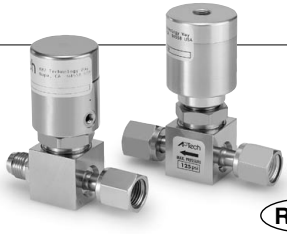
Diaphragm Valves

Diaphragm Valve for Ultra High Purity

Air operated type (For low pressure)

AP3500 Series

- **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)**



RoHS

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.)	150 psig (1.0 MPa)
550		300 psig (2.1 MPa)
580	Normally open (N.O.)	250 psig (1.7 MPa)

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy

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 page 783.

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

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.

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	Polyimide ∗2)

∗2) Not available with H material.

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 150 psig (1.0 MPa) ∗1)	Vacuum to 300 psig (2.1 MPa)	Vacuum to 250 psig (1.7 MPa)
Proof pressure		1.5 times the maximum operating pressure		
Burst pressure		3 times the maximum operating pressure		
Ambient and operating temperature		-10 to 71°C (No freezing) ∗2)		
Cv		0.29		
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s		
	Outboard leakage	2×10^{-10} Pa·m³/s ∗3)		
Across the seat leak		1×10^{-10} Pa·m³/s		
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 (360° rotatable)	Top
Installation		Bottom mount		
Internal volume		0.06 in³ (1.07 cm³)		
Weight		0.68 kg ∗4)	0.82 kg ∗4)	0.68 kg ∗4)
LOTO (Lockout)		Option (Part number: AP PL 210) ∗5)	N/A	

∗1) Vacuum to 125 psig (0.9 MPa) for Polyimide seat.
∗2) Max. 90°C for Polyimide seat. High temperature available. Please contact SMC.
∗3) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗4) Weight, including individual boxed weight, may vary depending on connections or options.
∗5) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code	ISO	ISC
Switch type	SPST	
Contacts	NO (When the valve is open, the circuit is closed.)	NC (When the valve is closed, the circuit is closed.)
Rated voltage	Max. 50 VDC	
Rated current	Max. 100 mA	
Contact capacity	1.0 VA	
Initial contact resistance	0.1 Ω or less	
Terminal shape	Soldered terminal	

Wetted Parts Material

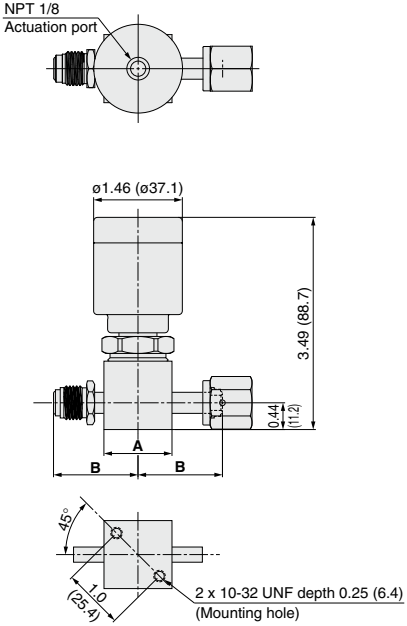
Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Ni-Co alloy	
Seat	PCTFE (Option: Polyimide)	PCTFE

SMC

Dimensions

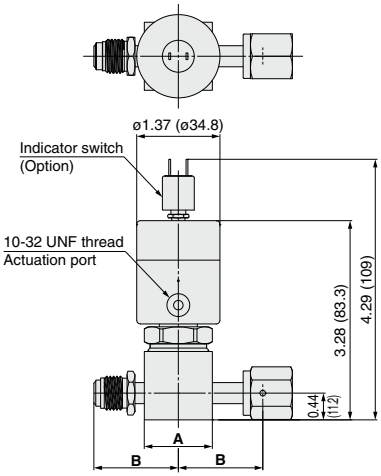
inch (mm)

AP3540

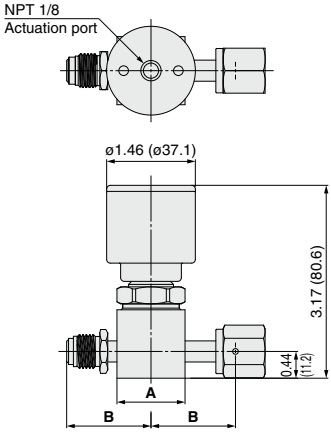


Bottom view

AP3550



AP3580

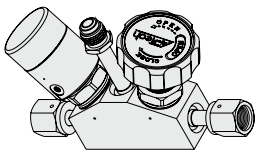


Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4				
	TW4			1.06	(26.9)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)
H	FV4	1.25 dia. *)	(ø31.8)	1.45	(36.8)
	MV4				
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

*) Ni-Cr-Mo alloy 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.



Diaphragm Valve for Ultra High Purity

Air operated type (For low pressure)

AP4500 Series

- **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)**

RoHS

How to Order

AP 4 540 S □ 2PW (Inlet) FV6 (Outlet) FV6 □ □ □

Size

Code	Cv
4	0.5

Model

Code	Status	Maximum operating pressure
540	Normally closed (N.C.)	125 psig (0.9 MPa)
550		300 psig (2.1 MPa)
580	Normally open (N.O.)	250 psig (1.7 MPa)

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy

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 page 783.

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

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.

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	Polyimide ∗2)

∗2) Not available with H material.

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 300 psig (2.1 MPa)	Vacuum to 250 psig (1.7 MPa)
Proof pressure		1.5 times the maximum operating pressure		
Burst pressure		3 times the maximum operating pressure		
Ambient and operating temperature		-10 to 71°C (No freezing) ∗1)		
Cv		0.5		
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s		
	Outboard leakage	2×10^{-10} Pa·m³/s ∗2)		
Across the seat leak		1×10^{-10} Pa·m³/s		
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 (360° rotatable)	Top
Installation		Bottom mount		
Internal volume		0.06 in³ (1.07 cm³)		
Weight		0.68 kg ∗3)	0.82 kg ∗3)	0.68 kg ∗3)
LOTO (Lockout)		Option (Part number: AP PL 210) ∗4)	N/A	

∗1) Max. 90°C for Polyimide seat. High temperature available. Please contact SMC.
∗2) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗3) Weight, including individual boxed weight, may vary depending on connections or options.
∗4) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code	ISO	ISC
Switch type	SPST	
Contacts	NO (When the valve is open, the circuit is closed.)	NC (When the valve is closed, the circuit is closed.)
Rated voltage	Max. 50 VDC	
Rated current	Max. 100 mA	
Contact capacity	1.0 VA	
Initial contact resistance	0.1 Ω or less	
Terminal shape	Soldered terminal	

