

Diaphragm Valve for Ultra High Purity

Manually operated type
(For high pressure and high flow)

Series AP3100

- 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



How to Order

AP31 00 S 2PW MV8 MV8

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)

(Inlet) (Outlet)

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

Option (AP3150 only)

Code	Specification
No code	—
ISH	Indicator switch Handle *4)

*4) Indication of opened/closed status.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)

*3) 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) *1)	Vacuum to 1300 psig (9.0 MPa)	Vacuum to 3000 psig (20.7 MPa) *1)	Vacuum to 1300 psig (9.0 MPa)	
Proof pressure	4500 psig (31 MPa)				
Burst pressure	10000 psig (69 MPa)				
Ambient and operating temperature	-40 to 65 °C (No freezing) *2)				
Cv *3)	0.7	1.3		1.0	
Leak rate	2 x 10 ⁻¹¹ Pa·m ³ /sec				
Inboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /sec *4)				
Outboard leakage	4 x 10 ⁻⁹ Pa·m ³ /sec *4)				
Across the seat leak	Ra max 15 μin. (0.4 μm) Option: 10 μin. (0.25 μm)				
Surface finish					
Connections	Face seal, Tube weld				
Installation	Bottom mount				
Internal volume	0.36 in ³ (6.0 cm ³)				
Weight	1.27 kg *5)				
Knob	Multi turn round knob (1 1/2 turn)		1/4 turn lever knob *6)	1/4 turn round knob with open/close indication window *7)	Pull twist knob *8)
Operational Safety Device (OSD)			Option (Part number: AP PL227) *9)	N/A	Standard
LOTO (Lockout)		N/A	Option (Part number: AP PL225) *9)		

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

*2) -10 to 90 °C for Polyimide seat.

*3) Figure of 1/2 inch connection.

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

*5) Weight, including individual boxed weight, may vary depending on connections or options.

*6) Optional lever color available. Please contact SMC.

*7) Optional indicator switch available. Please contact SMC.

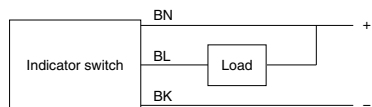
*8) Handle must be pulled to turn open from closed.

*9) Refer to the specification for options. (P.1088)

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



Diaphragm Valve for Ultra High Purity *Series AP3100*

Manually operated type (For high pressure and high flow)

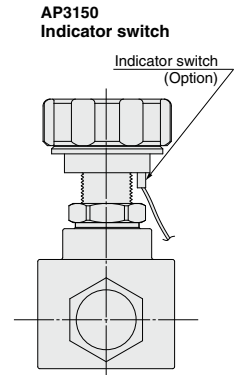
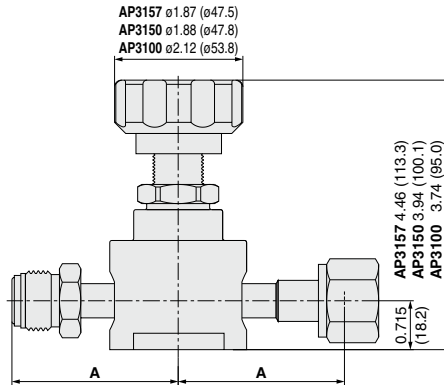
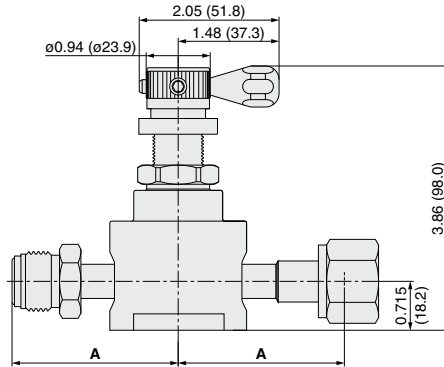
Wetted Parts Material

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

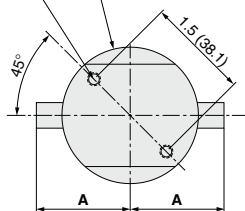
Dimensions

inch (mm)

AP3125



$\phi 2.0$ ($\phi 50.8$)
 2 x 10-32 UNF depth 0.35 (8.9)
 (Mounting hole)



Bottom view

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

AP

SL

AZ

AK

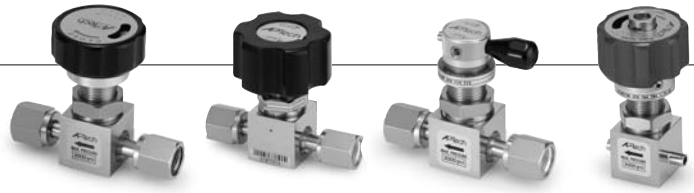
BP

Diaphragm Valve for Ultra High Purity

Manually operated type

Series AP3600

- 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)



How to Order

AP 3 650 S 2PW FV4 FV4

(Inlet) (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	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.

