



PF6 Stainless Steel Piston Actuated On/Off Valves

Description

A 2-port pneumatically actuated on / off stainless steel valve for use on steam, water, air, oil and gases. A pneumatic signal acts on the actuator piston to open or close the valve with a spring return action. A valve position indicator is included on standard and flow regulator models. **Standard** versions have PTFE stem seals for operation up to 180 °C. **Optionally**, high temperature stem seals (**H**) can be provided for operation up to 200 °C.

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)** - Designed for flow over the seat (port 1 to 2). **Caution:** Not recommended for waterhammer prevention.
- **NO (Normally Open)** - 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)** - 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 1 bar g.



Optional extras (see 'Valve selection guide', page 8):

Travel switch	Flow regulator	Position module
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Sizes, pipe connections and actuator combinations

Valve type and pipe connections	Actuator type and version	DN15 1/2"	DN20 3/4"	DN25 1"	DN32 1 1/4"	DN40 1 1/2"	DN50 2"
PF60G Threaded spigots to ISO 228 / 1 (DN50 to ISO 338)	1 PTFE version	•	•				
	2 PTFE version	•	•	•	•	•	•
PF61G Screwed to BSP or NPT	2 H version	•	•	•			
	3 PTFE version			•	•	•	•
PF62G Butt weld to DIN 11850 pipe, ASME B 36.10 / ISO 65 pipe	3 H version				•	•	•
	PF65G Sanitary clamp to ISO 2852 or ASME BPE 1,2						
PF63G Flanged to EN 1092 or ASME Class 150 (welded on flanges)	2 PTFE version	•	•	•	•	•	•
	2 H version	•	•	•			
	3 PTFE version			•	•	•	•
	3 H version				•	•	•

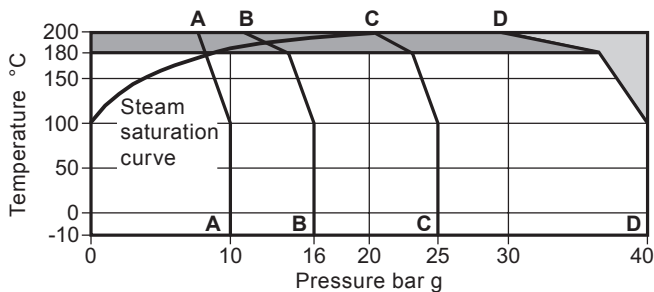
Notes:

1. DN32 is not available with ASME BPE end connections.
2. Clamp and clamp gasket are not included.

Available range

Valve action	Screwed (BSP or NPT)	Butt weld	Flanged (EN 1092 or ASME)	Sanitary clamp	Threaded spigots
NC - Normally Closed (flow over seat)	PF61G-1NC	PF62G-1NC		PF65G-1NC	PF60G-1NC
	PF61G-2NC	PF62G-2NC	PF63G-2NC	PF65G-2NC	PF60G-2NC
	PF61G-3NC	PF62G-3NC	PF63G-3NC	PF65G-3NC	PF60G-3NC
NO - Normally Open (flow under seat)	PF61G-1NO	PF62G-1NO		PF65G-1NO	PF60G-1NO
	PF61G-2NO	PF62G-2NO	PF63G-2NO	PF65G-2NO	PF60G-2NO
	PF61G-3NO	PF62G-3NO	PF63G-3NO	PF65G-3NO	PF60G-3NO
BD - Bi-Directional normally closed (flow over or under seat)	PF61G-1BD	PF62G-1BD		PF65G-1BD	PF60G-1BD
	PF61G-2BD	PF62G-2BD	PF63G-2BD	PF65G-2BD	PF60G-2BD
	PF61G-3BD	PF62G-3BD	PF63G-3BD	PF65G-3BD	PF60G-3BD

