



PF6 Series Stainless Steel Piston Actuated On/Off Valves

Description

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

A pneumatic signal acts on the actuator piston to open or close the valve with a spring return action. The valve plugs have a PTFE soft seal (G) to provide a tight shut-off. A valve position indicator is included on standard and flow regulator models.

Valves are available with one of three sizes of actuator:

Type 1 (45 mm), **Type 2** (63 mm) and **Type 3** (90 mm) with the following action options:

- **NC (Normally Closed)** - These valves are designed for flow over the seat (port 1 to 2). Recommended for pneumatic applications. Not recommended for water applications.
- **NO (Normally Open)** - These valves are designed for flow under the seat (port 2 to 1). Can be used to prevent waterhammer on valve closure in liquid applications.
- **BD (Bi-Directional normally closed)** - These valves are designed for special applications that require flow in both directions and incorporates an anti-waterhammer design for liquid applications flowing under the seat (port 2 to 1).
Note: To help prevent the possibility of waterhammer on liquid applications flowing over the seat (port 1 to 2) the pressure should not exceed 15 psi g.

Optional extras (see 'Valve selection guide', page 10):

- Travel switch.
- Flow regulator.



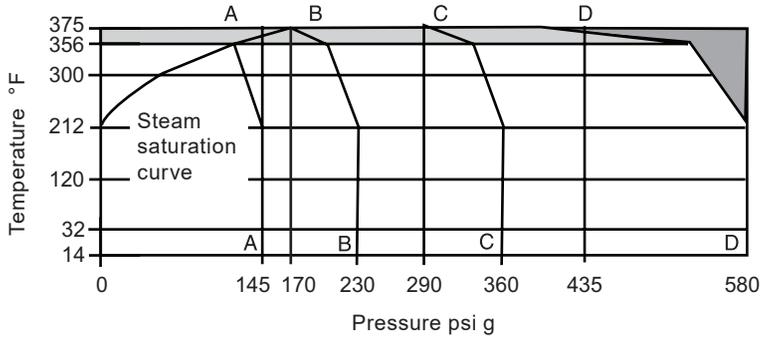
Sizes, pipe connections and actuator combinations

Valve type	Pipe connections	Actuator type	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	
PF61G	NPT or BSP	1	PTFE version	•	•				
		2	PTFE version	•	•	•	•	•	
			H version	•	•	•			
		3	PTFE version			•	•	•	•
			H version				•	•	•
		PF63G	Flanged to ANSI Class 150 or EN 1092 (welded on flanges)	2	PTFE version	•	•	•	•
H version	•				•	•			
3	PTFE version					•	•	•	•
	H version						•	•	•

Available range

Valve action	BSP or NPT	Butt weld	Flanged (EN 1092 or ANSI)	Socket weld
NC - Normally Closed (flow over seat)	PF61G - 1NC	PF62G - 1NC		PF64G - 1NC
	PF61G - 2NC	PF62G - 2NC	PF63G - 2NC	PF64G - 2NC
	PF61G - 3NC	PF62G - 3NC	PF63G - 3NC	PF64G - 3NC
NO - Normally Open (flow under seat)	PF61G - 1NO	PF62G - 1NO		PF64G - 1NO
	PF61G - 2NO	PF62G - 2NO	PF63G - 2NO	PF64G - 2NO
	PF61G - 3NO	PF62G - 3NO	PF63G - 3NO	PF64G - 3NO
BD - Bi-Directional normally closed (flow over or under seat)	PF61G - 1BD	PF62G - 1BD		PF64G - 1BD
	PF61G - 2BD	PF62G - 2BD	PF63G - 2BD	PF64G - 2BD
	PF61G - 3BD	PF62G - 3BD	PF63G - 3BD	PF64G - 3BD

Pressure/temperature limits



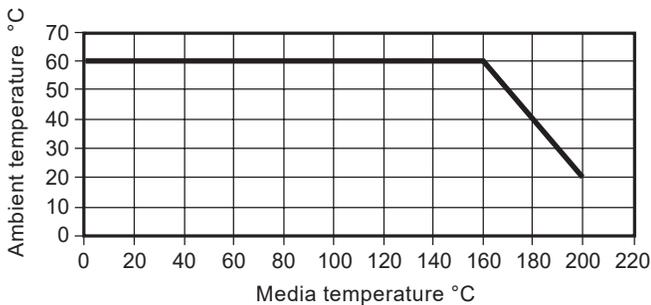
- A - A** PN10
- B - B** PN16 and ANSI 150
- C - C** PN25
- D - D** PN40

The product **must not** be used in this region or beyond the body design conditions quoted in the table below as damage to the internals will occur.

