



Stream-Flo Pneumatic Diaphragm Actuator

Overview

The Stream-Flo pneumatic diaphragm actuator (SPDA) line provides a practical and inexpensive alternative solution to automate gate valves used in the oil and gas industry. It is a suitable choice for a variety of key applications such as production trees, wellhead outlets, drilling and production

manifolds, and separation and storage manifold systems. Stream-Flo SPDA is supplied either as a full actuator/gate valve assembly or as an actuated bonnet assembly ready to mount on other manufacturers' valves.



Features and Benefits

- a. **Fail-safe actuation:** the SPDA is designed to safely close the gate valve upon loss of pneumatic pressure.
- b. **Bi-directional valves:** Stream-Flo valves offer a bi-directional gate, which allow reversing direction of flowline without impacting valve operation.
- c. **Adaptable for use on other manufacturers' valves:** The SPDA actuator bonnet can be adapted to work on valves from manufacturers. The actuators are designed to allow for the maximum available stroke on the market.
- d. **Corrosion protection:** The SPDA actuator is corrosion resistant against environmental conditions. Critical internal and external parts are either stainless steel or coated to maintain a clean actuation medium and smooth operation.
- e. **Over-pressure protection:** A pressure relief valve is included in the actuator assembly to protect operators and the actuator against over pressurization.
- f. **Metal-to-metal backseat:** The gate valve design offers a metal-to-metal backseat, which allows for packings to be replaced while the valve is in service.
- g. **Reliable bonnet seal design:** The bonnet includes a grease fitting to ease of lubricating the valve body. A tattletale weep port above the packing is included in the bonnet as a visual indication of the stem seal integrity.
- h. **Ease of maintenance:** The SPDA assembly includes few simple components, which makes it easy to maintain and inspect. An upper seal cartridge houses non-metallic seals and is removable for ease of seals replacement.



Specifications

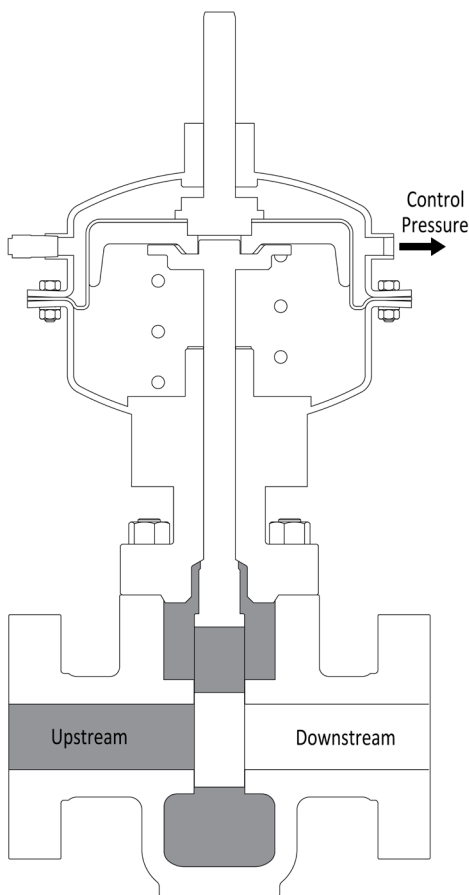
Actuator Specifications

API Material Class	AA
API Temperature Class	P (-20°F to 180°F)
Maximum Operating Pressure	170 psi
Test Pressure	255 psi

Bonnet Specifications

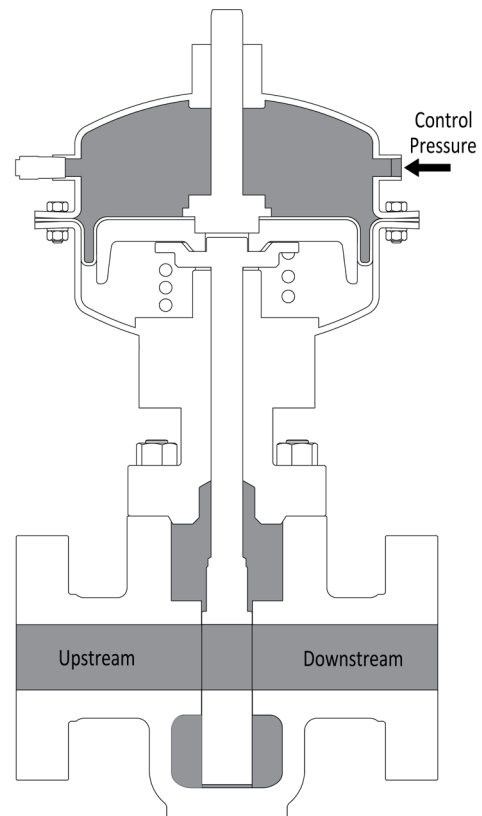
Available API Material Class	AA-HH
Available API Temperature Class	P-U (-20°F to 250°F)
Available Sizes	1-13/16" to 4-1/16"
Available Pressure Ratings	API 6A 2,000 to 15,000 psi
Available API Product Specification Level (PSL)	PSL-1, 2, or 3