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	Vespel® *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	4000 psig (27.6 MPa)			
Burst pressure	8000 psig (55.2 MPa)			
Ambient and operating temperature	-40 to 160°F (-40 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			
Installation	Bottom mount (Option: panel mount)			
Internal volume	0.06 in ³ (1.07 cm ³)			
Mass	0.8 lbs (0.36 kg) *3)	0.99 lbs (0.45 kg) *3)	1.61 lbs (0.73 kg) *3)	0.88 lbs (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) 14 to 194°F (-10 to 90°C) for Vespel® seat. High temperature available. Please contact SMC.

*2) Tested with Helium gas inlet pressure 250 psig (1.7 MPa).

*3) Mass, 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.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

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

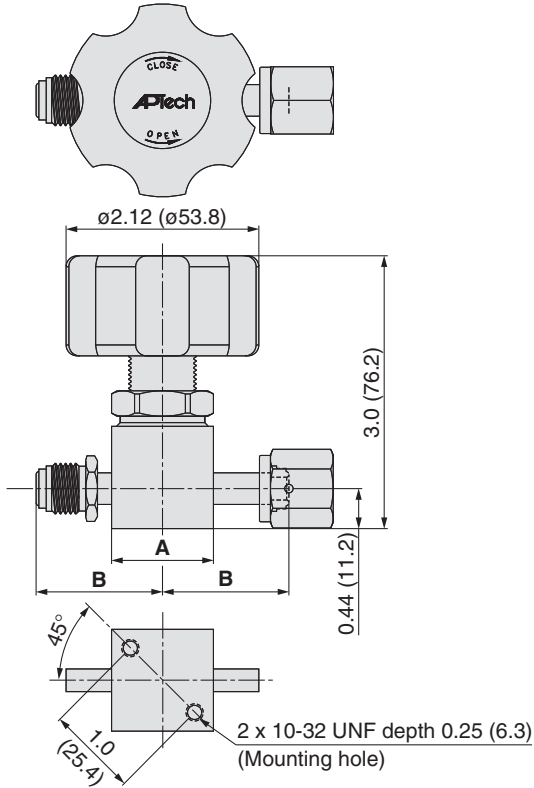
Diaphragm Valve for Ultra High Purity

Manually operated type **Series AP3600**

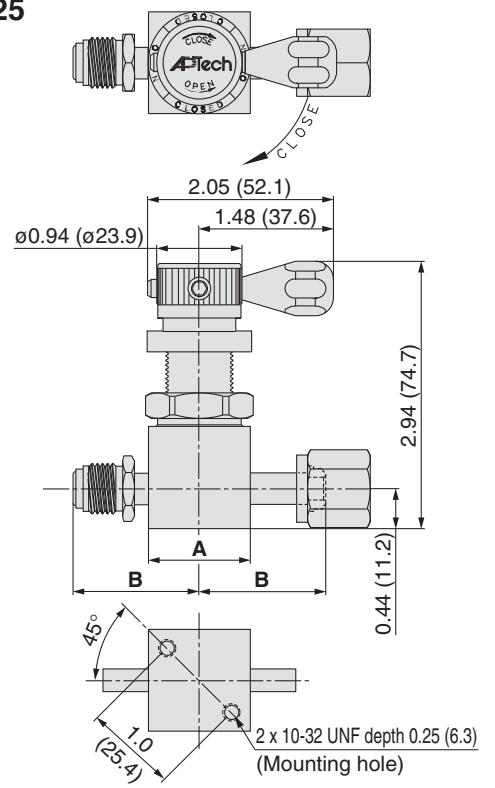
Dimensions

inch (mm)

