

# spirax sarco®

## Type PF51G-BD (Bi-directional Normally Closed) Piston Actuated On/Off Valves

### Description

A 2-port bi-directional normally closed pneumatically actuated on/off bronze valve for use on water, air, oil and gases and can also be used on lower specification steam applications.

The valve is designed for special applications that require flow in both directions and incorporates an anti-waterhammer design for liquid applications flowing under the seat (ports 2 to 1).

A pneumatic signal acts below the actuator piston to open the valve.

A spring acts above the piston to close the valve. The valve plug has a PTFE soft seal to provide tight shut-off. A valve position indicator is included on standard and flow regulator models.

### Available types

PF51G-1BD normally closed with 45 mm diameter actuator

PF51G-2BD normally closed with 63 mm diameter actuator

PF51G-3BD normally closed with 90 mm diameter actuator

### Sizes and pipe connections

PF51G-1BD 1/2", 3/4" and 1" NPT

PF51G-2BD 1/2", 3/4", 1", 1-1/4", 1-1/2" and 2" NPT

PF51G-3BD 1", 1-1/4", 1-1/2" and 2" NPT

### Options

#### Travel switch

Relays an electrical signal to indicate open or closed position of the valve. Maximum rating: Voltage (V) = 500 V, Current (I) = 0.5 A, Power (P) = 30 VA. Available on 63 mm and 90 mm actuators with nomenclature suffix 'I'. i.e. PF51G-2BD-I-1" NPT

#### Stroke regulator

Limits valve lift to regulate maximum flow. Available on 63 mm and 90 mm actuators with nomenclature suffix 'R'. i.e. PF51G-2BD-R-1" NPT

#### Pilot Solenoid Valves

For direct mounting, use type "DM" Pilot Solenoid Valves.

(see TI-P373-04US for details)

For remote mounting for a series of PAV's, use type "DMD" banked Pilot Solenoid Valves. (see TIS 8.500 US for details)

For remote mounting for individual PAV's, at a panel or separate location, consult SSI for options.

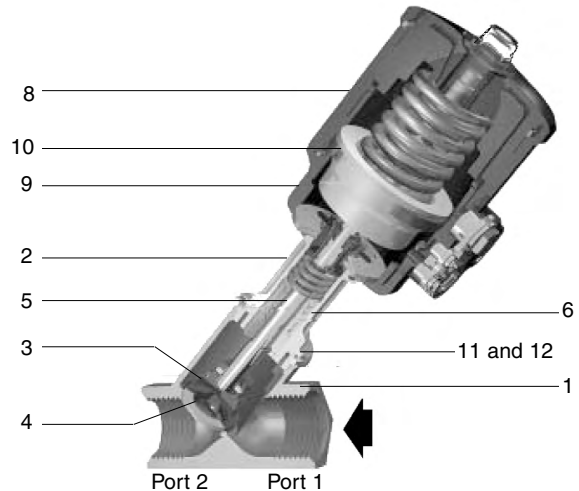
All Pilot Solenoid Valves are available in 240, 120, 24 VAC and 24 VDC voltages. (see applicable TI sheets)

### Technical details

Leakage	PTFE soft seal	ANSI class VI	
Flow characteristic	Fast opening	on / off	
Flow direction	Flow over seat	port 1 to 2	
Anti-waterhammer	Flow under seat	port 2 to 1	
Pilot media	Air, water or inert gas	(140°F max.)	
Actuator housing rotation	360°		
	Pilot connection	Max. pilot pressure	
Actuator size	45 mm (1-3/4") dia.	1/8" BSP	150 psig
	63 mm (2-1/2") dia.	1/4" BSP	150 psig
	90 mm (3-9/16") dia.	1/4" BSP	115 psig

### Limiting conditions

Maximum design temperature	356°F
Minimum design temperature	14°F
Maximum saturated steam pressure	130 psig
Maximum differential pressure	See table overleaf