Pressure / temperature limits



- A - A** PN10
- B - B** PN16 and ASME 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	Screwed, butt weld, threaded spigots and flanged EN 1092	DN15 - DN25 (½" - 1")	PN40
		DN32 and DN40 (1¼" - 1½")	PN25
		DN50 (2")	PN16
	Flanged ASME	DN15 - DN50 (½" - 2")	Class 150
	Sanitary clamp compatible connections	DN15 - DN50	PN10
Maximum design pressure	Refer to the graph above		
Maximum design temperature	200 °C		
Minimum design temperature	-10 °C		
Maximum operating pressure for saturated steam service	Standard seals	9 bar g @ 180 °C	
	High temperature seals - Option H	14.5 bar g @ 200 °C	
Maximum operating temperature	Standard seals	180 °C @ 9 bar g	
	High temperature seals - Option H	200 °C @ 14.5 bar g	
Minimum operating temperature	(Note: For lower operating temperatures consult Spirax Sarco)		-10 °C
Ambient temperature limits	Maximum	60 °C	
	Minimum	-10 °C	
Maximum differential pressure	(see page 4)		
Designed for a maximum cold hydraulic test pressure of:	1.5 x PMA (PN rating)		
Maximum test pressure is equal to the maximum differential pressure			

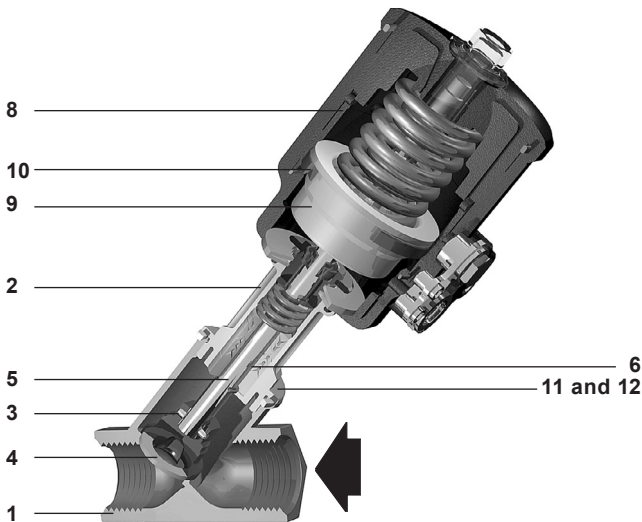
Technical details

Leakage		TFM 1600 soft seal	ASME Class VI
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	Instrument air or inert gases - For use with other flow media contact Spirax Sarco		60 °C maximum
Actuator rotation	360°		
Actuator type and size	Type 1 = 45 mm diameter	Pilot connection	Maximum pilot pressure
	Type 2 = 63 mm diameter	1/8" BSP	10 bar g
	Type 3 = 90 mm diameter	1/4" BSP	10 bar g
		1/4" BSP	8 bar g

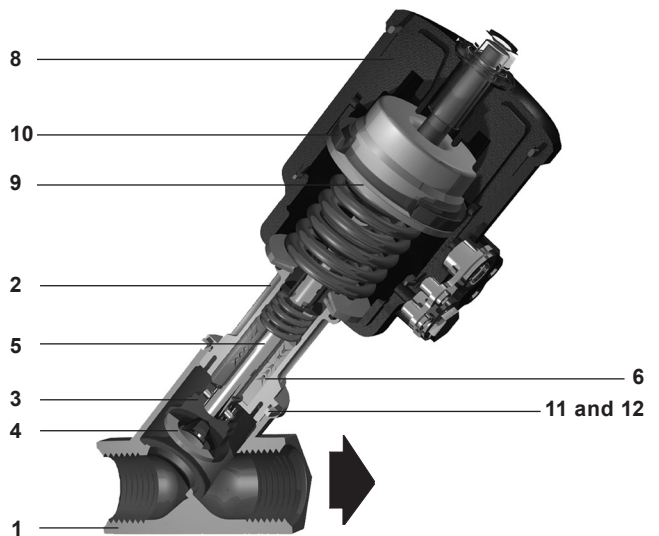
Kvs values

Size	DN15 1/2"	DN20 3/4"	DN25 1"	DN32 1 1/4"	DN40 1 1/2"	DN50 2"	For conversion: $C_v (UK) = K_v \times 0.963$ $C_v (US) = K_v \times 1.156$
K_{vs}	4.5	8.0	15.6	24.6	42.0	57.0	

