

Diaphragm Valve for Ultra High Purity

Air operated type
(For low pressure)

Series AP3500

- Suitable for UHP gas supply line
- Body material : 316L SS secondary remelt
- Pneumatically actuated normally closed or normally open
- LOTO option available as an option (AP3540)
- Indicator switch available as an option (AP3550)



How to Order

AP 3 540 S 2PW FV4 FV4 (Inlet) (Outlet)

Size

Code	Cv
3	0.29

Model

Code	Status	Maximum operating pressure
540	Normally closed (N.C.)	125 psig (0.9 MPa)
550	Normally closed (N.C.)	250 psig (1.7 MPa)
580	Normally open (N.O.)	250 psig (1.7 MPa)

Material

Code	Body material
S	316L SS secondary remelt
H	Hastelloy® C-22

Surface finish

Code	Surface finish Ra max
No code	15 μin. (0.4 μm) Standard
M	10 μin. (0.25 μm)
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Ports

Code	Ports
2PW	2 ports

Optional portings and porting configurations available. Please refer to P.125.

Option (AP3550 only)

Code	Specification
No code	—
ISC	N.C. Indicator switch *3)
ISO	N.O. Indicator switch *4)

*3) Indication of closed status.
*4) Indication of opened status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Vespe® *2)

*2) Not available with H material.

Face to face dimension *1)

Code	Dimension
No code	2.12 inch (53.8 mm) Standard
1.75	1.75 inch (44.5 mm)

*1) Only applies to S material with TW4 connections.

Connections (Inlet, Outlet)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Specifications

Operating Parameters		AP3540	AP3550	AP3580
Status		Normally closed (N.C.)		Normally open (N.O.)
Gas		Select compatible materials of construction for the gas		
Operating pressure		Vacuum to 125 psig (0.9 MPa)	Vacuum to 250 psig (1.7 MPa)	
Proof pressure		1000 psig (6.9 MPa)		
Burst pressure		8000 psig (55.2 MPa)		
Ambient and operating temperature		14 to 160°F (−10 to 71°C) (No freezing) *1)		
Cv		0.29		
Leak rate	Inboard leakage	2 x 10 ^{−11} Pa·m ³ /sec		
	Outboard leakage	2 x 10 ^{−10} Pa·m ³ /sec *2)		
Across the seat leak		4 x 10 ^{−9} Pa·m ³ /sec *2)		
Surface finish		Ra max 15 μin. (0.4 μm)	Option: 10 μin. (0.25 μm), 7 μin. (0.18 μm), 5 μin. (0.13 μm)	
Connections		Face seal, Tube weld		
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)		
Actuation port connection		NPT 1/8 inch	10-32 UNF thread	NPT 1/8 inch
Actuation port location		Top	Side	Top
Installation		Bottom mount		
Internal volume		0.06 in ³ (1.07 cm ³)		
Mass		1.5 lbs (0.68 kg) *3)	1.8 lbs (0.82 kg) *3)	1.5 lbs (0.68 kg) *3)
LOTO (Lockout)		Option (Part number: AP PL 210) *4)	N/A	

*1) High temperature available. Please contact SMC.

*2) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

*3) Mass, including individual boxed weight, may vary depending on connections or options.

*4) Refer to the specification for options. (P.124)

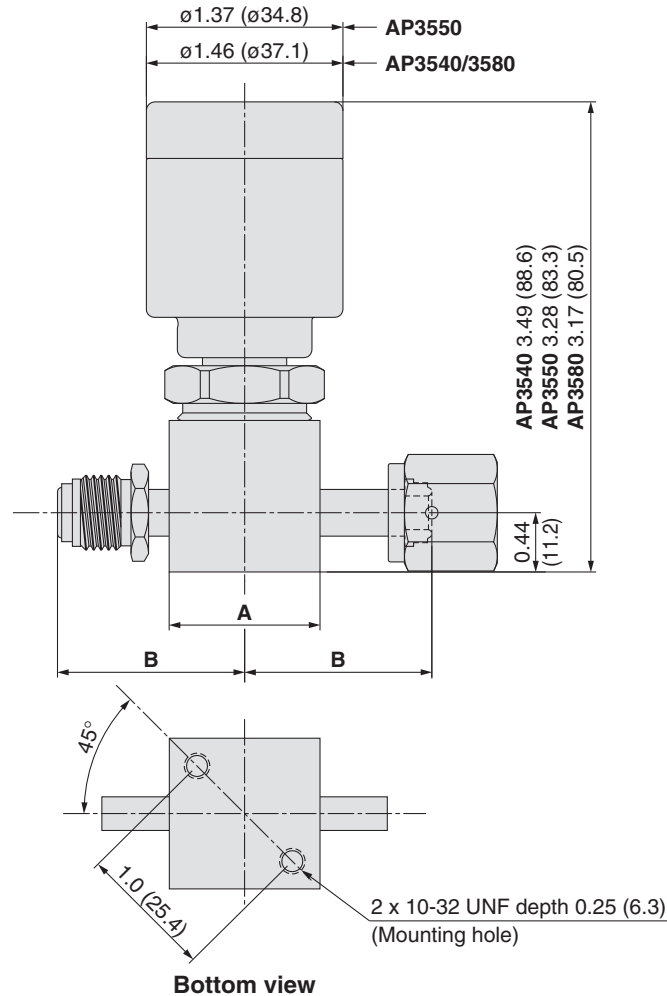
Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Hastelloy® C-22
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Elgiloy®	
Seat	PCTFE (Option: Vespel®)	PCTFE

Dimensions

inch (mm)

AP3500



Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4			1.06	(26.9)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6				
	TW6				
H	FV4	1.25 dia. *)	(ø31.8)	1.45	(36.8)
	MV4			1.08	(27.4)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6				
	TW6				

*) Hastelloy valve body is round not square.

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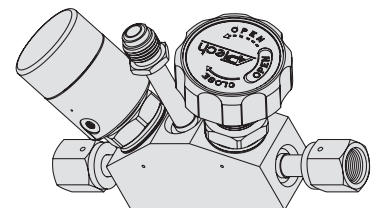
Hastelloy® is a registered trademark of Haynes International.

Vespel® is a registered trademark of DuPont.



Made to Order

Products such as three port dual valves can be made with monoblock configurations. Please contact SMC for details.



Diaphragm Valve for Ultra High Purity

Air operated type
(For low pressure)

Series AP4500

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Pneumatically actuated normally closed or normally open
- LOTO option available as an option (AP4540)
- Indicator switch available as an option (AP4550)



How to Order

AP 4 540 S 2PW FV6 FV6

(Inlet) (Outlet)

Size

Code	Cv
4	0.5

Model

Code	Status	Maximum operating pressure
540	Normally closed (N.C.)	125 psig (0.9 MPa)
550	Normally open (N.O.)	250 psig (1.7 MPa)

Material

Code	Body material
S	316L SS secondary remelt
H	Hastelloy® C-22

Surface finish

Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Ports

Code	Ports
2PW	2 ports

Optional portings and porting configurations available. Please refer to P.125.

