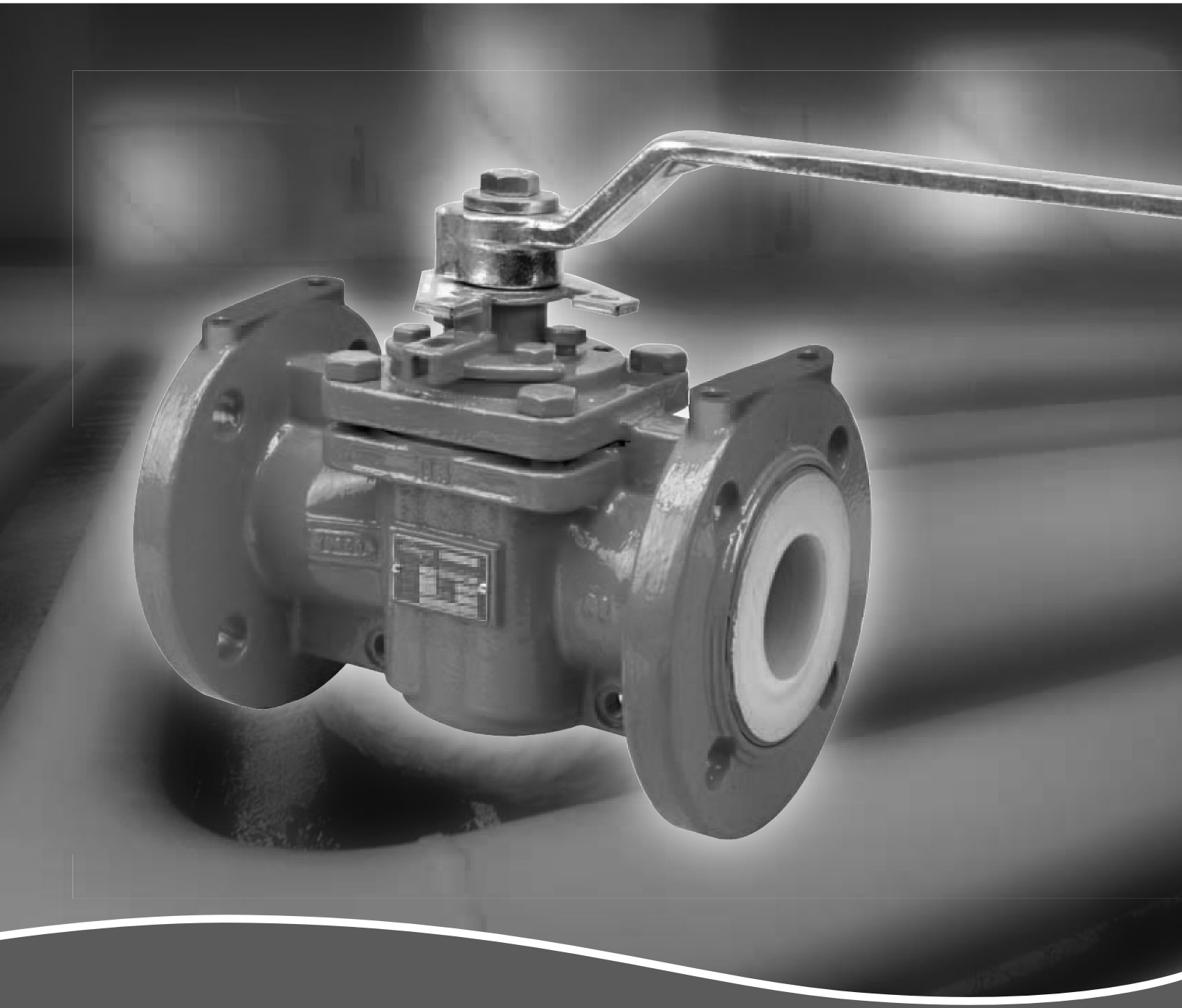
FLOWSERVE

Durco T4E Lined Plug Valves

Fluoropolymer Lined Valves



Experience In Motion

History

Flowserve Durco T4E valves have been designed and developed with the latest technology and are the most preferred fluoropolymer lined valves in the global chemical industries.
Durco T4E valves provide maximum corrosion resistance and the elimination of product contamination at a reasonable cost.