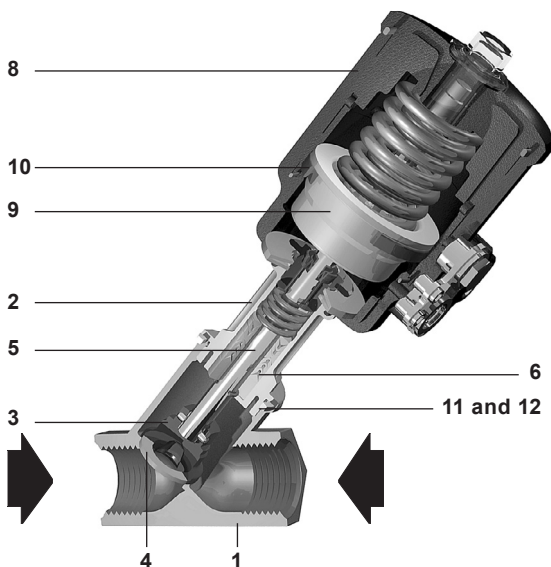
NC (Normally Closed)



NO (Normally Open)



BD (Bi-Directional normally closed)



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	Stem seals	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.

ΔPMX - Maximum differential pressures for PF6 piston actuated valves

*** Notes:**

1. Maximum differential pressure for saturated steam service is 11.5 bar g and 14.5 bar g for high temperature valve versions.
2. Sanitary clamp connections are limited to PN10 pressure rating.
3. ASME flange connections are limited to ASME 150 pressure rating.

PF6_G-NC (Normally closed)

Model	Valve size	Actuator diameter (mm)	Flow direction (port 1 to 2)	* Maximum differential pressure (bar)	Pilot Pressure	
					Minimum (bar)	Maximum (bar)
PF6_G-1NC	DN15 - (1/2")	45	over seat	16	1.8	10
	DN20 - (3/4")	45	over seat	16	1.8	10
	DN15 - (1/2")	63	over seat	20	1.5	10
	DN20 - (3/4")	63	over seat	20	1.5	10
PF6_G-2NC	DN25 - (1")	63	over seat	20	1.5	10
	DN32 - (1 1/4")	63	over seat	16	2.8	10
	DN40 - (1 1/2")	63	over seat	16	2.8	10
	DN50 - (2")	63	over seat	11	2.8	10
PF6_G-3NC	DN25 - (1")	90	over seat	20	1.0	8
	DN32 - (1 1/4")	90	over seat	16	2.8	8
	DN40 - (1 1/2")	90	over seat	16	2.8	8
	DN50 - (2")	90	over seat	15	2.8	8

* see Notes at the top of this page

PF6_G-NO (Normally open)

Model	Valve size	Actuator diameter (mm)	Flow direction (port 1 to 2)	* Maximum differential pressure (bar)	Pilot Pressure	
					Minimum (bar)	Maximum (bar)
PF6_G-1NO	DN15 - (1/2")	45	under seat	16	1.8	10
	DN20 - (3/4")	45	under seat	16	1.8	10
	DN15 - (1/2")	63	under seat	16	1.5	10
	DN20 - (3/4")	63	under seat	16	1.5	10
PF6_G-2NO	DN25 - (1")	63	under seat	16	1.5	10
	DN32 - (1 1/4")	63	under seat	16	1.5	10
	DN40 - (1 1/2")	63	under seat	16	1.5	10
	DN50 - (2")	63	under seat	12	1.5	10
PF6_G-3NO	DN25 - (1")	90	under seat	16	1.0	8
	DN32 - (1 1/4")	90	under seat	16	1.0	8
	DN40 - (1 1/2")	90	under seat	16	1.0	8
	DN50 - (2")	90	under seat	16	1.0	8

