



Model DF2410 Control Valve

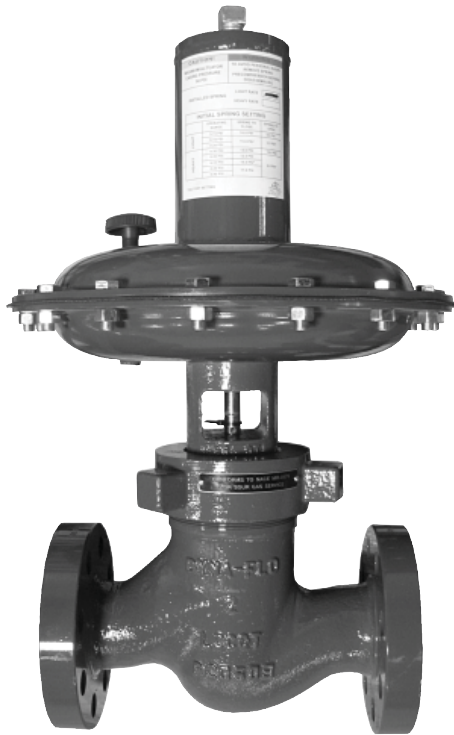


Figure 1 DF2410 Control Valve (Fail Closed)

The Model DF2410 Control Valve is a rugged globe style control valve intended for demanding applications in process control. It is suitable for a wide range of applications, especially high pressure and severe service. The compact design makes installation and maintenance more convenient than traditional valve and actuator assemblies while still offering the same functionality. The Model DF2410 is designed to accept instrumentation requiring valve stem linkages making it an excellent control valve.

Incorporated into the design are features that assure easy and safe maintenance. Maintenance can be performed with the valve body in line.

The Dyna-Flo DF2410 control valve is manufactured to a high level of quality to ensure superior performance and customer satisfaction.

Features

NACE Service Ready

Standard construction for the DF2410 control valve features NACE trim. The valve bonnet and body also conform to NACE MR075 (National Association of Corrosion Engineers) recommendations.

Live Loaded Packing

Packing for the DF2410 control valve is designed to provide a quality stem seal and to prevent the loss of hazardous gases or fluids. The live loaded feature provides for reduced maintenance and positive sealing in temperature and pressure cycling conditions.

Easy Trim Changes

Bonnet and actuator removal is easily accomplished by loosening the hammer nut. Unique plug with quick-lock pin allows for easy removal and replacement without the need for punches and hammers. The seat ring is removed using the same tool as the corresponding size DF2000. The hammer nut allows for easy bonnet removal and access while the valve is still in line.

Simple Installation

The DF2410 control valves compact design allows for easy installation in tight areas where space is limited.

Easy Trim Changes

The DF2410 control valve is light weight for easy installation and handling. DF2410 control valves compact design makes it ideal for tight fitting applications.

Low Temperature Materials

The DF2410 valve and actuator are constructed with materials that are capable of functioning in temperatures of -46°C (-50°F).



Model DF2410 Control Valve

Specifications

Port Diameters

1/4", 3/8", 1/2", 3/4", 1" and 1-1/4"

See Table 1.

Sizes and Connection Styles

Size: 1 & 2 inch

Rating: ASME 150 / 300 / 600 / 900 / 1500

Connections: RF / RTJ / NPT

See Table 1 for details and Port Diameters.

Maximum Inlet Temperatures and Pressures

Flanged valves consistent with ASME Class rating as per ASME B16.34, unless limited by either material pressure or temperature limitations.

Maximum Pressure Drops

See Tables 10, 11, 12 & 13

Standard Shut-off Classifications

Class IV Shut-off

In accordance with ASME / FCI 70.2

Dimensions

Fail Closed Valve Configuration Dimensions

See Figure 4

Fail Open Valve Configuration Dimensions

See Figure 5

Flow Characteristics

Equal Percentage

Flow Direction

Flow Up

Valve Plug Travel

3/4 inch (19 mm)

Approximate Valve Body and Actuator Weights

See Table 1

Body Style

Globe body style

Materials

See Table 3 for typical construction materials.

Material Temperature Capabilities

Body Assembly

-50 to 300°F (-46 to 149°C)

Actuator Assembly

Fail Closed: -40 to 200°F (-40 to 93°C)

Fail Open: -40 to 170°F (-40 to 77°C)

Valve Cross Section

See Figures 2 & 3

Packing Type

The Standard packing is Double PTFE V-ring Live-loaded low emission.

