

Model DF233 Control Valves

Technical Sales Bulletin



Figure 1 DF233 Control Valve

The Dyna-Flo Model DF233 control valve is primarily designed for on/off control of a variety of gases or fluids. These tough valves are manufactured for use as dump valves and feature a low profile and lightweight design that fits into tight locations and makes for easier handling. The DF233 is well suited for many other high pressure gas or fluid applications up to 2,250 Psig (155.13 Bar). The DF233 is available in 1 inch and 2 inch sizes, either in a globe or angle style valve body with threaded NPT or flanged connections.

The Dyna-Flo Model DF233 control valve is manufactured to a high level of quality specifications to ensure superior performance and customer satisfaction.

Features

NACE Service Ready

Standard construction for the DF233 control valve features NACE trim. The valve bonnet and body also conform to NACE MR0175 (National Association of Corrosion Engineers) recommendations.

ASME Class 900

The DF233 is designed and rated for ASME B16.34 Class 150 - 900 service.

Live Loaded Packing

Packing for the DF233 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.

Field-Reversible Actuator

Field conversion of the DF233 actuator is designed to be quick and easy. Switch the DF233 from a spring-close to spring-open actuator without any additional parts.

Easily Maintained

The hammer union body to bonnet connection allows for easy removal of the bonnet/actuator for access to trim and packing. Trim removal requires no special tools and is quick and simple. The two piece cage seat allows replacement of the seat ring while using the existing cage making port changes and maintenance more economical.

Low Temperature Materials

The DF233 valve and actuator are constructed with materials that are capable of functioning in temperatures of -40°C.

Open Yoke

The DF233 features an open yoke that allows for the mounting of a feedback arm to facilitate positioners and indicators.

Versatile Trim Material Options

Plug and seat ring materials are available in S17400 DH1150 and S30300 / Tungsten Carbide.



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SPECIFICATIONS

Port Diameter

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

See Table 1 & 2 for details and Port Diameters.

Sizes and Connection Styles

Size: 1 & 2 inch

Rating: ASME 150 / 300 / 600 / 900

Connections: NPT / RF / RTJ

See Table 1, 2, & 3 for details and Port Diameters.

Standard Shut-off Classification

ANSI Class IV ASME / FCI 70-2

Optional Soft Seat ASME Class VI ASME / FCI 70-2

Dimensions

See Table 5 (Page 6) & Figures 4 - 5 (Page 7)

Flow Characteristics

Quick Opening

Flow Direction

Up or down (See Table 2)

Maximum Travel

3/8 inch (10 mm)

Material Temperature Capabilities

Body Assembly

-46 to 150°C (-50 to 300°F)

Actuator Assembly

-40 to 82°C (-40 to 180°F)

Body Style

Available in Globe and Angle style.

Bonnet/Body Connection

Threaded Hammer Nut.

Actuator Configuration

The DF233 utilizes a on/off style spring and diaphragm actuator. Fail action is field-reversible.

Maximum Actuator Casing Pressure

50 Psig (3.45 Bar)

Effective Actuator Diaphragm Area

33 inches² (213 cm²)

Actuator Pressure Connections

NPS 1/4 inch NPT

For more information and other options contact your Dyna-Flo sales office.

Maximum Pressures and Temperatures ¹		
Valve Size	200°F (93°C)	300°F (150°C)
NPS 1-2 inch NPT	2,250 Psig (155.13 Bar)	2,182 Psig (150.44 Bar)
NPS 1-2 inch Class 600	1,500 Psig (103.42 Bar)	1,454 Psig (100.24 Bar)
NPS 1-2 inch Class 900	2,250 Psig (155.13 Bar)	2,185 Psig (15.65 Bar)

1 - The limitations shown are as per ASME B16.34. Refer to the pressure temperature ratings in this standard for all other flange ratings. Do not exceed these ratings.