* see Notes at the top of this page

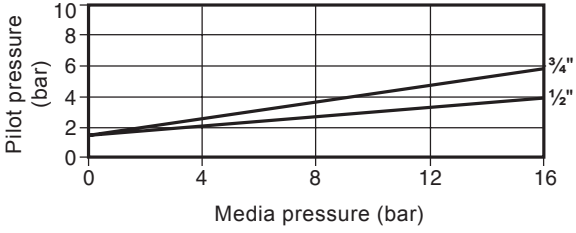
PF6_G-BD (Bi-Directional normally closed)

Model	Valve size	Actuator diameter (mm)	Flow direction (port 1 to 2)	* Maximum differential pressure (port 1 to 2) (bar)	Flow direction (port 2 to 1)	* Maximum differential pressure (port 2 to 1) (bar)	Pilot pressure	
							Minimum (bar)	Maximum (bar)
PF6_G-1BD	DN15 - (1/2")	45	over seat	16	under seat	16.0	5.0	10
	DN20 - (3/4")	45	over seat	16	under seat	7.0	5.0	10
	DN15 - (1/2")	63	over seat	16	under seat	16.0	3.8	10
	DN20 - (3/4")	63	over seat	16	under seat	16.0	3.8	10
PF6_G-2BD	DN25 - (1")	63	over seat	16	under seat	11.0	3.8	10
	DN32 - (1 1/4")	63	over seat	16	under seat	6.0	3.8	10
	DN40 - (1 1/2")	63	over seat	12	under seat	4.0	3.8	10
	DN50 - (2")	63	over seat	8	under seat	2.5	3.8	10
PF6_G-3BD	DN25 - (1")	90	over seat	16	under seat	14.0	3.3	8
	DN32 - (1 1/4")	90	over seat	16	under seat	12.0	3.3	8
	DN40 - (1 1/2")	90	over seat	16	under seat	8.0	3.3	8
	DN50 - (2")	90	over seat	14	under seat	6.0	3.3	8

Pilot / media pressure relationship

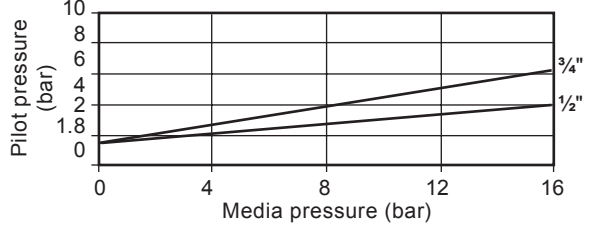
PF6_G-NC (Normally Closed)

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

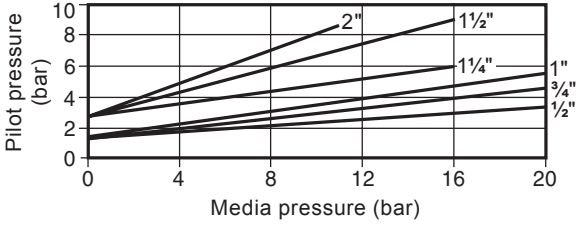


PF6_G-NO (Normally Open)

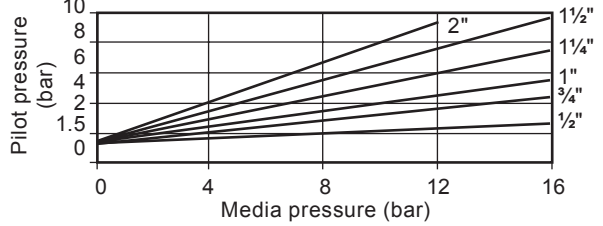
PF6_G-1NO flow under seat (2 to 1)



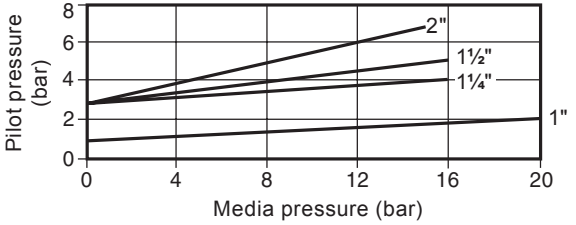
PF6_G-2NC flow over seat (1 to 2)