ESD Fail-Safe Operation



Closed

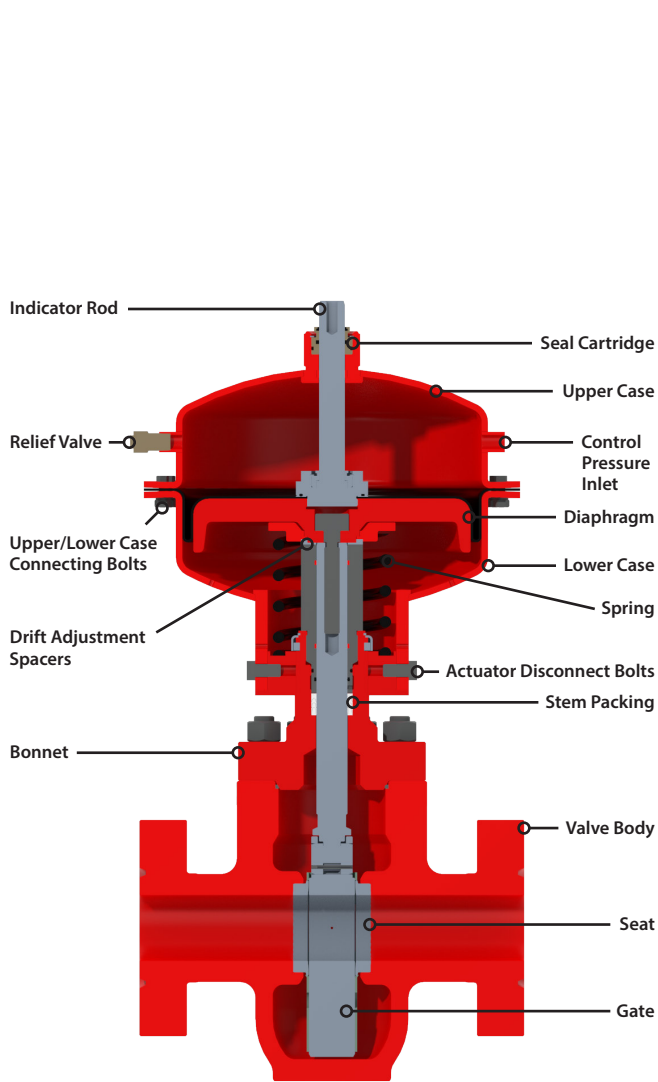
In the event of an emergency or abnormal conditions, the control pressure is released and an applied thrust load from the process line pressure and spring drive the gate to a closed position.



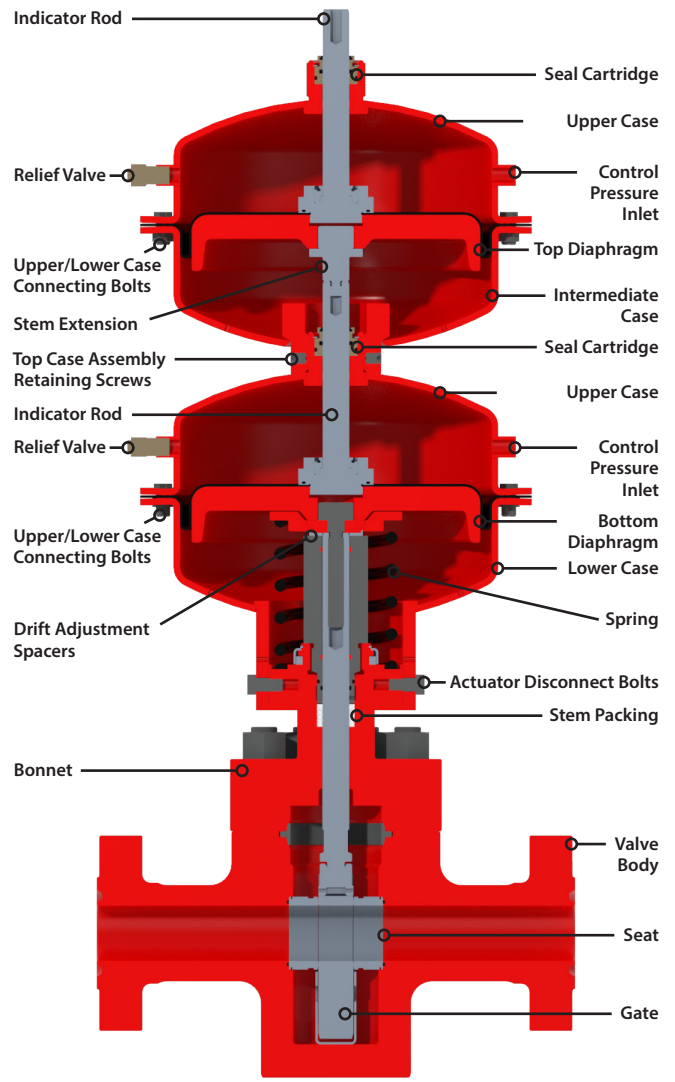
Open

Application of a clean pneumatic control pressure will drive and hold the gate/stem into an open position under normal operating conditions.

