

Model DFC and DFO Valve Actuator

Technical Sales Bulletin

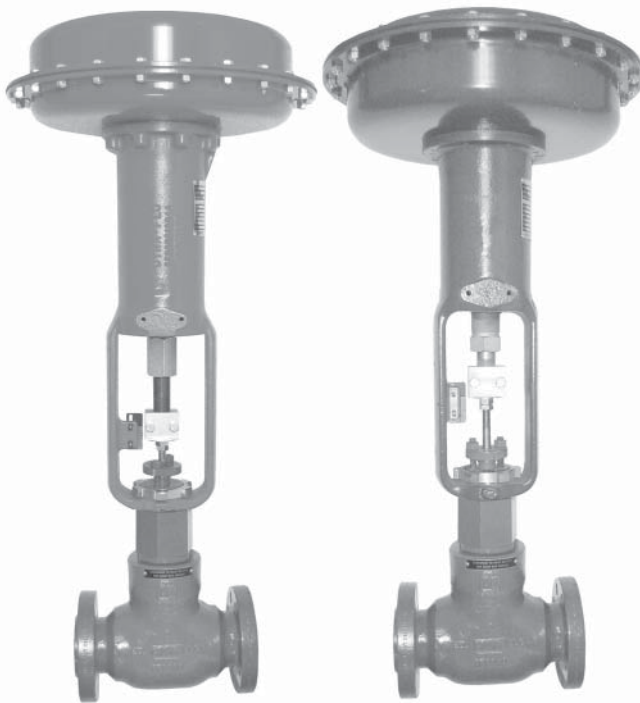


Figure 1 Models DFC and DFO Actuators

The Model DFC and DFO series linear output spring and diaphragm actuators are used in all kinds of demanding applications. The large area of the diaphragm allows low-pressure operation, and the spring provides fail safe positioning of a control valve on loss of the pneumatic supply. Both model DFC and DFO are used to automate control valves in both throttling and on/off control of liquids or gases.

When combined with a Dyna-Flo Model DF2000 or 360 valve, the DFC or DFO is part of a rugged control valve assembly, to which a wide variety of controllers and instruments can be attached.

Dyna-Flo's high level of quality specifications used in manufacturing the Model DFC and DFO series linear pneumatic actuators ensures superior performance and customer satisfaction.

Features

Reliable Design

Formed diaphragm has no friction with other moving parts allowing maintenance free operation through years of constant cycling.

Protective Coatings

External surfaces are either epoxy or powder coated for optimum resistance to harsh environments.

Individually Tested

Each actuator receives extensive testing to confirm smooth leak free operation.

Designed for Instrument Mounting

Integrated mounting pads with threaded holes make easy work of mounting instruments to the actuator. The open yoke allows easy access to stems for feed arms.

Travel Indication

Highly visible travel scale is adjustable for precise position indication.



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

SPECIFICATIONS

Material Temperature Capabilities

Standard: -40 to 180 °F (-40 to 82 °C)

Construction Materials

Refer to Tables 15-18 for construction details. Contact your Dyna-Flo sales office for more information and other options.

Valve Stem Compatibility, inches (mm)

- 1046, 1069 3/8 (9.5)
- 2069, 2105, 2156 1/2 (12.7)
- 3105, 3156, 3220, 3220-4 3/4 (19)

Valve Mounting Connection Sizes, inches (mm)

- 1046, 1069 2-1/8 (54)
- 2069, 2105, 2156 2-13/16 (71)
- 3105, 3156, 3220, 3220-4 3-9/16 (90)

Actuator Weights, lb (kg)

Size	DFC	DFO
1046	34 (15)	36 (16)
1069	48 (22)	40 (18)
2069	50 (23)	51 (23)
2105	90 (41)	82 (37)
2156	121 (55)	107 (49)
3105	94 (43)	92 (42)
3156	122 (55)	116 (53)
3220	254 (115)	235 (107)
3220-4	274 (124)	255 (116)

Line Connection Size

All sizes, 1/4 inch FNPT, other sizes available.

Actuator Mounting

Vertical on valve yoke 360° rotatable for optimum accessory orientation.

Actuator Dimensions

Refer to Figures 2-6 for actuator diagram. Refer to Tables 10-14 for actuator dimensions.

Options

- Reduced travel output
- Increased tubing connection size
- Stem connections
- Mechanical Travel stops
- Corrosion resistant materials

Operation

The Model DFC spring return diaphragm actuator (Figure 7) employs time proven reliable technology. As the instrument signal to the sealed lower diaphragm casing is increased, the force generated by that pressure on the diaphragm, and diaphragm plate, force the diaphragm plate and actuator stem up, compressing the spring.

The lifting action is transferred to the valve stem through a secure split and bolted connecting block. On a decrease, or complete loss of pneumatic signal, the actuator spring will force the actuator stem to extend, putting the valve in its fail-safe position. Using a push down to close action valve with a Model DFC will result in a fail closed valve assembly.

The Model DFO spring return diaphragm actuator is also time proven. Refer to Figure 8. As the instrument signal to the sealed upper diaphragm casing is increased, the force generated by that pressure on the diaphragm, and diaphragm plate, force the diaphragm plate and actuator stem down, compressing the spring. The extension action is transferred to the valve stem through a secure split and bolted connecting block. On a decrease, or complete loss of pneumatic signal, the actuator spring will force the actuator stem to retract, putting the valve in its fail-safe position. Using a push down to close action valve with a Model DFO will result in a fail open valve assembly.

Handwheels (Figures 9, 10, 13, 14)

Top-mounted handwheels are the cost effective option available for manual override for DFC and DFO actuators. The top-mounted handwheel is a good choice for emergency only positioning of a valve, and it is commonly used as a travel stop. These top-mounted handwheels are available in all actuator sizes. Side-mounted handwheels are also available.

External Travel Stops (Figures 11 & 12)

Top mounted handwheel based travel stops are available to restrict valve opening or closing. Configurations are available with caps to reduce tampering.

Model DFC and DFO Valve Actuator

Technical Sales Bulletin



Table 1

Volumetric Casing Displacement Inch³ (cm³)

Actuator Size	Clearance Volume (ZeroTravel)	Travel Inch (mm)							
		7/16 (11)	5/8 (16)	3/4 (19)	1-1/8 (29)	1-1/2 (38)	2 (51)	3 (76)	4 (102)
1046	33 (540)	56 (918)	66 (1080)	72 (1180)	---	---	---	---	---
1069	57 (934)	90 (1470)	104 (1700)	113 (1850)	142 (2330)	170 (2790)	---	---	---
2069	57 (934)	90 (1470)	104 (1700)	113 (1850)	142 (2330)	170 (2790)	---	---	---
2105	95 (1560)	---	170 (2790)	183 (3000)	227 (3720)	270 (4420)	330 (5410)	---	---
2156	133 (2180)	---	237 (3880)	257 (4210)	322 (5280)	387 (6340)	472 (7740)	---	---
3105	95 (1560)	---	170 (2790)	183 (3000)	227 (3720)	270 (4420)	330 (5410)	---	---
3156	133 (2180)	---	237 (3880)	257 (4210)	322 (5280)	387 (6340)	472 (7740)	---	---
3220	213 (3490)	320 (5240)	363 (5950)	392 (6420)	478 (7830)	564 (9240)	678 (11110)	980 (14880)	---
3220-4	213 (3490)	320 (5240)	363 (5950)	392 (6420)	478 (7830)	564 (9240)	678 (11110)	980 (14880)	1133 (18570)



