233	8197	23835	18338	41644	30423
3.5	3.0	2264	1645	3135	2398	4354	3323	7140	5345	15151	11958	26470	19838
	2.0	3484	2511	4825	3662	6701	5074	10990	8161	23319	18257	40742	30288
	1.0	3935	2806	5448	4092	7567	5670	12409	9119	26332	20400	46005	33844
	.3-0	4007	2836	5549	4136	7706	5732	12638	9218	26818	20622	46855	34213
4	3.0	3224	2335	4464	3405	6200	4719	10168	7589	21575	16977	37695	28166
	2.0	4081	2932	5650	4276	7848	5926	12870	9530	27310	21320	47714	35370
	1.0	4412	3138	6109	4577	8485	6342	13915	10199	29526	22818	51586	37855
	.5-0	4449	3150	6160	4594	8556	6367	14031	10239	29774	22906	52019	38002
5	4.0	3592	2605	4974	3799	6908	5264	11330	8466	24041	18940	42003	31421
	3.0	4644	3346	6430	4880	8930	6762	14645	10875	31076	24329	54294	40363
	2.0	5152	3684	7134	5373	9908	7446	16249	11975	34479	26789	60240	44444
	.8-0	5336	3779	7389	5511	10262	7636	16830	12281	35712	27475	62394	45582
7	5.0	5612	4057	7771	5917	10792	8199	17700	13186	37558	29500	65618	48941
	3.0	6866	4910	9507	7161	13204	9923	21655	15958	45951	35702	80282	59230
	1.4-0	7111	5036	9846	7343	13675	10176	22427	16365	47589	36613	83144	60741
9	7.0	6442	4666	8920	6805	12389	9429	20318	15165	43115	33926	75327	56284
	5.0	8153	5858	11289	8544	15680	11839	25714	19040	54565	42596	95332	70668
	2.0-0	8886	6292	12303	9176	17088	12716	28024	20450	59466	45750	103895	75900
10	8.0	6821	4943	9444	7209	13117	9990	21512	16066	45648	35942	79752	59629
	5.0	9254	6632	12813	9672	17795	13403	29184	21555	61927	48222	108195	80001
	2.3-0	9773	6921	13532	10093	18794	13985	30823	22492	65404	50319	114270	83480
	10.0	7522	5457	10415	7958	14466	11027	23724	17735	50341	39675	87952	65823
12	7.0	10485	7539	14518	10994	20163	15235	33068	24501	70169	54814	122594	90938
	5.0	11295	8061	15639	11756	21721	16290	35622	26199	75588	58611	132063	97237
	2.9-0	11548	8177	15989	11925	22207	16525	36420	26576	77281	59456	135020	98639
14	10.0	10764	7777	14905	11342	20701	15716	33949	25276	72039	56547	125861	93813
	7.0	12688	9089	17568	13254	24400	18367	40017	29538	84913	66082	148354	109631
	3.5-0	13323	9434	18447	13758	25621	19065	42019	30661	89162	68593	155777	113798
15	12.0	10043	7277	13906	10612	19313	14706	31674	23650	67211	52910	117426	87778
	10.0	12119	8740	16780	12746	23305	17662	38221	28405	81103	63547	141697	105427
	3.8-0	14211	10062	19676	14674	27328	20334	44819	32703	95103	73162	166157	121378
17	15.0	9044	6570	12523	9581	17392	13277	28524	21353	60526	47769	105746	79251
	12.0	13103	9462	18142	13799	25197	19122	41324	30753	87687	68800	153199	114141
	10.0	14559	10466	20158	15263	27998	21150	45916	34014	97431	76096	170225	126245
	4.4-0	15986	11319	22135	16507	30743	22874	50419	36787	106986	82299	186918	136537

BOSS AIR CAPACITY TABLE

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.

BOSS WATER CAPACITY TABLE

(Modified Equal Percent Contour Plug) (G.P.M.)