Internal Configuration



Single Actuator

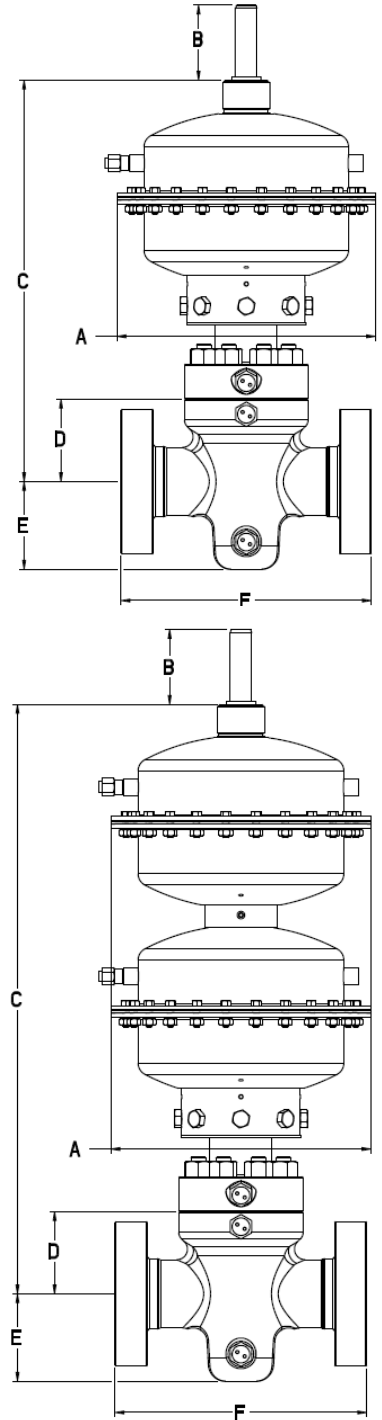


Tandem Actuator



Dimensional Data*

Valve Size (in)	Working Pressure (psi)	Stroke (in)	Actuator Model	Swept Volume (in ³)	Weight (lbs)	Major Dimensions (in)						
						A	B**	C	D	E	F	
1-13/16	10,000	2.250	SPDA-15	370	440	18.38	3.13 – 5.38	26.73	3.880	5.87	18.25	
			SPDA-18	529	510	21.13	3.20 – 5.45	28.05				
			SPDA-20	652	630	23.50	3.25 – 5.50	29.65				
			SPDA-12T	932	460	15.15	2.14 – 4.39	34.48				
			SPDA-15T	1490	600	18.38	3.13 – 5.38	40.05				
	15,000	2.250	SPDA-18	529	510	21.13	3.20 – 5.45	28.58	3.880	5.88	18.00	
SPDA-20			652	630	23.50	3.25 – 5.50	20.18					
SPDA-12T			932	460	15.15	2.14 – 4.39	35.66					
2-1/16	5,000	2.500	SPDA-10	172	240	13.13	0.51 – 3.01	22.69	4.813	5.12	14.62	
			SPDA-12	257	280	15.15	1.89 – 4.39	22.79				
	10,000	2.380	SPDA-15	392	445	18.38	3.00 – 5.38	27.10	4.005	5.75	20.50	
			SPDA-18	559	510	21.13	3.07 – 5.45	27.76				
			SPDA-20	690	630	23.50	3.12 – 5.50	29.78				
			SPDA-12T	986	460	15.15	2.01 – 4.39	23.76				
			SPDA-15T	1576	600	18.38	3.00 – 5.38	40.17				
	15,000	2.620	SPDA-18	615	590	21.13	2.83 – 5.45	29.08	4.875	7.00	19.00	
			SPDA-20	759	710	23.50	2.88 – 5.50	30.68				
			SPDA-15T	1735	675	18.38	2.76 – 5.38	14.07				
	2-9/16	5,000	3.000	SPDA-12	308	340	15.15	1.39 – 4.39	24.18	5.64	6.31	16.62
				SPDA-15	494	430	18.38	2.38 – 5.38	27.51			
10,000		3.000	SPDA-15	494	510	18.38	2.38 – 5.38	28.66	4.755	6.75	22.25	
			SPDA-18	705	575	21.13	2.45 – 5.45	29.33				
			SPDA-20	869	690	23.50	2.50 – 5.50	30.93				
			SPDA-12T	1243	530	15.15	1.39 – 4.39	24.72				
15,000		3.120	SPDA-20	904	720	23.50	2.38 – 5.50	32.57	5.630	8.12	21.00	
			SPDA-15T	2066	700	18.38	2.26 – 5.38	42.97				
3-1/8	3,000	3.875	SPDA-12	396	370	15.15	0.51 – 4.39	25.72	7.13	7.25	17.12	
			SPDA-15	636	455	18.38	1.50 – 5.38	28.94				
	5,000	3.875	SPDA-15	636	510	18.38	1.51 – 5.38	28.94	7.13	7.43	18.62	
			SPDA-18	908	575	21.13	1.57 – 5.45	30.00				
3-1/16	10,000	3.560	SPDA-20	1121	690	23.50	1.62 – 5.50	31.59	5.505	7.99	24.38	
			SPDA-12T	1603	530	15.15	0.51 – 4.39	37.07				
4-1/16	3,000	4.750	SPDA-18	834	700	21.13	1.89 – 5.45	30.50	8.38	9.12	20.12	
			SPDA-20	1030	815	23.50	1.94 – 5.50	31.11				
			SPDA-15	773	685	18.38	0.63 – 5.38	32.53				
	5,000	4.750	SPDA-18	1107	750	21.13	0.70 – 5.45	31.90	8.38	9.31	21.62	
			SPDA-20	1368	870	23.50	0.75 – 5.50	33.50				
			SPDA-15T	1959	920	18.38	0.63 – 5.38	44.79				