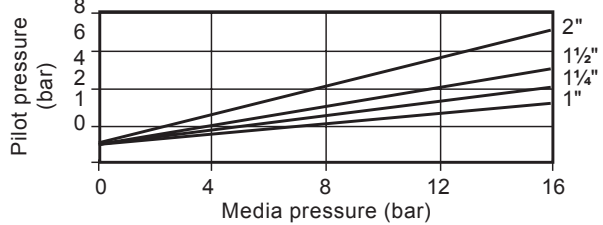
PF6_G-2NO flow under seat (2 to 1)



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

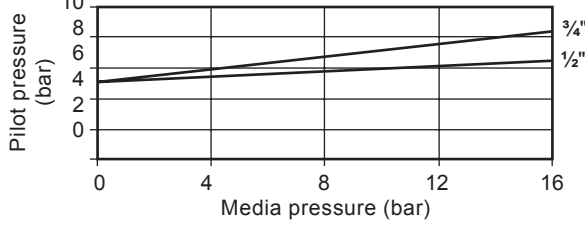


PF6_G-3NO flow under seat (2 to 1)

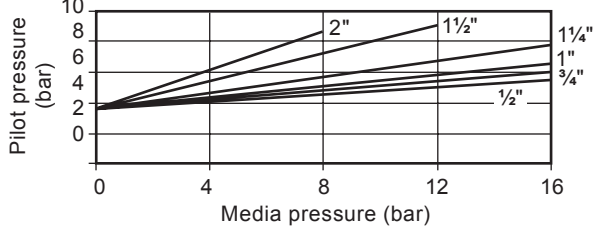


PF6_G-BD (Bi-Directional normally closed)

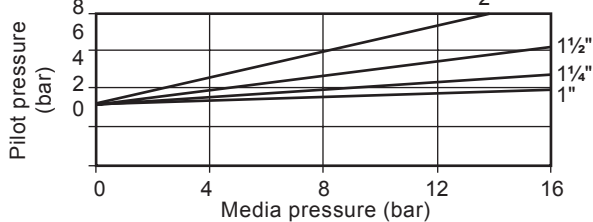
PF6_G-1BD flow over seat (1 to 2)



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



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

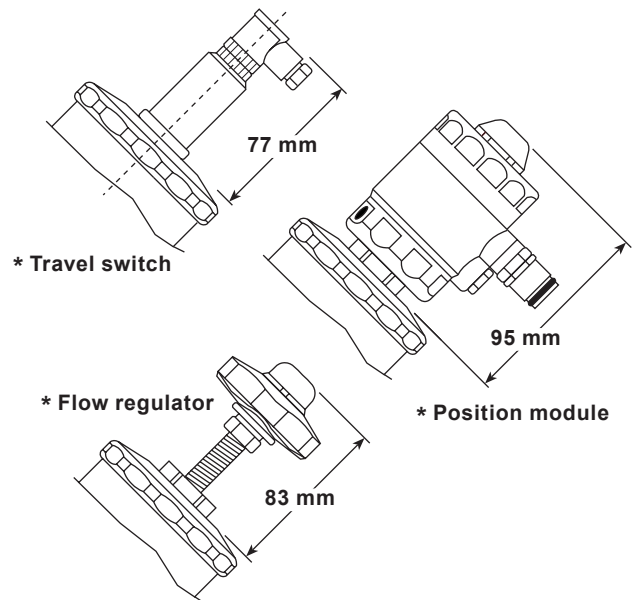


Dimensions and weights (approximate) in mm and kg

Notes: * Add 0.2 kg for travel switch or flow regulator options (not available for use with the Type 1 actuator). Add 0.45 kg for the position module.