Actuator Configurations

Fail Closed

Fail Open

Actuator Pressure Connections

1/4 inch Female NPT

Maximum Actuator Casing Pressure

50 Psig (345 kPag)

Effective Actuator Diaphragm Area

69 inches² (452 cm²)

Valve Sizing Coefficients

See Table 2 & 3



Model DF2410 Control Valve

Table 1

Available Valve Sizes, Connection Styles and Approximate Weights

Port Diameter inch (mm)	Connection Style						
	NPT lb (kg)	Raised Face (RF) Flanged lb (kg)				Ring Type Joint (RTJ) Flanged lb (kg)	
1 Inch Valve 1/4 (6.40) 3/8 (9.50) 1/2 (12.7) 3/4 (19.1)	3600 PSI	Class 150	Class 300	Class 600	Class 900 and 1500	Class 600	Class 900 and 1500
	71 (32)	74 (34)	81 (37)	81 (37)	110 (50)	81 (37)	110 (50)
2 Inch Valve 1/4 (6.40) 3/8 (9.50) 1/2 (12.7) 3/4 (19.1) 1 (25.4) 1-1/4 (38.1)	3600 PSI	Class 150	Class 300	Class 600	Class 900 and 1500	Class 600	Class 900 and 1500
	87 (39)	87 (39)	106 (48)	106 (48)	146 (66)	106 (48)	146 (66)

Table 2

Model DF2410 Valve Sizing Coefficients, for Equal Percentage Trim

1 Inch Valve

		10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1/4 Inch (6.40 mm)	C_v	0.080	0.115	0.164	0.224	0.315	0.450	0.641	0.921	1.28	1.64
	X_T	0.783	0.783	0.744	0.691	0.625	0.614	0.608	0.611	0.610	0.610
	F_L	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
3/8 Inch (9.50 mm)	C_v	0.155	0.260	0.407	0.596	0.858	1.21	1.65	2.22	3.00	4.03
	X_T	0.625	0.535	0.534	0.539	0.535	0.535	0.538	0.534	0.537	0.536
	F_L	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
1/2 Inch (12.7 mm)	C_v	0.272	0.435	0.630	0.910	1.29	1.83	2.56	3.64	5.07	6.50
	X_T	0.613	0.627	0.585	0.576	0.565	0.553	0.535	0.509	0.490	0.501
	F_L	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
3/4 Inch (19.1 mm)	C_v	0.482	0.774	1.24	1.96	2.90	4.12	5.87	8.15	10.8	12.2
	X_T	0.581	0.616	0.581	0.586	0.581	0.573	0.549	0.541	0.529	0.528
	F_L	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

Relationships of Note: $C_1 = 39.76 \sqrt{X_T}$

$C_6 = C_v C_1$

$K_M = F_L^2$



Model DF2410 Control Valve

Table 3

Model DF2410 Valve Sizing Coefficients, for Equal Percentage Trim

2 Inch Valve

		10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1/4 Inch (6.40 mm)	C_v	0.08	0.115	0.164	0.224	0.315	0.45	0.641	0.921	1.28	1.64
	X_T	0.783	0.783	0.744	0.691	0.625	0.614	0.608	0.611	0.61	0.610
	F_L	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
3/8 Inch (9.50 mm)	C_v	0.155	0.26	0.407	0.596	0.858	1.21	1.65	2.22	3.00	4.03
	X_T	0.625	0.535	0.534	0.539	0.535	0.535	0.538	0.534	0.537	0.536
	F_L	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
1/2 Inch (12.7 mm)	C_v	0.348	0.505	0.709	0.996	1.38	1.92	2.69	3.82	5.25	6.82
	X_T	0.613	0.627	0.585	0.576	0.565	0.553	0.535	0.509	0.49	0.501
	F_L	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
3/4 Inch (19.1 mm)	C_v	0.613	0.952	1.44	2.06	2.92	4.13	5.86	8.16	11.1	14.0
	X_T	0.581	0.616	0.581	0.586	0.581	0.573	5.49	0.541	0.529	0.528
	F_L	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1 Inch (25.4 mm)	C_v	1.20	1.68	2.44	3.53	5.05	7.28	10.5	14.0	18.4	23.7
	X_T	0.517	0.569	0.559	0.542	0.544	0.54	0.507	0.508	0.507	0.508
	F_L	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
1-1/4 Inch (38.1 mm)	C_v	1.32	1.76	2.49	3.66	5.42	8.23	12.7	20.6	28.9	34.5
	X_T	0.521	0.563	0.548	0.534	0.498	0.503	0.553	0.528	0.524	0.579
	F_L	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Relationships of Note: $C_1 = 39.76 \sqrt{X_T}$