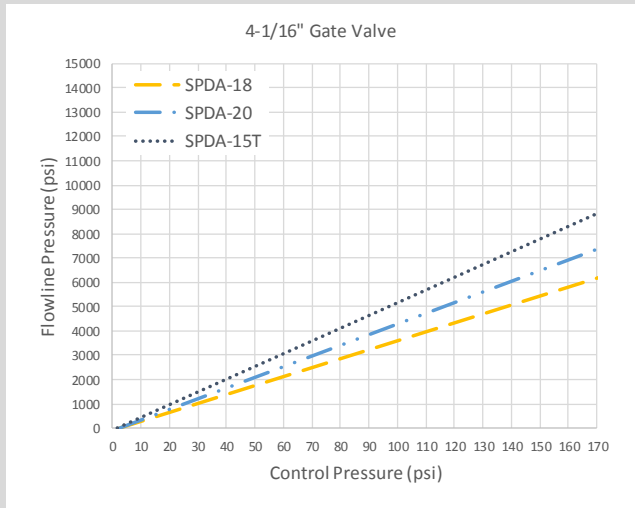
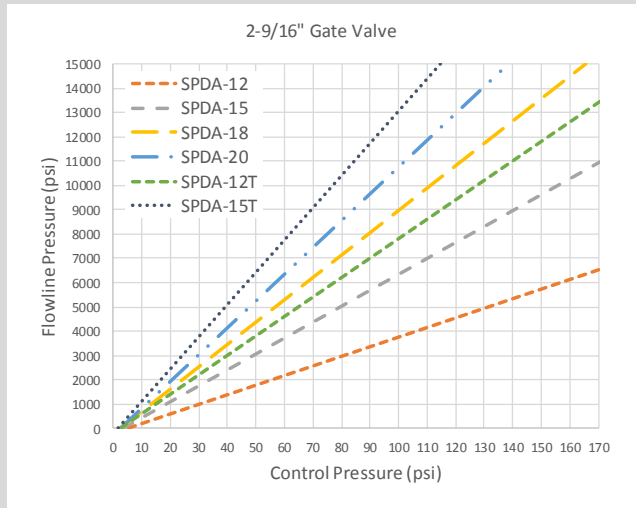
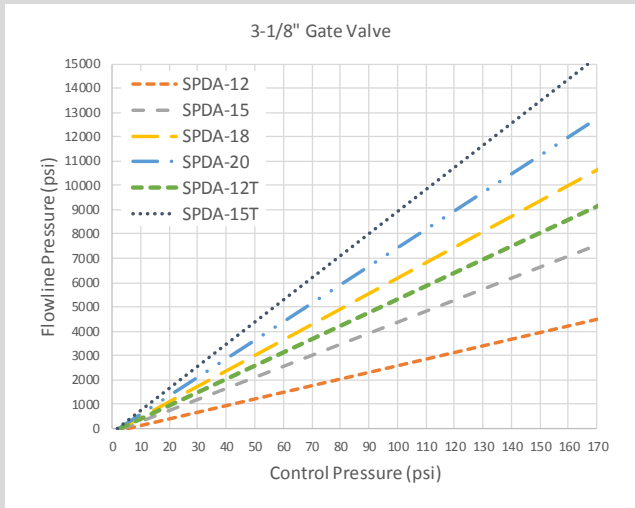
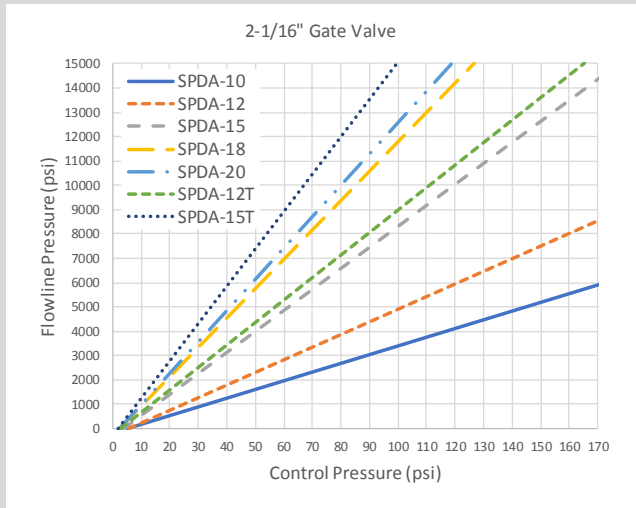
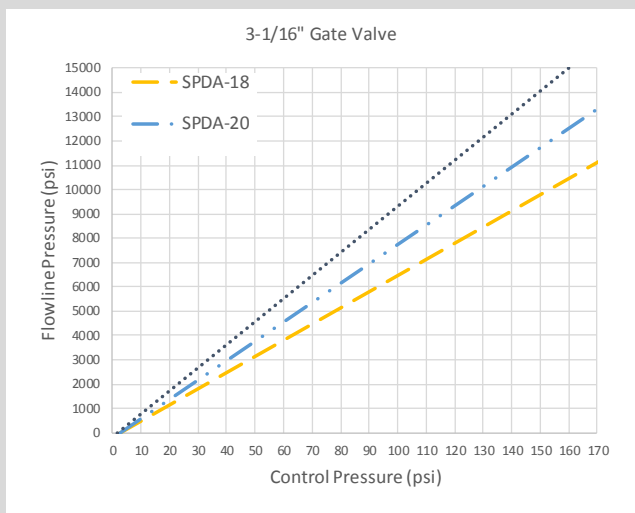
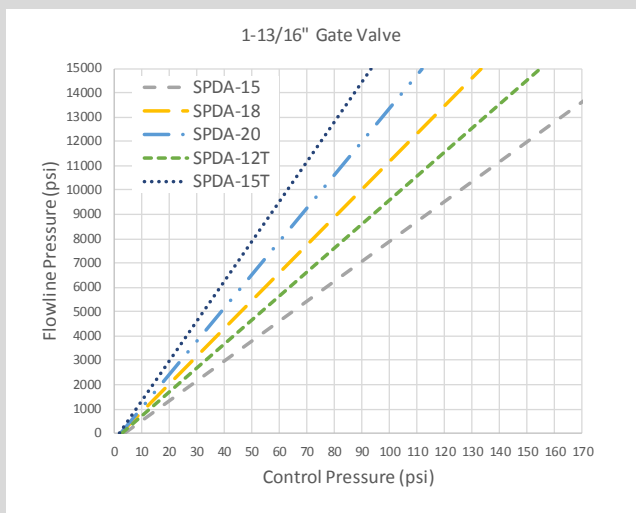


* Dimensions may vary between assemblies and are for reference only.
 SPDA-18 and SPDA-20 model sizes are currently not available.