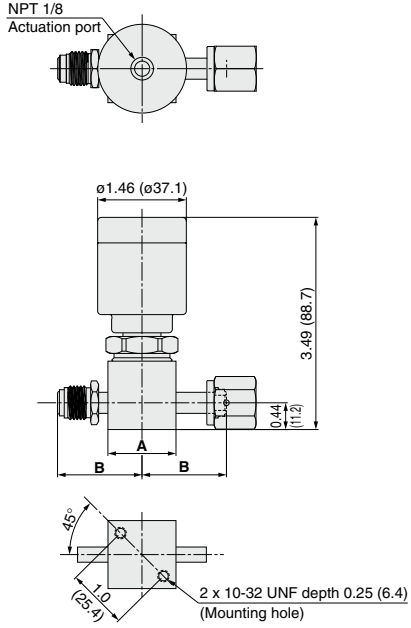
Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Ni-Co alloy	
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

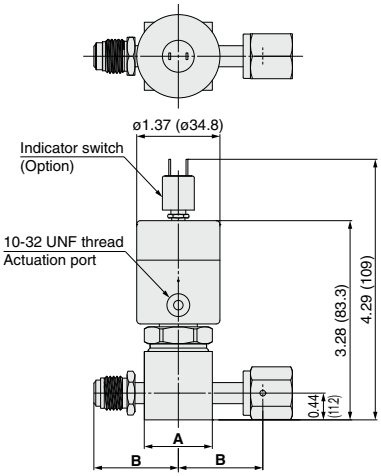
inch (mm)

AP4540

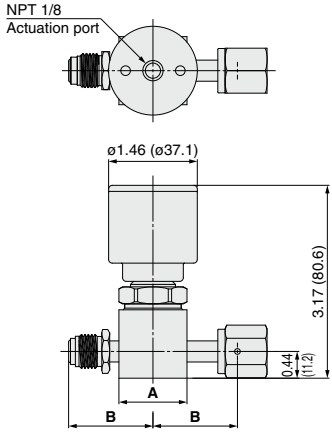


Bottom view

AP4550



AP4580

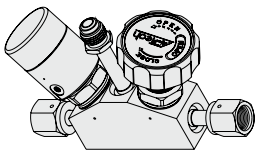


Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(□28.4)	1.39	(35.3)
	MV4				
	TW4			1.06	(26.9)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)
H	FV4	1.25 dia. *)	(ø31.8)	1.45	(36.8)
	MV4				
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

*) Ni-Cr-Mo alloy valve body is round not square.

Made to Order

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



Diaphragm Valve for Ultra High Purity

Air operated type (For high pressure)

AP3000 Series

- **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**

RoHS

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	Ni-Cr-Mo alloy

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 page 783.

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

Option

Code	Specification
No code	—
IS	Indicator switch ∗3)

∗3) Indication of opened/closed status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide ∗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.

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		1.5 times the maximum operating pressure	
Burst pressure		3 times the maximum operating pressure	
Ambient and operating temperature		-10 to 71°C (No freezing)	
Cv		0.23	0.28
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s	
	Outboard leakage	2×10^{-10} Pa·m³/s ∗1)	
Across the seat leak		1×10^{-10} Pa·m³/s	
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 in³ (1.07 cm³)	
Weight		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) Weight, including individual boxed weight, may vary depending on connections or options.
∗3) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code		IS
Switch type		SPDT
Rated voltage		Max. 30 VDC
Contact capacity		Max. 3 VA
Switching current		Max. 0.2 A
Carrying current		Max. 0.5 A
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue: Common line
		Brown: NC (When the valve is closed, the circuit is closed.)
		Black: NO (When the valve is open, the circuit is closed.)

Wetted Parts Material

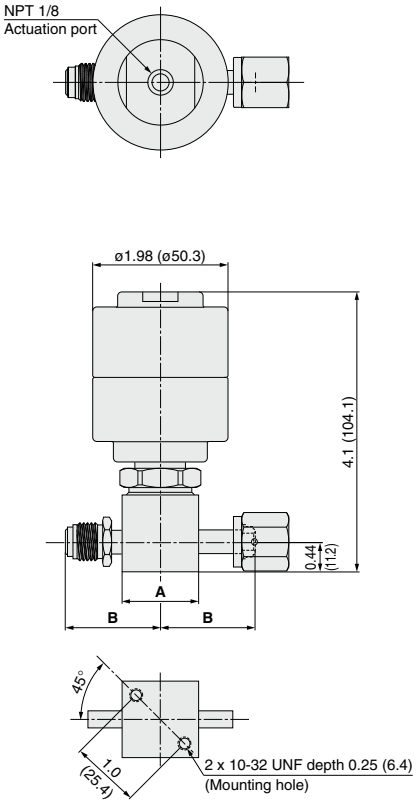
Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Ni-Co alloy	
Seat	PCTFE (Option: Polyimide)	PCTFE

SMC

Dimensions

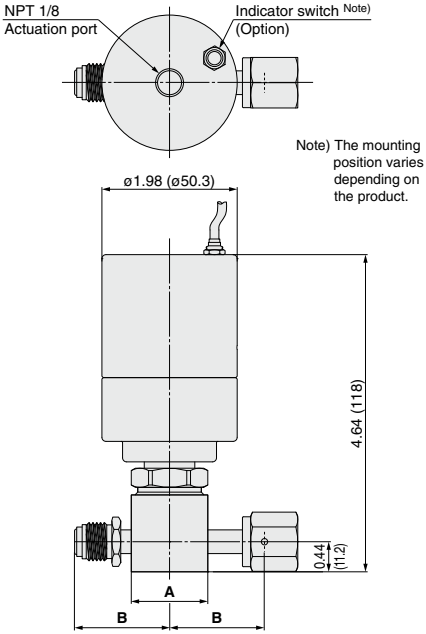
inch (mm)

AP3000



Bottom view

Indicator switch



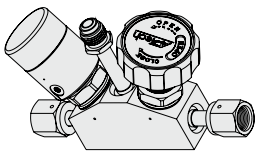
Note) The mounting position varies depending on the product.

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)
H	FV4	1.25 dia. *)	(ø31.8)	1.45	(36.8)
	MV4				
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

*) Ni-Cr-Mo alloy 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.



Diaphragm Valve for Ultra High Purity

Air operated type
(For high pressure and high flow)

AP3130 & 3113 Series

- **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**

RoHS

How to Order

AP31 [30] [S] [ ] 2PW [MV8] (Inlet) [MV8] (Outlet) [ ] [ ]

Model

Code	Maximum operating pressure	Cv
13	1300 psig (9.0 MPa)	1.0
30	3000 psig (20.7 MPa) ∗1)	0.7

∗1) 2400 psig (16.5 MPa) for connection size 3/4 inch.

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy ∗2)

∗2) Special export controls apply to Ni-Cr-Mo alloy 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) ∗3)
MV12	3/4 inch face seal (Male) ∗3)
TW12	3/4 inch tube weld

∗3) Prepare a suitable mating fitting with a rated pressure.