Available in a Broad Size Range and

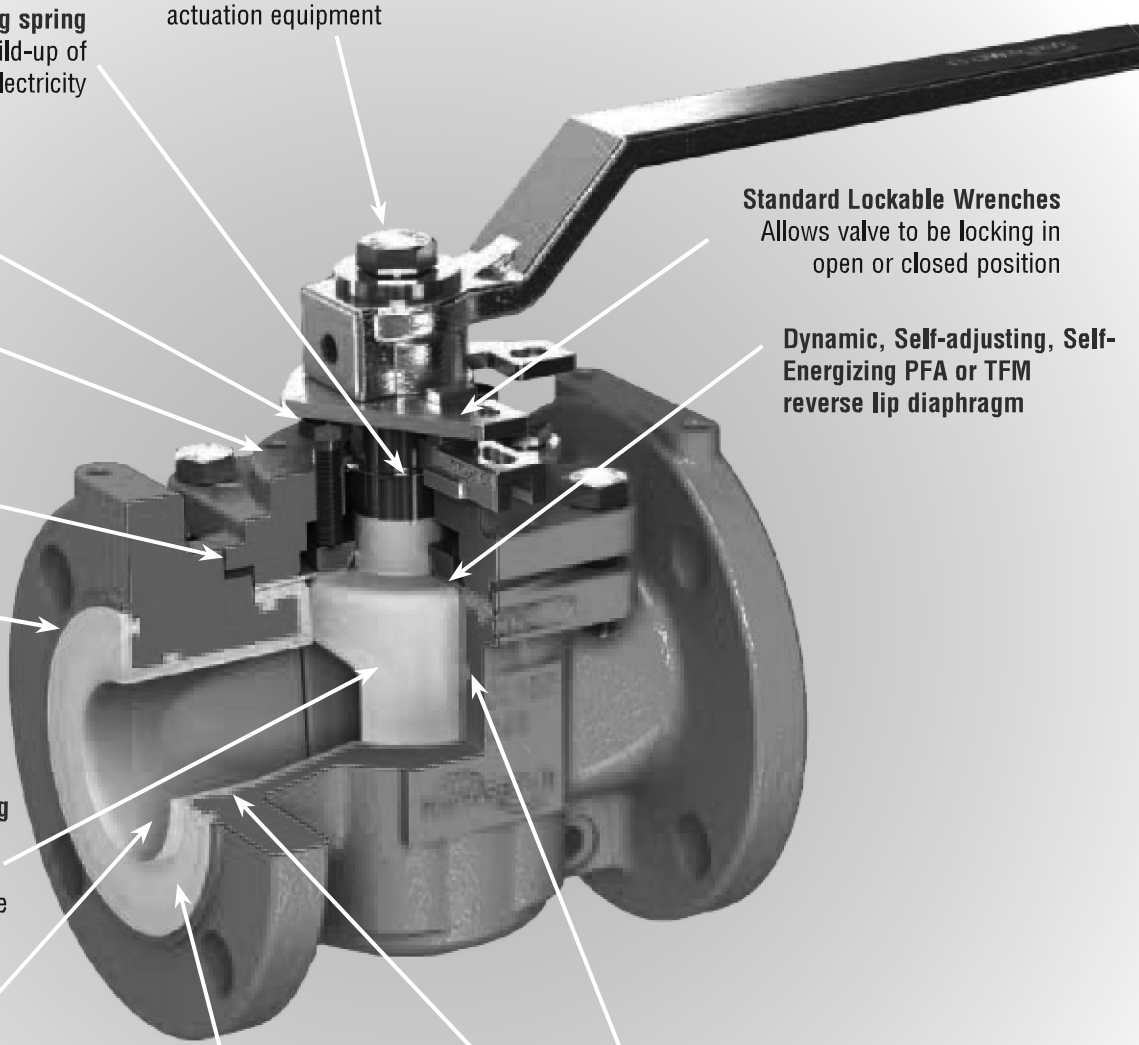
- ***T4E1*** *ASME Class 150 is available in sizes ½" through 12"*
- ***T4E2*** *DIN PN 16 is available in sizes DN 15 through DN 300*
- ***T4E3*** *ASME Class 300 is available in sizes ½" through 10"*

Extended Pressure Classes

- ***T4E1 and T4E2*** *rated 180 psi @400 °F (12.4 bar @ 204 °C), 250 psi @ 100 °F (17.2 bar @ 100 °C)*
- ***T4E3*** *rated 320 psi @ 400 °F (22 bar @ 204 °C), 740 psi @ 100 °F (51 bar @ 100 °C)*

Available with pneumatic or electric actuators for On-Off or modulating control applications.
All T4E valve series are rated to 4 Kpa (30 inches Hg) vacuum at ambient temperature.

Features



Double-D plug stem
accepts most standard actuation equipment

Grounding spring
To avoid build-up of static electricity

Inline adjustment
Stops thru-line leakage

ISO 5211 Mounting Pad
Universal flange for easy actuation mounting

Anti-Rotation Lugs
Help to eliminate stress on fasteners during actuation

Raised Lip
Prevents cold flow outward

Standard Lockable Wrenches
Allows valve to be locking in open or closed position

Dynamic, Self-adjusting, Self-Energizing PFA or TFM reverse lip diaphragm

Solid Encapsulated PFA Molded Plug
All plug inserts have anchor holes to ensure a strong adhesion of the plug PFA liner material even under extreme cycling conditions

Large Ports
Offer good Cv values. Reduced frictional losses & pressure drop

High Quality PFA Liner
Protects the body and forms the flange gasket. The PFA liner is resistant against a wide variation of chemical products

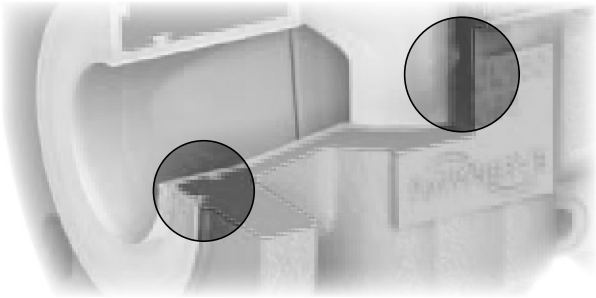
T-Slots in Critical Areas to Lock Liner Against Body Wall
Advantage will be a tight and perfect fit of the liner and an additional support during vacuum service

Additional Benefits

Benefits that give you the extra security which you will appreciate when using the T4E valves

Body Liner

- A perfectly fixed PFA body liner is well anchored to the body by means of machined T-slots. The plug substrate has anchor holes to ensure that the PFA liner material is securely attached to the plug.
- Due to the selected mode to lock the liner to the valve body and plug, the T4E valve series is very suitable for extreme service conditions including vacuum applications at elevated temperatures.
- The PFA body liner covers all wetted surfaces in the body.
- Due to it's large sealing surface a tight shut-off is assured.
- In addition to the large seating area the valve is fully bi-directional and the seal is totally independent of line pressure.

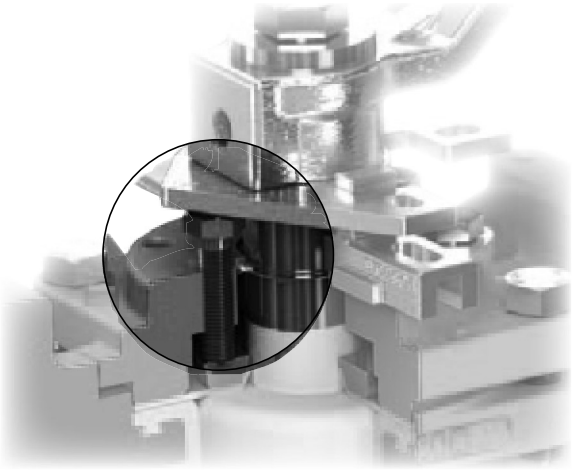


In-Line Adjustment

- No disassembly required to restore seating; plug can be reseated with a quick and easy in-line adjustment.
- An open end wrench and a few seconds are the extent of your maintenance requirements.