Option (AP4550 only)

Code	Specification
No code	—
ISC	N.C. indicator switch *3)
ISO	N.O. indicator switch *4)

*3) Indication of closed status.
*4) Indication of opened status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Vespel® *2)

*2) Not available with H material.

Face to face dimension *1)

Code	Dimension
No code	2.12 inch (53.8 mm) Standard
1.75	1.75 inch (44.5 mm)

*1) Only applies to S material with TW4 connections.

Connections (Inlet, Outlet)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Specifications

Operating Parameters		AP4540	AP4550	AP4580
Status		Normally closed (N.C.)		Normally open (N.O.)
Gas		Select compatible materials of construction for the gas		
Operating pressure		Vacuum to 125 psig (0.9 MPa)	Vacuum to 250 psig (1.7 MPa)	
Proof pressure		1000 psig (6.9 MPa)		
Burst pressure		8000 psig (55.2 MPa)		
Ambient and operating temperature		14 to 160°F (−10 to 71°C) (No freezing) *1)		
Cv		0.5		
Leak rate	Inboard leakage	2 x 10 ^{−11} Pa·m³/sec		
	Outboard leakage	2 x 10 ^{−10} Pa·m³/sec *2)		
Across the seat leak		4 x 10 ^{−9} Pa·m³/sec *2)		
Surface finish		Ra max 15 µin. (0.4 µm)	Option: 10 µin. (0.25 µm), 7µin. (0.18 µm), 5 µin. (0.13 µm)	
Connections		Face seal, Tube weld		
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)		
Actuation port connection		NPT 1/8 inch	10-32 UNF thread	NPT 1/8 inch
Actuation port location		Top	Side	Top
Installation		Bottom mount		
Internal volume		0.06 in³ (1.07 cm³)		
Mass		1.5 lbs (0.68 kg) *3)	1.8 lbs (0.82 kg) *3)	1.5 lbs (0.68 kg) *3)
LOTO (Lockout)		Option (Part number: AP PL 210) *4)	N/A	

*1) High temperature available. Please contact SMC.

*2) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

*3) Mass, including individual boxed weight, may vary depending on connections or options.

*4) Refer to the specification for options. (P.124)

Diaphragm Valve for Ultra High Purity

Air operated type (For low pressure)

Series AP4500

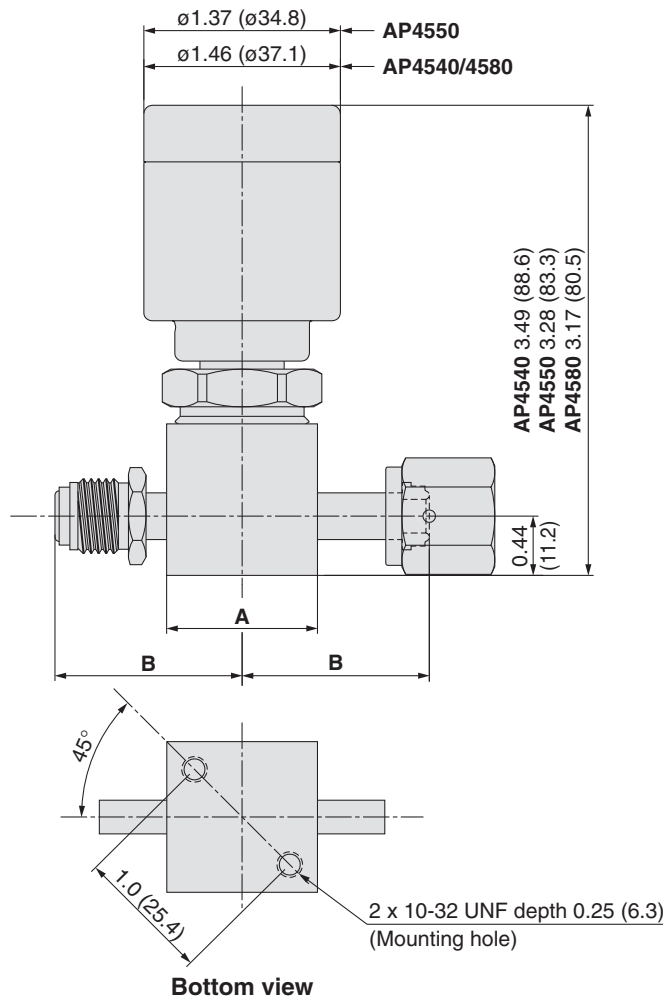
Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Hastelloy® C-22
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Elgiloy®	
Seat	PCTFE (Option: Vespel®)	PCTFE

Dimensions

inch (mm)

AP4500



Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4			1.06	(26.9)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6			1.45	(36.8)
	TW6			1.08	(27.4)
H	FV4	1.25 dia. *)	(ø31.8)	1.93	(49.0)
	MV4			1.325	(33.7)
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6			1.325	(33.7)
	TW6			1.08	(27.4)

*) Hastelloy valve body is round not square.

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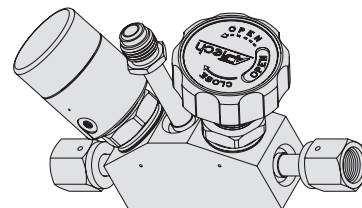
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Vespel® is a registered trademark of DuPont.



Made to Order

Products such as three port dual valves can be made with monoblock configuration. Please contact SMC for details.



Recommendations

Regulators

AP

SL

AZ

AK

KT

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

Precautions

Diaphragm Valve for Ultra High Purity

Air operated type
(For high pressure)

Series AP3000

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Pneumatically actuated normally closed
- High pressure type: Max. 3000 psig (20.7 MPa)
- LOTO option available as an option
- Indicator switch available as an option



How to Order

AP30 **00** **S** **2PW** **FV4** **FV4**

(Inlet) (Outlet)

Model

Code	Cv
00	0.23
02	0.28

Material

Code	Body material
S	316L SS secondary remelt
H	Hastelloy® C-22

Surface finish

Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Ports

Code	Ports
2PW	2 ports

Optional portings and porting configurations available. Please refer to P.125.

Option

Code	Specification
No code	—
IS	Indicator switch *3)

*3) Indication of opened/closed status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	VespeI® *2)

*2) Not available with H material.

Face to face dimension *1)

Code	Dimension
No code	2.12 inch (53.8 mm) Standard
1.75	1.75 inch (44.5 mm)

*1) Only applies to S material with TW4 connections.

Connections (Inlet, Outlet)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Specifications

Operating Parameters		AP3000	AP3002
Status		Normally closed (N.C.)	
Gas		Select compatible materials of construction for the gas	
Operating pressure		Vacuum to 3000 psig (20.7 MPa)	
Proof pressure		4000 psig (27.6 MPa)	
Burst pressure		8000 psig (55.2 MPa)	
Ambient and operating temperature		14 to 160°F (–10 to 71°C) (No freezing)	
Cv		0.23	0.28
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /sec	
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /sec *1)	
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /sec *1)	
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10 µin. (0.25 µm), 7 µin. (0.18 µm), 5 µin. (0.13 µm)	
Connections		Face seal, Tube weld	
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)	
Actuation port connection		NPT 1/8 inch	
Actuation port location		Top	
Installation		Bottom mount	
Internal volume		0.06 in ³ (1.07 cm ³)	
Mass		2.8 lbs (1.27 kg) *2)	
LOTO (Lockout)		Option (Part number: AP PL 210) *3)	

*1) Tested with Helium gas inlet pressure 1000 psig (6.9 MPa).