Available Valve Sizes, Connection Styles and Approximate Weights							
Port Diameter inch (mm)	Connection Style						
	Threaded lb (kg)	Raised Face (RF) Flanged lb (kg)				Ring Type Joint (RTJ) Flanged lb (kg)	
1 Inch Valve 1/4 (6.4) 3/8 (9.5) 1/2 (12.7) 3/4 (19.7) 1 (25.4)	NPT	Class 150	Class 300	Class 600	Class 900	Class 600	Class 900
	25 (11)	29 (13)	35 (16)	35 (16)	64 (29)	35 (16)	64 (29)
	NPT	Class 150	Class 300	Class 600	Class 900	Class 600	Class 900
	30 (14)	34 (15)	50 (23)	50 (23)	89 (40)	50 (23)	89 (40)

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Table 2

Maximum Shut-off Pressure Drops

Actuator Action	Flow Direction (pressure tends to)	Port Diameter	Number of Springs 0-20 Psig Operating Signal		Number of Springs 0-35 Psig Operating Signal	
			3	6	3	6
			Psi (Bar)	Psi (Bar)	Psi (Bar)	Psi (Bar)
Fail Closed	Flow Up (open valve)	1/4"	2,250 (155.13)	2,250 (155.13)	2,250 (155.13)	2,250 (155.13)
		3/8"	1,672 (115.28)	2,250 (155.13)	1,672 (115.28)	2,250 (155.13)
		1/2"	770 (53.09)	1,867 (128.73)	770 (53.09)	1,867 (128.73)
		3/4"	***	684 (47.16)	***	684 (47.16)
		1"	***	290 (20.00)	***	290 (20.00)
	Flow Down (close valve)	1/4"	1,469 (101.28)	2,250 (155.13)	1,469 (101.28)	2,250 (155.13)
		3/8"	2,139 (147.48)	2,250 (155.13)	2,139 (147.48)	2,250 (155.13)
		1/2"	2,250 (155.13)	2,250 (155.13)	2,250 (155.13)	2,250 (155.13)
		3/4"	1,710 (117.90)	942 (64.95)	2,250 (155.13)	2,250 (155.13)
		1"	784 (54.05)	392 (27.03)	1,512 (104.25)	1,064 (73.36)
Fail Open	Flow Up (open valve)	1/4"	2,250 (155.13)	***	2,250 (155.13)	2,250 (155.13)
		3/8"	2,250 (155.13)	***	2,250 (155.13)	2,250 (155.13)
		1/2"	1,193 (82.25)	***	2,250 (155.13)	2,035 (140.31)
		3/4"	385 (26.54)	***	1,507 (103.90)	759 (52.33)
		1"	177 (12.20)	***	807 (55.64)	345 (23.79)
	Flow Down (close valve)	1/4"	2,244 (154.72)	***	2,250 (155.13)	2,250 (155.13)
		3/8"	2,250 (155.13)	***	2,250 (155.13)	2,250 (155.13)
		1/2"	2,250 (155.13)	***	2,250 (155.13)	2,250 (155.13)
		3/4"	897 (61.85)	***	897 (61.85)	1,646 (113.49)
		1"	672 (46.33)	***	672 (46.33)	1,288 (88.80)

Table 3

DF233 C_v Values

Body	Port Size Inch (mm)	C _v Value (100% Travel)
Flow Up	1/4 (6.4)	1.68
	3/8 (9.5)	3.82
	1/2 (12.7)	5.70
	3/4 (19.1)	11.6
	1 (25.4)	15.5
Flow Down	1/4 (6.4)	1.68
	3/8 (9.5)	3.82
	1/2 (12.7)	6.19
	3/4 (19.1)	13.0
	1 (25.4)	18.0