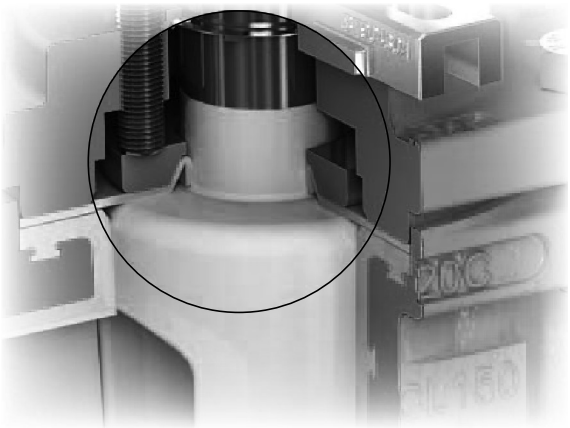
There are:

- No seats to replace
- No lengthy production disruption
- No piping disconnection
- No complicated, time-consuming maintenance procedures
- No hazards to personnel

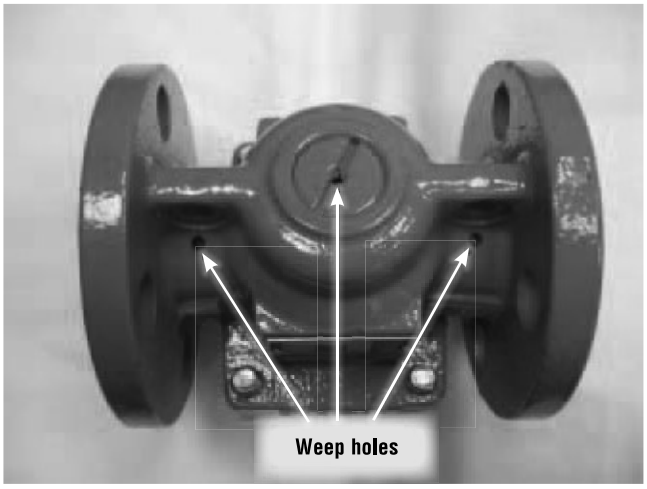


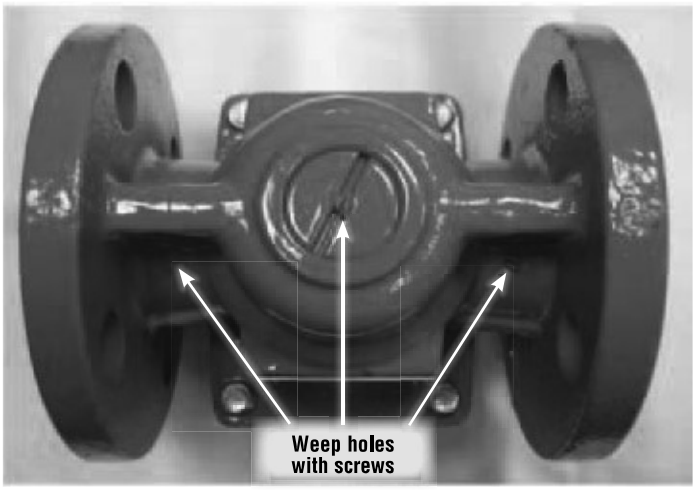
Secure Sealing

- A dynamic self-adjusting, self energized reverse lip PFA diaphragm seal prevents stem leakage.
- If line pressure forces liquid to the stem seal area, the self-energizing reverse lip PFA diaphragm will be forced against the stem to prevent external leakage.
- A sealing surface as much as 10x greater than other lined valves assures drop tight shut-off.
- In addition to the large sealing area, sealing is both upstream and downstream and is totally independent of line pressure.



Weepholes

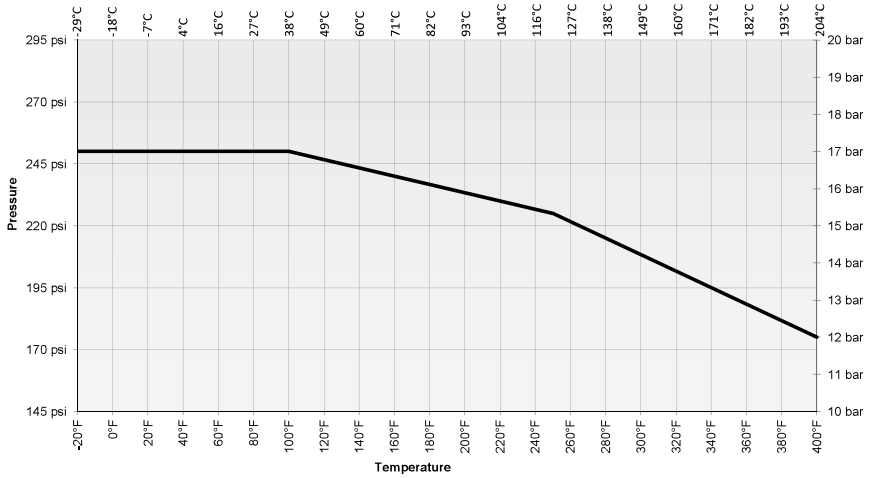




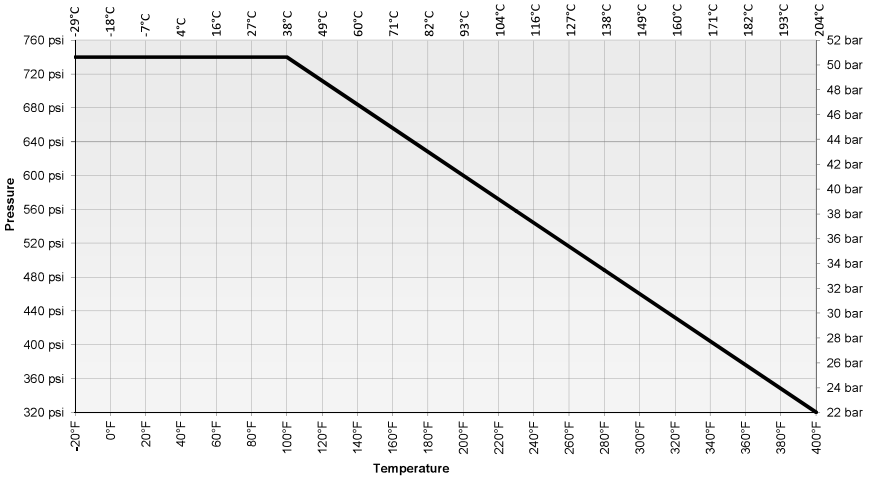
Weepholes for early leakage detection

Durco T4E valves are supplied with three weepholes that are plugged with screws. The customer has the option to remove the screws. In so doing he is able to detect any leakage of process fluid through the liner and to take appropriate action.