BOSS WATER
CAPACITY TABLE

Pressure (PSI)		Valve Port and Trim											
		2		2-1/2		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
10	5	145	72	201	89	280	141	458	230	973	485	1699	680
	3	206	101	285	126	395	199	648	326	1376	686	2403	961
15	10	145	72	201	89	280	141	458	230	973	485	1699	680
	5	206	101	285	126	395	199	648	326	1376	686	2403	961
	0	252	124	349	155	484	244	794	399	1685	840	2943	1177
20	15	145	72	201	89	280	141	458	230	973	485	1699	680
	10	206	101	285	126	395	199	648	326	1376	686	2403	961
	0	291	143	402	179	559	282	917	461	1945	970	3399	1360
30	25	145	72	201	89	280	141	458	230	973	485	1699	680
	10	291	143	402	179	559	282	917	461	1945	970	3399	1360
	0	346	175	480	219	666	345	1093	564	2319	1189	4051	1665
40	25	252	124	349	155	484	244	794	399	1685	840	2943	1177
	10	356	175	493	219	685	345	1123	564	2383	1189	4163	1665
	0	384	202	531	253	738	398	1210	651	2567	1372	4484	1923
50	40	206	101	285	126	395	199	648	326	1376	686	2403	961
	30	291	143	402	179	559	282	917	461	1945	970	3399	1360
	25	325	160	450	200	625	315	1025	515	2175	1085	3800	1520
	0	417	226	578	283	802	445	1316	728	2793	1534	4879	2150
60	45	252	124	349	155	484	244	794	399	1685	840	2943	1177
	40	291	143	402	179	559	282	917	461	1945	970	3399	1360
	25	385	189	532	237	740	373	1213	609	2573	1284	4496	1798
	0	449	248	621	310	863	488	1415	798	3002	1681	5244	2355
75	55	291	143	402	179	559	282	917	461	1945	970	3399	1360
	50	325	160	450	200	625	315	1025	515	2175	1085	3800	1520
	25	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	0	492	277	681	346	946	546	1551	892	3290	1879	5749	2633
100	75	325	160	450	200	625	315	1025	515	2175	1085	3800	1520
	50	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	0	556	320	770	400	1070	630	1754	1030	3722	2170	6503	3040
125	100	325	160	450	200	625	315	1025	515	2175	1085	3800	1520
	50	563	277	779	346	1083	546	1775	892	3767	1879	6582	2633
	0	614	355	850	444	1181	699	1936	1143	4109	2408	7179	3374
150	100	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	50	650	320	900	400	1250	630	2050	1030	4350	2170	7600	3040
	0	667	386	923	482	1282	759	2103	1241	4462	2615	7796	3664
175	150	325	160	450	200	625	315	1025	515	2175	1085	3800	1520
	100	563	277	779	346	1083	546	1775	892	3767	1879	6582	2633
	50	716	358	991	447	1376	704	2257	1152	4789	2426	8367	3399
	0	716	414	991	517	1376	815	2257	1332	4789	2807	8367	3933
200	150	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	50	761	392	1054	490	1464	772	2401	1261	5096	2658	8903	3723
	0	761	440	1054	551	1464	867	2401	1418	5096	2987	8903	4184
225	150	563	277	779	346	1083	546	1775	892	3767	1879	6582	2633
	50	805	423	1114	529	1547	833	2537	1363	5384	2871	9407	4022
	0	805	465	1114	582	1547	916	2537	1498	5384	3156	9407	4421
250	200	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	150	650	320	900	400	1250	630	2050	1030	4350	2170	7600	3040
	50	846	453	1171	566	1626	891	2667	1457	5659	3069	9886	4299
	0	846	489	1171	611	1626	963	2667	1574	5659	3317	9886	4647
300	250	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	100	919	453	1273	566	1768	891	2899	1457	6152	3069	10748	4299
	0	922	533	1277	667	1773	1050	2908	1717	6171	3617	10781	5067
400	350	460	226	636	283	884	445	1450	728	3076	1534	5374	2150
	150	1028	506	1423	632	1976	996	3241	1629	6878	3431	12017	4807
	0	1059	612	1466	765	2036	1206	3339	1971	7084	4152	12377	5817

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.

BOSS WATER CAPACITY TABLE

(Modified Equal Percent Contour Plug) (M3/Hr.)