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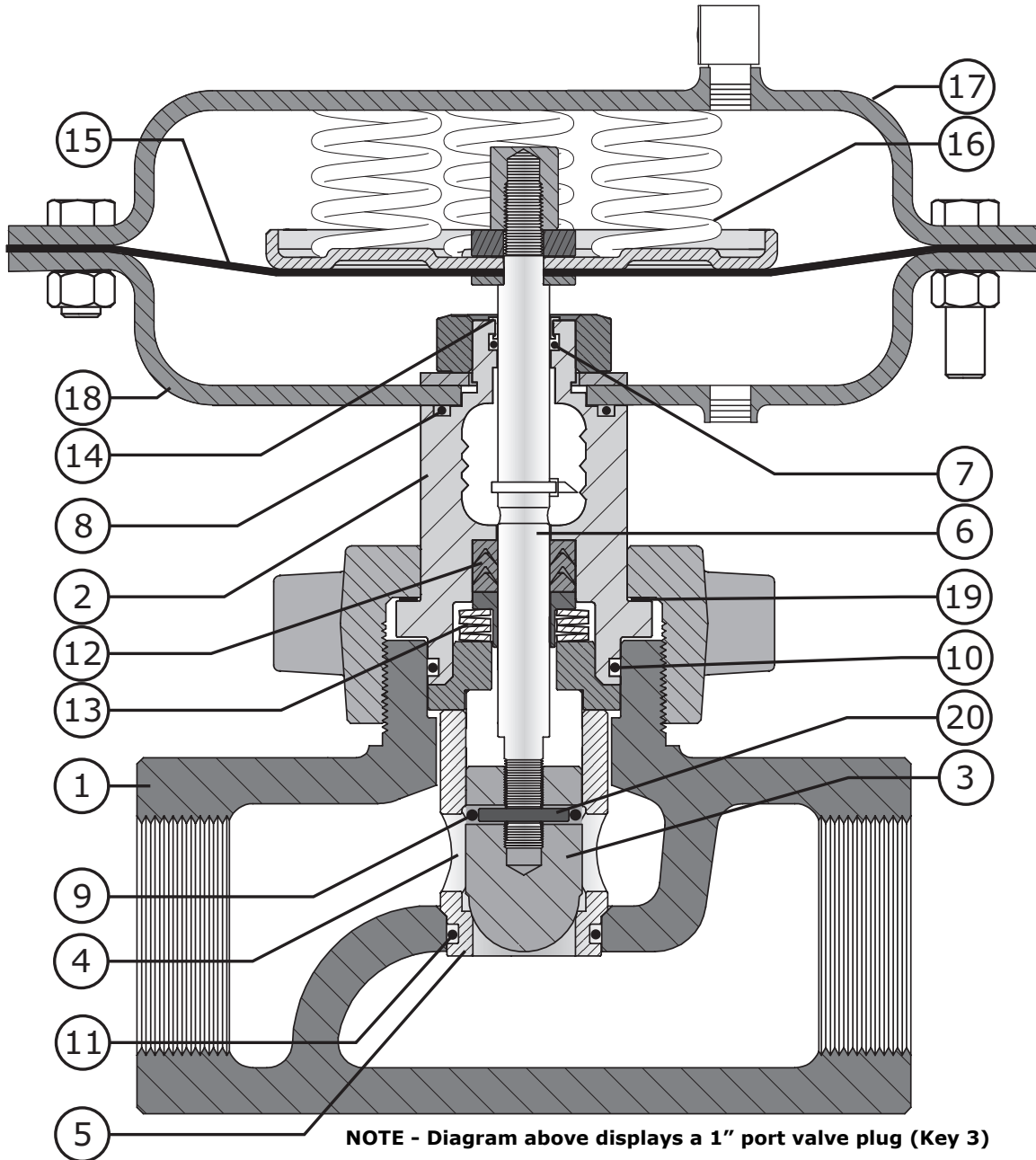