Pressure-Temperature-Diagram - T4E1 and T4E2



Pressure-Temperature-Diagram - T4E3



Durco T4E Automated Valves

Choose from a complete line of Flowserve Automax Automation Equipment for precise proportioning and On-Off control.....or we'll build a control package to your specification.

Flowserve Automax, a specialist in complete automation systems, produces a broad line of rack and pinion, heavy-duty, electric and linear actuators. In addition, a comprehensive line of engineered special control circuits, solenoid valves, limit switches, positioners and actuator mounting kits is offered.

Actuator Mounting

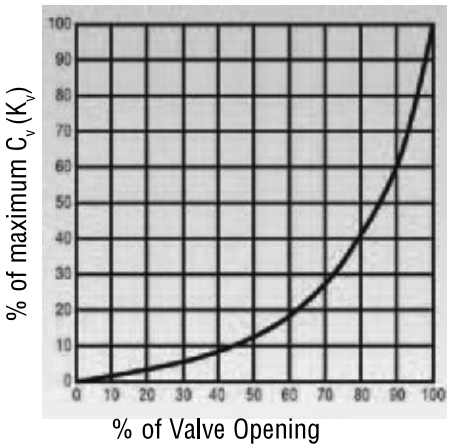
The body style of the T4E offers a choice of two locations for actuator mounting : an ISO 5200 pattern on the topcap or the flat-top pads of the flanges.

Software Capability

Flowserve offers a state-of-the-art range of software to help in sizing valves and actuation and creating drawings.

Modulating Control

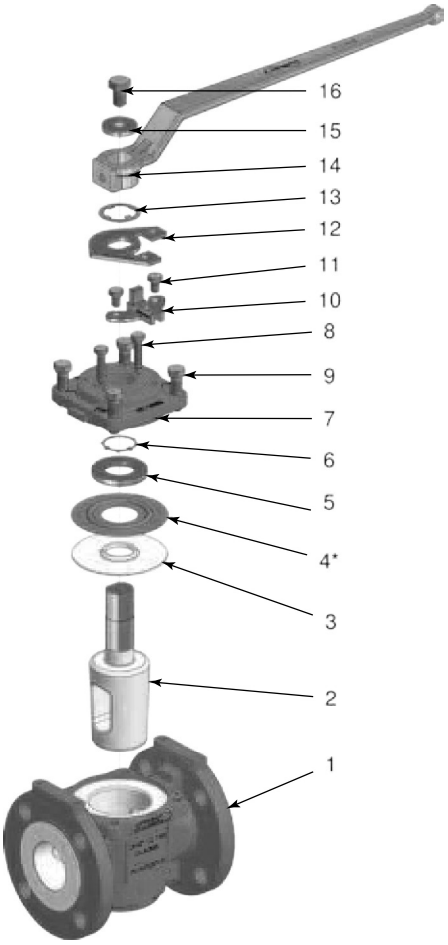
V-port T4E valves are available in 1" (DN 25) through 4" (DN 100) sizes with Cv (Kv) values of 1 through 187 (Kv of 1 through 161). Standard port T4E valves are available in ½" (DN 15) through 12" (DN 300) sizes with Cv (Kv) values from 15 through 3200 (Kv from 13 through 2750).



Control Plugs

Size	Cv	Kv	Plug Type
1"	1	1	slotted plug
1"	3	3	slotted plug
1"	8	7	V-port
1"	13	11	V-port
1"	25	21	V-port
1½"	30	26	V-port
2"	54	46	V-port
3"	89	76	V-port
4"	187	161	V-port

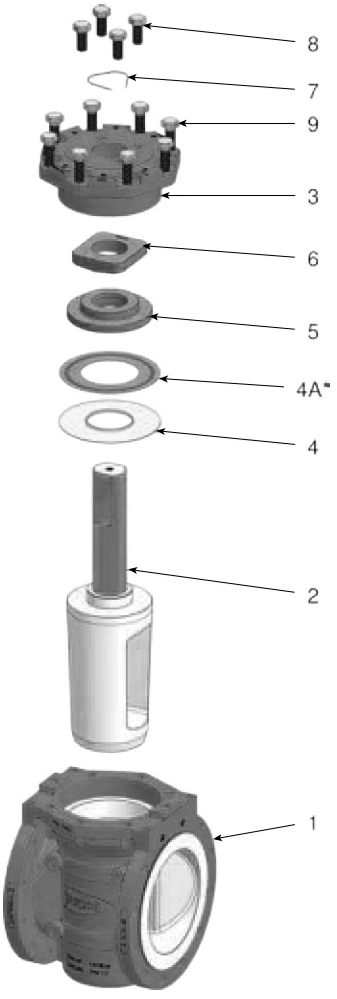
Material Specification



T4E1, T4E2 and T4E3 (½" - 6")

No.	Designation	Material
1	Body T4E1	Ductile cast iron - EN-JS1049/ASTM A395, PFA lined
	Body T4E3	Carbon steel ASTM A216 grade WCB, PFA lined
2	Plug	Ductile cast iron - EN-JS1049/ASTM A395, PFA lined
3	Diaphragm	T4E1: TFM (PFA*) | T4E3: PFA
4*	Metal diaphragm	Stainless steel - 302
5	Thrust gland	Machining steel - 1.0718
6	Grounding spring	Stainless steel - 302
7	Top cap T4E1	Ductile cast iron - EN-JS1049/ASTM A395
	Top cap T4E3	Carbon steel ASTM A995 Gr CD4MCuN
8	Adjuster bolt	ASTM A193 grade B7YC
9	Top cap bolt	ASTM A193 grade B7YC
10	Stop	Stainless steel ASTM A351/A744 grade CF-8M (316 SS)
11	Stop fastener	Stainless steel 1.4301
12	Stop collar	Carbon steel, protective plated
13	Stop collar retainer	Stainless steel - 302
14	Wrench	Ductile cast iron - EN-JS1082/ASTM A536
15	Washer	Stainless steel - 1.4301
16	Hexagon bolt	Stainless steel - 1.4301