Option

Code	Specification
No code	—
IS	Indicator switch ∗5)

∗5) Indication of opened/closed status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide ∗4)

∗4) 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)
Proof pressure		1.5 times the maximum operating pressure	
Burst pressure		3 times the maximum operating pressure	
Ambient and operating temperature		-10 to 65°C (No freezing)	
Cv ∗1)		1.0	0.7
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s	
	Outboard leakage	2×10^{-10} Pa·m³/s ∗2)	
Across the seat leak		1×10^{-10} Pa·m³/s	
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 in³ (6.0 cm³) for body	
Weight		1.27 kg ∗3)	
LOTO (Lockout)		Option (Part number: AP PL 210) ∗4)	

∗1) Figure of 1/2 inch connection.
∗2) Tested with Helium gas inlet pressure 500 psig (3.5 MPa).
∗3) Weight, including individual boxed weight, may vary depending on connections or options.
∗4) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code		IS
Switch type		SPDT
Rated voltage		Max. 30 VDC
Contact capacity		Max. 3 VA
Switching current		Max. 0.2 A
Carrying current		Max. 0.5 A
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue: Common line
		Brown: NC (When the valve is closed, the circuit is closed.)
		Black: NO (When the valve is open, the circuit is closed.)

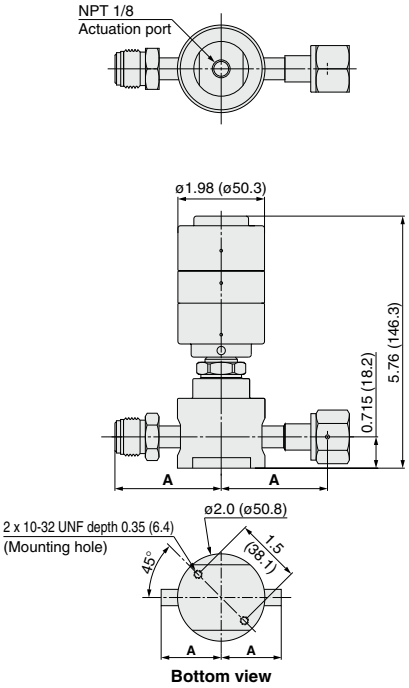
Wetted Parts Material

Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Spring	316L SS	Ni-Cr-Fe alloy
Diaphragm	Ni-Co alloy	
Poppet	316L SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

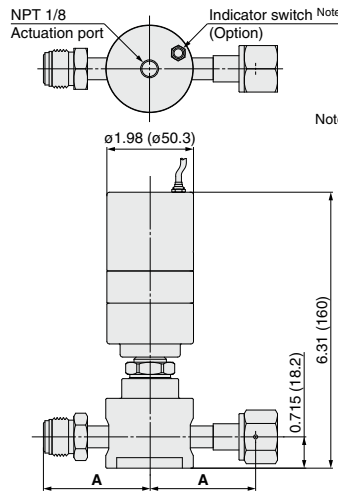
inch (mm)

AP3113



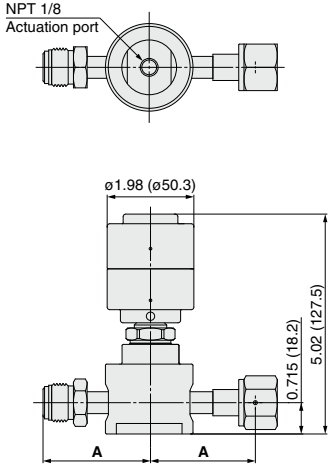
Bottom view

Indicator switch

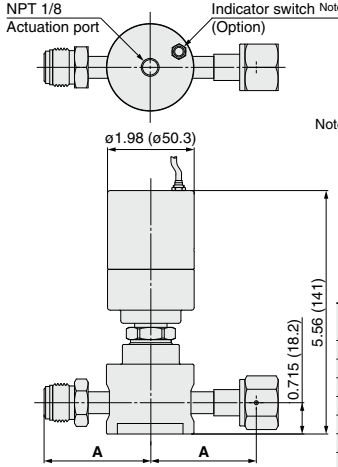


Note) The mounting position varies depending on the product.

AP3130



Indicator switch



Note) The mounting position varies depending on the product.

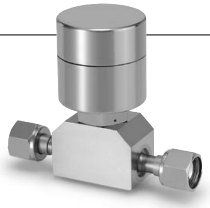
Connections	A	
	inch	(mm)
FV4	2.00	(50.8)
MV4		
TW6	1.375	(34.9)
FV8	2.425	(61.6)
MV8		
TW8	1.79	(45.4)
FV12	3.50	(88.9)
MV12		
TW12	3.25	(82.6)

Diaphragm Valve for Ultra High Purity

Air operated type (For high flow)

AP3700 Series

- **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**



RoHS

How to Order

AP37 [00] [S] [ ] [MV8 (Inlet)] [MV8 (Outlet)] [00] [ ] [ ] [ ]

Model

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

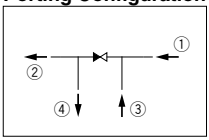
Material

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 (Inlet①, Outlet②)

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	Polyimide

Purge port ∗1)

Code	Inlet③	Outlet④
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		1.5 times the maximum operating pressure	
Burst pressure		3 times the maximum operating pressure	
Ambient and operating temperature		-10 to 71°C (No freezing)	
Cv		2.8	
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s	
	Outboard leakage	2×10^{-10} Pa·m³/s ∗1)	
Across the seat leak		1×10^{-10} Pa·m³/s	
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		80 to 100 psig (0.55 to 0.7 MPa)	
Actuation port connection		10-32 UNF thread	
Actuation port location		Side (360° rotatable)	
Installation		Bottom mount	
Internal volume		0.76 in³ (12.52 cm³)	
Weight		1.54 kg ∗2)	

∗1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗2) Weight, including individual boxed weight, may vary depending on connections or options.

Indicator Switch (Option) Specification

Code	ISO	ISC
Switch type	SPST	
Contacts	NO (When the valve is open, the circuit is closed.)	NC (When the valve is closed, the circuit is closed.)
Rated voltage	Max. 50 VDC	
Rated current	Max. 100 mA	
Contact capacity	1.0 VA	
Initial contact resistance	0.1 Ω or less	
Terminal shape	Soldered terminal	

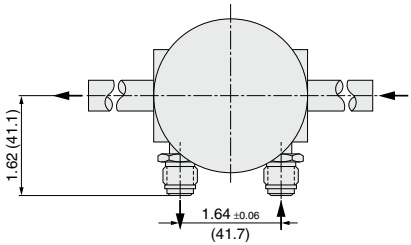
Wetted Parts Material

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

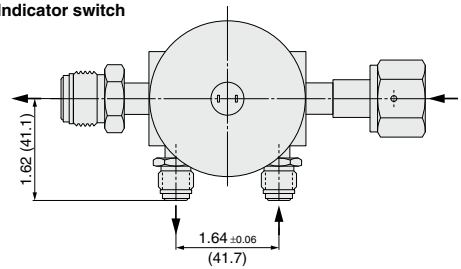
Dimensions

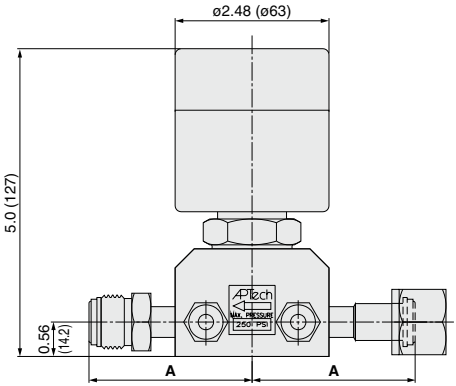
inch (mm)