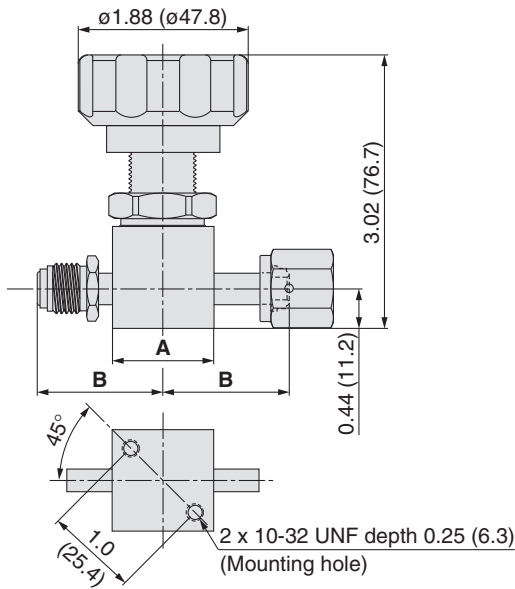
AP3600



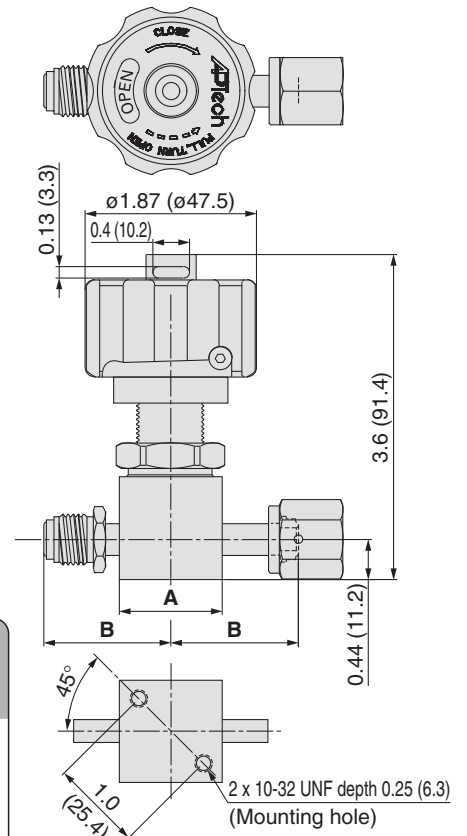
AP3625



AP3650



AP3657



Material	Connections	A		B	
		inch	(mm)	inch	(mm)
S	FV4	1.12 sq.	(28.4)	1.39	(35.3)
	MV4			1.06	(26.9)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6			1.325	(33.7)
H	FV4	1.25 dia. *)	(31.8)	1.45	(36.8)
	MV4			1.08	(27.4)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6			1.325	(33.7)

*) 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.



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

Manually operated type

Series AP4600

- 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)



How to Order

(Inlet) (Outlet)

AP 4 650 S 2PW FV6 FV6

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	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.

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 (44.5mm)

*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	Vespel® *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 250 psig (1.7 MPa)			
Proof pressure	1000 psig (6.9 MPa)			
Burst pressure	8000 psig (55.2 MPa)			
Ambient and operating temperature	-40 to 160°F (-40 to 71°C) (No freezing) *1)			
Cv	0.5			
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			
Installation	Bottom mount (Option: panel mount)			
Internal volume	0.06 in ³ (1.07 cm ³)			
Mass	0.8 lbs (0.36 kg) *3)	0.99 lbs (0.45 kg) *3)	1.61 lbs (0.73 kg) *3)	0.88 lbs (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) 14 to 194°F (-10 to 90°C) for Vespel® seat. High temperature available. Please contact SMC.
 *2) Tested with Helium gas inlet pressure 250 psig (1.7 MPa).
 *3) Mass, 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.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