$C_G = C_v C_1$

$K_M = F_L^2$



Model DF2410 Control Valve

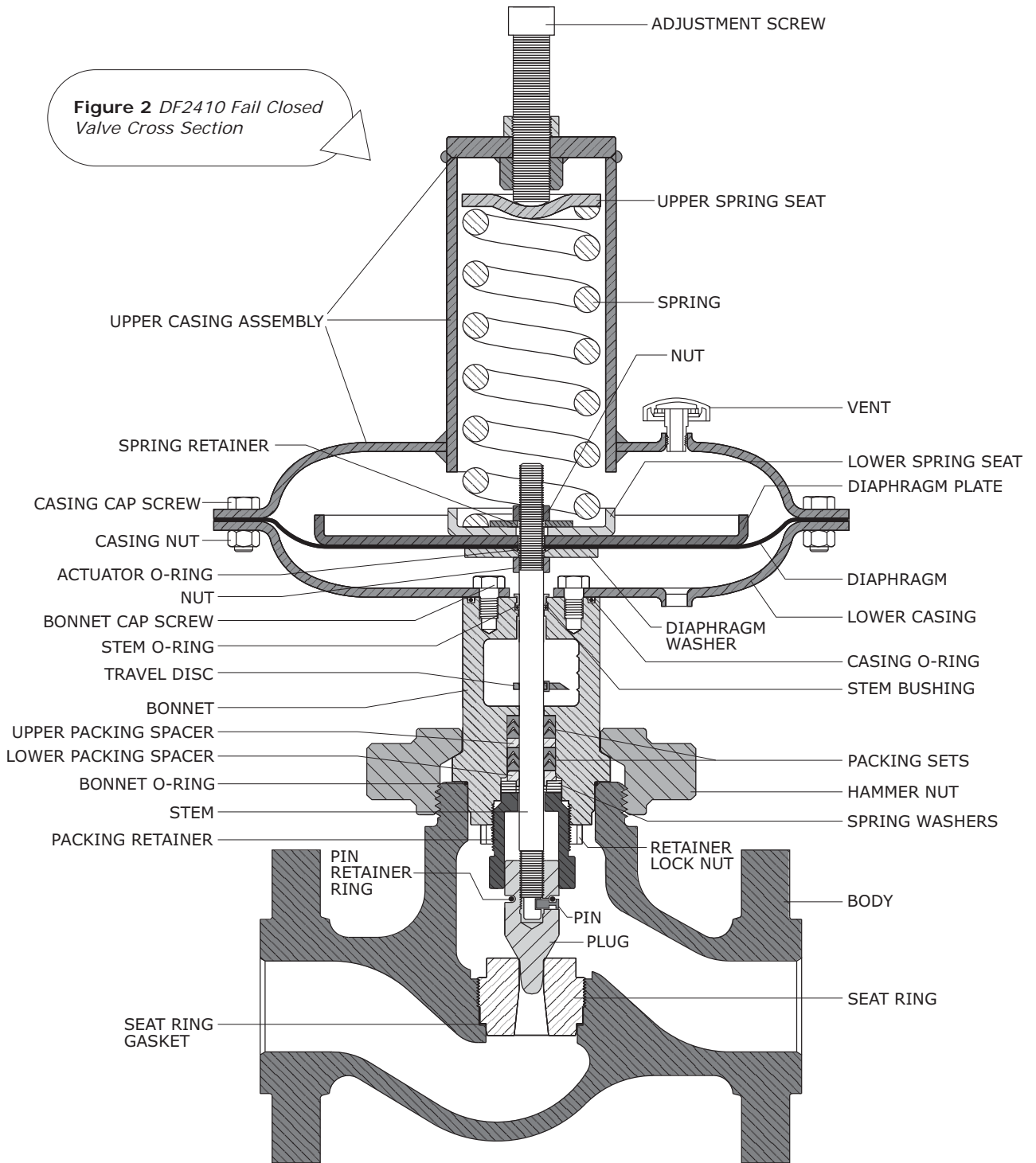