** Range of dimensions between open and closed positions.



Control Pressure





Single Actuator

Bore Size	Working Pressure (psi)	SPDA-10		SPDA-12		SPDA-15		SPDA-18		SPDA-20	
		Equation	CP	Equation	CP	Equation	CP	Equation	CP	Equation	CP
1-13/16"	10,000					$(0.012 * WP) + 4$	124	$(0.009 * WP) + 2$	92	$(0.007 * WP) + 2$	72
	15,000							$(0.009 * WP) + 2$	137	$(0.007 * WP) + 2$	107
2-1/16"	5,000	$(0.028 * WP) + 5$	145	$(0.019 * WP) + 5$	100						
	10,000					$(0.013 * WP) + 4$	134	$(0.009 * WP) + 2$	92	$(0.008 * WP) + 2$	82
	15,000							$(0.009 * WP) + 2$	137	$(0.008 * WP) + 2$	122
2-9/16"	5,000			$(0.025 * WP) + 5$	130	$(0.015 * WP) + 4$	79				
	10,000					$(0.015 * WP) + 4$	154	$(0.011 * WP) + 2$	112	$(0.009 * WP) + 2$	92
	15,000									$(0.009 * WP) + 2$	137
3-1/8"	3,000			$(0.037 * WP) + 5$	116	$(0.022 * WP) + 4$	70				
	5,000					$(0.022 * WP) + 4$	114	$(0.016 * WP) + 2$	82	$(0.013 * WP) + 2$	67
3-1/16"	10,000							$(0.015 * WP) + 2$	153	$(0.013 * WP) + 2$	132
4-1/16"	3,000					$(0.038 * WP) + 4$	118	$(0.027 * WP) + 3$	83	$(0.023 * WP) + 2$	71
	5,000							$(0.027 * WP) + 3$	137	$(0.023 * WP) + 2$	117

Note: CP is the required control pressure to fully activate the actuator. WP is the flowline working pressure. SPDA-18 and SPDA-20 model sizes are currently not available.

Tandem Actuator

Bore Size	Working Pressure (psi)	SPDA-12T		SPDA-15T	
		Equation	CP	Equation	CP
1-13/16"	10,000	$(0.010 * WP) + 3$	103	$(0.006 * WP) + 2$	62
	15,000	$(0.010 * WP) + 3$	153	$(0.006 * WP) + 2$	92
2-1/16"	10,000	$(0.011 * WP) + 3$	113	$(0.007 * WP) + 2$	72
	15,000			$(0.006 * WP) + 2$	92
2-9/16"	10,000	$(0.012 * WP) + 3$	123	$(0.008 * WP) + 2$	82
	15,000			$(0.007 * WP) + 2$	107
3-1/8"	5,000	$(0.018 * WP) + 3$	93		
3-1/16"	10,000			$(0.011 * WP) + 2$	112
4-1/16"	5,000			$(0.019 * WP) + 2$	97

Note: CP is the required control pressure to fully activate the actuator. WP is the flowline working pressure. SPDA-18 and SPDA-20 model sizes are currently not available.



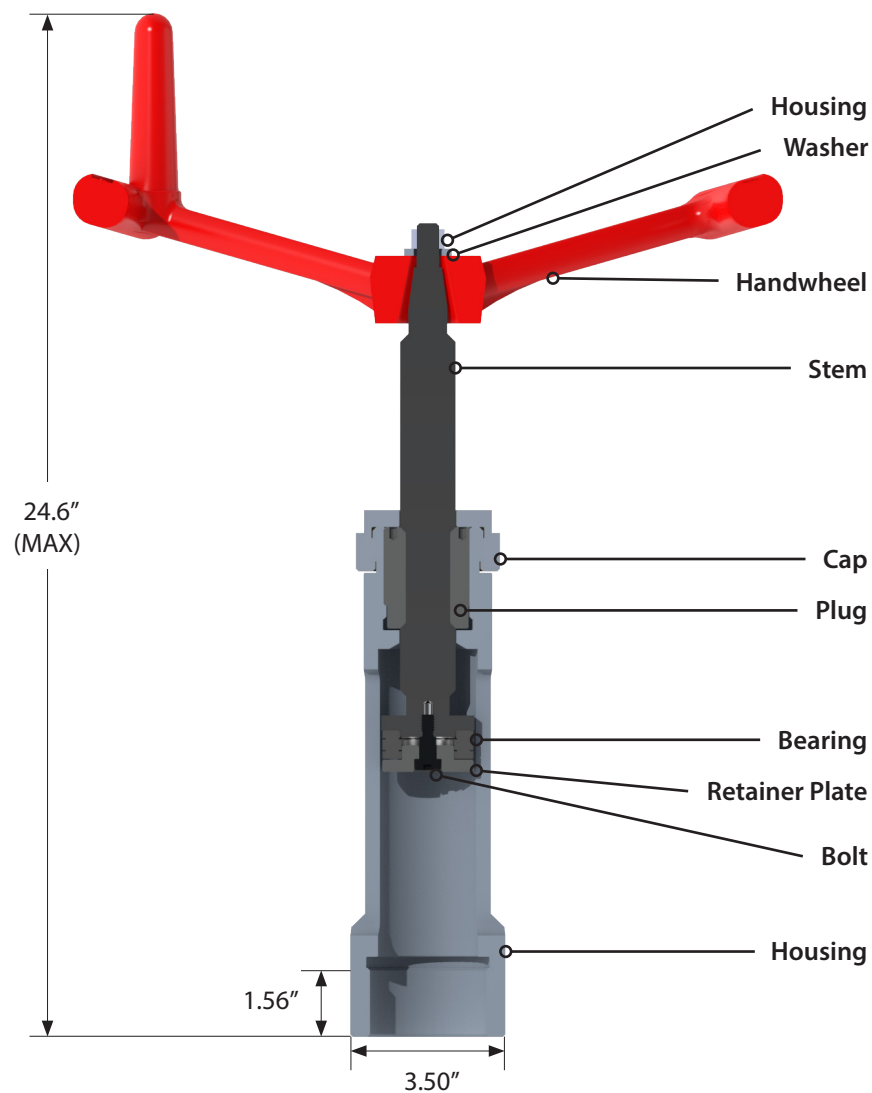
Accessories

Manual Override

The Stream-Flo manual override accessory is used to open a reverse acting gate valve when pneumatic pressure is unavailable to operate the SPDA actuator. It is threaded to the SPDA upper plug and uses a high thrust bearing to reduce the friction due to the high thrust.