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

Table 2

Model DFC Actuator Specifications

SPECIFICATION		ACTUATOR SIZE								
		1046	1069	2069	2105	2156	3105	3156	3220 ⁽¹⁾	
Nominal Effective Area	inch ²	46	69	69	105	156	105	156	220	
	cm ²	297	445	445	667	1006	677	1006	1419	
Yoke Boss Diameter	inch	2-1/8	2-1/8	2-13/16	2-13/16	2-13/16	3-9/16	3-9/16	3-9/16	
	mm	54	54	71	71	71	90	90	90	
Acceptable Valve Stem Diameter	inch	3/8	3/8	1/2	1/2	1/2	3/4	3/4	3/4	
	mm	9.5	9.5	12.7	12.7	12.7	19.1	19.1	19.1	
Maximum Allowable Output Thrust	lb	2,300	2,300	2,700	5,650	7,550	5,650	6,800	8,800	
	N	10,230	10,230	12,010	25,131	33,582	25,131	30,246	39,142	
Maximum Travel ⁽²⁾	Standard	inch	3/4	1-1/8	1-1/2	2	2	2	2	3 ⁽³⁾
		mm	19	29	38	51	51	51	51	76
	Top-Loaded	inch	---	3/4	---	3/4	---	---	1-1/8	---
		mm	---	19	---	19	---	---	29	---
Maximum Casing Pressure for Actuator Sizing ^(4,5)	Psig	55	70	70	65	55	65	55	50	
	kPag	380	483	483	448	379	448	379	345	
Maximum Excess Diaphragm Pressure ⁽⁴⁾	Psig	55	20	20	10	10	10	10	10	
	kPag	380	138	138	69	69	69	69	69	
Maximum Diaphragm Casing Pressure ^(4,5)	Psig	110	90	90	75	65	75	65	60	
	kPag	760	621	621	517	448	517	448	414	
Material Temperature Capabilities	Nitrile Elastomers	-40 to 180°F (-40 to 82°C)								
	Silicone Elastomers	-40 to 300°F (-40 to 149°C)								

NOTES:

- 1 These values also apply to the DFC Size 3220-4 actuator.
- 2 Actuator travel may be less than the value listed after connected to the valve.
- 3 Maximum actuator travel for the 3220-4 is 4 inches (102 mm).
- 4 Additional pressure may be added to the actuator when the actuator is at full travel. Damage to the actuator will occur if the Maximum Excess Diaphragm Pressure is exceeded. When the actuator has reached its full travel, and the diaphragm plate is physically stopped from moving, the energy from additional pressure is transferred to the diaphragm and casing. The amount of excess pressure that can be added at full travel is limited, exceeding this limiting factor will result in damage to the actuator, leakage, and/or casing fatigue or deformation.
- 5 This Maximum Casing Pressure is not to be used for normal operating pressure. Its purpose is to allow for typical regulator supply settings and/or relief valve tolerances. The maximum casing pressure is the pressure that can be applied to the actuator when the actuator is at less than full travel. Damage to the actuator may occur if this pressure is exceeded before the full travel is reached.

Model DFC and DFO Valve Actuator

Technical Sales Bulletin



Table 3

Model DFO Actuator Specifications

SPECIFICATION	ACTUATOR SIZE								
		1046	1069	2069	2105	2156	3105	3156	3220 ⁽¹⁾
Nominal Effective Area	inch ²	46	69	69	105	156	105	156	220
	cm ²	297	445	445	677	1006	677	1006	1419
Yoke Boss Diameter	inch	2-1/8	2-1/8	2-13/16	2-13/16	2-13/16	3-9-16	3-9/16	3-9/16
	mm	54	54	71	71	71	90	90	90
Acceptable Valve Stem Diameter	inch	3/8	3/8	1/2	1/2	1/2	3/4	3/4	3/4
	mm	9.5	9.5	12.7	12.7	12.7	19.1	19.1	19.1
Maximum Allowable Output Thrust	lb	2300	2300	2700	5650	7550	5650	6800	8800
	N	10,231	10,231	12,010	25,132	33,584	25,132	30,248	39,144
Maximum Travel ⁽²⁾	inch	3/4	1-1/8	1-1/2	2	2	2	2	3 ⁽³⁾
	mm	19	29	38	51	51	51	51	76
Maximum Casing Pressure for Actuator Sizing ⁽⁴⁾	Psig	125	65	65	50	40	50	40	55
	kPag	862	448	448	345	276	345	276	379
Maximum Diaphragm Casing Pressure ^(4,5)	Psig	140	75	75	60	50	60	50	65
	kPag	965	517	517	414	345	414	345	448
Material Temperature Capabilities	Nitrile Elastomers	-40 to 180°F (-40 to 82°C)							

NOTES:

- 1 These values also apply to the DFO Size 3220-4 actuator.
- 2 Actuator travel may be less than the value listed after connected to the valve.
- 3 Maximum actuator travel for the 3220-4 is 4 inches (102 mm).
- 4 The Operating Diaphragm Pressure must not exceed the Maximum Diaphragm Casing Pressure and must not produce a force on the actuator stem greater than the maximum allowable valve stem load.
- 5 This Maximum Casing Pressure is not to be used for normal operating pressure. Its purpose is to allow for typical regulator supply settings and/or relief valve tolerances. The maximum casing pressure is the pressure that can be applied to the actuator when the actuator is at less than full travel. Damage to the actuator may occur if this pressure is exceeded before the full travel is reached.



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

Table 4

Model DFO Actuator Thrust Available lbf (N)

Actuator Size	Travel Inches (mm)	Bench Range - Psig (kPag) (Based on 0-18 Psig Supply)			Bench Range - Psig (kPag) (Based on 0-33 Psig Supply)		
		3 - 15 (21 - 103)	3 - 11 (21 - 76)	3 - 9 (21 - 62)	6 - 30 (41 - 207)	6 - 26 (41 - 179)	6 - 22 (41 - 152)
1046	3/4 (19)	138 (614)	322(1432)	414 (1,842)	138 (614)	322 (1,432)	506 (2,251)
1069 ^A and 2069	3/4 (19) to 1-1/2 (38)	207 (921)	438 (2,148)	621 (2762)	207 (921)	483 (2,148)	759 (3,376) ^B
2105 and 3105	3/4 (19) to 2 (51)	315 (1,401)	630 (2,802)	945 (4,204)	315 (1,401)	735 (3,269)	1,155 (5,138)
2156 and 3156	3/4 (19) to 2 (51)	468 (2,082)	10,92 (4,857)	1,404 (6,245)	468 (2,082)	1,092 (4,857)	1,716 (7,633)
3220	3/4 (19)	880 (3,914) ^A	1,320 (5,872) ^D	1,980 (8,807)	2,640 (11,743) ^E	3,520 (15,658) ^F	Consult Dyna-Flo
	1-1/2 (38) to 2 (51)	660 (2,936)	1,320 (5,872) ^D	1,980 (8,807)	880 (3914) ^G	1,540 (6,850) ^H	2,640 (11,743) ^E
3220-4	3 (76)	N/A	N/A	N/A	3,300 (22,753) ^J	N/A	N/A
	4 (102)	N/A	N/A	N/A	N/A	2,420 (16,685) ^K	N/A

NOTES:

A - 3/4" (19 mm) MAX Travel

B - Consult Dyna-Flo on 2069 thrust value

C - 3 - 14 Psig (21 - 97 kPag) Bench Range

D - 3 - 12 Psig (21 - 83 kPag) Bench Range

E - 6 - 21 Psig (41 - 145 kPag) Bench Range

F - 6 - 17 Psig (41 - 117 kPag) Bench Range

G - 6 - 19 Psig (41 - 131 kPag) Bench Range

H - 2200 lb-f, 6 - 23 Psig (41 - 159 kPag) at 1-1/2" travel

J - 6 - 18 Psig (41 - 124 kPag) Bench Range

K - 6 - 22 Psig (41 - 152 kPag) Bench Range

Model DFC and DFO Valve Actuator

Technical Sales Bulletin



Table 5

Model DFC Actuator Thrust Available lbf (N)

