

Model DFRP Rotary Actuator

Technical Sales Bulletin

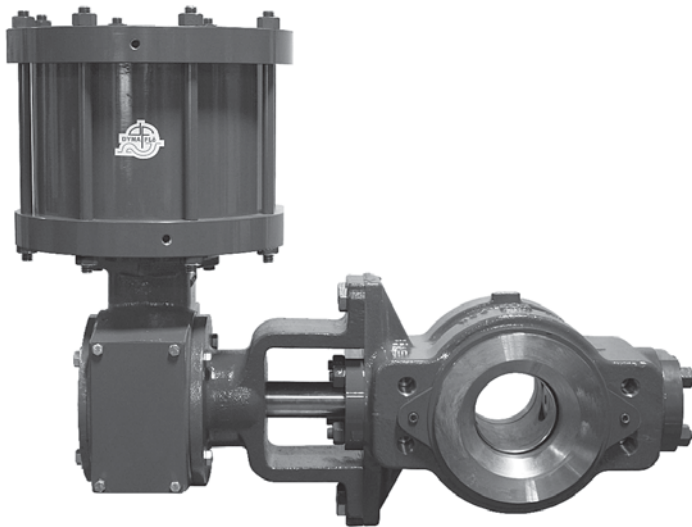


Figure 1 *Dyna-Flo Size 112 DFRP Actuator with 6 inch 590 Rotary Control Valve*

The Model DFRP pneumatic piston actuator is designed for high powered demanding rotary applications. It utilizes a standard splined shaft connection typically found on Dyna-Flo 590 and 570 series Control Valves. Multiple mounting configurations and actions can easily be achieved due to the universal design.

The Model DFRP, when combined with a positioner, is suitable for throttling applications. Additionally, DFRPs can be used for on/off service when paired with a two-position control signal. A volume tank is required to hold fail position.

The high level of quality specifications used in the manufacture of the Model DFRP rotary actuators ensures superior performance and customer satisfaction.

Features

Rugged Long Lasting Construction

Dyna-Flo's expert CNC machining process and superior quality parts come together to make DFRP actuators a rugged, long lasting product. DFRP actuators are manufactured to deliver a high level of safety and performance.

Flexible Configuration

The DFRP is available in push-down-to-open or push down-to-close and may be mounted in any of four mounting positions (See Figures 3 & 4).

Positioner Flexibility

The Model DFRP is designed to accept the latest in positioners, either electronic or pneumatic, shaft drive or integrally mounted.

Minimal Dead Band

The Model DFRP has a single-point linkage with a splined and clamped lever which reduces lost motion and improves the accuracy of actuator control.

Superior Cylinder Design

The advanced composite cylinder is lightweight, high cycle, and corrosion resistant making it superior to aluminum and steel designs.



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SPECIFICATIONS

Available Actuator Sizes

028, 079, 112, 113, and 154

Available Actuator Configurations

- Double-Acting
- Throttling (with Positioner)
- On-Off (with Switching Device)

Cylinder Operating Pressure

Minimum Recommended:

- 20 Psig (138 kPag)
- When used with a positioner, always set supply pressure 5 psi (35 kPa) above actuator requirement but do not exceed maximum values below

Maximum Allowable Operating Pressure:

- Size 028:** 150 Psig (1,034 kPag)
- Size 079:** 100 Psig (689 kPag)
- Size 112:** 85 Psig (586 kPag)
- Size 113:** 150 Psig (1,034 kPag)
- Size 154:** 150 Psig (1,034 kPag)

Maximum Valve Shaft Rotation

90 degrees.

Stroking Time

Stroking Time is dependent on actuator size, rotation, and Positioner (if used). For more information consult the Dyna-Flo Sales Office.

Material Temperature Limitations

-40°F to 180°F (-40°C to 82°C) with standard Elastomers.

Pressure Connections

1/4 inch FNPT, and 3/4 inch FNPT (for optional pipe-away vent).

Travel Indication

Graduated scale and pointer located on the actuator end of the valve shaft.

Cylinder Displacement

See Table 5.

Actuator Mounting

Right-hand, or Left-hand (as viewed from seal end of valve). In one of 4 positions (12 (Std.), 3, 6, and 9 o'clock) with respect to the valve body in a horizontal pipe.

Construction Materials

See Table 1 for construction materials.