High temperature stem seals (Option H) are required for use in this region.

Body design conditions	NPT, BSP	1/2" - 2"
	Flanged ANSI 150	
PMA	Maximum allowable pressure	Refer to the graph
TMA	Maximum allowable temperature	356 °F
	Minimum allowable temperature	14 °F
PMO	Maximum operating pressure	130 psi g @ 356 °F
TMO	Maximum operating temperature	356 °F
	Minimum operating temperature	14 °F
	(Note: For lower operating temperatures consult Spirax Sarco.)	
ΔPMX	Maximum differential pressure	(see page 4)
	Designed for a maximum cold hydraulic test pressure of:	1.5 x PMA (PN rating)
PTMX	Maximum test pressure is equal to the $\sqrt{\Delta PMX}$	

Temperature degradation



Technical details

Leakage		PTFE soft seal	ANSI class V1
Flow characteristic		Fast opening	On/off
Flow direction	PF6_G-NC	Flow over seat	Port 1 to 2
	PF6_G-NO	Flow under seat	Port 2 to 1
	PF6_G-BD	Flow over seat	Port 1 to 2
		Flow under seat	Port 2 to 1
Pilot media		Air or water	140 °F maximum
Actuator rotation		360 °	
Actuator type and size		Pilot connection	Maximum pilot pressure
	Type 1 = 45 mm diameter	1/8" BSP	150 psi g
	Type 2 = 63 mm diameter	1/4" BSP	150 psi g
	Type 3 = 90 mm diameter	1/4" BSP	115 psi g

C_v values

Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
C_{vs}	4.9	9.0	22	31	49	60

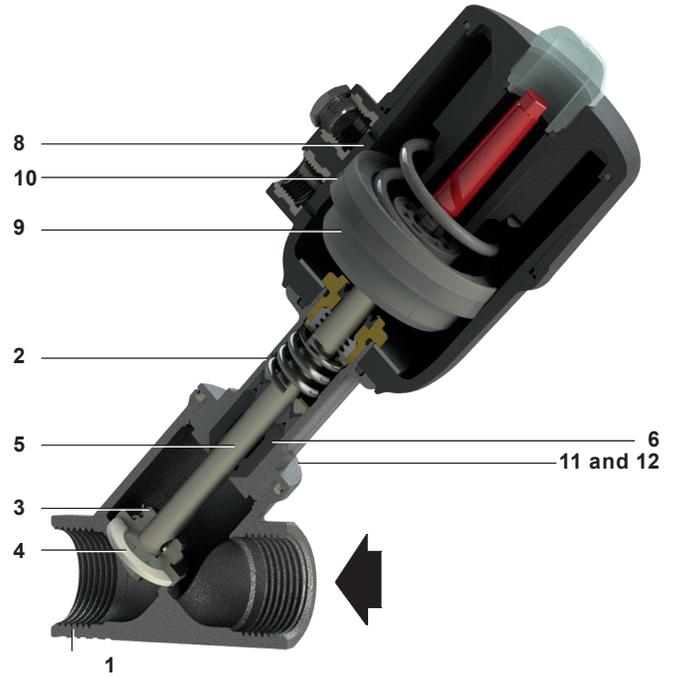
Materials

No. Part	Material	
1	Body	Stainless steel AISI 316L
2	Bonnet	Stainless steel AISI 316L
3	Plug	Stainless steel AISI 316L
4	Valve plug seal	Modified PTFE G500
5	Valve stem	Stainless steel AISI 316L
6	Standard	PTFE + 25% carbon graphite filled PTFE + FKM chevron
	Option H	25% carbon graphite filled PTFE + FKM chevron
7	Stem 'O' ring	FKM
8**	Actuator housing	30% glass filled polyamide (for H version PA66)
9	Piston	50% glass filled polyamide
10	Piston lip seal	NBR
11	Gasket	PTFE
12	'O' ring	FKM