Actuator Size	Travel Inches (mm)	Bench Range - Psig (kPag) (Based on 0-18 Psig Supply)			Bench Range - Psig (kPag) (Based on 0-33 Psig Supply)		
		3 - 15 (21 - 103)	6 - 15 (41 - 103)	8 - 15 (55 - 103)	6 - 30 (41 - 207)	10 - 30 (69 - 207)	14 - 30 (97 - 207)
1046	3/4 (19) ^A	138 (614)	322 (1,432) ^A	368 (1,637)	276 (1,228)	460 (2,046)	644 (2,865)
1069 and 2069	3/4 (19) to 1-1/2 (38)	207 (921)	414 (1,842)	552 (2,455)	414 (1,842)	690 (3,069)	966 (4,297)
2105 and 3105	3/4 (19) to 2 (51)	315 (1,401)	630 (2,802)	966 (4,297)	630 (2,802)	1,050 (4,671)	1,470 (6,530)
2156 and 3156	3/4 (19) to 2 (51)	468 (2,082)	936 (4,164)	1,248 (5,551)	936 (4,164)	1,560 (6,939)	2,184 (9,715)
3220	3/4 (19) to 2 (51)	660 (2,936)	1,320 (5,872)	1,760 (7,829)	1,320 (5,872)	2,200 (9,786)	3,080 (13,700)
3220-4	3 (76)	N/A	N/A	N/A	N/A	3,080 (21,236) ^C	N/A
	4 (102)	N/A	N/A	N/A	2,420 (16,685) ^B	N/A	N/A

NOTES:

A - 7 - 15 Psig (48 - 103 kPag) Bench Range

B - 11 - 26 Psig (76 - 176 kPag) Bench Range

C - 14 - 26 Psig (97 - 176 kPag) Bench Range



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

Table 6

DFC Top-Mounted Handwheel Specifications

Actuator Size	Handwheel Diameter Inch (mm)	Turns Per Travel		Rim Force ⁽¹⁾		Maximum Handwheel Output Force ⁽²⁾	
		Per Inch	Per mm	lb	N	lb	N
1046	8.75 (222)	8	0.3	34	151	1,500	66,72
1069	8.75 (222)	8	0.3	51	227	2,250	10,009
2069	8.75 (222)	8	0.3	51	227	2,250	10,009
2105	12.00 (305)	6	0.2	113	502	6,000	26,689
2156	12.00 (305)	6	0.2	113	502	6,000	26,689
3105	12.00 (305)	6	0.2	113	502	6,000	26,689
3156	12.00 (305)	6	0.2	113	502	6,000	26,689
3220	14.00 (356)	6	0.2	97	431	6,000	26,689
3220-4	14.00 (356)	6	0.2	97	431	6,000	26,689
NOTES:	1 - Tangential handwheel force required to produce the handwheel output force shown. (Proportional to the handwheel output force).						
	2 - The maximum force available to compress actuator spring.						

Table 7

DFO Top-Mounted Handwheel Specifications

Actuator Size	Handwheel Diameter Inch (mm)	Turns Per Travel		Rim Force ⁽¹⁾		Maximum Handwheel Output Force ⁽²⁾	
		Per Inch	Per mm	lb	N	lb	N
1046	8.75 (222)	8	0.3	32	142	1,500	6,672
1069	8.75 (222)	8	0.3	48	214	2,250	10,009
2069	8.75 (222)	8	0.3	48	214	2,250	10,009
2105	12.00 (305)	8	0.3	95	423	3,390	15,079
2156	12.00 (305)	8	0.3	110	489	5,100	22,686
3105	12.00 (305)	8	0.3	95	423	3,390	15,079
3156	12.00 (305)	8	0.3	110	489	5,100	22,686
3220 3220-4	14.00 (356)	5	0.3	136	605	6,600	29,358
NOTES:	1 - Tangential handwheel force required to produce the handwheel output force shown. (Proportional to the handwheel output force).						
	2 - The maximum force available to compress actuator spring.						

Model DFC and DFO Valve Actuator

Technical Sales Bulletin



Table 8

DFC Side-Mounted Handwheel Specifications

Actuator Size	Handwheel Diameter Inch (mm)	Turns Per Travel		Rim Force ⁽¹⁾		Maximum Handwheel Output Force ⁽²⁾	
		Per Inch	Per mm	lb	N	lb	N
1046	-	-	-	-	-	-	-
1069	12.00 (305)	5.14	0.2	52	230	2,250	10,010
2069	12.00 (305)	5.14	0.2	52	230	2,250	10,010
2105	14.00 (356)	6.65	0.3	81	360	3,390	15,080
2156	14.00 (356)	6.65	0.3	122	540	5,100	22,690
3105	14.00 (356)	6.65	0.3	81	360	3,390	15,080
3156	14.00 (356)	6.65	0.3	122	540	5,100	22,690
3220 3220-4	19.50 (495)	20	0.8	36	160	6,600	29,360
NOTES:	1 - Tangential handwheel force required to produce the handwheel output force shown. (Proportional to the handwheel output force).						
	2 - The maximum force available to compress actuator spring.						

Table 9

DFO Side-Mounted Handwheel Specifications

Actuator Size	Handwheel Diameter Inch (mm)	Turns Per Travel		Rim Force ⁽¹⁾		Maximum Handwheel Output Force ⁽²⁾	
		Per Inch	Per mm	lb	N	lb	N
1046	-	-	-	-	-	-	-
1069	12.00 (305)	5.14	0.2	52	230	2,250	10,010
2069	12.00 (305)	5.14	0.2	52	230	2,250	10,010
2105	14.00 (356)	6.65	0.3	81	360	3,390	15,080
2156	14.00 (356)	6.65	0.3	122	540	5,100	22,690
3105	14.00 (356)	6.65	0.3	81	360	3,390	15,080
3156	14.00 (356)	6.65	0.3	122	540	5,100	22,690
3220 3220-4	19.50 (495)	20	0.8	36	160	6,600	29,360
NOTES:	1 - Tangential handwheel force required to produce the handwheel output force shown. (Proportional to the handwheel output force).						
	2 - The maximum force available to compress actuator spring.						



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

Table 10

Model DFC Outline Dimensions (Refer to Figures 2 & 3)

Actuator Size	Dimension Reference Inch (mm)				
	A	B	C (Yoke Boss)	D	E
1046	18.78 (478)	11.38 (289)	2-1/8 (54.0)	7.62 (194)	1.50 (38.1)
1069	22.68 (576)	13.12 (333)	2-1/8 (54.0)	8.83 (224)	1.50 (38.1)
2069	23.38 (594)	13.12 (333)	2-13/16 (71.4)	9.62 (244)	1.50 (38.1)
2105	30.25 (768)	16.00 (406)	2-13/16 (71.4)	12.19 (310)	1.50 (38.1)
2156	30.25 (768)	18.62 (473)	2-13/16 (71.4)	12.19 (310)	1.50 (38.1)
3105	30.91 (785)	16.00 (406)	3-9/16 (90.5)	12.81 (325)	1.50 (38.1)
3156	30.91 (785)	18.62 (473)	3-9/16 (90.5)	12.81 (325)	1.50 (38.1)
3220	36.48 (927)	21.12 (536)	3-9/16 (90.5)	14.75 (375)	1.50 (38.1)
3220-4	42.85 (1088)	21.12 (536)	3-9/16 (90.5)	14.75 (375)	1.50 (38.1)

Table 11

Model DFO Outline Dimensions (Refer to Figures 2 & 3)

Actuator Size	Dimension Reference Inch (mm)				
	A	B	C (Yoke Boss)	D	E
1046	17.31 (440)	11.38 (289)	2-1/8 (54.0)	8.38 (213)	—
1069	19.25 (489)	13.12 (333)	2-1/8 (54.0)	8.75 (222)	1.00 (25.4)
2069	21.20 (538)	13.12 (333)	2-13/16 (71.4)	10.69 (272)	1.00 (25.4)
2105	25.72 (653)	16.00 (406)	2-13/16 (71.4)	11.44 (291)	1.50 (38.1)
2156	25.72 (653)	18.62 (473)	2-13/16 (71.4)	11.44 (291)	1.50 (38.1)
3105	28.10 (714)	16.00 (406)	3-9/16 (90.5)	13.94 (354)	1.50 (38.1)
3156	28.10 (714)	18.62 (473)	3-9/16 (90.5)	13.94 (354)	1.50 (38.1)
3220	32.69 (830)	21.12 (536)	3-9/16 (90.5)	16.00 (406)	1.50 (38.1)
3220-4	38.90 (988)	21.12 (536)	3-9/16 (90.5)	16.00 (406)	1.50 (38.1)