Contact your Dyna-Flo sales office for more information and other options.

Valve Dimensions

See Figure 5 for actuator diagram.

See Tables 3 & 4 for actuator dimensions.

Maximum Torque

- Size 028:** 7,104 lbf-in (803 N·m)
- Size 079:** 13,800 lbf-in (1,559 N·m)
- Size 112:** 16,896 lbf-in (1,909 N·m)
- Size 113:** 56,004 lbf-in (6,328 N·m)
- Size 154:** 65,004 lbf-in (7,345 N·m)
(with 2-1/2" spline shaft diameter)

See Figures 6 & 7 for Actuator Torque Charts and Table 7 for Breakout Torques.

Approximate Actuator Weights

- Size 028:** 62 lb (28 Kg)
- Size 079:** 85 lb (39 Kg)
- Size 112:** 120 lb (54 Kg)
- Size 113:** 245 lb (111 Kg)
- Size 154:** 295 lb (134 Kg)

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

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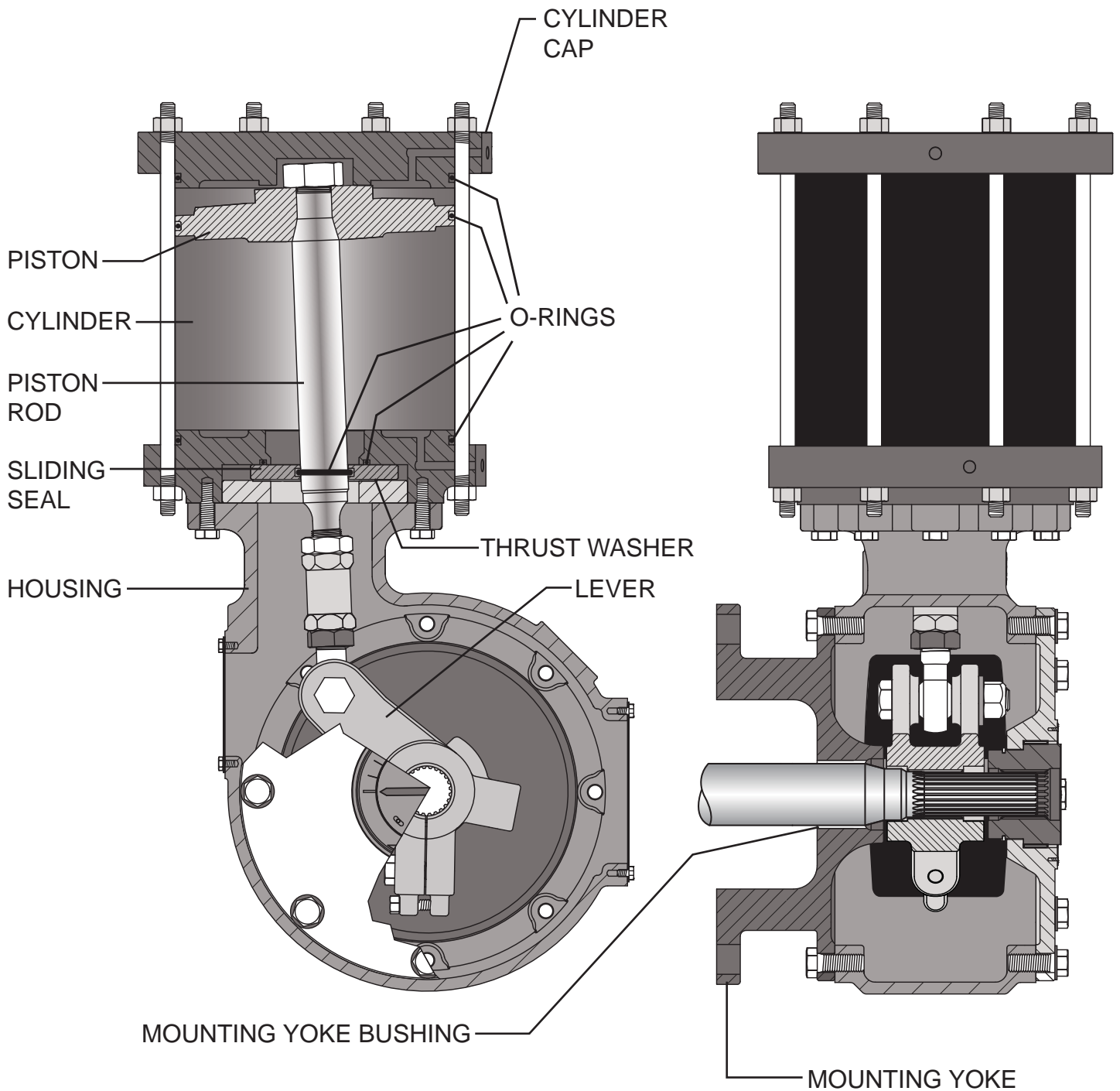