BOSS WATER
CAPACITY TABLE

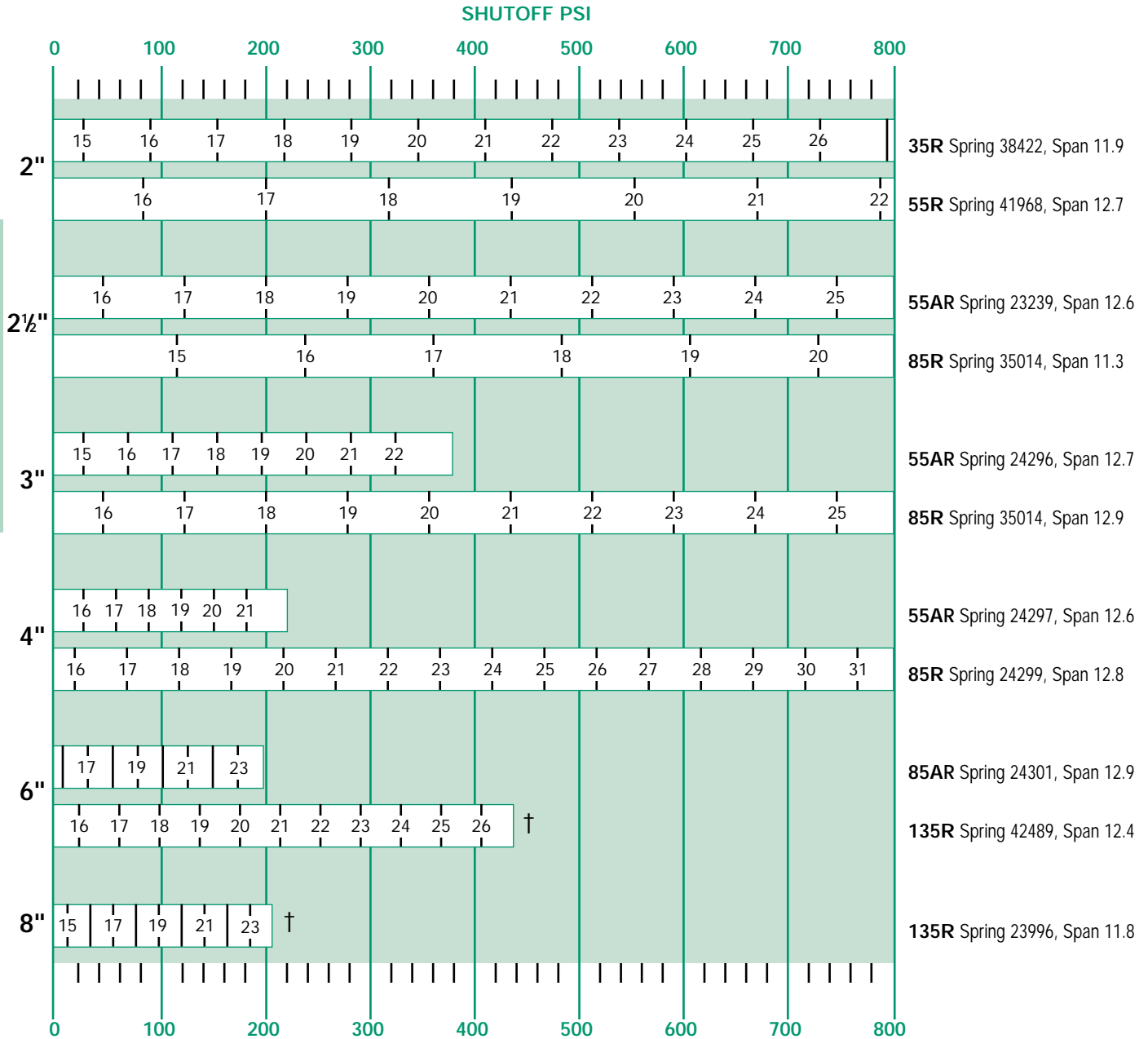
Pressure (bar)		Valve Port and Trim											
		2		2½		3		4		6		8	
P1	P2	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic	Full	Sonic
0.7	0.5	25	12	35	15	48	24	79	40	168	84	294	118
	0	59	34	81	42	113	67	185	109	392	230	684	322
1	0.7	31	15	43	19	59	30	97	49	206	103	360	144
	0.5	63	20	88	24	122	39	200	63	425	133	742	186
	0	63	37	88	46	122	72	200	118	425	249	742	349
1.5	1	40	20	55	24	76	39	125	63	266	133	465	186
	0.7	71	25	98	31	137	49	224	80	475	168	830	235
	0	71	41	98	51	137	81	224	132	475	279	830	390
2	1.5	40	20	55	24	76	39	125	63	266	133	465	186
	1	56	28	78	35	108	54	177	89	376	188	657	263
	0	78	45	108	56	150	89	245	145	521	305	910	428
3	2	56	28	78	35	108	54	177	89	376	188	657	263
	1	90	39	124	49	173	77	283	126	601	265	1051	372
	0	90	52	124	65	173	102	283	167	601	352	1051	494
3.5	3	40	20	55	24	76	39	125	63	266	133	465	186
	2	69	34	95	42	132	67	217	109	461	230	805	322
	1	95	44	132	55	183	86	301	141	638	297	1114	416
	0	95	55	132	69	183	109	301	177	638	374	1114	524
4	3	56	28	78	35	108	54	177	89	376	188	657	263
	2	79	39	110	49	153	77	251	126	532	265	929	372
	1	100	48	139	60	193	94	317	154	672	325	1175	455
	0	100	58	139	73	193	114	317	187	672	394	1175	552
5	4	56	28	78	35	108	54	177	89	376	188	657	263
	3	79	39	110	49	153	77	251	126	532	265	929	372
	2	97	48	135	60	187	94	307	154	652	325	1138	455
6	0	110	64	152	80	212	125	347	205	737	432	1287	605
	5	56	28	78	35	108	54	177	89	376	188	657	263