*Optional



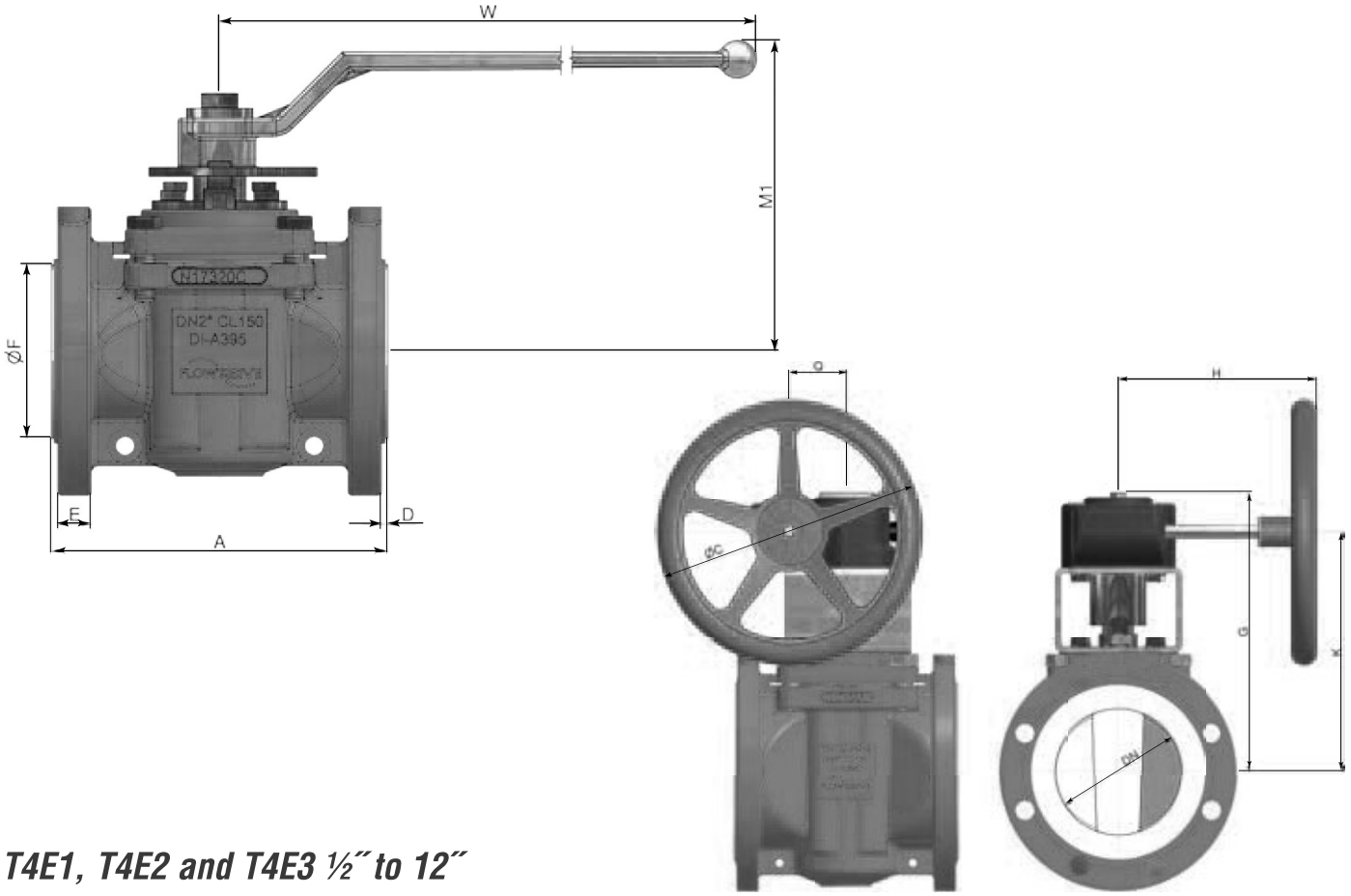
T4E1 and T4E2 (8" - 12") T4E3 (8" - 10")

No.	Designation	Material
1	Body T4E1	Ductile cast iron - EN-JS1049/ASTM A395*, PFA lined
	Body T4E3	Carbon steel ASTM A216 grade WCB, PFA lined
2	Plug	Ductile cast iron - EN-JS1049/ASTM A395, PFA lined
3	Top cap T4E1	Ductile cast iron - EN-JS1049/ASTM A395
	Top cap T4E3	Carbon steel ASTM A995 grade CD4MCuN
4	Diaphragm	T4E1: DN8" - TFM (PFA*), DN10"-DN12" - PFA | T4E3: PFA
4a**	Metal diaphragm	Stainless steel - 302
5	Thrust gland	Dupex stainless steel ASTM A995 Gr CD4MCuN
6	Adjuster	Dupex stainless steel ASTM A995 Gr CD4MCuN
7	Grounding spring	Stainless steel - 302
8	Adjuster bolt	88YC
9	Hexagon bolt	88YC

* Other materials upon request
** Optional

Dimensions

Valve Dimensions Dimensions are in Inches and millimetres. Weights are in lb. and kg.