Figure 2 Model DFRP Cross-Section



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Table 1

Model DFRP Construction Materials

Key	Part Description	Material
01	Housing	Sizes 028, 079, 112: Cast Iron Sizes 113 and 154: Aluminum
02	Lever	1020 Steel (G10200)
03	Sliding Seal	Aluminum
04	Mounting Yoke	Cast Iron
05	Mounting Yoke Bushing	Bronze
06	Piston Rod	S17400 H900
07	Cylinder	Fiberglass
08	Piston	Aluminum
09	Cylinder Cap	Aluminum
10	O-rings	Nitrile
11	Thrust Washer	PTFE

Table 2

Model DFRP Mounting Styles and Positions

Mounting	Action	Ball Rotation To Close	Model 590	Model 570, 571, 573
Right Hand	Push Down to Close	counterclockwise	Style A	Style A
	Push Down to Open	counterclockwise	Style B	Style B
Left Hand	Push Down to Close	counterclockwise	-	Style D
	Push Down to Open	counterclockwise	-	Style C

Mounting	Action	Ball Rotation To Close	Model 590
Right Hand	Push Down to Close	clockwise	-
	Push Down to Open	clockwise	-
Left Hand	Push Down to Close	clockwise	Style C
	Push Down to Open	clockwise	Style D

NOTE: The fail position of the DFRP actuator is dependent on the tubing setup of the trip valve and volume tank if applicable (for any mounting position, actuator may be set as Fail Open, Fail Closed, or Lock-in-Last). Consult Dyna-Flo regarding required fail position upon order.

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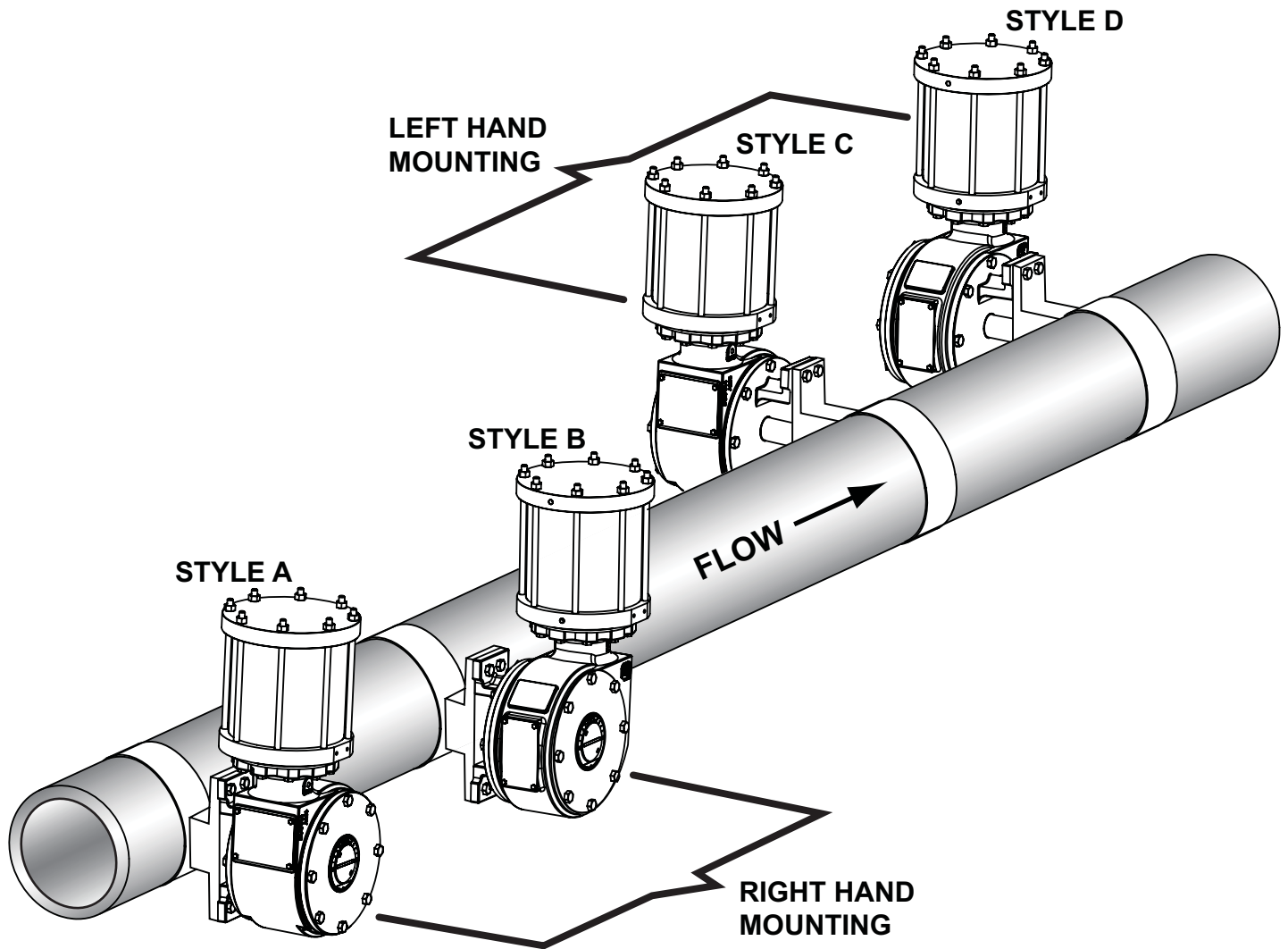