	4	79	39	110	49	153	77	251	126	532	265	929	372
8	0	119	69	165	86	229	135	375	221	796	466	1390	653
	6	79	39	110	49	153	77	251	126	532	265	929	372
	5	97	48	135	60	187	94	307	154	652	325	1138	455
10	0	135	78	187	98	259	154	425	251	902	529	1577	741
	8	79	39	110	49	153	77	251	126	532	265	929	372
	5	126	62	174	77	242	122	396	199	841	420	1470	588
12	0	149	86	206	108	287	170	470	278	998	585	1743	819
	10	79	39	110	49	153	77	251	126	532	265	929	372
	8	112	55	156	69	216	109	355	178	752	375	1314	526
14	5	149	73	206	92	286	144	469	236	995	496	1739	696
	0	162	94	224	117	312	185	511	302	1085	636	1895	891
	10	112	55	156	69	216	109	355	178	752	375	1314	526
15	5	174	83	241	104	335	163	549	267	1165	563	2036	789
	0	174	101	241	126	335	198	549	324	1165	683	2036	957
	10	126	62	174	77	242	122	396	199	841	420	1470	588
17	5	180	88	249	109	346	172	567	282	1204	593	2103	831
	0	180	104	249	130	346	205	567	335	1204	705	2103	988
	14	97	48	135	60	187	94	307	154	652	325	1138	455
20	10	149	73	206	92	286	144	469	236	995	496	1739	696
	5	191	96	264	120	367	189	602	309	1277	650	2230	911
	0	191	110	264	138	367	217	602	355	1277	748	2230	1048
27	15	126	62	174	77	242	122	396	199	841	420	1470	588
	10	178	88	246	109	342	172	561	282	1190	593	2078	831
	0	206	119	285	149	396	235	650	384	1379	808	2409	1132
27	20	149	73	206	92	286	144	469	236	995	496	1739	696
	10	232	114	321	143	446	225	731	367	1551	774	2710	1084
	0	238	138	329	172	458	271	750	443	1592	933	2782	1307