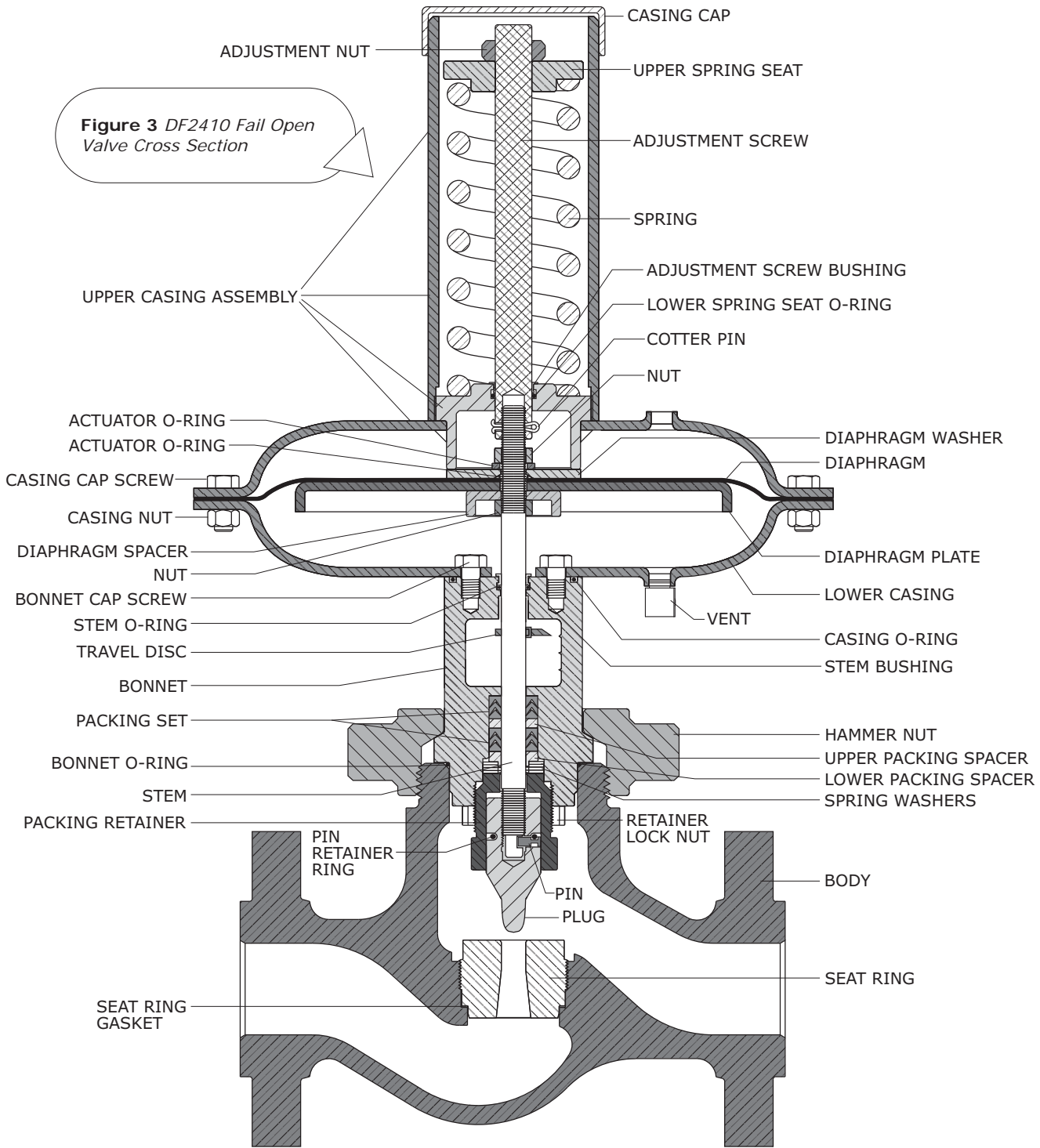
Figure 2 DF2410 Fail Closed Valve Cross Section