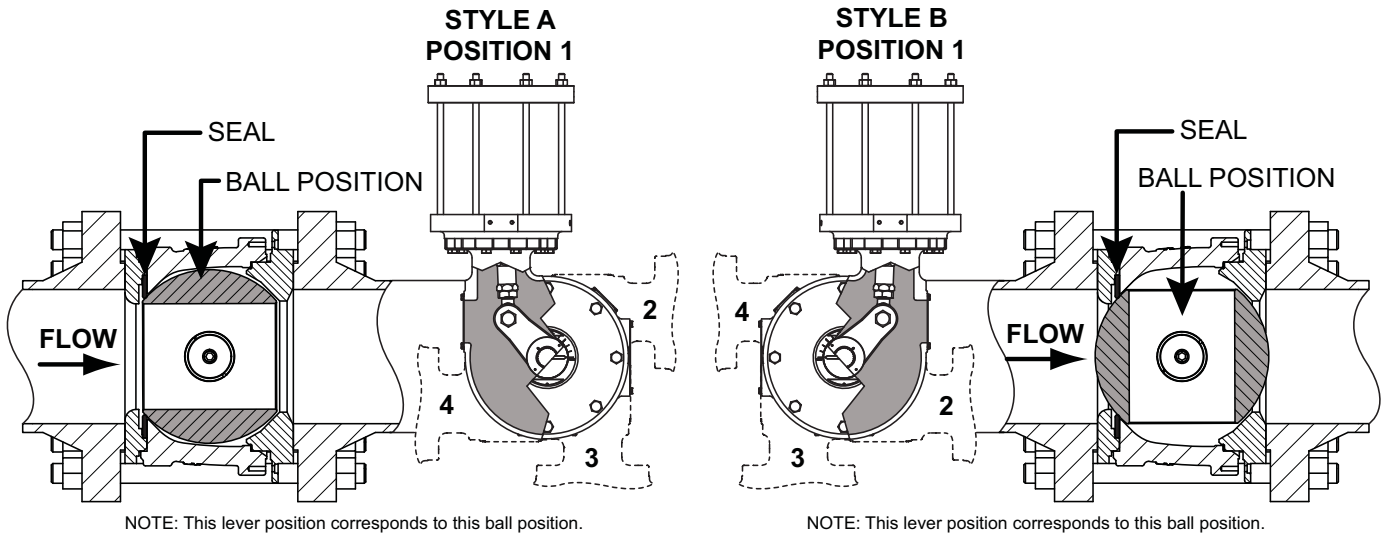
Figure 3 Model DFRP Mounting Positions



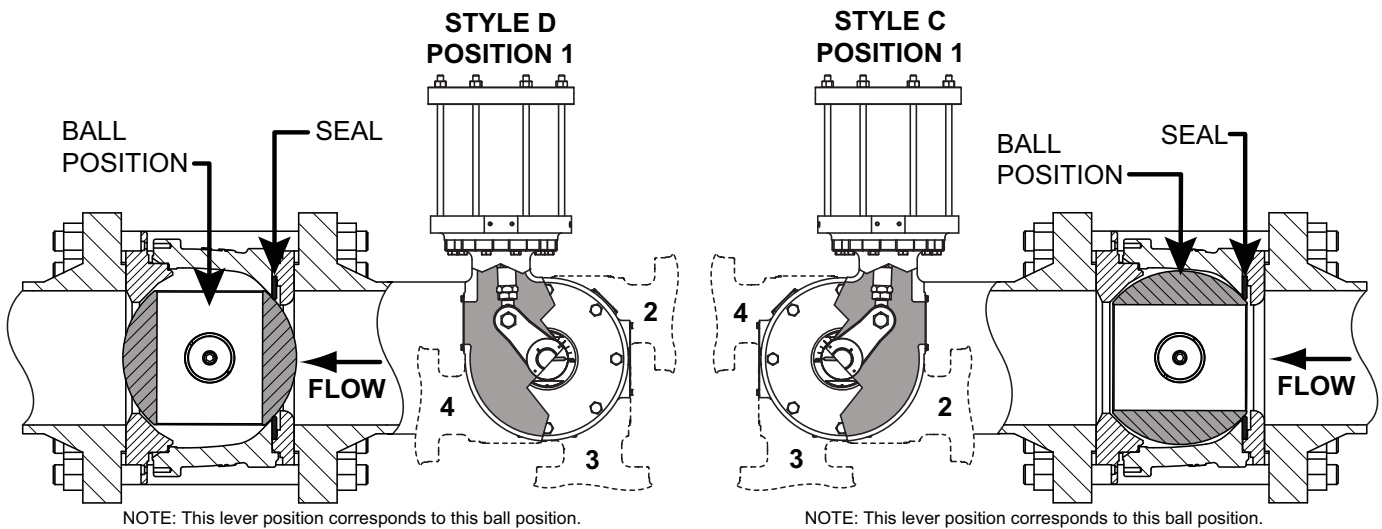
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RIGHT HAND MOUNTING - DFRP WITH 590 CONTROL VALVE



LEFT HAND MOUNTING - DFRP WITH 590 CONTROL VALVE



NOTES:

- Position 1 is standard. Positions 2 - 4 are optional.
- Forward Flow is into the face side of the ball sealing surface.
- Reverse Flow is into the hub side of the ball.

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Figure 4 Model DFRP Actuator Positions