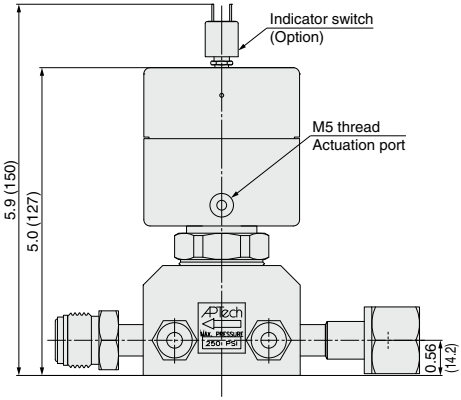
AP3700

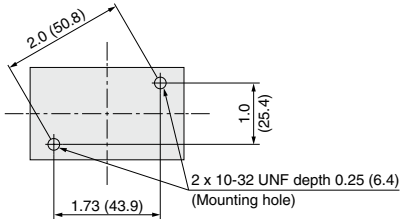


Indicator switch









Bottom view

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

Diaphragm Valve for Ultra High Purity

Air operated type
Two Step

AP3571 & 4571 Series

- **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 N_2

RoHS

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 page 783.

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

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.

Specifications

Operating Parameters		AP3571	AP4571
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		1.5 times the maximum operating pressure	
Burst pressure		3 times the maximum operating pressure	
Ambient and operating temperature		0 to 51°C (No freezing)	
Cv		0.29	0.5
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s	
	Outboard leakage	2×10^{-10} Pa·m³/s *1)	
Across the seat leak		1×10^{-10} Pa·m³/s	
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 in³ (1.07 cm³)	
Adjustable range of metered flow *2)		10 to 200 slpm	10 to 350 slpm
Tolerance of metered flow *2)	**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	±25 slpm

*1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa)
*2) At 80 psig (0.55 MPa) N_2

SMC

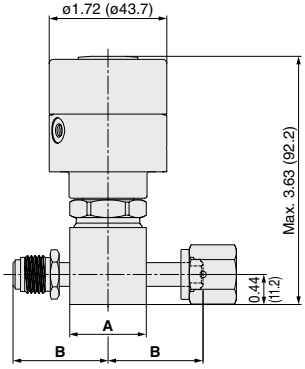
Wetted Parts Material

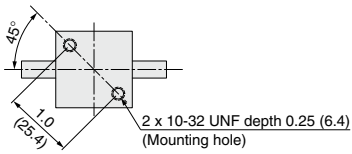
Wetted parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	Ni-Co alloy
Seat	PCTFE

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)

Diaphragm Valve for Ultra High Purity

Air operated type (Metal seated)

AP3200 Series

- **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**

RoHS

How to Order

AP32 00 S □ 2PW MV4 MV4 □ □

(Inlet) (Outlet)

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 page 783.

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

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.

Option

Code	Specification
No code	—
IS	Indicator switch ∗2)

∗2) Indication of opened/closed status

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		1.5 times the maximum operating pressure
Burst pressure		3 times the maximum operating pressure
Ambient and operating temperature		-10 to 100°C (No freezing)
Cv		0.27
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s
	Outboard leakage	2×10^{-10} Pa·m³/s ∗1)
Across the seat leak		1×10^{-7} Pa·m³/s ∗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 in³ (1.07 cm³)
Weight		1.27 kg ∗2)

∗1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗2) Weight, including individual boxed weight, may vary depending on connections or options.

Indicator Switch (Option) Specification

Code		**IS**
Switch type		SPDT
Rated voltage		Max. 30 VDC
Contact capacity		Max. 3 VA
Switching current		Max. 0.2 A
Carrying current		Max. 0.5 A
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue: Common line
		Brown: NC (When the valve is closed, the circuit is closed.)
		Black: NO (When the valve is open, the circuit is closed.)

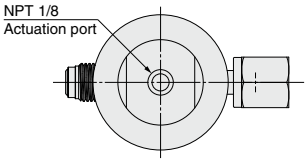
Wetted Parts Material

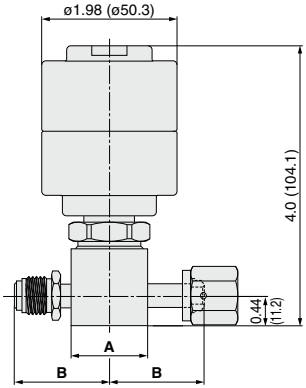
Wetted Parts	**S**
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	Ni-Co alloy

Dimensions

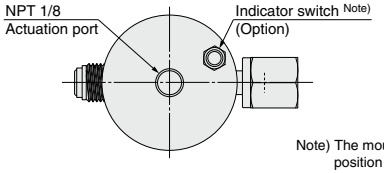
inch (mm)

AP3200

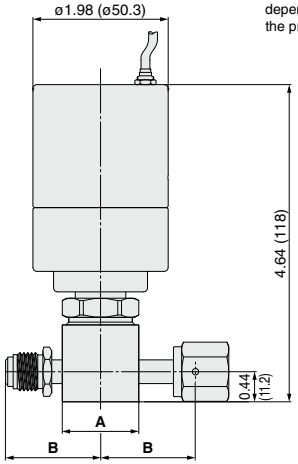


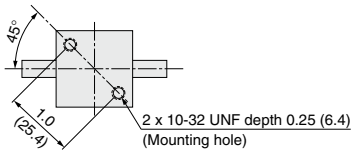


Indicator switch



Note) The mounting position varies depending on the product.





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)

Diaphragm Valve for Ultra High Purity

Manually operated type

AP3600 Series

- **Suitable for UHP gas supply line**
- **Body material: 316L SS secondary remelt**
- **LOTO standard with AP3657, optional AP3625**
- **Indicator switch available as an option (AP3650)**

RoHS

How to Order

AP 3 650 S 2PW FV4 (Inlet) FV4 (Outlet)

Size

Code	Cv
3	0.29

Model

Code	Knob
600	Multi turn round knob
625	1/4 turn lever knob
650	1/4 turn round knob with open/close indication window
657	Pull twist knob with LOTO

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy

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 page 783.

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

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.

Option (AP3650 only)

Code	Specification
No code	—
ISH	Indicator switch ∗4)

∗4) Indication of opened/closed status.

Installation option

Code	Installation
No code	Bottom mount (Standard)
P	Panel Installation ∗3)

∗3) Panel mounting hole: dia.0.78 inch (19.8 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide ∗2)

∗2) Not available with H material.