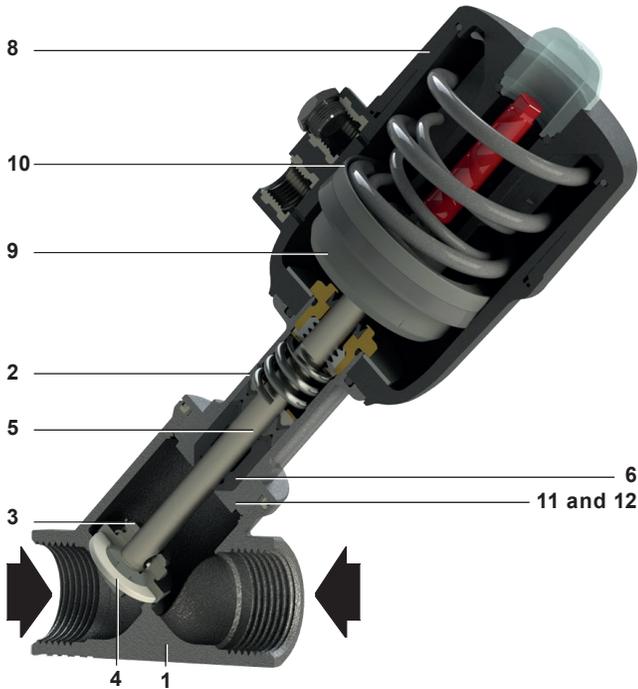
* **Note** Item 7 is not shown.

** **Note** Optional stainless steel actuator available on request.

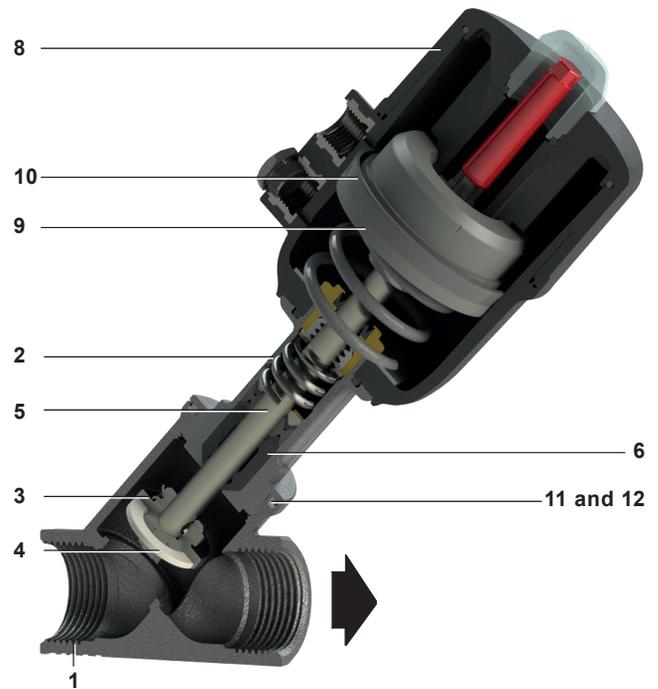
NC (Normally Closed)



BD (Bi-Directional normally closed)



NO (Normally Open)



ΔPMX - Maximum differential pressures for PF6 piston actuated valves

- *Notes:**
1. Maximum differential pressure for saturated steam service is 130 psi g.
 2. Sanitary clamp connections are limited to PN10 pressure rating.
 3. ANSI flange connections are limited to ANSI 150 pressure rating.