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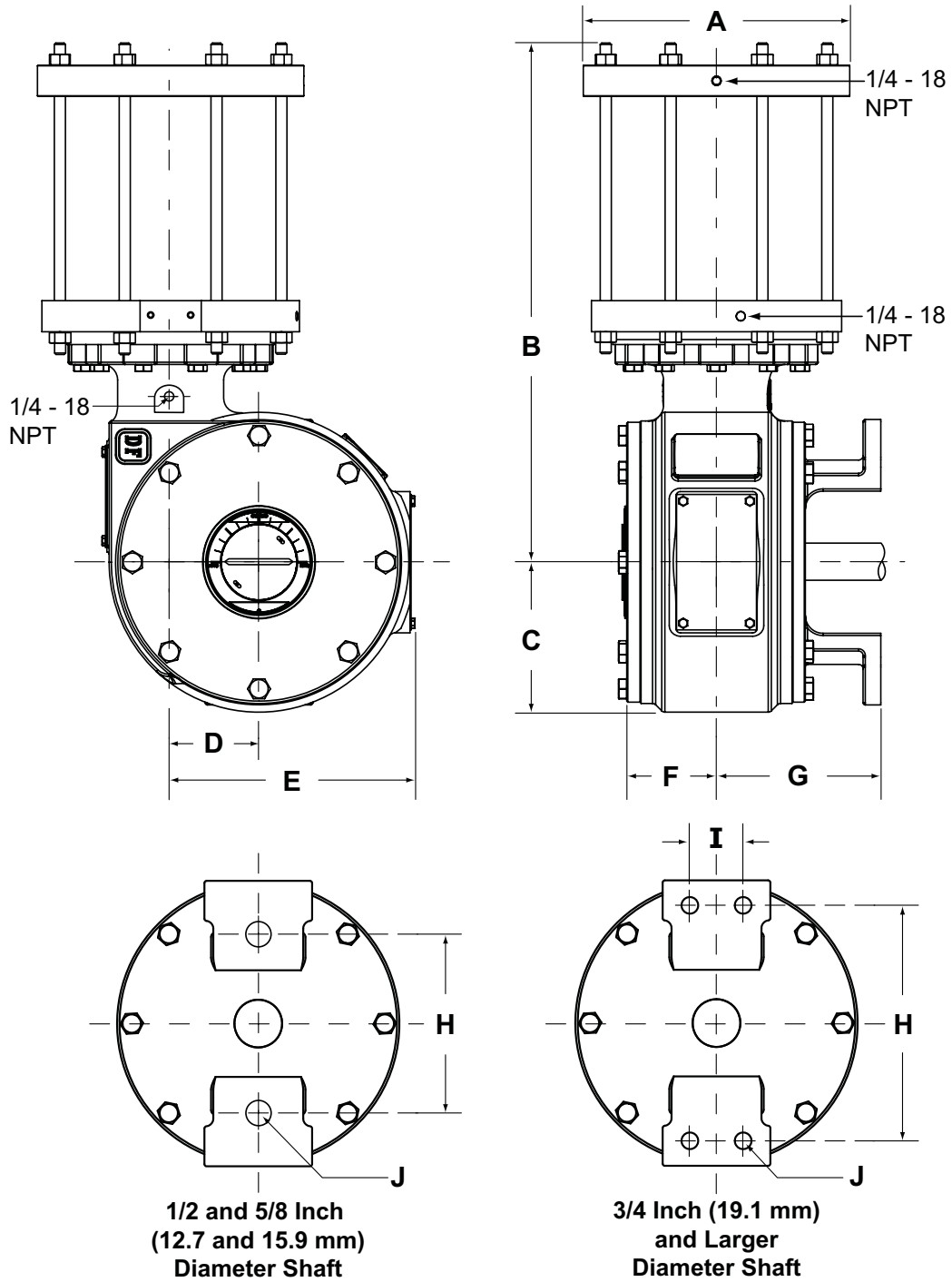


Figure 5 Model DFRP Actuator Dimensional Diagram



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Table 3

Model DFRP Actuator Dimensions

Actuator Size	Dimensional Reference inch (mm)					
	A	B	C	D	E	F
028	8.125 (206)	16.38 (416)	4.75 (121)	2.50 (63.5)	7.31 (186)	3.00 (76.2)
079	12.50 (318)	16.70 (424)	4.75 (121)	2.50 (63.5)	7.31 (186)	3.00 (76.2)
112	15.00 (381)	19.97 (507)	4.45 (113)	2.57 (65)	7.38 (187)	2.92 (74)
113	15.00 (381)	29.22 (742)	8.44 (214)	4.75 (121)	13.52 (343)	5.05 (128)
154	16.75 (425)	29.22 (742)	8.44 (214)	4.75 (121)	13.31 (338)	5.05 (128)

Table 4

Model DFRP Actuator Dimensions Continued

Valve Spline Shaft Diameter inch (mm)	Dimensional Reference inch (mm)			
	G	H	I	J
1/2 (12.7)	5.38 (137)	4.62 (117)	-	0.56 (14.3)
5/8 (15.9)	5.38 (137)	4.62 (117)	-	0.56 (14.3)
3/4 and 1 (19.1 and 25.4)	6.31 (160)	6.00 (152)	1.25 (31.7)	0.56 (14.3)
1-1/4 and 1-1/2 (31.8 and 38.1)	5.81 (148)	9.25 (235)	1.81 (45.9)	0.69 (17.5)
1-3/4 and 2 (44.5 and 50.8)	11.25 (286) ⁽¹⁾	10.75 (273)	2.00 (50.8)	0.81 (20.5)
2-1/2 (63.5)	9.25 (235)	13.25 (337)	3.00 (76.2)	0.94 (23.8)

NOTE: (1) - For Size 113 and 154 Actuators, Dimension 'G' is 9.25 inches (160 mm).