Specifications

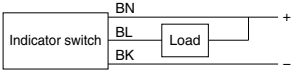
Operating Parameters		AP3600	AP3625	AP3650	AP3657
Gas		Select compatible materials of construction for the gas			
Operating pressure		Vacuum to 3000 psig (20.7 MPa)			
Proof pressure		1.5 times the maximum operating pressure			
Burst pressure		3 times the maximum operating pressure			
Ambient and operating temperature		-40 to 71°C (No freezing) ∗1)			
Cv		0.29			
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s			
	Outboard leakage	2×10^{-10} Pa·m³/s ∗2)			
Across the seat leak		1×10^{-10} Pa·m³/s			
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			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.06 in³ (1.07 cm³)			
Weight		0.36 kg ∗3)	0.45 kg ∗3)	0.73 kg ∗3)	0.4 kg ∗3)
Knob		Multi turn round knob	1/4 turn lever knob ∗4)	1/4 turn round knob with open/close indication window	Pull twist knob with LOTO ∗5)
Operational Safety Device (OSD)		N/A	Option (Part number: AP PL227) ∗6)	N/A	Standard
LOTO (Lockout)			Option (Part number: AP PL225) ∗6)		

∗1) Max. 90°C for Polyimide seat. High temperature available. Please contact SMC.
∗2) Tested with Helium gas inlet pressure 250 psig (1.7 MPa).
∗3) Weight, including individual boxed weight, may vary depending on connections or options.
∗4) Optional lever color available. Please contact SMC.
∗5) Handle must be pulled to turn open from closed.
∗6) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code		ISH
Output type		NPN
Power supply voltage		3.8 to 30 VDC
Output voltage		Max. 0.4 VDC
Supply current		Max. 11 mA
Output current		Max. 20 mA
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue (BL), Brown (BN), Black (BK)

Wiring Diagram



Wetted Parts Material

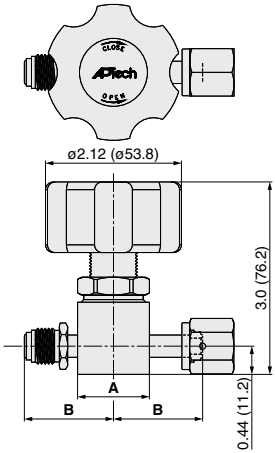
Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Ni-Co alloy	
Seat	PCTFE (Option: Polyimide)	PCTFE

SMC

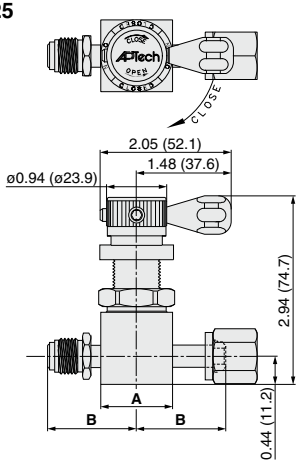
Dimensions

inch (mm)

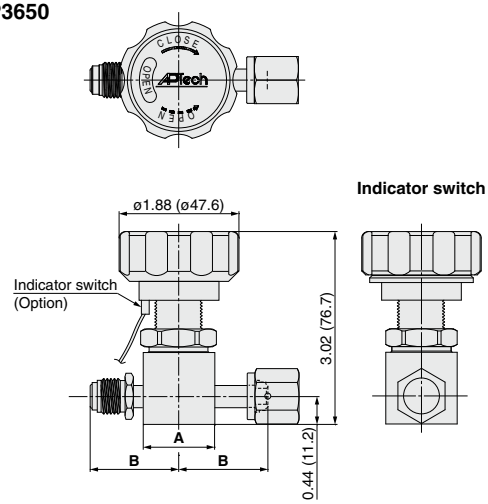
AP3600



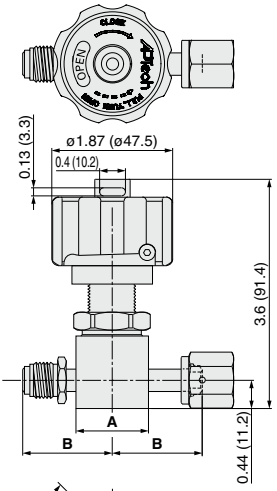
AP3625



AP3650

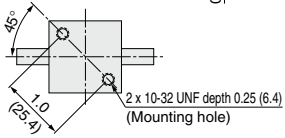


AP3657



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)
H	FV4	1.25 dia.*)	(ø31.8)	1.45	(36.8)
	MV4				
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

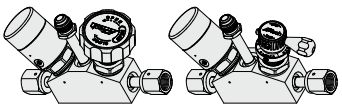
*) Ni-Cr-Mo alloy valve body is round not square.



Bottom view

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

Manually operated type

AP4600 Series

- **Suitable for UHP gas supply line**
- **Body material: 316L SS secondary remelt**
- **LOTO standard with AP4657, optional AP4625**
- **Indicator switch available as an option (AP4650)**

RoHS

How to Order

AP 4 [650] [S] [ ] 2PW [FV6] [FV6] [ ] [ ] [ ] [ ]

(Inlet) (Outlet)

Size

Code	Cv
4	0.5

Model

Code	Knob
600	Multi turn round knob
625	1/4 turn lever knob
650	1/4 turn round knob with open/close indication window
657	Pull twist knob with LOTO

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy

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 page 783.

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

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.

Option (AP4650 only)

Code	Specification
No code	—
ISH	Indicator switch *4)

*4) Indication of opened/closed status.

Installation option

Code	Installation
No code	Bottom mount (Standard)
P	Panel Installation *3)

*3) Panel mounting hole: dia.0.78 inch (19.8 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *2)

*2) Not available with H material.

Specifications

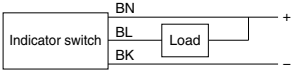
Operating Parameters		AP4600	AP4625	AP4650	AP4657
Gas		Select compatible materials of construction for the gas			
Operating pressure		Vacuum to 300 psig (2.1 MPa)			
Proof pressure		1.5 times the maximum operating pressure			
Burst pressure		3 times the maximum operating pressure			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.5			
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s			
	Outboard leakage	2×10^{-10} Pa·m³/s *2)			
Across the seat leak		1×10^{-10} Pa·m³/s			
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			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.06 in³ (1.07 cm³)			
Weight		0.36 kg *3)	0.45 kg *3)	0.73 kg *3)	0.4 kg *3)
Knob		Multi turn round knob	1/4 turn lever knob *4)	1/4 turn round knob with open/close indication window	Pull twist knob with LOTO *5)
Operational Safety Device (OSD)		N/A	Option (Part number: AP PL227) *6)	N/A	Standard
LOTO (Lockout)			Option (Part number: AP PL225) *6)		

*1) Max. 90°C for Polyimide seat. High temperature available. Please contact SMC.
*2) Tested with Helium gas inlet pressure 250 psig (1.7 MPa).
*3) Weight, including individual boxed weight, may vary depending on connections or options.
*4) Optional lever color available. Please contact SMC.
*5) Knob must be pulled to turn open from closed.
*6) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code		ISH
Output type		NPN
Power supply voltage		3.8 to 30 VDC
Output voltage		Max. 0.4 VDC
Supply current		Max. 11 mA
Output current		Max. 20 mA
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue (BL), Brown (BN), Black (BK)