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

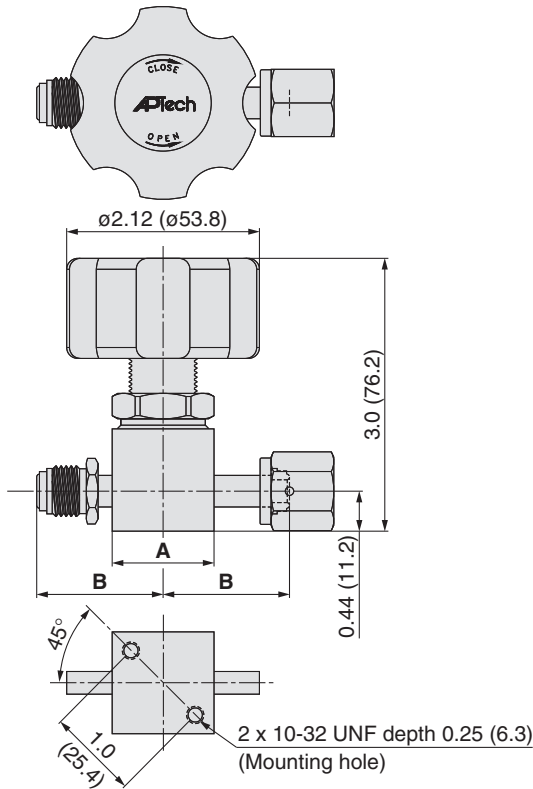
Diaphragm Valve for Ultra High Purity

Manually operated type **Series AP4600**

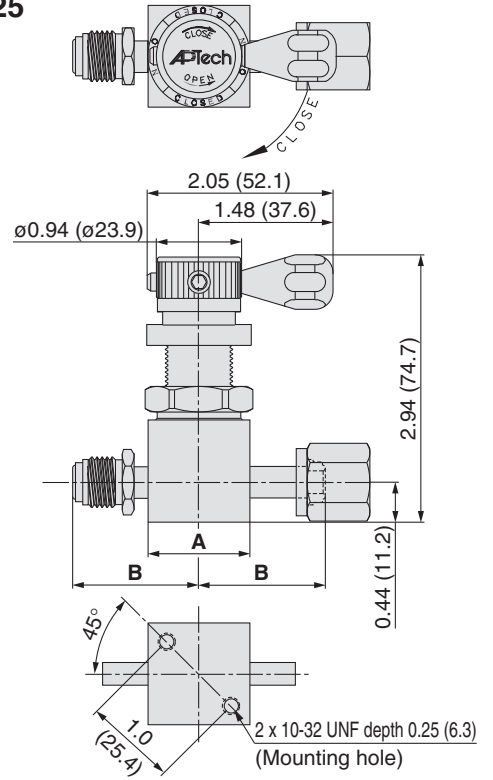
Dimensions

inch (mm)