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Table 5

Model DFRP Cylinder Displacement for 90 Degree Rotation

Size	Piston Up inch ³ (cm ³)	Piston Down inch ³ (cm ³)
028	125 (2,048)	131 (2,147)
079	361 (5,916)	369 (6,047)
112	517 (8,472)	564 (9,242)
113	942 (15,437)	997 (16,338)
154	1,290 (21,139)	1,361 (22,303)

Table 6

Model DFRP Available Shaft Connection Sizes

Shaft Connection Size	Actuator Size				
	028	079	112	113	154
1/2 Inch					
5/8 Inch					
3/4 Inch	✓	✓	✓		
7/8 Inch	✓	✓	✓		
1 Inch	✓	✓	✓		
1-1/4 Inch	✓	✓	✓		
1-1/2 Inch	✓	✓	✓		
1-3/4 Inch	✓	✓	✓	✓	✓
2 Inch	✓	✓	✓	✓	✓
2-1/2 Inch				✓	✓



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Figure 6 Available Actuator Torque Sizes 028 to 112

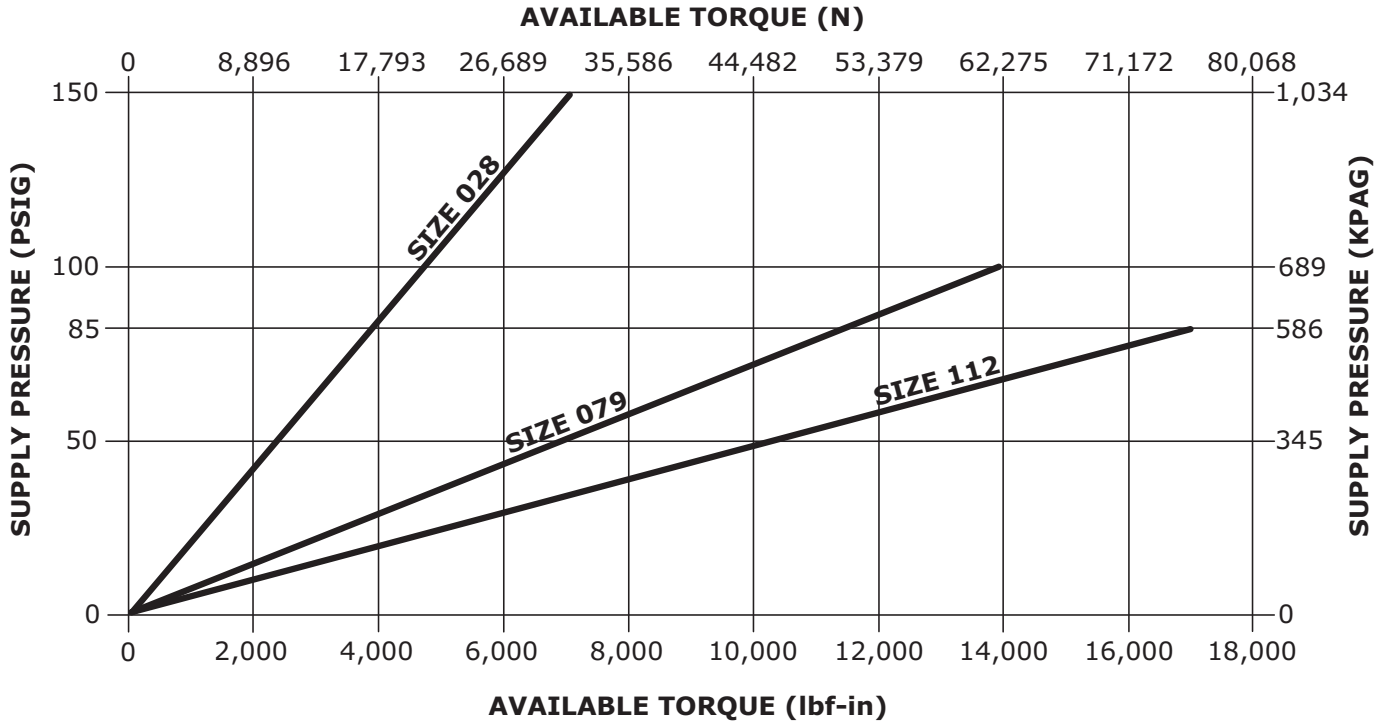
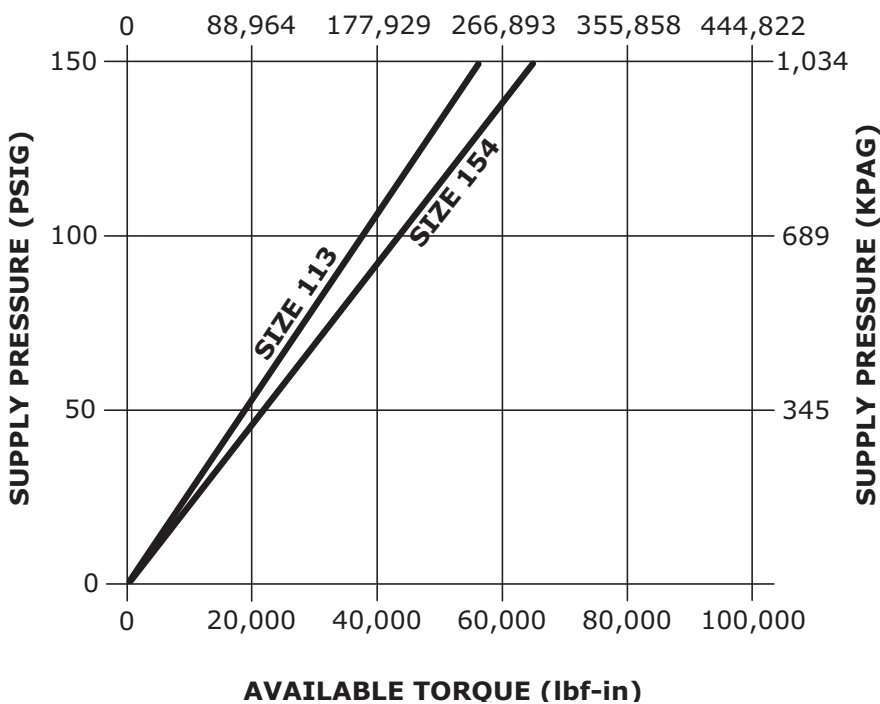