Wiring Diagram



Wetted Parts Material

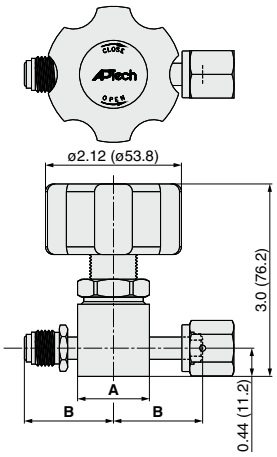
Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Diaphragm	Ni-Co alloy	
Seat	PCTFE(Option: Polyimide)	PCTFE

SMC

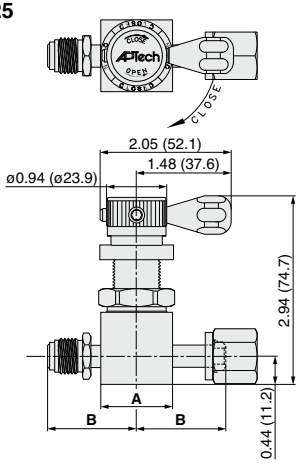
Dimensions

inch (mm)

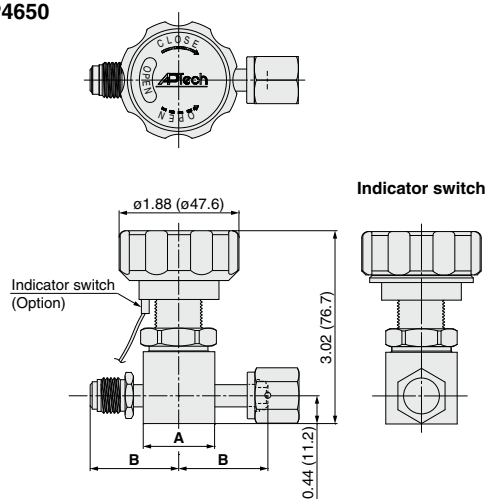
AP4600



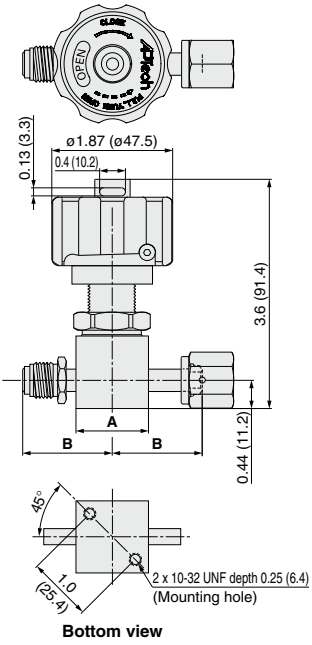
AP4625



AP4650



AP4657



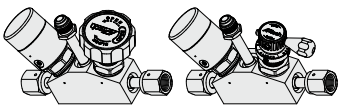
Bottom view

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)
H	FV4	1.25 dia.*)	(ø31.8)	1.45	(36.8)
	MV4				
	TW4			1.08	(27.4)
	FV6			1.93	(49.0)
	MV6				
	TW6			1.325	(33.7)

*) Ni-Cr-Mo alloy 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.



Diaphragm Valve for Ultra High Purity

Manually operated type
(For high pressure and high flow)

AP3100 Series

- **Suitable for UHP gas supply line**
- **Body material: 316L SS secondary remelt**
- **High pressure type: 20.7 MPa and 9 MPa**
- **Designed for bulk specialty gas (BSGS) delivery**
- **LOTO standard with AP3157, optional AP3125**

RoHS

How to Order

AP31 [00] [S] [ ] [2PW] [MV8] [MV8] [ ] [ ]

(Inlet) (Outlet)

Model

Code	Maximum operating pressure	Cv	Knob
00	3000 psig (20.7 MPa) ∗1)	0.7	Multi turn round knob
02	1300 psig (9.0 MPa)	1.3	
25	3000 psig (20.7 MPa) ∗1)	1.0	1/4 turn lever knob
50	1300 psig (9.0 MPa)	1.0	1/4 turn round knob
57	1300 psig (9.0 MPa)	1.0	Pull twist knob with LOTO

∗1) 2400 psig (16.5 MPa) for connection size 3/4 inch.

Material

Code	Body material
S	316L SS secondary remelt
H	Ni-Cr-Mo alloy ∗2)

∗2) Special export controls apply to Ni-Cr-Mo alloy 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) ∗3)
MV12	3/4 inch face seal (Male) ∗3)
TW12	3/4 inch tube weld

∗3) Prepare a suitable mating fitting with a rated pressure.

Option (AP3150 only)

Code	Specification
No code	—
ISH	Indicator switch ∗5)

∗5) Indication of opened/closed status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide ∗4)

∗4) Not available with H material.

Specifications

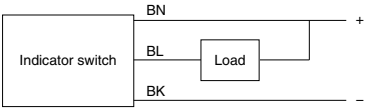
Operating Parameters		AP3100	AP3102	AP3125	AP3150	AP3157
Gas		Select compatible materials of construction for the gas				
Operating pressure		Vacuum to 3000 psig (20.7 MPa)	Vacuum to 1300 psig (9.0 MPa)	Vacuum to 3000 psig (20.7 MPa)	Vacuum to 1300 psig (9.0 MPa)	
Proof pressure		1.5 times the maximum operating pressure				
Burst pressure		3 times the maximum operating pressure				
Ambient and operating temperature		-40 to 65°C (No freezing) ∗1)				
Cv ∗2)		0.7	1.3	1.0		
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s				
	Outboard leakage	2×10^{-10} Pa·m³/s ∗3)				
Across the seat leak		1×10^{-10} Pa·m³/s				
Surface finish		Ra max 15 µin. (0.4 µm) Option: 10 µin. (0.25 µm)				
Connections		Face seal , Tube weld				
Installation		Bottom mount				
Internal volume		0.36 in³ (6.0 cm³)				
Weight		1.27 kg ∗4)				
Knob		Multi turn round knob (1 1/2 turn)		1/4 turn lever knob ∗5)	1/4 turn round knob with open/close indication window ∗6)	Pull twist knob ∗7)
Operational Safety Device (OSD)		N/A		Option (Part number: AP PL227) ∗8)	N/A	Standard
LOTO (Lockout)				Option (Part number: AP PL225) ∗8)		

∗1) Max. 90°C for Polyimide seat.
∗2) Figure of 1/2 inch connection.
∗3) Tested with Helium gas inlet pressure 500 psig (3.5 MPa).
∗4) Weight, including individual boxed weight, may vary depending on connections or options.
∗5) Optional lever color available. Please contact SMC.
∗6) Optional indicator switch available. Please contact SMC.
∗7) Knob must be pulled to turn open from closed.
∗8) Refer to the specification for options. (P.782)

Indicator Switch (Option) Specification

Code		ISH
Output type		NPN
Power supply voltage		3.8 to 30 VDC
Output voltage		Max. 0.4 VDC
Supply current		Max. 11 mA
Output current		Max. 20 mA
Cable	**Lead wire**	AWG 24
	Cable length	3 m
	Color (Lead wire)	Blue (BL), Brown (BN), Black (BK)