*2) Mass, including individual boxed weight, may vary depending on connections or options.

*3) Refer to the specification for options. (P.124)

Diaphragm Valve for Ultra High Purity *Series AP3000*

Air operated type (For high pressure)

Recommendations

Regulators

AP

SL

AZ

AK

KT

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

Precautions

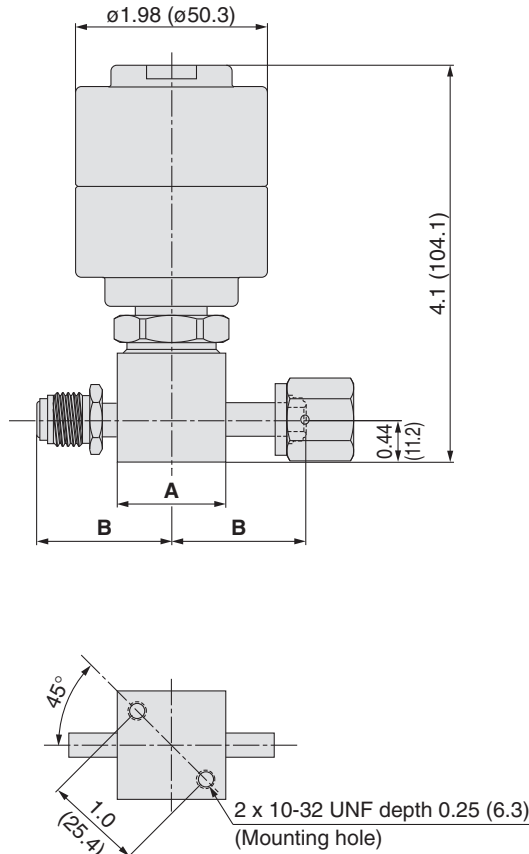
Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Hastelloy® C-22
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Elgiloy®	
Seat	PCTFE (Option: Vespel®)	PCTFE

Dimensions

inch (mm)

AP3000



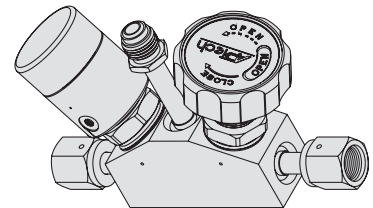
Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4			1.06	(26.9)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6				
	TW6				
H	FV4	1.25 dia. *)	(ø31.8)	1.45	(36.8)
	MV4			1.08	(27.4)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6				
	TW6				

*) Hastelloy valve body is round not square.



Made to Order

Products such as three port dual valves can be made with monoblock configurations. Please contact SMC for details.



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Vespel® is a registered trademark of DuPont.



Diaphragm Valve for Ultra High Purity

Air operated type
Two Step

Series AP3571 & 4571

- Two step mode - metered flow and full open
- Two separate actuation ports
- Soft start valve to minimize vacuum chamber pressurization turbulence
- Metered flow adjustable AP3571: 10 to 200 slpm*
AP4571: 10 to 350 slpm*
- Pneumatically actuated normally closed
- Body material: 316L SS secondary remelt

* At 80 psig (0.55 MPa) of N₂



How to Order

AP 3 571 S 2PW FV4 FV4 M 050

(Inlet) (Outlet)

Size

Code	Cv
3	0.29
4	0.5

Model

Code	Mode	Status
571	Two step mode	Normally closed (N.C.)

Material

Code	Body material
S	316L SS secondary remelt

Surface finish

Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Ports

Code	Ports
2PW	2 ports

Optional portings and porting configurations available. Please refer to P.125.

Metered flow

Code	Metered adjusted flow in slpm
XXX (3 digits)	Metered adjusted flow in slpm at 80 psig (0.55 MPa) N ₂ . Replace XXX with flow rate using 3 digits, example 50 slpm = "050" Adjustable Range: AP3571= 10 to 200 slpm, AP4571= 10 to 350 slpm

Face to face dimension *2)

Code	Face to face
No code	2.12 inch (53.8 mm) Standard
1.75	1.75 inch (44.5 mm)

*2) Only applies to S material with TW4 connections.

Connections (Inlet, Outlet)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld *1)
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

*1) TW4 is not available with AP4571

Specifications

Operating Parameters		AP3571	AP4571
Status		Normally closed (N.C.)	
Gas		Select compatible materials of construction of the gas	
Operating pressure		Vacuum to 125 psig (0.9 MPa)	
Proof pressure		200 psig (1.4 MPa)	
Burst pressure		1000 psig (6.9 MPa)	
Ambient and operating temperature		32 to 124°F (0 to 51°C) (No freezing)	
Cv		0.29	0.5
Leak rate	Inboard leakage	2x10 ⁻¹¹ Pa·m ³ /sec	
	Outboard leakage	2x10 ⁻¹⁰ Pa·m ³ /sec *1)	
Across the seat leak		4x10 ⁻⁹ Pa·m ³ /sec *1)	
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10 µin. (0.25 µm), 7 µin. (0.18 µm), 5 µin. (0.13 µm)	
Connections		Face seal, Tube weld	
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)	
Actuation port connection		M5 thread (2 each)	
Actuation port location		Sides (2 each)	
Installation		Bottom mount	
Internal volume		0.06 in ³ (1.07 cm ³)	
Adjustable range of metered flow *2)		10 to 200 slpm	10 to 350 slpm
Tolerance of metered flow	10 to 20 slpm	±6 slpm	
	21 to 50 slpm	±10 slpm	
	51 to 100 slpm	±15 slpm	
	101 to 200 slpm	±20 slpm	
	201 to 350 slpm	N/A	

*1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa)

*2) At 80 psig (0.55 MPa) N₂

Diaphragm Valve for Ultra High Purity *Series AP3571 & 4571*

Air operated type (Two Step)

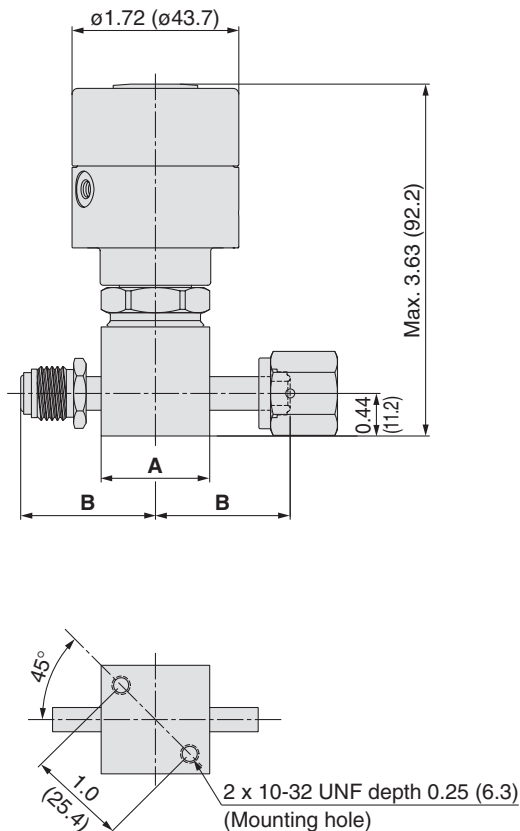
Wetted Parts Material

Wetted parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	Elgiloy®
Seat	PCTFE