FLANGED DF2410 CONTROL VALVE FAIL CLOSED CONFIGURATION



Model DF2410 Control Valve

Figure 3 DF2410 Fail Open Valve Cross Section



**FLANGED DF2410 CONTROL VALVE
FAIL OPEN CONFIGURATION**



Model
DF2410 Control Valve

Table 3

Standard Construction Materials

Part Description	Standard Construction
Valve Body and Bonnet	ASME SA352 LCC, ASME SA350 LF2
Bonnet O-Ring	HNBR (standard), Fluoroelastemer (optional)
Hammer Nut	ASME SA350 LF2, Forged 1040 Steel
Seat Ring	S17400 (NACE), Tungsten Carbide
Seat Ring Gasket	S30400 (304 SST)
Valve Plug	S17400 (NACE), Tungsten Carbide
Pin	S31600 (316 SST)
Pin Retainer Ring	HNBR
Packing Retainer and Lock Nut	S17400 (17-4 PH)
Upper Packing Spacer	S31600 (316 SST)
Lower Packing Spacer	S31600 (316 SST)
Spring Washers	N07718 (Inconel 718)
Packing Sets	PTFE / Carbon Filled PTFE
Valve Stem	S20910
Stem O-Ring	HNBR
Stem Bushing	PPS
Lower Casing	Steel / Zinc
Upper Casing Assembly	Steel / Zinc
Adjustment Screw	Steel / Zinc
Casing O-Ring	HNBR
Diaphragm Plate	Steel
Diaphragm	Nitrile / Nylon
Spring	Steel (painted)
Lower Spring Seat	Steel / Zinc



Model DF2410 Control Valve

Figure 4 DF2410 Fail Closed Valve Dimensions

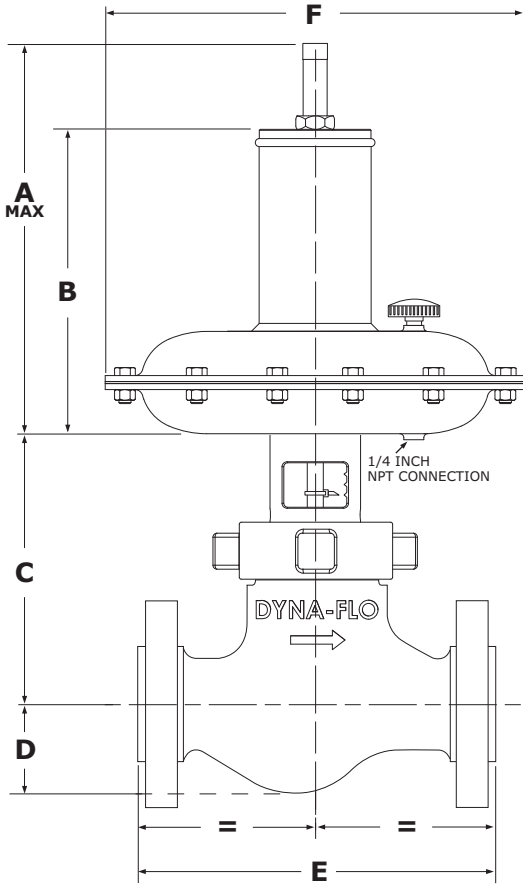


Table 4

DF2410 Fail Closed Dimensions

Key	Dimensions inch (mm)
A Max	12.3 (312)
B	9.50 (241)
F	13.10 (333)

Table 5

1" DF2410 Fail Closed Dimensions inch (mm)

Connection Style	Key		
	C	D	E
NPT	8.20 (208)	1.81 (46)	6.62 (168)
Class 150 RF Flanged	8.20 (208)	1.81 (46)	8.12 (206)
Class 300 RF Flanged	8.20 (208)	1.81 (46)	8.62 (219)
Class 600 RF Flanged	8.20 (208)	1.81 (46)	9.12 (232)
Class 900/1500 RF Flanged	8.20 (208)	1.81 (46)	10.0 (254)
Class 600 RTJ Flanged	8.20 (208)	1.81 (46)	9.12 (232)
Class 900/1500 RTJ Flanged	8.20 (208)	1.81 (46)	10.0 (254)

Table 6

2" DF2410 Fail Closed Dimensions inch (mm)

Connection Style	Key		
	C	D	E
NPT	8.42 (214)	2.75 (70)	9.00 (230)
Class 150 RF Flanged	8.42 (214)	2.75 (70)	10.50 (267)
Class 300 RF Flanged	8.42 (214)	2.75 (70)	10.50 (267)
Class 600 RF Flanged	8.42 (214)	2.75 (70)	11.25 (286)
Class 900/1500 RF Flanged	8.42 (214)	2.75 (70)	12.12 (308)
Class 600 RTJ Flanged	8.42 (214)	2.75 (70)	11.38 (289)
Class 900/1500 RTJ Flanged	8.42 (214)	2.75 (70)	12.25 (311)