PF6_G-NC (Normally closed)

Model	Valve size	Actuator diameter (mm)	Flow direction (port 1 to 2)	*Maximum differential pressure (psi g)	Pilot Pressure	
					Minimum (psi g)	Maximum (psi g)
PF6_G-1NC	½"	45	over seat	230	26	150
	¾"	45	over seat	230	26	150
PF6_G-2NC	½"	63	over seat	290	57	150
	¾"	63	over seat	290	67	150
	1"	63	over seat	290	75	150
	1¼"	63	over seat	230	83	150
	1½"	63	over seat	230	128	150
	2"	63	over seat	160	113	150
PF6_G-3NC	1"	90	over seat	290	44	115
	1¼"	90	over seat	230	44	115
	1½"	90	over seat	230	58	115
	2"	90	over seat	220	84	115

* See Notes at the top of this page

PF6_G-NO (Normally open)

Model	Valve size	Actuator diameter (mm)	Flow direction (port 2 to 1)	*Maximum differential pressure (psi g)	Pilot Pressure	
					Minimum (psi g)	Maximum (psi g)
PF6_G-1NO	½"	45	under seat	230	26	150
	¾"	45	under seat	230	26	150
	½"	63	under seat	230	41	145
	¾"	63	under seat	230	65	145
PF6_G-2NO	1"	63	under seat	230	83	145
	1¼"	63	under seat	230	97	145
	1½"	63	under seat	230	127	145
	2"	63	under seat	175	139	145
PF6_G-3NO	1"	90	under seat	230	65	116
	1¼"	90	under seat	230	58	116
	1½"	90	under seat	230	78	116
	2"	90	under seat	230	101	116

* See Notes at the top of this page

ΔPMX - Maximum differential pressures for PF6 piston actuated valves (continued)

- *Notes:**
1. Maximum differential pressure for saturated steam service is 130 psi g.
 2. ANSI flange connections are limited to ANSI 150 pressure rating.

PF6_G-BD (Bi-Directional normally closed)

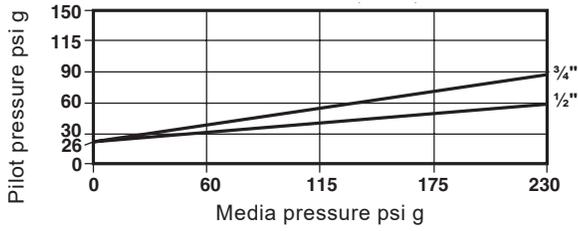
Model	Valve size	Actuator diameter (mm)	Flow direction (port 1 to 2)	*Maximum differential pressure (port 1 to 2) (psi g)	Flow direction (port 2 to 1)	*Maximum differential pressure (port 2 to 1) (psi g)	Pilot pressure	
							Minimum (psi g)	Maximum (psi g)
PF6_G-1BD	½"	45	over seat	230	under seat	230	60	150
	¾"	45	over seat	230	under seat	100	60	150
	½"	63	over seat	230	under seat	230	61	150
	¾"	63	over seat	230	under seat	230	61	150
PF6_G-2BD	1"	63	over seat	230	under seat	160	61	150
	1¼"	63	over seat	230	under seat	87	61	150
	1½"	63	over seat	175	under seat	60	61	150
	2"	63	over seat	115	under seat	36	61	150
	1"	90	over seat	230	under seat	205	55	115
PF6_G-3BD	1¼"	90	over seat	230	under seat	175	55	115
	1½"	90	over seat	230	under seat	115	55	115
	2"	90	over seat	205	under seat	73	55	115

* See Notes at the top of this page

Pilot/media pressure relationship

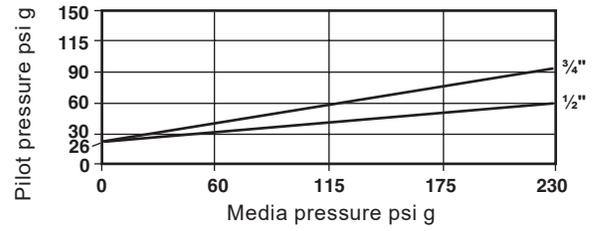
PF6_G-NC (Normally Closed)

PF6_G-1NC flow over seat (1 to 2)