Dimensions

inch (mm)

AP3571 & 4571



Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4				
	TW4			1.06	(26.9)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

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Diaphragm Valve for Ultra High Purity

Air operated type
(Metal seated)

Series AP3200

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- All metal wetted parts
- Pneumatically actuated normally closed
- Indicator switch available as an option



How to Order

AP32 00 S 2PW (Inlet) MV4 (Outlet) MV4

Air operated •

Material •

Code	Body material
S	316L SS secondary remelt

Surface finish •

Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Ports •

Code	Ports
2PW	2 ports

Optional portings and porting configurations available. Please refer to P.125.

Option

Code	Specification
No code	—
IS	Indicator switch *2)

*2) Indication of opened/closed status

Face to face dimension *1)

Code	Dimension
No code	2.12 inch (53.8 mm) Standard
1.75	1.75 inch (44.5 mm)

*1) Only applies to TW4 connections.

Connections (Inlet, Outlet)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Specifications

Operating Parameters		AP3200
Status		Normally closed (N.C.)
Gas		Select compatible materials of construction for the gas
Operating pressure		Vacuum to 125 psig (0.9 MPa)
Proof pressure		1000 psig (6.9 MPa)
Burst pressure		8000 psig (55.2 MPa)
Ambient and operating temperature		14 to 212°F (–10 to 100 °C) (No freezing)
Cv		0.27
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /sec
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /sec *1)
Across the seat leak		1 x 10 ⁻⁷ Pa·m ³ /sec *1)
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10 µin. (0.25 µm), 7 µin. (0.18 µm), 5 µin. (0.13 µm)
Connections		Face seal, Tube weld
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)
Actuation port connection		NPT 1/8 inch
Actuation port location		Top
Installation		Bottom mount
Internal volume		0.06 in ³ (1.07 cm ³)
Mass		2.8 lbs (1.27 kg) *2)

*1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

*2) Mass, including individual boxed weight, may vary depending on connections or options.

Wetted Parts Material

Wetted Parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	Elgiloy®

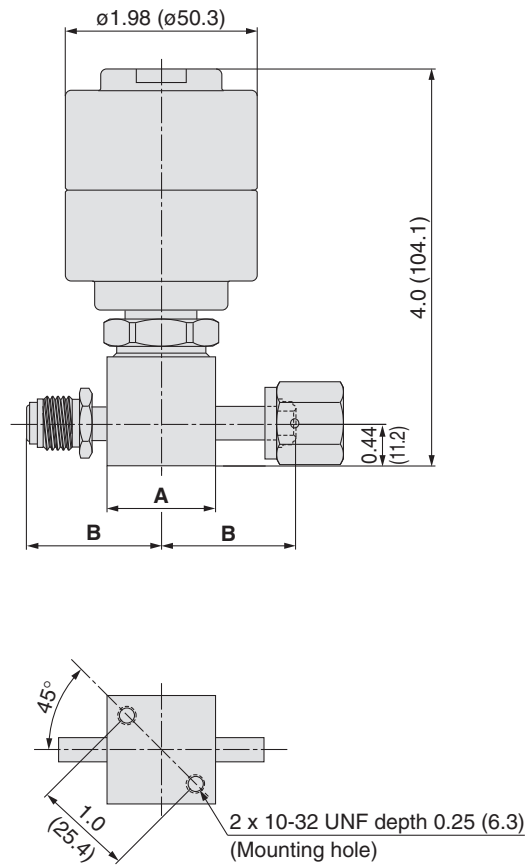
Diaphragm Valve for Ultra High Purity *Series AP3200*

Air operated type (Metal seated)

Dimensions

inch (mm)

AP3200



Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4			1.06	(26.9)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6				
	TW6				

Diaphragm Valve for Ultra High Purity

Air operated type
(For high pressure and high flow)

Series AP3130 & 3113

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Pneumatically actuated normally closed
- High pressure type: 20.7 MPa and 9 MPa
- Designed for bulk specialty gas (BSGS) delivery
- LOTO option available as an option



How to Order

Model

AP31 **30** **S** **2PW** **MV8** **MV8**

Option

Code **Specification**

No code —

IS Indicator switch *4)

*4) Indication of opened/closed status.

Material

Code **Body material**

S 316L SS secondary remelt

H Hastelloy® C-22 *2)

*2) Special export controls apply to Hastelloy body with 1/2 inch or greater size connection.

Surface finish

Code **Surface finish Ra max**

No code 15 µin. (0.4 µm) Standard

M 10 µin. (0.25 µm)

Ports

Code **Ports**

2PW 2 ports

Connections (Inlet, Outlet)

Code **Connections**

FV4 1/4 inch face seal (Female)

MV4 1/4 inch face seal (Male)

TW6 3/8 inch tube weld

FV8 1/2 inch face seal (Female)

MV8 1/2 inch face seal (Male)

TW8 1/2 inch tube weld

FV12 3/4 inch face seal (Female)

MV12 3/4 inch face seal (Male)

TW12 3/4 inch tube weld

Seat material

Code **Material**

No code PCTFE (Standard)

VS Vespel® *3)

*3) Not available with H material.

Specifications

Operating Parameters		AP3113	AP3130
Status		Normally closed (N.C.)	
Gas		Select compatible materials of construction for the gas	
Operating pressure		Vacuum to 1300 psig (9.0 MPa)	Vacuum to 3000 psig (20.7 MPa) *1)
Proof pressure		4500 psig (31 MPa)	
Burst pressure		10000 psig (69 MPa)	
Ambient and operating temperature		14 to 149°F (-10 to 65°C) (No freezing)	
Cv *2)		1.0	0.7
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /sec	
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /sec *3)	
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /sec *3)	
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10 µin. (0.25 µm)	
Connections		Face seal, Tube weld	
Actuation pressure		70 to 110 psig (0.48 to 0.76 MPa)	
Actuation port connection		NPT 1/8 inch	
Actuation port location		Top	
Installation		Bottom mount	
Internal volume		0.36 in ³ (6.0 cm ³) for body	
Mass		2.8 lbs (1.27 kg) *4)	
LOTO (Lockout)		Option (Part number: AP PL 210) *5)	

*1) Maximum operating pressure 2400 psig (16.5 MPa) for connection size 3/4 inch.

*2) Figure of 1/2 inch connection.

*3) Tested with Helium gas inlet pressure 500 psig (3.5 MPa).

*4) Mass, including individual boxed weight, may vary depending on connections or options.