Model DF2410 Control Valve

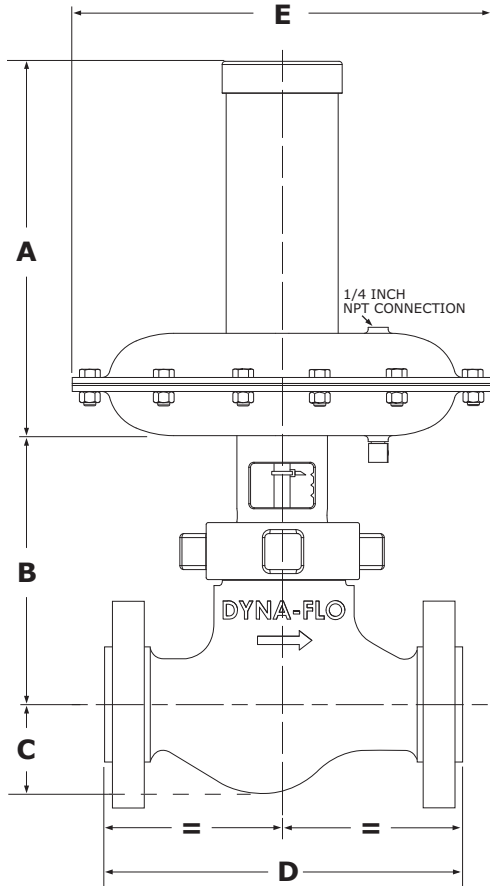


Figure 5 DF2410 Fail Open Valve Dimensions

Table 7

DF2410 Fail Open Dimensions

Key	Dimensions inch (mm)
A	12.75 (323)
E	13.10 (333)

Table 8

1" DF2410 Fail Open Dimensions inch (mm)

Connection Style	Key		
	B	C	D
NPT	8.20 (208)	1.81 (46)	6.62 (168)
Class 150 RF Flanged	8.20 (208)	1.81 (46)	8.12 (206)
Class 300 RF Flanged	8.20 (208)	1.81 (46)	8.62 (219)
Class 600 RF Flanged	8.20 (208)	1.81 (46)	9.12 (232)
Class 900/1500 RF Flanged	8.20 (208)	1.81 (46)	10.0 (254)
Class 600 RTJ Flanged	8.20 (208)	1.81 (46)	9.12 (232)
Class 900/1500 RTJ Flanged	8.20 (208)	1.81 (46)	10.0 (254)

Table 9

2" DF2410 Fail Open Dimensions inch (mm)

Connection Style	Key		
	B	C	D
NPT	8.42 (214)	2.75 (70)	9.00 (230)
Class 150 RF Flanged	8.42 (214)	2.75 (70)	10.50 (267)
Class 300 RF Flanged	8.42 (214)	2.75 (70)	10.50 (267)
Class 600 RF Flanged	8.42 (214)	2.75 (70)	11.25 (286)
Class 900/1500 RF Flanged	8.42 (214)	2.75 (70)	12.12 (308)
Class 600 RTJ Flanged	8.42 (214)	2.75 (70)	11.38 (289)
Class 900/1500 RTJ Flanged	8.42 (214)	2.75 (70)	12.25 (311)



Model DF2410 Control Valve

Table 10

Maximum Shut-off Pressure Drops³ for a Fail Closed DF2410 When used with common instrumentation¹