Figure 2 Cross-section of DF233 2 inch Valve Body Fail Closed Configuration

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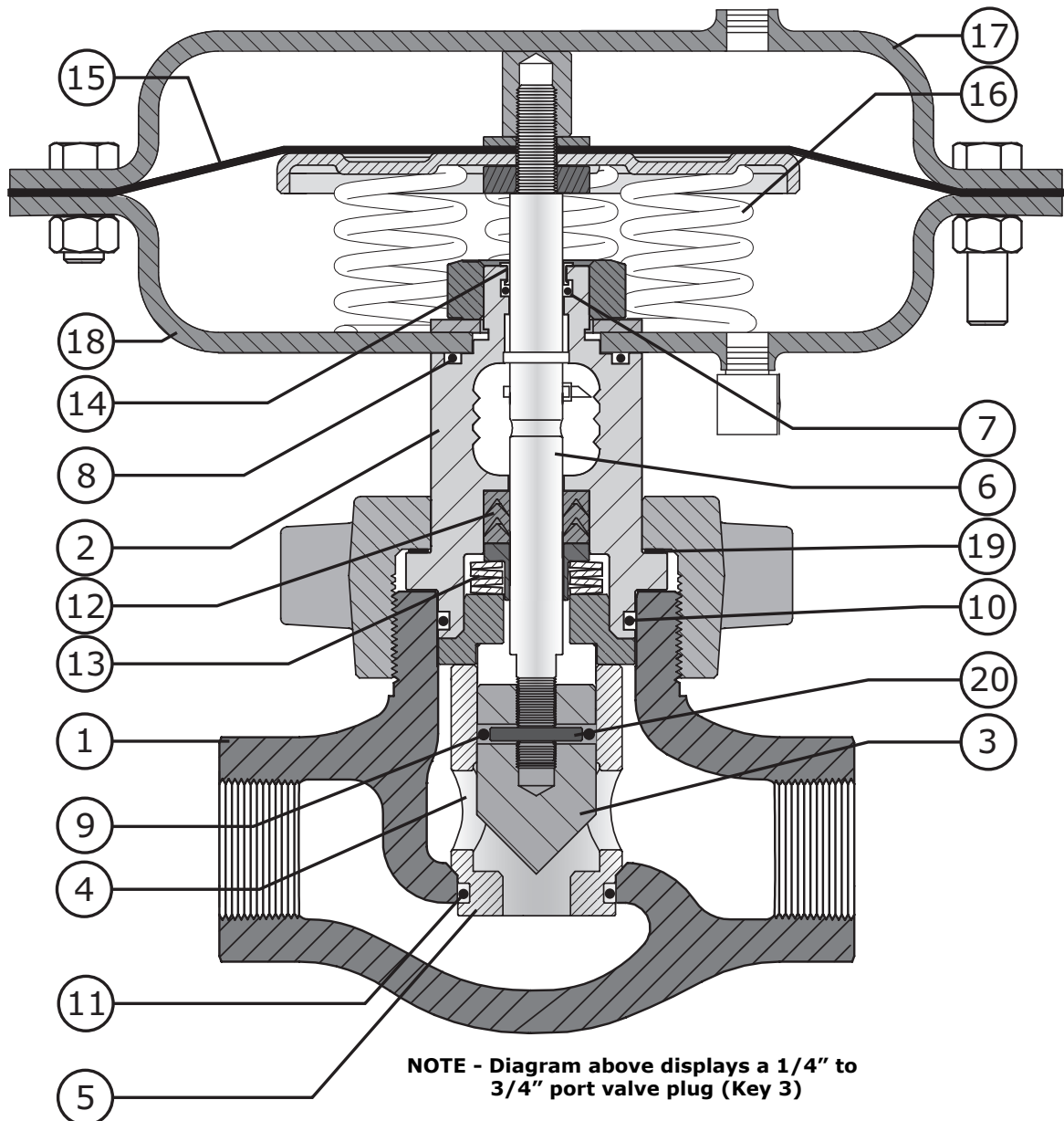


Figure 3 Cross-section of DF233 1 inch Valve Body Fail Open Configuration



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Table 4

Standard Construction Materials		
Key	Part Description	Standard Construction
1	Valve Body	LCC
2	Bonnet	LCC
3	Valve Plug	S17400 DH1150) (NACE), S30300 / Tungsten Carbide (optional)
4	Cage (Part of Seat Ring)	S17400 DH1150) (NACE), S30300 / Tungsten Carbide (optional)
5	Seat Ring	S17400 DH1150) (NACE), S30300 / Tungsten Carbide (optional)
6	Valve Stem	S20910
7, 8, 9, 10, 11	O-Ring	HNBR
12	Packing	PTFE / CPTFE
13	Spring Washers	N07718
14	Valve Stem Bushing	Nylon
15	Actuator Diaphragm	Nitrile / Nylon
16	Actuator Springs	Steel / Zinc
17	Upper Casing	Steel / Zinc
18	Lower Casing	Steel / Zinc
19	Washer	S30200
20	Pin	S31600 - All S31600 barstock is dual grade S31600/S31603 (316/316L)