Model DFC and DFO Valve Actuator

Technical Sales Bulletin

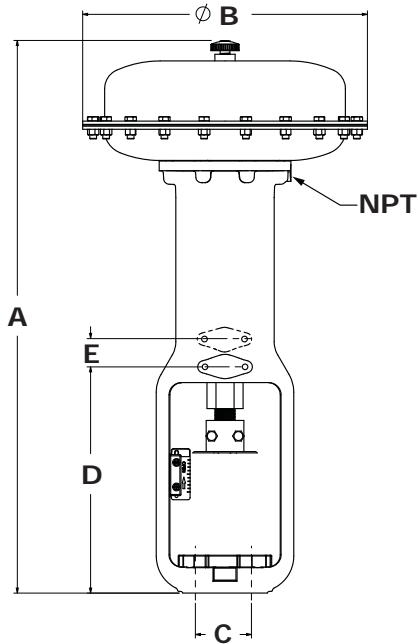


Figure 2 Model DFC Dimensions

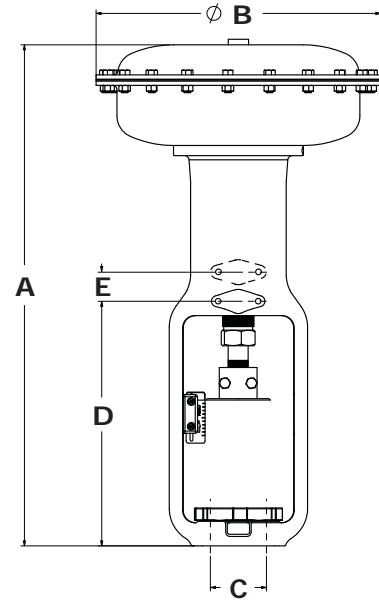


Figure 3 Model DFO Dimensions

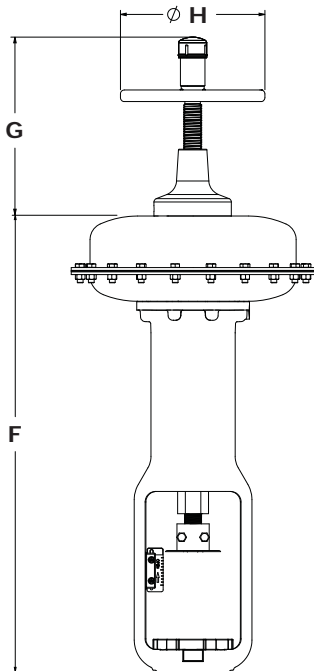


Figure 4 Model DFC Top-Mounted Handwheel Dimensions

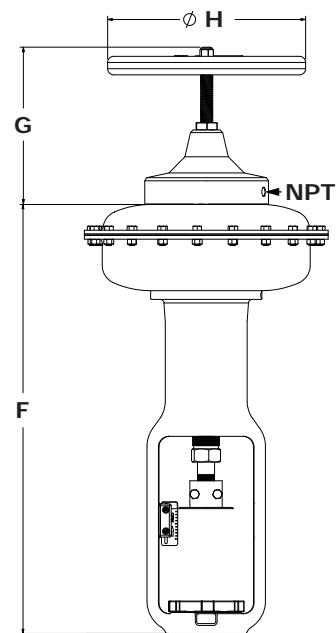


Figure 5 Model DFO Top-Mounted Handwheel Dimensions



Model DFC and DFO Valve Actuator

Technical Sales Bulletin

Table 12

Model DFC Top-Mounted Handwheel Outline Dimensions (Refer to Figures 4 & 5)

Actuator Size	Dimension Reference Inch (mm)			
	TRAVEL	G MAX.	F	H
1046	-	-	17.78 (452)	8.75 (222)
1069	3/4 (19.1)	12.88 (327)	21.68 (551)	8.75 (222)
2069	3/4 (19.1)	12.88 (327)	22.38 (568)	8.75 (222)
2105	1-1/2 (38.1)	14.86 (377)	29.25 (743)	12.00 (305)
	2 (50.8)	15.36 (390)		
2156	1-1/2 (38.1)	14.86 (377)	29.25 (743)	12.00 (305)
	2 (50.8)	15.36 (390)		
3105	1-1/2 (38.1)	14.86 (377)	29.90 (760)	12.00 (305)
	2 (50.8)	15.36 (390)		
3156	1-1/2 (38.1)	14.86 (377)	29.90 (760)	12.00 (305)
	2 (50.8)	15.36 (390)		
3220	2 (50.8)	17.48 (444)	35.47 (901)	14.00 (356)
	3 (76.2)	18.48 (469)		
	3-1/2 (88.9)	20.69 (526)		
3220-4	4 (102)	20.94 (532)	41.85 (1063)	14.00 (356)

Table 13

Model DFO Top-Mounted Handwheel Outline Dimensions (Refer to Figures 4 & 5)

Actuator Size	Dimension Reference Inch (mm)		
	F	G	H
1046	16.93 (430)	7.00 (178)	8.75 (222)
1069	19.23 (488)	7.00 (178)	8.75 (222)
2069	21.21 (539)	7.00 (178)	8.75 (222)
2105	25.72 (653)	8.70 (221)	12.00 (305)
2156	25.72 (653)	8.70 (221)	12.00 (305)
3105	28.16 (715)	8.70 (221)	12.00 (305)
3156	28.16 (715)	8.70 (221)	12.00 (305)
3220	32.69 (830)	12.60 (320)	14.00 (356)
3220-4	38.89 (988)	-	14.00 (356)

Model DFC and DFO Valve Actuator

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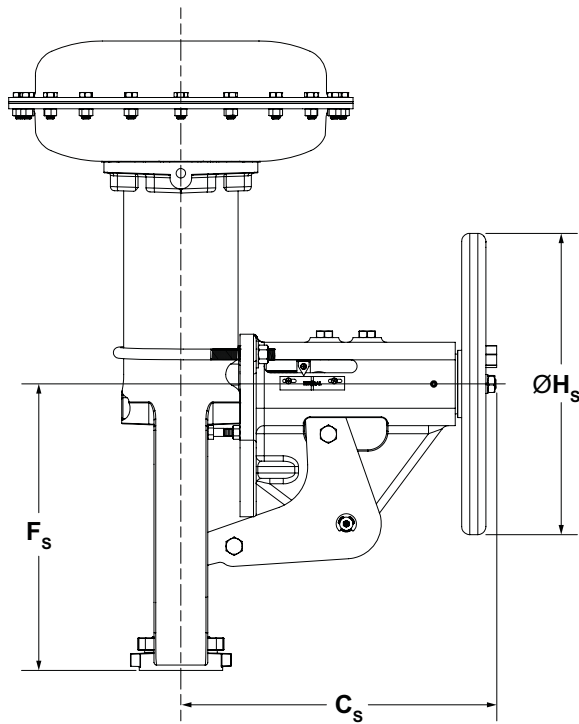


Figure 6 Side-Mounted Handwheel Dimensions

Table 14				
Side-Mounted Handwheel Outline Dimensions (Refer to Figure 6)				
Actuator Size	Model	Dimension Reference Inch (mm)		
		F_s	C_s	H_s
1046	DFC	-	-	-
	DFO	-	-	-
1069	DFC	8.44 (214)	11.19 (284)	12.00 (305)
	DFO	8.88 (226)		
2069	DFC	9.75 (248)	11.25 (286)	12.00 (305)
	DFO	9.75 (248)		
2105	DFC	14.25 (362)	14.75 (375)	14.00 (356)
	DFO	12.06 (306)		
2156	DFC	14.25 (362)	14.75 (375)	14.00 (356)
	DFO	12.06 (306)		
3105	DFC	14.88 (378)	14.88 (378)	14.00 (356)
	DFO	14.56 (370)		
3156	DFC	14.88 (378)	14.88 (378)	14.00 (356)
	DFO	14.56 (370)		
3220 3220-4	DFC	17.56 (446)	11.50 (292)	19.50 (495)
	DFO	17.56 (446)		