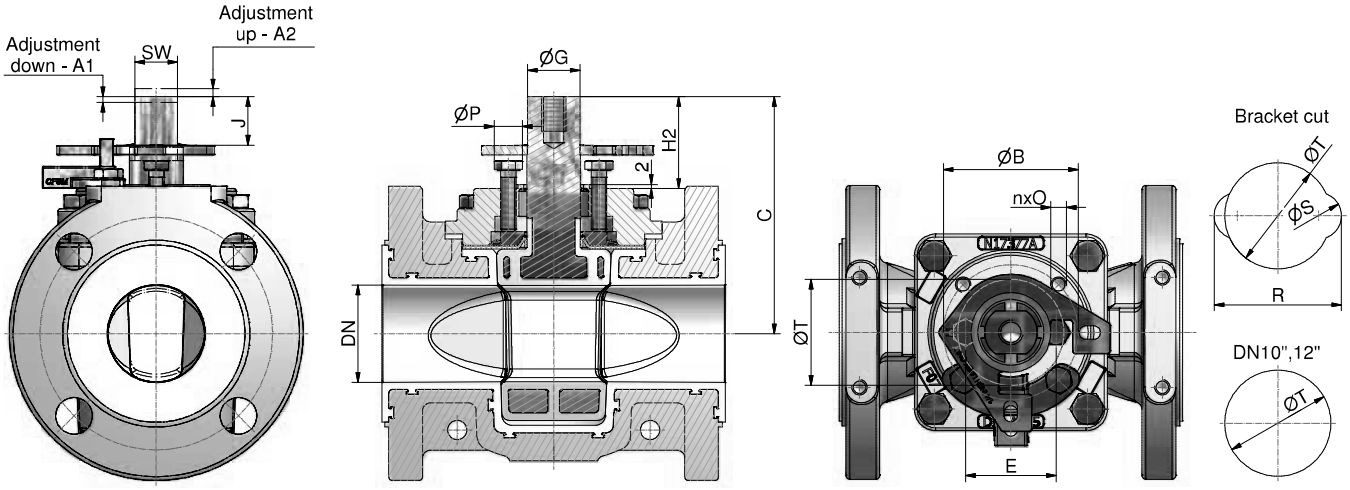
T4E1, T4E2 and T4E3 ½˝ to 12˝

Size	Units	A			D			E			ØF			W	MI	ØC	H	G	K	Q	Weight			
		150	300	DIN PN16	150	300	DIN PN16	150	300	DIN PN16	150	300	DIN PN16								Units	150	300	DIN PN16
½"	inch	4.3	5.5	5.1	0.12	0.16	0.24	0.43	0.51	0.47	1.4	1.4	1.65	10.2	5.5						lb.	8.2	9.9	9.3
	mm	109	140	130,0	3,0	4,1	6,0	11	13	12	36	36	42	259	140						kg,	3,7	4,5	4,2
¾"	inch	4.6	6.0	5.9	0.12	0.24	0.24	0.49	0.61	0.63	1.7	1.7	2.20	10.2	5.5						lb.	9.0	12.3	10.8
	mm	117	152	150,0	3,0	6,1	6,0	12	15	16	43	43	56	259	140						kg,	4,1	5,6	4,9
1"	inch	5.0	6.5	6.3	0.12	0.26	0.26	0.5	0.63	0.55	2.0	2.0	2.56	10.2	5.5						lb.	10.8	14.3	12.8
	mm	127	165	160,0	3,0	6,6	6,5	13	16	14	51	51	65	259	140						kg,	4,9	6,5	5,8
1½"	inch	6.5	7.5	7.9	0.16	0.26	0.26	0.63	0.74	0.59	2.9	2.9	3.35	10.2	5.7						lb.	16.3	22.3	20.1
	mm	165	191	200,0	4,1	6,6	6,5	16	19	15	74	74	85	259	145						kg,	7,4	10,1	9,1
2"	inch	7.0	8.5	9.1	0.14	0.26	0.26	0.69	0.86	0.67	3.6	3.6	3.86	16.1	6.5						lb.	24.9	30.9	29.1
	mm	178	216	230,0	3,6	6,6	6,5	18	22	17	91	91	98	409	165						kg,	11,3	14,0	13,2
3"	inch	8.0	11.1	12.2	0.12	0.28	0.28	0.88	1.06	0.75	5.0	5.0	5.24	16.1	7.0						lb.	38.6	52.2	45.8
	mm	203	282	310,0	3,0	7,1	7,0	22	27	19	127	127	133	409	178						kg,	17,5	23,7	20,8
4" WO	inch	9.0	12	13.8	0.16	0.28	0.28	0.88	1.18	0.75	6.2	6.2	5.98	26.5	8.7						lb.	68.5	93.4	76.5
	mm	229	305	350,0	4,1	7,1	7,0	22	30	19	157	157	152	673	221						kg,	31,1	42,4	34,7
4" GO	inch	9.0	12	13.8	0.16	0.28	0.28	0.88	1.18	0.75	6.2	6.2	5.98			9.8	9.6	11.0	9.6	2.1	lb.	88	147	191
	mm	229	305	350,0	4,1	7,1	7,0	22	30	19	157	157	152			250	245	280	245	54	kg,	39,9	66,7	43,5
6"	inch	10.5	15.9	10.5	0.16	0.28	0.16	0.94	1.37	0.94	8.2	8.2	8.19			13.8	11.2	12.2	10.8	2.6	lb.	128	187	128
	mm	267	404	267	4,1	7,1	4,0	24	35	24	208	208	208			350	285	309	275	67	kg,	58,1	84,8	58,1
8"	inch	11.5	16.5	11.5	0.16	0.16	0.16	0.92	1.53	0.92	10.3	10.3	10.3			19.7	12.6	20.7	18.0	3.6	lb.	352	450	352
	mm	292	419	292	4,1	4,1	4,1	23	39	23	262	262	262			500	320	525	457	92	kg,	160	204	160
10	inch	13	18	13	0.16	0.16	0.16	1.3	1.81	1.3	12.4	12.4	12.4			23.6	14.6	27.3	22.4	5.2	lb.	522	590	522
	mm	330	457	330	4,1	4,1	4,1	33	46	33	315	315	315			600	370	693	570	132	kg,	237	268	237
12	inch	14		14	0.16		0.16	1.41		1.41	15		15			23.6	14.6	28.3	26.1	5.2	lb.	595		595
	mm	356		356	4,1		4,1	36		36	381		381			600	370	720	664	132	kg,	270		270