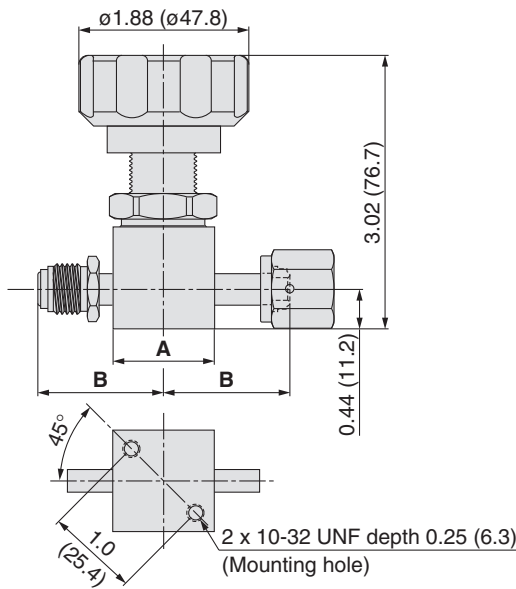
AP4600



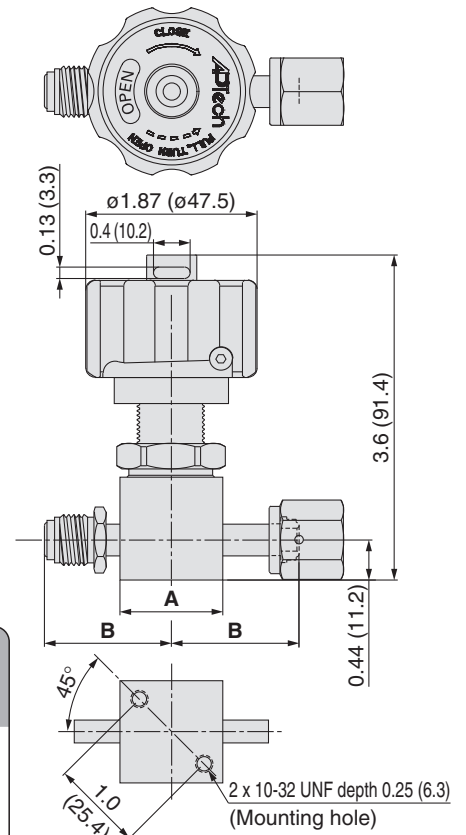
AP4625



AP4650



AP4657



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			1.325	(33.7)
H	FV4	1.25 dia.*	(31.8)	1.45	(36.8)
	MV4			1.08	(27.4)
	TW4			1.93	(49.0)
	FV6			1.325	(33.7)
	MV6			1.325	(33.7)

*) 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.



- 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

Manually operated type
(Metal seated)

Series AP3260

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



How to Order

(Inlet) (Outlet)

AP32 60 S **2PW** **MV4** **MV4**

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 P. 125.

Installation option

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

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

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		AP3260
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		-40 to 194°F (-40 to 90°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
Installation		Bottom mount (Option: panel mount)
Internal volume		0.06 in ³ (1.07 cm ³)
Mass		0.79 lbs (0.36 kg) *2)
Knob		Multi turn round knob

*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®

Elgiloy® is a registered trademark of Elgiloy Specialty Metals.

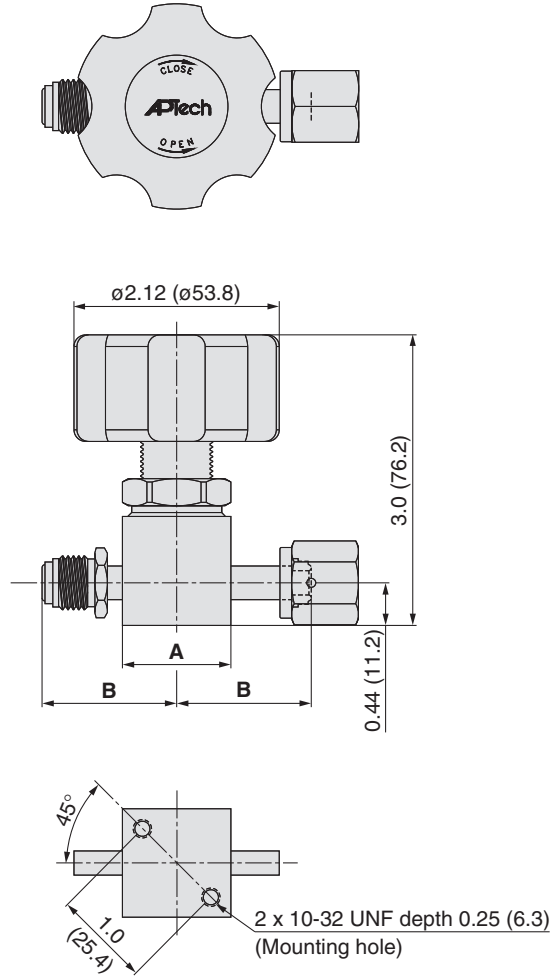
Diaphragm Valve for Ultra High Purity *Series AP3260*

Manually operated type (Metal seated)

Dimensions

inch (mm)

AP3260



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				

Recommendations

Regulators

AP

SL

AZ

AK

KT

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

Precautions

LOTO Options for Diaphragm Valves

* Made to order specifications

Lockout Device/For Air Operated Valve (Order Separately)

Product number: AP PL210

Feature

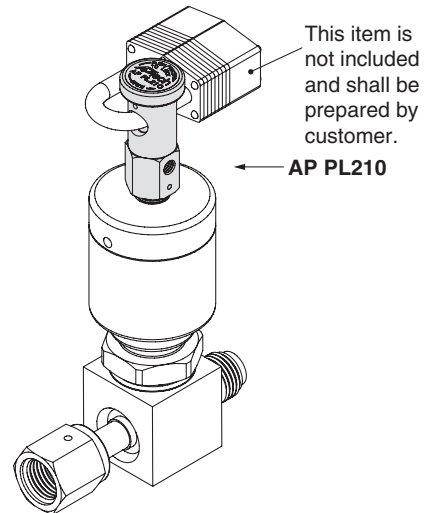
- Lockable by installing the AP PL210 to the actuation port of air operated valve (only available for N.C. with actuation port connection NPT 1/8 inch)
- Prevent accidental valve opening by manually shutting off actuation pressure
- Lockable only in the closed position
- Accept standard pad lock with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