Model DFC and DFO Valve Actuator

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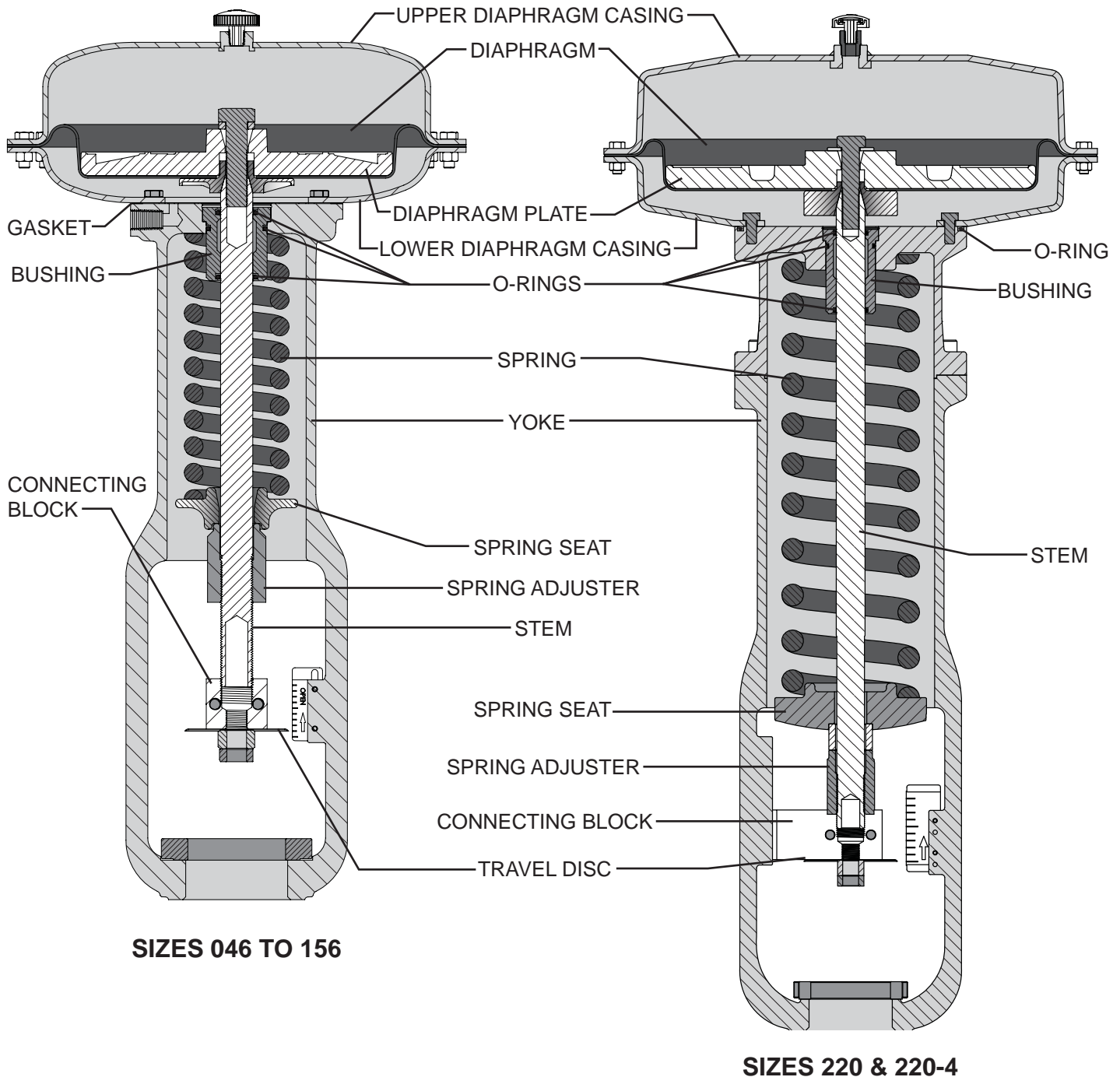


Figure 7 DFC Standard Actuator Cross Section

Model DFC and DFO Valve Actuator

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Table 15

Model DFC Standard Construction Materials

Description	Material
ACTUATOR STEM	S17400
BUSHING	BRASS
CONNECTING BLOCK	ZINC PLATED STEEL
DIAPHRAGM	NITRILE/NYLON
DIAPHRAGM PLATE	ALUMINUM OR CAST IRON
GASKET	COMPOSITION
LOWER DIAPHRAGM CASING	STEEL
O-RINGS	NITRILE
SPRING	STEEL
SPRING ADJUSTER	ZINC PLATED STEEL
SPRING SEAT	ZINC PLATED STEEL
TRAVEL DISC	S30400
UPPER DIAPHRAGM CASING	STEEL
YOKE	CAST IRON

Table 16

Model DFO Construction Materials

Description	Material
ACTUATOR STEM	ZINC PLATED STEEL
CONNECTING BLOCK	ZINC PLATED STEEL
DIAPHRAGM	NITRILE/NYLON
DIAPHRAGM PLATE	ALUMINUM OR CAST IRON
LOWER DIAPHRAGM CASING	STEEL
SPRING	STEEL
SPRING ADJUSTER	ZINC PLATED STEEL
SPRING SEAT	ZINC PLATED STEEL
TRAVEL INDICATOR	S30400
UPPER DIAPHRAGM CASING	STEEL
YOKE	CAST IRON



Model DFC and DFO Valve Actuator

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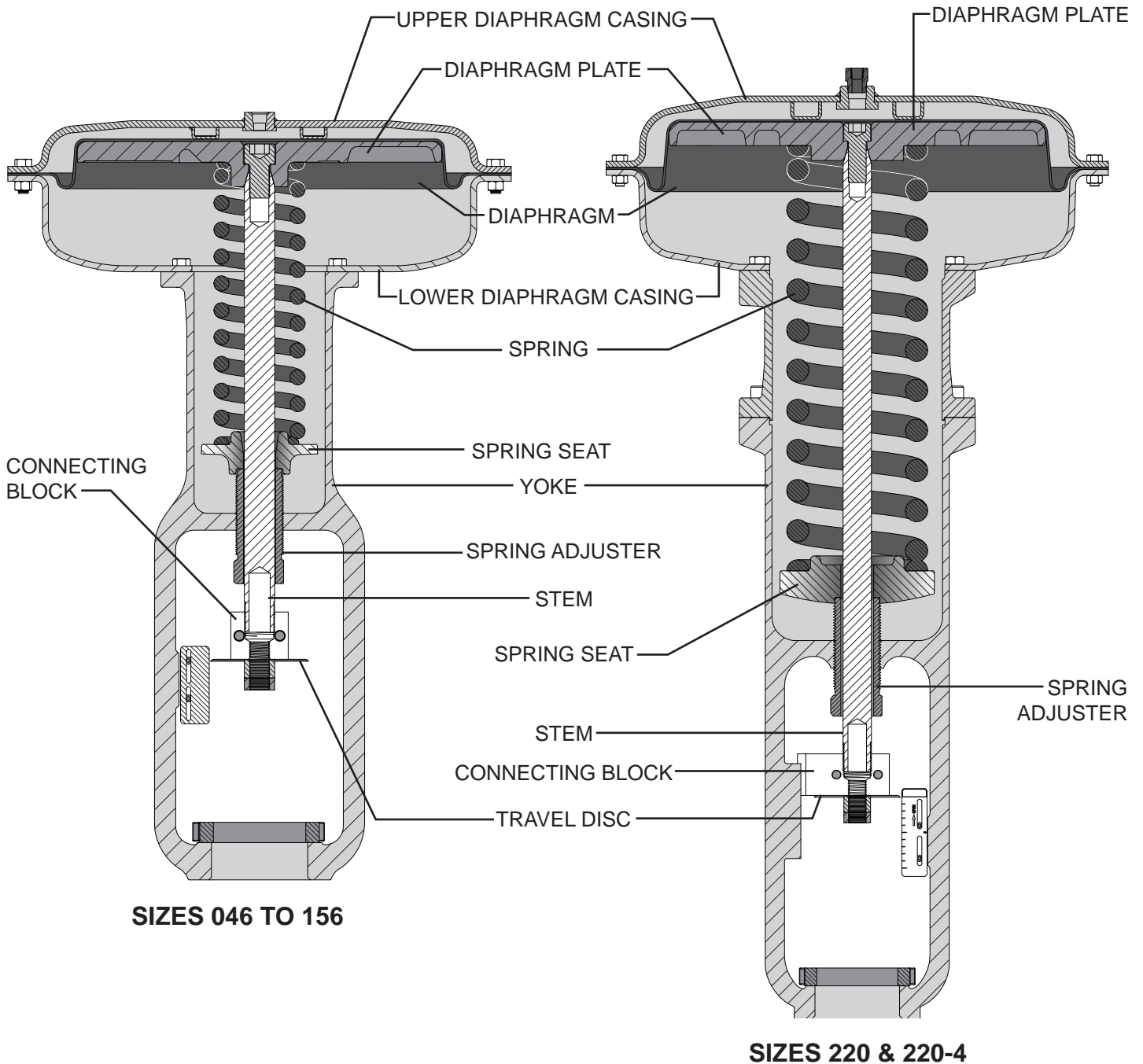