*5) Refer to the specification for options. (P.124)

Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Hastelloy® C-22
Surface finish	Electropolish + Passivation	Electropolish
Spring	316L SS	Inconel® 600
Diaphragm	Elgiloy®	
Poppet	316L SS	Hastelloy® C-22
Seat	PCTFE (Option: Vespel®)	PCTFE

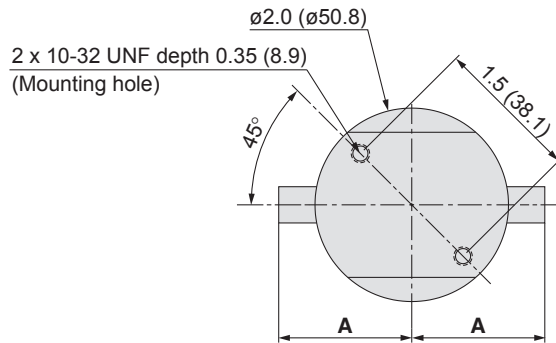
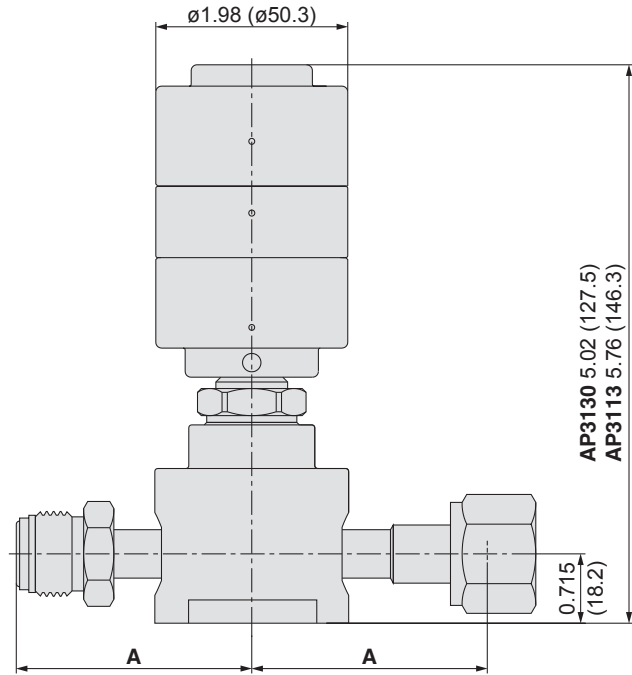
Diaphragm Valve for Ultra High Purity *Series AP3130 & 3113*

Air operated type (For high pressure and high flow)

Dimensions

inch (mm)

AP3130 & 3113



Bottom view

Connections	A	
	inch	(mm)
FV4	2.00	(50.8)
MV4	2.00	(50.8)
TW6	1.375	(34.9)
FV8	2.425	(61.6)
MV8	2.425	(61.6)
TW8	1.79	(45.4)
FV12	3.50	(88.9)
MV12	3.50	(88.9)
TW12	3.25	(82.6)

Elgiloy® is a registered trademark of Elgiloy Specialty Metals.
Hastelloy® is a registered trademark of Haynes International.
Inconel® is a registered trademark of Special Metal.
Vespel® is a registered trademark of DuPont.



Recommendations

Regulators

AP

SL

AZ

AK

KT

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

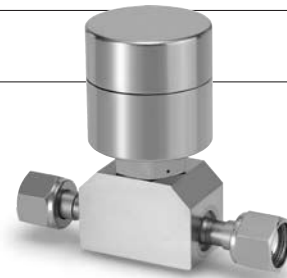
Precautions

Diaphragm Valve for Ultra High Purity

Air operated type
(For high flow)

Series AP3700

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Pneumatically actuated normally closed or normally open
- Purge ports and monoblock configurations available



How to Order

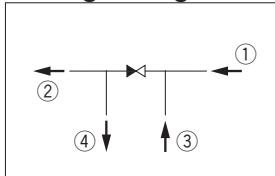
AP37 **00** **S** **00** **MV8** **MV8** **00**

Model	
Code	Status
00	Normally closed (N.C.)
08	Normally open (N.O.)

Material	
Code	Body material
S	316L SS secondary remelt

Surface finish	
Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Porting Configuration



Connections (Inlet^①, Outlet^②)

Code	Connections
TW6	3/8 inch tube weld
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld
FV12	3/4 inch face seal (Female)
MV12	3/4 inch face seal (Male)
TW12	3/4 inch tube weld

Option (AP3700 Only)

Code	Specification
No code	—
ISC	N.C. indicator switch *2)
ISO	N.O. indicator switch *3)

*2) Indication of closed status.
*3) Indication of opened status.

Purge port option

Code	Specification
No code	—
C	Capped purge port

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Vespe [®]

Purge port *1)

Code	Inlet ^③	Outlet ^④
00	None	None
M0	Available	None
0B	None	Available
MB	Available	Available

*1) 1/4 inch face seal (Male) as standard.

Specifications

Operating Parameters		AP3700	AP3708
Status		Normally closed (N.C.)	Normally open (N.O.)
Gas		Select compatible materials of construction for the gas	
Operating pressure		Vacuum to 250 psig (1.7 MPa)	
Proof pressure		500 psig (3.4 MPa)	
Burst pressure		1000 psig (6.9 MPa)	
Ambient and operating temperature		14 to 160°F (−10 to 71°C) (No freezing)	
Cv		2.8	
Leak rate	Inboard leakage	2 x 10 ^{−11} Pa·m ³ /sec	
	Outboard leakage	2 x 10 ^{−10} Pa·m ³ /sec *1)	
Across the seat leak		4 x 10 ^{−9} Pa·m ³ /sec *1)	
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10µin.(0.25 µm), 7µin.(0.18 µm), 5µin.(0.13 µm)	
Connections		Face seal, Tube weld	
Actuation pressure		80 to 100 psig (0.55 to 0.7 MPa)	
Actuation port connection		10-32 UNF thread	
Actuation port location		Side	
Installation		Bottom mount	
Internal volume		0.76 in ³ (12.52 cm ³)	
Mass		3.4 lbs (1.54 kg) *2)	

*1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

*2) Mass, including individual boxed weight, may vary depending on connections or options.