Valve size	Actuator type and size	Screwed and Butt weld				Flanged					
		A1	B1	C	* Weight	EN 1092 A3	ASME 150 A4	EN 1092 B3	ASME 150 B4	C	* Weight
DN15 - 1/2"	1 (45 mm)	65	144	123	0.8	-	-	-	-	-	-
	2 (63 mm)	65	192	171	1.2	130	139.7	229.0	226.2	202.1	2.6
DN20 - 3/4"	1 (45 mm)	75	155	126	0.9	-	-	-	-	-	-
	2 (63 mm)	75	198	176	1.3	150	152.4	235.9	232.7	207.4	3.0
DN25 - 1"	2 (63 mm)	90	212	185	1.5	160	165.1	249.2	247.6	216.2	3.8
	3 (90 mm)	90	223	196	2.0	160	165.1	260.2	258.6	227.2	4.4
DN32 - 1 1/4"	2 (63 mm)	110	225	193	1.9	180	184.2	262.0	259.9	224.0	5.6
	3 (90 mm)	110	234	202	2.4	180	184.2	273.0	270.9	235.0	6.0
DN40 - 1 1/2"	2 (63 mm)	120	230	198	2.1	200	203.2	267.0	266.5	229.0	6.5
	3 (90 mm)	120	239	207	2.6	200	203.2	278.0	277.5	240.0	7.0
DN50 - 2"	2 (63 mm)	150	248	207	2.9	230	228.6	288.2	237.3	237.8	8.7
	3 (90 mm)	150	257	216	3.3	230	228.6	299.2	298.3	248.8	9.1

Valve size	Actuator type and size	Threaded spigot (to ISO 228 / 1)				
		A5	B5	C	Ø Spigot	* Weight
DN15 - 1/2"	1 (45 mm)	90	148	123	G 3/4"	0.90
	2 (63 mm)	90	196	171	G 3/4"	1.30
DN20 - 3/4"	1 (45 mm)	110	156	126	G 1"	1.00
	2 (63 mm)	110	206	176	G 1"	1.40
DN25 - 1"	2 (63 mm)	118	217	185	G 1 1/4"	1.65
	3 (90 mm)	118	228	196	G 1 1/4"	2.15
DN32 - 1 1/4"	2 (63 mm)	130	226	193	G 1 1/2"	2.00
	3 (90 mm)	130	237	202	G 1 1/2"	2.50
DN40 - 1 1/2"	2 (63 mm)	140	224	198	G 1 3/4"	2.20
	3 (90 mm)	140	235	207	G 1 3/4"	2.70
DN50 - 2" **	2 (63 mm)	175	246	207	G 2 3/8"	3.10
	3 (90 mm)	175	257	216	G 2 3/8"	3.50