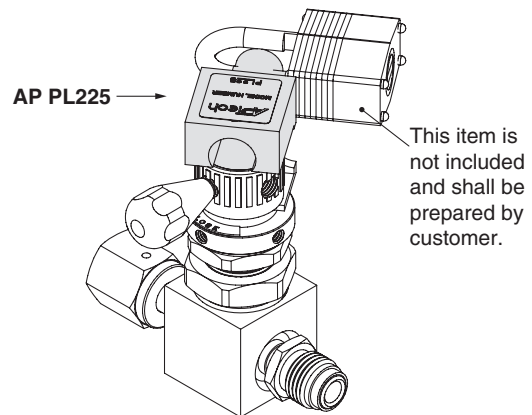
Product number: AP PL225

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)

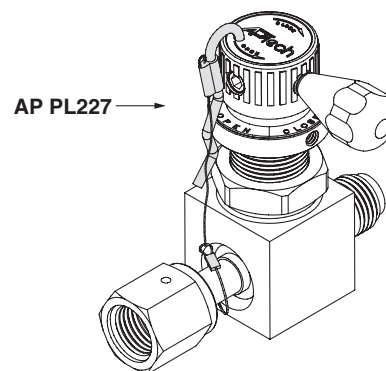
Product number: AP PL227

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

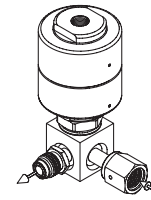
Surface finish
Depends on the product series

Ports

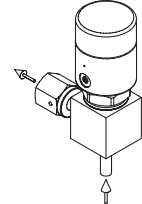
Code	Ports	Configuration
2PW	2 ports	Refer to the following (Port specification)
2PWA		
2PWB		
2PWC		
3PWD	3 ports	Refer to the following (Port specification)
3PWE		
3PWF		
3PWG		
3PWH		
3PWJ		
4PWK	4 ports	Refer to the following (Port specification)
4PWL		
4PWM		
4PWN		