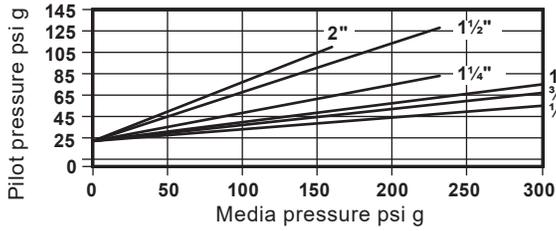


PF6_G-NO (Normally Open)

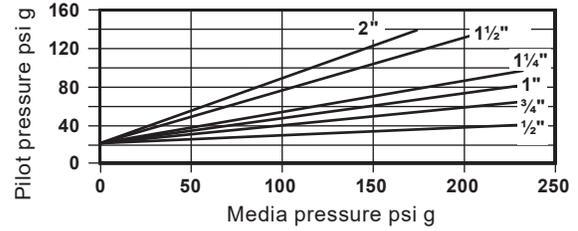
PF6_G-1NO flow under seat (2 to 1)



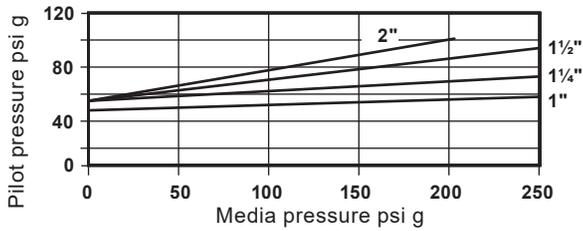
PF6_G-2 NC flow over seat (1 to 2)



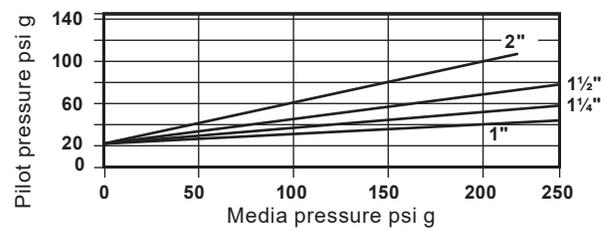
PF6_G-2NO flow under seat (2 to 1)



PF6_G-3 NC flow over seat (1 to 2)

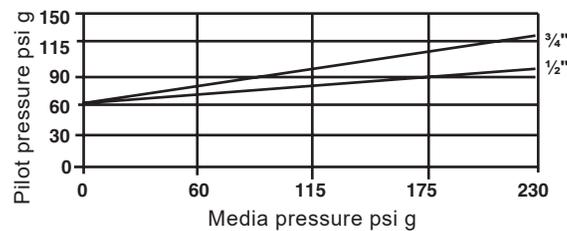


PF6_G-3NO flow under seat (2 to 1)

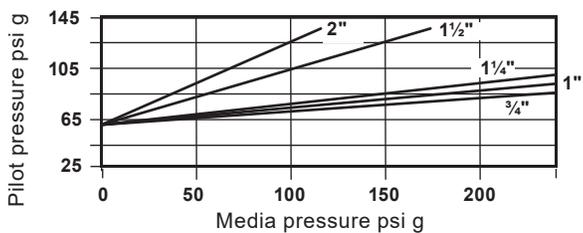


PF6_G-BD (Bi-Directional normally closed)

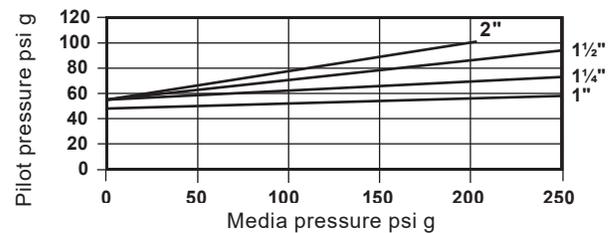
PF6_G-1BD flow over seat (1 to 2)



PF6_G-2BD flow over seat (1 to 2)



PF6_G-3BD flow over seat (1 to 2)

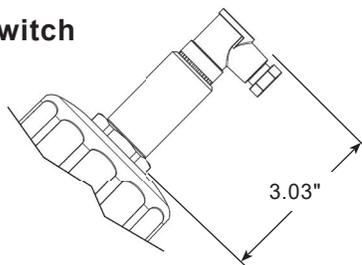


Dimensions and weights (approximate) in inches and lbs.