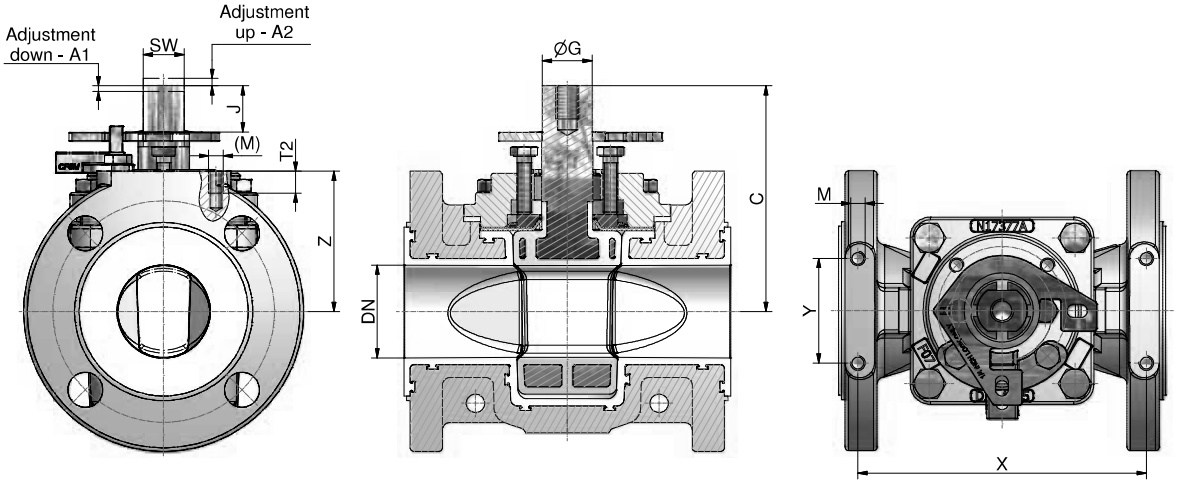
Note: All dimensions are approximate and for illustration purposes only. For exact dimensions consult certified dimensional prints
Valve 8"-12" are shown with double D stems which are standard. However spline shafts are also available for these sizes as an option.
All weights include either wrench or gear operator
Face-to-face dimensions comply to ANSI B16.10 and flange connections comply to ANSI B16.5

T4E - Dimension sheet for actuator mounting

Top cap mounting acc. to DIN EN ISO 5211



Flange top mounting



DN		SW	ØG	J	H2	C	Adjustment		F-Size DIN/ISO 5211	ØB	nxO	E	ØP	R	ØS	ØT	M (M)	T2	X		Z		Y	
							A1	A2											T4E1	T4E3	T4E1	T4E3	T4E1	T4E3
½"	inch	0.65	0.79	0.61	1.52	3.64	0.08	0.08	F05	1.97	4xM6	1.5	0.51	2.13	0.63	1.38	UNC 1/4-20	0.35	3.56	4.65	1.83	1.97	2	2
	mm	16,6	20	15,5	38,5	92,5	2	2		50	- 8 deep	38	13	54	16	35		9	90,5	118	46,5	50	50,8	50,8
¾"	inch	0.65	0.79	0.61	1.52	3.64	0.08	0.08	F05	1.97	4xM6	1.5	0.51	2.13	0.63	1.38	UNC 1/4-20	0.35	3.92	5	2.03	2.4	2	2
	mm	16,6	20	15,5	38,5	92,5	2	2		50	- 8 deep	38	13	54	16	35		9	99,6	127	51,5	61	50,8	50,8
1"	inch	0.65	0.79	0.61	1.52	3.64	0.08	0.08	F05	1.97	4xM6	1.5	0.59	2.28	0.79	1.38	UNC 5/16-18	0.47	4.19	5.35	2.34	2.44	1.75	1.75
	mm	16.6	20	15.5	38.7	92.5	2	2		50	- 8 deep	38	15	58	20	35		12	106.4	136	59.5	62	44.5	44.5
1½"	inch	0.65	0.79	0.75	1.48	4.02	0.08	0.08	F05	1.97	4xM6	1.5	0.59	2.28	0.79	1.38	UNC 5/16-18	0.47	5.63	6.38	2.500	3.07	1.75	1.75
	mm	16,6	20	19	37,7	102	2	2		50	- 8 deep	38	15	58	20	35		12	142,9	162	63,5	78	44,5	44,5
2"	inch	0.87	1.07	0.99	1.93	4.84	0.08	0.08	F07	2.76	4xM8	1.85	0.59	2.64	0.79	2.17	UNC 5/16-18	0.47	6.19	7.36	3.01	3.25	2.25	2.25
	mm	22,2	27,2	25,2	49	123	2	2		70	- 12 deep	47	15	67	20	55		12	157,2	187	76,5	82,5	57,2	57,2
3"	inch	0.87	1.07	0.99	1.99	5.39	0.12	0.12	F07	2.76	4xM8	2.13	0.87	3.15	1.02	2.17	UNC 3/8-16	0.55	7.13	9.87	3.76	4.13	3.5	3.5
	mm	22,2	27,2	25,2	50,6	137	3	3		70	- 12 deep	54	22	80	26	55		14	181	250,8	95,5	105	88,9	88,9
4"	inch	1.42	1.69	1.59	2.76	6.97	0.12	0.12	F10	4.02	4xM10	2.87	0.87	3.90	1.02	2.76	UNC 7/16-14	0.63	8	10.63	4.51	5.000	4	4
	mm	36	42,8	40,4	70,2	177	3	3		102	- 16 deep	73	22	99	26	70		16	203,2	269,9	114,5	127	101,6	101,6
6"	inch	1.42	1.69	1.59	2.67	8.23	0.16	0.16	F12	4.92	4xM12	3.39	1.38	4.96	1.57	3.35	UNC 7/16-14	0.63	9.44	14.25	5.47	6.26	4	4
	mm	36	42,8	40,4	67,7	209	4	4		125	- 21 deep	86	35	126	40	85		16	239,7	362	139	159	101,6	101,6
8"	inch	1.97	2.5	3.94	6.6	15.8	0.2	0.2	---	7.5	8xM16	5.25	2.1	7.48	2.20	5.12	M16	1.42	10.25	14.82	6.83	7.50	7.69	7.62
	mm	50	63,5	100	166,6	402	5	5		190,5	- 26 deep	133,4	53	190	56	130		36	260,4	376,4	173,5	190,5	195,2	193,6
10"	inch	2.36	3	4.92	8.46	19.49	0.2	0.2	F25	10	8xM16	5.13	1.46	---	---	7.87	M20	1.54	11.57	*	8.43	*	7.87	*
	mm	60	76,2	125	214,8	495	5	5		254	- 26 deep	130,2	37			200		39	294		214		200	
12"	inch	2.36	3	4.92	8.48	20.35	0.2	0.2	F25	10	8xM16	5.13	1.46	---	---	7.87	M20	1.57	12.28	17.69	9.19	10.55	7.87	6.00
	mm	60	76,2	125	215,4	517	5	5		254	-26 deep	130,2	37			200		40	312	449,3	233,5	268	200	152,4