Figure 7 Available Actuator Torque Sizes 113 & 154



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Table 7

Model DFRP Torque Chart

ACTUATOR SIZE	PRESSURE Psig (kPag)	PISTON AREA inch ² (cm ²)	0 - 90° MAX TORQUE lbf-in (N·m)	TORQUE PER PSIG lbf-in (N·m)
028	150 (1,034)	28.27 (182)	7,104 (9,626)	47 (5.31)
079	100 (689)	78.54 (507)	13,800 (18,710)	175 (19.77)
112	85 (586)	113.10 (730)	16,896 (22,913)	199 (22.48)
113	150 (1,034)	113.10 (730)	56,004 (75,926)	373 (42.14)
154	150 (1,034)	153.94 (993)	65,004 (88,128)	433 (48.92)



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MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: DFRP-112-06-RA1-N

ACTUATOR							112	
028	SIZE 028	079	SIZE 079	112	SIZE 112	113		SIZE 113
154	SIZE 154	154	SIZE 154					
CYLINDER OPTIONS							-	
-	STANDARD							
SHAFT CONNECTION SIZE							06	
04	1/2 INCH	05	5/8 INCH	06	3/4 INCH	07		7/8 INCH
08	1 INCH	10	1-1/4 INCH	12	1-1/2 INCH	14		1-3/4 INCH
16	2 INCH	17	2-1/8 INCH	20	2-1/2 INCH			
PAINT							-	
-	DFPS-01 (STANDARD)			2	DFPS-02 (SEVERE SERVICE)			
3	DFPS-03 (HIGH TEMPERATURE)							
MOUNTING							RA1	
R	RIGHT HAND MOUNT - SEE FIGURE 3			L	LEFT HAND MOUNT - SEE FIGURE 3			
A	STYLE A B C D - SEE FIGURE 4							
1	POSITION 1 2 3 4 - SEE FIGURE 4 (STANDARD POSITION IS RIGHT HAND POSITION 1)							
N	NOT APPLICABLE							
OPTIONS							-	
-	NONE							
HANDWHEELS / ADJUSTABLE STOPS							N	
N	NONE							

DFRP - _____ - _____

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