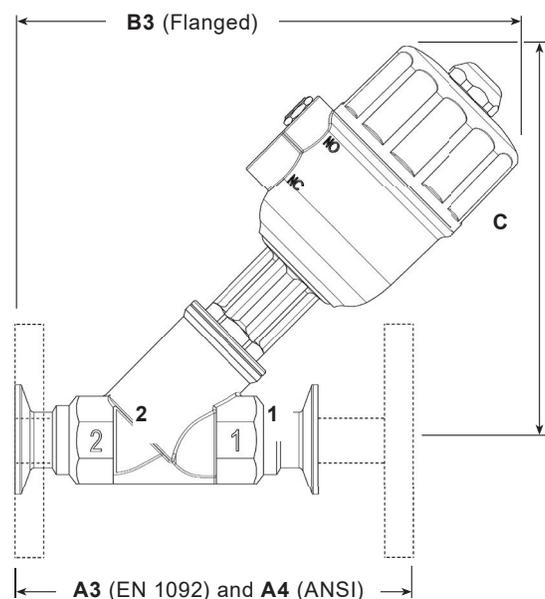
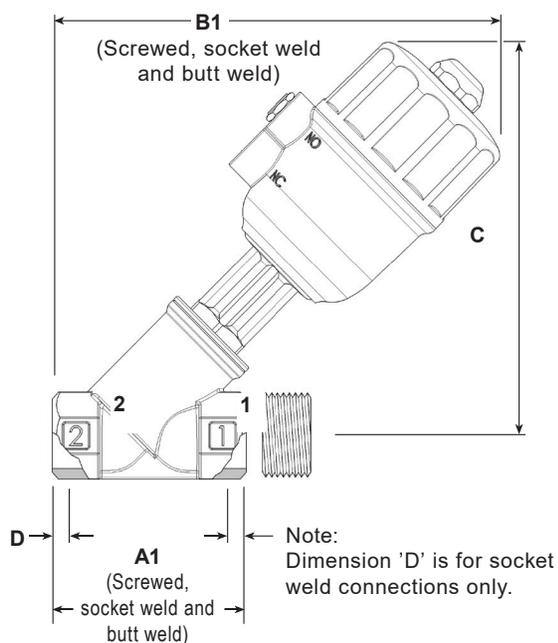
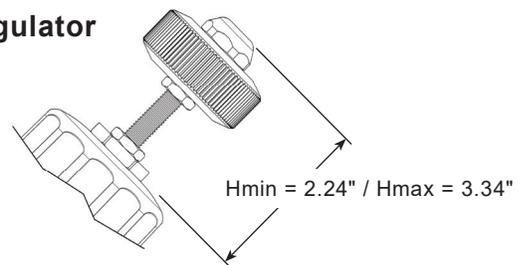
Valve size	Actuator type and size	Screwed, socket weld and butt weld					Flanged				
		A1	B1	C	D†	Weight	EN 1092 A3	ANSI 150 A4	B3	C	Weight
½"	1 (45 mm)	2.56	5.67	4.85	.20	1.8	-	-	-	-	-
	2 (63 mm)	2.56	7.56	6.74	.20	2.7	5.12	5.51	8.59	7.65	5.5
¾"	1 (45 mm)	2.96	6.11	4.97	.28	2.0	-	-	-	-	-
	2 (63 mm)	2.96	7.80	6.93	.28	2.9	5.91	6.00	9.30	8.28	6.4
1"	2 (63 mm)	3.55	8.35	7.29	.32	3.3	6.31	6.50	9.42	8.20	8.2
	3 (90 mm)	3.55	8.79	7.72	.32	4.9	6.31	6.50	9.85	8.63	9.5
1¼"	2 (63 mm)	4.33	8.87	7.60	.39	4.2	7.09	7.26	9.93	8.51	12.2
	3 (90 mm)	4.33	9.22	7.96	.39	5.3	7.09	7.26	10.37	8.95	13.0
1½"	2 (63 mm)	4.73	9.06	7.80	.47	5.3	7.88	8.00	10.13	8.67	14.2
	3 (90 mm)	4.73	9.42	8.16	.47	5.8	7.88	8.00	10.56	9.14	15.2
2"	2 (63 mm)	5.91	9.77	8.16	.63	6.4	9.06	9.00	10.84	9.06	19.0
	3 (90 mm)	5.91	10.13	8.51	.63	7.3	9.06	9.00	11.27	9.46	20.0