- It is recommended to keep valve outlet velocity below 30,000 ft./min.
- Capacities based on maximum Cv.

BOSS SHUTOFF TABLE - REVERSE ACTING

ACTUATOR SHUTOFF TABLE

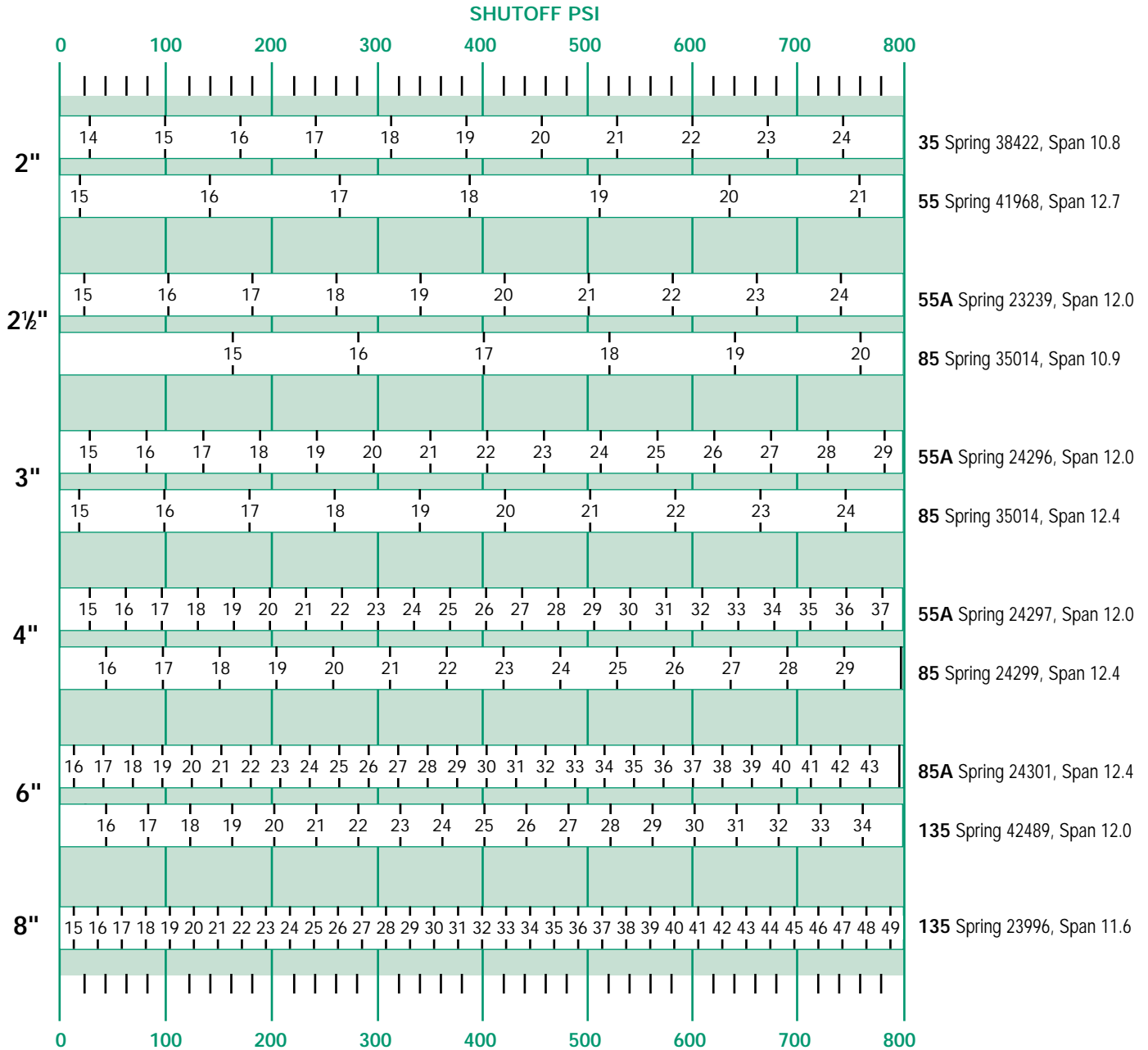
CONTROL VALVES



† For shutoff pressure above this value, consult factory.

BOSS SHUTOFF TABLE - DIRECT ACTING

ACTUATOR SHUTOFF TABLE



CONTROL VALVES

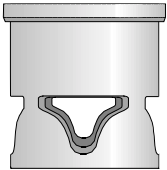
BOSS SERIES D CONTROL VALVE

HUNG CAGE DESIGN

Unlike competitor's valves (which use the cage to compress the seat ring into the body), Spence's cage is suspended in the body from a machined shoulder. This eliminates bonnet gasket leakage, cage deformation, sticking plugs, seat gasket and body washout which can occur with cage retained seat designs. The Spence hung cage design utilizes a 17-4 Ph stainless steel Belleville load ring to maintain a constant seat gasket load, even in temperature cycling service.