Actuator Input Signal	0 to 18 Psig (0 to 124 kPag)	0 to 20 Psig (0 to 138 kPag)	0 to 30 Psig (0 to 207 kPag)	0 to 33 Psig (0 to 228 kPag)	0 to 35 Psig (0 to 241 kPag)	0 to 50 Psig (0 to 345 kPag)
Spring	Light Spring		Heavy Spring			
Initial Spring Setting	11.0 Psig (75.8 kPag)	11.0 Psig (75.8 kPag)	12.5 Psig (86.2 kPag)	15.5 Psig (107 kPag)	17.0 Psig (117 kPag)	17.0 Psig (117 kPag)
Port Diameter inch (mm)	Maximum Pressure Drop Psi (kPa)					
1/4 (6.40)	3,750 (25,855) ²	3,750 (25,855) ²	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
3/8 (9.50)	3,750 (25,855) ²	3,750 (25,855) ²	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
1/2 (12.7)	2,765 (19,064)	2,765 (19,064)	3,180 (21,925)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
3/4 (19.1)	1,160 (7,998)	1,160 (7,998)	1,340 (9,239)	1,785 (12,307)	2,080 (14,341)	2,080 (14,341)
1 (25.4)	610 (4,206)	610 (4,206)	715 (4,930)	965 (6,653)	1,130 (7,791)	1,130 (7,791)
1-1/4 (31.8)	365 (2,517)	365 (2,517)	430 (2,965)	590 (4,068)	700 (4,826)	700 (4,826)

- Notes:**
- 1 - For a 3-15 Psig (21-105 kPag) pneumatic controller with a supply pressure of 20 Psig (138 kPag), use the 0 to 20 Psig (Light Spring) column.
 - 2 - For applications where downstream pressure exceeds 2,845 Psig (19, 616 kPag), 2,845 Psig should be used as the Maximum Shut-off Pressure.
 - 3 - Do not exceed the Pressure Temperature Limitations as per ASME B16.34.

Table 11

Maximum Shut-off Pressure Drops³ for a Fail Closed DF2410 When used with restricted output range instrumentation¹

Actuator Input Signal	3 to 15 Psig (20.7 to 103 kPag)	6 to 30 Psig (41 to 207 kPag)
Initial Spring Setting	10 Psig (69 kPag) (Light Spring)	14 Psig (97 kPag) (Heavy Duty Spring)
Port Diameter inch (mm)	Maximum Pressure Drop Psi (kPa)	Maximum Pressure Drop Psi (kPa)
1/4 (6.40)	3,750 (25,855) ⁴	3,750 (25,855) ²
3/8 (9.50)	2,205 (15,203) ⁴	3,045 (20,995) ²
1/2 (12.7)	1,160 (7,998)	1,635 (11,273)
3/4 (19.1)	445 (3,068)	655 (4,516)
1 (25.4)	210 (1,448)	330 (2,275)
1-1/4 (31.8)	110 (758)	185 (1,276)

- Notes:**
- 1 - example: for a Electro-Pneumatic Transducer calibrated for 6 to 30 Psig (41 to 207 kPag).
 - 2 - For valve use where downstream pressure exceeds 1,715 Psig (11,825 kPag), 1,715 Psig should be used as the Maximum Shut-off Pressure.
 - 3 - Do not exceed the Pressure Temperature Limitations as per ASME B16.34.
 - 4 - For valve use where downstream pressure exceeds 740 Psig (kPag), 740 Psig should be used as the Maximum Shut-off Pressure.



Model DF2410 Control Valve

Table 12

Maximum Shut-off Pressure Drops³ for a Fail Open DF2410 When used with common instrumentation¹

Actuator Input Signal	0 to 18 Psig (0 to 124 kPag)	0 to 20 Psig (0 to 138 kPag)	0 to 30 Psig (0 to 207 kPag)	0 to 33 Psig (0 to 228 kPag)	0 to 35 Psig (0 to 241 kPag)	0 to 50 Psig (0 to 345 kPag)
Spring	Light Spring		Heavy Spring			
Initial Spring Setting	3.5 Psig (24 kPag)	3.5 Psig (24 kPag)	4.0 Psig (28 kPag)	4.0 Psig (28 kPag)	4.0 Psig (28 kPag)	4.0 Psig (28 kPag)
Port Diameter inch (mm)	Maximum Pressure Drop Psi (kPa)					
1/4 (6.40)	3,750 (25,855) ²	3,750 (25,855) ²	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
3/8 (9.50)	3,750 (25,855) ²	3,750 (25,855) ²	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
1/2 (12.7)	2,715 (18,719)	3,380 (23,304)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)	3,750 (25,855)
3/4 (19.1)	1,135 (7,826)	1,430 (9,860)	2,130 (14,686)	2,575 (17,754)	2,875 (19,822)	3,750 (25,855)
1 (25.4)	600 (4,137)	765 (5,274)	1,160 (7,998)	1,410 (9,722)	1,575 (10,859)	2,830 (19,512)
1-1/4 (31.8)	355 (2,448)	465 (3,206)	715 (4,930)	875 (6,033)	985 (6,791)	1,785 (12,307)

- Notes:**
- 1 - For a 3-15 Psig (21-105 kPag) pneumatic controller with a supply pressure of 20 Psig (138 kPag), use the 0 to 20 Psig (Light Spring) column.
 - 2 - For valve use where downstream pressure exceeds 2,750 Psig (18,960 kPag), 2,750 Psig should be used as the Maximum Shut-off Pressure.
 - 3 - Do not exceed the Pressure Temperature Limitations as per ASME B16.34.