Option Depends on the product series

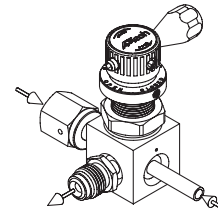
Examples of The Many Available options



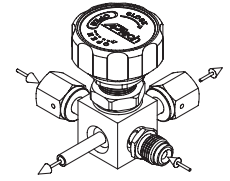
AP3000S
2PWC FV4 MV4



AP3550S
2PWB TW4 FV4



AP3625S
3PWD TW4 MV4 FV4



AP3650S
4PWM MV4 TW4 FV4 FV4

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

Port Specifications

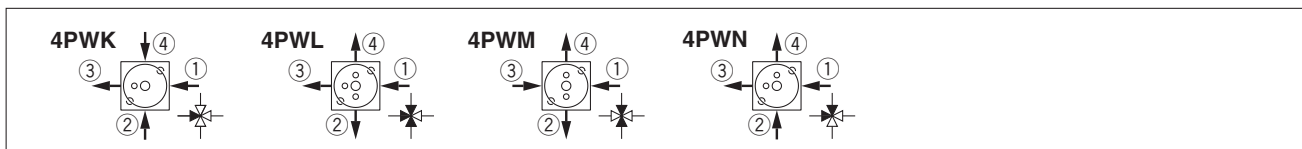
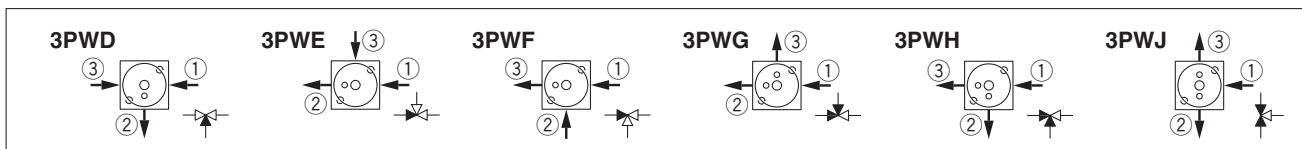
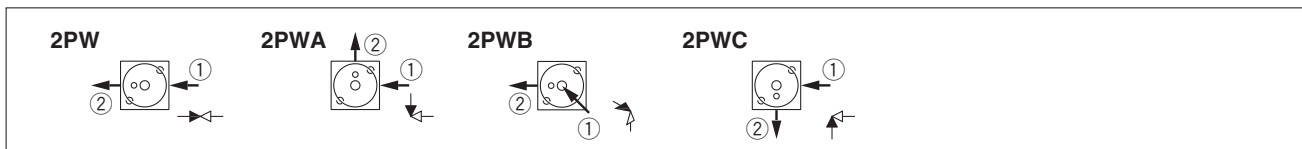
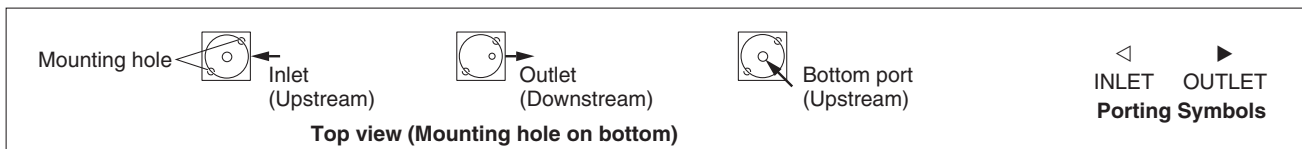
Valves are illustrated top view looking down through the valve.

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.



2 Ports

3 Ports

4 Ports



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

Manually operated type
(For high flow)

Series AP3800 & 3900

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



How to Order

AP **3800** **S** **M** **MV8** **MV8** **00**

(Inlet) (Outlet)

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 min. (0.4mm) Standard
M	10 μin. (0.25 μm)
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Purge port option

Code	Specification
No code	—
C	Capped purge port

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Vespel®

Purge port *1)

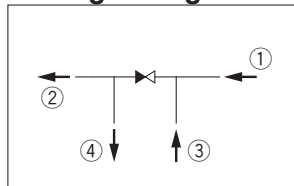
Code	Inlet ^③	Outlet ^④
00	None	None
M0	Available	None
0B	None	Available
MB	Available	Available

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

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

Porting Configuration



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		500 psig (3.4 MPa)	
Burst pressure		1000 psig (6.9 MPa)	
Ambient and operating temperature		-40 to 160°F (-40 to 71°C) (No freezing) *1)	
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 *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), 7μin.(0.18 μm), 5 μin.(0.13 μm)	
Connections		Face seal, Tube weld	
Installation		Bottom mount	
Internal volume		0.76 in ³ (12.52 cm ³)	
Mass		3 lbs (1.36 kg) *3)	3.20 lbs (1.45 kg) *3)
Knob		Round knob with open/close indication window	Pull twist knob *4)
LOTO (Lockout)		N/A	Standard

*1) 14 to 194°F (-10 to 90°C) for Vespel® seat.

*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) Handle 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: Vespel®)

Vespel® is a registered trademark of DuPont.