Figure 8 DFO Standard Actuator Cross Section

Model DFC and DFO Valve Actuator

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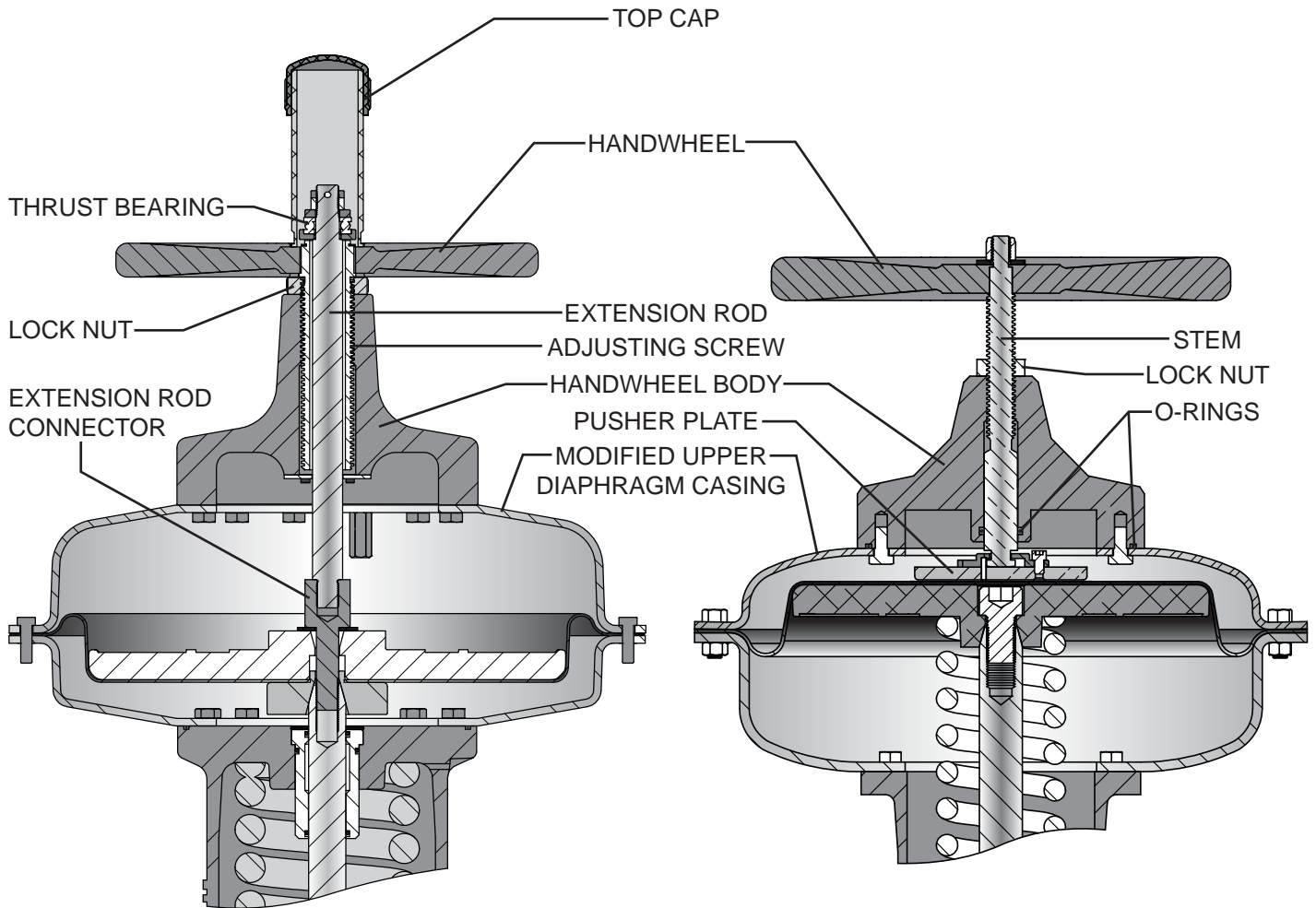
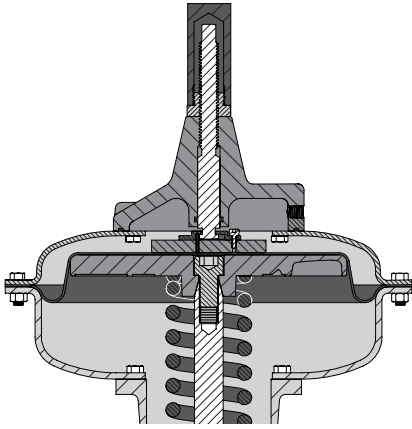


Figure 9 Model DFC Top-Mounted Handwheel Cross Section

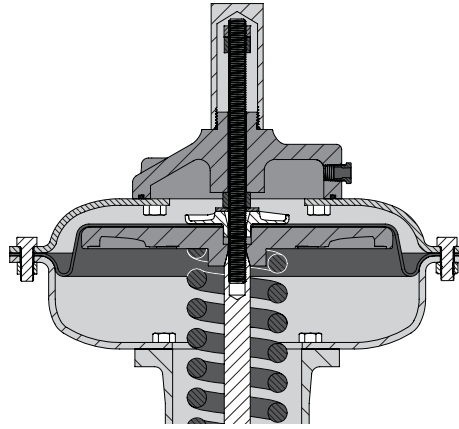
Figure 10 Model DFO Top-Mounted Handwheel Cross Section

Model DFC and DFO Valve Actuator

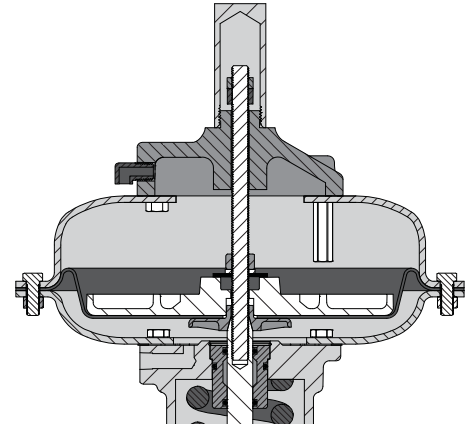
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**TYPE 1
UP STOP DFO**