Table 5

DF233 RF and RTJ Valve Dimensions Inches (mm)			
Valve Size	Connection Style	A	B
1"	NPT	6.25 (159)	1.77 (45)
	ASME 150 RF	7.25 (184)	3.63 (92)
	ASME 300 RF	7.75 (197)	3.88 (99)
	ASME 600 RF	8.25 (210)	4.13 (105)
	ASME 900 RF	9.38 (238)	4.69 (119)
	ASME 600 RTJ	8.25 (210)	4.13 (105)
	ASME 900 RTJ	9.38 (238)	4.69 (119)
2"	NPT	7.50 (191)	1.73 (44)
	ASME 150 RF	10.00 (254)	5.00 (127)
	ASME 300 RF	10.50 (267)	5.25 (134)
	ASME 600 RF	11.25 (286)	5.63 (143)
	ASME 900 RF	12.88 (327)	6.44 (164)
	ASME 600 RTJ	11.38 (289)	5.69 (145)
	ASME 900 RTJ	12.88 (327)	6.44 (164)

NOTE: Refer to Figures 4 & 5

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Figure 4 DF233 1 inch Control Valve Dimensions inch (mm)

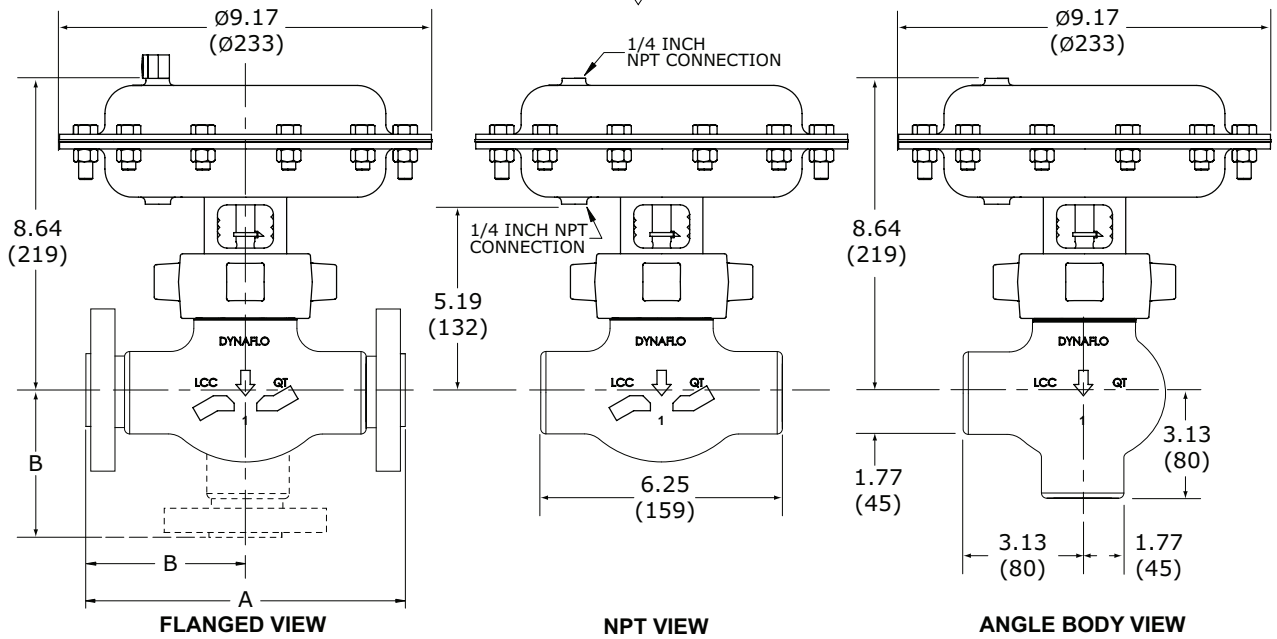
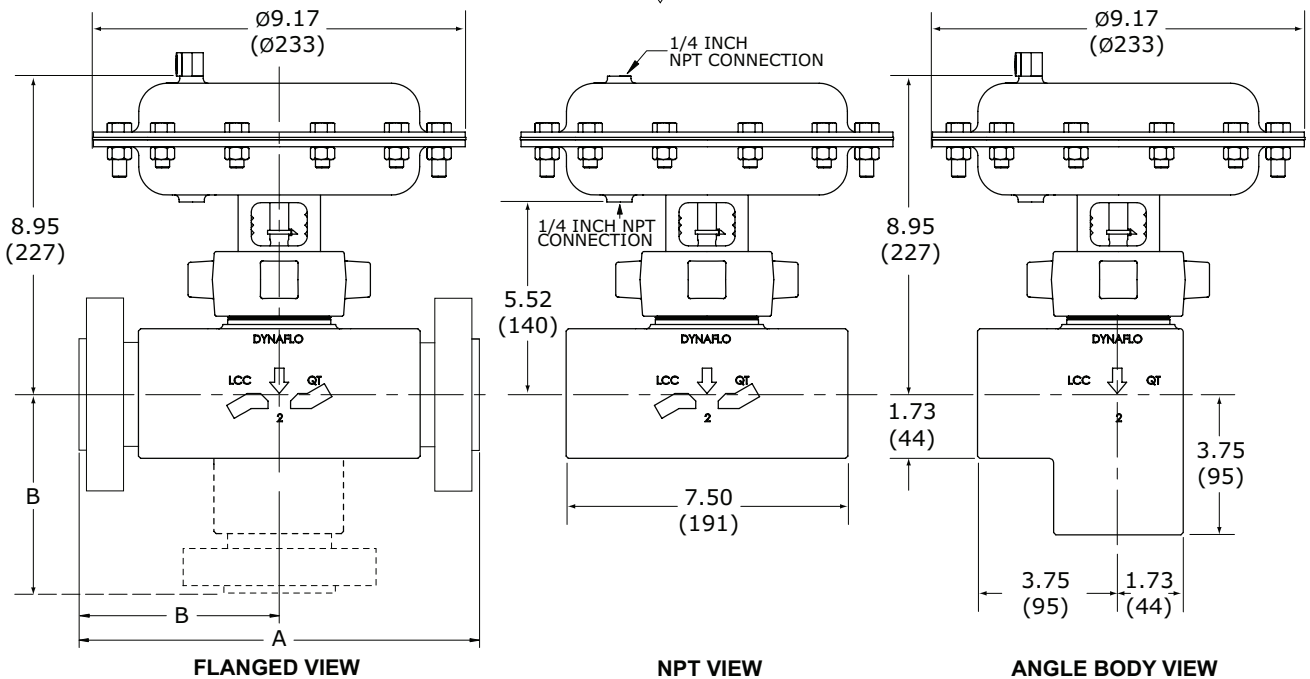