** Note: The DN50 threaded spigot is to ISO 338.

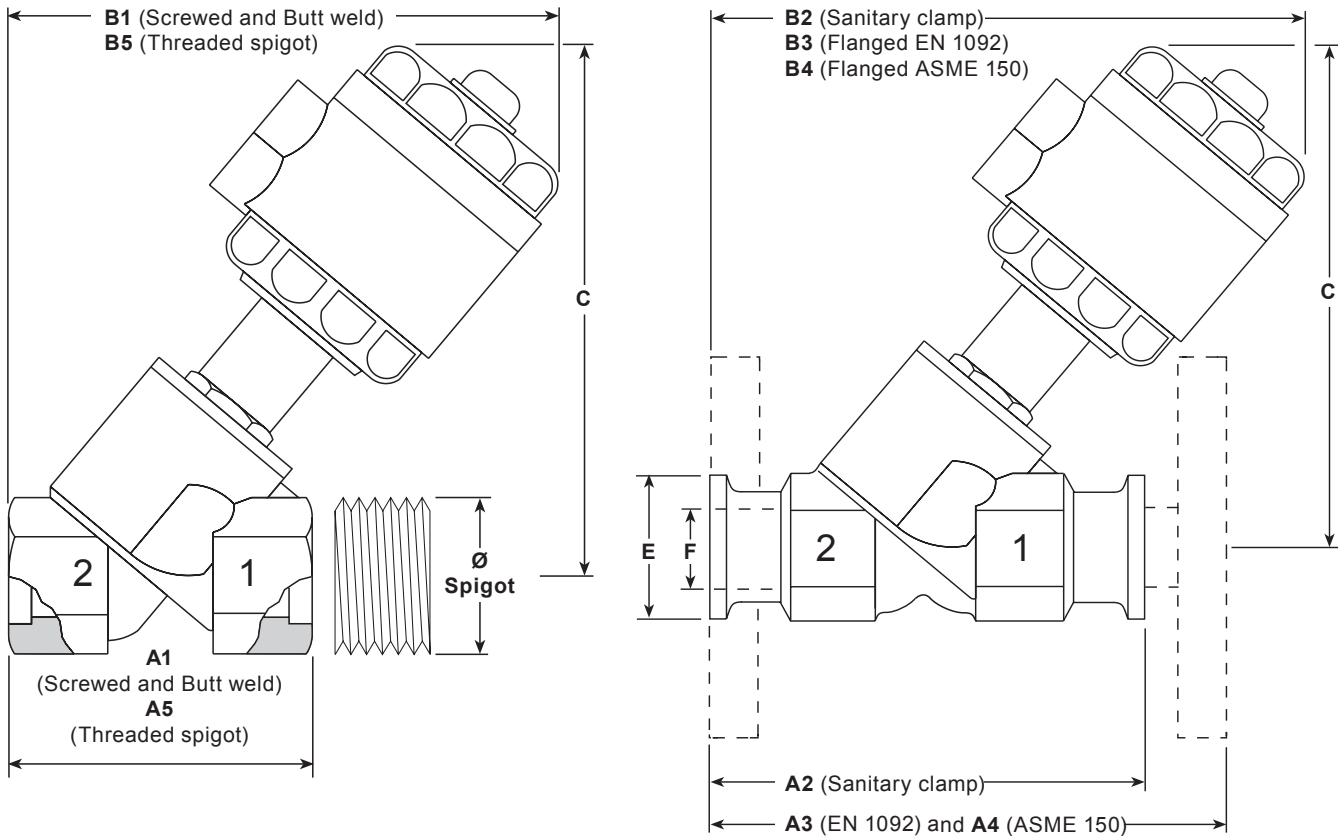
Valve size	Actuator type and size	Sanitary clamp (to ISO 2852)						Sanitary clamp (ASME BPE)					
		A2	B2	C	E	F	* Weight	A2	B2	C	E	F	* Weight
DN15 - 1/2"	1 (45 mm)	102	162	123	34	17.2	0.8	102	162	123	25	9.4	0.8
	2 (63 mm)	102	210	171	34	17.2	1.2	102	210	171	25	9.4	1.2
DN20 - 3/4"	1 (45 mm)	114	167	126	34	21.3	1.3	114	167	126	25	15.75	1.3
	2 (63 mm)	114	217	176	34	21.3	1.5	114	217	176	25	15.75	1.5
DN25 - 1"	2 (63 mm)	140	231	185	50.5	25.0	1.8	140	231	185	50.5	22.1	1.8
	3 (90 mm)	140	243	196	50.5	25.0	2.4	140	243	196	50.5	22.1	2.4
DN32 - 1 1/4"	2 (63 mm)	159	240	193	50.5	33.7	2.4	-	-	-	-	-	-
	3 (90 mm)	159	251	202	50.5	33.7	2.8	-	-	-	-	-	-
DN40 - 1 1/2"	2 (63 mm)	159	249	198	64	40.0	2.8	159	249	198	50.5	34.8	2.8
	3 (90 mm)	159	260	207	64	40.0	3.2	159	260	207	50.5	34.8	3.2
DN50 - 2"	2 (63 mm)	190	267	207	64	51.0	3.6	190	267	207	64	47.5	3.6
	3 (90 mm)	190	279	216	64	51.0	4.0	190	279	216	64	47.5	4.0

PF6 piston actuated valves - opening / closing times (seconds)

Notes:

1. Pilot pressure is 6 bar
2. Pressure in the body 0 bar

Valve size	Actuator Ø45 mm				Actuator Ø63 mm				Actuator Ø90 mm			
	NC valves		NO valves		NC valves		NO valves		NC valves		NO valves	
	opening	closing	opening	closing	opening	closing	opening	closing	opening	closing	opening	closing
DN15 - 1/2"	0.09	0.22	0.22	0.09	0.14	0.30	0.30	0.14	-	-	-	-
DN20 - 3/4"	0.09	0.22	0.22	0.09	0.20	0.30	0.30	0.20	-	-	-	-
DN25 - 1"	-	-	-	-	0.32	0.34	0.34	0.32	0.32	0.34	0.34	0.32
DN32 - 1 1/4"	-	-	-	-	0.34	0.38	0.38	0.34	0.36	0.40	0.40	0.36
DN40 - 1 1/2"	-	-	-	-	0.34	0.38	0.38	0.34	0.40	0.46	0.46	0.40
DN50 - 2"	-	-	-	-	0.36	0.38	0.38	0.36	0.40	0.46	0.46	0.40