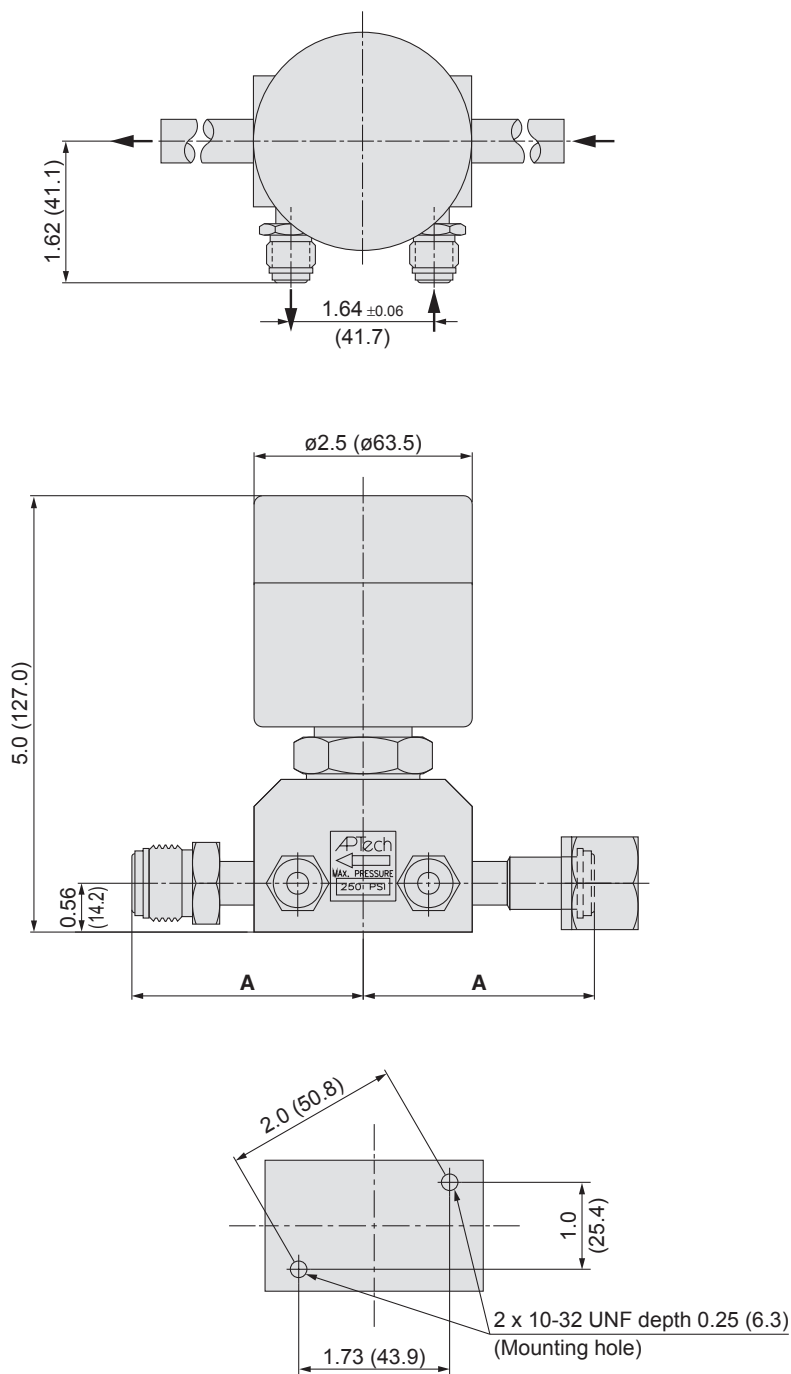
Wetted Parts Material

Wetted Parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	316L SS
Seat	PCTFE (Option: Vespe [®])

Dimensions

inch (mm)

AP3700



Connections	A	
	inch	(mm)
TW6	4.25	(108.0)
FV8	2.65	(67.3)
MV8	2.65	(67.3)
TW8	4.25	(108.0)
FV12	3.20	(81.3)
MV12	3.20	(81.3)
TW12	4.25	(108.0)



Made to Order

Change of porting configuration and products such as three port dual valves can be made. Please contact SMC for details.

LOTO Options for Diaphragm Valves

* Made to order specifications

Lockout Device/For Air Operated Valve (Order Separately)

Product number: AP PL210

Feature

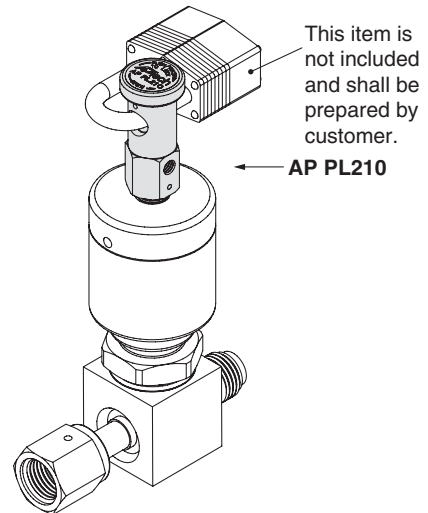
- Lockable by installing the AP PL210 to the actuation port of air operated valve (only available for N.C. with actuation port connection NPT 1/8 inch)
- Prevent accidental valve opening by manually shutting off actuation pressure
- Lockable only in the closed position
- Accept standard pad lock with 1/4 inch shackle
- Actuation port connection: 10-32 UNF thread
- Actuation port pressure rating: Maximum 150 psig (1.0 MPa)

Operation

Push top button down and twist to close the valve. This feature allows the valve to stay in closed position even if actuation pressure is supplied into an actuation port. Valve opens by repositioning the button, then pressurizing the actuation port.

Series

AP3000, AP3113, AP3130, AP3540, AP4540, AP3200



Lockout Device/For Manually Operated Valve (Order Separately)

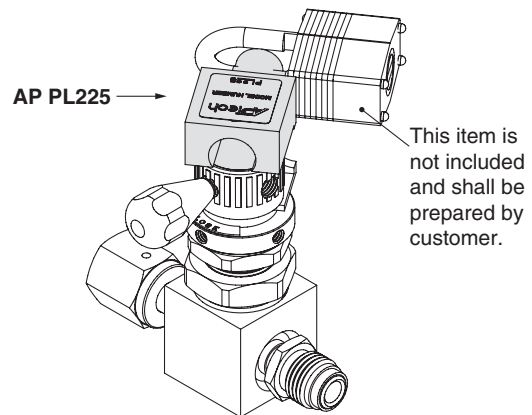
Product number: AP PL225

Feature

- Lockable by installing the AP PL225 to the manually operated valve (only available for lever knob)
- Lockable in the closed position
- Accept standard pad lock with 1/4 inch shackle.

Series

AP3125, AP3625, AP4625



Hook for Operational Safety Device (OSD) (Order Separately)

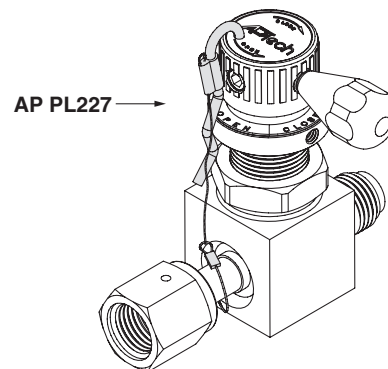
Product number: AP PL227

Feature

- Secure valve in the closed position by installing the AP PL227 to the top of the handle.
- Prevents accidental opening of the valve.