Wiring Diagram



SMC

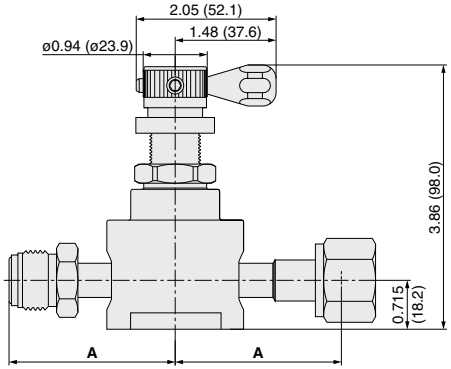
Wetted Parts Material

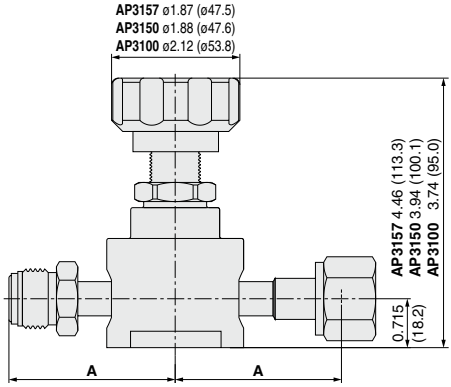
Wetted Parts	S	H
Body	316L SS secondary remelt	Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation	Electropolish
Spring	316L SS	Ni-Cr-Fe alloy
Diaphragm	Ni-Co alloy	
Poppet	316L SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

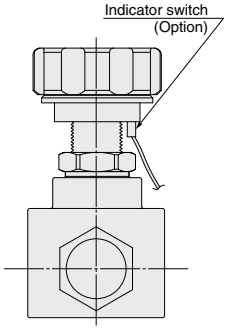
inch (mm)

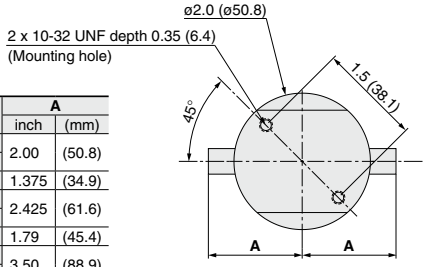
AP3125





AP3150
Indicator switch





Bottom view

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

Diaphragm Valve for Ultra High Purity

Manually operated type (For high flow)

AP3800 & 3900 Series

- **Suitable for UHP gas supply line**
- **Body material: 316L SS secondary remelt**
- **Purge ports and monoblock configurations available**
- **LOTO available (AP3900)**

RoHS

How to Order

AP 3800 S M MV8 (Inlet) MV8 (Outlet) 00 ☐ ☐

Model

Code	Knob
3800	Round knob with open/close indication window
3900	Pull twist knob with LOTO

Material

Code	Body material
S	316L SS secondary remelt

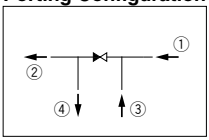
Surface finish

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)

Connections (Inlet①, Outlet②)

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

Porting Configuration



Purge port option

Code	Specification
No code	—
C	Capped purge port

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide

Purge port ∗1)

Code	Inlet③	Outlet④
00	None	None
M0	Available	None
0B	None	Available
MB	Available	Available

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

Specifications

Operating Parameters		AP3800	AP3900
Gas		Select compatible materials of construction for the gas	
Operating pressure		Vacuum to 250 psig (1.7 MPa)	
Proof pressure		1.5 times the maximum operating pressure	
Burst pressure		3 times the maximum operating pressure	
Ambient and operating temperature		-40 to 71°C (No freezing)	
Cv		2.8	
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s	
	Outboard leakage	2×10^{-10} Pa·m³/s ∗1)	
Across the seat leak		1×10^{-10} Pa·m³/s	
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	
Installation		Bottom mount	
Internal volume		0.76 in³ (12.52 cm³)	
Weight		1.36 kg ∗2)	1.45 kg ∗2)
Knob		Round knob with open/close indication window	Pull twist knob ∗3)
LOTO (Lockout)		N/A	Standard

∗1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗2) Weight, including individual boxed weight, may vary depending on connections or options.
∗3) Knob must be pulled to turn open from closed.

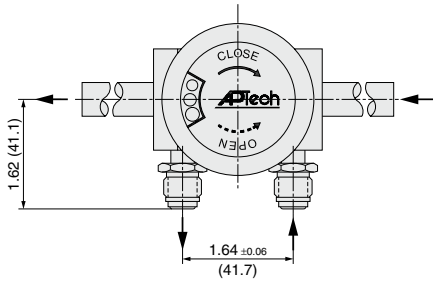
Wetted Parts Material

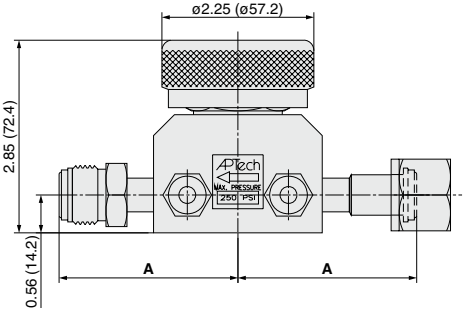
Wetted Parts	S
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	316L SS
Seat	PCTFE (Option: Polyimide)

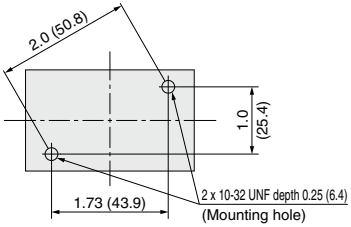
Dimensions

inch (mm)

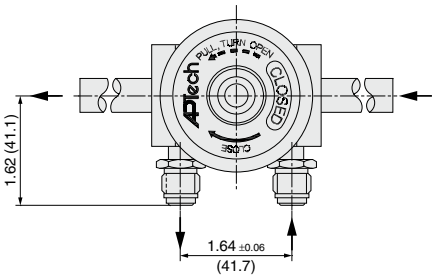
AP3800

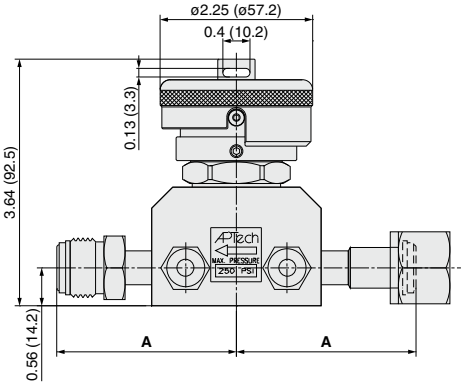


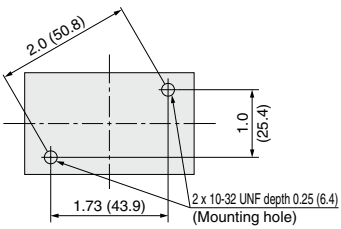




AP3900







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

Diaphragm Valve for Ultra High Purity

Manually operated type (Metal seated)

AP3260 Series

- **Suitable for UHP gas supply line**
- **Body material: 316L SS secondary remelt**
- **All metal wetted parts**

RoHS

How to Order

AP32 60 S □ 2PW MV4 MV4 □ □

(Inlet) (Outlet)

Manually operated type

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 page 783.