* no actuator mounting for T4E2 valves

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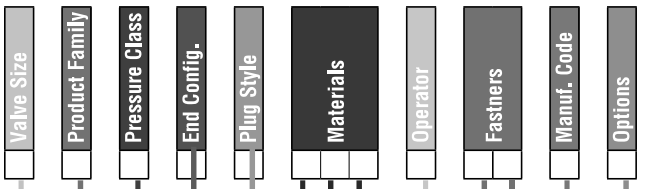
How to Specify T4E Valves



Size[1]
0.5 in.
0.75 in.
1.5 in.
2 in.
3 in.
4 in.
6 in.
8 in.
10 in.
12 in.

Product Family
T4E = Standard

Pressure Class[1]
1 = ASME Cl. 150
2 = DIN PN 16
3 = ASME Cl. 300

End Configuration
1 = Raised Face Flanges

Plug Style		
C = 2-Way		
D = Slot	Cv = .8	1"
E = Vport	Cv = 3	1"
F = Vport	Cv = 8.3	1"
G = Vport	Cv = 13	1"
H = Vport	Cv = 29.6	1.5"
J = Vport	Cv = 53.6	2"
K = Vport	Cv = 88.7	3"
L = Vport	Cv = 187.1	4"

Options
C = Chlorine Service
D = Chlorine Clean Only
G = Bottom Vented Plug[8]
H = Upstream Vented Plug (side)
J = Side/Bottom Vented Plug (upstream)
L = Anti-Vibration Clip for Top Cap Bolts
M = Side Vent Downstream (requires release from customer in writing)
O = Oxygen Cleaning
R = Built Dry (no lubrication)[9]
S = Silicone Free Lubrication
W = No Options
@ = DuPont Flouropolymer Material
Q = Quality Plan

Manufacturers code
N = Internal use

Adjuster fastener[7]
1 = B840
2 = B9
3 = B7YC
4 = B7T
5 = C20
6 = HC
7 = B7
8 = MKH
9 = B7M
0 = B7MZ
E = 88YC

Top Cap Fastener[7]
1 = B840
2 = B9
3 = B7YC
4 = B7T
5 = C20
6 = HC
7 = B7
8 = MKH
9 = B7M
0 = B7MZ
E = 88YC

Operator
0 = Std. Wrench[5]
1 = Gear CI[6]
2 = Locking Gear CI
4 = Caustic Gear PF
9 = Bare Stem
B = Babbit/Chain

Standard Valve Codes		
Size	Class 150	Class 300
0.5	.5-T4E-11C11D033NW	.5-T4E-31C210033NW
0.75	.75-T4E-11C11D033NW	.75-T4E-31C210033NW
1	1-T4E-11C11D033NW	1-T4E-31C210033NW
1.5	1.5-T4E-11C11D033NW	1.5-T4E-31C210033NW
2	2-T4E-11C11D033NW	2-T4E-31C210033NW
3	3-T4E-11C11D033NW	3-T4E-31C210033NW
4	4-T4E-11C11D033NW	4-T4E-31C210033NW
6	6-T4E-11C11D033NW	6-T4E-31C210033NW
8	8-T4E-11C11D1EENW	8-T4E-31C2101EENW
10	10-T4E-11C11D1EENW	10-T4E-31C2101EENW
12	12-T4E-11C11D1EENW	

[1] Class 150 valves = ½" thru 12" ductile iron / 8" thru 12" stainless steel
Class 300 valves = ½" thru 10" carbon steel
[2] DIPA body = class 150 valves only
D4PA body = 8", 10" 12" class 150 valves only
DSPA body = class 300 valves only
[3] DIPA plug = ½" thru 12"
CDPA plug = 8", 10" and 12" only
[4] DCI top cap = DIPA valve bodies
CD4M top cap = D4PA and DSPA valve bodies
[5] Locking wrench standard thru 4"
[6] Gear standard 6" and above (also available on smaller sizes)
[7] B7YC = standard for ½" thru 6"
88YC = standard for 8", 10", 12" (Gr. 8.8 yellow chromated)
[8] 8" and larger plugs have bottom vent as standard
[9] No lubrication for valves up to 4"
Built with Krytox for valves 6" and above

Body liner[2]	Plug Alloy[3]	Top Cap Alloy[4]
1 = DIPA	1 = DIPA	D = DCI
2 = DSPA	2 = D4PA	O = CD4M
3 = D4PA	3 = CDPA	

Codes	
DIPA	Ductile iron, PFA lined
DSPA	Carbon steel, PFA lined
D4PA	316 SS, PFA lined
CDPA	CD4MCuN, PFA lined



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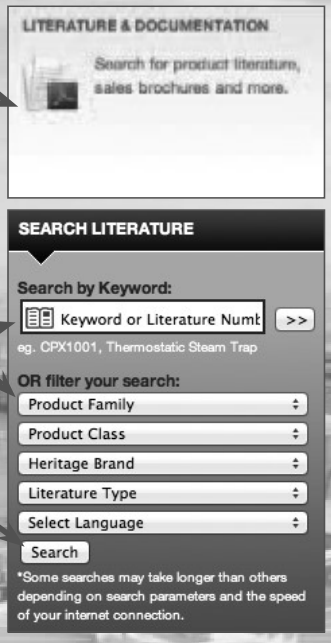

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In addition to lined plug valves, lined butterfly valves (Document number DVENTB0020) and lined ball valves, check valves and sight glasses (Document number ATENTB0010) are also available.

Finally, a wide variety of metallic and lined rotary valves and actuation equipment is summarized in the Document number DVENBR0001.

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