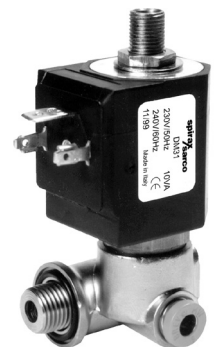
Associated equipment

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.

Available types

Model	Type	Actuator	Voltage/Frequency	Connection
DM11	1	45 mm	230/50 or 240/60 Vac	1/8" BSP
DM12	1	45 mm	110/50 or 120/60 Vac	1/8" BSP
DM13	1	45 mm	24/50 or 24/60 Vac	1/8" BSP
DM14	1	45 mm	24 Vdc	1/8" BSP
DM21	2	63 mm	230/50 or 240/60 Vac	1/4" BSP
DM22	2	63 mm	110/50 or 120/60 Vac	1/4" BSP
DM23	2	63 mm	24/50 or 24/60 Vac	1/4" BSP
DM24	2	63 mm	24 Vdc	1/4" BSP
DM31	3	90 mm	230/50 or 240/60 Vac	1/4" BSP
DM32	3	90 mm	110/50 or 120/60 Vac	1/4" BSP
DM33	3	90 mm	24/50 or 24/60 Vac	1/4" BSP
DM34	3	90 mm	24 Vdc	1/4" BSP



Valve selection guide

Valve size	DN15 (½"), DN20 (¾"), DN25 (1"), DN32 (1¼"), DN40 (1½") and DN50 (2")			DN25
Valve type	P	=	Piston valve	P
Valve characteristic	F	=	Fast opening	F
Body material	6	=	Stainless steel	6
	0	=	Threaded spigots to ISO 228 / 1	
	1	=	Screwed BSP or NPT	
Connections	2	=	Butt weld Note: state pipeline connection when ordering: - DIN 11850 pipe - ASME B 36.10 / ISO 65 pipe	3
	3	=	Flanged EN 1092 or ASME Class 150 (welded on flanges)	
	4	=		
	5	=	Sanitary clamp Note: state pipeline connection ISO 2852 or ASME BPE when ordering	
Valve plug seal	G	=	Modified PTFE G500 soft seat	G
	Blank	=	PTFE + 25% carbon graphite filled PTFE + FKM chevron (standard)	
Stem seal		=	25% carbon graphite filled PTFE + FKM chevron	
	H	=	Note: Option H is not available for the sanitary clamp version or valves fitted with Type 1 actuators.	
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	
	Blank	=	No options required	
Optional	A	Position module = with mechanical switch	Change-over contacts, max. tension 230 Vac, Max. current 6 A	Provides indication of open and closed valve position through an inductive or mechanical switch. Available on all actuators types.
	B	Position module = with inductive switch	PNP, supply 14 - 12 Vdc power 13 mA max.	
			Provides indication of open or closed valve position through a magnetic reed switch with volt free contacts.	
	I	= Travel switch	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.	
	R	= Flow regulator	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

DN25	-	P	-	F	-	6	-	3	-	G	-		-	2	-	NC	-		-	Flanged EN 1092 PN40
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How to order

Example: 1 off Spirax Sarco DN25 PF63G-2NC stainless steel piston actuated on/off valve having flanged EN 1092 PN40 connections.

Spare parts

A seal kit is available for all valve and actuator sizes comprising: Piston lip seal, stem 'O' ring, valve head seal (Modified PTFE G500), 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. 02/14 = Month 02, Year 2014).

Example: 1 off Seal kit for a 1" PF61G-2NC, date code 02/14.

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.