Diaphragm Valve for Ultra High Purity *Series AP3800 & 3900*

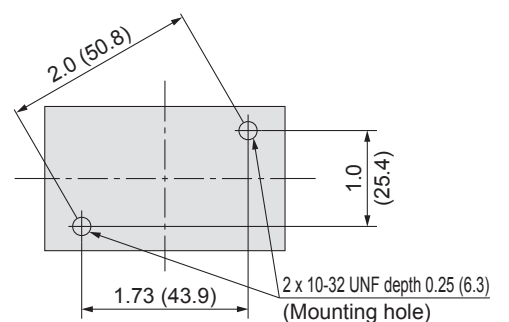
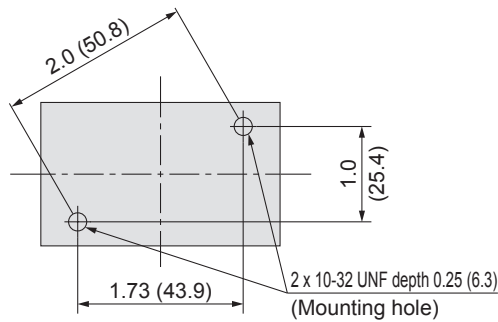
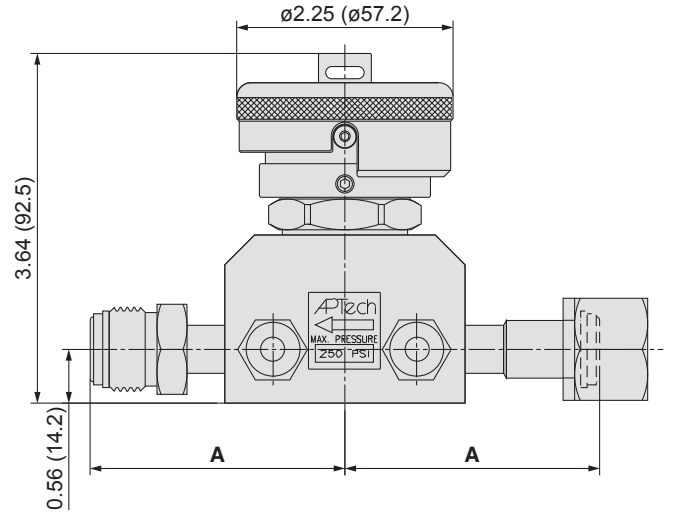
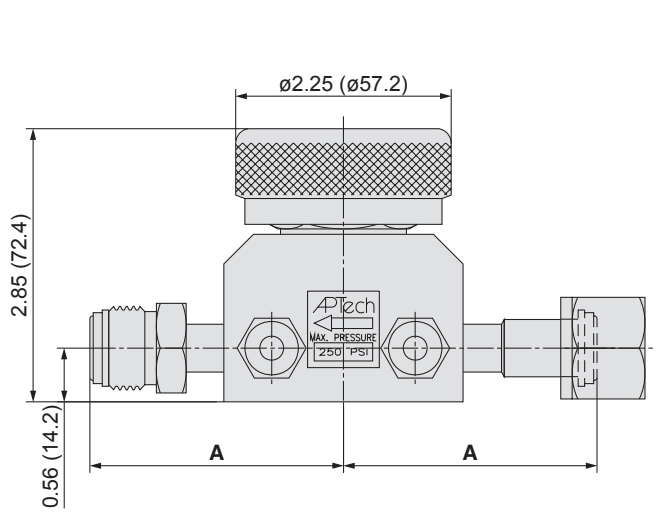
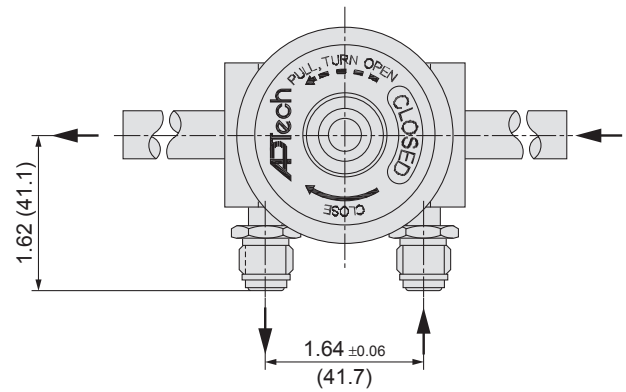
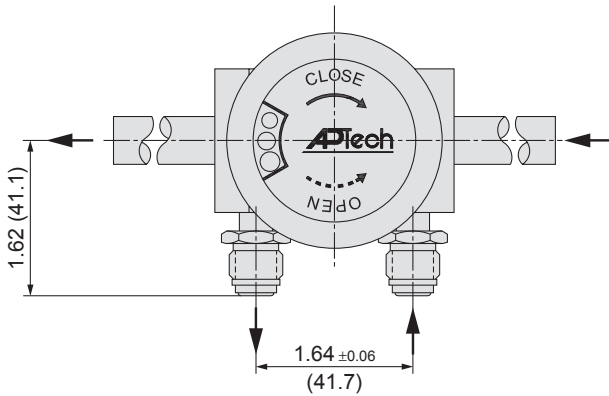
Manually operated type (For high flow)

Dimensions

inch (mm)

AP3800

AP3900



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.

Recommendations

Regulators

AP

SL

AZ

AK

KT

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

Precautions