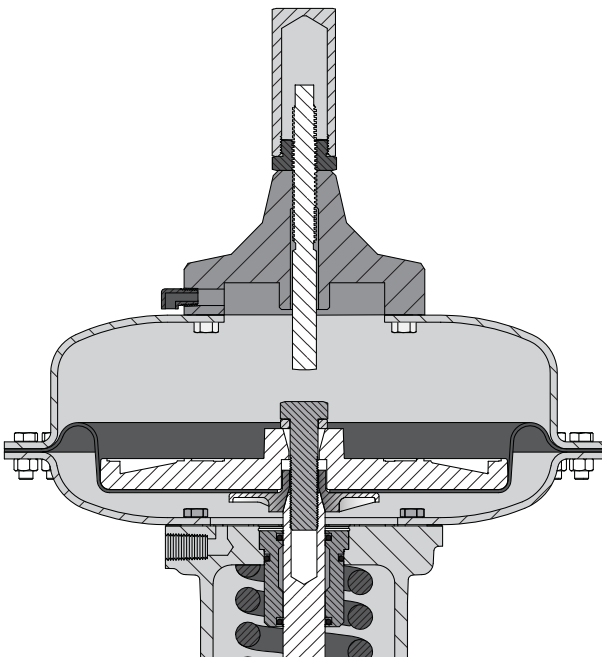


**TYPE 2
DOWN STOP DFO**

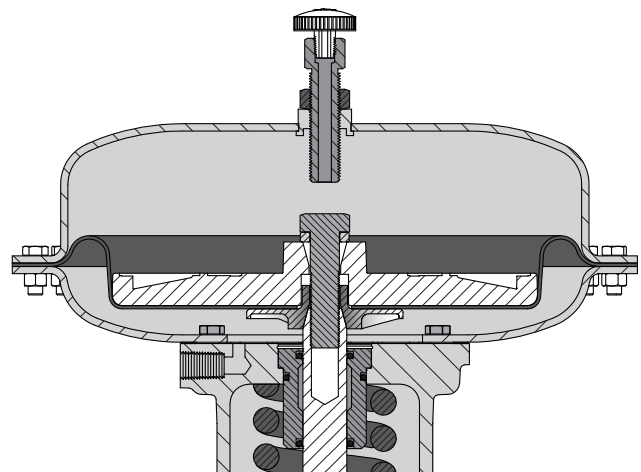


**TYPE 3
DOWN STOP DFC**

Figure 11 *Optional Adjustable Travel Stops*



**TYPE 4
UP STOP DFC**



**TYPE 5
UP STOP DFC**

Figure 12 *Optional Adjustable Travel Stops Continued*

Model DFC and DFO Valve Actuator

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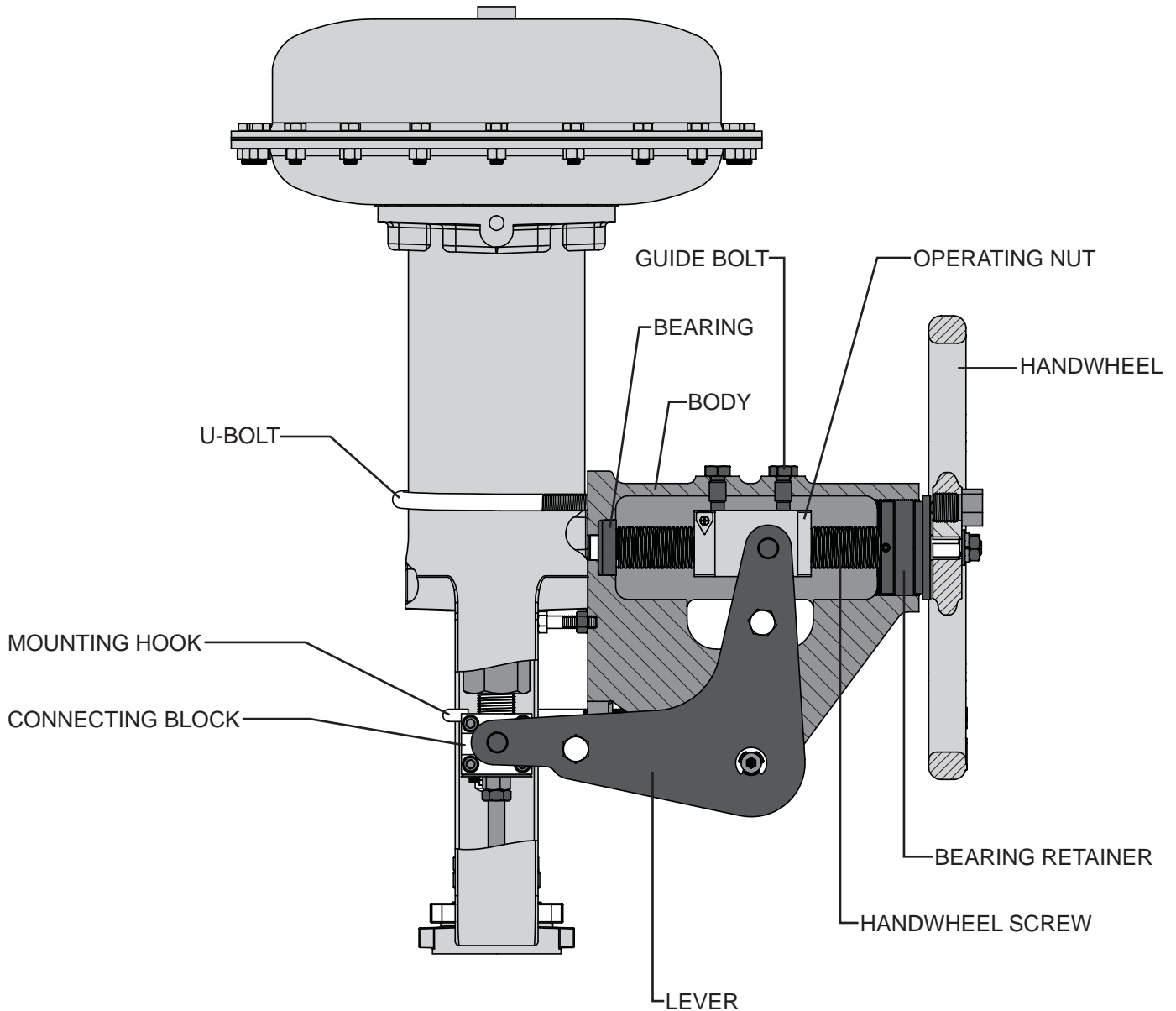


Figure 13 Side-Mounted Handwheel Cross Section - Sizes 1069 to 3156

Model DFC and DFO Valve Actuator



Table 17

Side-Mounted Handwheel Sizes 1069 to 3156 Standard Construction Materials

Description	Material	
BODY	CAST IRON	
BEARING	STEEL	
BEARING RETAINER	SMHW100 & SMHW150	BRASS
	SMHW200 & SMHW300	STAINLESS STEEL
CONNECTING BLOCK	STEEL	
GUIDE BOLT	STAINLESS STEEL	
HANDWHEEL	CAST IRON	
HANDWHEEL SCREW	BRONZE	
LEVER	STEEL	
MOUNTING HOOK	ZINC PLATED STEEL	
OPERATING NUT	STEEL	
U-BOLT	STEEL	

Table 18

Side-Mounted Handwheel Size 3220 Standard Construction Materials

Description	Material
BACK WORM RETAINER	ZINC PLATED STEEL
BALL BEARING	STEEL
BEARING RETAINER FLANGE	STEEL
FRONT WORM RETAINER	ZINC PLATED STEEL
HANDWHEEL	CAST IRON
LOWER SLEEVE	STEEL
SPRING ADJUSTER	ZINC PLATED STEEL
SPRING ADJUSTER SCREW	ZINC PLATED STEEL
SPRING SEAT	ZINC PLATED STEEL
WORM GEAR	BRONZE
WORM SHAFT	STEEL
YOKE	CAST IRON