Figure 5 DF233 2 inch Control Valve Dimensions inch (mm)





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Ordering Guide

Dyna-Flo DF233 Control Valve | Model Numbering System

Sample Part Number

DF233-1GC3-6BN-14S-X

Code	Description												
X	Special												
S	Trim Material S17400 DH1150 T S30300/Tungsten Carbide												
14	Trim Size <table border="0"> <tr> <td>14</td> <td>1/4"</td> <td>38</td> <td>3/8"</td> <td>10</td> <td>1"</td> </tr> <tr> <td>12</td> <td>1/2"</td> <td>34</td> <td>3/4"</td> <td></td> <td></td> </tr> </table>	14	1/4"	38	3/8"	10	1"	12	1/2"	34	3/4"		
14	1/4"	38	3/8"	10	1"								
12	1/2"	34	3/4"										
N	Connection Style N NPT F RF J RTJ												
B	ASME Rating <table border="0"> <tr> <td>A</td> <td>150</td> <td>B</td> <td>300</td> <td>F</td> <td>900 NPT</td> </tr> <tr> <td>C</td> <td>600</td> <td>D</td> <td>900</td> <td></td> <td></td> </tr> </table>	A	150	B	300	F	900 NPT	C	600	D	900		
A	150	B	300	F	900 NPT								
C	600	D	900										
6	Number of Springs 3 3 Springs 6 6 Springs												
3	Spring Range 3 Size 33 Actuator with 0-20 Psig Operating Signal 6 Size 33 Actuator with 0-35 Psig Operating Signal												
C	Actuator Style C Fail Closed O Fail Open												
G	Body Style G Globe Style T Angle Style												
1	Body Size 1 1 Inch Valve 2 2 Inch Valve												

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