Table 13

Maximum Shut-off Pressure Drops³ for a Fail Open DF2410 When used with restricted output range instrumentation¹

Actuator Input Signal	3 to 15 Psig (20.7 to 103 kPag)	6 to 30 Psig (41 to 207 kPag)
Initial Spring Setting	6 Psig (41 kPag) (Light Spring)	14 Psig (97 kPag) (Heavy Duty Spring)
Port Diameter inch (mm)	Maximum Pressure Drop Psi (kPa)	Maximum Pressure Drop Psi (kPa)
1/4 (6.40)	3,275 (22,580) ⁴	3,750 (25,855) ²
3/8 (9.50)	1,315 (1,315) ⁴	3,750 (25,855) ²
1/2 (12.7)	660 (4,551)	2,845 (19,616)
3/4 (19.1)	220 (1,517)	1,195 (8,239)
1 (25.4)	—	630 (4,344)
1-1/4 (31.8)	—	380 (2,620)

- Notes:**
- 1 - example: for a Electro-Pneumatic Transducer calibrated for 6 to 30 Psig (41 to 207 kPag).
 - 2 - For valve use where downstream pressure exceeds 2,925 Psig (20,168 kPag), 2,925 Psig should be used as the Maximum Shut-off Pressure.
 - 3 - Do not exceed the Pressure Temperature Limitations as per ASME B16.34.
 - 4 - For valve use where downstream pressure exceeds 740 Psig (kPag), 740 Psig should be used as the Maximum Shut-off Pressure.



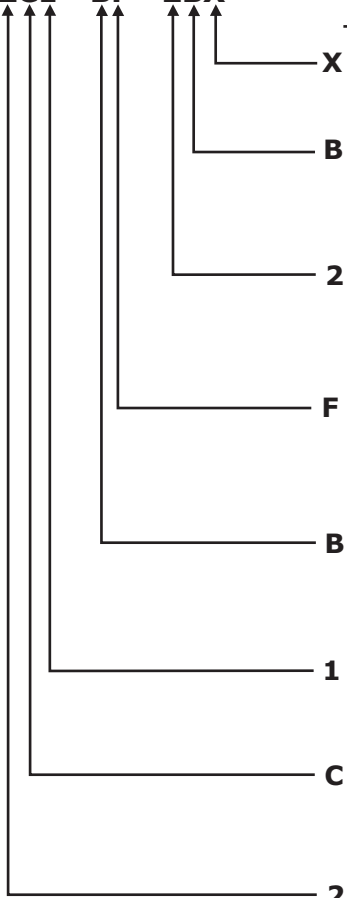
Model DF2410 Control Valve

Ordering Guide

Dyna-Flo DF2410 Control Valve | Model Numbering System

Sample Part Number

DF2410 - 2C1 - BF - 2BX



Code	Description
X	Special
Trim Material	
B	S17400 (NACE)
D	Tungsten Carbide
Orifice Size	
2	1/4 Inch Port
3	3/8 Inch Port
4	1/2 Inch Port
6	3/4 Inch Port
8	1 Inch Port
1	1-1/4 Inch Port
Connection Style	
F	RF
J	RTJ
N	NPT
ASME Rating	
A	150
B	300
C	600
D	900 / 1500
E	3750 PSI (NPT)
Spring Range	
0	3-15 Psig (21-103 kPag) (Light Duty)
1	6-30 Psig (41-207 kPag) (Heavy Duty)
Actuator Style	
C	Fail Closed
O	Fail Open
Body Size	
1	1 Inch Body
2	2 Inch body

Our Commitment of Quality

Dyna-Flo is committed to continuous improvement. All efforts have been taken to maximize the accuracy of this information. Without notification, product specifications and designs may be modified at any time. The issue of this document is for information only, and does not imply suitability, a warranty, or guarantee for a specific service.