The manual override materials of construction are corrosion protected alloy steel and stainless steel.

A fusible version is available for applications requiring tripping the gate valve in the event of a fire. It is designed and validated according to API 6A latest edition.



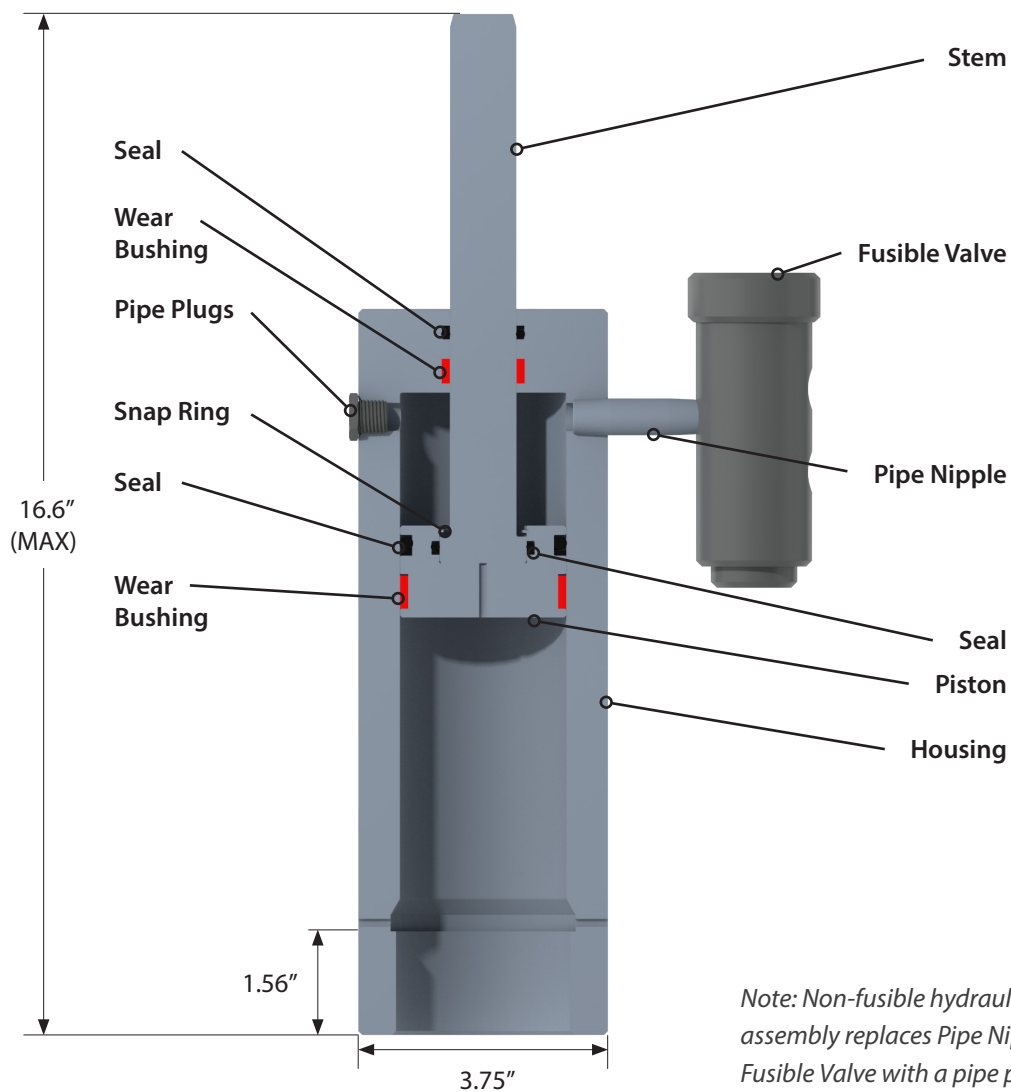
Accessories

Hydraulic Override

For higher thrust loads, a hydraulic override is available to operate the reverse acting gate valve in the absence of pneumatic pressure. The hydraulic override accessory can be operated using a portable hydraulic pump for simplified field operation.

The hydraulic override is constructed from corrosion protected alloy steel and stainless steel.

A fusible hydraulic override option is available that provides an automatic fail-safe activation of the gate valve during a fire incident. Elevated temperatures (multiple service temperature ratings are available) near the device during a fire incident will subsequently melt the fusible plug in the fusible valve allowing the normal actuator forces to move the gate valve into a fail-safe position.





Accessories

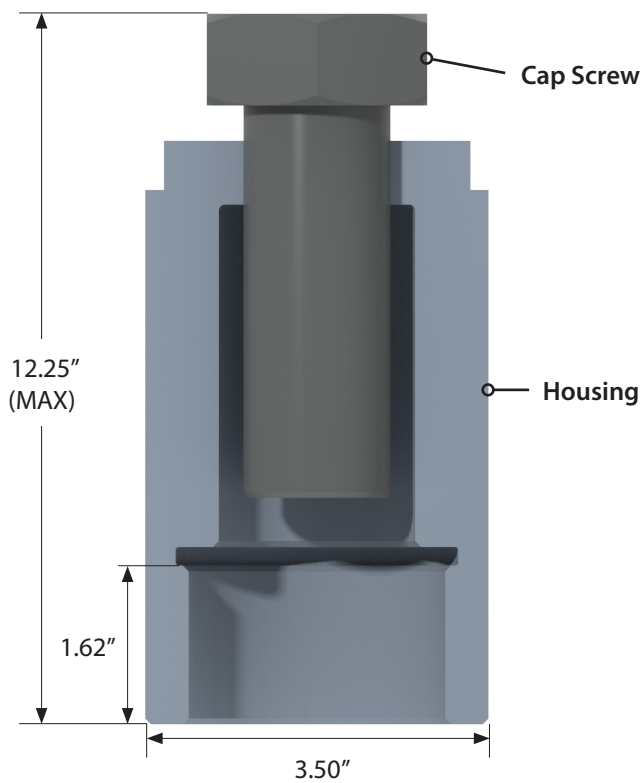
Manual Lock Open

The Stream-Flo manual lock open device is used to hold a reverse acting gate valve in the fully open position when pneumatic pressure is unavailable to hold open the SPDA actuator. The device is threaded to the actuator's upper plug.