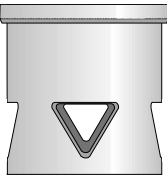
The Spence Boss D Series Control Valves are specifically designed for high pressure drop service. Pressure drop, high velocities and throttling occur between the cage window and the plug, thereby protecting the seat ring and tight shutoff capability of the valve. An optional "protected seat" seat ring provides outstanding wear and shutoff performance.

DIGIBOSS HUNG CAGE & TRIM MATERIAL



STANDARD CAGE

The full ported, standard cage, provides maximum flow with minimum pressure drop. The inherent modified linear flow characteristic provides excellent low flow control, high rangeability and maximum flows per given body size.

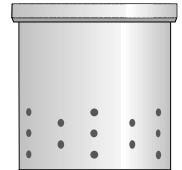


40% REDUCED TRIM CAGE

This optional cage reduces the maximum Cv and flow to 40% of the normal, full port valve. Used to provide body velocity control, future flow expandability, or to correct for oversized valve conditions.

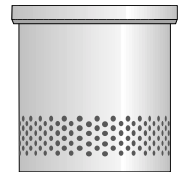
ANTI-CAVITATION CAGE

The Seco-Cav cage eliminates the effects of valve cavitation providing a normal valve/trim life expectancy in cavitating conditions. Diametrically opposed holes, increase the valves cavitation index (Kc) and direct impinging flows to the center of the cage, preventing mechanical trim/body damage.



NOISE REDUCING CAGE

The Seco-Sonic cage is designed to reduce valve generated noise up to 10dBA in steam, gas or any compressible fluid service. When used in conjunction with a Seco-Sonic silencing orifice, noise attenuations of 15-20dBA can be achieved.



TRIM MATERIAL SELECTION

Balanced Plug design allows line pressure under the plug to build up above the plug, effectively cancelling out any unbalanced stem force due to pressure. In addition to providing smooth, high pressure control, balanced plugs allow use of small, light, cost effective actuators. Class III, IV or VI shutoff can be provided.

The piston seal is critical to maintaining tight shutoff in any cage valve. The Boss's heavy cupwasher style PTFE plug seal has three times the cross sectional area and wear surface of competitive valves and provides tight shutoff for longer than competitor's designs at both low and high pressures.

Table 1	Maximum Service Temp.	Plug	Seat Ring	Gaskets	ANSI/ISA 70-2 Shut-off
Standard Balanced Trim	500°F (260°C)	AISI 410 St. St. w/PTFE Seal	AISI Type 400 St. St.*	Filled Type 304 St. St	IV
Stellite Balanced Trim	500°F (260°C)	AISI 410 St. St. w/PTFE Seal	AISI Type 400 St. St. Stellite	Filled Type 304 St. St	IV
High Temp. Trim	800°F (426°C)	AISI 410 St. St. w/ Ni-Resist Seal	AISI Type 400 St. St. Stellite	Inconel Graphite	III
Soft-Seated Trim	500°F (260°C)	AISI 410 St. St. w/PTFE Seal	AISI Type 400 St. St. w/PTFE Insert	Filled Type 304 St. St	VI

* Stellite seat optional.



STANDARD & STELLITE BALANCED PLUG

Balanced plug design eliminates large stem forces allowing the use of small, cost-effective actuators. Provides smooth throttling control even at pressures to 1000 psi. Standard PTFE piston seal provides ANSI Class IV tight shut-off to temperatures of 500°F.



HIGH-TEMP BALANCED PLUG


Balanced plug with high-temp ni-resist or carbon piston seal provides ANSI Class II shut-off at temperatures up to 800°F.



SOFT SEATED TRIM

Balanced plug with PTFE piston seal and an optional seat design with PTFE insert provide ANSI Class VI bubble tight shut-off at temperatures up to 460°F.