### Materials

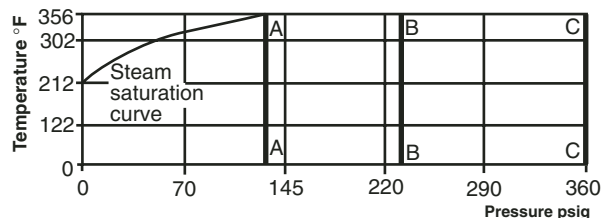
No.	Part	Material
1	Body	Bronze EN 1982 CC491K
2	Bonnet	Bronze EN 12165 CW617N
3	Plug	Stainless steel AISI 316L
4	Plug seal	PTFE
5	Valve stem	Stainless steel AISI 316
6	Stem seals	PTFE chevrons
*7	Stem 'O' ring	Viton
8	Actuator housing	Glass filled polyamide
9	Piston	Glass filled polyamide
10	Piston lip seal	Viton
11	Gasket	PTFE
12	'O' ring	Viton

\* not shown

### C<sub>v</sub>s values

Size	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
C <sub>v</sub>	4.7	8.8	19.6	29.4	45.5	57.8

### Operating range



A-A	Maximum operating pressure on saturated steam	130 psig
B-B	Maximum operating pressure on gas & liquids sizes 1-1/4" to 2"	230 psig
C-C	Maximum operating pressure on gas & liquids sizes 1/2" to 1"	360 psig

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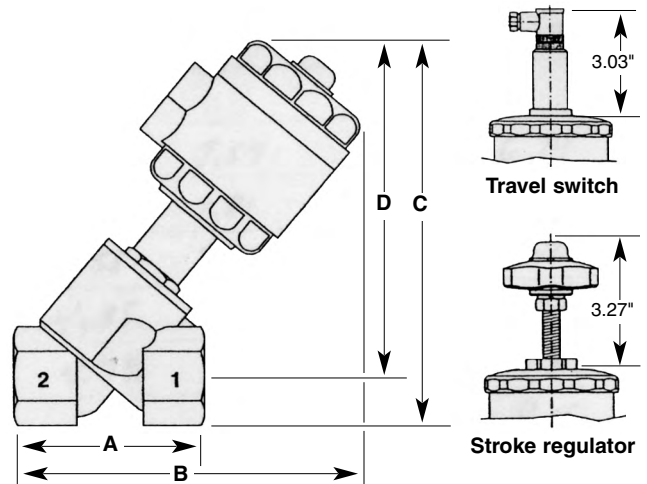
Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only.  
In the interests of development and improvement of the product, we reserve the right to change the specification.

# Type PF51G-BD (Bi-directional Normally Closed) Piston Actuated On/Off Valves

Dimensions / weight (approximate) in inches and lbs.

Port size (NPT)	Actuator Diameter inches	A inches	B inches	C inches	D inches	Bronze Weight pounds
1/2"	1-3/4" (45mm)	2.56	5.67	5.36	4.85	1.1
3/4"	1-3/4" (45mm)	2.96	6.11	5.63	5.12	1.8
1"	1-3/4" (45mm)	3.55	6.60	6.30	5.79	2.6
1/2"	2-1/2" (63mm)	2.56	7.57	7.25	6.74	2.0*
3/4"	2-1/2" (63mm)	2.96	7.81	7.57	6.94	2.9*
1"	2-1/2" (63mm)	3.55	8.36	8.08	7.29	3.5*
1-1/4"	2-1/2" (63mm)	4.35	8.87	8.55	7.61	4.4*
1-1/2"	2-1/2" (63mm)	4.73	9.06	8.87	7.81	5.3*
2"	2-1/2" (63mm)	5.91	9.78	9.50	8.16	6.0*
1"	3-9/16" (90mm)	3.55	8.76	8.44	7.67	4.6*
1-1/4"	3-9/16" (90mm)	4.34	9.27	8.94	7.96	5.5*
1-1/2"	3-9/16" (90mm)	4.73	9.42	9.26	8.16	6.2*
2"	3-9/16" (90mm)	5.91	10.13	9.85	8.51	7.1*