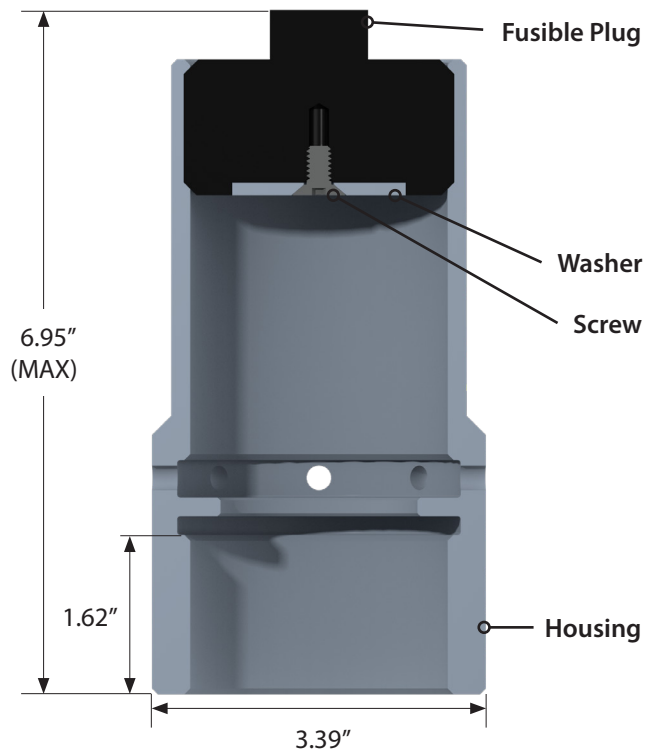
A fusible manual lock open cap assembly option is available that provides an automatic fail-safe activation of the gate valve during a fire incident. Elevated temperatures,

above 350°F, near the device during a fire incident will serve to melt the fusible plug allowing the normal actuator forces to move the gate valve into a fail-safe position. It is designed and validated according to API 6A latest edition.

The device is constructed from corrosion protected alloy steel and can hold open any size SPDA actuator/gate valve assembly.