Series

AP3125, AP3625, AP4625



Diaphragm Valve Porting Guide

* Made to order specifications

How to Order

AP 3650 S 4PWM MV4 TW4 FV4 FV4

Available series

Code	Series
30□□	AP3000 series
32□□	AP3200 series
35□□	AP3500 series
45□□	AP4500 series
36□□	AP3600 series
46□□	AP4600 series

Materials
Stainless steel

Surface finish
Depends on the product series

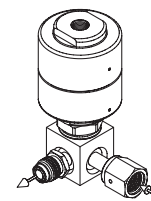
Code	Ports	Configuration
2PW	2 ports	Refer to the following (Port specification)
2PWA		
2PWB		
2PWC		
3PWD	3 ports	
3PWE		
3PWF		
3PWG		
3PWH	4 ports	
3PWJ		
4PWK		
4PWL		
4PWM		
4PWN		

Connections (Number indicates the port location)

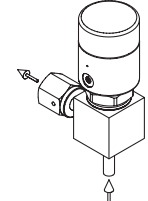
Code	Connections
No code	No port
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Option
Depends on the product series

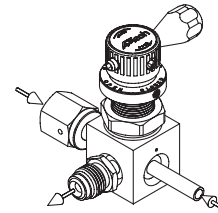
Examples of The Many Available options



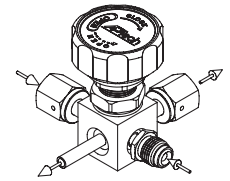
AP3000S
2PWC FV4 MV4



AP3550S
2PWB TW4 FV4



AP3625S
3PWD TW4 MV4 FV4



AP3650S
4PWM MV4 TW4 FV4 FV4

Port Specifications

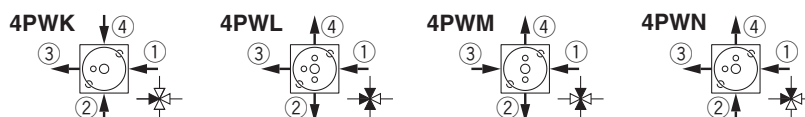
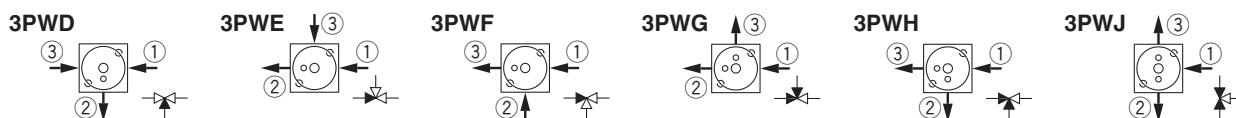
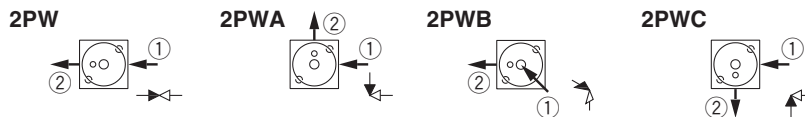
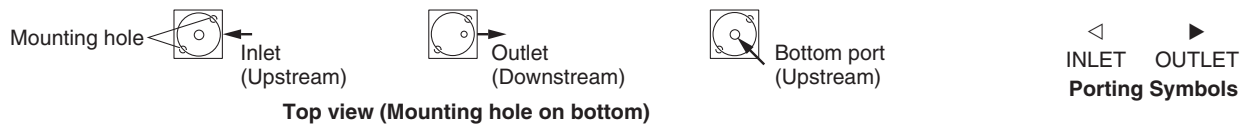
Valves are illustrated top view looking down through the valve.

The traditional flow direction is INLET to OUTLET, but AP Tech valves may be employed in either flow direction.

Port locations are indicated by numbers.

INLET (Upstream) is defined as a port connected to the region below the valve seat. It is illustrated with an arrow pointing towards the valve body or an "empty" triangle on the schematic.

OUTLET (Downstream) is defined as a port connected to the region above the seat and below the diaphragm. It is illustrated with an arrow pointing away from the valve body or a "filled" triangle on the schematic.





Process Gas Equipment / Diaphragm Valve Specific Product Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions and P. 145 and 146 and the "Operation Manual" for common precautions. Operation manual is available from the SMC web site. <http://www.smcworld.com>

Selection

Warning

1. Confirm the specifications.

This product is used in gas delivery systems to shutoff gas flow. When selecting the product, confirm the operating conditions, such as type of gas, operating pressure (inlet and outlet), flow rate, actuating pressure, operating temperature etc., and use within the operating range specified in the catalog. The product may not be suitable for use with specific gases and applications/environments. Check the compatibility of the product materials with the process gas. Design the equipment and select the product by understanding the characteristics of gas.

Mounting

Warning

1. Confirm the mounting direction of the product.

Inlet ports are labeled with an "IN" mark. The outlet ports are usually not labeled but may be labeled with an "OUT" mark. Orient the valve as specified by the system designer.

2. Connect actuation pressure to the valve actuator connection. (Air operated type)

Use nitrogen or clean dry air for actuation pressure. The connection may be a 1/8 inch NPT female thread or 10-32 female thread or M5 depending on the valve model.

3. After installation, check internal leakage (leakage across seat) with inert gases.

Perform a helium leak test depending on applications.

Maintenance

Warning

1. If a valve requires repair, contact SMC.

Operation (Air operate type)

Warning

1. Use nitrogen or clean dry air as actuation pressure.

2. Confirm the valve type (N.C. or N.O.).

In the case of N.C. (Normally Closed), valve will open when applying actuation pressure to the valve actuator connection and valve will close when actuation pressure is vented to atmospheric pressure. In the case of N.O. (Normally Open), its actuation mechanism is opposite to the N.C. type. Valve will close when applying actuation pressure to the valve actuator connection.

3. Apply actuation pressure within the range of specifications.

Operation (Manually operated type)

Warning

4. When closing the valve, rotate the handle clockwise until it completely stops.

There is the internal stop in the handle or in the valve body. Rotate the handle clockwise until the internal stop is reached and it completely stops.

5. When closing the valve with LOTO feature, rotate the handle fully clockwise until the stop.

(AP3657, AP4657, AP3157, AP3900)

When the handle is fully clockwise, the indicator plate roller is aligned with a vertical slot in the handle allowing the handle to drop downward. This feature prevents the valve from being accidentally opened.

6. When opening the valve, rotate the handle counterclockwise until it completely stops.

There is the internal stop in the handle. Rotate the handle counterclockwise until the internal stop is reached and it completely stops.

7. When opening the valve with LOTO feature, the handle must first be lifted up, away from the valve body, and rotated counterclockwise until it completely stops.

(AP3657, AP4657, AP3157, AP3900)

When valve is closed, handle will not rotate as the fixed indicator plate roller is positioned within the vertical slot in the handle. The handle must first be lifted up away from the valve body and rotated counterclockwise until it completely stops.

8. Do not use a tool when rotating the handle.

When the handle is rotated with a tool, it may apply excessive torque to the handle or inside the valve body and it may cause damage. Rotate the handle by hand.

9. When locking the valve with LOTO feature in the closed position, use safety lockout hasp. (AP3657, AP4657, AP3157, AP3900)

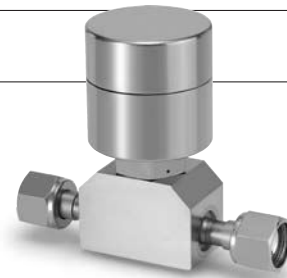
The valve with LOTO feature has a built in LOTO capability. When using LOTO feature, rotate the handle clockwise and insert safety lockout hasp into lock stem slot.