\* Plus 0.5 lbs. for travel switch or stroke regulator option

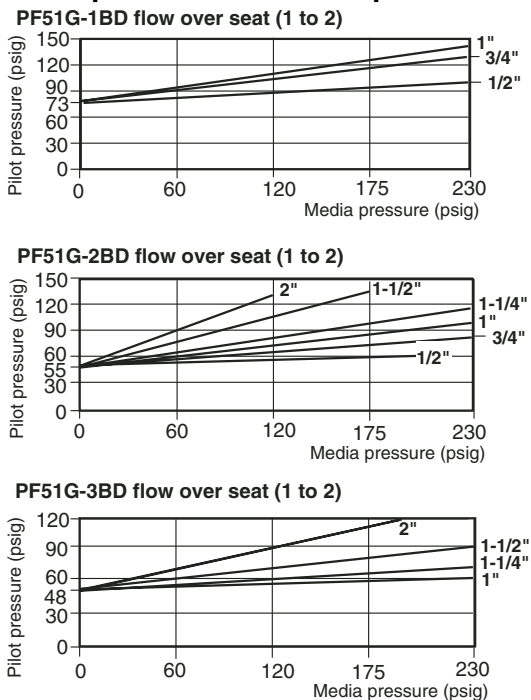


## Differential pressures for PF51G-BD (Normally closed) piston actuated valves

Model	Valve size (inches)	Actuator size (mm)	Flow direction (1 to 2)	Max diff.pres. (psig)	Max diff.pres. (psig)	Flow direction	Max diff.pres. (psig)	Max diff.pres. (psig)	Pilot pressure	
				gas & liquid	steam	(2 to 1)	gas & liquid	steam	min (psig)	max. (psig)
PF51G-1BD	1/2"	45	over seat	230	130	under seat	230*	130	73	150
PF51G-1BD	3/4"	45	over seat	230	130	under seat	100*	100*	73	150
PF51G-1BD	1"	45	over seat	230	130	under seat	75*	75*	73	150
PF51G-2BD	1/2"	63	over seat	230	130	under seat	230*	130	55	150
PF51G-2BD	3/4"	63	over seat	230	130	under seat	230*	130	55	150
PF51G-2BD	1"	63	over seat	230	130	under seat	160*	130	55	150
PF51G-2BD	1-1/4"	63	over seat	230	130	under seat	90*	90*	55	150
PF51G-2BD	1-1/2"	63	over seat	175	130	under seat	60*	60*	55	150
PF51G-2BD	2"	63	over seat	115	115*	under seat	36*	36*	55	150
PF51G-3BD	1"	90	over seat	230	130	under seat	200*	130	48	116
PF51G-3BD	1-1/4"	90	over seat	230	130	under seat	175*	130	48	116
PF51G-3BD	1-1/2"	90	over seat	230	130	under seat	115*	115*	48	116
PF51G-3BD	2"	90	over seat	200	130	under seat	75*	75*	48	116

\* Maximum differential pressures for all pilot pressures.

## Pilot / media pressure relationship



## Installation

The valve can be installed in any position with the direction of flow as indicated on the inlet/outlet ports by the connection numbers 1 to 2.

To simplify mounting of the pilot pressure line or solenoid valves, the actuator can be rotated through 360°.

The pipework should be supported to prevent the valve body being stressed.

Installation and Maintenance Instructions are provided with the valve.

## How to order

Standard Valve	1 - PF51G-2BD-1" NPT
Valve with travel switch	1 - PF51G-2BD-I-1" NPT
Valve with stroke regulator	1 - PF51G-2BD-R-1" NPT

## Spare parts

A seal kit is available for all valve and actuator sizes comprising: piston lip seal, actuator stem 'O' ring, plug soft seal (PTFE), body seal and 'O' ring.

## How to order spare seal kits

Always order spares by specifying the valve size, type and date code (given on actuator label i.e. 401=week 40, year 2001).

Example: 1-seal kit for PF51G-2BD-1" NPT date code 401

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