Model DFC and DFO Valve Actuator

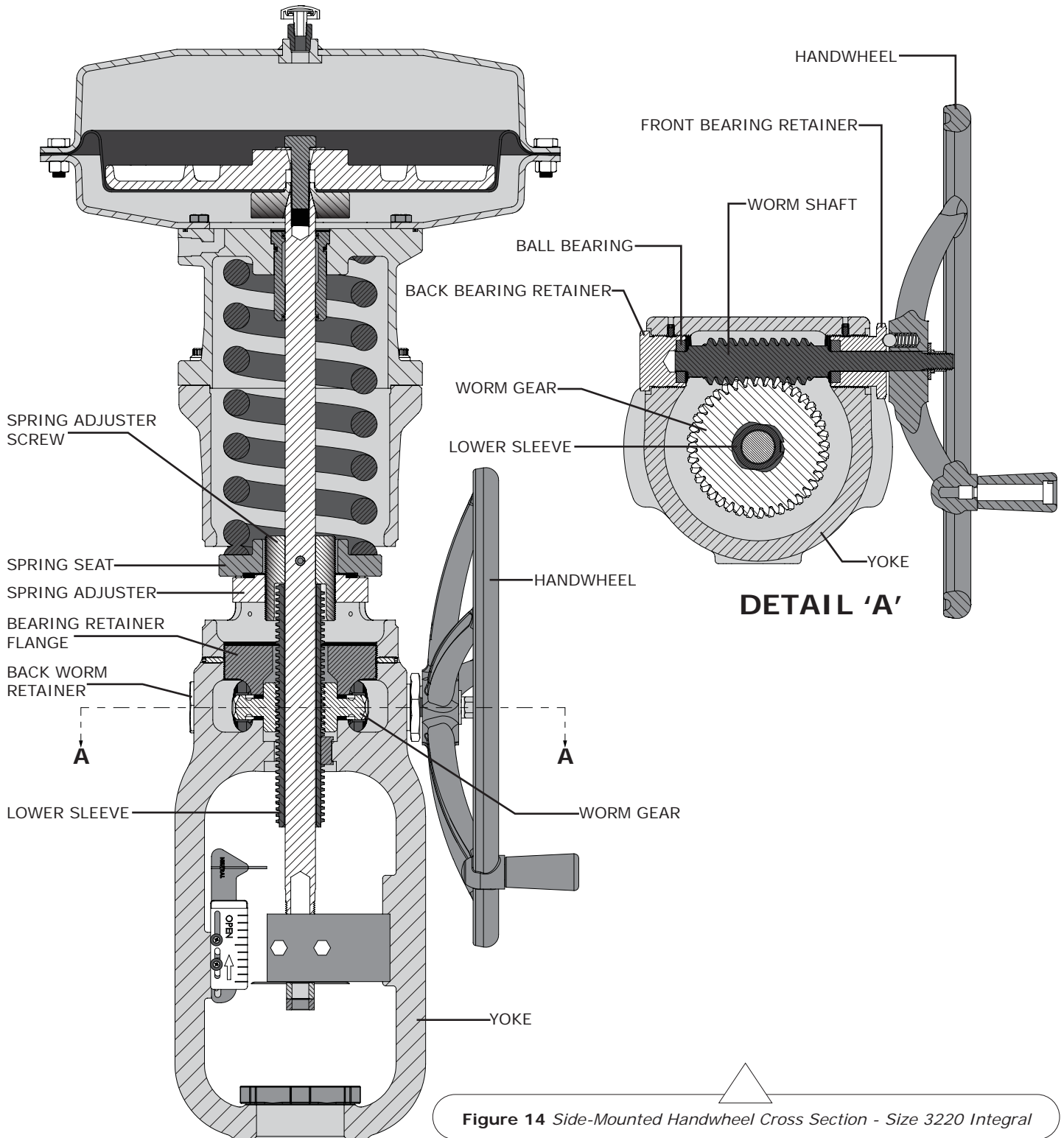


Figure 14 Side-Mounted Handwheel Cross Section - Size 3220 Integral

Model DFC and DFO Valve Actuator



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Model DFC and DFO Valve Actuator



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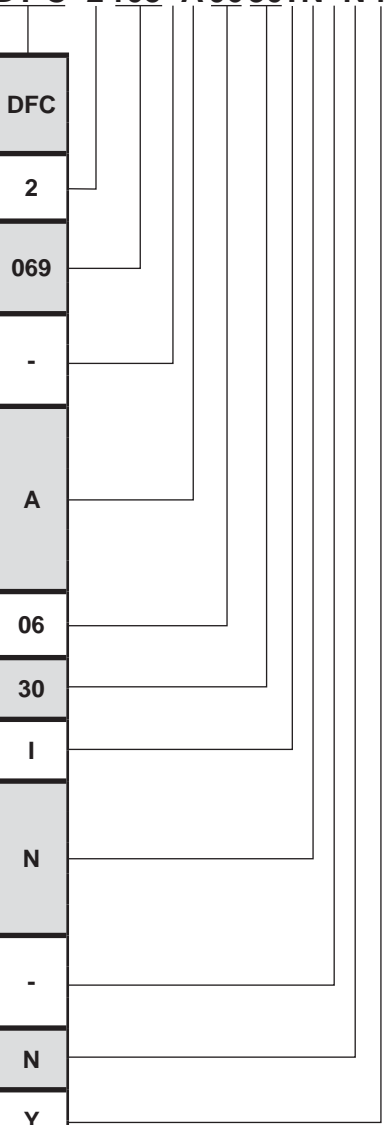


Model DFC and DFO Valve Actuator

MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: DFC-2105-A0630IN-NY

ACTION						DFC
DFC	FAIL CLOSED	DFO	FAIL OPEN			
DFC4	FAIL CLOSED (EXTENDED TRAVEL)	DFO4	FAIL OPEN (EXTENDED TRAVEL)			
VALVE YOKE						2
1	2-1/8 INCH	2	2-13/16 INCH	3	3-9/16 INCH	
ACTUATOR SIZE						069
046	46 INCH ²	069	69 INCH ²	105	105 INCH ²	
220	220 INCH ²	156	156 INCH ²			
PAINT						-
-	DFPS-01 (STANDARD)	2	DFPS-02 (SEVERE SERVICE)			
3	DFPS-03 (HIGH TEMPERATURE)					
TRAVEL						A
P	3/8 INCH	L	7/16 INCH	K	1/2 INCH	
A	3/4 INCH	M	7/8 INCH	I	1 INCH	
R	1-1/4 INCH	C	1-1/2 INCH	T	1-5/8 INCH	
N	2-1/8 INCH	S	2-1/4 INCH	E	2-1/2 INCH	
Q	3-3/8 INCH	G	3-1/2 INCH	H	4 INCH	
J	5/8 INCH	B	1-1/8 INCH	D	2 INCH	
F	3 INCH					
LOWER BENCH SET						06
ACTUAL VALUE (PSI)			EXAMPLE: 03, 06, 17, 21, ETC.			
UPPER BENCH SET						30
ACTUAL VALUE (PSI)			EXAMPLE: 27, 09, 15, 30, ETC.			
INPUT SIGNAL (AIR TO DIAPHRAGM)						I
	0 - 18 PSIG		0 - 33 PSIG	I	3 - 15 PSIG	
				I	6 - 30 PSIG	
HANDWHEEL AND TRAVEL STOPS						N
N	NONE (STANDARD)		S	SIDE MOUNTED HANDWHEEL		
T	TOP MOUNTED HANDWHEEL		1	TYPE 1 UP STOP - DFO		
2	TYPE 2 DOWN STOP - DFO		3	TYPE 3 DOWN STOP - DFC		
4	TYPE 4 UP STOP - DFC		5	TYPE 5 UP STOP - DFC		
CONNECTING BLOCK OPTIONS						-
-	NONE		T	TAPPED 1/4" - 20 UNC		
B	TAPPED 3/8" - 16 UNC		F	TAPPED 5/8" - 18 UNC		
CONSTRUCTION OPTIONS						N
N	NONE		S	STAINLESS STEEL FASTENERS		
YOKE OPTIONS						Y
	NONE		Y	TAPPED 5/16" - 18 UNC		



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