Linear Valve Specification Form

 CONTROL VALVE SPEC SHEET	Project/Job _____ Unit/Customer _____ P.O./LCO File # _____ Item _____ Contract _____ MFR Serial# _____	Data Sheet _____ of _____ Spec _____ Tag _____ Dwg _____ Service _____																																									
Fluid <input type="checkbox"/> Steam <input type="checkbox"/> Water <input type="checkbox"/> Gas _____ <input type="checkbox"/> Liquid _____		Crit Pres PC _____																																									
Service Conditions Flow <input type="checkbox"/> #/hr <input type="checkbox"/> gpm <input type="checkbox"/> scfh <input type="checkbox"/> _____ Inlet Pressure <input type="checkbox"/> psig <input type="checkbox"/> psia <input type="checkbox"/> _____ Outlet Pressure <input type="checkbox"/> psig <input type="checkbox"/> psia <input type="checkbox"/> _____ Temperature <input type="checkbox"/> °C <input type="checkbox"/> °F _____ Max Press/Temperature: _____ / _____ Density/MW/SG _____ Viscosity _____ Vapor Pressure <input type="checkbox"/> psia <input type="checkbox"/> _____ Required C _v _____ Noise (dBA) Allowable _____	<table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 25%;">Max. Flow</th> <th style="width: 25%;">Norm. Flow</th> <th style="width: 25%;">Min. Flow</th> <th style="width: 25%;">Shut-off Pressure</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Max. Flow	Norm. Flow	Min. Flow	Shut-off Pressure																																				
Max. Flow	Norm. Flow	Min. Flow	Shut-off Pressure																																								
Line Info Pipe Size In _____ /Sch _____ Pipe Size Out _____ /Sch _____																																											
Valve, Body & Bonnet Body Size in. <input type="checkbox"/> ½ <input type="checkbox"/> ¾ <input type="checkbox"/> 1 <input type="checkbox"/> 1¼ <input type="checkbox"/> 1½ <input type="checkbox"/> 2 <input type="checkbox"/> 2½ <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> 10 <input type="checkbox"/> 12 <input type="checkbox"/> 16 ANSI Class <input type="checkbox"/> 125 <input type="checkbox"/> 150 <input type="checkbox"/> 250 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/> 900 <input type="checkbox"/> 1500 <input type="checkbox"/> 2500 <input type="checkbox"/> 4500 <input type="checkbox"/> Other _____ Body/Bonnet Material: <input type="checkbox"/> Cast Iron <input type="checkbox"/> Cast Steel <input type="checkbox"/> Cr Mo <input type="checkbox"/> 316SS <input type="checkbox"/> Bronze <input type="checkbox"/> Hast C <input type="checkbox"/> Titanium <input type="checkbox"/> Alloy 20 <input type="checkbox"/> Other _____ End Conn. Inlet/Outlet: <input type="checkbox"/> NPT <input type="checkbox"/> SWE <input type="checkbox"/> BWE Sch. _____ <input type="checkbox"/> Sep. Flanges <input type="checkbox"/> Int. Flanges <input type="checkbox"/> Other _____ Packing Material: <input type="checkbox"/> PTFE <input type="checkbox"/> BTG <input type="checkbox"/> Laminated Graphite <input type="checkbox"/> Kalrez <input type="checkbox"/> Other _____																																											
Trim Size <input type="checkbox"/> 100% <input type="checkbox"/> 60% <input type="checkbox"/> 40% <input type="checkbox"/> 20% <input type="checkbox"/> Other _____																																											
Actuator Spring Action: <input type="checkbox"/> Air to Open <input type="checkbox"/> Air to Close <input type="checkbox"/> Last Position <input type="checkbox"/> None Available Air Supply Pressure: Max. _____ Min. _____ Manual Override: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____																																											
Solenoid <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ <input type="checkbox"/> Voltage _____																																											
Positioner <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ <input type="checkbox"/> Pneu <input type="checkbox"/> I/P																																											
Switch <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____																																											
Air Set <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type: _____ <input type="checkbox"/> Range: _____																																											
Other Accessories <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____																																											
Test ANSI/FCI Leakage Class: <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI <input type="checkbox"/> Leslie VIII																																											

BOSS