Lock Open Device



Fusible Lock Open Device

Accessories

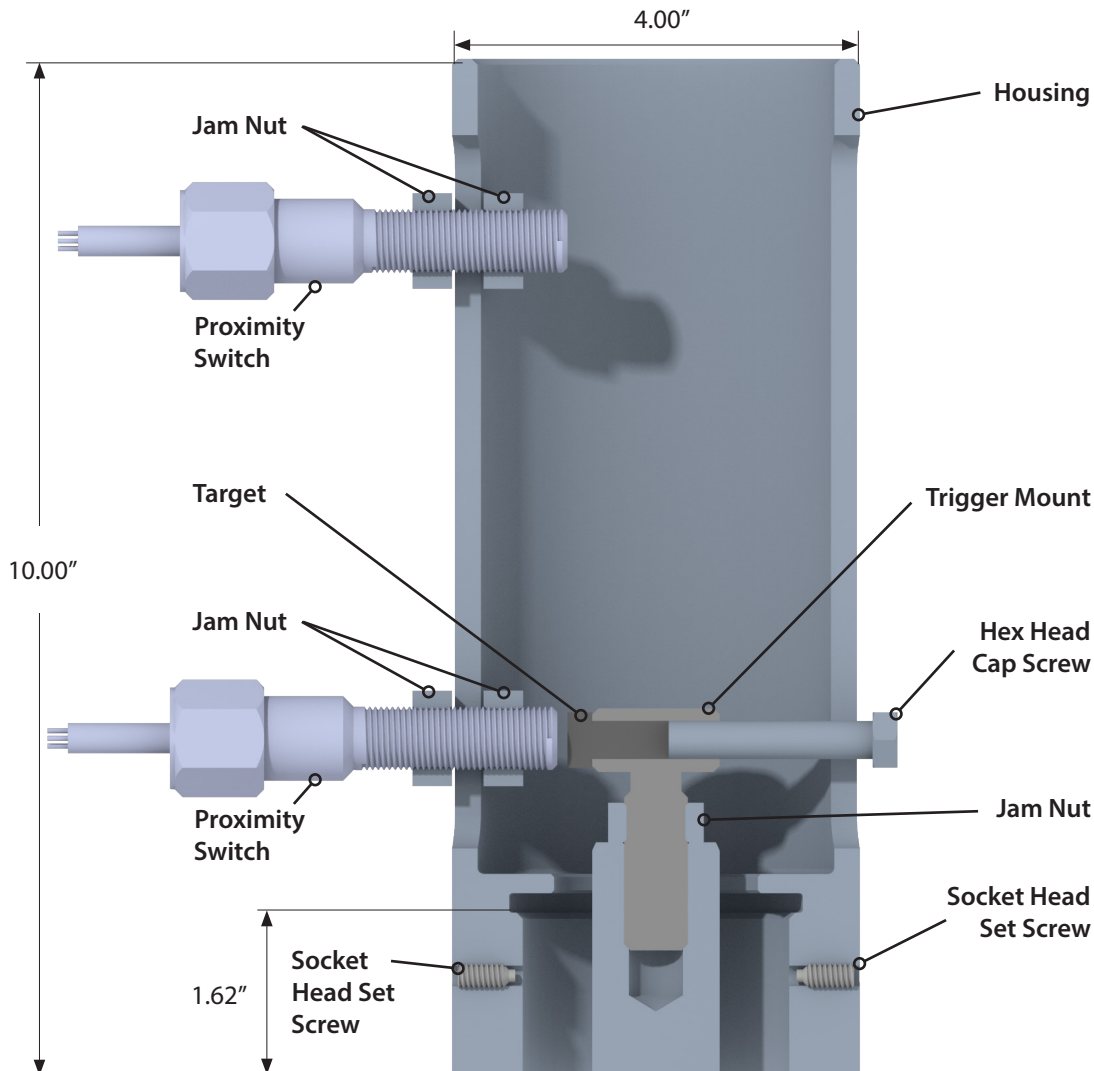
Limit Switch

The Stream-Flo proximity switch assembly is used to electronically monitor the valve position, open or closed. The assembly is designed to mount standard barrel-style limit switches with fine position adjustments to fit a large range of SPDA strokes.

Depending on the selected proximity switch technology, either a ferrous or magnetic target is mounted to a

holder on the actuator's rising stem to trigger the proximity switches. The assembly includes a side slot with a threaded element to the trigger mount to serve as a visual indicator for the open and closed positions.

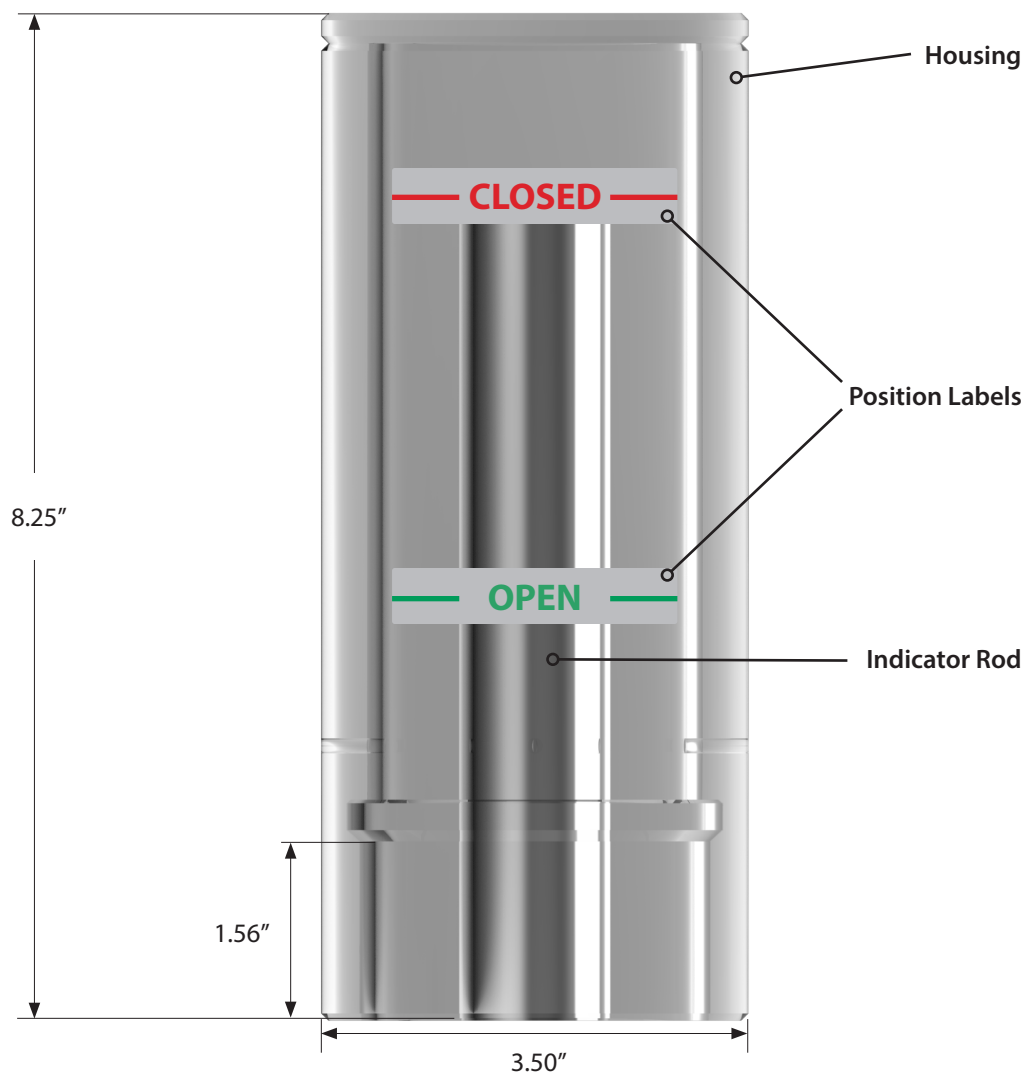
The assembly is constructed from corrosion protected alloy steel with all fasteners and the proximity switches made of stainless steel.



Accessories

Clear Stem Protector

The transparent stem protector is designed to shield the actuator's stem against damage that may negatively impact the integrity of the stem seal. The stem protector is made of a clear acrylic material to provide a visual reference to help in determining the position of the valve's gate. Open and closed position marks may be scribed in, or the user can use the provided position labels and place them onto the stem protector housing to provide a quick position reference point.





Head Office and Manufacturing Facility

4505 74 Avenue
Edmonton, Alberta, Canada T6B 2H5
Tel: 780.468.6789 | Fax: 780.469.7724

Sales and Marketing Office

700, 250 – 6 Ave SW
Calgary, Alberta, Canada T2P 3H7
Tel: 403.269.5531 | Fax: 403.266.3307

Stream-Flo USA Head Office

8726 Fallbrook Drive
Houston, Texas, USA 77064
Tel: 832.912.1022 | Fax: 281.653.1188

streamflo.com | info@streamflo.com