Diaphragm Valve for Ultra High Purity

Air operated type
(For high flow)

Series AP3700

- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Pneumatically actuated normally closed or normally open
- Purge ports and monoblock configurations available



How to Order

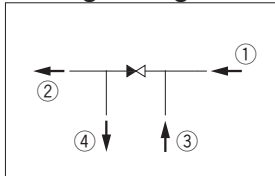
AP37 **00** **S** **00** **MV8** **MV8** **00**

Model	
Code	Status
00	Normally closed (N.C.)
08	Normally open (N.O.)

Material	
Code	Body material
S	316L SS secondary remelt

Surface finish	
Code	Surface finish Ra max
No code	15 µin. (0.4 µm) Standard
M	10 µin. (0.25 µm)
V	7 µin. (0.18 µm)
X	5 µin. (0.13 µm)

Porting Configuration



Connections (Inlet^①, Outlet^②)

Code	Connections
TW6	3/8 inch tube weld
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld
FV12	3/4 inch face seal (Female)
MV12	3/4 inch face seal (Male)
TW12	3/4 inch tube weld

Option (AP3700 Only)

Code	Specification
No code	—
ISC	N.C. indicator switch *2)
ISO	N.O. indicator switch *3)

*2) Indication of closed status.
*3) Indication of opened status.

Purge port option

Code	Specification
No code	—
C	Capped purge port

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Vespe [®]

Purge port *1)

Code	Inlet ^③	Outlet ^④
00	None	None
M0	Available	None
0B	None	Available
MB	Available	Available

*1) 1/4 inch face seal (Male) as standard.

Specifications

Operating Parameters		AP3700	AP3708
Status		Normally closed (N.C.)	Normally open (N.O.)
Gas		Select compatible materials of construction for the gas	
Operating pressure		Vacuum to 250 psig (1.7 MPa)	
Proof pressure		500 psig (3.4 MPa)	
Burst pressure		1000 psig (6.9 MPa)	
Ambient and operating temperature		14 to 160°F (−10 to 71°C) (No freezing)	
Cv		2.8	
Leak rate	Inboard leakage	2 x 10 ^{−11} Pa·m ³ /sec	
	Outboard leakage	2 x 10 ^{−10} Pa·m ³ /sec *1)	
Across the seat leak		4 x 10 ^{−9} Pa·m ³ /sec *1)	
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10µin.(0.25 µm), 7µin.(0.18 µm), 5µin.(0.13 µm)	
Connections		Face seal, Tube weld	
Actuation pressure		80 to 100 psig (0.55 to 0.7 MPa)	
Actuation port connection		10-32 UNF thread	
Actuation port location		Side	
Installation		Bottom mount	
Internal volume		0.76 in ³ (12.52 cm ³)	
Mass		3.4 lbs (1.54 kg) *2)	

*1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

*2) Mass, including individual boxed weight, may vary depending on connections or options.

Wetted Parts Material

Wetted Parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	316L SS
Seat	PCTFE (Option: Vespe [®])

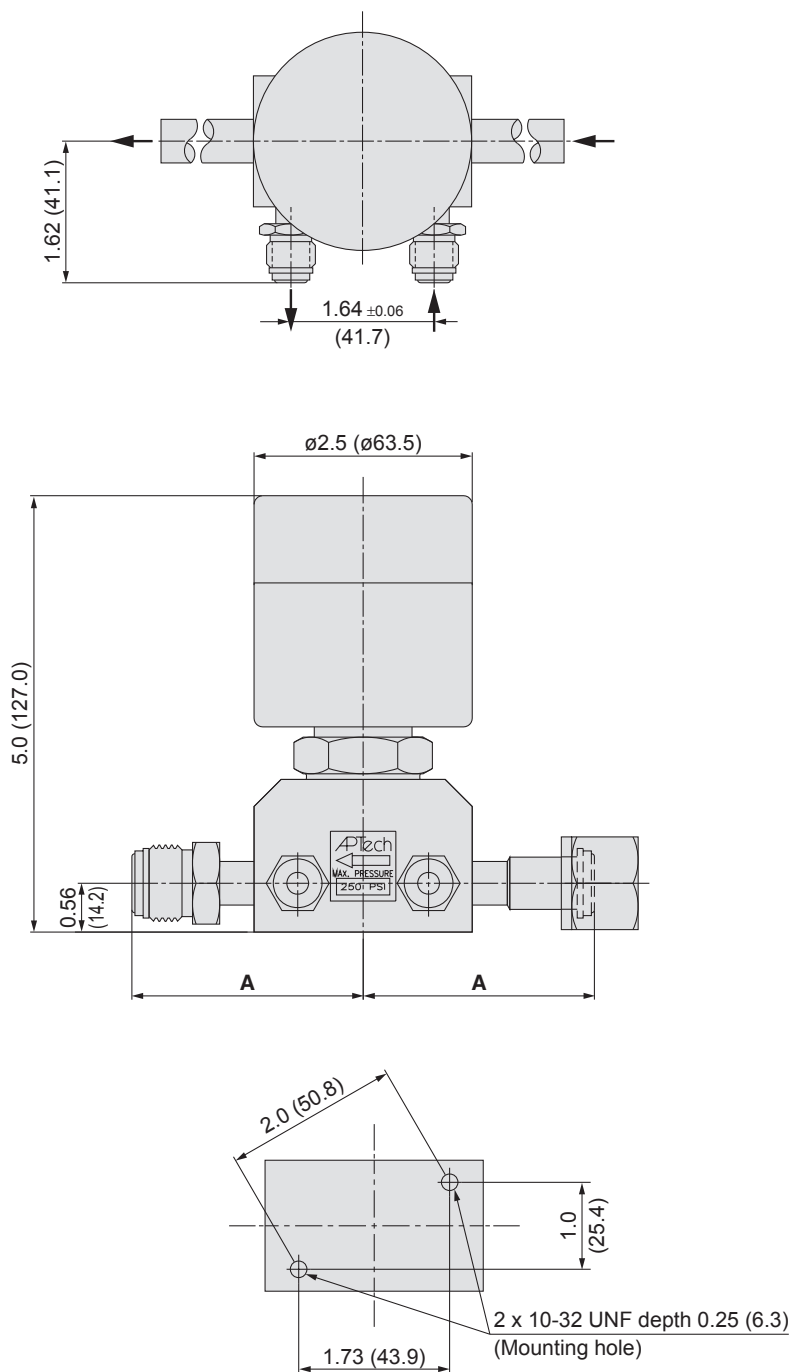
Diaphragm Valve for Ultra High Purity *Series AP3700*

Air operated type (For high flow)

Dimensions

inch (mm)

AP3700



Connections	A	
	inch	(mm)
TW6	4.25	(108.0)
FV8	2.65	(67.3)
MV8	2.65	(67.3)
TW8	4.25	(108.0)
FV12	3.20	(81.3)
MV12	3.20	(81.3)
TW12	4.25	(108.0)



Made to Order

Change of porting configuration and products such as three port dual valves can be made. Please contact SMC for details.