Notes: * Add 0.5 lbs. for travel switch or flow regulator options (not available for use with the Type 1 actuator).
 † Dimension 'D' is for socket weld connections only.

*** Travel switch**



*** Flow regulator**



Valve selection guide

Valve type	P = Piston valve	P
Valve characteristic	F = Fast opening	F
Body material	6 = Stainless steel	6
Connections	1 = BSP or NPT	1
	3 = Flanged EN 1092 or ANSI Class 150 (welded on flanges)	
Valve plug seal	G = PTFE	G
Actuator type	1 = 45 mm diameter	2
	2 = 63 mm diameter	
	3 = 90 mm diameter	
Valve position	NC = Normally Closed	NC
	NO = Normally Open	
	BD = Bi-Directional	
Valve size	½", ¾", 1", 1¼", 1½", 2"	1"
Optional	I = Travel switch	I
	R = Flow regulator	

Provides indication of open or closed valve position through a magnetic reed switch with volt free contacts.

Maximum rating: Voltage (V) = 500 V,
Current (I) = 0.5 A,
Power (P) = 30 VA.

Available on Type 2 and Type 3 actuators with suffix 'I' if this option is required. Provides manual control of maximum flow through the valve. Can also provide manual shut-off on normally open valves. Available on Type 2 and Type 3 actuators with suffix 'R' if this option is required.

Note: Shaded areas represent fixed parameters

Valve selection guide example	PF6	1	G	2	NC	1"	I	SS, 63mm, Normally Closed, NPT TravelSwitch
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How to order

Example: 1 of Spirax Sarco PF61G-2NC-1" NPT- I stainless steel piston actuated on/off valve having NPT connections, with travel switch

Spare parts

A seal kit is available for all valve and actuator sizes comprising: Piston lip seal, stem 'O' ring, valve head 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 the actuator label i.e. 120 = week 12, year 2000).

Example: 1 of Seal kit for a 1" PF61G-2NC, date code 120.

Safety information, installation and maintenance

For full details, see the Installation and Maintenance Instructions supplied with the product.

Installation note

These valves can be mounted in any orientation. The actuator can be rotated 360 ° in the direction indicated on the product label to facilitate easy pilot mounting connection.

Associated equipment

Pilot solenoid

Type DM 3-port two way electropneumatic pilot solenoid valve that can be directly mounted (banjo connection) to the PF61G-NC, NO and BD series piston actuated valves to provide actuator pilot pressure to open normally closed or close normally open valves. Suitable for air or water operating media. The valve is supplied with a DIN connector. For full details refer to the relevant Technical Information Sheet.

Please refer to TI-P373-04 or IM-P373-12 for more information.

Available types



Model	Type	Actuator	Frequency/Voltage	Actuator Connection	Line Connection
DM11N	1	45 mm	230/50 or 240/60 Vac	1/8" BSP	1/8" NPT
DM12N	1	45 mm	110/50 or 120/60 Vac		
DM13N	1	45 mm	24/50 or 24/60 Vac		
DM14N	1	45 mm	24 Vdc		
DM21N	2	63 mm	230/50 or 240/60 Vac	1/4" BSP	
DM22N	2	63 mm	110/50 or 120/60 Vac		
DM23N	2	63 mm	24/50 or 24/60 Vac		
DM24N	2	63 mm	24 Vdc		
DM31N	3	90 mm	230/50 or 240/60 Vac		
DM32N	3	90 mm	110/50 or 120/60 Vac		
DM33N	3	90 mm	24/50 or 24/60 Vac		
DM34N	3	90 mm	24 Vdc		