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

Installation option

Code	Installation
No code	Bottom mount (Standard)
P	Panel Installation ∗2)

∗2) Panel mounting hole: dia. 0.78 inch (19.8 mm).

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.

Specifications

Operating Parameters		**AP3260**
Gas		Select compatible materials of construction for the gas
Operating pressure		Vacuum to 125 psig (0.9 MPa)
Proof pressure		1.5 times the maximum operating pressure
Burst pressure		3 times the maximum operating pressure
Ambient and operating temperature		-40 to 90°C (No freezing)
Cv		0.27
Leak rate	**Inboard leakage**	2×10^{-11} Pa·m³/s
	Outboard leakage	2×10^{-10} Pa·m³/s ∗1)
Across the seat leak		1×10^{-7} Pa·m³/s ∗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
Installation		Bottom mount (Option: panel mount)
Internal volume		0.06 in³ (1.07 cm³)
Weight		0.36 kg ∗2)
Knob		Multi turn round knob

∗1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).
∗2) Weight, including individual boxed weight, may vary depending on connections or options.

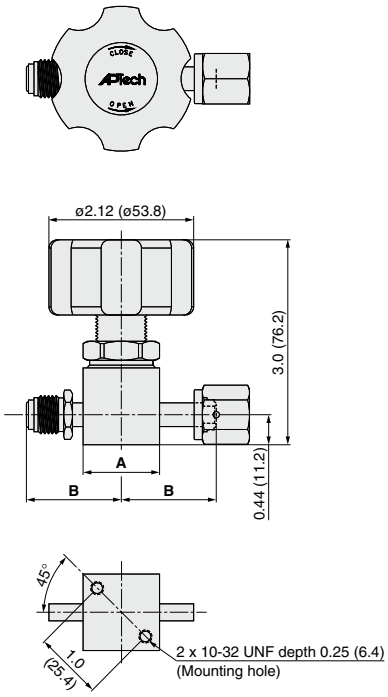
Wetted Parts Material

Wetted Parts	**S**
Body	316L SS secondary remelt
Surface finish	Electropolish + Passivation
Diaphragm	Ni-Co alloy

Dimensions

inch (mm)

AP3260



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)

LOTO Options
for Diaphragm Valves

∗ Made to order specifications

Lockout Device/For Air Operated Valve (Order Separately)

Product number: AP PL210

Feature

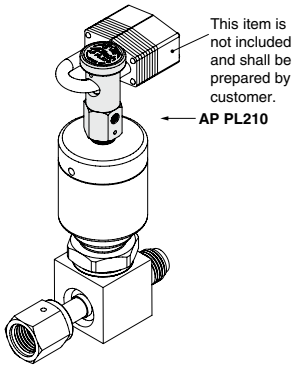
- Lockable by installing the AP PL210 to the actuation port of air operated valve (only available for N.C. with actuation port connection NPT 1/8 inch)
- Prevent accidental valve opening by manually shutting off actuation pressure
- Lockable only in the closed position
- Accept standard pad lock with 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)

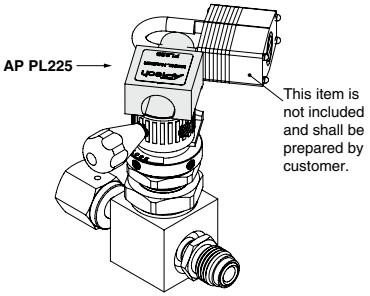
Product number: AP PL225

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)

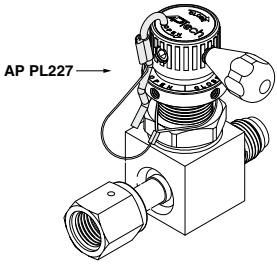
Product number: AP PL227

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** **□** **□** **□**

(①) (②) (③) (④)

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

Ports

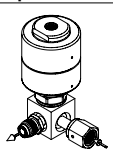
Code	Ports	Configuration
2PW	2 ports	Refer to the following (Port specification)
2PWA		
2PWB		
2PWC		
3PWD	3 ports	
3PWE		
3PWF		
3PWG		
3PWH		
3PWJ		
4PWK	4 ports	
4PWL		
4PWM		
4PWN		

Connections
(Number indicates the port location)

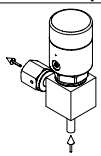
Code	Connections
No code	No port
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld
FV6	3/8 inch face seal (Female)
MV6	3/8 inch face seal (Male)
TW6	3/8 inch tube weld

Option
Depends on the product series

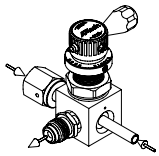
Examples of The Many Available options



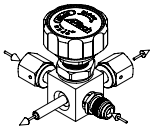
AP3000S
2PWC FV4 MV4



AP3550S
2PWB TW4 FV4



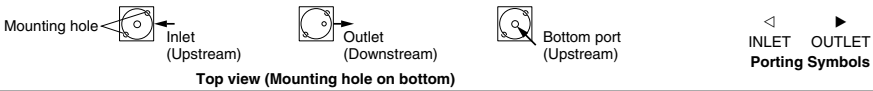
AP3625S
3PWD TW4 MV4 FV4



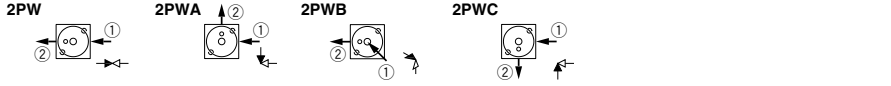
AP3650S
4PWM MV4 TW4 FV4 FV4

Port Specifications

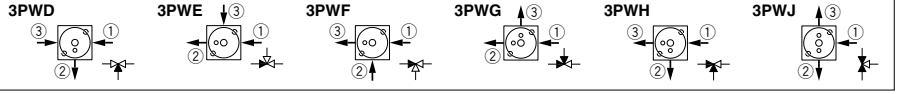
Valves are illustrated top view looking down through the valve.
The traditional flow direction is INLET to OUTLET, but AP Tech valves may be employed in either flow direction.
Port locations are indicated by numbers.
INLET (Upstream) is defined as a port connected to the region below the valve seat. 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.



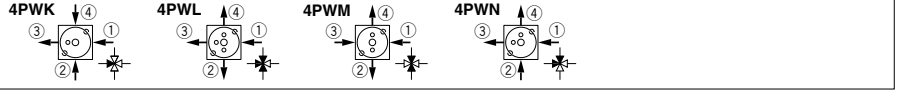
Top view (Mounting hole on bottom)



2 Ports



3 Ports



4 Ports

Process Gas Equipment/Diaphragm Valve Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 633 and 634 for Process Gas Equipment Precautions.

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 M5 female thread 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.